PORSCHE

82, 83 Models

911 SC, 911 Turbo

Technical Specifications

Contents

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Air Conditioner

Body

Important conversion factors and new units of measurement

	Old units		New units
Pressure	tech. atmosphere	at (kp/cm²)	Bar (bar)
Output	Horsepower	HP	Kilowatt (kW)
Force	Kilopond	kp	Newton (N)
Power	Kilopondmeter	kpm	Newtonmeter (Nm)

Conversion factors

at (kp/cm²)	in bar	× 0.981
kp	in N	× 9.81
HP	in kW	× 0.736
kpm	in Nm	× 9.81
m/s	in km/h	× 3.6
at	in mm Hg	× 735.56
km/h	in mph (miles)	× 0.621
° F (Fahrenheit)	in ° C	(° F − 32) × 0.555
l	in U.S. gal	× 0.264
l	in Imp. gal	× 0.22

The conversion factor 10 is applied for the conversion of tightening torque from kpm to Nm. This is more than sufficient for shop practice.

Chassis numbers — 1982 model

Explanation of digits:

1 2 3 — World manufacturing code

4 5 6 — VDS Code USA

7 8 — 1st and 2nd digits of type

9 — Test digit

10 — Model year

11 — Production site

12 — 3rd digit of type

13 — Code for body and engine

14 15 16 17 — Serial number

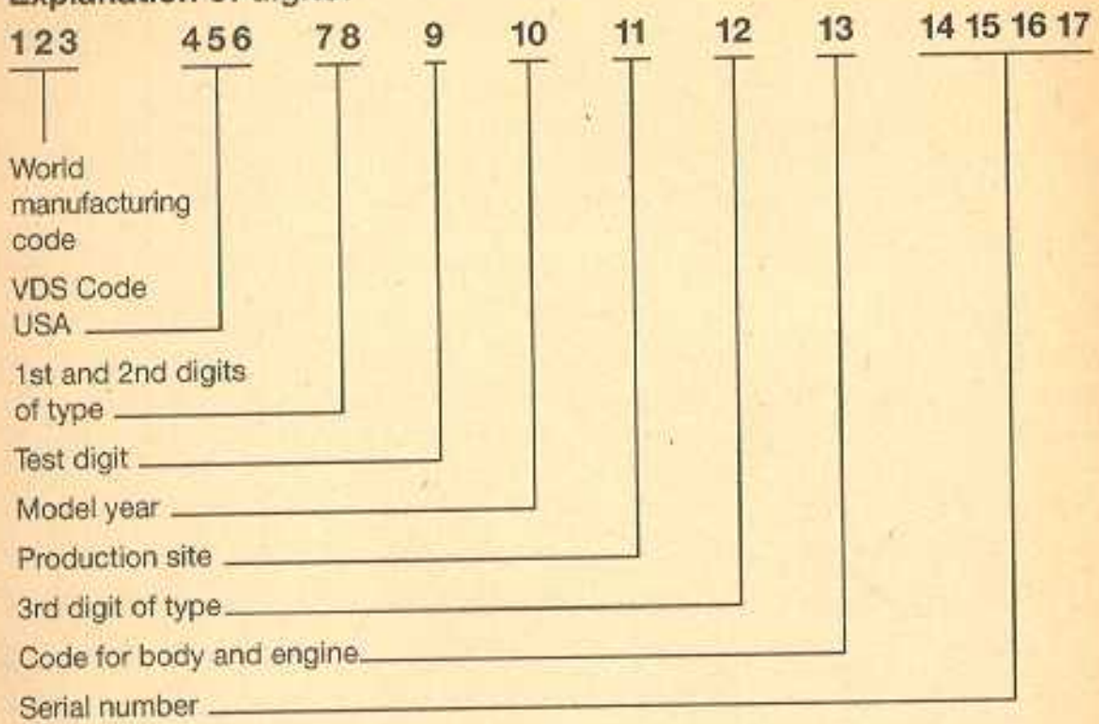
Chassis number ranges

Vehicle type		Engine type	Number range
911 SC-Coupé	R.o.W.	930/10	WPO ZZZ 91 Z CS 10 0001 – 5000
911 SC-Coupé	Japan	930/17	WPO ZZZ 91 Z CS 10 9501 – 9999
911 SC-Targa	R.o.W.	930/10	WPO ZZZ 91 Z CS 14 0001 – 5000
911 SC-Targa	Japan	930/17	WPO ZZZ 91 Z CS 14 9501 – 9999
911 SC-Coupé	USA	930/16	WPO AAO 91 – CS 12 0001 – 5000
911 SC-Targa	USA	930/16	WPO EAO 91 – CS 16 0001 – 5000
930 Turbo	R.o.W.	930/60	WPO ZZZ 93 Z CS 00 0001 – 2000
930 Turbo	Canada	930/60	WPO JAO 93 – CS 05 0001 – 2000

Chassis numbers

1983 model

Explanation of digits:



Chassis number ranges

Vehicle type		Engine type	Number range
911 SC-Coupé	R.o.W.	930/10	WPO ZZZ 91 Z DS 10 0001 – 5000
911 SC-Coupé	Japan	930/17	WPO ZZZ 91 Z DS 10 9501 – 9999
911 SC-Targa	R.o.W.	930/10	WPO ZZZ 91 Z DS 14 0001 – 5000
911 SC-Targa	Japan	930/17	WPO ZZZ 91 Z DS 14 9501 – 9999
911 SC-Coupé	USA	930/16	WPO AAO 91 – DS 12 0001 – 5000
911 SC-Targa	USA	930/16	WPO EAO 91 – DS 16 0001 – 5000
911 Turbo	R.o.W.	930/66	WPO ZZZ 93 Z DS 00 0001 – 2000
911 Turbo	Canada	930/66	WPO JAO 93 – DS 05 0001 – 2000

Engine type designations

Year mfd.	Model year	Engine type designation Official		Internal	Displace-ment	kW/HP
1981/82	**1982**	911 SC	R. o. W.	930/10	3.0 l	150/204
		911 SC	Japan	930/16	3.0 l	132/180
		911 SC	USA	930/17	3.0 l	132/180
		911 Turbo	R. o. W.	930/60	3.3 l	221/300
		911 Turbo	Canada	930/60	3.3 l	221/300
1982/83	**1983**	911 SC	R. o. W.	930/10	3.0 l	150/204
		911 SC	Japan	930/16	3.0 l	132/180
		911 SC	USA	930/17	3.0 l	132/180
		911 Turbo	R. o. W.	930/66	3.3 l	221/300
		911 Turbo	Canada	930/66	3.3 l	221/300

Engine numbers

1982 model

Explanation of digits Example: 63 C 2701

1	2		3	4 5 6 7
Unit type	Engine types		Model year	Serial number
6 = 6 cyl. engine	3 = 911 SC	R. o. W.	**C = 1982**	
	4 = 911 SC	USA		
	7 = 911 Turbo	R. o. W.		

Engine number ranges

Engine type	Technical data	Installed in model		Number range
930/10	3.0 l 150 kW	911 SC	R. o. W.	63 C 0001 – 8000
930/17	3.0 l 132 kW	911 SC	Japan	63 C 8001 – 9000
930/16	3.0 l 132 kW	911 SC	USA	64 C 0001 – 9999
930/60	3.3 l 221 kW	911 Turbo	R. o. W. and Canada	67 C 0001 – 1000

Engine numbers

1983 model

Explanation of digits Example: 63 D 2701

1	2		3	4 5 6 7
Unit type	Engine types		Model year	Serial number
6 = 6 cyl. engine	3 = 911 SC	R. o. W.	**D = 1983**	
	4 = 911 SC	USA		
	7 = 911 Turbo	R. o. W./Canada		

Engine number ranges

Engine type	Technical data	Installed in model		Number range
930/10	3.0 l 150 kW	911 SC	R. o. W.	63 D 0001 – 8000
930/17	3.0 l 132 kW	911 SC	Japan	63 D 8001 – 9000
930/16	3.0 l 132 kW	911 SC	USA	64 D 0001 – 9999
930/66	3.3 l 221 kW	911 Turbo	R. o. W. and Canada	67 D 0001 – 1000

Transmission numbers — 1982 model

Explanation of digits Example: 73 C 3495

1	2		3	4 5 6 7
Unit type	Transmission types		Model year	Serial number
7 = Transmission for 6 cyl. engine	3 = 5-gear 911 4 = 5-gear 911 7 = 911 Turbo	R. o. W. USA, Japan	**C = 1982**	

Transmission number ranges

Transmission type	Technical data	Installed in model		Number range
915/62	5-gear	911 SC	R. o. W.	73 C 0001 – 9999
915/63	5-gear	911 SC	USA, Japan	74 C 0001 – 9999
930/34	4-gear	911 Turbo		77 C 0001 – 2000

Transmission numbers — 1983 model

Explanation of digits Example: 73 D 3495

1	2		3	4 5 6 7
Unit type	Transmission types		Model year	Serial number
7 = Transmission for 6 cyl. engine	3 = 5-gear 911 4 = 5-gear 911 7 = 911 Turbo	R. o. W. USA, Japan	**D = 1983**	

Transmission number ranges

Transmission type	Technical data	Installed in model		Number range
915/62	5-gear	911 SC	R. o. W.	73 D 0001 – 9999
915/63	5-gear	911 SC	USA, Japan	74 D 0001 – 9999
930/34	4-gear	911 Turbo		77 D 0001 – 2000

Transmission type codes

Trans-mission Type	No. of Gears	1st Gear	2nd Gear	3rd Gear	4th Gear	5th Gear	Pinion/ Ring Gear	As from Transmission Number	Remarks
915.62	5	11/35	18/33	23/29	26/26	28/22	8/31	731 0001	Manual transm. 911 R.o.W.
915.63	5	11/35	18/32	23/29	26/26	28/23	8/31	741 0001	Manual transm. 911 USA/Japan
930.34	4	16/36	23/30	28/25	32/20	—	9/38	771 0001	Manual transm. 911 Turbo Worldwide

Since 1983 models the 911 Turbo transmission 930/34 for cars in Switzerland has a longer second gear:

24 : 30, i = 1.250
was (23 : 30, i = 1.304)

The shift cover on the transmission has a dot of paint for identification.

Engine specifications 911 SC — 1982 and 1983 models

Engine Internal engine code		911 SC 930/16/17	930/10
Design		Four stroke internal combustion engine (two banks of cylinders opposite each other)	
No. of cylinders		6	6
Bore	mm/inch	95.0/3.74	95.0/3.74
Stroke	mm/inch	70.4/2.77	70.4/2.77
Total displacement	cm^3/$inch^3$	2994/182.7	2994/182.7
Compression ratio		9.3 : 1	9.8 : 1
Max. engine power acc. DIN 70020	kW/HP	132/180	150/204
Net power, SAE J 245	kW/HP	128/172	145/195
at engine speed	rpm	5500	5900
Max. torque acc. DIN 70020	Nm/kpm	265/27	267/27
Net torque, SAE J 245	Nm/ft lbs	257/189	258/190
at engine speed	rpm	4200	4300
Max. liter output acc. DIN 70020	kW/l, HP/l	44/60	50.1/68.1
acc. SAE J 245	kW/l, HP/l	42/57	48.4/65.1
Max. permissible speed	rpm	6700	7000

Engine Internal engine code		911 SC 930/16/17	930/10
Cut-off speed			
Speed governed by switching-off ignition	rpm		6800 ± 200
Speed governed by switching-off fuel pump	rpm	6500 + 200	
Engine weight (dry)	kg/lbs. approx.	200/441	190/419
Fuel octane	RON	91 91 lead-free (USA)	98
Cooling system		air-cooling from axial blower on alternator	
Blower drive		by v-belt off of crankshaft	
Crankshaft/blower ratio		1 : 1.68	1 : 1.68
Air delivery rate		1500 l/s at 6000 rpm of crankshaft	1500 l/s at 6000 rpm of crankshaft
Drive belt		9.5 × 710	9.5 × 710

Engine		911 SC
Internal engine code		930 (all engine types)
Lubricating system		dry sump lubrication
Oil cooling		oil cooler on crankcase in blower air stream, plus cooling pipe coil or pipe oil cooler
Oil pressure at 90° C oil temperature and speed of 5000 rpm	bar	approx. 4.0
Oil consumption	ltr./1000 km	approx. 1.5
Crankcase		two-piece aluminum alloy
Crankshaft		forged (tenifer treated)
Crankshaft bearings		8 plain bearings
Connecting rods		forged (steel)
Connecting rod bearings		plain bearing half shells
Piston pin bearing in conrod		press-fit bronze bush
Pistons		cast or forged aluminum
Piston pin		floating installation, held by circlips
Piston rings		2 compression rings, 1 oil scraper ring

