

FOREWORD

We have compiled this booklet covering

Models, Dimensions and Tolerances

to provide the Porsche mechanic with a ready reference for data and specifications necessary to render proper service.

We took into account that service operations outlined in the workshop manual are known to the user.

The contents of this booklet is arranged to correspond with subject groups in the workshop manual.

When using this booklet, also refer to technical bulletins since the data are subject to change.

PORSCHE

TECHNICAL SPECIFICATIONS

MODELS DIMENSIONS TOLERANCES

911 T · 911 E · 911 S · Carrera RS

72, 73 MODELS

1st English Edition

Current as of May
31, 1973

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6 Type Classification Code

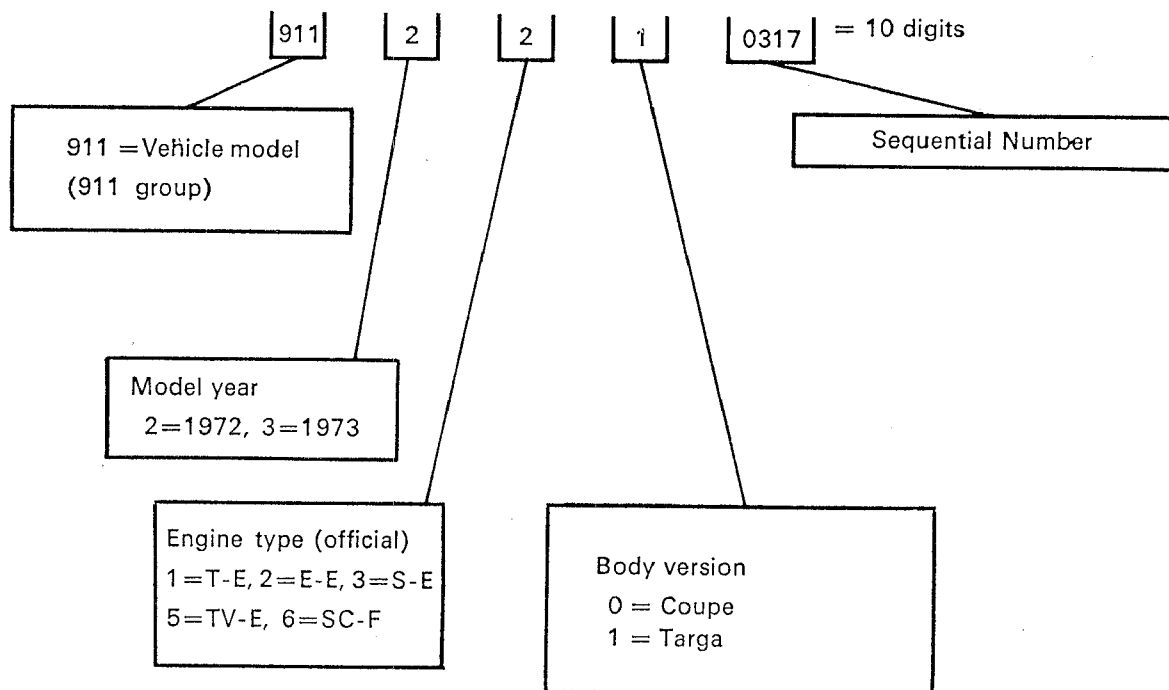
Year Mfd.	Model Year	Model Design. (Off.)	Engine Designation		Displ. (cm ³)	Horsepower DIN - HP (kW) at rpm	Stroke & Bore (mm)	Compr. Ratio
			Official	Internal				
1971/ 1972	1972	911 T	911 TV-E	911/57	2341	130 (96)/ 5600	70.4/84	7.5 : 1
				911/67 (w/Sportomatic)				
			911 T-E	911/51 (USA)	2341	140 (103)/ 5600	70.4/84	8.0 : 1
				911/61 (USA-Sportomatic)				
		911 E	911 E-E	911/52	2341	165 (121)/ 6200	70.4/84	8.0 : 1
				911/62 (w/Sportomatic)				
		911 S	911 S-E	911/53	2341	190 (140)/ 6500	70.4/84	8.5 : 1
				911/63 (w/Sportomatic)				
1972/ 1973	1973	911 T	911 TV-E	911/57	2341	130 (96)/ 5600	70.4/84	7.5 : 1
				911/67 (w/Sportomatic)				
			911 T-E	911/51 (USA)	2341	140 (103)/ 5600	70.4/84	8.0 : 1
				911/61 (USA-Sportomatic)				
		911 E	911 E-E	911/91 (USA)	2341	140 (103)/ 5700	70.4/84	8.0 : 1
				911/96 (USA Sportomatic)				
		911 S	911 S-E	911/52	2341	165 (121)/ 6200	70.4/84	8.0 : 1
				911/62 (w/Sportomatic)				
		911 SC	911 SC-F	911/53	2341	190 (140)/ 6500	70.4/84	8.5 : 1
				911/63 (w/Sportomatic)				
		911 SC	911 SC-F	911/83	2687	210 (154)/ 6300	70.4/90	8.5 : 1

7

Carburetors, F/I Pump or CIS	Engine Numbers	Transmission Type (Standard)	Chassis Numbers	
			Coupe	Targa
Carburetor	652 0001—652 3284	915/12	911 250 0001— 911 250 1963	911 251 0001— 911 251 1523
	652 9001—652 9224	905/21	Chassis Number end December 1971	911 251 0687
F/I Pump	612 0001—612 4478	915/12	911 210 0001— 911 210 2931	911 211 0001— 911 211 1821
	612 9001—612 9293	925/00	Chassis Number end December 1971	911 211 0746
F/I Pump	622 0001—622 1765	915/12	911 220 0001— 911 220 1124	911 221 0001— 911 221 0861
	662 9001—622 9248	925/00	Chassis Number end December 1971	911 221 0290
F/I Pump	632 0001—632 2586	915/12	911 230 0001— 911 230 1750	911 231 0001— 911 231 0989
	632 9001—632 9147	925/01	Chassis Number end December 1971	911 231 0311
Carburetor	653 0001—	915/12	911 350 0001—	911 351 0001—
	653 9001—	905/21	Chassis Number end December 1972	911 351 0736
F/I Pump	613 0001—	915/12	911 310 0001— 911 310 1252	911 311 0001— 911 311 0781
	613 9001—	925/00		
Continuous Injection System	613 3001—	915/12	911 310 1501—	911 311 1001
	613 9301—	925/00		
F/I Pump	623 0001—	915/12	911 320 0001—	911 321 0001
	623 9001—	925/00	Chassis Number end December 1972	911 321 0431
F/I Pump	633 0001—	915/12	911 330 0001—	911 331 0001—
	633 9001—	925/01	Chassis Number end December 1972	911 331 0468
F/I Pump	663 0001—	915/08	911 360 0001—	—
			Chassis Number end December 1972	911 360 0319

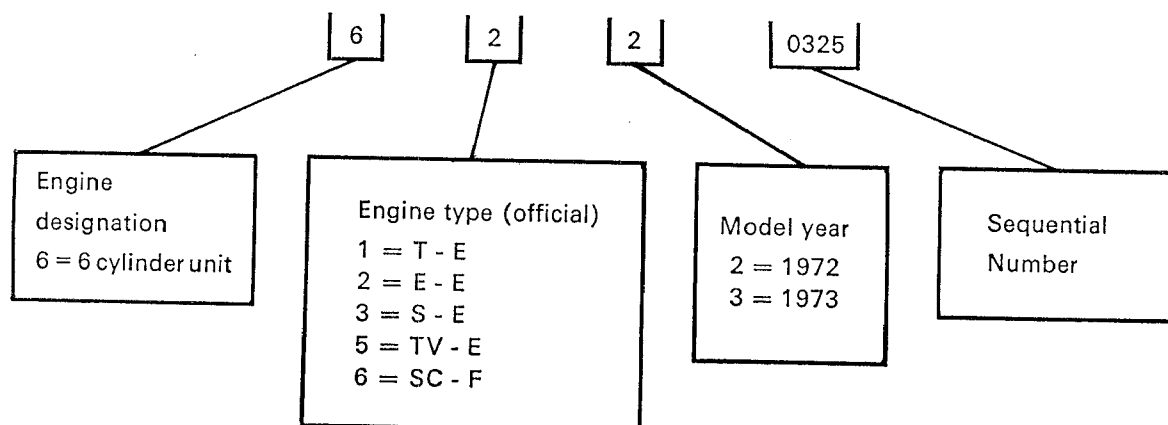
Chassis Number Code

Example : Chassis number of a Type 911 E 1972 model,
Targa version vehicle



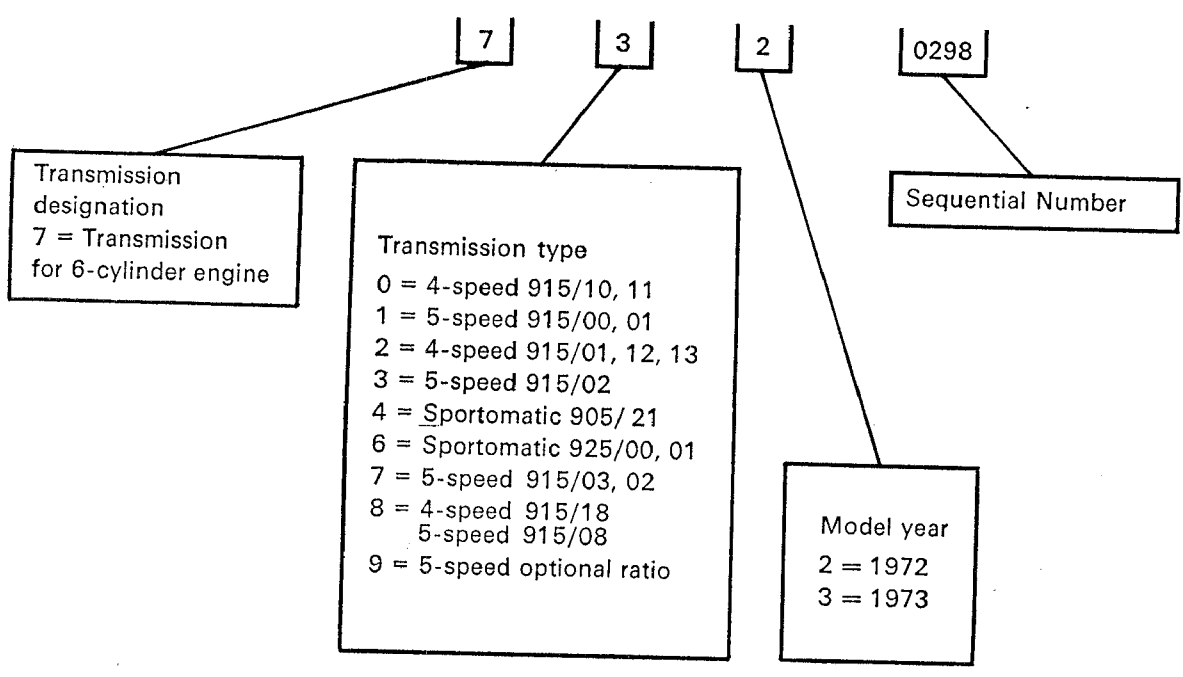
Engine Number Code

Example: Engine number of a Type 911 E, 1972 model



Transmission Number Code

Example: 5-speed transmission (915/02) for a 6-cylinder engine, 1972 model



12 Technical Data for Type 911 Vehicles

Engine specifications for 1972, 1973 models

Engine		911 TV (911 T - USA)
Type design		Four-stroke cycle, internal combustion gasoline engine with two horizontally opposed banks with three cylinders each
Number of cylinders		6
Bore	mm	84
Stroke	mm	70,4
Total displacement	cm ³	2,341
Compression ratio		7.5 : 1 (8.0 : 1)
Cylinder pressure	kp/cm ²	maximum deviation between cylinders up to 1.5 kp/cm ² ; engine oil temperature 60°C minimum
Maximum power output (DIN)	HP/kW	130/96 (140/103)
(SAE)	HP/kW	147/110 (157/117)
at engine speed of	rpm	5,600 (5,700)
Maximum torque	mkg/Nm	20/196 (20,5/201)
at engine speed of	rpm	4,000
Maximum output in liters (DIN)	HP/1/kW/1	55/41 (60/44)
Mean piston speed at maximum output	m/sec	13.1
Mean pressure at Ne maximum	kp/cm ²	10.76
Maximum speed	rpm	6,400
Governed engine speed	rpm	6,500 ± 100

13

1

911 E	911 S	Carrera 2.7
same as 911 T	same as 911 T	same as 911 T
6	6	6
84	84	90
70,4	70,4	70,4
2341	2341	2687
8,0 : 1	8,5 : 1	8,5 : 1
same as 911 T	same as 911 T	same as 911 T
165/121	190/140	210/154
185/138	210/157	230/172
6200	6500	6300
21/206	22/216	26/225
4500	5200	5100
70/52	81/60	78/57
14,5	15,3	14,8
11,30	11,84	12,19
7000	7300	7300
7100 ± 100	7300 ± 100	7300 ± 100

911 TV (911 T - USA)

Fuel octane number RON	91
Engine cooling	By air fan on alternator shaft
Cooling fan drive	Off crankshaft by V-belt
Ratio crankshaft - alternator shaft	approx. 1 : 1.3
Lubrication	Dry sump, forced feed
Oil cooling	Oil cooler on crankcase in cooling air stream
Oil pressure indicator	Warning light
Oil pressure in warm engine at 5,000 rpm	5.5 to 7 kp/cm ² at 80°C
Max. oil temperature	130°C
Oil filter	Full flow
Oil consumption	1.5 to 2.0 ltr/1,000 km/600 miles
Crankcase	Pressure cast, light alloy two-piece
Crankshaft	forged (Tenifer treated)
Main bearings	8 plain journals
Main bearings 1-7	Tri-metal, split inserts
Main bearing 1	Thrust bearing with hard lead journal
Main bearing 8	Sleeve insert with hard lead journal
Connecting rods	Forged steel
Connecting rod bearings	Split sleeve, tri-metal inserts

911 E**911 S****Carrera 2.7**

91	91	91
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	Oil cooler on crankcase in cooling air stream, plus oil cooler in front section of vehicle (cooling coil)	same as 911 S
same as 911 T	by instrument in kp/cm ²	same as 911 S
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
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same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	forged steel (Tenifer treated)	same as 911 S
same as 911 T	same as 911 T	same as 911 T

