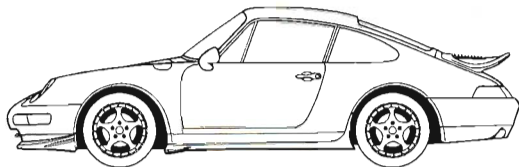


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911 Carrera

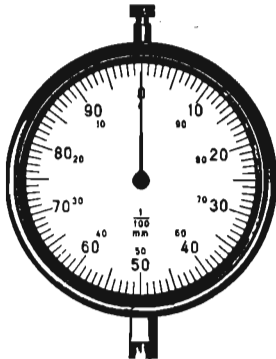
911 Carrera 4

911 Carrera RS

94 Model

95 Model

Technical Speci- fications



Preface

This booklet

Technical Specifications

provides the Porsche mechanic with dimensions and adjustment values for carrying out repairs in the correct manner.

We assume that those concerned are familiar with the operations described in the Repair Manual.

When looking up the various data, be sure to cross check against the Technical Information; the specified values may change.

Technical Specifications

**911 Carrera (993)
94, 95 Models**

**911 Carrera 4 (993)
95 Model**

**911 Carrera RS (993)
95 Model**

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Conversion Factors and Dimensioning Units

	Former Unit		New Units
Pressure	Technical atmosphere	at (kp/cm ²)	Bar (bar)
Output	Horsepower	HP	Kilowatt (kW)
Force	Kilopond	kp	Newton (N)
Torque	Kilopondmeter	kpm	Newtonmeter (Nm)

Conversion Factors

at (kp/cm ²)	into bar	x 0.981
kp	into N	x 9.81
HP	into kW	x 0.736
kpm	into Nm	x 9.81
Nm	into ftlb	x 0.737
m/s	into km/h	x 3.6
at	into mmHg	x 735.56
km/h	into mph (miles)	x 0.621
°F (Fahrenheit)	into °C	(°F-32)x0.555
l	into U.S. gal	x 0.264
l	into Imp. gal	x 0.22

The conversion factor 10 can be used to convert tightening torques from kpm into Nm. This is sufficient for workshop applications.

Survey of Type Designations – Overview of 911 Carrera (1993)

Model- Year- Designation	Vehicle- Type Designation	Engine- Type Designation	Dis- place-DIN kW (act- ual) (cm3)	Output at rpm	Stroke/ Bore (mm)	Com- pression ratio
	T = Tiptronic					ε
1994	Coupe RoW	M64/05	3600	200(272)	76.4/100	11.3:1
	Coupe RoW	T M64/06	3600	200(272)	76.4/100	11.3:1
	Cabrio RoW	M64/05	3600	200(272)	76.4/100	11.3:1
	Cabrio RoW	T M64/06	3600	200(272)	76.4/100	11.3:1
	Coupe Taiwan	T M64/06	3600	200(272)	76.4/100	11.3:1
	Cabrio Taiwan	T M64/06	3600	200(272)	76.4/100	11.3:1
1995	Coupe RoW	M64/05	3600	200(272)	76.4/100	11.3:1
	Coupe RoW	T M64/06	3600	200(272)	76.4/100	11.3:1
	Cabrio RoW	M64/05	3600	200(272)	76.4/100	11.3:1
	Cabrio RoW	T M64/06	3600	200(272)	76.4/100	11.3:1
	RS M002	M64/20	3750	220(300)	76.4/102	11.3:1
	RS M003	M64/20	3750	220(300)	76.4/102	11.3:1
	RS M002+M003 CH	M64/20	3750	220(300)	76.4/102	11.3:1
	Coupe USA/Canada	M64/07	3600	200(272)	76.4/100	11.3:1
	Coupe USA/Canada	T M64/08	3600	200(272)	76.4/100	11.3:1
	Cabrio USA/Canada	M64/07	3600	200(272)	76.4/100	11.3:1
	Cabrio USA/Canada	T M64/08	3600	200(272)	76.4/100	11.3:1
	Coupe USA/Canada	M64/07	3600	200(272)	76.4/100	11.3:1
	Coupe USA/Canada	T M64/08	3600	200(272)	76.4/100	11.3:1
	Cabrio USA/Canada	M64/07	3600	200(272)	76.4/100	11.3:1
	Cabrio USA/Canada	T M64/08	3600	200(272)	76.4/100	11.3:1

Fuel Induc- tion System	Engine Numbers	Trans- mis- sion Type	Chassis Numbers
SU= Super Unleaded			
DME SU	63R00001-20000	G50/21	WP0 ZZZ 99 ZRS3 10001-19000
DME SU	63R50001-60000	A50/04	WP0 ZZZ 99 ZRS3 10001-19000
DME SU	63R00001-20000	G50/21	WP0 ZZZ 99 ZRS3 30001-39000
DME SU	63R50001-60000	A50/04	WP0 ZZZ 99 ZRS3 30001-39000
DME SU	64R50001-60000	A50/05	WP0 AA2 99 ZRS3 10001-19000
DME SU	64R50001-60000	A50/05	WP0 CA2 99 ZRS3 30001-39000
DME SU	63S00001-20000	G50/21	WP0 ZZZ 99 ZSS3 10001-19000
DME SU	63S00001-20000	G50/21	WP0 ZZZ 99 ZSS3 10001-19000
DME SU	63S00001-20000	G50/21	WP0 ZZZ 99 ZSS3 30001-39000
DME SU	63S00001-20000	G50/21	WP0 ZZZ 99 ZSS3 30001-39000
DME SU	63S85001-90000	G50/31	WP0 ZZZ 99 ZSS3 90001-90400
DME SU	63S85001-90000	G50/32	WP0 ZZZ 99 ZSS3 90001-90400
DME SU	63S85001-90000	G50/33	WP0 ZZZ 99 ZSS3 90001-90400
DME SU	64R00001-20000	G50/20	WP0 AA2 99 ©SS3 20001-29000
DME SU	64R50001-60000	A50/05	WP0 AA2 99 ©SS3 20001-29000
DME SU	64R00001-20000	G50/20	WP0 CA2 99 ©SS3 40001-49000
DME SU	64R50001-60000	A50/05	WP0 CA2 99 ©SS3 40001-49000
DME SU	64S00001-20000	G50/20	WP0 AA2 99 ©SS3 20001-29000
DME SU	64S50001-60000	A50/05	WP0 AA2 99 ©SS3 20001-29000
DME SU	64S00001-20000	G50/20	WP0 CA2 99 ©SS3 40001-49000
DME SU	64S50001-60000	A50/05	WP0 CA2 99 ©SS3 40001-49000

Survey of Type Designations – Overview of 911 Carrera 4 (993)

Model- Year- Designation	Vehicle- Type Designation	Engine- Type Designation	Dis- place- ment- (act- ual) (cm3)	Output DIN kW at rpm	Stroke/ Bore (mm)	Com- pression ratio
	T = Tiptronic					ε
1995	Coupe RoW	M64/05	3600	200(272)	76.4/100	11.3:1
	Cabrio RoW	M64/05	3600	200(272)	76.4/100	11.3:1
	Coupe USA/Canada	M64/07	3600	200(272)	76.4/100	11.3:1
	Cabrio USA/Canada	M64/07	3600	200(272)	76.4/100	11.3:1

Fuel Induc- tion System	Engine Numbers	Trans- mis- sion Type	Chassis Numbers
SU= Super Unleaded			
DME SU	63S00001-20000	G64/21	WP0 ZZZ 99 ZSS3 10001-19000
DME SU	63S00001-20000	G64/21	WP0 ZZZ 99 ZSS3 30001-39000
DME SU	64S00001-20000	G64/20	WP0 AA2 99 ©SS3 20001-29000
DME SU	64S00001-20000	G64/20	WP0 CA2 99 ©SS3 40001-49000

Structure of Engine Codes

Explanation of Digits:

1	2	3	45678
Type of Drive Unit	Engine Type	Model Year	Serial Number
6 = 6-Cyl. Engine	3 = 993 nat.asp. RoW 4 = 964 nat.asp. USA	R = 1994 S = 1995	00001...99999 00001...99999

The first serial number in each case is 501

Example: 63R00604

Engine for 911 Carrera (993), 104. Engine in model year 1994

Engine Type Codes

Pro- duction Year	Model- Year	Type Desig- nation	Displace- ment (actual) (cm3)	Engine Output to DIN (kW/HP)	Fuel- Induction	Fitted in	T = Tip- tronic
1993/94	1994	M64/05 M64/06	3600 3600	200/272 200/272	DME DME	911 Carrera RoW 911 Carrera RoW	T
1994/95	1995	M64/05 M64/06 M64/20	3600 3600 3750	200/272 200/272 220/300	DME DME DME	911 Carrera RoW 911 Carrera RoW 911 Carrera RS	T
		M64/07 M64/08	3600 3600	200/272 200/272	DME DME	911 Carrera USA 911 Carrera USA	T

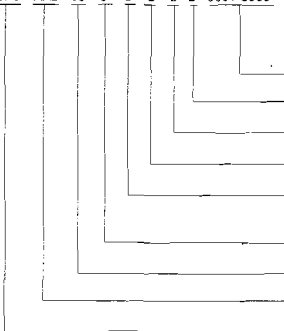
Structure of Chassis Number Codes

WP0 ZZZ 99 Z R S 3 1 0001-9000

Europe/Rest of the World

WP0 AA2 99 ©* S S 3 2 0001-9000

USA/Canada



Serial Number

Code for Body and Engine

3rd Digit of Type

Manufacturing Location

Model Year (R = 1994, S = 1995)

Test Digit or Fill-In Character

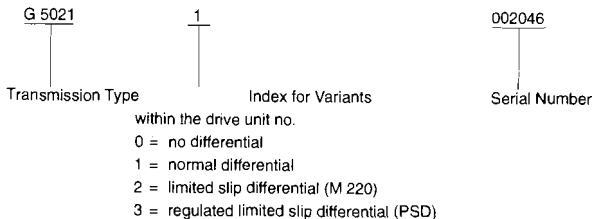
1st and 2nd Digit of Type

VDS Code USA

World Manufacturer Code

* © = Test digit can be 0 ... 9 or X

Structure of Transmission Codes



NB: The transmission nos. 1...2000 of each type are reserved for testing.
The first serial number is 2001.

Example: G 5021 1 002046

Transmission G 50/21 manufactured as of model year 1994 as 46th standard transmission (with normal differential).

Survey Type Codes - Transmission

Transm. Type	Number of Gears	Fitted in Veh. Type	Fitted as of Transm. No.	Remarks
G 50/20	6	911 Carrera	G 5020 1 000001	Manual Transmission USA, CAN, CH, A
G 50/20	6	911 Carrera	G 5020 2 000001	Manual Transmission + M220 USA, CAN, CH, A
G 50/21	6	911 Carrera	G 5021 1 000001	Manual Transmission RoW
G 50/21	6	911 Carrera	G 5021 2 000001	Manual Transmission + M220 RoW
G 50/31	6	911 Carrera RS	G 5031 2 000001	Manual Transmission RoW
G 50/32	6	911 Carrera RS	G 5032 2 000001	Manual Transmission Sports Kit
G 50/33	6	911 Carrera RS	G 5033 2 000001	Manual Transmission CH
G 64/20	6	911 Carrera 4	G 6420 2 000001	Manual Transmission + M220 USA, CAN, CH, A
G 64/21	6	911 Carrera 4	G 6421 2 000001	Manual Transmission + M220 RoW
A 50/04	4	911 Carrera	A 5004 1 000001	Tiptronic Transmission RoW
A 50/05	4	911 Carrera	A 5005 1 000001	Tiptronic Transmission USA, CAN

Technical Data, 911 Carrera and 911 Carrera 4

Engine		911 Carrera	911 Carrera 4
Engine Type:			
Manual Transmission		M64/05/07	M 64/05/07
Tiptronic		M64/06/08	
Bore	mm/in	100/3.94	=
Stroke	mm/in	76.4/3.01	=
Displacement	cm ³ /cu.in	3600/219.7	=
Compression Ratio		11.3 : 1	=
Max. Engine Power			
to EC 80/1269	kW/HP	200/272	=
to SAE J 1349	kW/HP	—	=
at Engine Speed	rpm	6100	=
Max. Torque			
to EC 80/1269	Nm/kpm	330/33.6	=
to SAE J 1349	Nm/lbft.		=
at Engine Speed	rpm	5000	=
Max. Specific Power			
to EC 80/1269	kW/l, HP/l	55.6/75.6	=
to SAE J 1349	kW/l, HP/l	—	=
Engine Speed Limitation			
at	rpm	6700 ± 20	=
Engine Weight			
(Tiptronic)	kg/lbs	232 (224)	=
Valve Arrangement per Combustion Chamber		1 intake, 1 exhaust, suspended in V	
Valve Clearance		Hydraulic valve clearance self-adjustment	