Engine	911 SC
Internal engine code	930 (all engine types)
Cylinders	Nikasil (Mahle) and Alusil (KS)
Cylinder head	single alloy cylinder head
Valve seat insert	shrink-fit made of annealed sintered steel
Valve guide	thermohedul FS 15
Valve arrangement for each cylinder	1 intake and 1 exhaust valve in vee suspension
Exhaust valve	without sodium filling, with reinforced seat surface
Valve springs	2 coil springs per valve
Valve timing	left and right one each overhead camshaft
Camshaft	cast, 4 bearings direct in camshaft housing (no bearing shells)
Camshaft drive	by chain
Valve clearance on cold engine	
Intake	0.1 mm measured between valve stem end surface and
Exhaust	cap of valve adjusting screw

Engine		911 SC
Internal engine code		930 (all engine types)
Clutch		single plate dry type
Diameter	mm	225
Contact pressure	N (kp)	7800...8500 (775...866)
Fuel supply		K-Jetronic 1 electric roller cell pump, EKP 4, with exchangable pressure holding valve, steel fuel and injection pipes

Engine specifications 911 Turbo — 1982 and 1983 models

Engine		911 Turbo
Internal engine code		930/60/66
Design		Four stroke internal combustion engine (two banks of cylinders opposite each other)
No. of cylinders		6
Bore	mm/inch	97.0/3.82
Stroke	mm/inch	74.4/2.93
Total displacement	cm^3/$inch^3$	3299/201.3
Compression ratio		7.0 : 1
Max. engine power	kW/HP kW/HP	221/300 221/296
at engine speed	rpm	5500
Max. torque	Nm/kpm Nm/lbft	412/42 412/304
at engine speed	rpm	4000
Max. liter output	kW/l, HP/l	67/91
Max. permissible speed	rpm	6700

Engine Internal engine code		911 Turbo 930/60/66	
Max. permissible constant speed	rpm	6000	
Cut-off speed of speed governor in distributor	rpm	7000 ± 200	
Engine weight (dry)		930/60	930/66
	kg/lbs	230/507	269/593
Fuel octane	RON/MON (leaded premium grade gasoline to DIN 51 600)	98/88	

Engine Internal engine code		911 Turbo 930 (all engine types)
Cooling system		air-cooling from axial blower on alternator
Blower drive		by v-belt off of crankshaft
Crankshaft/blower ratio		1 : 1.68
Air delivery rate		1500 l/s at 6000 rpm of crankshaft
Blower drive belt		9.5 × 710
Lubricating system		dry sump lubrication
Oil cooling		oil cooler on crankcase in blower air stream, plus cooling pipe coil or oil cooler
Oil pressure at 90° C oil temperature and speed of 5000 rpm	bar	approx. 5.0
Oil consumption	l/1000 km	approx. 1.0 to 2.0
Crankcase		two-piece aluminum alloy
Crankshaft		forged (tenifer treated)
Crankshaft bearings		8 plain bearings
Connecting rods		forged steel

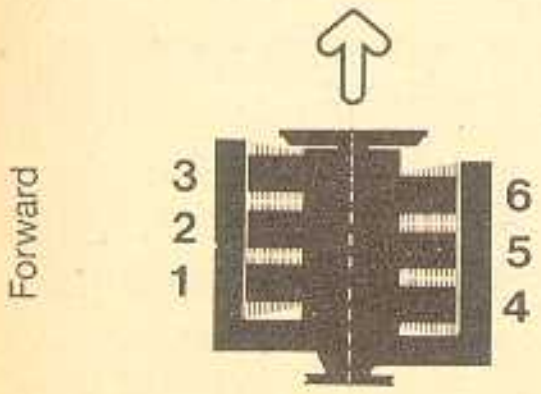
Engine Internal engine code	911 Turbo 930 (all engine types)
Connecting rod bearings	plain bearings half shells
Piston pin bearing in conrod	press-fit bronze bush
Intermediate shaft bearing	two plain bearings
Pistons	forged alloy (Mahle)
Piston pins	floating installation, held by circlips
Piston rings	2 compression rings, 1 oil scraper ring
Cylinders	Nikasil (Mahle)
Cylinder head	light alloy single cylinder head
Valve seat insert	shrink-fit, made of annealed sintered steel
Valve guide	thermohedul FS 15
Arrangement of valves per cylinder	1 intake and 1 exhaust valve in vee suspension
Exhaust valve	sodium filled with reinforced seat surface
Valve springs	2 coil springs per valve
Valve timing	left and right one each overhead camshaft
Camshaft	cast, 4 bearings direct in camshaft housing (no bearing shells)
Camshaft drive	by chain

Engine Internal engine code		911 Turbo 930 (all engine types)
Valve clearance on cold engine		
Intake Exhaust		0.1 mm measured between valve stem end surface and cap of valve adjustment screw
Clutch		single plate dry type
Diameter (manual transmission)	mm	240
Contact pressure	N (kp)	11200 – 12100 (1142 – 1233)
Fuel supply		K-Jetronic (CIS) since 1983 models fuel distributor with capsule valve, Bosch 0438 100 037 data plate color: blue/green
Supercharging		KKK exhaust gas turbocharger, charge pressure regulated via bypass valve, charged air cooling

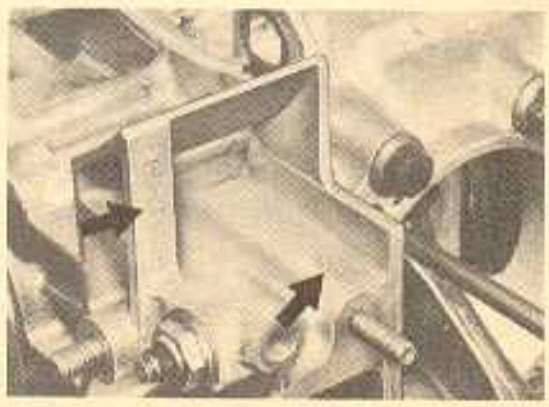
Electrical system		
Battery voltage	V	12
Battery capacity	Ah	66 (88 optional extra)
Alternator/output	A/W	70/980
Regulator switch		matched to alternator (black plastic housing screwed on alternator)
Ignition		CDI without contacts
Ignition transformer		Bosch
Firing order		1 - 6 - 2 - 4 - 3 - 5

Designation of cylinders on 6 cylinder engine

Firing order
1 - 6 - 2 - 4 - 3 - 5



Engine number and
engine type designation



Engine tolerance and wear limit survey – 911 SC

Note: B = bore W = shaft

Measuring point		Installation size with tolerances mm	Clearance (+) or press-fit (–) from	to	Wear limits in mm
Crankshaft	– main bearing	B 60.020 – 60.059	+0.010	+0.072	visual inspection
Bearings 1 – 7	(d 1)	W59.971 – 59.990			59.960
Crankshaft	– main bearing	B 31.041 – 31.084	+0.048	+0.104	visual inspection
Bearing 8	(d 3)	W30.980 – 30.993			30.970
Crankpin	– conrod bearing	B 53.020 – 53.059	+0.030	+0.088	visual inspection
	(d 2)	W52.971 – 52.990			52.960
Crankshaft runout (measured on bearings 4 and 8 with bearings 1 and 7 in vee blocks)					max. 0.04
Crankshaft unbalance					max. 10 cmg.
Crankshaft	– main bearing				
Axial play			+0.110	+0.195	0.30
Crankshaft	– timing gear	B 41.975 – 42.000	–0.002	–0.038	
		W42.002 – 42.013			
Crankshaft	– distributor drive	B 41.975 – 42.000	–0.002	–0.038	
		W42.002 – 42.013			
Crankshaft	– flywheel	B 50.002 – 50.021	+0.021	+0.028	
		W50.000 – 50.030			
Crankshaft	– pulley	B 30.000 – 30.033	+0.007	+0.073	
		W29.960 – 29.993			
Pulley: radial runout					max. 0.15
lateral runout					max. 0.20

Engine tolerance and wear limit survey – 911 Turbo

Note: B = bore W = shaft

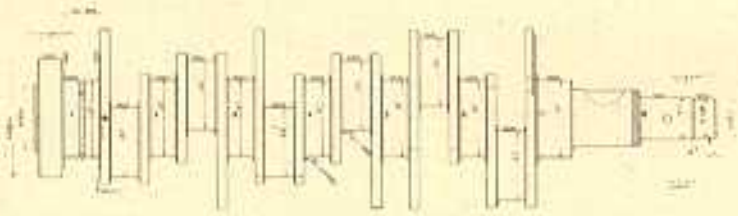
Measuring point	Installation size with tolerances mm	Clearance (+) or press-fit (–) from	to	Wear limits in mm
Crankshaft – main bearing Bearings 1–7 (d 1)	B 60.020–60.059 W59.971–59.990	+0.010	+0.072	visual inspection 59.960
Crankshaft – main bearing Bearing 8 (d 3)	B 31.041–31.084 W30.980–30.993	+0.048	+0.104	visual inspection 30.970
Crankpin – conrod bearing (d 2)	B 55.020–55.059 W54.971–52.990	+0.030	+0.088	visual inspection 54.960
Crankshaft runout (measured on bearings 4 and 8 with bearings 1 and 7 in vee blocks)				max. 0.04
Crankshaft unbalance				max. 10 cmg.
Crankshaft – main bearing Axial play		+0.110	+0.195	0.30
Crankshaft – timing gear	B 41.975–42.000 W42.002–42.013	–0.002	–0.038	
Crankshaft – distributor drive	B 41.975–42.000 W42.002–42.013	–0.002	–0.038	
Crankshaft – flywheel	B 90.000–90.030 W89.780–90.000	0.0	+0.049	
Crankshaft – pulley	B 30.000–30.033 W29.960–29.993	+0.007	+0.073	
Pulley: radial runout				max. 0.15
lateral runout				max. 0.20

Crankshaft – standard and repair sizes – 911 SC

Size	Crankcase diameter bearings 1–8	All main bearings d 1	Connecting rod bearings d 2	Main bearing diameter d 3 of crankshaft bearing 8	Collar diameter d 4	Seat for timing gear diameter d 5	Crankshaft pulley diameter d 6	Thrust bearing width A
Stand.		59.971...59.990	52.971...52.990	30.980...30.993	89.780...90.000	42.002...42.013	29.960...29.993	28.000...28.060
–0.25		59.721...59.740	52.721...52.740	30.730...30.743				
–0.50		59.471...59.490	52.471...52.490	30.480...30.493	89.280...89.500		29.370...29.500	
–0.75		59.221...59.240	52.221...52.240	30.230...30.243				
–1.00		58.971...58.990	51.971...51.990	29.980...29.993				

Normal
65.000...65.019

Oversize
65.250...65.269



Only grind bearing surface for radial oil seals to 29.5 and 89.5 as specified here when scoring is too deep. Otherwise repolish as necessary: 3 microns.
After grinding give oil bores a 0.5 radius. Break sharp edges with 0.2 to 0.5 radius. Max. radial runout in reference to take-up in —.—: max. 0.04.
Specification for tenifer treatment according to Tenifer 120 W PN 1053 ferroflux.
Never straighten main bearings 3 and 5 after tenifer treatment. Straightening of the other main bearing journals through stemming in the radii is permitted.