911 TV (911 T - USA)

Piston pin bearings	Pressed-in bronze bushings
Intermediate shaft bearings	Double, plain bearings
Pistons	Cast, light alloy Autothermic pistons
Piston pins	Floating, secured with circlips
Piston rings	2 compression rings, 1 oil scraper ring
Cylinders	Finned grey cast iron
Cylinder heads	1 per cylinder bank, light alloy
Valve seat inserts	Shrunk-in, special bronze
Spark plug threads	M 14 × 1.25, cut into cylinder head
Valves	1 intake and 1 exhaust valve per cylinder
Valve arrangement	Overhead in "V"
Exhaust valves	Sodium-filled with reinforced seats
Intake valve dia mm	46
Exhaust valve dia. mm	40
Valve springs	2 coil springs per valve
Valve timing	1 OHC per cylinder bank
Camshafts	Cast, three-bearing camshaft riding in base metal of camshaft housing
Camshaft drive	by chains

911 E

911 S

Carrera 2.7

same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	Light metal forged	same as 911 S
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
Grey-cast iron with light alloy finned jacket	same as 911 E	Light alloy cylinder with Ni-lining
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T

911 TV (911 T - USA)

Valve timing at 1 mm
valve clearance

Intake opens	16° BTC
Intake closes	30° ABC
Exhaust opens	42° BBC
Exhaust closes	4° BTC

Intake valve lift at overlap
TC with 0.1 mm valve clear-
ance

mm 2.4-2.8

Valve clearance in cold engine

Intake	0.10 mm between valve and rocker arm
Exhaust	

Clutch

Pressure plate	Type	MFZ 225 Fichtel and Sachs
Clutch pressure	kp	650-720

Fuel system

2 zenith triple-throat (Intake port fuel in-
doudraft Type 40 jecton Bosch
TIN 6-plunger double
row injection pump)

Air filter Induction silencer with micronic cartridge
insert and preheated induction air

Fuel pump 1 Electric roller-cell pump

Fuel delivery rate 80 (125) ltr/h

Operating pressure 0.3 (1.0) kp/cm²

Pressure relief valve opens at 0.2-0.3 (approx. 2) kp/cm²

911 E

911 S

Carrera 2.7

1

18° BTC	38° BTC	38° BTC
36° ABC	50° ABC	50° ABC
38° BBC	40° BBC	40° BBC
8° ATC	20° ATC	20° ATC
2.7-3.1	5.0-5.4	5.0-5.4
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	720-780
Intake pipe injection Bosch 6-plunger double row injection	same as 911 E	same as 911 E
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T

911 TV (911 T - USA)

Fuel filter with integral overflow valve (in front of injection pump)

Electrical System

Battery rated voltage	12 V
Battery capacity	2 × 36 Ah
Alternator output	770 Watts
Ignition	Battery, capacitive discharge
Firing order	1—6—2—4—3—5
Ignition transformer	Bosch
Ignition distributor	Bosch JFUDR 6 0231169003
(optional)	Marelli 50109741
Ignition timing advance	centrifugal and vacuum
Ignition basic adjustment (with vacuum hose connected)	5° ATC at 900 rpm ± 50
Dwell angle/ breaker point gap	Bosch 38° ± 3°/0.35 mm Marelli 37° ± 3°/0.35 mm
Spark plugs (electrode gap in mm)	Bosch W 230 T 30 (0.7) Bosch W 235 P 21 (0.55)
Optional brands	Beru 225/14/3 (0.7) Beru

911 E

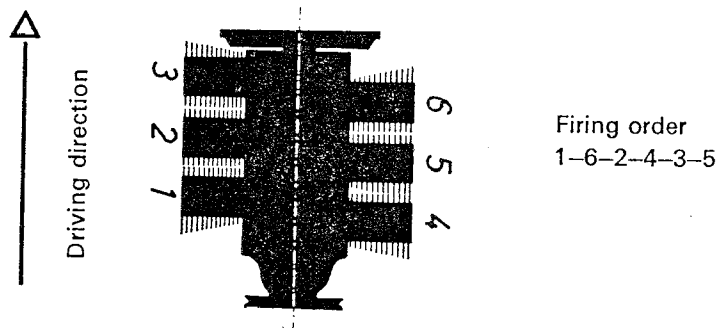
911 S

Carrera 2.7

1

with integral overflow valve (in front of injection pump)	same as 911 E	same as 911 E
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	same as 911 T
JFUDR 6 0231169004	JFUDR 6 0231169005	JFUDR 6 0231169011 61015155
50109742	50109743	
same as 911 T	same as 911 T	same as 911 T
same as 911 T	same as 911 T	TDC at 900 rpm ± 50
same as 911 T	same as 911 T	same as 911 T
W 260 T 2 (0.7) W 265 P 21 (0.55)	same as 911 E	same as 911 E
260/14/3 (0.7) 265/14/3 P (0.55)	same as 911 E	same as 911 E

22 Numbering of Cylinders and Firing Order



Technical Data Model 911 T Continuous Injection System

(Data different from those of 1972 model 911 T)

Engine	911 T CIS	
Maximum power output (DIN) HP/kW (SAE) HP/kW	HP/kW	140/103 157/117
At engine speed of	rpm	5,700
Maximum output in liters	HP/l/ KW/l	60/44
Maximum torque	mkg/Nm	20.5/201
At engine speed of	rpm	4,000
Compression ratio		8.0 : 1
Valve timing at 1 mm valve clearance:		
Intake opens	0° at TC	Exhaust opens 30° BBC
Intake closes	32° ABC	Exhaust closes 10° BTC
Intake valve lift at overlap TC at 0.1 mm valve clearance:	mm 0.9-1.1	

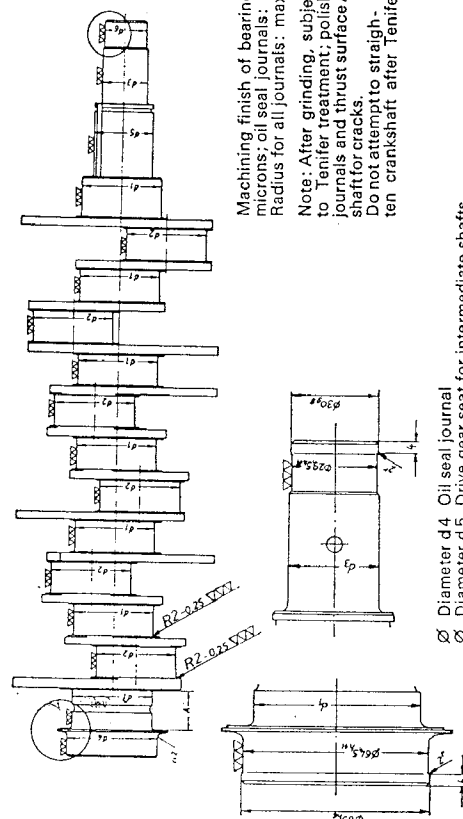
Tolerances and Wear Limits - Engine

Note: B = Bore S = Shaft

Measuring Point	Installation Size with Tolerances mm	Clearance (+) or Preload (-)	Wear Limits
		from to	mm
Crankshaft to main bearing Bearings 1-7 (d1)	B 57.020-57.059 S 56.971-56.990	+ 0.010 + 0.072	Visual insp. 56.960
Crankshaft to main bearing Bearing 8 (d3)	B 31.041-31.084 S 30.980-30.993	+ 0.048 + 0.104	Visual insp. 30.970
Crankpin to connecting rod bearing (d2)	B 52.020-52.059 S 51.971-51.990	+ 0.030 + 0.088	Visual insp. 51.960
Crankshaft runout (measured on bearings 4 and 8, with bearings 1 and 7 on V-blocks)			max. 0.04
Crankshaft unbalance			max. 10 cmg
Crankshaft to main bearing, end play			
Crankshaft to timing gear		+ 0.110 + 0.195 - 0.002 - 0.038	0.30
Crankshaft to distributor drive gear	B 41.975-42.000 S 42.002-42.013		
Crankshaft to flywheel	B 41.975-42.000 S 42.002-42.013	- 0.002 - 0.038	
Crankshaft to V-belt pulley	B 65.000-65.030 S 64.981-65.000	0.0 + 0.049	
Pulley: Vertical runout Lateral runout	B 30.000-30.033 S 29.960-29.993	+ 0.007 + 0.073	max. 0.15 max. 0.20

CRANKSHAFT — Standard and Reconditioning Stages

Stage	Crankcase Bore	All Main Bearing Journals d ₁	Connecting Rod Bearing Journals d ₂	Main Bearing Journals d ₃	Oil Seal Journal d ₄	Timing Gear Seat d ₅	Crankshaft Pulley Width A of Thrust Surface Seat d ₆	
Normal		56,990-56,971	51,990-51,971	30,993-30,980	65,000-64,981	42,013-42,002	29,993-29,960	28,000-28,06
- 0.25	62,262-62,250	56,740-56,721	51,740-51,721	30,743-30,730				
- 0.50		56,490-56,471	51,490-51,471	30,493-30,480	64,500-64,310		29,500-29,370	
- 0.75		56,240-56,221	51,240-51,221	30,243-30,230				



Machining finish of bearing journals: 2 microns; oil seal journals: 2–5 microns. Radius for all journals: maximum 2 mm.

Note: After grinding, subject crankshaft to Tenifer treatment; polish all bearing journals and thrust surface A; test crankshaft for cracks. Do not attempt to straighten crankshaft after Tenifer treatment.

Oil seal journal
Drive gear seat for intermediate shafts
Oil seal journal and crankshaft pulley seat

Measuring Point	Installation Size with Tolerances mm	Clearance (+) or Preload (–) from to	Wear Limits mm
-----------------	--------------------------------------	---	----------------

Crankcase

Crankcase bore for main bearings:

Bearings 1–8	62.000–62.019
Oversize	62.250–62.269

Crankcase bore for intermediate shaft:

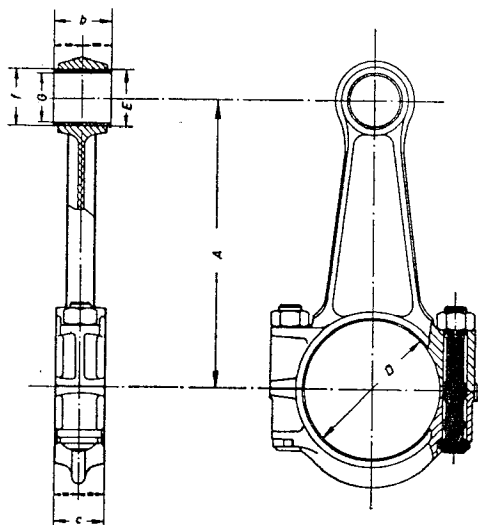
Bearing 1 (fitted bearing)	27.500–27.521
Bearing 2	26.500–26.521

Spring for pressure relief and safety valve:

Free length	70.00
Spring pressure at 52 mm	10.6 kp
Spring pressure at 46 mm	14.1 kp
Spring wire dia.	1.8 mm

Connecting Rods

A Distance between centers	127.80	
B Piston pin bushing width	26.00–25.98	
C Big end width	23.80–23.70	
Bearing width at crankpin	24.00–24.10	+0.200+0.400
D Big end dia. (without bearing shell)	56.000–56.019	
E Small end dia.	25.000–25.021	
F Dia. with piston pin bushing removed	25.035–25.055	
Preload of bushing in connecting rod		–0.014–0.055
G Dia. of installed piston pin bushing (finished dimension)	22.020–22.033	
Clearance piston pin bushing to piston pin		+0.020+0.039 0.055



Connecting Rod Weight Groups

Connecting rods are arranged in weight groups. End digits of the spare part number indicate the given weight group.

The respective end digits are stamped into the shank of the given connecting rod if it was supplied as a spare part.

Weight Over grams	Weight Under grams	KD (Service) Weight Group	KD (Service) Connecting Rod Spare Part No.	Connecting Rod Mark
645	654	1	911.103.015.31	31
654	663	2	911.103.015.32	32
663	672	3	911.103.015.33	33
672	681	4	911.103.015.34	34
681	690	5	911.103.015.35	35
690	699	6	911.103.015.36	36
699	708	7	911.103.015.37	37
708	717	8	911.103.015.38	38

Note

Connecting rods installed in a given engine must not differ among each other by more than 9 grams. To determine weight group, weigh the complete connecting rod without bearing inserts.

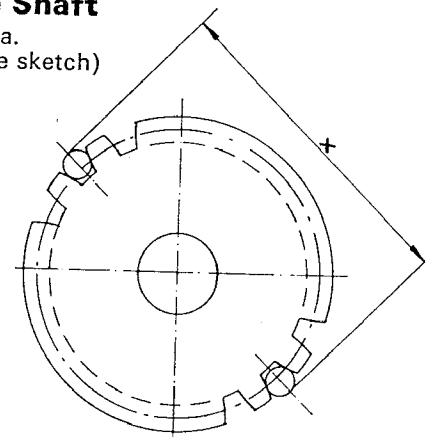
Matching Intermediate Shaft and Crankcase

See marking on left crankcase half below alternator support (0 or 1)

Axis Distance mm	Crankcase Marking	Marking on Crankshaft Gear	Marking on Intermediate Shaft	Gear Backlash
103.975–103.990	0	0 Installation still permissible 1 0	0 still permissible 0 1	0.029–0.049 0.016–0.042 0.017–0.043
103.990–104.000	1	1 Installation still permissible 0 1	1 still permissible 1 0	0.012–0.041 0.025–0.049 0.025–0.048

Checking Intermediate Shaft

Use steel rollers of 4.5 mm dia. to help make measurements (see sketch)



Intermediate shaft gear standard – wear limit $\times =$ 136.5 mm

Intermediate shaft gear marked 1 – wear limit $\times =$ 136.55 mm

Intermediate shaft gear and crankshaft gear can be replaced as a set only.