Engine	911 Carrera	911 Carrera 4
Timing		
at 1 mm Valve Stroke		
Intake opens	°KW	1° before TDC =
Intake closes	°KW	60° after BDC =
Exhaust opens	°KW	45° before TDC =
Exhaust closes	°KW	5° after BDC =
Engine Cooling		
Type	Air cooling	
Cooling Fan	Driven by V-belt: from crankshaft	
Transmission Ratio	1 : 1.60	=
Air circulation quantity at engine speed 6100 rpm	1010 l/s	=
Drive Belts		
Fan	9.5 x 776 Lw	=
Alternator	9.5 x 760 Lw	=
Air conditioning	13 x 1085 Lw	=
	Only use approved Porsche original drive belts.	
Engine Lubrication	Dry sump lubrication with separate oil tank	
Oil Cooling	Oil cooler in air flow thermostatically regulated. 2-stage electric blower	
Oil Pressure at 5000 rpm		
Oil Temperature 90° Cbar	6.5	=
Oil Consumption	l/1000 km	approx. 1.0 =

Engine		911 Carrera	911 Carrera 4
Electrical System			
Alternator Output	W/A	1610/115	=
Battery	V/Ah	12/75	=
Special Equipment	V/Ah	—	—
Ignition		DME, twin ignition with anti-knock	
Ignition Sequence		1-6-2-4-3-5	=
Spark Plugs			
Bosch		FR 6 LDC/FR 5 DTC	=
Beru		14FR 5DTU	=
Electrode Gap			
Bosch	mm/in	0.7/0.026	=
Beru	mm/in	0.7/0.026	=
Fuel System			
		DME wit sequential fuel injection	
Fuel Delivery		1 electr.delivery pump.EKP 4/2	
System Pressure without Vacuum	bar	3.6...4.0	=
Fuel ROZ/MOZ		min. 98/88	=
Idle Engine Speed			
Man. Transm.	rpm	800 ± 40	=
Tiptronic Sel. in	rpm	750 ± 40	=
Lev. in Final Drive			
CO content in % - with cat. converter at idle engine speed		0.4...1.2	=
Test Conditions		Probe connector not separated, measured before cat. conv.	
CO content in % - without cat. converter at idle engine speed		0.5...1.0	=
Test Conditions		—	—

Engine	911 Carrera		911 Carrera 4	
Exhaust Cleansing	Three-way catalytic converter with heated Lambda probe			
Fuel Consumption (to EU)		Manual-Transm.	Tiptronic Autom.	Manual
A) at constant 90 kph	l/100 km	7.4	7.8	7.8
B) at constant 120 kph	l/100 km	9.1	9.6	9.6
C) EC City Cycle	l/100 km	17.9	17.2	16.8
Average $\frac{A+B+C}{3}$	l/100 km	11.5	11.5	11.4

Power Transmission	911 Carrera RoW	911 Carrera CH/A	911 Carrera 4	
<hr/>				
Clutch	Single-disk dry clutch with pressure plate extended version. Dual-mass flywheel.			
Pressure Plate	G MFZ 240	=	=	
Drive Plate	rigid 240	=	=	
Manual Transmission	G50/21	G50/21	G64/21	G64/20
Transmission Ratios:				
1st gear	3.818	3.818	=	=
2nd gear	2.150	2.048	=	=
3rd gear	1.560	1.407	=	=
4th gear	1.242	1.118	=	=
5th gear	1.027	0.921	1.024	0.928
6th gear	0.820	0.775	=	=
R gear	2.857	2.857	=	=
Final Drive	3.444	3.444	=	=
Limited Slip Differential	M Equipment		Stand.	Stand.
Blocking Value	%		25/40 load-dependent	
Transmission Weight				
with Oil	kg/lbs	66/145.50	66/145.50	72.5/160

Power Transmission		911 Carrera	911 Carrera 4
Tiptronic		A 50/04	=
Converter Ø	mm/in	260	=
Stall Speed	rpm	2300 – 400	=
Transmission Ratios:			
Intermediate Shaft		1.100	=
1st gear		2.479	=
2nd gear		1.479	=
3rd gear		1.000	=
4th gear		0.728	=
R gear		2.086	=
Final Drive		3.667	=
Starting Conversion		1.98 : 1	=
Transmission Weight		105/231.5	=
with Oil	kg/lbs		

Chassis		911 Carrera	911 Carrera 4
<hr/>			
Front Axle			
Spring Wire Ø	mm/in	11(8/11.1)	10.9(8/11.1)/ 0.43(0.31/0.46)
Spring Coil Ø	mm/in	103/4.06	=
Stabilizer Ø	mm/in	21(22)/0.83(0.87)	=
Steering			
Steering Wheel Ø	mm/in	380/14.96	=
Steering Wheel Ratio (RHD)		16.48:1(16.60:1)	=
Steering Wheel Turns (RHD)		2.47(2.49)	
Turning Circle Ø	m/ft	11.74/0.46	=
Rear Axle			
Spring Wire Ø (Sports Chassis)	mm/in	13(13.5)/0.51(0.53)	=
Spring Coil Ø (Sports Chassis)	mm/in	102/3.54	=
Stabilizer Ø (Sports Chassis)	mm/in	18(20)/0.71(0.79)	=
Tiptronic	mm/in	18/0.71	=

Chassis	911 Carrera	911 Carrera 4
<hr/>		
Wheel Alignment		
Front Axle:		
Toe-in (total)	+5' ± 5'	=
Camber	-20° ± 10'	=
	max. difference left to rt. 10'	=
Caster	5 °20' ± 15'	=
	max. diff.left to rt. 15'	
Toe Difference Angle at 20° Lock	-1° ± 30'	=
Sports-type running gear	-1°45' ± 30'	
Wheel Alignment		
Rear Axle:		
Toe-in (per wheel)	+15' ± 5'	+10' ± 5'
Camber	-55' ± 15'	=
Sports-type running gear	-1°10' ± 15'	

Chassis	911 Carrera	911 Carrera 4
Brake System		
Operating Brakes	Hydraulic dual-circuit brake system with axle-wise division. Vacuum brake booster, vented brake disks on front and rear axles. ABS as standard.	
Brake Booster Coefficient	3.15 : 1	4.8 : 1
Brake Master Cylinder Ø		
Front mm/in	23.81/0.94	=
Rear mm/in	23.81/0.94	=
Brake Power Regulator		
Switchover Pressure bar	40	45
Reduction Coefficient	0.46	=
Pistons Ø in Brake Caliper		
Front mm/in	44 and 36/1.57 and 1.42	
Rear mm/in	30 and 34/1.10 and 1.18	
Brake Disks Ø		
Front mm/in	304/11.73	=
Rear mm/in	299/11.77	=
Effective Brake Disk Ø		
Front mm/in	251/9.87	=
Rear mm/in	246/9.69	=
Brake Pad Thickness		
Front mm/in	32/1.10	=
Rear mm/in	24/0.95	=
Effective Total Lining Surface cm ² /sq.in	422/53.32	=
Parking Brake	Mechanical on both rear wheels	
Brake Drum Ø mm/in	180/7.09	=
Brake Shoe Width mm/in	25/0.98	=
Brake Lining Surface per Wheel cm ² /sq.in	85/13.18	=

Chassis	911 Carrera	911 Carrera 4
Wheels and Tires		
Standard Tires at Front on Wheel	205/55 ZR 16 7 J x 16 H2 ET 55	= =
Optional at Front	205/50 ZR 17 7 J x 17 H2 ET 55	= =
Standard Tire at Rear on Wheel	245/45 ZR 16 9 J x 16 H2 ET 70	= =
Optional at Rear	255/40 ZR 17 9 J x 17 H2 ET 70	= =
Folding Spare Wheel	165/70 - 16 92P	=
Tire Pressure		
Front bar	2.5	=
Rear with 16" Wheel bar	3.0	=
Rear with 17" Wheel bar	2.5	=
Folding Spare Wheel bar	2.5	=

Dimensions and Weights		911 Carrera	911 Carrera 4
Measurements without Load DIN 70020			
Length	mm/in	4245/167.1	=
Width	mm/in	1735/65.0	=
Height	mm/in	1300/51.6	=
Wheelbase	mm/in	2272/89.45	=
Track Width			
Front	mm/in	1405/54.3	=
Rear	mm/in	1444/54.1	=
Ground Clearance (at max.perm.weight)	mm/in	110/4.5	=
Overhang Angle	Front	11.0°	=
	Rear	12.5°	=
Weights to DIN 70020			
Curb Weight (Tiptronic)			
Front	kg/lbs	550 (555)	590/1301
Rear	kg/lbs	820 (840)	830/1830
Total	kg/lbs	1370 (1395)	1420/3131
Perm. Axle Load			
Front	kg/lbs	720	760/1675
Rear	kg/lbs	1050	1070/2359
Permitted	kg/lbs	1710 (1735)	1760/3880
Total Weight			

Dimensions and Weights		911 Carrera	911 Carrera 4
Permitted Trailer Load			
unbraked	kg/lbs	—	—
braked	kg/lbs	—	—
Permitted Haul- age Weight (Tiptr.)	kg/lbs	—	—
Permitted Support Load	kg/lbs	—	—
Permitted Roof Load	kg/lbs	35/77	=
With Original Porsche Roof Transport System	kg/lbs	75/165	=

Filling Capacities	911 Carrera	911 Carrera 4
Engine Oil Quantity ¹ l/US.gal.	11.5/2.53	=
Manual Transmission ¹ /US.gal. with Final Drive ³	3.6/0.79	=
FA Final Drive l/US.gal.		0.6/0.13
Tiptronic Oil Quantity Automatic Part ⁴ l/US.gal.	9/1.98	=
Oil Quantity Final Drive ³ l/US.gal.	0.9/0.20	=
Fuel Tank l/US.gal.	71/15.7	=
Optional l/US.gal.	91.5/20.2	=
Brake Fluid Reservoir ⁵ l/US.gal.	0.34/0.07	0.75/0.16
Fluid Reservoir ⁴ for Power Steering l/US.gal.	1.0/0.22	=
Fluid Reservoir for Windshield Wash/Headlight Wash System l/US.gal.	7.3/1.6	=
Coolant R 134a g/lbs	840/1.851	=
Refrigerant Oil cm ³ /cu.in	140/8.55	=

1) Permitted API SE/SF with combinations
API SE/CC – SF/CC – SF/CD - SE/CD multigrade oils
as released by factory.

3) Multigrade transmission oil 75 W 90 to MIL-L 2105 B or
API classification GL 5.

4) ATF Dexron II D.

5) Brake Fluid DOT 4 Type 200

Technical Data 911 Carrera RS

Engine	911 Carrera RS
Engine Type:	M64/20
No. of Cylinders	6
Bore mm/in	102/4.02
Stroke mm/in	76.4/3.01
Displacement cm ³ /cu.in	3746/228.6
Compression Ratio	11.3:1
Max. Engine Power to EC 80/1269 kW/HP	221/300
to SAE J 1349 kW/HP at Engine Speed rpm	- 6500
max. Torque to EC 80/1269 Nm/kpm at Engine Speed rpm	355/36.2 5400
Max. Specific Power to EC 80/1269 kW/l, HP/l	59/80.1
Engine Speed Limitation at rpm	6840
Engine Weight (without ZMS) kg/lbs	230 (221)/507.0 (487.2)
Valve Arrangement per Combustion Chamber	1 intake, 1 exhaust, suspended in V
Valve Clearance	Hydraulic valve clearance self-adjustment
Timing at 1 mm valve stroke	
Intake opens °KW	5° before TDC
Intake closes °KW	58° after BDC
Exhaust opens °KW	50° before TDC
Exhaust closes °KW	2° after BDC

Engine		911 Carrera RS
<hr/>		
Engine Cooling		
Type		Air cooling
Cooling Fan		Driven by V-belt from crankshaft
Transmission Ratio		1 : 1.6
Air circulation quantity at engine speed 6100 rpm	l/s	1010
Engine Lubrication		
		Dry sump lubrication with separate oil tank
Oil Cooling		Oil cooler in air flow thermostatically regulated, 2-stage electric blower
Oil Pressure at 5000 rpm		
Oil Temperature 90° C	bar	6.5
Oil Consumption	l/1000 km	up to 1.5
Electrical System		
Alternator Output	W/A	1610/115
Battery	V/Ah	12/36
Ignition		DME, twin ignition with anti-knock
Ignition Sequence		1-6-2-4-3-5
Spark Plugs		
Bosch		FR 6 LDC/FR 5 DTC
Beru		14FR 5DTU/14 FR6 LDU
Electrode Gap		
Bosch	mm/in	0.7/0.026
Beru	mm/in	0.7/0.026