Color codes for repair sizes

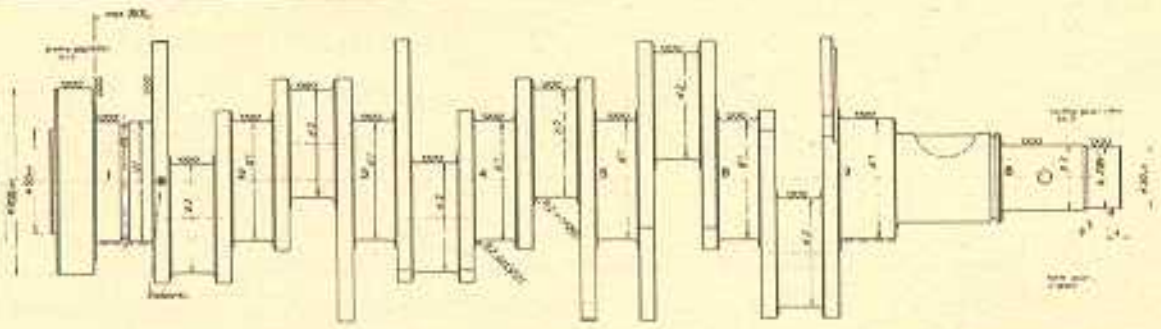
1st repair size	blue	paint dot
2nd repair size	green	paint dot
3rd repair size	yellow	paint dot
4th repair size	white	paint dot

Crankshaft – standard and repair sizes – 911 Turbo

Size	Crankcase diameter bearings 1–8	All main bearings d 1	Connecting rod bearings d 2	Main bearing diameter d 3 of crankshaft bearing 8	Collar diameter d 4	Seat for timing gear diameter d 5	Crankshaft pulley diameter d 6	Thrust bearing width A
Stand.		59.971...59.990	54.971...54.990	30.980...30.993	89.780...90.000	42.002...42.013	29.960...29.993	28.000...28.060
–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	89.280...89.500		29.370...29.500	
–0.75		59.221...59.240	54.221...54.240	30.230...30.243				
–1.00		58.971...58.990	53.971...53.990	29.980...29.993				

Normal
65.000...65.019

Oversize
65.250...65.269



Only grind bearing surface for radial oil seals to 29.5 and 89.5 as specified here when scoring is too deep. Otherwise repolish as necessary: 3 microns.
After grinding give oil bores a 0.5 radius. Break sharp edges with 0.2 to 0.5 radius. Max. radial runout in reference to take-up in —.—: max. 0.04.
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Color codes for repair sizes

1st repair size	blue	paint dot
2nd repair size	green	paint dot
3rd repair size	yellow	paint dot
4th repair size	white	paint dot

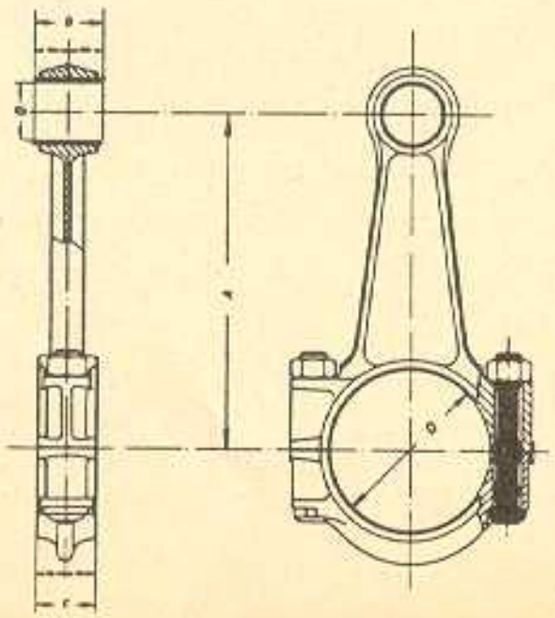
Measuring point	Installation size with tolerances mm	Clearance (+) or press-fit (–) from	to	Wear limit mm
Crankcase				
Case bore for main bearings:				
Bearings 1 – 8	65.000 – 65.019			
Oversize	65.250 – 65.269			
Case bore for intermediate shaft:				
Bearing 1 (thrust bearing)	27.500 – 27.521			
Bearing 2	26.500 – 26.521			
Spring for safety valve:				
Relaxed length	approx. 69			
Spring force at 52 mm	104 N/10.6 kp			
Spring force at 46 mm	138 N/14.1 kp			
Spring wire dia.	1.8			
Spring for pressure relief valve:				
Relaxed length	approx. 87			
Spring force at 50.5 mm	82.4 N/8.4 kp			
Spring wire dia.	1.5			

Installation note:

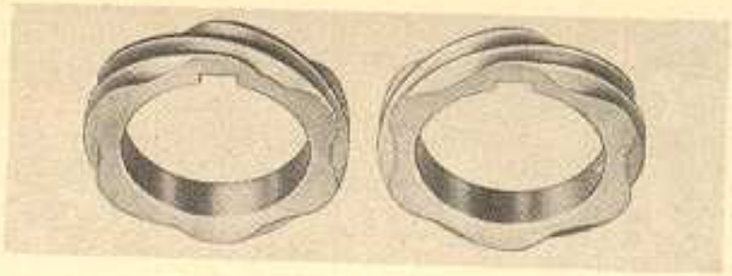
The pressure relief valve spring (approx. 87 mm long) may only be used in conjunction with a spring guide (safeguard against bending).

Never press springs flat.

Measuring point	Installation size with tolerances mm 911 SC	911 Turbo	Clearance (+) or press-fit (–) from	to	Wear limit mm
Connecting rods					
A Distance between centers	127.75–127.80	126.95–127.00			
b Width of conrod bush	24.8–25.0	24.5–25.0			
c Width at big end	21.7–21.8	21.7–21.8			
Width at crankpin	22.00–22.05	22.00–22.05	+0.200	+0.350	
D Conrod dia. (without bearing shell)	56.000–56.019	58.000–58.019			
G Conrod bush dia. installed in conrod (finished)	22.020–22.033	23.020–23.033			
Piston pin bushing/piston pin clearance			+0.020	+0.037	0.055



Installing drive gear for left-hand turning distributor on crankshaft



For left-hand turning distributor (with Porsche manufacturing code stamped)
Part No. 930 102 115 01

For right-hand turning distributor

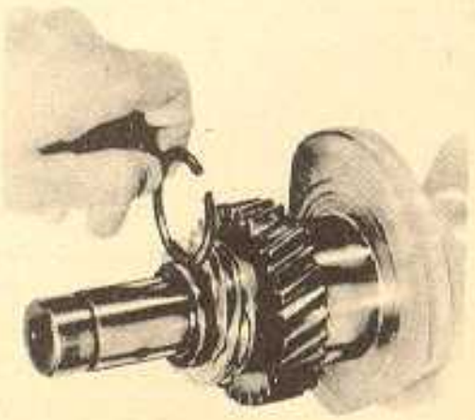
Installing circlips on crankshaft

To take up axial play on distributor drive gear, there are circlips in different thicknesses.

The following circlips are available:

Part No.	Thick-ness	Code
901.102.148.00	2.4 mm	0
901.102.148.01	2.3 mm	1
901.102.148.02	2.2 mm	2
901.102.148.03	2.1mm	3

Install timing gear, intermediate ring and drive gear for left-hand turning distributor on crankshaft against stop. Find correct circlip thickness by inserting different circlips. Circlip must be installed without play.



Connecting rod weight groups – 911 SC

Connecting rods are grouped according to weights.

Final digits of the part number indicate the specified weight group.

These final digits are stamped on the connecting rod shank if it is supplied as a replacement part.

Weight Over g	Weight Under g	Weight group for service	Service Conrod part number	Conrod code
633	642	1	930.103.015.51	51
642	651	2	930.103.015.52	52
651	660	3	930.103.015.53	53
660	669	4	930.103.015.54	54
669	678	5	930.103.015.55	55
678	687	6	930.103.015.56	56
687	696	7	930.103.015.57	57
696	705	8	930.103.015.58	58
705	714	9	930.103.015.59	59

Connecting rod weight groups – 911 Turbo

Weight Over g	Weight Under g	Weight group for service	Service Conrod part number	Conrod code
615	624	3	930.103.020.73	73
624	633	4	930.103.020.74	74
633	642	5	930.103.020.75	75
642	651	6	930.103.020.76	76
651	660	7	930.103.020.77	77
660	669	8	930.103.020.78	78
669	678	9	930.103.020.79	79
678	687	10	930.103.020.80	80
687	696	11	930.103.020.81	81

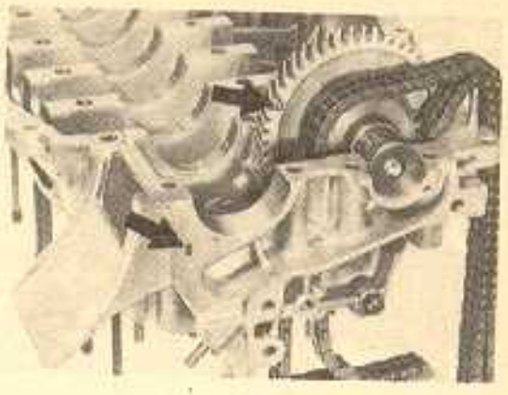
Note:

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

Matching intermediate shaft and crankcase

Gears and crankcase may only be matched with each other as shown in the table below.

Code (0 or 1) is die-stamped on left-hand side of crankcase below the alternator holder.

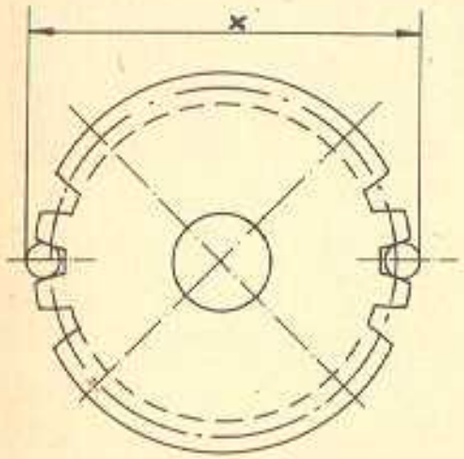


Distance Betw. Centers mm	Crankcase Code	Drive Gear on Crankshaft Code	Intermediate Shaft Gear Code	Backlash mm
103.975 – 103.990	0	0	0	0.029 – 0.049
		Installation still possible		
		1	0	0.016 – 0.042
		0	1	0.017 – 0.043
103.990 – 104.000	1	1	1	0.012 – 0.041
		Installation still possible		
		0	1	0.025 – 0.049
		1	0	0.025 – 0.048

Checking and installing intermediate shaft

Checking

1. Inspect intermediate shaft gear for wear. Measure intermediate shaft gear with help of 4.5 mm diameter steel rollers.

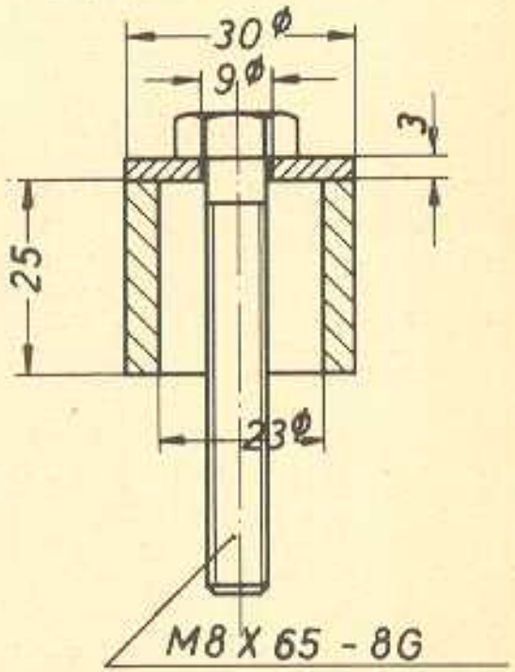


If distance x is less than 136.5 mm, intermediate shaft gear and drive gear on crankshaft must be replaced.

If it concerns an intermediate shaft gear with code 1, distance x must not be less than 135.55 mm. Visual inspection for signs of wear is very important in addition to this measuring test. The intermediate shaft and drive gear on the crankshaft must always be replaced.

2. Remove aluminum plug on face of intermediate shaft and clean oil bore to remove residue, if engine has been operated a long time or when reconditioning an engine (also for bearing damage).

3. Drill a 6.4 mm diameter hole in center of aluminum plug and tap M 8 threads. Pull out aluminum plug with a suitable tool and clean oil bore in intermediate shaft. Press in a new aluminum plug afterwards.



Note:

An intermediate shaft with bolted gear is one replacement part and can only be replaced complete.
Sprockets can be replaced separately.