Measuring Point	Installation Size with Tolerances mm	Clearance (+) or Preload (-) from to	Wear Limits mm
Intermediate Shaft			
Bearing 1			
Crankcase bore — shaft	B 27.500—27.521 S 25.000—24.980		
Bearing 2			
Crankcase Bore — shaft	B 26.500—26.521 S 23.980—23.967		
Intermediate shaft running clearance		+ 0.030 + 0.084	
Intermediate shaft end play		+ 0.040 + 0.133	0.16
Flywheel to steel bushing for input shaft		- 0.001 - 0.035	
	B 25.000—25.021 S 25.022—25.035		
Distributor to crankcase		+ 0.020 + 0.074	
	B 27.000—27.021 S 26.947—26.980		
Distributor pinion to distributor shaft		+ 0.001 + 0.030	
	B 12.456—12.474 S 12.444—12.455		
Guide rail to stud bolts			
	B 8.000— 8.015 S 7.822— 7.837		
Flywheel			
Lateral runout			max. 0.10
Vertical runout			max. 0.20

Measuring Point	Installation Size with Tolerances mm	Clearance (+) or Preload (-) from to	Wear Limits mm
Timing Chain Housing			
Pivot shaft for sprocket wheel carrier to chain tensioner housing	B 15.000—15.018 S 14.973—14.984	+ 0.016 + 0.045	Visual inspection
Pivot shaft for sprocket wheel carrier to sprocket wheel carrier	B 15.000—15.018 S 14.973—14.984	+ 0.016 + 0.045	
Sprocket wheel carrier to sprocket wheel shaft	B 15.000—15.018 S 14.989—15.000	0.000 + 0.029	
Stud to chain housing	B 7.857— 7.872 S 7.886— 7.895	- 0.014 - 0.038	
Stud to chain guide rail	B 8.000— 8.015 S 7.886— 7.895	+ 0.105 + 0.129	
Sprocket wheel to sprocket wheel shaft	B 15.032—15.050 S 14.989—15.000	+ 0.032 + 0.610	Visual inspection
Parallel alignment of both sprocket wheels may not deviate by more than 0.25 mm			

Measuring Point	Installation Size with Tolerances mm	Clearance (+) or Preload (-)		Wear Limits
		from	to	
Camshaft Housings and Camshafts				
Camshaft bearings to camshaft	B 46.967—46.992	+ 0.025	+ 0.066	0.10
	S 46.926—46.942			
Camshaft end play		+ 0.150	+ 0.200	0.40
Camshaft to sprocket wheel flange	B 30.000—30.013	0.000	+ 0.034	max. 0.02
	S 20.979—30.000			
Camshaft runout, measured at center journal (between points)				
Rocker arm shaft to camshaft housing	B 18.000—18.018	Rocker arm shafts are held firm by wedge effect of bolt		0.0800
	S 17.992—18.000			
Rocker arm to rocker arm shaft	B 18.016—18.027	+ 0.016	+ 0.035	0.50
	S 17.992—18.000			
End play		+ 0.100	+ 0.350	

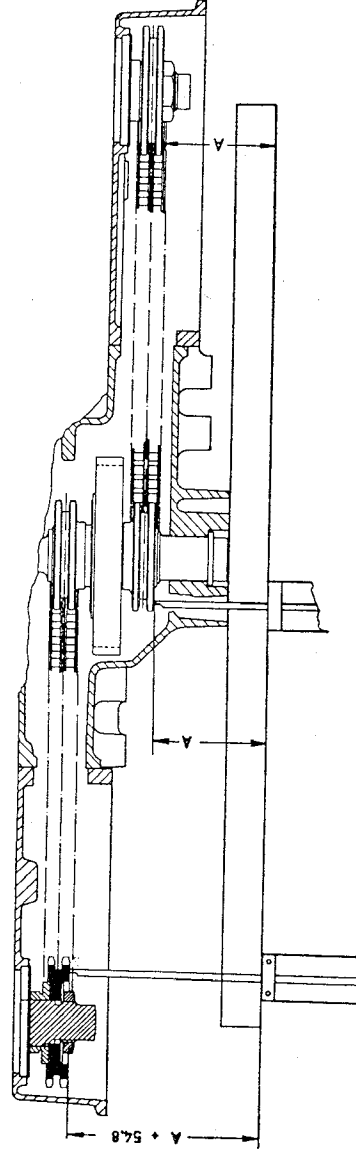
Measuring Sprocket Wheel Parallel Alignment

Before measuring, push intermediate shaft and camshaft axially toward the flywheel to set bearing thrust flanges in position.

The measurement is made through the hole below the intermediate shaft against the side of the forward chain sprocket on the intermediate shaft (dimension A).

This dimension must also be achieved at the sprocket wheel for bank of cylinders 4–6. Use shims if necessary (maximum permissible difference is 0.25 mm).

Sprocket wheel for bank of cylinders 1–3, mounted on the intermediate shaft, is positioned 54.8 mm farther to the front. These 54.8 mm (design dimension) must be considered when determining dimension A (maximum permissible difference is 0.25 mm).



Example: Measured dimension A = 78.8 mm

The formula for sprocket wheel of cylinder bank 1–3 is: $A + 54.8 = 78.7 + 54.8 = 133.5$ mm

32 **Piston and Cylinder Specifications**
(Dimensions, Weights and Markings)
2.4 Liter Engine and Carrera 2.7

Vehicle Type Manufacturer Dimensions	Markings	Rated Dia.	Cylinder Dia
Standard	0	84.00	84.00–84.01
	1		84.01–84.02
	2		84.02–84.03
1st oversize	0 KD 1	84.25	84.25–84.26
	1 KD 1		84.26–84.27
	2 KD 1		84.27–84.28
2nd oversize	0 KD 2	84.50	84.50–84.51
	1 KD 2		84.51–84.52
	2 KD 2		84.52–84.53
Tolerances			
Dimension h from bottom edge			
Clearance between piston and cylinder			
Piston weight			

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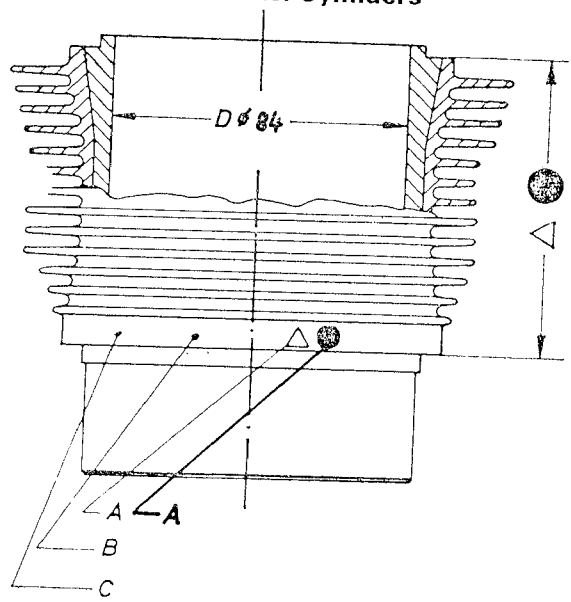
1

911 T Schmidt Piston Dia.	911 E Mahle Piston Dia.	911 S Mahle Piston Dia.	Carrera 2.7 Mahle Cylinder Dia Piston Dia.
83.97	83.97	83.97	83.95
83.98	83.98	83.98	83.96
83.99	83.99	83.99	83.97
84.22	84.22	84.22	84.20
84.23	84.23	84.23	84.21
84.24	84.24	84.24	84.22
84.47	84.47	84.47	84.45
84.48	84.48	84.48	84.46
84.49	84.49	84.49	84.47
+0.007 -0.008	±0.005	±0.005	±0.005
12.5	8.0	2.5	8.0
0.023– 0.048	0.025– 0.045	0.025– 0.045	0.045– 0.065
375 ± 4 g	376 ± 3 g	371 ± 3 g	354 ± 3 g
			392 ± 3 g

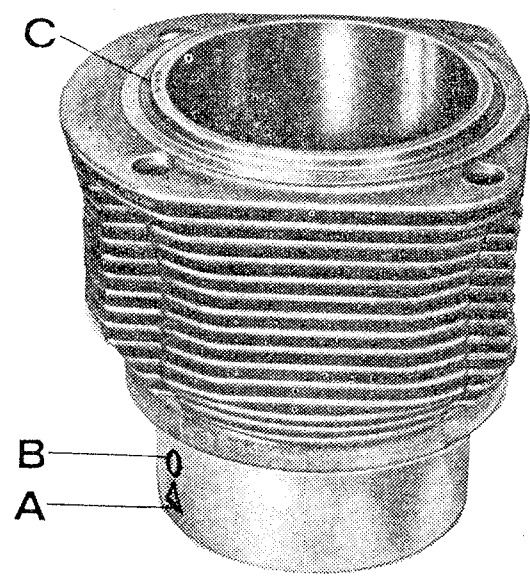
No oversize
for pistons
and cylinders
provided

Cylinder Dimensions

Biral Cylinders and Ni Cylinders

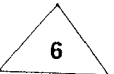


Grey Cast Iron Cylinders



- A = Tolerance group for cylinder height (for Carrera 2.7 provided with a color dot)
- B = Tolerance group for cylinder Dia. (refer to table)
- C = Manufacturer's identification

Tolerance Groups for Cylinder Heights (2.4 Liter Engine)

Marking A	Cylinder Height (Production)	Marking A	Cylinder Height (Replacement Parts)
	85.400—85.425		85.150—85.175
	85.425—85.450		85.175—85.200

Tolerance Groups for Cylinder Heights (Carrera 2.7)

Color Marking A	Cylinder Height (Production)	
red	85.400—85.425	No oversize provided for pistons and cylinders
blue	85.425—85.450	

Only cylinders of equal height may be installed in any given cylinder bank.

Cylinders

D 1 = Measuring point for wear and ovality

Measured 2–3 mm below the upper return point of the upper piston ring. The cylinder can be considered worn to the limit when the dimension at this point exceeds the installation dimension by 0.1 mm. Ovality is determined by measuring the bore across lines a and b. Dimension a should not differ from dimension b by more than 0.04 mm.

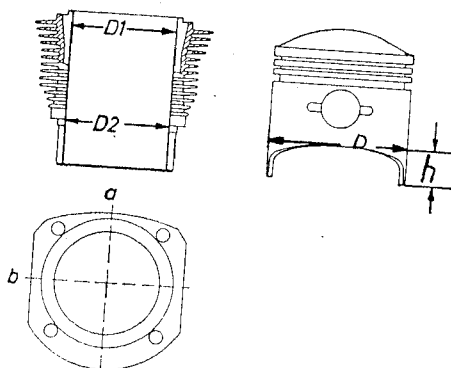
D 2 = Measuring point for ovality

Measured at the height of the cylinder base gasket. This measuring point is especially important for determining ovality, although not valid for determining cylinder wear.

Pistons

D = Measuring point for wear

The measuring point is to be determined from the table in all cases. Maximum wear: not to exceed 0.1 mm (of installation diameter).

**Dimensions for Piston Pins**

Color	Piston Pin Dia.	Piston Pin Bore Dia. in Piston
white	22.000 0 to -0.004	22.000 0 to + 0.005

Measuring Point		Installation Size with Tolerances mm	Clearance (+) or Preload (-)		Wear Limit
			from	to	mm
Pistons					
Piston ring side clearance Ring I	Groove Ring	1.560—1.590 1.478—1.490	+ 0.070	+ 0.112	0.20
Piston ring side clearance Ring II	Groove Ring	1.530—1.560 1.478—1.490	+ 0.040	+ 0.082	
Piston ring side clearance Ring 2 CIS	Groove Ring	1.790—1.810 1.728—1.740	+ 0.050	+ 0.028	
Oil scraper ring side clearance	Groove Ring	4.010—4.040 3.978—3.990	+ 0.020	+ 0.062	
Piston ring gap			+ 0.15	+ 0.45	
Cylinder Heads					

Cylinder Heads

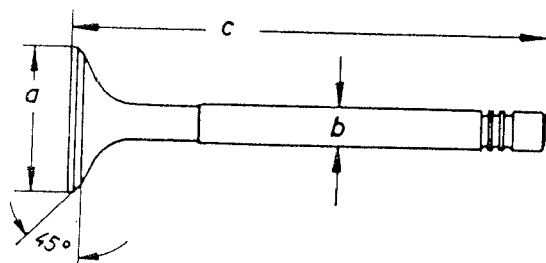
Cylinder head to valve guide	B	13.000—13.018	- 0.031	- 0.060	
	S	13.049—13.060			
Valve guide to intake valve	B	9.000— 9.015	+ 0.030	+ 0.057	0.15
	S	8.958— 8.970			
Valve guide to exhaust valve	B	9.000— 9.015	+ 0.050	+ 0.077	0.20
	S	8.938— 8.950			

NOTE: B = Bore S = Shaft

Cylinders

Cylinder to crankcase	B	92.072— 92.159	+ 0.144	+ 0.285	
2.4 liter engine	S	91.874— 91.928			
Cylinder to cylinder head	B	97.072— 97.159	+ 0.144	+ 0.285	
2.7 liter engine	S	96.874— 96.928			
Cylinder to cylinder head	B	107.000—107.073	+ 0.072	+ 0.180	
	S	106.893—106.928			

Valve Dimensions



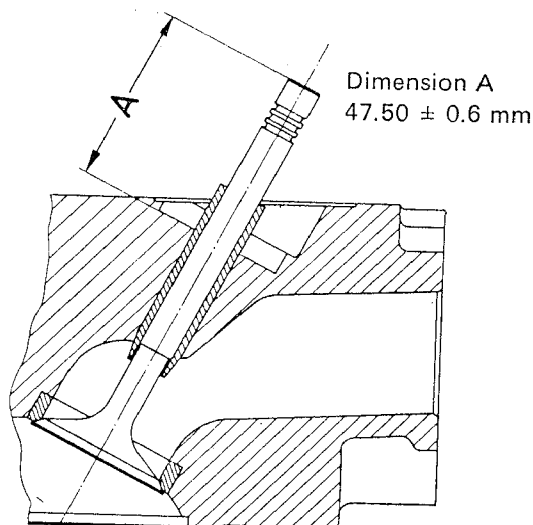
911 T, E, S, Carrera 2.7

	Intake	Exhaust
a	46 ± 0.1	40 ± 0.1
b	$8.97-0.012$	$8.95-0.012$
c	114 ± 0.1	113.5 ± 0.1

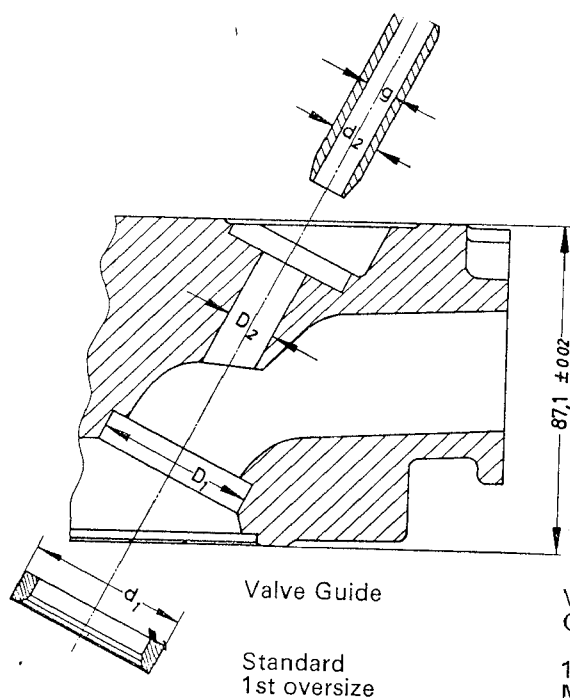
Checking Valve Seats

To check valve seat depth, insert the respective valve in the guide and measure the distance between the valve stem end and the bottom of the shim cavity, without shims (see dimension A in sketch).

If the dimension is greater than specified, measure again using a new valve. If the dimension still is beyond specification, it is an indication that the valve seat insert has been cut too deep and should be replaced or the cylinder head exchanged.