Engine		911 Carrera RS
<hr/>		
Fuel System		DME wit sequential fuel injection
Fuel Delivery		1 electr.delivery pump EKP 4/2
System Pressure without Vacuum	bar	3.6...4.0
Fuel ROZ/MOZ		min. 98/88
Idle Engine Speed	rpm	960 ± 40
Exhaust Cleansing		Three-way catalytic converter with heated Lambda probe
Fuel Consumption (to EU)		
A) at constant 90 km/h	l/100 km	7.6
B) at constant 120 km/h	l/100 km	9.5
C) EC City Cycle	l/100 km	20.1
Average $\frac{A+B+C}{3}$	l/100 km	12.4
Switzerland		
City Cycle	l/100 km	15.5
Overland Cycle	l/100 km	8.4

Power Transmission	911 Carrera RS		
Clutch Basic Version (M002)	Single-disk dry clutch with pressure plate extended version, dual-mass flywheel.		
Pressure Plate	G MFZ 240		
Drive Plate Ø	240 rigid		
Clutch Clubsport Version (M003)	Single-disk dry clutch with pressure plate, extended version, rigid flywheel		
Pressure Plate	G MFZ 240		
Drive Plate Ø	240 with torsion damper		
Manual Transmission	M002	M003	M002/3 CH
Type	G50/31	G50/32	G50/33
Transmission Ratios:			
1st gear	3.154	3.154	3.154
2nd gear	2.000	2.000	2.000
3rd gear	1.522	1.522	1.407
4th gear	1.242	1.241	1.118
5th gear	1.024	1.031	0.937
6th gear	0.821	0.829	0.821
R gear	2.857	2.857	2.857
Final Drive	3.444	3.444	3.444
Limited Slip Differential	Standard		
Blocking Value %	40/65		
Transmission Weight with Oil	kg/lbs 69/152.1		

Chassis	911 Carrera RS	
Front Axle		
Spring Wire Ø	mm/in	11.3...8.5/0.445...0.332
Spring Coil Ø	mm/in	103/4.06
Stabilizer Ø	mm/in	23/0.91
Steering		
Steering Wheel Ø	mm/in	360/14.2
Steering Wheel Ratio (RHD)		18.25 : 1 (17.65 : 1)
Steering Wheel Turns (RHD)		2.73 (2.64)
Turning Circle Ø	m/ft	11.76/38.7
Rear Axle		
Spring Wire Ø	mm/in	8.35...12.8/0.33...0.50
Spring Coil Ø	mm/in	68...77
Stabilizer Ø	mm/in	20/0.79
Wheel Alignment		
Front Axle:		
Toe-in (Total)		+5' + 5'
Camber		-1°± 10' max. difference left to rt. 10'
Caster		5 °20' ± 15'-30' max. diff.left to rt. 15'
Toe Difference Angle at 20° Lock		-1°27' ± 30'
Toe-in (per wheel)		+15' + 5'
Camber		-1°20' ± 10'

Chassis**Brake System****Operating Brakes****Brake Booster**

Coefficient i

Brake Master Cylinder Ø

Front mm/in

Rear mm/in

Brake Power Regulator

Switchover Pressure bar

Reduction Coefficient

Pistons Ø in Brake Caliper

Front mm/in

Rear mm/in

Brake Disks Ø

Front mm/in

Rear mm/in

Effective Brake Disk Ø

Front mm/in

Rear mm/in

Brake Pad Thickness

Front mm/in

Rear mm/in

911 Carrera RS

Hydraulic dual-circuit brake system with axle-wise division. Vacuum brake booster, vented brake disks on front and rear axles. ABS as standard.

(hydraulic) 3.6 : 1

25.4/1.0

25.4/1.0

40

0.46

44 and 36/1.57 and 1.42

30 and 36/1.18 and 1.42

322/12.68

322/12.68

259.6/10.22

268/10.55

32/1.26

28/1.10

ChassisEffective Total cm²/sq.in
Lining Surface**Parking Brake**

Brake Drum Ø mm/in

Brake Shoe Width mm/in

Brake Lining Surface cm²/sq.in
pro Rad**Wheels and Tires**Standard Tires at Front
on WheelStandard Tires at Rear
on WheelWinter Tires at Front
on WheelWinter Tires at Rear
on Wheel**Tire Pressure**

Front bar

Rear bar

911 Carrera RS

552/85.56

Mechanical on both rear wheels

180/7.09

25/0.98

85/13.18

225/40 ZR 18
8 J x 18 H2 ET 52265/35 ZR 18
10 J x 18 H2 ET 65205/50 R 17
7 J x 17 H2 ET 55225/45 R 17
8 J x 17 H2 ET 70

2.5

3.0

Chassis**911 Carrera RS****Dimensions and Weights
Measurements without
Load DIN 70020**

Length	mm/in	4245/167.1
Width	mm/in	1735/68.3
Height	mm/in	1270/50.0
Wheelbase	mm/in	2284/90.0
Track Width Front	mm/in	1413/55.6
Rear	mm/in	1452/57.2
Ground Clearance (at max.perm.weight) mm/in		90/3.5
Overhang Angle Front		M002 9.7°

Weights to DIN 70020

Curb Weight		
Front	kg/lbs	495/1091
Rear	kg/lbs	775/1708
Total	kg/lbs	1270/2800
Perm. Axle Load		
Front	kg/lbs	720/1587
Rear	kg/lbs	1065/2348
Permitted Total Weight	kg/lbs	1710 (1735)/3770 (3825)
Permitted Roof Load	kg/lbs	35/77
With original Porsche- roof transport system	kg/lbs	75/165

Filling Capacities**911 Carrera RS**

Engine Oil Quantity ¹	l/US.gal.	11.5/2.53
Manual Transmission ¹ /US.gal. with Final Drive ³		3.6/0.79
Fuel Tank	l/US.gal.	92/20.2
Right-hand drive and Japan	l/US.gal.	73/16.6
Brake Fluid Reservoir ⁵	l/US.gal.	0.34/0.07
Fluid Reservoir ⁴ for Power Steering	l/US.gal.	1.0/0.22
Fluid Reservoir for Windshield Wash/Head- light Wash System	l/US.gal.	1.2/0.3

=

- 1) Permitted API SE/SF with combinations
API SE/CC – SF/CC – SF/CD - SE/CD multigrade oils
as released by factory.
- 3) Multigrade transmission oil 75 W 90 to MIL-L 2105 B or
API classification GL 5.
- 4) ATF Dexron II D.
- 5) Brake Fluid DOT 4 Type 200

Chassis		911 Carrera RS	
Maximum Speed	km/h (mph)	277/172	
Acceleration 0-100 km/h	s	5.0	
Kilometres from standing start	s	24	
Performance Weight		kg/kW	6.85
		kg/HP	5.04

Tightening Torques for Engine

Location	Thread	Tightening Torque Nm
Crankshaft/ Crankcase		
Connecting Rod Bolts (Designation 14)	M 9 x 1.25	
1st stage:		30
2nd stage:		1 x 90° ± 2° torque angle
Check		60 (see Rep.Guide)
Oil Pump	M 8	23
Crankcase - Bolt Joints (Studs)	M 10 x 1.25	50
Hexagon Nuts and/or Hexagon Head Bolts to Crankcase	M 8	23
Flywheel to Crankshaft	M 10 x 1.25 x 70	85
Drive Plate to Crankshaft (Tiptronic)		90
V-Belt Plate to Crankshaft	M 14 x 1.5	170
Screw Plug - Overpressure - and Safety Valve	M 18 x 1.5	60
Oil Drain Plug for Crankcase	M 20 x 1.5	50 + 5
Oil Drain Plug for Thermostat Housing	M 20 x 1.5	50 + 5
Screw Connections in Left-Hand Crankcase Section (Oil Return to Oil Tank)	M 22 x 1.5	70
Screw Connections in Right-Hand Crankcase Section (Oil Flow to Oil Pump)	M 24 x 1.5	90

Location	Thread	Tightening Torque Nm
Cylinders and Cylinder Head		
Cylinder Head Bolts		
1st stage:		20
2nd stage:		1 x 90° ± 2° torque angle
Camshaft Housing / Cylinder Heads	M 8	23
Knock Bridge to Cylinder Bank	M 6	9.7
Knock Sensor to Knock Bridge		20 ± 5
Engine - NTC to Cylinder Head 3		10...12 (max. 15)
Rocker Arm Shafts	M 6 x 35	13
Spark Plugs	M 14 x 1.25	25...30
Control		
Sprocket Wheel to Camshaft	M 12 x 1.5	120
Sprocket Wheel to Camshaft (4-tooth Sprocket Wheel)	1. Stage 2. Stage	20 90° torque angle
Gearwheel / Power Steering Pump to Camshaft		120
Slide Collar Bolts (Guide and Tensioning Rail to Crankcase)		30
Chain Housing to Crankcase		23
Chain Housing Cover		9.7
Valve Cover to Camshaft Housing	M 6	9.7
Bearing Bush/Chain Housing		9.7

Location	Thread	Tightening Torque Nm
Fan		
Tightening Strap		8
Pulley Alternator (Carrera RS)		50 ± 5
Pulley Section / Impeller	M 6	9.7
Impeller for Alternator Cooling		14 ± 1
Exhaust System		
Heat Exchanger - Cylinder Head		23
Heat Exchanger / Cat. Conv. or Front Muffler		23
Cat. Conv. Final Muffler (Ball Clamp)		25 - 30
Final Muffler / Tail Pipe (Ball Clamp)		25 - 30
Tightening Strap to Catalytic Conv. or Front Muffler		20
Tightening Strap / Final Muffler		20
Lambda Probe	M 18 x 1.5	50 - 60
Plug Nut to Catalytic Converter	M 8 x 1	15
Secondary Air Intake Lines to Camshaft Housing		25
Belt Monitoring		
Bracket to Crankcase	M 6	15 - 20
Belt Monitoring to Bracket	M 6	9.7

Location	Thread	Tightening Torque Nm
Clutch		
Dual-Mass Flywheel (Luk)		
Dual-Mass Flywheel to Crankshaft	M 10 x 1.25 x 70	85
Pressure Plate	M 8 x 40	23
Tiptronic Transmission		
Transmission Rim Bolts	M 8 x 35	23
Torque Converter to Drive Plate	M 6 x 16	16

Tightening Torques: Removing and Fitting the Engine

Location	Thread	Tightening Torque Nm
Engine Support on Engine Mount	M 12	85
Transmission Support to Body	M 12	46
Driveshaft to Transmission Flange	M 10	81
Oil Drain Plug to Thermostat Housing	M 20 x 1.5	50 + 5
Oil Drain Plug to Crankcase	M 20 x 1.5	50 + 5
Shift Rod (Shoulder Screw)		18
Stabilizer to Crossmember	M 8	23
Stabilizer Housing to Mufflers	M 10	46
Trailing Arm 2 to Crossmember (Eccentric)	M 12 x 1.5	85
Trailing Arm 2 (Tie Trailing Arm) to Wheel Support	M 12 x 1.5	85
Rear Crossmember to Side Parts	M 12 x 1.5	120
Front Crossmember to Side Parts	M 10	65
Tiptronic Transmission		
Transmission Rim Bolts	M 8 x 35	23
Torque Converter to Drive Plate	M 6 x 16	16

Overview of Tolerances and Wear Limits – Engine 911 Carrera

Remarks: B = Bore W = Width

Measuring Point	When Installed with Tolerance mm	Play (+) or Wear Compression (-) from to	Limits mm
Crankshaft - Main Bearing Bearing 1 - 7 (d1)	B 60.020 - 60.059 W 59.971 - 59.990	+ 0.010 + 0.072	Visual Check 59.960
Crankshaft - Main Bearing Lager 8 (d3)	B 31.041 - 31.084 W 30.980 - 30.993	+ 0.048 + 0.048	Visual Check 30.970
Crankshaft Journals - Con Rod Bearings (d2)	B 55.020 - 55.059 W 54.971 - 54.990	+ 0.030 + 0.088	Visual Check 54.960
Crankshaft Runout (measured at bearings 4 and 8, bearings 1 and 7 on prisms)			max. 0.04
Crankshaft Unbalance			max. 10 cmg.
Crankshaft - Main Bearing Axial Play		+ 0.110 + 0.195	0.30
Crankshaft - Timing Sprocket	B 41.975 - 42.000 W 42.002 - 42.013	- 0.002 - 0.038	
Crankshaft - Distributor Drive	B 41.975 - 42.000 W 42.002 - 42.013	- 0.002 - 0.038	
Crankshaft - Flywheel	B 90.000 - 90.030 W 89.780 - 90.000	0.0 + 0.049	
Crankshaft - V-Belt Disc	B 30.000 - 30.033 W 29.960 - 29.993	+ 0.007 + 0.073	
Belt Disc: Radial Runout Axial Runout			max. 0.15 max. 0.20

Remarks: B = Bore W = Width

Measuring Point	When Installed with Tolerance mm	Play (+) or Wear - Compression (-) from to	Limits mm
Intermediate Shaft			
Bearing 1	B 27.500 - 27.521		
Crankcase Bore - Shaft	W 25.000 - 24.980		
Bearing 2	B 26.500 - 26.521		
Crankcase Bore - Shaft	W 23.980 - 23.967		
Intermediate Shaft Running Play		+ 0.030 + 0.084	
Intermediate Shaft Axial Play		+ 0.040 + 0.133	0.16
Pinion - Distributor Shaft	B 12.456 - 12.474 W 12.444 - 12.455	+ 0.001 + 0.030	
Distributor - Crankcase	B 27.000 - 27.021 W 29.960 - 29.993	+ 0.020 + 0.074	
Flywheel			
Radial Runout			max. 0.10
Axial Runout			max. 0.20
Camshaft Housing - Camshaft			
Camshaft Bearing	B 48.967 - 48.992	+ 0.025 + 0.066	0.10
Camshaft	W 48.926 - 48.942		
Camshaft - Axial Play		+ 0.150 + 0.200	0.40
Camshaft- Sprocket Wheel Flange	B 30.000 - 30.013 W 29.979 - 30.000	0.000 + 0.034	
Camshaft- Runout measured at center bearing (between the tips)			max. 0.02

Crankshaft - Normal - and Reconditioning Dimensions

Stage	Main Bearing d 1	Con Rod Bearings d 2	Main Bearing Ø d 3 (Bearing 8)
Normal Dimension	59.971...59.990	54.971...54.990	30.980...30.993
- 0.25	59.721...59.740	54.721...54.740	30.730...30.743
- 0.50	59.471...59.490	54.471...54.490	30.480...30.493

Stage	Collar Ø d 4	Seat for Timing Sprocket Mount Ø d 5	Ø d 6	Thrust Bearing Width A
Normal Dimension	89.780...90.000	42.002...42.013	29.960...29.993	28.000...28.060
Wear Dimension	89.580		29.670	

Crankcase Ø
Bearing 1...8

Normal
65.000...65.019

Oversize
65.250...65.269

Grind bearing surface for oil seals to dimensions 29.670 and 89.580 only if score marks are too deep.