Measuring point	Installation size with tolerances mm	Tolerance (+) or press-fit (–) from	to	Wear limits mm
Intermediate shaft				
Bearing 1 Crankcase bore – shaft	B 27.500 – 27.521 W 25.000 – 24.980	+ 0.030	+ 0.084	
		+ 0.040	+ 0.133	0.16
Bearing 2 Crankcase bore – shaft	B 26.500 – 26.521 W 23.980 – 23.967	+ 0.030	+ 0.084	
		+ 0.040	+ 0.133	0.16
Intermediate shaft clearance				
Intermediate shaft axial play				
Chain guide – bolt	B 8.000 – 8.015 W 7.822 – 7.837	+ 0.001	+ 0.030	
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 26.947 – 26.980	+ 0.020	+ 0.074	
Flywheel				
Lateral runout				max. 0.10
Radial runout				max. 0.20

Measuring point	Installation size with tolerances mm	Clearance (+) or press-fit (–) from	to	Wear limits mm
Timing chain case				
Sprocket carrier shaft – chain tensioner housing	B 15.000 – 15.018 W 14.973 – 14.984	+0.016	+0.045	Visual inspection
Sprocket carrier shaft – sprocket carrier	B 15.000 – 15.018 W 14.973 – 14.984	+0.016	+0.045	
Sprocket carrier – sprocket pin	B 15.000 – 15.018 W 14.989 – 15.000	0.000	+0.029	
Sprocket – sprocket pin	B 15.032 – 15.050 W 14.989 – 15.000	+0.032	+0.610	Visual inspection
Pin – chain guide	B 8.000 – 8.015 W 7.886 – 7.895	+0.105	+0.129	
Pin – timing chain case	B 7.857 – 7.872 W 7.886 – 7.895	–0.014	–0.038	

Measuring point	Installation size with tolerances mm	Clearance (+) or press-fit (–) from	to	Wear limits mm
Camshaft housing – camshaft				
Camshaft bearings Camshaft	B 48.967 – 48.992 W 48.926 – 48.942	+0.025	+0.066	0.10
Camshaft – axial play		+0.150	+0.200	0.40
Camshaft – sprocket flange	B 30.000 – 30.013 W 29.979 – 30.000	0.000	+0.034	
Camshaft – runout measured on center bearing (between points)				max. 0.02
Rocker arm shaft – camshaft housing	B 18.000 – 18.018 W 17.992 – 18.000	Rocker arm shaft held firm by wedge effect		
Rocker arm – rocker arm shaft	B 18.016 – 18.027 W 17.992 – 18.000	+0.016	+0.035	0.080
Axial play		+0.100	+0.350	0.50

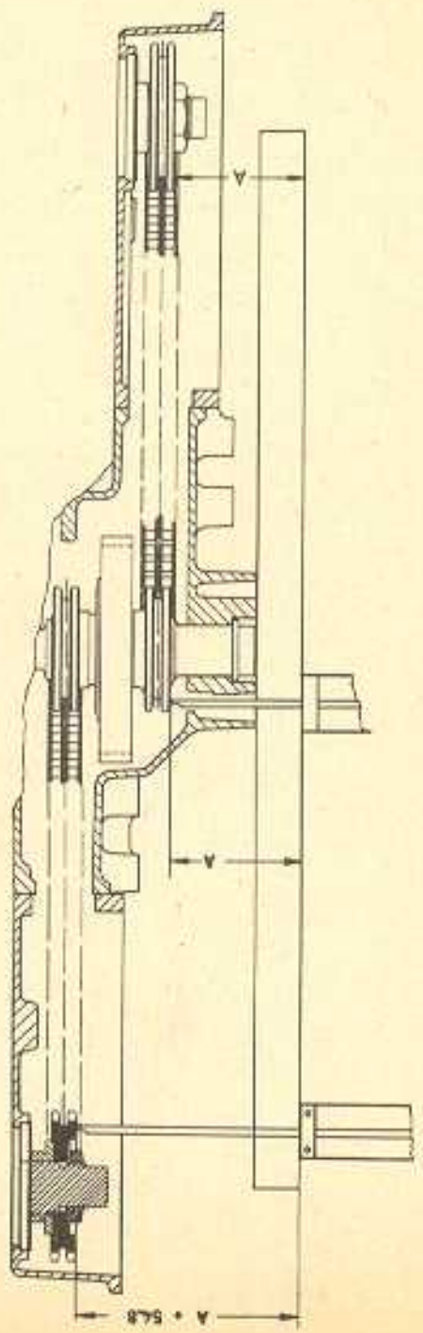
Checking parallel alignment of timing chain sprockets (old crankcase until March, 1983)

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

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

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

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



Example: measured dimension A = 78.7 mm
This means sprocket of cylinders 1 – 3 is A + 54.8 = 133.5 mm

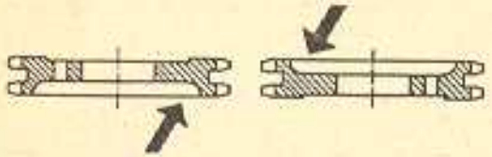
Checking parallel alignment of sprockets (modified crankcase since March, 1983)

Identification: oil filter screen ommitted, oil drain plug on left side of crankcase.

Preparations

1. Install thrust washer and quantity of removed shims on the camshaft (sprocket flange is same for both ends).

2. Sprocket on camshaft is same for both ends, however the chain running center from the take-up flange of the sprocket is offset. Sprocket for cylinder bank side 1 - 3 is mounted in such a manner, that the deep cut faces back. When mounting the sprocket for cylinder bank side 4 - 6 the deep cut must face forward.



Cylinder bank side 1 – 3 | Cylinder bank side 4 – 6

3. Hold sprockets with Special .Tool 9191 and torque the hexagon head bolts to 120 Nm.

Note:

First give threads of hexagon head bolts a thin coat of Optimoly HT.

Deviation in parallel alignment between the driving sprocket on the intermediate shaft and driven sprocket on the camshaft may be max. ± 0.25 mm. Before measuring, push intermediate shaft and camshaft axially toward flywheel to set bearing thrust collar in position.

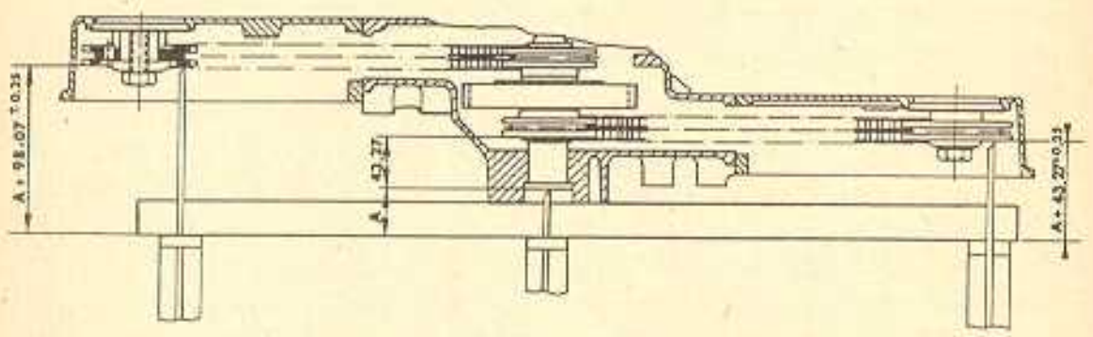
Sprockets are adjusted by installing or removing shims, Part No. 901.105.561.00, 0.5 mm shim thickness. Normally 3 shims will be required underneath the left sprocket (cylinder bank 1 - 3) and 4 shims underneath the right sprocket (cylinder bank 4 - 6).

Adjustment

1. Measure distance "A" from front edge of crankcase or a steel ruler to face of intermediate shaft.

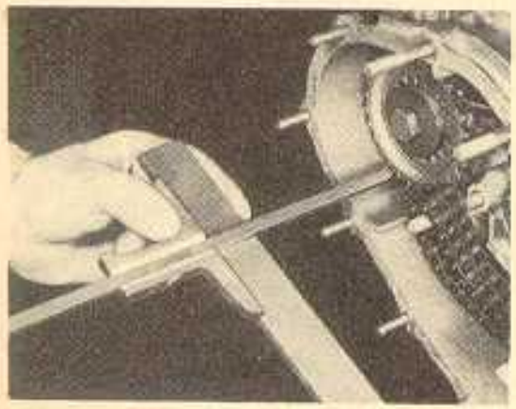
Design size of drive gears on intermediate shaft:
from face of intermediate shaft –
to face of rear intermediate shaft sprocket (cylinders 1 - 3) = 98.07 mm or
to face of front intermediate shaft sprocket (cylinders 4 – 6) = 43.27 mm

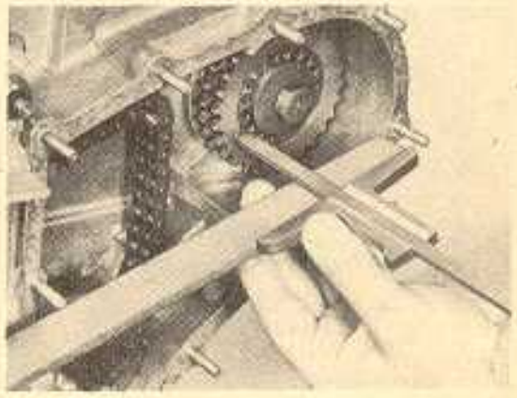
Design size + measured distance "A" produce position of sprockets on camshafts (max. permissible deviation ± 0.25 mm).



Example:
Measured distance "A" = 35.5 mm
For sprocket of cylinders 1 - 3 we then have

A + 98.07 =
35.5 + 98.07 = 133.57 ± 0.25 mm





For sprocket of cylinders 4 - 6 we then have

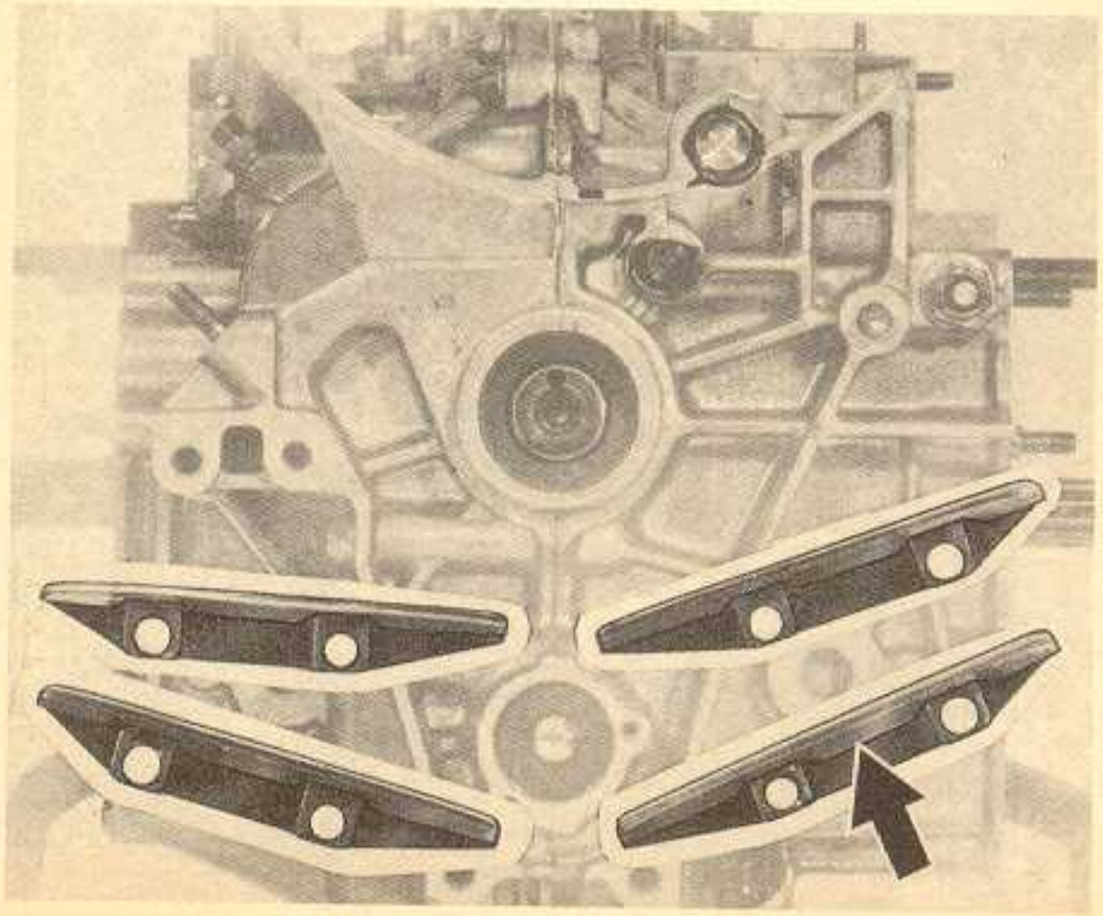
A + 43.27 =
35.5 + 43.27 = 78.77 ± 0.25 mm

Survey of guide rails on crankcase

Three black guide rails,
Part No. 911 105 222 06, and
one brown guide rail,
Part No. 911 105 222 05

Brown guide rail must be mounted from underneath (arrow) on right half of the crankcase.

Longer end of guide rails faces chain drive gears of the intermediate shaft.



Pistons and cylinders (sizes, weights and marks)

Size	Code	Nominal dia.	911 SC Piston dia. D Mahle	911 SC Piston dia. D KS	911 Turbo Piston dia. D Mahle
Standard	0	95/97	94.965–94.975	94.963–94.977	96.960–96.970
	1		94.972–94.982	94.970–94.984	96.967–96.977
	2		94.979–94.989	94.977–94.991	96.974–96.984
	3		94.986–94.996	94.984–94.998	96.981–96.991
			Cylinder dia. Nikasil	Cylinder dia. Alusil	Cylinder dia. Nikasil
Standard	0	95/97	95.000–95.007	95.000–95.007	97.000–97.007
	1		95.007–95.014	95.007–95.014	97.007–97.014
	2		95.014–95.021	95.014–95.021	97.014–97.021
	3		95.021–95.028	95.021–95.028	97.021–97.028
Play between piston and cylinder			0.025–0.042	0.023–0.044	0.030–0.047

Weight classes of pistons – 911 SC

Weight classes for **Mahle pistons**
Pistons weighed with components (piston pin, piston rings, circlips).