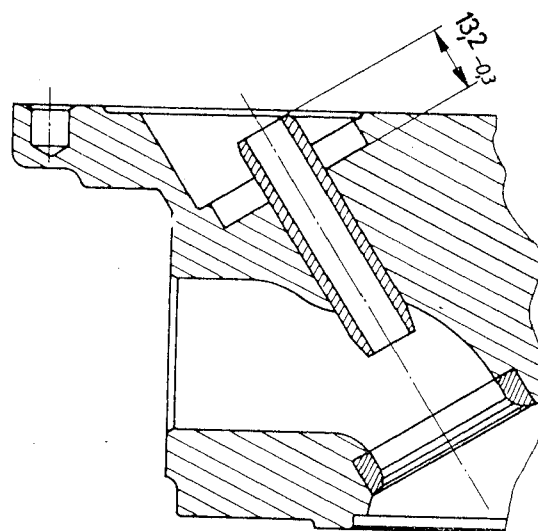


Specifications for Installing Valve Guides



Valve Guide

Standard
1st oversize



Valve Guide
Outside Diameter d 2

13.060—13.049

Machine to size according to bore in cylinder head.

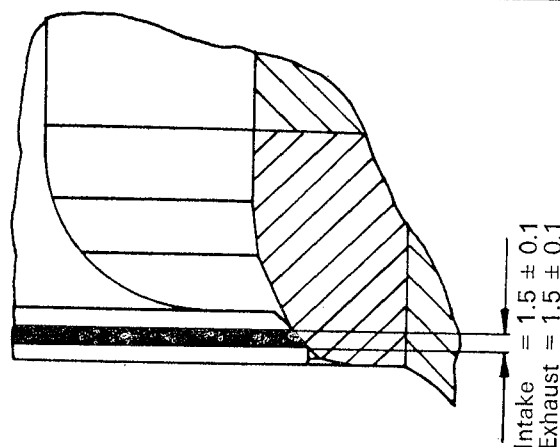
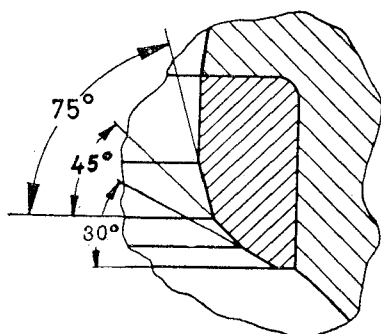
D 2 Bore Diameter in
Cylinder Head

13.000—13.018

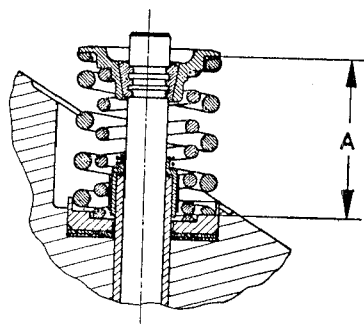
Specifications for Installing Valve Seat Inserts

911 T, E, S a. Carrera 2.7	Valve Seat Insert	Outside Dia. of Valve Seat Insert		Bore in Cylinder Head Intake Exhaust D 1
		Intake	Exhaust d 1	
Standard	Intake	48.180—48.164		48.000—48.025
1st oversize	Intake	48.500—48.484		48.320—48.345
Standard	Exhaust	42.200—42.184		42.000—42.025
1st oversize	Exhaust	42.760—42.744		42.560—42.585

Angles and Dimensions of Valve Seat Inserts



Valve Springs and Installation Dimensions



	Intake	Exhaust
911 T	35 ± 0.3 mm	35 ± 0.3 mm
911 E	34 ± 0.3 mm	34 ± 0.3 mm
911 S	35.5 ± 0.3 mm	34.5 ± 0.3 mm
Carrera 2.7	35.5 ± 0.3 mm	34.5 ± 0.3 mm

42 **Camshafts for Type 911 and Carrera 2.7 Engines**

Type	Left Camshaft	Right Camshaft
Model Year 72-73		
911 T Engine	911/51 911/61 (with Sportomatic)	901.105.133.00 901.105.134.00
911 T Engine CIS	911/91 911/92 (with Sportomatic)	911.105.141.00 911.105.142.00
911 E Engine	911/52 911/62 (with Sportomatic)	901.105.181.00 901.105.110.05
911 S Engine	911/53 911/63 (with Sportomatic)	901.105.183.01 901.105.168.00
Carrera 2.7	911/83	901.105.183.01 901.105.168.00

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Intake Valve Lift at Overlap TC with 0.1 mm Valve Clearance	Cam Lift with Base Circle Radius	Valve Timing with 1 mm Valve Clearance
2.40—2.80 2.60*	I = 36.25 mm E = 35.51 mm	I = opens 16° BTC I = closes 30° ABC E = opens 42° BBC E = closes 4° BTC
0.90—1.10 1.00*	I = 38.00 mm E = 37.48 mm	I = opens 0° at TC I = closes 32° ABC E = opens 30° BBC E = closes 10° BTC
2.70—3.10 2.90*	I = 36.58 mm E = 36.25 mm	I = opens 18° BTC I = closes 36° ABC E = opens 48° BBC E = closes 8° ATC
5.00—5.40 5.20*	I = 37.30 mm E = 36.44 mm	I = opens 38° BTC I = closes 50° ABC E = opens 40° BBC E = closes 20° ATC
5.00—5.40 5.20*	I = 37.30 mm E = 36.44 mm	I = opens 38° BTC I = closes 50° ABC E = opens 40° BBC E = closes 20° ATC

Note: * desired adjustment value

Measuring Point	Installation Size with Tolerance mm	Clearance (+) or Overload (-)	Wear Limit mm
-----------------	---	-------------------------------------	------------------

Clutch

Clutch plate with riveted lining

Free thickness (new)	8.1 ± 0.4		6.0 (when worn evenly)
Permissible lateral runout	max. 0.6		max. 0.6
Contact pressure (911 T, E, S)	650–720 kp		
Contact pressure (Carrera 2.7)	715–780 kp		

Note: Clutch plates cannot be reconditioned and must be replaced when necessary.

Transmission Clutch – Sportomatic

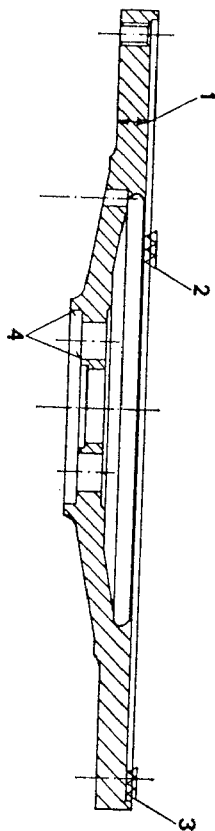
Clutch plate with riveted lining

Free thickness (new)	7.3 ± 0.4		5.5 (when worn evenly)
Permissible lateral runout	max. 0.5		max 0.5
Contact pressure	800–880 kp		

Note: Clutch plates cannot be reconditioned and must be replaced when necessary.

Machining (Refinishing) Flywheel

The flywheel may be machined on a lathe to clean grooves or heatspots. The machine cut should be kept as small as possible. Wear limit of flywheel thickness is 8.5 mm.



- 1 Wear limit 8.5 mm
- 2 Smallest possible cut
- 3 Maximum runout 0.1 mm
- 4 Lathe mounting points

46 Ignition Timing for Engine Types 911 T, 911 E, 911 S and Carrera 2.7

1. Check dwell angle and adjust, if required.
2. Make basic timing adjustment.
3. Bring engine to operating temperature.
4. Adjust ignition timing.

Adjustment must be made at approx. 80°C oil temperature with stroboscopic timing light. The notch at left of Z1-mark on V-belt pulley (5° ATC) should be in alignment with mark on fan housing at 900 rpm (vacuum hose connected).

On Carrera 2.7 the notch on V-belt pulley marked Z1 (TDC) must be in alignment with mark on fan housing at 900 rpm.

The vacuum hose must be connected to ignition distributor.

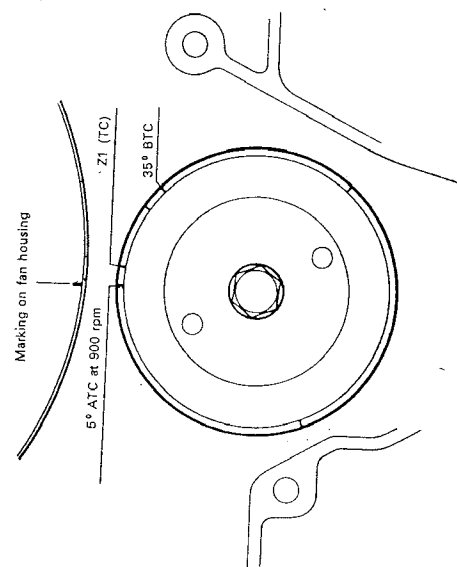
Note: At 900 rpm, ignition timing may fluctuate by $\pm 1^\circ$.

At 6,000 rpm, with vacuum hose pulled off, ignition timing should not exceed 38°.

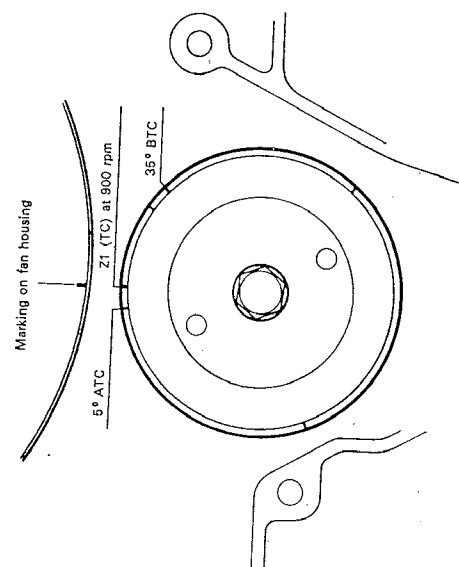
Engine Type	Basic Adjustment	Ignition Adjustment at 900 rpm
911 T, 911 E, 911 S (Marelli or Bosch distributor)	TDC (Z1)	5° ATC
Carrera 2.7 (Marelli or Bosch distributor)	TDC (Z1)	TDC (Z1)

Ignition Timing for Engines 911 T, 911 E, 911 S and Carrera 2.7

911 T, 911 E, 911 S



Carrera 2.7



48 Adjustment Values for Distributor

Bosch Distributor

Dwell angle $38^\circ \pm 3^\circ$
Breaker gap 0.35 mm
Contact pressure 650–800 p

Marelli Distributor

Dwell angle $37^\circ \pm 3^\circ$
Breaker gap 0.35 mm
Contact pressure 650–750 p

Checking Centrifugal Advance with Distributor Installed

(Bosch and Marelli)

With vacuum hose pulled off the following values apply:

911 T, 911 E, 911 S

Carrera 2.7

Engine speed	Timing setting BTC	Engine speed	Timing setting BTC
1000 rpm	3.5° — 6.5°	1000 rpm	8° — 12°
1500 rpm	4.5° — 14°	1500 rpm	8° — 15°
2000 rpm	16° — 24°	2000 rpm	11.5° — 20°
4000 rpm	24° — 31°	4000 rpm	25° — 31.5°
6000 rpm	31° — 38°	6000 rpm	32° — 38°

Torque Values for Bolts or Nuts on Engine

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Designation	Wrench Size	Thread	Tightening Torque mkp
Attachment of crankcase halves	13	M 8	2.2—2.5
Attachment of camshaft housing to cylinder heads	13 + 3 Allen head SW 8	M 8	2.2—2.5
Attachment of crankcase halves at main bearing webs	15	M 10	3.5
Flywheel attachment (multipoint bolt)	XZN-M 12	M 12 × 1.5	15
Connecting rod bolts	14	M 10 × 1.25	5—5.5
Cylinder head nuts	10 Allen head	M 10	3—3.3
Camshaft nut	46	M 27 × 2	10
Rocker arm shafts (studs)	5 Allen head	M 7	1.8
Crankshaft pulley to crankshaft	19	M 12 × 1.5	8
Alternator pulley to alternator	22	M 14 × 1.5 M 16 × 1	4
Spark plugs	21	M 14 × 1.25	2.5—3

50 **Fuel Pump for Type 911 TV, T-USA, 911 E**

Vehicle Type	911 TV
Spare part number	911 608 107 00
Bosch number	0580960009
Operating pressure	0.3 kp/cm ² (0.3 bar)
Pressure relief valve opens between	0.2—0.3 kp/cm ² (0.2—0.3 bar)
Fuel delivery rate	80 ltr/h at 12 Volts
Marking	Blue dot on pump housing (across from the fuel connections) Bosch number clearly embossed
Current input	2.5 Amps at 12 Volts
Speed	approx. 2,000 rpm
Fuel testing pressure	
Minimum fuel delivery rate	900—1,000 cm ³ /min
Weight	approx. 2.2 lbs.

911 S and Carrera 2.7 from Model 72

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911 TE, 911 E, 911 S, Carrera 2.7 911 T CIS

901 608 105 00	901 608 110 00
0580970001	058254998
1 kp/cm ² (1 bar)	5 kp/cm ² (5 bar)
approx. 2 kp/cm ² (2 bar)	
125 ltr/h at 12 Volts	90 ltr/h at 12 Volts
no color dot (Bosch number clearly embossed)	Lettering Bosch symbol B 580 082 320
3.5 Amps at 12 Volts	max. 8 Amps at 12 Volts
2,800 rpm	
0.8 ± 0.2 atm	
900—1,000 cm ³ with power on for 30 sec.	750 cm ³ /30 seconds
approx. 1 kg (2.2 lb)	

2

Carburetor Specifications Type 911 TV

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Carburetor Type

Solex-Zenith
40 TIN with auxiliary enrichment for overrun operation

Vehicle and Engine Types

911 T (Model 72 and 73)
911 TV
911/57 and 911/67

from Engine No.

6522313 911/57
Transmission
6529165 911/67
Sportomatic
Change April 7, 1972

Venturi

28.5

Main jet

120

Air correction jet

190

Emulsion tube

4.3 mm dia.

Idle jet

47.5

Idle air bleed

155

Float needle valve

P 1.5

*120 with changed
flow characteristic

210

Float weight

15.7 grams

Fuel level (measured from housing
upper edge without gasket

17 ± 1 mm

Injection quantity

0.5 ± 0.1 cm³/stroke per tube

Injection tube

0.3 mm dia. cal.

Bypass orifices

0.65 / 0.75 / 1.1 / 1.45 mm dia.