Otherwise, polish if required, Rt = 3.

Oil bores are rounded to R 0.5 after grinding.

Remove sharp edges with $R = 0.2 \dots 0.5$.

Permissible radial runout relative to support -
 - max. 0.04.

Regulation for surface reconditioning: gas - nitro-carbonated PN 2063.

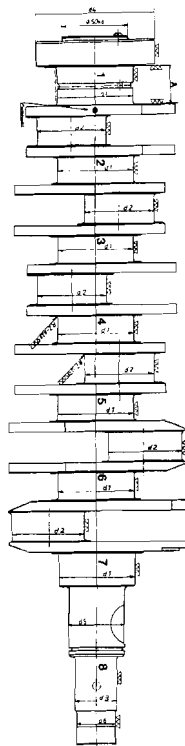
Do not align main bearings 3 and 5 after nitriding treatment.

The other main bearing journals may be aligned by levering at the radii.

Working surfaces of the main and con rod bearing journals polished after nitriding.

Color Coding of Reconditioning Sizes:

1st Reconditioning Size blue dot
2nd Reconditioning Size green dot



Weight Categories of the Connecting Rods

The con rods are divided into weight categories. The last digit of the spare parts number indicates the weight categories. This last digit appears on the shaft of con rods supplied as spare parts.

Note:

Only con rods with a weight difference not exceeding 6 g may be fitted into an engine. To determine the weight category, weigh the complete con rod without the bearing shells.

Con rod designation for Customer Service - parts are color-stamped.

Connecting rods Type 1 and Type 2 can no longer be supplied as spare parts. In the event of repairs, a complete set of con rods of Type 3 must be fitted.

Note:

Connecting rods Type 3 are available singly.

Type 1 (as of production start 993)

Weight from (grams)	to (grams)	Weight Categ. for CS	SP Number of CS Con Rod	Code on Con Rod
508	514	1	993.103.020.50	50
514	520	2	993.103.020.51	51
520	526	3	993.103.020.52	52
526	532	4	993.103.020.53	53
532	538	5	993.103.020.54	54
538	544	6	993.103.020.55	55
544	550	7	993.103.020.56	56

Type 2

As of Engine No.: M64/05 63 S 02522 - 05847 / M64/06 63 S 51344 - 52684 / M64/07 64 S 02413 - 04238 / M64/08 64 S 50791 - 51180

Weight from (grams)	to (grams)	Weight Categ. for CS	SP Number of the CS Con Rod	Code on Con Rod
518	524	1	993.103.020.57	57
524	530	2	993.103.020.58	58
530	536	3	993.103.020.59	59
536	542	4	993.103.020.60	60
542	548	5	993.103.020.61	61
548	554	6	993.103.020.62	62

Type 3

As of Engine No.: M64/05 63 S 05848 / M64/06 63 S 52685 / M64/07 64 S 04238 / M64/08 64 S 51181 / M64/20 63 S 85654 / M64/60 61 T 00932

Weight from (grams)	to (grams)	Weight Categ. for CS	SP Number of the CS Con Rod	Code on Con Rod
534	540	1	993.103.020.64	64
540	546	2	993.103.020.65	65
546	552	3	993.103.020.66	66
552	558	4	993.103.020.67	67
558	564	5	993.103.020.68	68
564	570	6	993.103.020.69	69

Determining the Parallel Alignment of the Sprocket Wheels

Note:

In the case of a final drive with a one-piece sprocket wheel flange unit (4-tooth sprocket wheel), the measure of parallel alignment described below is not required.

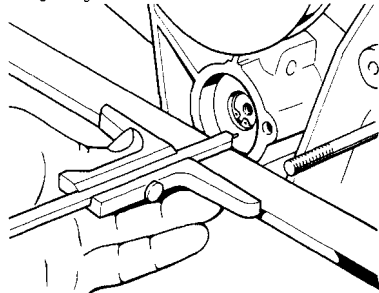
The deviation in parallel alignment of the driving sprocket wheel on the intermediate shaft to the driven sprocket wheel on the camshaft must not exceed ± 0.25 mm. Before carrying out the measurement, the intermediate shaft and the camshafts must be shifted axially towards the flywheel so that the guide collar of the bearing is accessible.

The sprocket wheels are adjusted by inserting or removing compensating washers, Part No. 901.105.561.00 (plate thickness 0.5 mm). As a rule, two washers are required beneath the left-hand sprocket wheel (cylinders 1 - 3), and two washers are required beneath the right-hand sprocket wheel (cylinders 4 - 6).

Adjustment

Tighten the hexagon screws of the sprocket wheels with approx. 30 Nm, countering with Special Tool 9551 or 9552 (blocking device for camshafts).

Determine dimension "A", measuring from the front edge of the crankcase or straight edge to the front edge of the intermediate shaft.



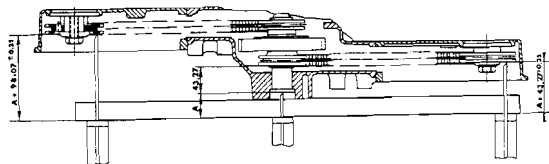
Construction Dimensions of the Drive Wheels on the Intermediate Shaft:

from front end of intermediate shaft -

to front end of rear intermediate shaft sprocket wheel (cyl. 1 - 3) = 98.07 mm

to front end of front intermediate shaft sprocket wheel (cyl. 4 - 6) = 43.27 mm

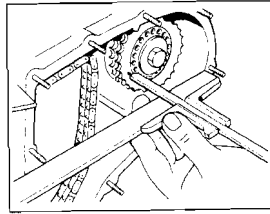
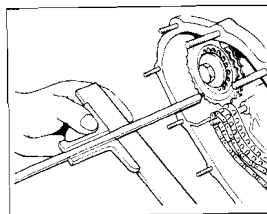
Construction dimensions + measured dimension "A" gives the position of the sprocket wheels on the camshafts (max. permissible deviation ± 0.25 mm).



Example: measured dimension "A" = 35.5 mm

For the sprocket wheel of cylinders 1 - 3, the result is

$$A + 98.07 = 35 + 98.07 = 133.57 \pm 0.25 \text{ mm}$$



For the sprocket wheel of cylinders 4 - 6, the result is

$$A + 43.27 = 35 + 43.27 = 78.77 \pm 0.25 \text{ mm}$$

Pistons

Weight Categories of the Pistons "heavy-duty"

Weight Categories of Mahle Pistons

Pistons weighed with accessories (piston bolts, piston rings, snap-rings)

	Total Piston Weight in g Weight Category within a Set	Code
Engine Type	M64/05/06/07/08	
Series Production	606 - 610	- -
	610 - 614	-
Perm. Weight	614 - 618	+
Variance 4 g	618 - 622	++
For CS Perm. Weight	606 - 614	- - or -
Variance 8 g	614 - 622	+ or ++

Weight Categories of the Pistons "light"

	Total Piston Weight in g Weight Category within a Set	Code
Engine Type	M64/05/06/07/08	
Series Production	592 - 596	- -
	596 - 600	-
Perm. Weight	600 - 604	+
Variance 4 g	604 - 608	++
For CS Perm. Weight	592 - 600	- - or -
Variance 8 g	600 - 608	+ or ++

Weight Categories of Pistons

For technical reasons connected with the production, the weight of the pistons has been altered. The pistons have become lighter. If, during a service, individual pistons and cylinders are replaced, the type of the piston or cylinder must first be ascertained.

The code on a piston can be made visible for identification by removing the deposits with a wire brush. Otherwise, the pistons have to be weighed.

Identification Features:

Old "heavy" pistons

Stamp on piston base: 11/0

New, "lighter" pistons

Stamp on piston base: 24/0

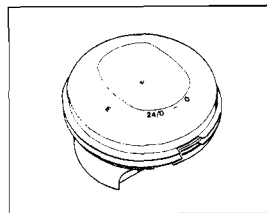
Weight Compensation

It is permitted to mix the types of pistons, i.e. new pistons and old ones. However, in this case a weight compensation must be carried out.

The weight compensation is achieved by fitting

a 14-gram CS - piston bold
(dimensions: 23 x 11 x 54).

To fit the CS - piston bold, use the Special Tool pressure element 9500/4, Order Number 000 721 950 04, .



Only the "light" pistons can now be supplied.

Pistons and Cylinders – Engine M64/05/06/07/08

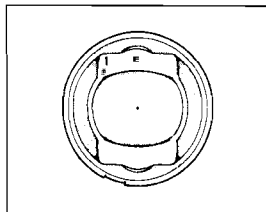
Tolerance Category	Cylinder Ø	Piston Ø
Stamped		
0	100.000 - 100.007	99.970 - 99.980
1	100.007 - 100.014	99.977 - 99.987
2	100.014 - 100.021	99.984 - 99.994
3	100.021 - 100.028	99.991 - 100.001

Play: Cylinders-Pistons 0.02 - 0.03 (new condition)

Piston Coding

The following codes appear on the upper part of the piston base section (fitting position):

The letter "E" in the center (on the inlet side); to the right of this, the alteration status for internal use at the Mahle company; to the left of the "E", the tolerance category (0, 1, 2 or 3); the weight category is beside the tolerance category.



Note:

The symbols-- (Minus Minus) for the weight category coding can also appear vertically.

Pistons and Cylinders – Engine M64/20 (RS)

Tolerance Category	Cylinder Ø	Piston Ø
Stamped		
0	102.000 - 102.007	101.945 - 101.955
1	102.007 - 102.014	101.952 - 101.962
2	102.014 - 102.021	101.959 - 101.969
3	102.021 - 102.028	101.966 - 101.976

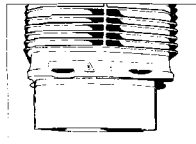
Play: Cylinders - Pistons 0.04 - 0.05 (new condition)

Cylinder Coding

The following codes are stamped on the opposite side to the cast securing element/knock sensor bridge:

Cylinder diameter tolerance category, e.g. category 0 and the cylinder height tolerance category

e.g. height 5



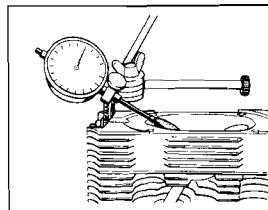
Each cylinder height tolerance category (5 or 6) is subdivided into the cylinder height tolerance category.

Height H - 0.020	Cylinder - Diameter + 0.007	Categories Stamped
82.750	100.000	0
82.750	100.007	1
82.750	100.014	2
82.750	100.021	3
82.770	100.000	0
82.770	100.007	1
82.770	100.014	2
82.770	100.021	3

Only cylinders of the same height category (5 or 6) may be fitted on one engine side.

Checking the Valve Guides

1. Clean the valve guide thoroughly.
2. Use a new valve to measure the tilt play.
3. Secure a dial gauge bracket VW 387 to the cylinder head. The dial gauge must be aligned parallel to the valve head.
4. The tilt play is measured at a valve stroke of 10 mm (distance between valve head and valve seat).
Wear Limit for
Intake = 0.80 mm
Exhaust = 0.80 mm



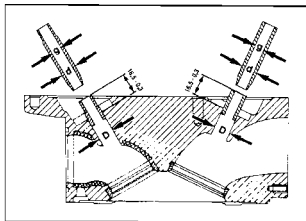
Note

Oval deformation in the entrance area of the valve guide is insignificant.