	Total piston weight in grams Weight class within one set		Code
Engine type	930/10 (R. o. W.)	930/16/17 (USA/Japan)	
Standard production	668–672	636–640	– –
	672–676	640–644	–
Max. weight difference 4 grams	676–680	644–648	+
	680–684	648–652	+ +
For service sector Max. weight difference 8 grams	668–676	636–644	– – or –
	676–684	644–652	+ or + +

Weight classes for **KS pistons**
Pistons weighed with components (piston pin, piston rings, circlips).

	Total piston weight in grams Weight class within one set	Code
Engine type	930/16/17	
Standard production	673–677	– –
	677–681	–
Max. weight difference 4 grams	681–685	+
	685–689	+ +
For service sector Max. weight difference 8 grams	673–681	– – or –
	681–689	+ or + +

Weight classes of pistons – 911 Turbo

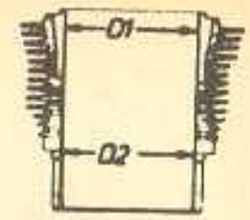
Installation specifications

1. Always only install pistons of same make and same weight class in one engine.
2. Piston pins must always remain with matching pistons and must not be mixed up even within an engine. Pay attention to this, marking pistons/pins if necessary, when disassembling and assembling engine.

Weight classes for **Mahle Pistons**
Pistons weighed with components (piston pin, piston rings, circlips).

	Total piston weight in grams Weight class within one set	Code
Engine type	930/60/66	
Standard production	616 – 620	– –
	620 – 624	–
Max. weight difference 4 grams	624 – 628	+
	628 – 632	+ +
For service sector Max weight difference 8 grams	616 – 624 624 – 632	– – or – + or + +

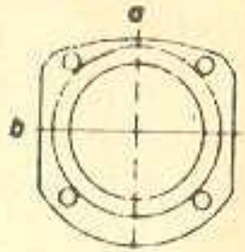
Checking pistons and cylinders



Cylinders
D 1 = measuring point for wear and ovality

30 mm below cylinder upper edge

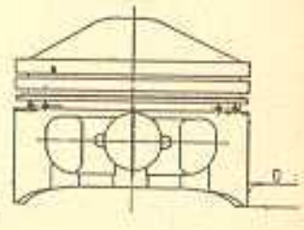
The cylinder is worn, if the distance at this measuring point is 0.08 mm more than the installation size. The ovality of a cylinder is determined by measuring in directions a and b. The difference between a and b must not exceed 0.04 mm.



D 2 = measuring point for piston ring end clearance

Rings slid in at height of cylinder base gasket.

Pistons
D = measuring point for wear



Mahle pistons = 18 mm
KS pistons = 10 mm

Replace pistons and cylinders when running clearance exceeds 0.12 mm. This results from the difference between the maximum cylinder diameter and minimum piston diameter.

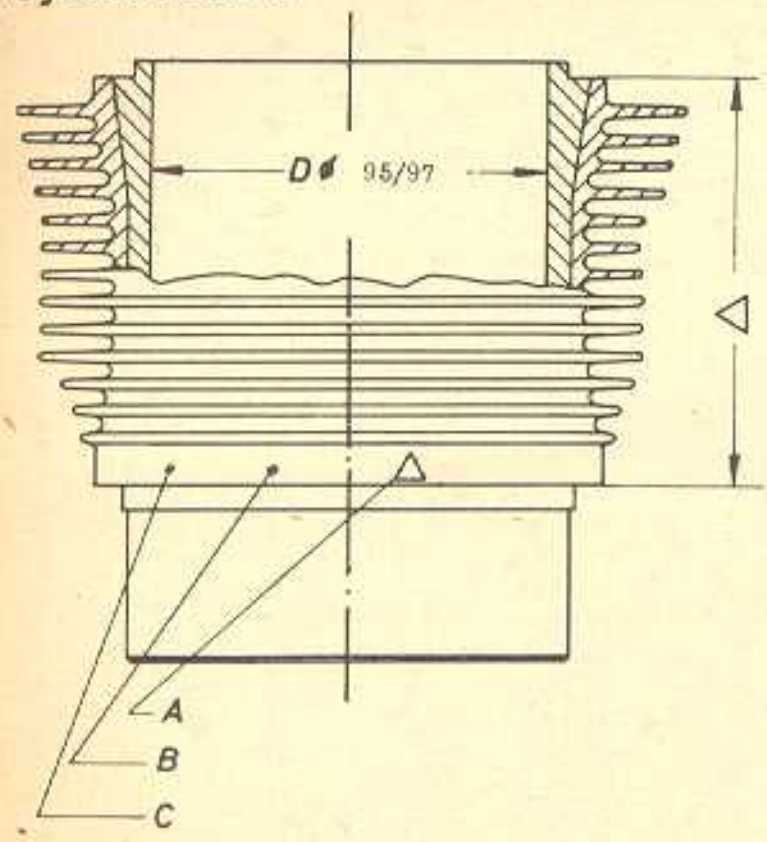
Piston ring end clearance

Piston ring	Clearance in mm (installation size)	Clearance in mm (wear limit)
Compression ring I	0.2 – 0.4	0.8
Compression ring II	0.2 – 0.4	1.0
Oil control ring III	0.3 – 0.6	2.0

Piston ring side clearance

Piston ring	Clearance in mm (installation size)	Clearance in mm (wear limit)
Compression ring I	0.070 – 0.102	0.2
Compression ring II	0.040 – 0.072	0.2
Oil control ring III	0.020 – 0.052	0.1

Cylinder sizes



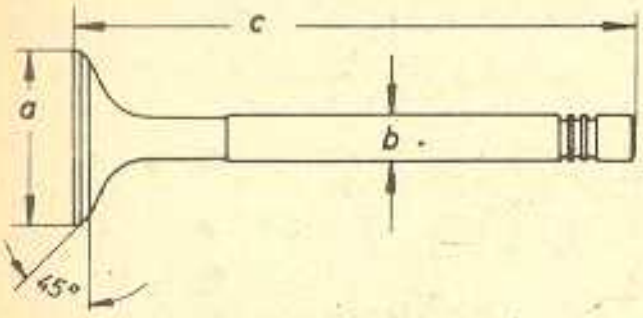
Cylinder height tolerances

Code A	Cylinder height	
5	85.400 – 85.425	911 SC
	85.600 – 85.625	911 Turbo
6	85.425 – 85.450	911 SC
	85.625 – 85.650	911 Turbo

A Tolerance group for cylinder height
B Tolerance group for cylinder diameter (refer to table)
C Manufacturer's identification

Valve sizes

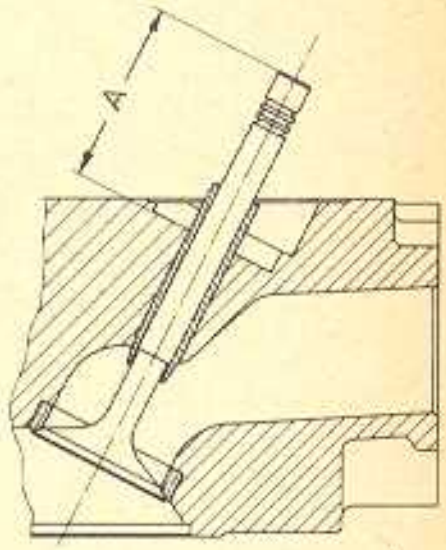
	911 SC Intake	Exhaust	911 Turbo Intake	Exhaust
a	49 ± 0.1	41.5 ± 0.1	49 ± 0.1	41.5 ± 0.1
b	8.97 – 0.012	8.95 – 0.012	8.97 – 0.012	8.95 – 0.012
c	110.1 ± 0.25	108.4 ± 0.25	110.1 ± 0.25	108.4 ± 0.25



Checking valve seats

To check valve seat depth, insert respective valve into guide and measure distance between valve stem and bottom of bearing surface for valve spring shims, however, without shims (see distance A in sketch).

If dimension is greater than specified, measure again with a new valve. If dimension is still beyond specifications, valve seat inserts have been cut too deep and should be replaced, or exchange the cylinder head.

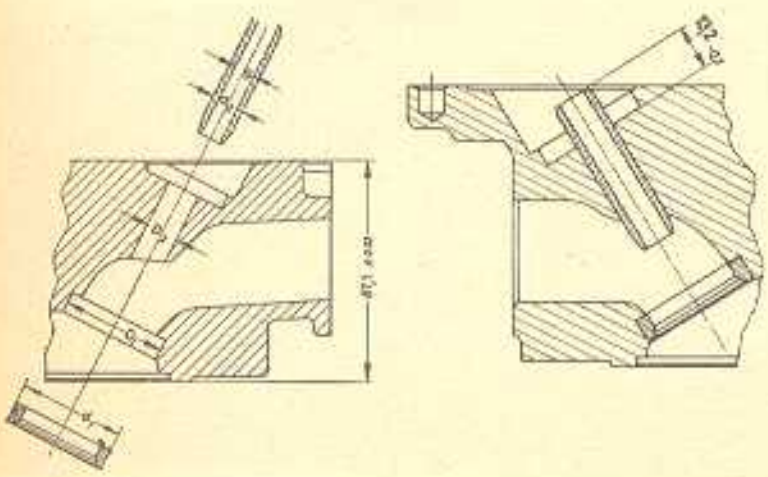


Distance A

911 SC, 911 Turbo 46.0 + 0.3 mm

Valve guides (wear limits, installation sizes)

Measuring point	Installation size with tolerances mm	Clearance (+) or press-fit (–) from	to	Wear limits mm
Valve guide, outside dia. d 2 Cylinder head, bore dia. D 2	13.049 – 13.060 13.000 – 13.018			
Intake valve guide, inside dia. g Intake valve stem, dia. b	9.000 – 9.015 8.958 – 8.970	+ 0.030	+ 0.057	0.15
Exhaust valve guide, inside dia. g Exhaust valve stem, dia. b	9.000 – 9.015 8.938 – 8.950	+ 0.050	+ 0.077	0.20



Machine oversize to correspond with bore in cylinder head.
Press-fit: 0.06 – 0.09 mm

Size table for pulling in valve guides

Valve guide	Outside dia. d 2 Valve guide *	Bore dia. D 2 Cylinder head
Standard size	13.060	13.000 – 13.018
1st oversize	13.260	13.000 – 13.200

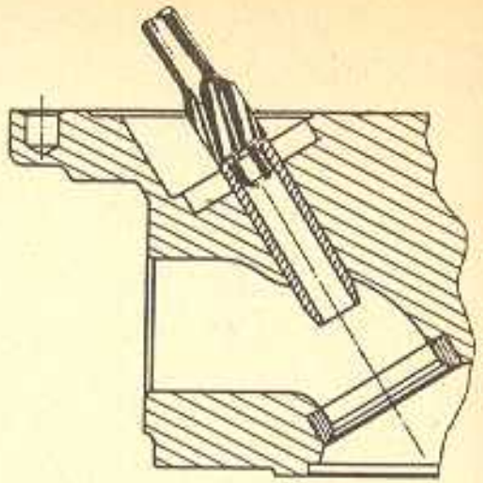
* Grind valve guides on diameter d 2 according to pertinent bore diameter D 2 – remembering press-fit of 0.06 – 0.09 mm

Replacing valve guides

Removal

Grind off protruding valve guides from the camshaft end with a counterbore, until guides are flush with the cylinder head.

Loosen guides with a brief hammer knock and press out in direction of combustion chamber with a press.



Installation

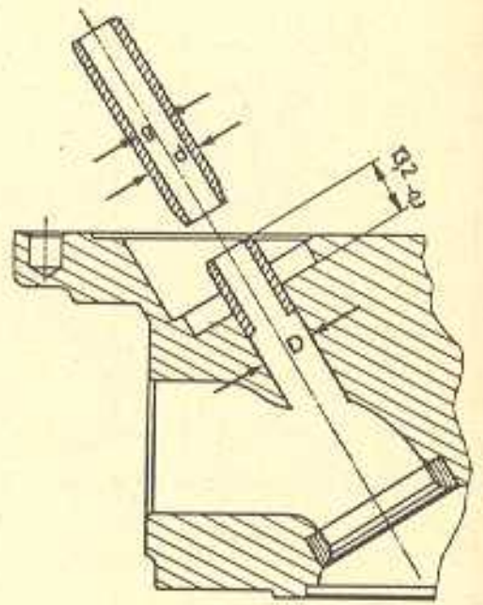
Removal operation will have widened bores in the cylinder head for valve guides slightly.