Fuel jet

50

Air correction (submerged)

100

Idle speed

900 ± 50 rpm

Exhaust emission (volume %)

At idling speed

3.5 ± 0.5 %

At 100-150 rpm rise

2.0-2.5 %

* Mark: Recess (groove) on outside diameter

2

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Fuel Injection System Specifications

- End of delivery stroke adjustment: Bring number 1 cylinder (Z 1) to top dead center overlap, then continue turning crankshaft beyond this top dead center mark for 40° and align FE mark
- Linkage dimensions: Injection pump control lever = 114 ± 0.2 mm (dimension-ball head center to ball head center).
Set push rods free of tension and individually in relation to throttle valve housing. (Adjust with engine at operating temperature of 75—85°C oil temperature).
Difference in length between lefthand rod and righthand rod may amount to max. 5 mm. Pull rod from accelerator linkage bell crank to cross shaft = 275 mm. (Dimension-ball head center to ball head center).

Correlation values of fuel injection pump with throttle valve assemblies

Protractor on pump	Protractor on throttle valve assy.	Maximum deviation	Protractor on pump	Protractor on throttle valve assy.	Maximum deviation
0°	0°	0.5°	40°	30.0°	± 1° (Full throttle)
5°	3°		50°	40.5°	
10°	6°		60°	52.0°	
15°	9.5°		70°	65.0°	
20°	13.0°		79°—82°	80°—85°	
30°	21.0°				

Injection valve opening pressure = 15 to 18 kp/cm²

Max. pressure difference between injection valves in given engine = 3 kp/cm²

Torque Values for Fuel Injection System

Nut M 12 for hub of pump drive wheel	2.5 mkp
Injection valve	3.0 mkp
Coupling nuts of fuel injection lines at injection valve and injection pump	1.0 mkp
Injection line fitting in injection pump	4.0 mkp

Emission Values

Operating temperature (approx. 80°C) at idle speed 900 ± 50 rpm

Idle Speed CO Adjusting Values:	USA	$2.5 \pm 0.5\%$
	Europe	$3.0 \pm 0.5\%$
	Carrera 2.7	$2.5 \pm 0.5\%$

Partial Load CO Adjusting Values: Determine emission values by means of road test or dynamometer test. Exhaust emissions (CO volume-%) in partial load range at 9° throttle valve setting and 2,400 rpm in 2nd speed:

	USA	Europe
911 T-USA	1.5—2.0	
911	2.0—2.5	2.0—3.0
911 S	2.0—2.5	2.0—3.0
Carrera 2.7	—	2.5—3.0

Testing and Adjusting Values for 911 T CIS

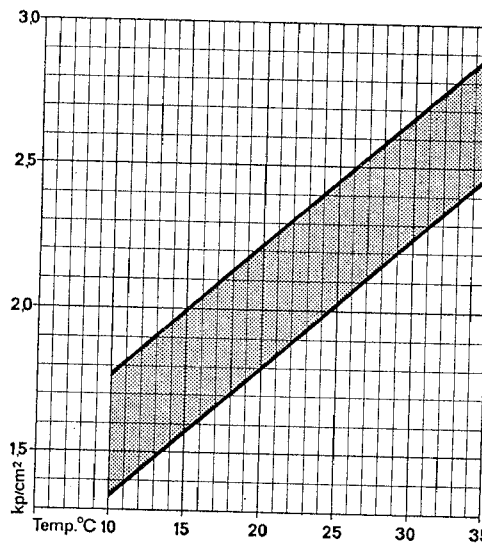
Test Procedure

Testing and Adjusting Values

Electric fuel pump delivered quantity

min. 750 cm³ / 30 seconds

Control pressure "cold"
(corresponding to outside temperature)



Control pressure "warm"

Throttle valve position: Idle speed

2.9 to 3.1 – adjusting tolerance 2.95 to 3.05

Part load

3.5 to 3.9

Full load

2.7 to 3.1

System pressure

4.5 to 5.2 kp/cm²

Leak test

Min. pressure after 10 minutes

0.7 kp/cm²

Injection valves:

Opening pressure

2.4 to 3.3 kp/cm²

Max. dispersion within one
set or engine

0.6 kp/cm²

Idle speed adjustment: Idle speed

900 ± 50 rpm

950 ± 50 rpm (Sportomatic)

CO contents

1.5 — 2.0%

1 kp/cm² = 0.981 bar

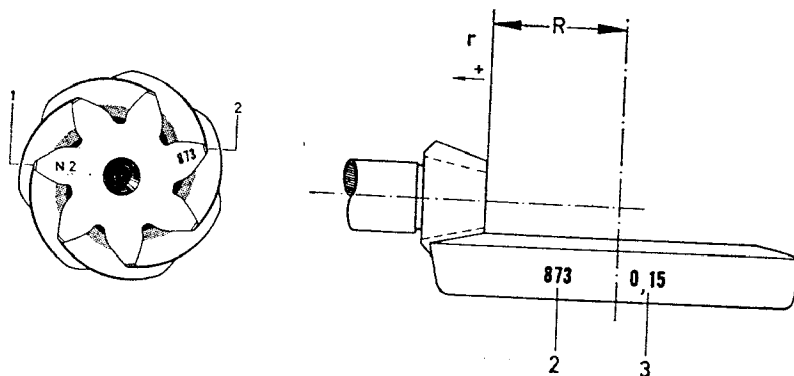
58 Transmission Type and Specification Table

Trans- mission Type	Number of Gears	1st Gear	2nd Gear	3rd Gear	4th Gear	5th Gear	Ring and Pinion
Model 72							
915/10	4	11:35	18:32	24:27	28:23		7:31
915/00	5	11:35	18:33	23:29	26:25	29:22	7:31
915/01	5	11:35	18:33	23:29	26:25	29:22	7:31
915/12	4	11:35	18:32	24:27	28:23		7:31
915/02	5	11:35	18:33	23:29	26:25	29:22	7:31
915/03	5	11:35	18:33	23:29	26:25	29:22	7:31
905/21	4	15:36	20:31	24:27	28:24		7:27
925/00	4	15:36	20:31	24:27	28:24		7:27
925/01	4	15:36	20:31	24:27	28:24		7:27
—	5						—
			Ratios to order				

Model 73							
915/10	4	11:35	18:32	24:27	28:23		7:31
915/11	4	11:35	18:32	24:27	28:23		7:31
915/00	5	11:35	18:33	23:29	26:25	29:22	7:31
915/01	5	11:35	18:33	23:29	26:25	29:22	7:31
915/12	4	11:35	18:32	24:27	28:23		7:31
915/13	4	11:35	18:32	24:27	28:23		7:31
915/02	5	11:35	18:33	23:29	26:25	29:22	7:31
915/03	5	11:35	18:33	23:29	26:35	29:22	7:31
915/08	5	11:35	18:33	23:29	27:25	29:21	7:31
—	5 + 4						—
			Ratios to order				
905/21	4	15:36	20:31	24:27	28:24		7:27
925/00	4	15:36	20:31	24:27	28:24		7:27
925/01	4	15:36	20:31	24:27	28:24		7:27

Transmission No.	Notes
702 0001—702 0013	Transmission with oil pump and ground gears
712 0001—712 0030	Transmission with oil pump and ground gears
712 5001—712 5012	Transmission with oil pump and shaved gears
722 0001—722 1357	Transmission without oil pump and ground gears
732 0001—732 9999	Transmission without oil pump and ground gears
772 0001—772 0658	
772 5001—772 5089	Transmission without oil pump and shaved gears
742 0001—742 0212	Sportomatic (for 911 TV only)
762 0001—762 0910	Sportomatic (for 911 T/USA and 911 E only)
762 0401—762 0535	Sportomatic (for 911 S only)
792 0001—792 0015	Special transmission
703 0001—703 5000	Transmission with oil pump and ground gears
703 5001—703 9999	Transmission with oil pump and shaved gears
713 0001—713 5000	Transmission with oil pump and ground gears
713 5001—713 9999	Transmission with oil pump and shaved gears
723 0001—723 5000	Transmission without oil pump and ground gears
723 5001—723 9999	Transmission without oil pump and shaved gears
733 0001—733 9999	Transmission without oil pump and ground gears
773 0001—773 5000	
773 5001—773 9999	Transmission without oil pump and shaved gears
783 0001—783 2000	Transmission with oil pump and ground gears
793 1001—793 2000	Special transmission with oil pump
743 0001—743 1000	Sportomatic (for 911 TV only)
763 0001—763 2000	Sportomatic (for 911 T/USA and 911 E only)
763 2001—763 4000	Sportomatic (for 911 S only)

Pinion Adjustment from Model 72



R = Blueprint value 66.30 mm
(Sportomatic 905/21 = 54.20 mm; 925/00 and 925/01 = 59.70 mm)

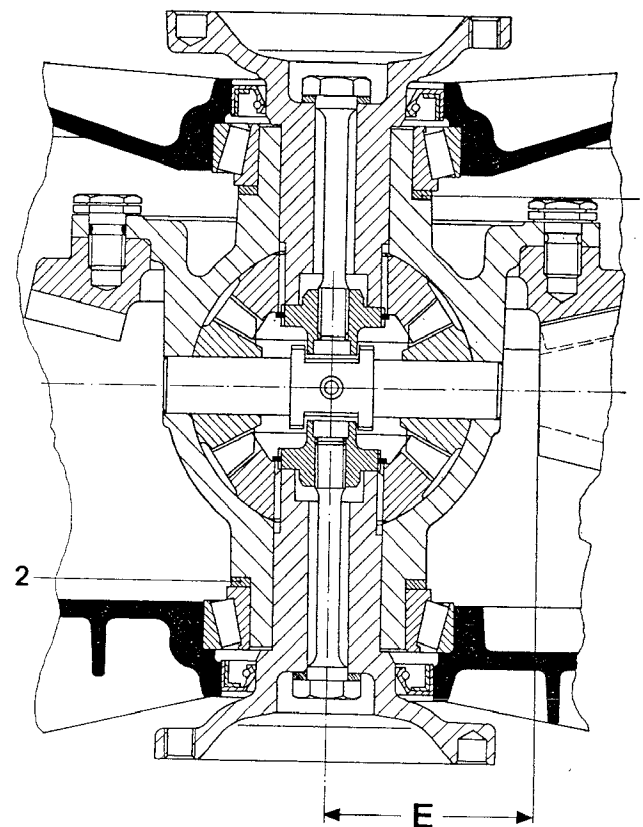
r = Deviation from R + shown in 1/100 mm (N2 = + 0.02 mm)

1 = Deviation r

2 = Mating number

3 = Gear backlash

Ring Gear Adjustment



Gear backlash between ring and pinion is adjusted only by changing spacer thickness and should be 0.12 to 0.18 mm (measure at 4 different points).

1 Spacer S 1

2 Spacer S 2

E Adjusting value

To ensure accurate measurements and proper operation, make sure all parts are clean.

Important Transmission Adjustment Data

2 Examples for Adjusting Ring Gear and Pinion Gears from Model 72

With Transmission Plug Gauge P 258

Blueprint value	66.30 mm
Deviation	+ 0.02 mm
	<u>66.32 mm</u>
Dial gauge setting	66.61 mm
Measured value (without gaskets)	- 0.39 mm
Distance to pinion shaft end face	<u>66.22 mm</u>
Adjustment value "E"	66.32 mm
Distance to pinion shaft end face	- 66.22 mm
Thickness of gaskets	<u>0.10 mm</u>

With Universal Plug Gauge VW 385

Blueprint value	66.30 mm
Deviation	+ 0.10 mm
	<u>66.40 mm</u>
Dial gauge setting	66.30 mm
Measured value (without gaskets)	- 0.29 mm
Distance to pinion shaft end face	<u>66.01 mm</u>
Adjustment value "E"	66.40 mm
Distance to pinion shaft end face	- 66.01 mm
Thickness of gaskets	<u>* 0.39 mm</u>

*) Round off to nearest 0.05 mm.

Gaskets are available 0.10, 0.15 and 0.20 mm thick.

Re-check adjustment value "E" upon installation of paper gaskets; a deviation of ± 0.03 mm is permissible.

Important Adjusting Data for Sportomatic Transmission

Transmission Type 905/21

	With Transmission Plug Gauge P 258
Blueprint value	54.20 mm
Deviation	+ 0.18 mm
	<u>54.38 mm</u>
Adjustment value "E"	54.38 mm
Empirical value (without gasket)	55.70 mm
Adjustment value	- 54.38 mm
Spacer thickness	<u>1.32 mm*</u>
Measurement after installation of spacers:	
Dial gauge setting	54.01 mm
Measured value (without gasket)	- 0.04 mm
Distance to pinion shaft end face	<u>53.97 mm</u>
Adjustment value "E"	54.38 mm
Distance to pinion shaft end face	- 53.97 mm
Paper gasket	<u>0.41 mm*</u>

Transmission Type 925/00
and 925/01

	With Transmission Plug Gauge P 258	With Universal Plug Gauge VW 385
Blueprint value	59.70 mm	59.70 mm
Deviation	+ 0.18 mm	+ 0.04 mm
	<u>59.88 mm</u>	<u>59.74 mm</u>
Adjustment value "E"	59.88 mm	59.74 mm
Empirical value (without gasket)	60.70 mm	60.70 mm
Adjustment value	- 59.88 mm	- 59.74 mm
Spacer thickness	<u>0.82 mm*</u>	<u>0.96 mm*</u>
Measurement after installation of spacers:		
Dial gauge setting	60.02 mm	59.70 mm
Measured value (without gasket)	- 0.37 mm	- 0.32 mm
Distance to pinion shaft end face	<u>59.65 mm</u>	<u>59.38 mm</u>
Adjustment value "E"	59.88 mm	59.74 mm
Distance to pinion shaft end face	- 59.65 mm	- 59.38 mm
Paper gasket	<u>0.23 mm*</u>	<u>0.36 mm*</u>

*) Round off to nearest 0.05 mm.

Paper gaskets are available 0.10, 0.15 and 0.20 mm thick.

Re-check adjustment value upon installation of paper gaskets; a deviation of ± 0.03 mm is permissible.