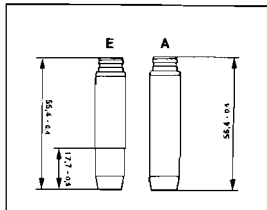
Table of Dimensions for Reworking the Valve Guides

Valve Guide	Outer Ø d * Valve Guide	Bore Ø D Cylinder Head
Normal Size (Series)	13.060	13.000 - 13.018
1. Oversize	13.260	13.000 - 13.200

* Rework valve guides at Ø d according to relevant bore Ø D - taking the compression into account.



Distinguishing Features of Valve Guides



Measuring the Valves

Valve Dimensions

911 Carrera RS (values in parentheses)

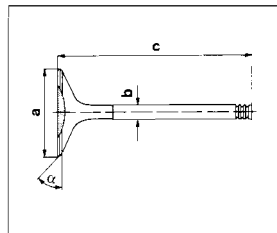
Dimension Intake Valve

a	49.0 ± 0.1 mm (51.5 ± 0.1 mm)
b	7.920 - 0.012 mm
c	110.1 ± 0.1 mm
α	45°

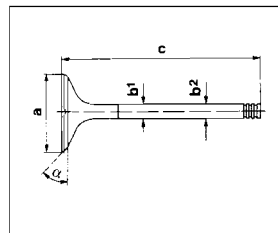
Dim.

Exhaust Valve
(b1 - b2 = conical)

a	42.5 ± 0.1 mm (43.5 ± 0.1 mm)
b1	7.950 - 0.012 mm (7.940 - 0.012 mm)
b2	7.970 - 0.012 mm (7.960 - 0.012 mm)
c	109 ± 0.1 mm
α	45°



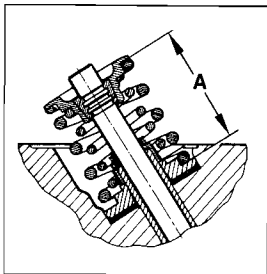
The intake valves on the 911 Carrera (993) and 911 Carrera RS are sodium-filled!



The exhaust valves on the 911 Carrera RS are sodium-filled!

Valve Springs - Checking and Adjusting the Installation Length

Installation Length Dimension "A"

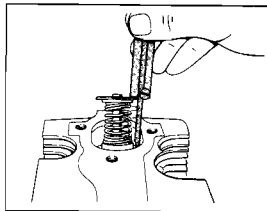


1. Fit the compensation washer(s), outer valve spring pad, valve, auxiliary spring, e.g. from oil thermostat, (engine 928)
Spare Parts No.: 928.107.171.01, valve spring plate and valve collets.

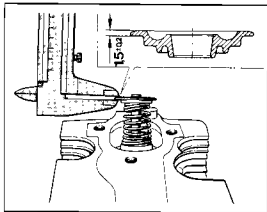
Note

To ease fitting, the spring can be shortened.

2. Use the depth gauge to measure down through from the surface of the valve spring plate to the surface of the outer spring pad. Note the value measured.



3. Determine the thickness of the valve spring plate. Note the value measured.



4. Determine the actual dimension.

Example of Determining the Actual Dimension:

Valve Spring - intake:

Measured Value:	38.5
Thickness of Valve Spring Plate	-1.6
	36.9

Result:

The value 36.9 is within the permitted tolerance.

Note

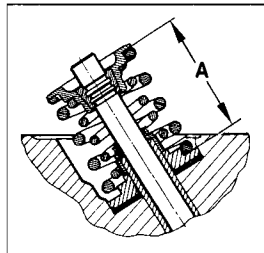
After measurement, ensure that the parts are not mixed up.

Engine
M64/05/06/07/08

Engine
M64/20(RS)

Target Dimension of Installation Length

Intake Valve A = 36.7 ± 0.3 mm	37.2 ± 0.3 mm
Exhaust Valve A = 35.7 ± 0.3 mm	35.8 ± 0.3 mm



Camshaft Timing

Engine Type M64/05/06/07/08

Engine Type M64/20

Camshafts

Camshaft Left Cylinder Bank 1...3	993.105.247.07	993.105.247.41
Camshaft Right Cylinder Bank 4...6	993.105.246.07	993.105.246.41
Coding on the front end of the Camshaft Left	993.247.07	993.247.41
Camshaft Right	993.246.07	993.246.41

Timing

at 1 mm valve stroke
and zero play

Intake opens	1° KW before TDC	5° KW before TDC
Exhaust closes	240° KW after BDC	238° KW after TDC
Exhaust opens	225° KW before BDC	230° KW before TDC
Exhaust closes	2° KW after TDC	2° KW after TDC

Securing the Cylinder Heads

Tighten the cylinder heads using an rotation-angle-controlled tightening method.

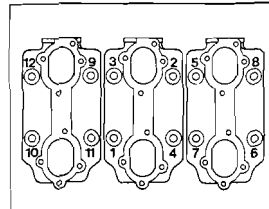
Notes on Installation

1. Grease thread of studs lightly with Optimoly HT (copper paste).
2. Fit the cylinder heads.
3. Grease the contact surfaces of the cylinder head nuts lightly with Optimoly HT and tighten as follows:

Tighten in two stages:

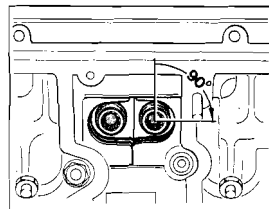
1st Stage: 20 Nm according to prescribed tightening sequence

2nd Stage: $1 \times 90^\circ \pm 2^\circ$ in same sequence

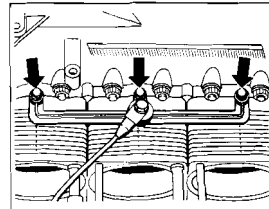


Note

Before tightening the cylinder heads, the hexagon screws of the knock sensor bridges may only be placed on by hand.



3. Finally, tighten the knock sensor bridges with 9.7 Nm.



Testing and Adjusting the Drive Belts for the Alternator and Fan.

Caution: During the measurement the key should always be removed from the ignition.

Test drive belt with drive belt run: Test with V-belt tension measuring device Special Tool 9574.

Re-tensioning is only necessary if, with the engine cold, the V-belt tension on the measuring device shows fewer than 15 scale units or, with the engine warm, fewer than 20 scale units.

Re-tensioning Procedure

Re-tensioning is carried out as described under General Adjustment Instructions.

Prior to the measurement, start the engine and let it idle for as short period.

Tension:	Cold Engine:	15 - 23 scale units
	Warm Engine:	20 - 28 scale units

Fitting a New Belt

When fitting a new belt, the **installation sequence** must be observed in order to ensure that the belt does not lose tension at a later stage.

1. Fit the new belt. Set the tension accordingly using compensation washers. Washers of thickness 0.5 mm or 0.7 mm are available for the adjustment. Identifying feature of the 0.7 mm washer: Bore with 2 mm Ø.
2. Before measuring the belt tension, restart the engine and let it idle for as short period.

Tension:	Cold Engine:	23 - 35 scale units
-----------------	--------------	---------------------

3. Let the engine idle for approx. 15 mins., or go for a test drive for approx. 15 km.

Check the tension. Target value 28 - 40 scale units

If necessary, re-tension. Test condition: Warm engine

General Adjustment Instructions

The drives for the fan and the alternator are separate from one another.

Test Values Engine Type M 64/05/06/07/08/20

Engine Type M 64/20 (values in parentheses)

Test Procedure	Test and Adjustment Values		Remarks
Electric Fuel Pump Delivery Quantity	minimum of 850 cm ³ /30 s		
Fuel Pressure (Stationary Engine)			
Fuel Pump Relay Bridged	3.8 ± 0.2 bar		
Control Valve in Neutral	approx. 3.3 ± 0.2 bar		
Seal Test			
Minimum Pressure after 20 min.	3.0 bar		
	without Cat. Conv.	with Cat. Conv.	
Idling Speed rpm	800 ± 40* (960)	800 ± 40* (960)	* The idling speed can only be checked. Setting the idling is not required.
CO Values %	0.5 - 1.0	0.4 - 1.2*	* Measured before cat.conv. and Lambda probe connector not separated. CO setting not required
HC Values ppm	≤ 300	≤ 300	

Idling speed of engine type M64/06/08 Tiptronic in gear at rpm 750 ± 40

Tightening Torques: Fuel System

Location	Thread	Tightening Torque Nm
Fuel Return Line (Engine Compartment)		35
Fuel Supply Line (Engine Compartment)		35
Fuel Pump to Body	M 6	6
Cap Nut to Fuel Pump		20
Fuel Pressure Line Fuel Filter		35
Connection of Fuel Pump to Fuel Tank (Hose Clip)		0.8

General Data

Front Axle Drive Z64 / 20

Type	Code Letter	Equipment	Installed in	Model Year
Z64/20	—	—	911 Carrera 4 worldwide	'95
General Data	Front Axle Drive Z64/20			
Transmission Ratio				
Final Drive (Z2 : Z1 = i)	31 : 9 = 3.444			
Final Drive	Bevel-gear drive without hypoid offset			
Filling Capacity	Approx. 0.6 liter hypoid oil 75 W 90 of API classification GL 5 (or MIL-L 2105 B)			

General Data

6-Speed Manual Transmission G50 / 20 / 21 for 911 Carrera (993)

Type	Code Letter	Equipment	Installed in	Model Year
G50/21	—	6 Speed	911 Carrera worldwide except USA, CH, A	'94/'95
G50/20	—	6 Speed	911 Carrera USA, CH, A	'94/'95

General Data

6-Speed Manual Transmission G50 / 31 / 32 / 33 for 911 Carrera RS

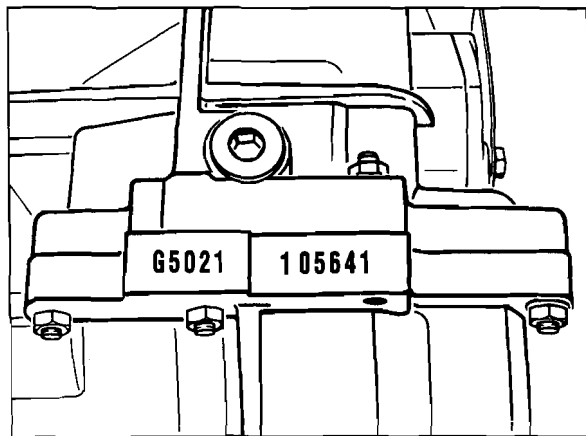
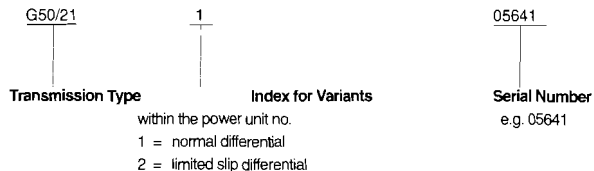
Type	Code Letter	Equipment	Installed in	Model Year
G50/31	—	6 Speed	911 Carrera RS (Basic Version)	'95
G50/32	—	6 Speed	911 Carrera RS (Clubsport)	'95
G50/31	—	6 Speed	911 Carrera RS (Basic Version and Clubsport) Switzerland	'95

Apart from a few variations regarding structure and repairs, the Carrera RS transmissions are the same as the Carrera transmissions G50/20/21.