New, oversized valve guides will have to be installed and matched accordingly (refer to size table).

1. Measure size of bores for valve guides.
2. Machine outside diameter of oversize valve guides in a lathe to match size of bores in cylinder head. Intake and exhaust valves must have a press-fit of 0.06 to 0.09 mm.
3. Coat machined valve guides with talcum powder and press into cylinder head from camshaft end with a locally made mandrel.
4. Open up valve guides to dimension "**g**" = 9.00 to 9.015 mm with a broach or in a finish drilling machine. If necessary, valve guides could also be machined with a suitable reamer.

Important: cylinder head must be mounted or clamped at right angle for pressing-in and machining valve guides.

Check contact pattern on valve seats and, if necessary, machine valve seats after replacement of valve guides.



Size table for pulling in valve guides:

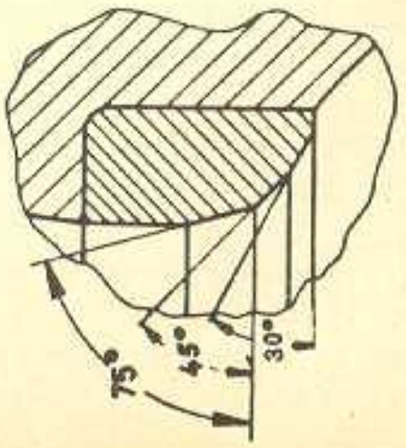
Valve guide	Outside dia. d Valve guide*	Bore dia. D Cylinder head
Standard size	13.060	13.000 – 13.018
1st oversize	13.260	13.000 – 13.200

* Grind valve guides on diameter **d** according to pertinent bore diameter **D** – remembering press-fit.

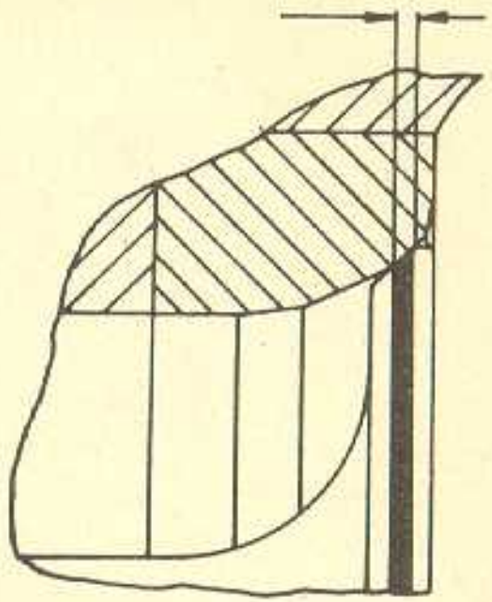
Specifications for installation of valve seat inserts

		Outside dia. d 1 valve seat insert	Bore D 1 in cylinder head
911 SC and 911 Turbo			
Standard size	Intake	51.680 – 51.661	51.500 – 51.530
Standard size	Exhaust	44.200 – 44.184	44.000 – 44.025
1st oversize	Intake	52.000 – 51.981	51.820 – 51.850
1st oversize	Exhaust	44.760 – 44.744	44.560 – 44.585

Angles and sizes of valve seat inserts

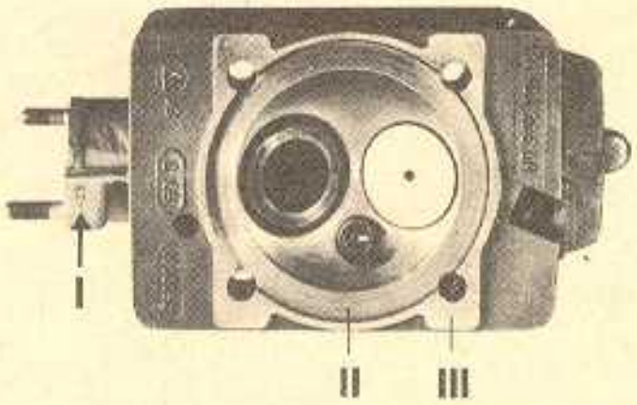


Intake = 1.3 ± 0.1
Exhaust = 1.5 ± 0.1



Machining cylinder head

Machining size (machining depth 0.25 ± 0.02 mm) is specified. These cylinder heads are marked with "–25" on flange of intake port (I).



Never install machined cylinder heads separately, but always all 3 machined cylinder heads on one side.

Thicker cylinder head gaskets (0.50 mm instead of 0.25 mm thick) will have to be installed with machined cylinder heads.

The use of two 0.25 mm gaskets instead of one 0.50 mm thick gasket is not approved because of the tolerances and unfavorable settling.

Repair information:

The sealing surfaces cannot be machined with conventional workshop equipment. The following procedures apply to workshops with pertinent equipment (vertical or universal milling machines required).

1. Clean cylinder head, sand blasting if necessary.
2. Clamp cylinder head on milling machine level. Grind 0.25 ± 0.02 mm off of inner (II) and outer (III) surfaces.
   Important: cylinder heads may only be machined **once.**
3. Bevel edges of machined surfaces slightly and mark cylinder head with "–25", see illustration.

Installation lengths of valve springs

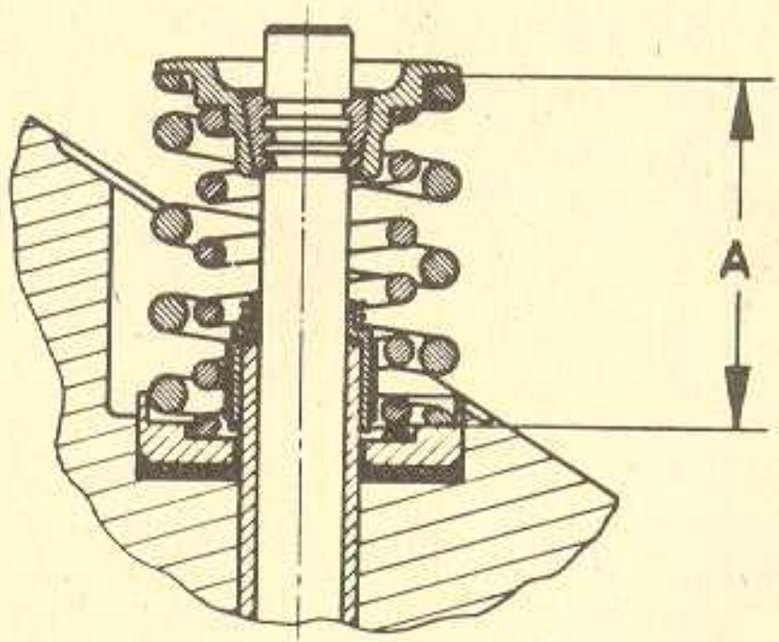
Checking

Install Special Tool P 10c together with shims, spring retainers, springs and both collets belonging to a pertinent valve.

Read distance "A" on Special Tool P 10c and correct by installing or removing shims when necessary.

Note

Check for correct seating of spring retainer in special tool, machining special tool if necessary.



	Intake	Exhaust
911 SC	34.5 – 0.3 mm	34.5 – 0.3 mm
911 Turbo	33.5 ± 0.3 mm	33.5 ± 0.3 mm

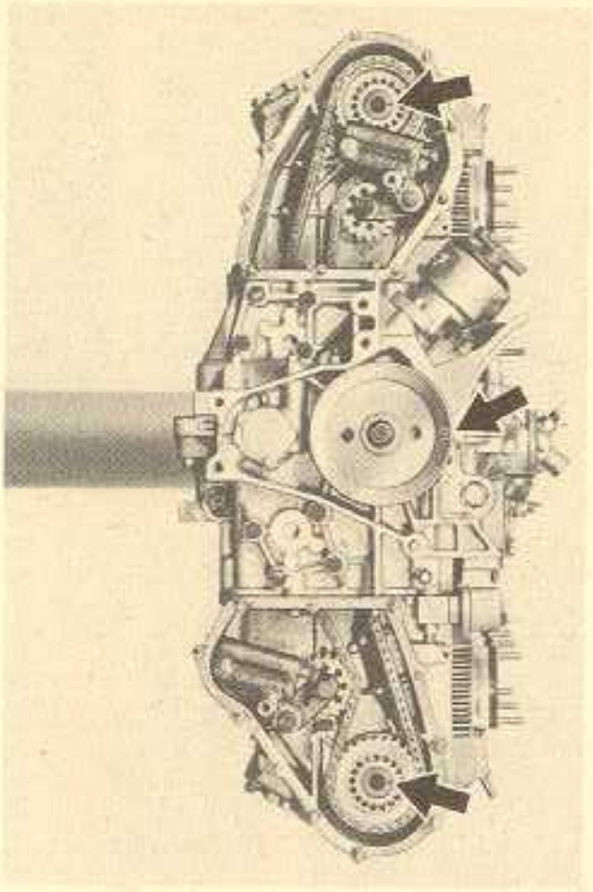
Camshafts, timing

	Type	Camshaft left Part No.	Camshaft right Part No.	Identification on face of camshaft Left	Right	Intake valve stroke in overlapping TDC with 0.1 mm valve clearance	Timing with 0.1 mm valve clearance
911 SC	930/10	930 105 147 08 or 930 105 147 10	930 105 148 08 or 930 105 148 10	930 147 08 or 930 147 10	930 148 08 or 930 148 10	0.9 – 1.1	Intake opens 1° BTDC Intake closes 53° ABDC Exhaust opens 43° BBDC Exhaust closes 3° ATDC
	930/16 930/17	930 105 147 08 or 930 105 147 10	930 105 148 08 or 930 105 148 10	930 147 08 or 930 147 10	930 148 08 or 930 148 10	1.4 – 1.7	Intake opens 7° BTDC Intake closes 47° ABDC Exhaust opens 49° BBDC Exhaust closes 3° BTDC
911 Turbo	930/60 930/66	930 105 143 00 or 930 105 143 01	930 105 142 00 or 930 105 142 01	930 147 08 or 930 143 01	930 143 00 or 930 142 01	0.65 – 0.80	Intake opens 3° ATDC Intake closes 37° ABDC Exhaust opens 27° BBDC Exhaust closes 5° BTDC

Adjusting timing

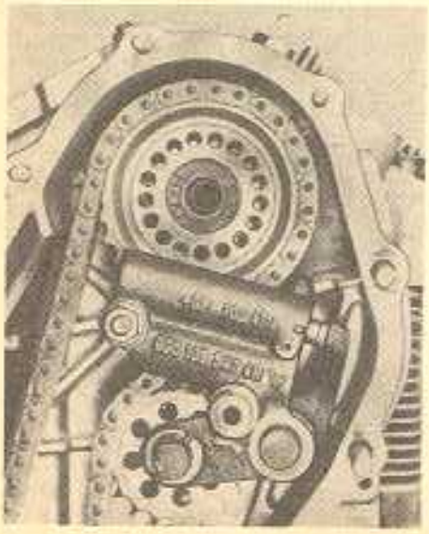
Initial adjustment

1. Turn crankshaft until Z 1 mark on pulley is precisely aligned with joint of crankcase or line on blower housing.

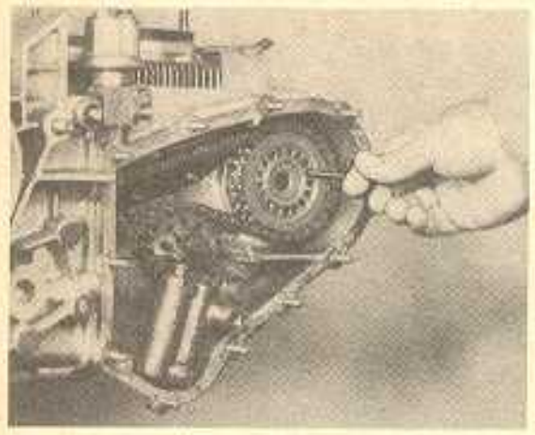


2. Position both camshafts with punch marks or code 930 facing up.

Aligning the Z 1 mark on the pulley with the joint and positioning the camshafts that punched marks face up gives the engine its basic setting of ignition TDC in cylinder no. 1 and overlapping valves in cylinder no. 4.



3. A bore in the sprocket will be aligned precisely with a bore in the sprocket range in the position described above. Insert pin in these precisely aligned bores.