64 Transmission Tolerances

Measuring Point	Installation Tolerance (new) mm	Wear Limit mm
1. Backlash between gear I and II		
1st gear		
2nd gear	0.06–0.12	0.22
2nd gear		
4th gear		
5th gear		
2. Free gears on input and pinion shafts		
1st gear	0.3–0.4	0.5
2nd gear	0.2–0.3	0.4
3rd gear axial play	0.2–0.3	0.4
4th gear	0.2–0.3	0.4
5th gear	0.2–0.3	0.4
3. Shift rods		
a) radial play in guides	0.195–0.236	0.4
b) runout	—	0.10
4. Shift fork in synchronizing sleeve, axial play		
5th and reverse gear	0.1–0.3	0.5
1st and 2nd gear	0.1–0.3	0.5
3rd and 4th gear	0.1–0.3	0.5
5. Synchronizing rings		
1st gear	86.20–86.54	When molybdenum layer has worn off in spots.
2nd gear	86.20–86.54	
3rd gear	76.12–76.48	
4th gear	76.12–76.48	
5th gear	76.12–76.48	
Outer diameter, installed		
6. Input shaft		
a) Guide pin runout	max. 0.1	max. 0.1 (straighten)

Torque Values for Transmission Bolts and Nuts

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Application	Designation	Threads	Material	Tightening Torque mkg
Final drive housing (oil drain)	Magnetic plug	M 24 Taper	St 37	2.0— 2.5
Trans. housing (oil filler)	Plug	M 24 Taper	St 37	2.0— 2.5
Trans. housing front cover, side cover	Self-locking nut	M 8 × 1.25	× 12 Cr Ni 18,8	2.2— 2.5
Front cover	Backup light switch	M 18 × 1.5	Ms	3.5— 4.0
Input shaft	Flange nut	M 30 × 1.5	8.8	16.0—18.0
Input shaft	Castle nut	M 18 × 1.5	6.8	12.0—14.0
Clamping plate and attachment of transmission carrier	Nut	M 8 × 1.25	8	2.1— 2.3
Pinion shaft	Flange nut	M 24 × 1.5	8	14.0—16.0
Fork, gear shift	Nut	M 6 × 1.0	8	0.8— 0.9

Shift detent, transmission housing	Bolt	M 10 × 1.5	8.8	1.5— 1.8
Trans. housing	Breather	M 16 × 1.5	9 S 20 K	2.0— 3.0
Shift forks	Bolt	M 8 × 1.25	8.8	2.4— 2.6
Ring gear (differential)	Bolt	M 12 × 1.25	11.9	11.5—12.0
Drive shaft	Stretch bolt	M 10 × 1.5	8.8	2.6— 3.0
Starter attachment	Nut	M 10 × 1.5	8	4.6— 4.8
Pressure pipe (pinion shaft)	Bolt M 6 × 35	M 6 × 1.0	8.8	0.8— 0.9
Front cover	Breather bolt	M 12 × 1.5	9 S 20 K	2.2— 2.5
Oil pump cover	Self-locking nut	M 6 × 1.0	× 12 Cr Ni 18.8	0.9— 1.0
Intake pipe	Allen head bolt M 6 × 15	M 6 × 1.0	8.8	0.8— 0.9
Pressure pipe (Trans. housing)	Bolt M 6 × 12	M 6 × 1.0	8.8	0.8— 0.9



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Torque Values for Sportomatic Transmission Bolts and Nuts

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Application	Designation	Threads	Material	Tightening Torque mkp
Transmission housing (on studs in side and front housing covers, as well as fork)	Nut	M 8 x 1.25	6.8	2.1—2.3
Transmission housing (oil filler)	Self-locking nut	M 8 x 1.25	18.8 x 12 Cr Ni	2.2—2.5
Final drive housing (oil drain)	Plug	M 24 x 1.5 (Taper 1:16)	St 37	2.0—2.5
Transmission housing	Magnetic plug	M 24 x 1.5 (Taper 1:16)	St 37	2.0—2.5
Transmission housing	Breather	M 14 x 1.5 (Taper 1:16)	9 S 20 K	2.0—3.0
Transmission housing	Backup light switch	M 18 x 1.5	Ms	3.5—4.0
Transmission housing	Bypass switch	M 18 x 1.5	Ms	3.5—4.0
Transmission housing (starter attachment)	Nut	M 10 x 1.5	8.8	4.6—4.8
Transmission housing (servo motor carrier and servo motor attachment)	Nut	M 8 x 1.25	6.8	21.—2.3
Torque converter housing (attachment to transmission housing)	Nut Nut	M 8 x 1.25 M 10 x 1.5	6.8 8.8 (SW 15)	2.1—2.3 4.6—4.8
Torque converter housing (attachment to freewheeling support)	Allen head bolt	M 6 x 1.0	10.9	1.2—1.4

Torque converter housing	Hydraulic connector	M 24 x 1.5	6 S	3.0—3.5
Torque converter housing	Temperature sensor	M 14 x 1.5	Ms	2.5—3.0
Torque converter housing	Temperature switch	M 14 x 1.5	Ms	2.5—3.0
Torque converter housing (clutch pressure plate)	Allen head bolt	M 6 x 1.0	10.9	1.2—1.4
Torque converter coupling plate	Twelve-point bolt	M 8 x 1.25	8.8	2.4—2.6
Intermediate plate (clamping plate)	Bolt	M 8 x 1.25	8.8	2.1—2.3
Intermediate plate	Bolt for guide lever	M 8 x 1.25	9 S 20 K	2.1—2.3
Intermediate plate (shift detent)	Plug	M 14 x 1.5	4.6	2.2—2.5
Front transmission cover (tachometer drive detent)	Bolt	M 8 x 1.25	8.8	1.6—1.8
Front transmission cover (ball dia. 9 mm — parking lock)	Plug	M 12 x 1.5	5.8	3.0—3.5
Angle drive in guide bushing	Hollow bolt	M 24 x 1.5	6.8	2.2—2.4
Input shaft	Nut	M 24 x 1.5	6.9	10—12
Input shaft	Flange nut	M 18 x 1.5	5.8	11—13
Pinion shaft	Stretch bolt	M 12 x 1.5	10.9	11—12
Shift forks	Bolt	M 8 x 1.25	8.8	2.2—2.6
Differential (ring gear attachment)	Bolt	M 12 x 1.25	11.9	11.5—12
Drive shaft (differential)	Stretch bolt	M 10 x 1.5	8.8	3.5—4.0
Front transmission cover (attachment of transmission carrier)	Nut	M 8 x 1.25	6.8	2.1—2.3

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3

70 Technical Data for Sportomatic

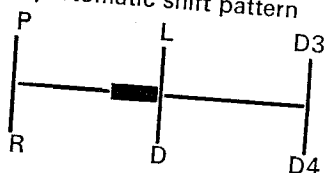
Clutch:

Hydrodynamic torque converter and vacuum-controlled, single-plate dry clutch.

Transmission: Porsche servo-thrust synchronization

No. of speeds: 4 forward, 1 reverse and parking lock

Sportomatic shift pattern



P = Parking lock
R = Reverse
L = Low (ratio for extreme gradients)
D = Drive (city ratio)
D3 = Drive 3 (road ratio)
D4 = Drive 4 (expressway ratio)

Model 72

	TV	T-USA	E
Final drive ratio	7:27	7:27	7:27
Stall speed	2,500— 2,700 rpm	2,500— 2,700 rpm	2,500— 2,700 rpm
Maximum reduction	2.1—2.27	2.1—2.27	2.1—2.27
Clutch speed (at full load)	approx. 3,720 rpm	approx. 3,720 rpm	approx. 3,720 rpm
Torque converter (oil transfer rate)	approx. 3 ltr/min max. pressure 4 kg/cm ²	approx. 3 ltr/min max. pressure 4 kg/cm ²	approx. 3 ltr/min max. pressure 4 kg/cm ²
Engine oil capacity (total capacity)	approx. 10 ltr	approx. 10 ltr	approx. 10 ltr
Transmission oil filling capacity	approx. 3 ltr	approx. 3 ltr	approx. 3 ltr

Model 73

	TV	T-USA	E	S
	7:27	7:27	7:27	7:27
	2,900—3,100 rpm	2,500—2,700 rpm	2,500—2,700 rpm	2,900—3,100 rpm
	2.0—2.2	2.1—2.27	2.1—2.27	2.0—2.2
	approx. 4,100 rpm	approx. 3,720 rpm	approx. 3,720 rpm	approx. 3,750 rpm
	approx. 3 ltr/min max. pressure 4 kg/cm ²	approx. 3 ltr/min max. pressure 4 kg/cm ²	approx. 3 ltr/min max. pressure 4 kg/cm ²	approx. 3 ltr/min max. pressure 4 kg/cm ²
	approx. 11 ltr	approx. 13.5 ltr	approx. 13.5 ltr	approx. 16 ltr
	approx. 3 ltr	approx. 2.5 ltr	approx. 3 ltr	approx. 3 ltr

Front Axle and Steering – Technical Data

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	911 T	911 E	911 S	Carrera 2.7
Front suspension	Wheels individually suspended to transverse control arms and shock absorber struts			
Springing	One round, longitudinal torsion bar per wheel (hydropneumatic suspension struts optional)			
Track	Wheel size 5 1/2 J×15	1.360 mm	same as 911 T	same as 911 T
	Wheel size 6 J×15	1.372 mm	same as 911 T	same as 911 T
	Wheel size 5 1/2 J×14	1.362 mm	—	—
Shock Absorbers	double acting hydraulic shock absorber struts	same as 911 T	same as 911 T	same as 911 T
Make				
Boge	standard	standard	standard	—
Koni	optional	optional	optional	—
Bilstein	optional	optional	optional	standard
self-levelling hydropneumatic struts	optional	optional	optional	—

Stabilizers:	Optional	Optional	standard	standard
front/rear	15/15 mm dia	15/15	15/15	15/15 or 18/19

Adjustment of the ZF Rack & Pinion Steering

Steering box turning torque (measured at steering flange with tie rods disconnected)	8 to 14 cmkp
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Technical Data for ZF Steering

Overall ratio	1 : 17.78 (mean)
Steering wheel turns, lock to lock	approx. 3.1
Smallest turning circle diameter	approx. 10.7 m
Steering track length	501 mm
Total stroke	171 mm

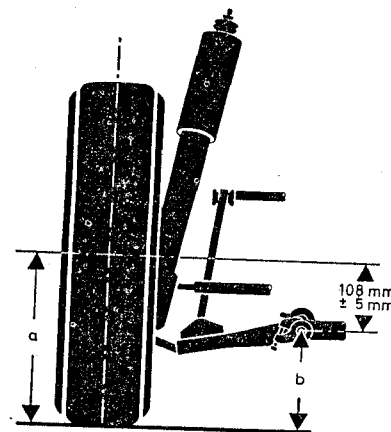
Tolerances and Adjustment Specifications

(Vehicle unladen, empty weight acc. to DIN 70020)

Designation	Adjustment Value and Tolerances	Maximum Deviation Left to Right
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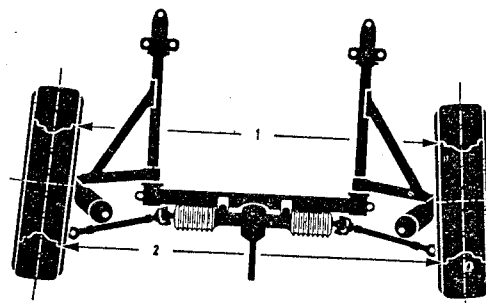
Front Axle

Wheel center to	108 mm	5 mm
center of torsion bar	± 5 mm	



Toe-in (pressed with 15 kp)

Total for left and right front wheel 0°



Designation	Adjustment Value and Tolerances	Maximum Deviation Left to Right
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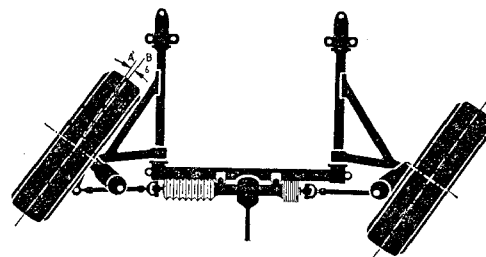
Angle differential in 0° to 30° / 20° turn (towards toe-in)

A' = Parallel to A

B = Wheel center line

γ = Angle differential

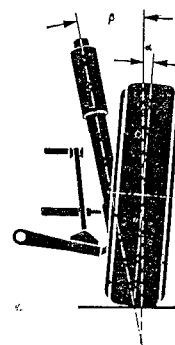
corrections only through replacement of steering levers



Front wheel camber (in straight ahead wheel position)

α = Camber angle $0^\circ \pm 10'$ $10'$

β = Steering axis inclination $10^\circ 55'$



Designation

Adjustment
Value and
Tolerances

Maximum
Deviation Left
to Right

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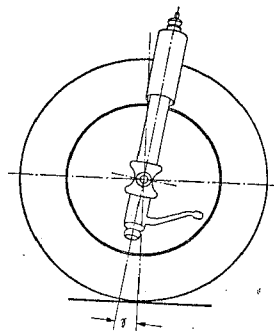
γ = Caster

$5^{\circ} 5' \pm 15'$

30'

Caster results from
total camber dif-
ference at 20° left-
hand turn and
 20° righthand turn
 $\times 1.5$

These wheel alignment values can also be
applied to earlier vehicles



Torque Values for Front Axle and Steering

Application	Designation	Threads	Class	Tightening Torque mkp
Supporting bearing to shock absorber strut	Nut	M 14 $\times$ 1.5	8	8
Clamp to tie rod	Nut	M 8	8.8	1.5
Supporting bearing to body	Allen head bolt	M 10	8.8	4.7
Auxiliary carrier to body	Bolt	M 12 $\times$ 1.5	8.8	9
Attachment underfloor protection	Bolt	M 10	8.8	4.7
Attachment underfloor protection	Bolt	M 8	8.8	2.5
Flanblock attachment	Bolt	M 10	8.8	4.7
Attachment auxiliary carrier	Bolt	M 10	8.8	4.7
Attachment steering gear	Bolt	M 10 $\times$ 20	8.8	4.7
Drag link to steering gear	Bolt	M 10	8.8	4.7
Stabilizer bearing to body	Bolt	M 8	8.8	2.5
Stabilizer arm to stabilizer	Bolt	M 8	8.8	2.5

Application	Designation	Threads	Class	Tightening Torque mkp
Wheel bearing clamping nut to steering knuckle	Allen head bolt	M 7	10.9	1.5
Ball joint to shock absorber strut	Self-locking nut	M 8	8	2.2
Ball joint to shock absorber strut	Bolt	M 10 × 30	10.9	4.5
Ball joint to transverse control arm (threads lubricated)	Slotted nut	M 45 × 1.5	8.8	25
Plug for shock absorber strut (Boge)	Plug			12 + 2
Plug for shock absorber strut (Koni)	Plug			20
Wheel to wheel hub	Wheel nut	M 14 × 1.5	10.9	13
Brake disc to wheel hub	Nut	M 8	8.8	2.3
Splash shield to steering knuckle	Bolt	M 8	8.8	1.0
Caliper to steering knuckle	Bolt	M 12 × 1.5	8.8	7.0

Brake fitting to caliper	Hollow bolt	M 10 × 1		2.0
Steering coupling to steering shaft	Bolt	M 8	8.8	2.5
Steering shaft to steering gear	Bolt	M 8	8.8	2.5
Attachment steering shaft bearing	Allen head bolt	M 8	8.8	2.5
Attachment universal joint to steering shaft	Bolt	M 8	8.8	2.5
Attachment steering wheel	Nut	M 18 × 1.5	8	7.5
Bellows holder to rack	Slotted nut	M 16 × 1.5	8	7.0
Ball joint to steering lever	Castle nut	M 10 × 1	8	4.5
Coupling flange to drive pinion	Self-locking nut	M 10	8	4.7
Housing cover to steering gear	Bolt	M 8 × 1	8.8	1.5

Rear Axle – Technical Data

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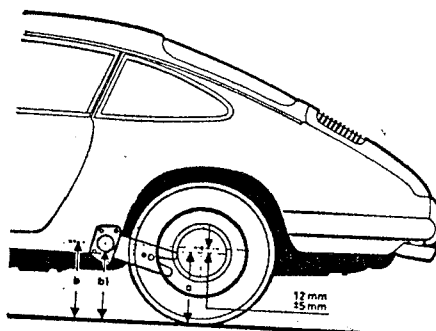
	911 T	911 E	911 S	Carrera 2.7
Rear suspension	Wheels individually suspended to trailing arms			
Springing	One round transverse torsion bar per wheel			
Track	Wheel size 5 1/2 J x 15 1.342 mm	same as 911 T	same as 911 T	same as 911 T
(wheel center 12 mm below cross tube center)	Wheel size 6 J x 15 1.354 mm	same as 911 T	same as 911 T	same as 911 T
	Wheel size 5 1/2 J x 14 1.344 mm	—	—	—
Shock Absorbers	double-acting hydraulic shock absorbers	same as 911 T	same as 911 T	Wheel size 7 J x 15 1.394 mm same as 911 T
M a k e				
Boge	standard			
Koni	optional	standard	standard	—
Bilstein	optional	optional	optional	—
Stabilizers	optional 15 mm dia.	optional 15 mm dia.	optional standard 15 mm dia.	standard standard 15 or 19 mm dia.