The most important differences are:

- Altered Transmission Ratios
- 2nd gear wheel on driveshaft
- Synchronizer ring steel/molybdenum (only transmission G50/32)
- Limited slip differential standard (slip value traction 40%, thrust 65%)
- Harder transmission mounting

Structure of Transmission Numbers



Technical Data

Manual Transmission 911 Carrera (993)

General Data

Manual Transmission G 50 / 21 / 20

Transmission Ratios	G50/21	G50/20
	Z1 Z2 = Z2 : Z1	Z1 Z2 = Z2 : Z1
1st Gear	11 : 42 = 3.818	11 : 42 = 3.818
2nd Gear	20 : 43 = 2.150	21 : 43 = 2.048
3rd Gear	25 : 39 = 1.560	27 : 38 = 1.407
4th Gear	33 : 41 = 1.242	34 : 38 = 1.118
5th Gear	37 : 38 = 1.027 41 : 42 = 1.024*	38 : 35 = 0.921 42 : 39 = 0.928**
6th Gear	39 : 32 = 0.820	40 : 31 = 0.775
R Gear	14 : 40 = 2.857	14 : 40 = 2.857
Final Drive	Hypoid Bevel-Gear Drive with 16 mm Offset	
Transmission Ratio	9 : 31 = 3.444	9 : 31 = 3.444
Final Drive		
Filling Capacity	3.6 l Multigrade transmission oil SAE 75 W 90 of API classification GL 5 (or MIL-L 2105 B)	

* As standard 15.12.94

** As standard 7.12.94

Technical Data

Manual Transmission 911 Carrera (993)

General Data	A50/01	A50/02	A50/03
Transmission Ratios	G50/31 $Z_1 : Z_2 = Z_2 : Z_1$	G50/32 $Z_1 : Z_2 = Z_2 : Z_1$	G50/33 $Z_1 : Z_2 = Z_2 : Z_1$
1st Gear	13 : 41 = 3.154	13 : 41 = 3.154	13 : 41 = 3.154
2nd Gear	20 : 40 = 2.000	20 : 40 = 2.000	20 : 40 = 2.000
3rd Gear	23 : 35 = 1.522	23 : 35 = 1.522	27 : 38 = 1.407
4th Gear	33 : 41 = 1.242	29 : 36 = 1.241	34 : 38 = 1.118
5th Gear	41 : 42 = 1.024	32 : 33 = 1.031	37 : 36 = 0.973
6th Gear	39 : 32 = 0.821	35 : 29 = 0.829	39 : 32 = 0.821
R Gear	14 : 40 = 2.857	14 : 40 = 2.857	14 : 40 = 2.857
Final Drive	Hypoid bevel-gear with 16 mm offset		
Transmission Ratio Final Drive	9 : 31 = 3.444	9 : 31 = 3.444	9 : 31 = 3.444
Filling Capacity Rear Axle Final Drive	3.6 l Multigrade transmission oil SAE 75 W 90 of API classification GL5 (or MIL-L 2105 B)		

Technical Data

Tightening Torques for Manual Transmission and Transmission Suspension

Location	Thread	Tightening Torque Nm
Oil Drain Plug and Oil Filler	M 22 x 1.5	30
Hexagon nuts on side transmission cover, di- stributor, gearwheels and transmission housing, tension plate	M 8	23
Tension Plate to Front Transmission Cover	M 6	10
Hexagon Nut / Driveshaft	M 22 x 1.5	200
Hexagon Nut/ Driveshaft	M 30 x 1.5	250
Hexagon Nut / Driveshaft	M 30 x 1.25	300
Hexagon Screw / Shift Fork	M 8	23
Reverse Light Switch to Gearbox	M 18 x 1.5	35
Guide Pipe to Transmission Housing	M 6	10
Shifting Gate to Tension Plate	M 6	10
Hexagon Screw / Reverse Idler Gear II	M 8	23
Breather to Transmission Housing	M 14 x 1.5	35
Hexagon Screw / Joint Flange	M 10	46

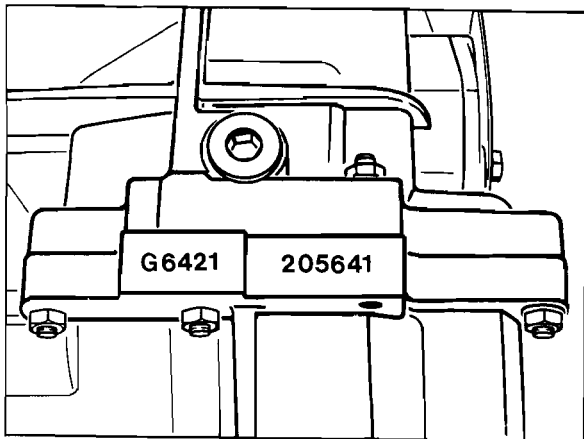
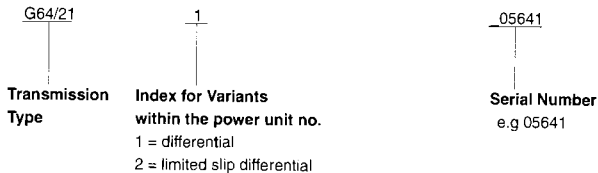
Location	Thread	Tightening Torque Nm
Hexagon Screw / Joint Flange	M 10	44
Oil Pan to Tension Plate	M 5 (microencapsulated)	6
Ring Gear to Differential Housing (Verbus- Ripp screw)	M 12 x 1.25	200
Transmission Support to Body	M 10 x 70	46
Transmission Support to Transmission (lock nut)	M 12 x 1.5	85
Longitudinal Carrier to Transmission	M 12 x 1.5 x 65	85
Longitudinal Carrier to Transmission (lock nut)	M 10	30

Technical Data

6-Speed Manual Transmission G 64

Type	Code Letter	Equipment	Installed in:	Model Year
G 64/21	—	6 Speed	911 Carrera 4 worldwide except USA, CH, A	'95
G 64/20	—	6 Speed	911 Carrera 4 USA, CH, A	'95

Structure of Transmission Numbers



Technical Data

General Data	Manual Transmission G 64 / 21 / 20	
Transmission Ratios	G64/21	G64/20
	$Z_1 : Z_2 = Z_2 : Z_1$	$Z_1 : Z_2 = Z_2 : Z_1$
1st Gear	11 : 42 = 3.818	11 : 42 = 3.818
2nd Gear	20 : 43 = 2.150	21 : 43 = 2.048
3rd Gear	25 : 39 = 1.560	27 : 38 = 1.407
4th Gear	33 : 41 = 1.242	34 : 38 = 1.118
5th Gear	41 : 42 = 1.024	42 : 39 = 0.928
6th Gear	39 : 32 = 0.820	40 : 31 = 0.775
R Gear	14 : 40 = 2.857	14 : 40 = 2.857
Final Drive	Hypoid bevel-gear drive with 16 mm offset	
Transmission Ratio	9 : 31 = 3.444	9 : 31 = 3.444
Final Drive		
Filling Capacity	3.8 l Multigrade transmission oil SAE 75 W 90 of API classification GL 5 (or MIL-L 2105 B)	

Tightening Torques for Manual Transmission. Front Axle Final Drive, Transmission Suspension und Central Tube, Carrera 4

Location	Thread	Tightening Torque Nm
Oil Drain Plug and Oil Filler	M 22 x 1.5	30
Hexagon Nuts on: side transmission cover, distributor, gearwheels and transmission housing, tension plate	M 8	23
Tension Plate to Intermediate Housing	M 6	10
Hexagon Nut / Driveshaft	M 22 x 1.5	200
Hexagon Nut / Driveshaft	M 30 x 1.5	250
Hexagon Nut / Driveshaft	M 30 x 1.25	300
Hexagon Screw / Shift Fork	M 8	23
Reverse Light Switch to Gearbox	M 18 x 1.5	35
Guide Pipe to Transmission Housing	M 6	10
Shifting Gate to Tension Plate	M 6	10
Hexagon Screw / Reverse Idler Gear II	M 8	23
Breather to Transmission Housing	M 14 x 1.5	35
Hexagon Screw / Joint Flange	M 10	44

Location	Thread	Tightening Torque Nm
Oil Pan to Tension Plate	M 5 (microencapsulated)	6
Ring Gear to Differential Housing (Verbus-Ripp screw)	M 12 x 1.25	200
Front Axle Final Drive		
Plug / Oil Filler	M 22	22
Plug / Oil Drain	M 22	30
Transm. Suspension HA		
Crossmember to Body	M 10 x 70	46
Support Bearing to Cross-member (lock nut)	M 10	46
Support Bearing to Transmission (lock nut)	M 10	46
Transm. Suspension VA		
Front Axle Final Drive Bearings to Front Axle Cross-member	M 8	23
Front Axle Final Drive Bearings to Central Tube	M 12	85
Central Tube		
Twin Clamp to Central Tube	M 8	35...40
Manual Transmission to Central Tube	M 12	85
FA Final Drive to Central Tube	M 10	46

General Data

4-Speed Tiptronic Transmission A50

Type	Code Letter	Equipment	Installed in	Model Year
A50/04	-	4 Speed	911 Carrera worldwide except USA and Taiwan	'94/'95
A50/05	-	4 Speed	911 Carrera USA, Taiwan	'94/'95

Technical Data

4-Speed Tiptronic Transmission A50

General Data	A50/04	A50/05
Design	Fully Automatic 4-Speed Planetary transmission (Tiptronic)	
Transmission Ratio		
Spur Gear Drive	1.100	1.100
1st Gear	2.479	2.479
2nd Gear	1.479	1.479
3rd Gear	1.000	1.000
4th Gear	0.728	0.728
R Gear	2.086	2.086
Final Drive	Hypoid bevel-gear drive with 16 mm offset	
Final Drive Transmission Ratio	9 : 33 i = 3.667 9 : 32 i = 3.556	
Stall Speed	2300 - 400	2300 - 400
@LINIE =		
Filling Capacity	approx. 0.9 l Multigrade transmission oil 75 W 90 of	
Rear Axle Final Drive	API classification GL 5 (or MIL-L 2105 B), optionally SAE 90	
Filling Capacity Automatic Section with Converter	Total Filling Capacity approx. 9.5 l Change Quantity approx. 3.5 l ATF-Dexron II D	

Tightening Torques Tiptronic Transmission

Location	Thread	Tightening Torque Nm
Multifunction Switch to Transmission	M 6 x 25	10
Operating Lever to Selector Shaft	M 8 x 1	15
Long Joint Flange to Transmission Housing	M 8	23
Short Joint Flange to Differential	M 10 x 60	46
Plug to Rear Transmission Housing	M 22 x 1.5	50
Rear Transmission Housing to Automatic Transmission	M 10	46
Front Transmission Cover to Intermediate Plate	M 10 x 35 M 8	46 23
Intermediate Plate to Automatic Transmission	M 8	23
Lock Nut to Helix Gearwheel	M 40 x 1.5	250
Guide Element for Park Lock to Housing	M 6 x 20	10
Plug to ATF pan	M 14 x 1.5	40
Banjo Bolt to ATF pan	M 12 x 1.5	40
Banjo Bolt to Housing	M 14 x 1.5	40
ATF pan to Housing	M 6	6
ATF filter to Hydraulic Control Unit	M 6 x 65	8

Location	Thread	Tightening Torque Nm
Plug to ATF Quick-Fill Connection	M 14 x 1.5	30
Slide Gear Case to Transmission	M 6	8
Hexagon Nut for Transmission Socket		12
ATF Spray Line to Transmission	M 6 x 4	5
Adapter for Slide Gear Case to Housing	M 6	8
Pressure Regulator and Solenoid Valve Mount to Control Unit	M 6	5
Solenoid Valves to Slide Gear Case	M 5 x 12	5
ATF Pump to Housing	M 6	10
Oil Drain Plug and Oil Filler	M 22 x 1.5	50
Side Transmission Cover to Housing	M 8 x 35	23
Bearing Cover to Bearing Bond	M 6 x 15	10
Driveshaft-Bearing Bond to Housing	M 10 x 35	50
Plug for ATF Ducts	M 14 - 1.5	25
Lock Nut to Bearing Bond	M 36 x 1.5	250
Ring Gear to Differential Housing	M 10 x 1.25	85 (and Loctite 262)

Tightening Torques for Transmission Suspension

Location	Thread	Tightening Torque Nm
Transmission Support to Body	M 10 x 70	46
Transmission Support to Transmission (Lock Nuts)	M 12 x 1.5	85
Longitudinal Carrier to Transmission	M 12 x 1.5 x 65	85
Longitudinal Carrier to Transmission Support (Lock Nuts)	M 10	30
Console to Transmission	M 8 x 35	23

Tightening Torques for ATF Lines and Cooler

Location	Thread	Tightening Torque Nm
Bracket to Headlight Shell	M 6	10
Console to Gearbox	M 8	23
Tension Strut to Console	M 6	10
Latch to ATF Cooler	M 6	10
ATF Cooler to Engine Cooler	M 6	10
Fanfare Bracket to Gearbox	M 6	10
ATF Lines to Transmission (Union Nut)	M 18	30
Separation Points to ATF Lines (Union Nut)	M 18	30

Tightening Torques for Selector Lever Operation

Location	Thread	Tightening Torque Nm
Lock Nut to Fork Head for Selector Lever Control Cable	M 5	6
Selector Lever Connection to Body	M 6 x 16	10
Bracket for Selector Lever Control Cable on Transmission	M 8	23
Control Cable-Slide Gear Housing to Shift Plate (Keylock)	M 4	2.5
Keylock-Control Cable to Ignition	M 10 x 1	2.5
Shiftlock to Selector Lever Housing	M 5	6.5
Stroke Magnet to Shiftlock Housing	M 4	2.5

Checking the Clutch Drive Plate for Wear

Check:

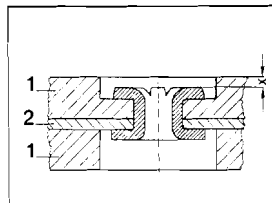
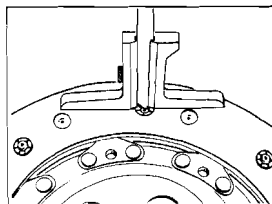
Using a depth gauge, measure from the lining surface to the rivet head (Dimension X).