4. Screw in bolts for sprockets finger tight. Counterhold with Special Tool P 9191.

Information

Give threads of bolts a light coat of Optimoly HT.

Information

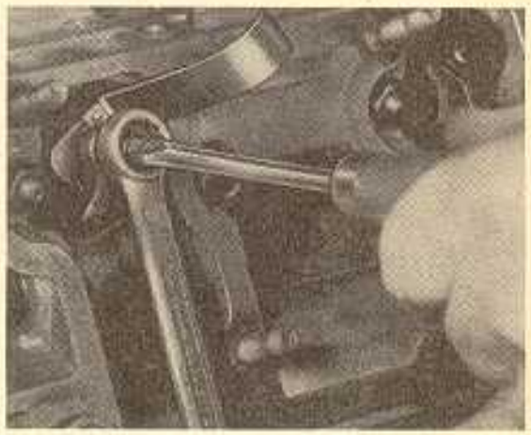
Proceed as described below, if one of the camshafts is displaced from its basic position.

Remove pin of camshaft in its basic position, so that it will also turn during the following adjustment. Turn the displaced camshaft to basic position with Special Tool P 9191 (punch mark or code 930 facing up).

Afterwards remove the sprocket mounting bolt and pin, and turn crankshaft to the Z 1 mark again.

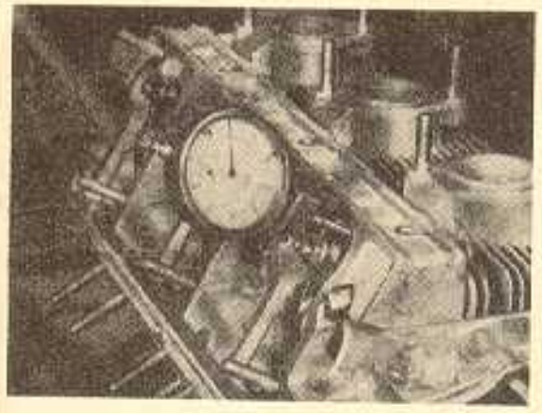
Final adjustment

1. Check or adjust valve clearance to precisely 0.10 mm with Special Tool P 213. It is sufficient for timing adjustments to have precise valve clearance for the intake valves of cylinders 1 and 4.



Left camshaft adjustment (cyl. no. 1)

2. Mount dial gage in Special Tool P 207 on stud of camshaft housing. Apply dial gage on spring retainer of cylinder 1 intake valve and set to 0 with about 10 mm preload and the valve closed.



3. Now turn crankshaft clockwise slowly about 1 turn from Z 1 (TDC), while observing the dial gage at the same time.

   Turn until the mean value of adjustment tolerances is reached.

4. Unscrew mounting bolt of left sprocket, remove and pull out dowel pin with Special Tool P 212.

5. Turn crankshaft accordingly until Z 1 mark on pulley is precisely aligned with joint of crankcase or line on blower housing.

6. Install dowel pin and srew in bolt finger tight, while counterholding.

7. Turn crankshaft two turns (720°) clockwise and recheck the adjustment. Read value should now be within adjustment tolerances.

8. Tighten bolt of left camshaft to final torque of 120 Nm (12 kpm), while a second person counterholds with Special Tool P 9191.

Right camshaft adjustment (cyl. no. 4)

1. Adjust cylinder no. 4 to ignition TDC (overlapping in cylinder no. 1).

2. Repeat adjusting procedures described in points 2 through 8 of the final adjustment for cylinder no. 1 on cylinder no.4.

Clutch drive plate

Measuring point, type	Installation size with tolerances mm	Wear limits mm
911 SC		
Clutch drive plate		
Relaxed thickness (new)	8.1 ± 0.3	6.3 for symmetrical wear
Max. lateral runout	0.6	0.6
911 Turbo		
Relaxed thickness (new)	10.1 ± 0.3	8.5 for symmetrical wear
Max. lateral runout	0.6	0.6

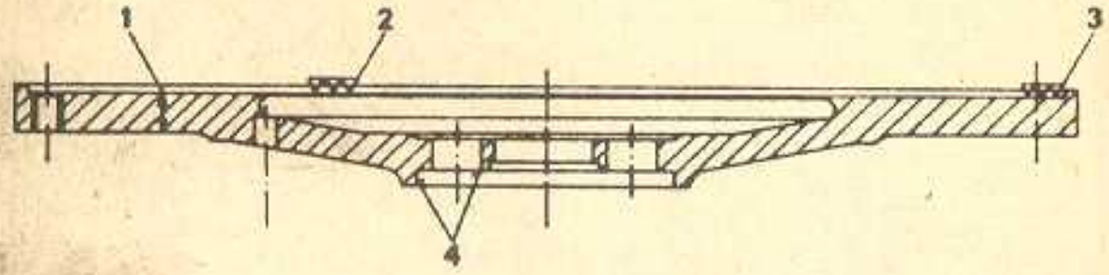
Machining flywheel

The flywheel bearing surface on the drive plate can be machined on a lathe, if there is serious scoring or considerable burnt spots.

Keep lathe cut as small as possible.

Wear limit of flywheel thickness:

911 SC 8.5 mm
911 Turbo 9.9 mm



1 Wear limit
2 Smallest possible out
3 Max. runout 0.1 mm
4 Lathe mounting points

Tightening torque for engine

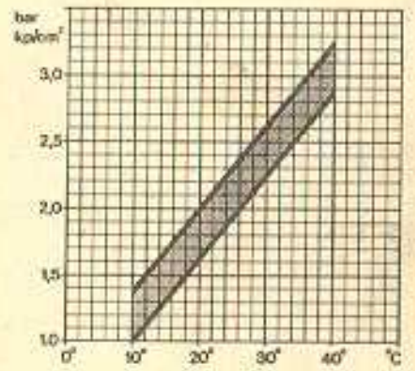
Location	Threads	Torque in Nm
Conrod nuts – 911 SC	M 10 × 1.25	50 – 55
Conrod nuts – 911 Turbo	M 10 × 1.25	
1st step (initial torque)		20
2nd step (final torque)		90 ± 2° torque angle
Crankcase bolts	M 10	35
All bolts on crankcase and camshaft housing	M 8	25
Flywheel to crankshaft	M 10 × 1.25	90
Bush with needle bearing to crankshaft	M 6	10
Pulley to crankshaft, bolt with washer	M 12 × 1.5	80
Durlok bolt for single and double pulley	M 12 × 1.5 × 22	170
Safety valve plug in crankcase	M 18 × 1.5	60
Pressure relief valve plug in crankcase	M 12 × 1.5	60
Adapter (on neck for oil pressure transmitter) to crankcase	M 12 × 1.5	35
Adapter to crankcase	M 22 × 1	120
Cylinder head nuts (1)	M 10 socket	
1st step (initial torque)		10
2nd step (final torque)		32
Rocker arm shafts	M 6 socket	18
Nut on camshaft	M 27 × 2	150
Bolt on camshaft (2) (introduced 10. 82)	M 12 × 1.5	120

(1) Lubricate threads of cylinder head mounting studs and cylinder head nut bearing surfaces lightly with Optimoly HT.

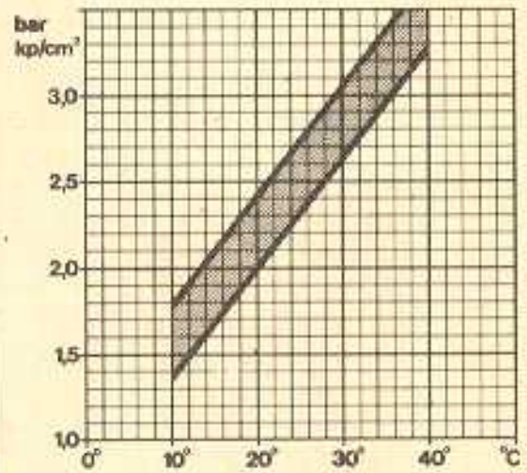
(2) Lubricate threads lightly with Optimoly HT (oil may not be used).

Location	Threads	Torque in Nm
Cover to camshaft housing	M 8	8
Console for engine carrier	M 10	40
Wide clamp to blower housing	M 8	12
Spark plugs	M 14 × 1.25	25 – 30
Pulley to alternator		40
Oil pressure control switch to crankcase	M 10 × 1	max. 20
Temperature transmitter to crankcase	M 14 × 1.5	max. 25
Oil pressure transmitter to connector	M 18 × 1.5	max. 35
Oxygen sensor to catalytic converter	M 18 × 1.5	50 – 60
Plug for catalytic converter exhaust test connection	M 8 × 1	15
Oil drain plug for oil filter screen cover	M 22 × 1.5	42
Oil drain plug for crankcase (introduced 3. 83)	M 20 × 1.5	70
Oil drain plug for oil tank	M 22 × 1.5	42

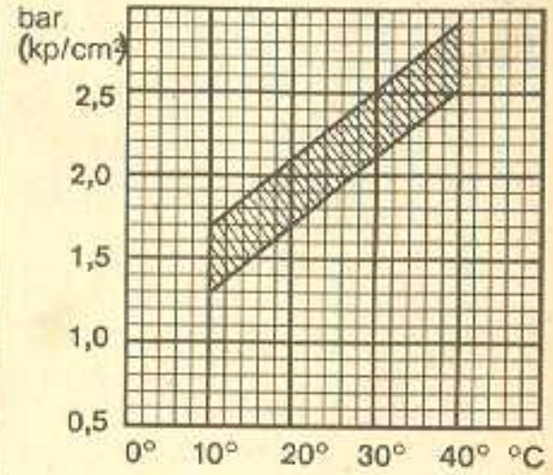
Testing and adjusting values – 911 SC (1982 and 1983 model)

Test step	Specification
Electric fuel pump Delivery rate	 at least 1000 cc/30 sec.
Control pressure "cold"	Diagram for warm-up regulator Part No. 911.606.105.09 Bosch No. 0438.140.089 Testing vacuum: 450...550 mbar (340...420 mmHg
	
Control pressure "warm" Test with atmospheric pressure (without vacuum) Vacuum pump connected for test on intake connection of warm-up regulator	 2.7...3.1 bar 3.4...3.8 bar
System pressure Testing value Adjusting value	 4.5...5.2 bar 4.7...4.9 bar
Leak test (engine warm) Pressure after 10 min. after 20 min.	 at least 1.3 bar at least 1.1 bar
Fuel injectors Opening pressure	 2.5...3.6 bar

Testing and adjusting values – 911 SC (USA) (with oxygen control)

Test step	Specification
Electric fuel pump Delivery rate	at least 1000 cc/30 sec.
Control pressure "cold"	Diagram for warm-up regulator Part No. 911.606.105.08 Bosch No. 0438.140.090
	
Control pressure "warm"	3.4...3.8 bar
System pressure Testing value Adjusting value	 4.5...5.2 bar 4.7...4.9 bar
Leak test (engine warm) Pressure after 10 min. after 20 min.	 at least 1.3 bar at least 1.1 bar
Fuel injectors Opening pressure	 2.5...3.6 bar

Testing and adjusting values – 911 SC (Japan)

Test step	Specification
Electric fuel pump Delivery rate	at least 1000 cc/30 sec.
Control pressure "cold"	Diagram for warm-up regulator Part No. 911.606.105.07 – 1980 mod. Part No. 911.606.105.10 – 1981 mod. Bosch No. 0438.140.072
	
Control pressure "warm"	3.4...3.8 bar
System pressure Testing value Adjusting value	 4.5...5.2 bar 4.7...4.9 bar
Leak test (engine warm) Pressure after 10 min. after 20 min.	 at least 1.3 bar at least 1.1 bar
Fuel injectors Opening pressure	 2.5...3.6 bar

Testing and adjusting values 911 SC

Test step	Remarks				
Idle adjustment	Europe	USA and Canada	California and High Altitude States	Japan	Australia and Sweden
Idle speed (rpm) ***	800...950	900 ± 50	900 ± 50	900 ± 50	800...950
CO level (%) ***	1.0 to 2.0*	0.4 to 0.8**	0.4 to 0.8**	0.4 to 0.8**	1.0 to 2.0*

* Air pump disconnected.
** Measured in front of catalytic converter with oxygen sensor plug pulled of.
*** From 1981 models (R.o.W.) the lower value is ideal for adjustments of idle speed and CO level (possible idling deviations).