Adjusting Values and Tolerances (at empty weight acc. to DIN 70020)

Designation	Adjustment Value and Tolerances	Maximum Deviation Left to Right
Rear Axle		
Torsion bar adjustment:		
Torsion bar	dia. 23 mm	
Radius arm angle		
Type 911 T, 911 E, 911 S,	36° 30' to 37°	
Carrera 2.7	-1° ± 10'	
Rear wheel camber	0° to +20' each wheel	
Toe-in		

Height Adjustment

Transverse tube center above	12 mm	8 mm
rear wheel center	± 5 mm	



Torque Specifications for Rear Axle Bolts and Nuts

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Application	Designation	Threads	Class	Tightening Torque mkgp
Bearing cap to body	Bolt	M 10	8.8	4.7
Rear axle control arm to transverse tube	Bolt	M 14 × 1.5	10 K	9.0
Radius arm to control arm	Eccentric bolt	M 12 × 1.5	8.8	6.0
Radius arm to control arm	Bolt	M 12 × 1.5	10.9	9.5
Caliper to control arm	Bolt	M 12 × 1.5	8.8	7.0
Shock absorber to control arm	Bolt	M 14 × 1.5	8.8	12.5
Shock absorber to body	Nut	M 10 × 1	8	2.5
Brake hose to lines	Brake hose	M 10 × 1		1.5
Stabilizer to body	Bolt	M 8	8.8	2.5
Drive shaft flange	Allen head bolt	M 10	12 K	8.3
Parking brake assembly to control arm	Bolt	M 8	8.8	2.5
Wheel to wheel hub	Wheel lug nut	M 14 × 1.5		13
Wheel hub to axle shaft	Castle nut	M 20 × 1.5	10.9	30—35
Brake disc to wheel hub	Countersunk screw	M 6	8.8	0.5
Parking brake control to control arm	Bolt	M 6	8.8	0.5

General Data

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Designation

Dimensions and Adjusting Values

Wear Limit

Tandem Brake Master Cylinder

Bore	
Stroke	19.05 mm dia.
Ratio on brake pedal	18/13 mm
Play: actuating rod/piston	5.4 : 1
	1 mm

Front Wheel Brake

Brake disc (OD)	282.5 mm, internal venting	
Thickness, when new	20.0 mm	
Minimum thickness upon refinishing *)	18.6 mm	
Thickness limit	max. 0.03 mm	18.0 mm
Lateral runout of brake disc	max. 0.05 mm	
Lateral runout installed	0.2 mm	
Caliper piston dia.	48 mm	
Lining thickness	10 mm	
Vent clearance	0.2 mm	2.0 mm
Lining surface per wheel		
Type 911 T, E	52.5 cm ²	
Type 911 S and Carrera 2.7	76.0 cm ²	

Rear Wheel Brake

Brake disc (OD)	290 mm, internal venting	
Thickness, when new	20.0 mm	
Minimum thickness upon refinishing *)	18.6 mm	18.0 mm
Thickness limit	max. 0.03 mm	
Lateral runout of brake disc	max. 0.05 mm	
Lateral runout installed	max. 0.2 mm	
Roughness of brake disc upon refinishing	max. 0.006 mm	
Caliper piston dia.	38 mm	
Lining thickness	10 mm	
Vent clearance	0.2 mm	2.0 mm
Lining surface par wheel Type 911, all	52.5 cm ²	

Parking Brake

Parking brake drum dia. when new	180 mm	181.0 mm
Parking brake lining thickness		2.0 mm

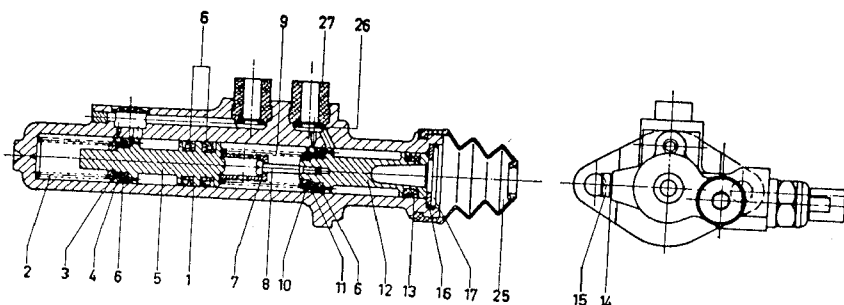
Calipers

911 T, E front: grey cast iron	911 S and front: light alloy
rear: grey cast iron	Carrera 2.7 rear: grey cast iron

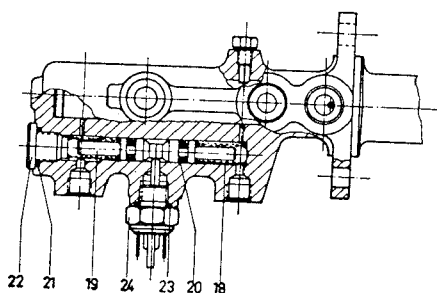
*) Machine brake disc uniformly on both sides.

Cross Section of Tandem Master Brake Cylinder (with Warning Sender, USA Version)

86



- 1 Housing
- 2 Second piston return spring
- 3 Spring seat
- 4 Supporting washer
- 5 Second piston with filler disc
- 6 Primary cup
- 7 Travel stop
- 8 Stroke limiting bolt
- 9 First piston return spring

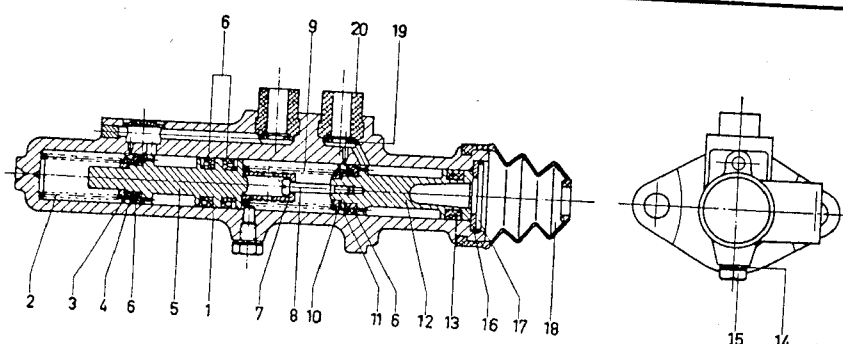


- 10 Spring seat
- 11 Supporting washer
- 12 First piston with filler disc
- 13 Secondary cup
- 14 Gasket
- 15 Stop bolt (outer)
- 16 Stop plate
- 17 Lock ring
- 18 Spring
- 19 Piston
- 20 Piston cup
- 21 O-ring
- 22 Bolt
- 23 O-ring
- 24 Brake failure warning switch
- 25 Dust boot
- 26 Washer
- 27 Grommet

Dual-Circuit Brake System

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Cross Section of Tandem Brake Master Cylinder
(without partial system failure indication, European version)



- | | |
|----------------------------------|----------------------------------|
| 1 Housing | 11 Supporting washer |
| 2 Second piston return spring | 12 First piston with filler disc |
| 3 Spring | 13 Secondary cup |
| 4 Supporting washer | 14 Gasket |
| 5 Second piston with filler disc | 15 Stop bolt (outer) |
| 6 Primary cup | 16 Stop plate |
| 7 Travel stop | 17 Lock ring |
| 8 Stroke limiting bolt | 18 Dust boot |
| 9 First piston return spring | 19 Washer |
| 10 Spring seat | 20 Grommet |

Reconditioning Dimensions and Wear Limits for Brake Discs and Parking Brake

Vehicle Type	Brake Disc Type	Brake Disc Location	Dimension "a" (based on new brake disc thickness)	Brake Disc Thickness New	Minimum Brake Disc Thickness when Reconditioned	Brake Disc Wear Limit (when worn symmetrically)
911 all	Vented disc	Front wheel	35 ± 0.1 mm	20.0–0.2 mm	18.6 mm	18.0 mm (1.0 mm each side)
911 all	Vented disc	Rear wheel	$76 + 0.2$ mm	20.0–0.2 mm	18.6 mm	18.0 mm (1.0 mm each side)
911 all	Brake disc thickness tolerance				max. 0.03 mm	
911 all	Brake disc lateral runout				max. 0.05 mm	
911 all	Brake disc machined roughness upon reconditioning max.				max. 0.006 mm	

Caution

The refinishing and wear dimensions named below are based on the assumption that the remaining thickness of the brake lining is not less than 2.0 mm, otherwise functional troubles on brake may result. (Guaranteed by installation of expanding spring.)

Only balanced brake discs will be supplied. Brake discs are balanced by special clips attached to the cooling vents.

Caution. Do not remove these clips.

Caution

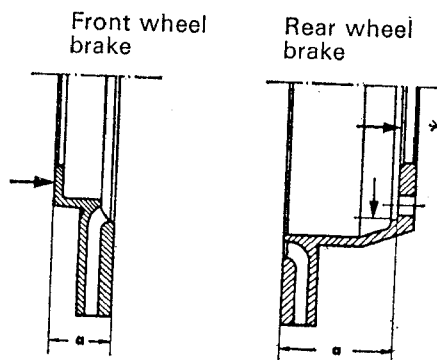
The brake disc must be machined evenly on both sides. See arrows for locating reference or mounting points of the disc.

Parking Brake:

Brake diameter of drum (new)	180 + 0.2 mm
Brake drum wear limit	max. 181.0 mm dia.
Brake lining width	25 mm

Caution

Parking brake linings may be used only to a thickness of 2.0 mm

**Checking Disc Wheels**

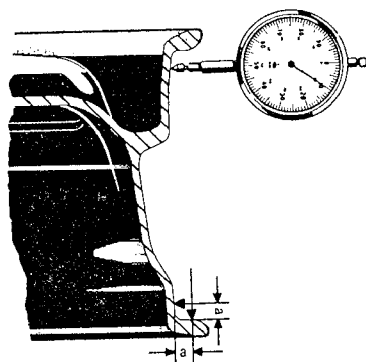
Measuring Points for Vertical and Lateral Runout on Wheel Rim

Dimension "a" = 8 mm

Max. permissible vertical runout for steel wheels	1.25 mm
Max. permissible vertical runout for light alloy wheels	1.0 mm
Max. permissible lateral runout for steel wheels	1.25 mm
Max. permissible lateral runout for light alloy wheels	0.8 mm

Caution

Straightening of distorted wheels is not permitted.

**Tire Pressures (Reference Values)**

Measured in cold tires

Tire Size Designation

165 HR 15 (4 1/2 and 5 1/2 J x 15)
185/70 VR 15 (6 and 7 J x 15)
215/60 VR 15 (7 and 8 J x 15)

Values also apply to winter tires.

Exceptions: Type Carrera RS

165 VR 15 (6 J x 15)

Air Pressure (kp/cm² or bar)

Front Axle	Rear Axle
2.0 (29 psi)	2.4 (35 psi)
2.0 (29 psi)	2.4 (35 psi)
2.0 (29 psi)	2.4 (35 psi)

Wheels and Tires

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Type	Model Year	Standard Wheel	Tires	Permissible Wheel	Tires
911 T	72—73	5 1/2 J × 15 (Steel)	165 HR 15	6 J × 15	185/70 VR 15
				5 1/2 J × 14	185 HR 14
				5 1/2 J × 15	185/70 SR 15 snow or studded snow
				4 1/2 J × 15	165 SR 15 snow or studded snow
911 E	72—73	6 J × 15 (Model 72 steel wheel) (from model 73 light-alloy die-cast wheel)	185/70 VR 15	5 1/2 J × 15	165 VR 15
				6 J × 15	185/70 SR 15 snow or studded snow
				5 1/2 J × 15	185/70 SR 15 snow or studded snow
				5 1/2 J × 15	165 SR 15 snow or studded snow
				4 1/2 J × 15	165 SR 15 snow or studded snow

911 S	72—73	6 J × 15 (Light alloy wheel, forged)	185/70 VR 15	6 J × 15	185/70 SR 15 snow or studded snow
				5 1/2 J × 15	185/70 SR 15 snow or studded snow
				5 1/2 J × 15	165 SR 15 snow or studded snow
				4 1/2 J × 15	165 SR 15 snow or studded snow
Carrera 2.7	73	front 6 J × 15 rear 7 J × 15 (Light alloy wheel, forged)	185/70 VR 15 215/60 VR 15	6 J × 15	185/70 SR 15 snow or studded snow
				5 1/2 J × 15	185/70 SR 15 snow or studded snow
				5 1/2 J × 15	165 SR 15 snow or studded snow

Torque Specifications for Front and Rear Wheel Brakes

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Application	Designation	Threads	Class	Tightening Torque mkg
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Tandem brake master cylinder mounting	Nut	M 8	8.8	2.5
Master cylinder push rod to adapter	Nut	M 10	C 45/6	1.0
Brake line connection	Union nut	M 10 x 1	5.8	1.5
Brake fitting to caliper	Hollow bolt	M 10 x 1		2.0
Caliper to steering knuckle	Bolt	M 12 x 1.5	8.8	7.0
Clamping nut for wheel bearing	Allen head bolt	M 7	10.9	1.5