Note

Only measure on the unflared side of the rivet head.

The wear dimension X is 0.3 mm (see diagram). With a new drive plate, this dimension is approx. 1.0 mm.

Please bear in mind that the lining wear does not occur uniformly during its service life. Due the settling properties (compression) of the lining, the lining wear is initially assumed to be greater. With increasing mileage, the wear is considerably less.



- 1 - Lining
- 2 - Drive Plate / Lining Spring

Tightening Torques for Front Axle

911 Carrera / 911 Carrera 4 / 911 Carrera RS

NB: bolt connections in Dacromet design – aluminum-colored appearance;
– do not grease.

Location	Thread	Tightening Torque Nm
Crossmember		
Crossmember to Body		
outer	M 12 x 1.5	105
inner	M 10	48
Bearing Plate of Gearshift to Crossmember	M 8	23
Central Tube / FA Final Drive		
FA Final Drive to Central Tube	M 10	46
Transmission Mounting (rubber-metal mounting) to FA Crossmember	M 8	23
to Transmission (Central Tube)	M 12 x 1.5	105
Driveshaft		
to FA Final Drive	M 8	42
to Wheel Hub	M 22 x 1.5	460
Longitudinal Carrier		
to Body (front)	M 12 x 1.5	90
to Crossmember (rear)	M 10	46
Control Arm / Control Arm Bearing		
Front Control Arm to Longitudinal Carrier	M 12 x 1.5	110

Location	Thread	Tightening Torque Nm
Rear Control Arm to Longitudinal Carrier	M 12 x 1.5	85
Control Arm Bearing to Control Arm		
Caster Eccentric	M 10	80
	M 112 x 1.5	140
Control Arm Bearing to Wheel Carrier (Ball Joint)	M 12 x 1.5	75
Cooling Air Line for Brake to Control Arm	M 6	10
McPherson Strut / Wheel Carrier		
McPherson Strut to Wheel Carrier	M 12 x 1.5	120
Upper Screw (Camber Adjustment)	M 12 x 1.5	200
Lower Screw		
Lock Nut for Height Adjustment Nut on McPherson Strut (only Carrera RS)	M 64 x 1.5	50
McPherson Strut-Support Bearing to Body	M 8	33
Inner Section of McPherson Strut Support Bearing to Outer Section of Support Bearing (only Carrera RS)	M 10	64
Plug* of McPherson Strut Support Bearing (only Carrera RS)	M 50 x 1.5	180*
McPherson Strut Support Bearing to Piston Rod	M 14 x 1.5	80

* Do not open plug when the vehicle is still on wheels.
Replace plug after disassembly.

Location	Thread	Tightening Torque Nm
Cover Plate to Wheel Carrier	M 6	10
Brake Caliper to Wheel Carrier*	M 12 x 1.5	85*
Speed Sensor to Wheel Carrier	M 6	10
Holding Plate for Wheel Bearing to Wheel Carrier	M 8	37
Wheel Hub to Wheel Carrier	M 22 x 1.5	460
Stabilizer		
to Longitudinal Carrier	M 8	23
Stabilizer Suspension to Wheel Carrier and Stabilizer	M 10	46
Steering		
(Values not listed are in Repair Category 48)		
Track Rod (Ball Joint) to Steering Arm	M 12 x 1.5	75
Universal Joint (Steering Shaft) to Steering Gear	M 8	23**
Steering Gear to Cross-member		Tightening torque and instruction in repair category Steering
Wheel Mounting		
Wheel to Wheel Hub	M 14 x 1.5	130

* Renew screws after every disassembly (only on the front axle).

** Renew shoulder screw after every disassembly.

Tightening Torques for Steering

Location	Thread	Tightening Torque Nm
Steering Gear on Longitudinal Carrier	M 8	45*
Track Rod (Ball Joint) to Steering Arm	M 12 x 1.5	75
Universal Joint (Steering Shaft) to Steering Gear	M 8	23**
Track Rod to Ball Joint and Universal Joint Fork (Lock Nut)	M 14 x 1.5	45
Track Rod to Rack	M 14 x 1.5	70
Steering Wheel to Steering Shaft	M 16 x 1.5	45
Steering Protection Tube to Body***	M 6	10
Pressure and Return Line to Steering Gear	M 12 x 1.5	20
Pressure Line to Servo Pump	M 14 x 1.5	30
Pressure Line to Pressure Line	M 14 x 1.5	25

* Renew screws after every disassembly. Use only original spare parts (micro-encapsulated screws). Threads in the crossmember, screws and washer must be clean and free of grease. Before tightening them, first turn the screws evenly until the securing clips make contact with the crossmember.

** Renew shoulder screws after every disassembly.

*** After a function check and visual check of the relevant parts, break off all the shear-off screws.

Tightening Torques for Rear Axle

NB: bolt connections in Dacromet design – aluminum-colored appearance;
– do not grease.

Location	Thread	Tightening Torque Nm
Sub-frame/Crossmember		
Sub-frame (Side Sections) to Body (Rubber- Metal Bearing)	M 12 x 1.5	120
Upper Crossmember (2 Parts)		
Bolt Connections to Side Sections	M 12 x 1.5	85
Center Bolt Connections of the 2 Halves	M 10	65
Rear Crossmember to Side Sections	M 12 x 1.5	120
Front Crossmember to Side Sections	M 10	65
Axle Control Arm		
Control Arm 2 (Track Con- trol Arm)	M 12 x 1.5	85
to Wheel Carrier	M 12 x 1.5	85
to Crossmember (Eccentric)		
Control Arm 1/5 (Lower Control Arm)	M 12 x 1.5	85
to Sub-frame	M 14 x 1.5	200
to Sub-frame	M 12 x 1.5	75
to Wheel Carrier		
Control Arm 3 (Camber Control Arm)	M 12 x 1.5	75
to Wheel Carrier	M 12 x 1.5	85
to Sub-frame (Eccentric)		
Control Arm 4 (Pinout Control Arm)		
to Wheel Carrier	M 12 x 1.5	75
to Sub-frame (Eccentric)	M 12 x 1.5	85

Location	Thread	Tightening Torque Nm
Wheel Carrier		
Wheel Bearing to Wheel Carrier*	M 8	23 with 8.8 screws*
	M 8	33 with 10.9 screws
Speed Sensor to Wheel Carrier	M6	10
Cover Plate to Wheel Carrier	M 6	10
Brake Disc to Wheel Hub	M 6	5
Brake Caliper to Wheel Carrier	M 12 x 1.5	85
McPherson Strut		
to Body	M 8	33
to Wheel Carrier (Control Arm 2)	M 12 x 1.5	85
Vibration Damper to Support Bearing (Piston Rod)	M 12 x 1.5	58
Plug** of McPherson Strut Support Bearing (only Carrera RS)	M 50 x 1.5	180**
Universal Bracket/Lock Nut*** to McPherson Strut (only Carrera RS)	M 52 x 1.5	100***
Wheel Mounting		
Wheel to Wheel Hub	M 14 x 1.5	130

* After the 8.8 screws have been used up, only 10.9 screws can be supplied.

** Do not open plug when the vehicle is still on wheels.
Replace plug after disassembly.

*** Do not remove. Observe instruction in Repair Guide.

Location	Thread	Tightening Torque Nm
Driveshaft		
to Transmission	M 10	81
to Wheel Hub		
Check Nut	M 22 x 1.5	460
Lock Nut*	M 22 x 1.5	200*
Stabilizer		
to Crossmember	M 8	23
to Stabilizer Suspension	M 10	46
Stabilizer Suspension to McPherson Strut	M 10	46

- * Additional on 911 Carrera RS: chamfer of lock nut facing
check nut

Adjustment Values for Vehicle Measurement

The following values refer to the curb weight to DIN 70020.

This means: full fuel tank, vehicle with spare wheel and tools.

Varying values for USA vehicles are in parentheses.

Carrera RS versions: M002 = Basic Version / M003 = Clubsport Version.

Vehicle Height		RoW: Series (USA: Series and long-distance chassis)	RoW: Sport and lowered (USA: Sport)	Carrera RS M002 / M003
Front Axle Height	mm			
From wheel contact surface to outer hexagon screw of bolted connection "Cross- member to Body" (as 964)		154 ± 10 (174 ± 10)	144 ± 10 (174 ± 10)	124 ± 10
Max. Difference left to right	mm	5	5	5
Rear Axle Height	mm			
From wheel contact surface to rear contact surface sub-frame underside		147 ± 10 (157 ± 10)	127 ± 10 (157 ± 10)	107 ± 10
Max. Difference left to right	mm	5	5	5
Max. Height Diff. Front Axle to Rear Axle	mm	10	10	10
Max. Wheel Load Differen- ce left to right to front and Rear Axle	kg	20	20	20

Wheel Alignment Values

The following values refer to the curb weight to DIN 70020.

This means: full fuel tank, vehicle with spare wheel and tools.

Varying values for USA vehicles are in parentheses.

Carrera RS versions: M002 = Basic Version / M003 = Clubsport Version.

Front Axle	RoW: Series (USA: Series (USA: Series and long-distance chassis)	RoW: Sport and lowered (USA: Sport)	Carrera RS M002 / M003
Toe Unpressed (Total)	+ 5' ± 5'	+ 5' ± 5'	+ 5' ± 5'
Toe Difference Angle with 20° Lock	- 1° ± 30'	- 1° 45' ± 30'	- 1° 27' ± 30'
Camber (with straight alignment of wheels)	- 20' ± 10'	- 20' ± 10'	- 1° ± 10'
Max. Difference left to right	10'	10'	10'
Caster*	5° 20' + 15' - 30'	5° 20' + 15' - 30'	5° 20' + 15' - 30'
Max. Difference left to right	15'	15'	15'

* The caster target value (5° 20') is desirable.

Wheel Alignment Values

The following values refer to the curb weight to DIN 70020.

This means: full fuel tank, vehicle with spare wheel and tools.

Varying values for USA vehicles are in parentheses.

Carrera RS versions: M002 = Basic Version / M003 = Clubsport Version.

Rear Axle	RoW: Series (USA: Series (USA: Series and long-distance chassis)	RoW: Sport and lowered (USA: Sport)	Carrera RS M002 / M003
Toe per Wheel	+ 10' ± 5'*	+ 10' ± 5'*	+ 10' ± 5'**
Max. Difference left to right			
Camber	- 1° 10' ± 15'*	- 1° 10' ± 15'	- 1° 20' ± 10'
Max. Difference left to right	20'	20'	20'
Kinematic Toe-in Adjustment	1.5 SU***	1.5 SU***	1.5 SU***
Max. Difference Steering Angle 2 to Steering Angle 5			

* Altered values which apply retroactively (as of series begin).

Previous values: Toe per wheel = + 15' ± 5' / Camber = - 55' ± 15'.

** The toe target value (+ 15' per wheel) is desirable.

*** SU = Scale Units. Measurement / Reading at spirit level center (bubble center).

Technical Data Brake System 911 Carrera

Designation		Remarks, Dimensions	Wear Limit
Operating Brakes (Foot Brake)		Hydraulic dual-circuit brake system with front/rear axle circuit division. Vacuum brake booster, vented brake discs and perforated brake discs with four-piston calipers on front and rear axles. ABS as standard. Special option ABS/ABD*.	
Brake Booster Ø		9 inches	
Vacuum Boost Coefficient		3.15	
Brake Master-Cylinder Ø	front	23.81 mm	
	rear	23.81 mm	
	Stroke	22.5/13 mm	
Brake Power Regulator**		40 bar - 0.46	
Switchover Pressure			
Reduction Coefficient			
Brake Discs Ø	front	304 mm	
	rear	299 mm	
Effective Brake Discs Ø	front	251 mm	
	rear	246 mm	
Pistons Ø in Brake Caliper	front	2 x 44 + 2 x 36 mm	
	rear	2 x 34 + 2 x 30 mm	
Brake Lining Area	front	250 cm ²	
	rear	172 cm ²	
Total Brake Lining Area		422 cm ²	
Brake Pad Thickness	front	approx. 11.0 mm	2 mm
	rear	approx. 12.0 mm	2 mm

* ABD = Automatic Braking Differential

** Vehicles with ABS = 1 Brake Power Regulator,
Vehicles with ABS/ABD = 2 Brake Power Regulator

Designation	Remarks, Dimensions	Wear Limit
Brake Disc Thickness new front	32 mm	
rear	24 mm	
Brake Disc Min. Thickness* after re-facing		
front	30.6 mm	30.0 mm
rear	22.6 mm	22.0 mm
Thickness Tolerance of Brake Disc Max.	0.02 mm	
Lateral Runout of Brake Disc Max.	0.05 mm	
Lateral Runout of Wheel Hub Max.	0.04 mm	
Lateral Runout of Brake Disc When Installed Max.	0.09 mm	
Surface Roughness of Brake Disc After Refacing Max.	0.006 mm	
Play at Brake Pedal (measured at the brake pedal plate)	approx. 8 mm	
Parking Brake (Handbrake)	Drum brake, with mechanical action on both rear wheels	
Parking Brake Drum Ø	180 mm	181 mm
Brake Shoe Width	25 mm	
Brake Lining Thickness	4.5 mm	2 mm

- * The brake disc may only be machined symmetrically, i.e. in a uniform manner on both sides.

Technical Data Brake System 911 Carrera 4

Designation		Remarks, Dimensions	Wear Limit
Operating Brakes (Foot Brake)		Hydraulic dual-circuit brake system with front/rear axle circuit division. Vacuum brake booster, vented brake discs and perforated brake discs with four-piston calipers on front and rear axles. ABS/ABD* as standard.	
Brake Booster		hydraulic	
Boost Coefficient		4.8	
Brake Master Cylinder Ø	front	25.4 mm	
	rear	25.4 mm	
	Stroke	17/15 mm	
Brake Power Regulator		45 bar - 0.46	
Switchover Pressure			
Reduction Coefficient			
Brake Discs Ø	front	304 mm	
	rear	299 mm	
Effective Brake Discs Ø	front	251 mm	
	rear	246 mm	
Pistons -Ø in Brake Caliper	front	2 x 44 + 2 x 36 mm	
	rear	2 x 30 + 2 x 28 mm	
Brake Lining Area	front	250 cm ²	
	rear	172 cm ²	
Total Brake Lining Area		422 cm ²	
Brake Pad Thickness	front	approx. 11.0 mm	2 mm
	rear	approx. 12.0 mm	2 mm

* ABD = Automatic Braking Differential

Designation	Remarks, Dimensions	Wear Limit
Brake Disc Thickness new		
front	32 mm	
rear	24 mm	
Brake Disc Min. Thickness* after re-facing		
front	30.6 mm	30.0 mm
rear	22.6 mm	22.0 mm
Thickness Tolerance of Brake Disc Max.	0.02 mm (new condition 0.01 mm)	
Lateral Runout of Brake Disc Max.	0.05 mm	
Lateral Runout of Wheel Hub Max.	0.04 mm	
Lateral Runout of Brake Disc When Installed Max.	0.09 mm	
Surface Roughness of Bra- ke Disc After Refacing Max.	0.006 mm	
Play at Brake Pedal (mea- sured at the brake pedal plate)	approx. 8 mm	
Parking Brake (Handbrake)	Drum brake, with mechanical action on both rear wheels	
Parking Brake Drum Ø	180 mm	181 mm
Brake Shoe Width	25 mm	
Brake Lining Thickness	4.5 mm	2 mm

* The brake disc may only be machined symmetrically, i.e. in a uniform manner on both sides. ***

Technical Data Brake System 911 Carrera RS

The following values refer to the basic version M002 and the Clubsport version M003.

Designation		Remarks, Dimensions	Wear Limit
Operating Brakes (Foot Brake)		Hydraulic dual-circuit brake system with front/rear axle circuit division. Vacuum brake booster, vented brake discs and perforated brake discs with four-piston calipers on front and rear axles. ABS/ABD* as standard.	
Brake Booster		hydraulic	
Boost Coefficient		3.6	
Brake Master- Cylinder Ø	front	25.4 mm	
	rear	25.4 mm	
	Stroke	17/15 mm	
Brake Power Regulator		40 bar - 0.46	
Switchover Pressure			
Reduction Coefficient			
Brake Discs Ø	front	322 mm	
	rear	322 mm	
Effective Brake Discs Ø	front	259.6 mm	
	rear	268.4 mm	
Pistons Ø in Brake Caliper	front	2 x 44 + 2 x 36 mm	
	rear	2 x 36 + 2 x 30 mm	
Brake Lining Area	front	302 cm ²	
	rear	250 cm ²	
Total Brake Lining Area		552 cm ²	
Brake Pad Thickness	front	approx. 11.0 mm	2 mm
	rear	approx. 12.0 mm	2 mm

* ABD = Automatic Braking Differential

The following values refer to the basic version M002 and the Clubsport version M003.

Designation	Remarks, Dimensions	Wear Limit
Brake Disc Thickness new		
front	32 mm	
rear	28 mm	
Brake Disc Min. Thickness* after re-facing		
front	30.6 mm	30.0 mm
rear	26.6 mm	26.0 mm
Thickness Tolerance of Brake Disc Max.	0.02 mm (new condition 0.01 mm)	
Lateral Runout of Brake Disc Max.	0.05 mm	
Lateral Runout of Wheel Hub Max.	0.04 mm	
Lateral Runout of Brake Disc When Installed Max.	0.09 mm	
Surface Roughness of Brake Disc After Refacing Max.	0.006 mm	
Play at Brake Pedal (mea- sured at the brake pedal plate)	approx. 8 mm	
Parking Brake (Handbrake)	Drum brake, with mechanical action on both rear wheels	
Parking Brake Drum Ø	180 mm	181 mm
Brake Shoe Width	25 mm	
Brake Lining Thickness	4.5 mm	2 mm

- * The brake disc may only be machined symmetrically, i.e. in a uniform manner on both sides.

Tightening Torques for Mechanical Brake System

Location	Thread	Tightening Torque Nm
Brake Caliper* to Front and Rear Axles	M 12 x 1.5	85*
Brake Disc to Wheel Hub (Front and Rear Axles)	M 6	5
Cover Plate to Front and Rear Axles	M 6	10
Speed Sensor to Front and Rear Axles	M 6	10
Universal Joint to Brake Pedal Rod	M 12 x 1.5** M 10***	17** 35***
Wheel to Wheel Hub	M 14 x 1.5	130

Booster Circuit (Hydraulic Brake Power Booster)

Brake Pressure Line to Pressure Accumulator, Brake Power Booster and Pump Unit	M 10 x 1	14 - 16 (steel lines)
Screw Coupling (mini measuring connection) to Accumulator	M 10 x 1	14 - 16
Pump Unit, Unit Mounting	M 6	10 - 13
Pressure Warning Switch to Pump Unit	M 25	26

* Replace the securing screws to front axle after every disassembly

** Vacuum brake power booster

*** Hydraulic brake power booster

Location	Thread	Tightening Torque Nm
Master Brake Cylinder		
Circuits/		
Hydraulic Unit		
Brake Pressure Line to Master Brake Cylinder, Brake Hose, Brake Power Regulator, Distributor, Brake Caliper and Hydraulic Unit	M 10 x 1 M 12 x 1	12 - 14 (copper line) 20 (copper line)
Brake Power Regulator to Hydraulic Unit	M 10 x 1	14
Hydraulic Unit to Bracket	M 6	10 (screw)
Hydraulic Unit to Body	M 6	4 (plastic nut)
Fluid Reservoir to Body	M 6	10
Intermediate Piece to Body	M 6	10
Brake Caliper		
Connection Line to Brake Caliper	M 10 x 1	12
Bleed Screw to Brake Cali- per	M 10 x 1	8 - 12

Location	Thread	Tightening Torque Nm
Brake System with Vacuum Booster		
Brake System (complete with mounting bracket and retainer) on Longitudinal Carrier	M 8	23
Brake Power Booster to Mounting Bracket	M 8	23
Master Brake Cylinder to Retainer and Brake Power Booster	M 8	23
Brake System with Hy-draul. Booster		
Brake Power Booster to Bulkhead	M 8	23
Master Brake Cylinder to Intermediate Piece* of Brake Power Booster	M 8	23

Technical Data of Air Conditioning

Compressor Type 10 PA 15 C

Refrigerant Volume

840 g Refrigerant **R 134a**

Refrigerant Oil in Compressor

100 ± 20 cm³ Densoil

Tightening Torques for Refrigerant Lines

Thread Outer Diameter	No. of Gears/Inches	Tightening Torque Nm
5/8"	18 UNF	17 ± 3
3/4"	16 UNF	24 ± 4
7/8"	14 UNF	33 ± 4

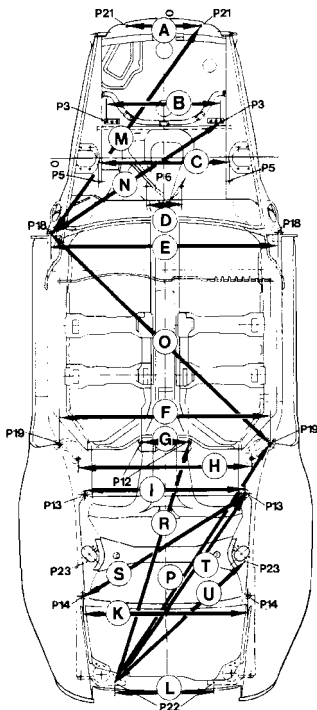
Hexagon Screws to	Thread	Tightening Torque Nm
Expansion Valve	M 5	6
Expansion Valve	M 6	9
Compressor	M 8	28

Note

When fitting the refrigerant lines, the screw connections and O rings must be moistened with refrigerant oil.

The refrigerant oil **must be disposed of as special waste.**

Dimensions for Floor System



Dimensions for Floor System

Dimension		Point	Designationmm
A	P 21	Lower front end section, reception bore	440 ± 2
B	P 3	Longitudinal carrier FA, screw point	$670 \pm 0,5$
C	P 5	Outer crossmember FA, screw point	770 ± 2
D	P 6	Inner crossmember FA, screw point	204 ± 2
E	P 18	Lifting platform/Jack front, reception bore	1330 ± 1
F	P 19	Jack rear, reception bore	1236 ± 1
G	P 12	Transmission carrier, screw point	278 ± 1
H	P 20	Lifting platform rear, reception bore	1018 ± 1
I	P 13	Sub-frame front, screw point	$935 \pm 1,5$
K	P 14	Sub-frame rear, screw point	$973 \pm 1,5$
L	P 22	Inner engine bearing, reception bore	640 ± 1
M	P 21 – P 18		1500 ± 3
N	P 3 – P 18		$1199 \pm 3 (1195 \pm 3)$
O	P 18 – P 19		1788 ± 3
P	P 19 – P 22		$1689 \pm 3 (1654 \pm 3)$
R	P 19 – P 22		$1447 \pm 3 (1414 \pm 3)$
S	P 13 – P 14		$1143 \pm 3 (1122 \pm 3)$
T	P 13 – P 22		$1372 \pm 3 (1344 \pm 3)$
U	P 23 – P 22		$1043 \pm 3 (1039 \pm 3)$

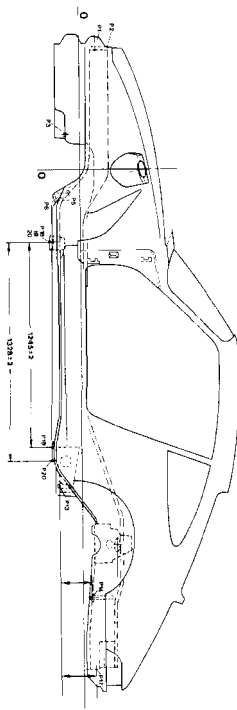
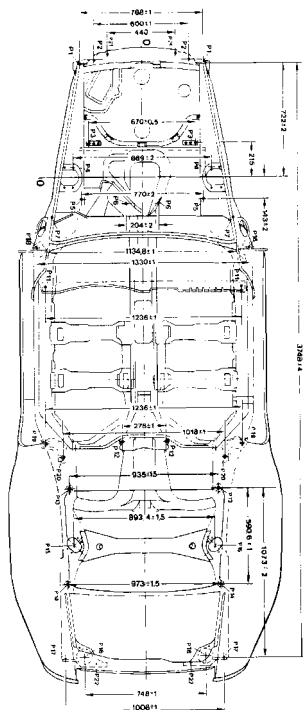
Note

All dimensions are measured from the center of the borehole or screw point. The dimensions were measured directly, thus diagonal dimensions. The dimensions in brackets were measured horizontally.

FA = Front Axle

RA = Rear Axle

Dimensions for Structure



Point lft - rt.	Designation
1	Impact absorber/Tube front, screw point (thread M 8)
2	Upper front end section, reception bore
3	Longitudinal carrier FA, screw point (thread M 12 x 1,5)
4	MacPherson strut support bearing FA, reception bore
5	Outer crossmember FA, screw point (thread M 10)
6	Inner crossmember FA, screw point (thread M 10)
7	Gearwheel case, reception bore
11	Shift plate, reception bore
12	Transmission carrier, screw point (thread M 10)
13	Sub-frame front, screw point (thread M 12 x 1,5)
14	Sub-frame rear, screw point (thread M 12 x 1,5)
15	MacPherson strut support bearing RA, reception bore
16	Engine bearing, reception bore
17	Impact absorber/Tube rear, screw point (thread M 8)
18	Lifting platform/Jack front, reception bore
19	Jack rear, reception bore
20	Lifting platform rear, reception bore
21	Lower front end, reception bore

FA = Front Axle

RA = Rear Axle