Brake disc to wheel hub	Nut	M 8	8.8	2.3
Splash shield for brake disc	Bolt	M 8	8.8	1.0
Housing bolt for caliper (front)	Allen head bolt	M 8	10.9	3.4
Housing bolt for caliper (rear)	Allen head bolt	M 6	12.9	2.2
Caliper to rear axle control arm	Bolt	M 12 x 1.5	8.8	7.0
Brake disc to rear wheel hub	Countersunk screw	M 6	8.8	0.5
Brake carrier plate to rear axle control arm	Bolt	M 10		4.7
Splash shield to brake carrier plate	Bolt	M 8	8.8	2.5
Parking brake cable guide to control arm	Bolt	M 6	8.8	0.5
Wheel to wheel hub	Wheel lug nut	M 14 x 1.5		13.0
Leader valve to caliper SW 7	—	—	—	0.3

Electrical System Specifications

	911 T	911 E	911 S	Carrera 2.7
Operating voltage	12 V	12 V	12 V	12 V
Radio noise suppression	acc. to VDE 0879	same as 911 T	same as 911 T	same as 911 T
Alternator	770 W, 55 A, 14 V Bosch: 0 120 400 725 S.E.V. Alternateurs: 712 237 12 (= Moto- rola = S.E.V. Marchal)	same as 911 T	same as 911 T	same as 911 T
Voltage regulator (same make as alternator)	Bosch: 0 190 601 006 S.E.V. Alternateurs: 0 33 542	same as 911 T	same as 911 E	same as 911 E
Spark plugs / electrode gap	Bosch: W 230 T 30/0.7 (not for USA) Beru: 225/14/3/0.7 (not for USA) Bosch: W 235 P 21/0.55 Beru: 235/14/3 P/0.55	Bosch: W 260 T 2/0.7 (not for USA) Beru: 260/14/3/0.7 (not for USA) Bosch: W 265 P 21/0.55 Beru: 265/14/3 P/0.55	same as 911 E	same as 911 E

Distributor	Bosch: 0 231 169 003 From Model 73: 008* Marelli: 501 09 741	Bosch: 0 231 169 004 From Model 73: 009* Marelli: 501 09 742	Bosch: 0 231 169 005 From Model 73: 010* Marelli: 501 09 743	Bosch: 0 231 169 011 Marelli: 610 151 55
Dwell angle	Bosch: $38^\circ \pm 3^\circ$ Marelli: $40^\circ \pm 3^\circ$ From Model 73: $37^\circ \pm 3^\circ$	same as 911 T	same as 911 T	same as 911 T
Starter	Bosch: 0 001 212 005 (.8 HP)	same as 911 T	same as 911 T	Bosch: 0 001 312 100 (1.5 HP)

*) Ignition distributors Model 73 may be installed in vehicles Model 72.

Battery Electrical Condition	Temperate Zones	§	Tropical Zones
	Specific Gravity	Freezing Point	Specific Gravity
Battery dead	1.12	— 11°C	1.08
Battery half-charged	1.20	— 27°C	1.14
Battery fully charged	1.28	— 65°C	1.23

98 Technical Data for Auxiliary Heater

Operating voltage	12 V
Calorific output	approx. 2,500 kcal/h
Fuel consumption rate	approx. 0.44 ltr/h
Air flow rate	110 cu. m/h
Heating air temperature	approx. 85°C
Power draw	
Heater	approx. 70 W
Ventilator	approx. 35 W

Technical Data for Porsche Air Conditioner

Operating voltage	12 V
Weight	approx. 35 kp
Power draw	
Evaporator blower	approx. 185 W
Condenser blower	approx. 62 W
Evaporation pressure at 1,000 rpm (engine)	2.0–2.6 kp/cm ² (2.0–2.6 bar)
Cold air delivery temperature	1°C – 5°C
Current draw of clutch	approx. 4 Amps
Air flow rate	approx. 90 ltr/sec

Bulb Chart

	Wattage	Base (DIN)
Headlamps (halogen) H 1	55 W	P 14, 5 S
Headlamps (halogen) H 4	60/55 W	P 43 t – 38
Auxiliary driving lamps (halogen) H 1 and H 3	55 W	P 14,5 S/PK 22 S
Fog lamps (halogen) H 1 and H 3	55 W	P 14,5 S/PK 22 S
Stop / tail lamps	21/5 W	BAY 15 d
Directional signal lamps	21 W	BA 15 S
Backup lamp	15 W	BA 15 S
Interior lamp, engine compartment lamp	10 W	SV 8,5 – 8
Tail fog lamp	18 W	SV 8,5 – 8
Luggage compartment lamp	10 W	BA 15 S
Parking and license plate lamp	4 W	BA 9 S
Instrument illumination, control lamps	2 W	BA 7 S
Glass base control lamps	1.2 W	W 2 x 4.6 d
Fog lamps (USA)	35 W	BA 20 S
Sealed beam headlamps (USA)	50/40 W	Base (SAE)
Sealed beam headlamps (righthand steering)	60/50 W	6012
Sealed beam headlamps (lefthand steering)	60/60 W	6014
Stop / tail lamps (USA)	32/3 cp	7002
Front directional / parking lamps (USA)	32/3 cp	1034
Directional lamp (USA)	32 cp	1034
Backup lamp	15 cp	1073
Side marker lamp (USA), license plate lamp (USA)	2 cp	1003
		1895

100 Fuse Chart

Fusebox I

1 Interior light, clock, luggage compartment lamp	5 A
2 Emergency flasher	16 A
3 (Window regulator)	25 A
4 Cigarette lighter (auxiliary heater)	16 A (25 A)
5 (Sun roof)	16 A
6 Windshield wiper and washer	25 A
7 Fresh air fan	25 A
8 Stop/rear turn/backup lights	16 A
9 Turn signal, left front	5 A
10 Turn signal, right front	5 A

Fusebox II

1 High beam left	8 A
2 High beam right	8 A
3 Low beam left	8 A
4 Low beam right	8 A
5 Parking light left	5 A
6 Parking light right	5 A
7 License plate light	5 A
8 (Fog lights)	16 A

Fusebox III

1 Sportomatic	5 A
2 Start enrichment / shutoff solenoids, solenoid valve	8 A
3 Rear window defogger	25 A

Fuse 2 not required for vehicles with CIS.

Weights and Measures

Dimensions at DIN Empty Weight	911 T	911 E	911 S	Carrera 2.7
Wheelbase	mm 2,271	same as 911 T	same as 911 T	same as 911 T
Track front (wheel center 108 mm above torsion bar center)	mm 1,360	1,372	1,372	1,372
Track rear (wheel center 12 mm below transverse tube center)	mm 1,342	1,354	1,354	1,394
Length	mm 4,127	4,127	4,147	4,147
Width	mm 1,610	same as 911 T	same as 911 T	1,652
Height (empty)	mm 1,320	same as 911 T	same as 911 T	same as 911 T
Ground clearance	mm 150	same as 911 T	same as 911 T	same as 911 T

Weights

Engine weight (complete w/o oil) approx.	kg 183	182	182	182
Transmission weight (complete w/o oil and starter)	kg 54	same as 911 T	same as 911 T	same as 911 T
Empty weight (DIN)	kg 1,050	1,075	1,075	1,075
Empty weight (DIN) with Sportomatic	kg 1,065	1,090	1,090	---
Permissible total weight	kg 1,400	1,400	1,400	1,400
Permissible axle load front/rear*)	kg 600/840	same as 911 T	same as 911 T	same as 911 T
Permissible trailer load load (w/o brakes)	kg 480	same as 911 T	same as 911 T	same as 911 T
Permissible trailer (w/brakes)	kg 600	same as 911 T	same as 911 T	same as 911 T

*) Do not exceed permissible total weight.

Filling Capacities

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	911 T	911 E	911 S	Carrera 2.7
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Engine (Total Capacity)

Single viscosity premium HD oil, or oil of API specification MS or SD.
Summer SAE 30, winter SAE 20 W/20, below -15°C SAE 10 W.

Model 72 (oil tank in front of rear axle)

	approx. liters	8	8	9	—
with Sportomatic	approx. liters	10	10	11	—

Model 73 (oil tank in right rear wheel housing)

Dipstick mark min./max.	liters	8.5/10.5	8.5/10.5	11.0/13.0	11.0/13.0
with Sportomatic	liters	11.0/13.0	11.0/13.0	13.5/15.5	—
Oil change quantity	liters	approx. 10	approx. 10	approx. 10	approx. 10

Transmissions *

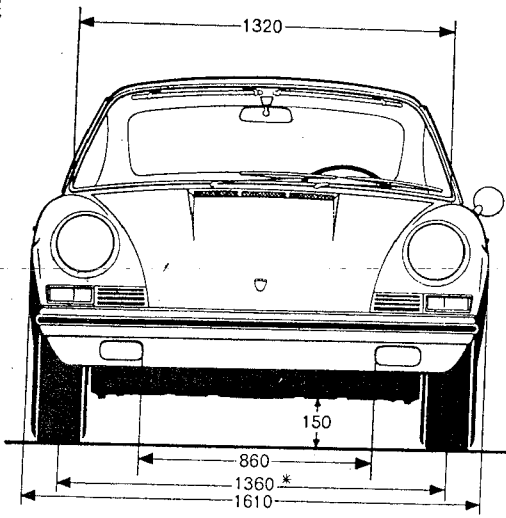
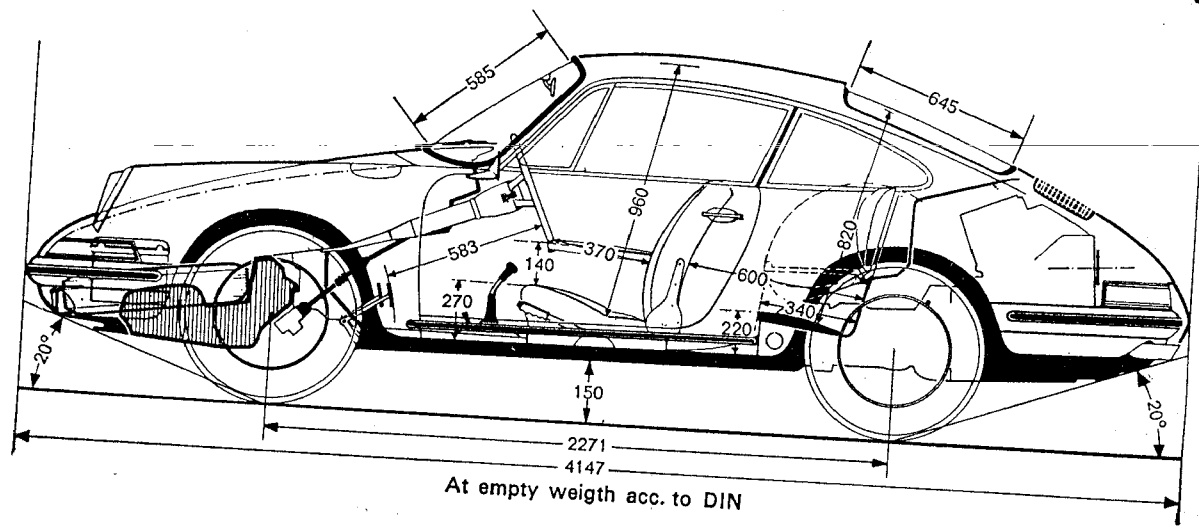
	liters	approx. 2.5	approx. 3.0	approx. 3.0	approx. 3.0
Fuel tank Model 72	liters	62, incl. approx. 6 liters reserve	same as 911 T	same as 911 T	—
Fuel tank Model 73	liters	62, incl. 6 liters reserve	85, incl. 9 liters reserve	85, incl. 9 liters reserve	85, incl. 9 liters reserve
Brake fluid reservoir	approx. liters	0.2	same as 911 T	same as 911 T	same as 911 T
Windshield washer	approx. liters	2	same as 911 T	same as 911 T	same as 911 T

*) EP oil acc. to MIL-L 2105 or 2105 B — for locking differential (positive traction) Shell S 1747 A

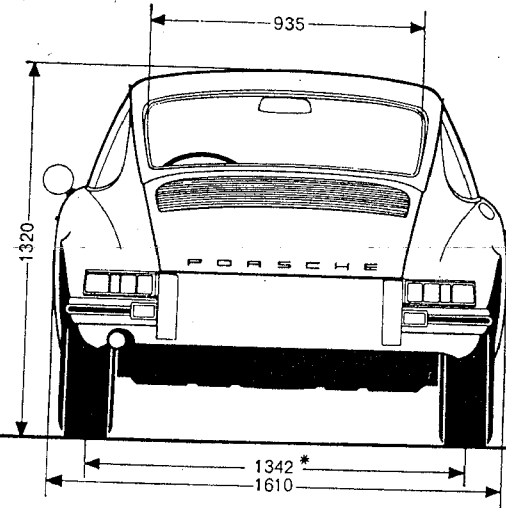
Performance

Max. speed (with 4-speed or 5-speed transmission)	mph	127	137	143	149
		with Sportomatic transmission	with Sportomatic transmission	approx. 3 mph slower than with manual transmission	
Acceleration 0–100 km/h (0–62 mph) at DIN empty weight plus 1/2 payload	sec	9.5	7.9	7.0	6.3
Kilometer from standing start (DIN empty weight plus 1/2 payload)	sec	30.35	28.5	27.5	26.5
Nominal fuel consumption liters/100 km		9.2	9.0	9.5	10.2

PORSCHE **Body Dimensions for Type 911 (from 1972 Models)**



* 1360 with wheels 5 1/2 J x 15
 1327 with wheels 6 J x 15



* 1342 with wheels 5 1/2 J x 15
 1354 with wheels 6 J x 15

Metric to English**LENGTH**

Millimeters to Inches	multiply by 0.03937
Centimeters to Inches	0.3937
Meters to Feet	3.2808
Meters to Yards	1.0936
Kilometers to Miles	0.6214

WEIGHT

Grammes to Ounces	multiply by 0.03527
Kilogrammes to lbs.	2.2046
Tons (Metric) to tons	0.9842

LIQUID

Liters to U. S. gallons	multiply by 0.2642
Liters to Imperial gallons	0.2200
Liters to U. S. pints	2.114
Liters to Imperial pints	1.7598

PRESSURE

Kg/cm ² to lbs./in. ²	multiply by 14.223
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TEMPERATURE

° Centigrade to ° Fahrenheit	multiply by 9/5 and add 32
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English to Metric**LENGTH**

Inches to millimeters	multiply by 25.4001
Inches to centimeters	2.54
Feet to meters	0.3048
Yards to meters	0.9144
Miles to kilometers	1.609

WEIGHT

Ounces to grammes	multiply by 28.35
Lbs. to kilogrammes	0.4536
Tons to tons (Metric)	1.016

LIQUID

U. S. gallons to liters	multiply by 3.875
Imperial gallons to liters	4.546
U. S. Pints to liters	0.473
Imperial pints to liters	0.568

PRESSURE

Lbs./in. ² to kg/cm ²	multiply by 0.07031
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TEMPERATURE

° Fahrenheit to ° Centigrade	subtract 32 and multiply by 5/9
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