Adjusting engine idle speed

Adjusting

Information

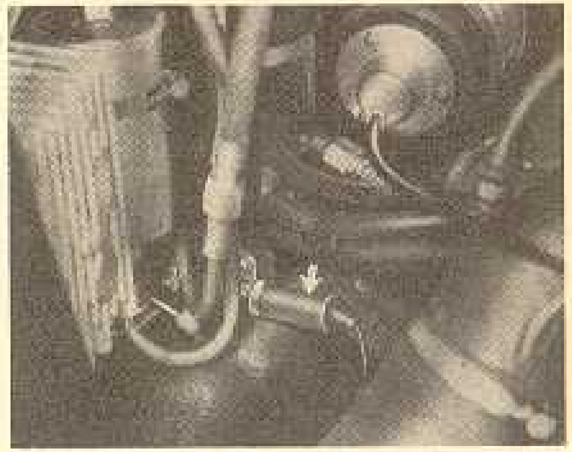
Always check for correct seating of oil tank cap and gasket prior to adjusting the engine idle speed. Leaks on oil cap would lead to incorrect measurements.

Adjusting requirements:

Engine in perfect running condition and correctly adjusted ignition timing.

1. Connect exhaust test pipe on test connection of catalytic converter.

2. Run engine to operating temperature (oil temperature approx. 90° C, oil temperature gage needle on upper end of field surrounded in white).
3. Connect CO tester to instructions supplied with tester.
4. Disconnect oxygen sensor plug in engine compartment on left-hand side.



5. Turn control screw or bypass screw on throttle valve housing until specified engine speed is reached.

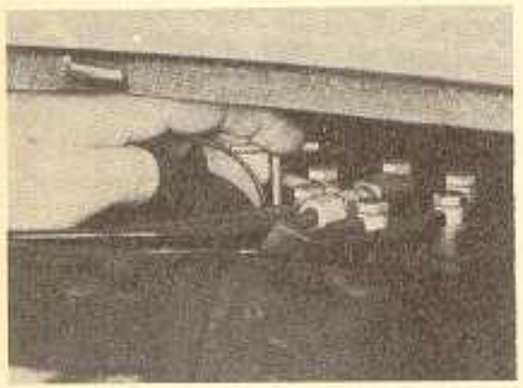
Information

Use separate tachometer from tester or similar.

6. Check CO level. If CO level is not in specified range, remove the mixture control unit of US cars and remove the threaded part of the shear-off screw in the bore providing access to the mixture control screw.

   Remove plug in mixture control unit between the fuel distributor and venturi of cars for Japan.

7. Insert Special Tool P 377.



8. Turn clockwise = richer mixture. Turn counterclockwise = leaner mixture.

Information

Always conform with the following points.

a) Basically always adjust CO level from lean to rich.

   Example: If mixture is excessively rich, first turn idle control screw counterclockwise further than necessary and then clockwise to nominal value.

b) Never exert pressure on special tool wrench while adjusting (engine would die).

c) Only turn control step minimum distances, since even a slight turn will change the CO content in exhaust considerably.

9. Remove special tool wrench.

10. Accelerate engine briefly.

11. Wait until CO tester displays CO level at idle speed.

    Repeat adjusting procedures, if necessary.

12. Recheck engine idle speed, correcting if necessary.

13. After finishing adjustments, screw a new shear-off screw in the access bore and tighten until head of screw shears off.

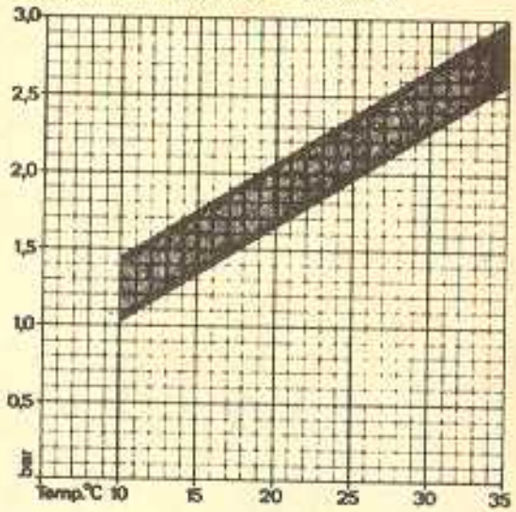
    Connect oxygen sensor plug.

14. Coat threads of nut plugging the test connection on catalytic converter with Bosch VS 140 16 Ft paste or Optimoly HT.

Testing and adjusting values for K-Jetronic (CIS) — 911 Turbo

Engine Type 930/60

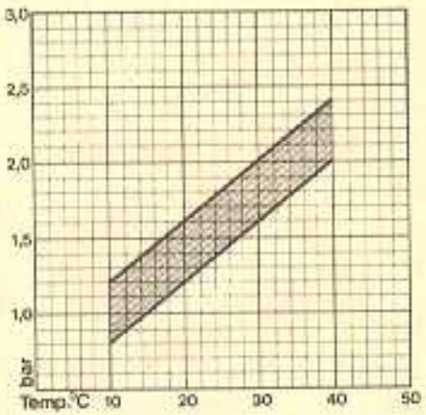
Test step	Specifications
Electric fuel pumps Delivery rate	at least 1500 cc/30 sec. (applicable for both pumps together)
Control pressure "cold" (= outside temperature)	Diagram for warm-up regulator Part No. 930.606.105.03 Bosch No. 0 438 140 054
Control pressure "warm"	3.65 ± 0.20 bar (kp/cm²)
"full throttle enrichment"	2.9 ± 0.20 bar (kp/cm²)
System pressure Testing value	6.0 to 6.7 bar (kp/cm²)
Adjusting value	6.2 to 6.4 bar (kp/cm²)
Leak test Pressure after 10 minutes	at least 1.6 bar (kp/cm²)
after 20 minutes	at least 1.4 bar (kp/cm²)
Fuel injectors Opening pressure	2.1 + 1.1 bar (kp/cm²)
delivery rate - control pressure circuit	160 to 240 cc minute



Testing and adjusting values for K-Jetronic (CIS) — 911 Turbo

Engine Type 930/66

Test step	Specifications
Electric fuel pumps Delivery rate	at least 1500 cc/30 sec. (applicable for both pumps together)
Control pressure "cold" (= outside temperature)	Diagram for warm-up regulator Part No. 930.606.105.05 Bosch No. 0 438 140 112
Control pressure "warm"	3.65 ± 0.20 bar (kp/cm²)
"full throttle enrichment"	2.9 ± 0.20 bar (kp/cm²)
System pressure Testing value Adjusting value	 6.0 to 6.7 bar (kp/cm²) 6.2 to 6.4 bar (kp/cm²)
Leak test Pressure after 10 minutes after 20 minutes	 at least 1.6 bar (kp/cm²) at least 1.4 bar (kp/cm²)
Fuel injectors Opening pressure	2.7 + 1.1 bar (kp/cm²)
delivery rate - control pressure circuit	160 to 240 cc minute



Idle adjustment

Engine Type 930/60/66

Note

Adjustments must be carried out with air cleaner mounted.

1. Disconnect air hose on air pump and insert a suitable plug in hose opening.
2. Turn control screw on throttle valve housing until specified idle speed is reached.
3. Adjust fuel/air mixture. Insert Special Tool 9156 into spring-loaded key wrench in the mixture control unit. Press special tool down about 18 mm to engage the spring-loaded key wrench in the mixture control screw.

   Turned clockwise = richer mixture

   Turned counterclockwise = leaner mixture

Test step	Specifications		
Idle adjustments (with approx. 90° C oil temp.)	Eng. Type	Europe	Canada
Idle speed (rpm)	930/60 930/66	950 ± 50	950 ± 50
CO (%)	930/60 930/66	1.5 to 2.5*	1.5 to 2.5*
HC		≤ 300 ppm	

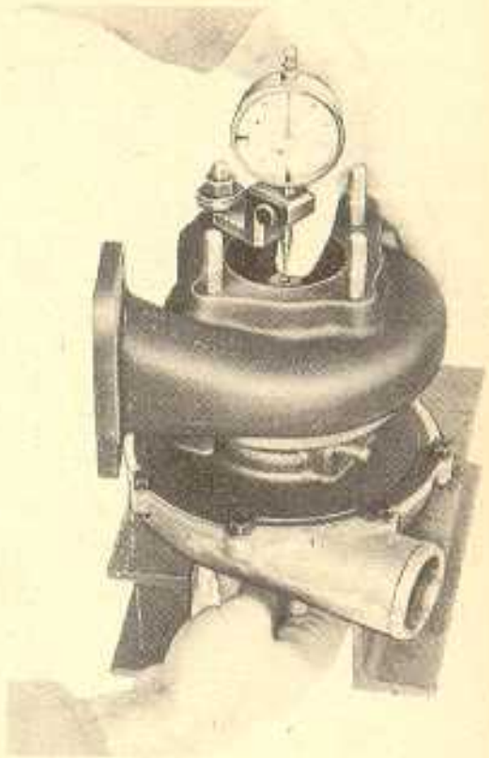
* Air pump disconnected

Checking turbocharger

Measuring axial play

Apply tip of dial gage on turbine shaft end. Pres rotor shaft against dial gage. Read and note value. Push rotor shaft in opposite direction. Read and note value. The differenve between both measured values is the axial play.

Max. play: 0.35 mm



Measuring radial play

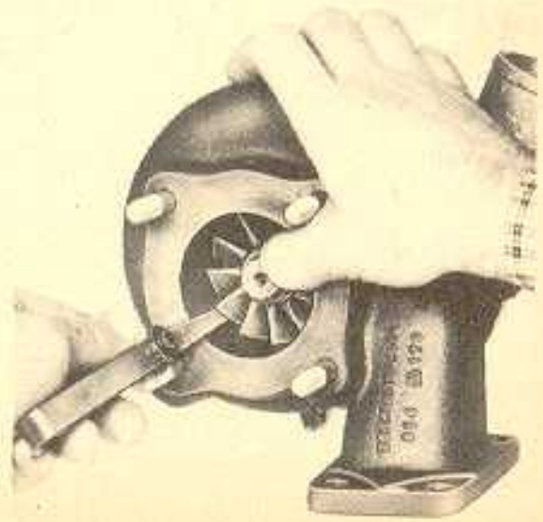
Radial play is only checked on turbine end.

Push down on turbine. Measure gap with a feeler gage and note value.

Push turbine in opposite direction. Measure gap with a feeler gage and note value.

The difference between both measured values is the radial play. Measure at at least two different points.

Max. play: 0.65 mm



Charge pressure

Engine Type 930/60/66:
0.70 to 0.85 bar at 5500 rpm
(measured on charge pressure safety switch)

Turbocharger identification

3 LDZ / 319 C 11.1

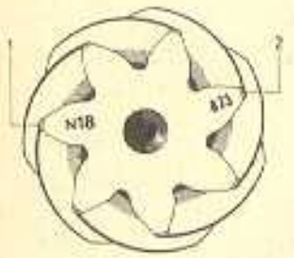
Version number
522 297 031 00

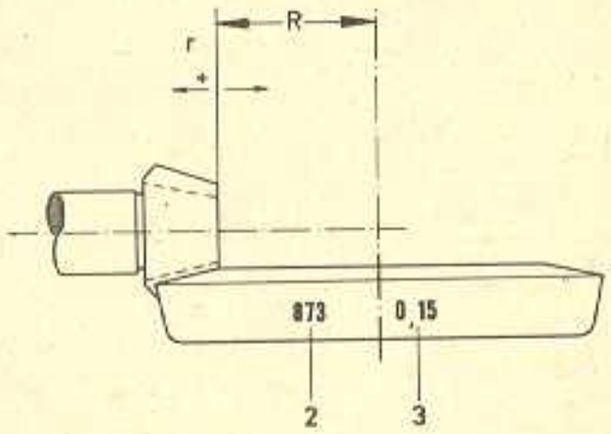
Adjusting drive pinion

General

Correct adjustment of drive pinion and ring gear is important for service life and smooth running of final drive. Consequently drive pinions and ring gears are already matched in production in special testing machines to guarantee good tooth contact pattern and quiet running in both directions. The point of smoothest running is found by moving the drive pinion in axial direction, whereby the ring gear is held within tolerances of the specified backlash. Deviation "r" (distance deviating from design distance "R") is measured and inscribed on face of pinion. Ring gear and pinion are always designed that deviation "r" is added to design distance "R", i. e. is preceded by a + sign.

To show difference to pinion/ring gear assemblies, whose deviation "r" had been + or –, the capitol letter "N" precedes the value "r" on the head of the drive pinion for these new pinion/ring gear sets. Each pinion/gear set has a pair number and both parts must always be replaced together.





R = Design distance
911 = 66.30 mm
911 Turbo = 82.29 mm

r = Deviation from R in + 1/100 mm (N 2 = + 0.02 mm)
1 = Deviation r
2 = Pair number
3 = Backlash

Important manual transmission adjusting data 915 and 930

2 examples for adjustment of pinion and ring gear

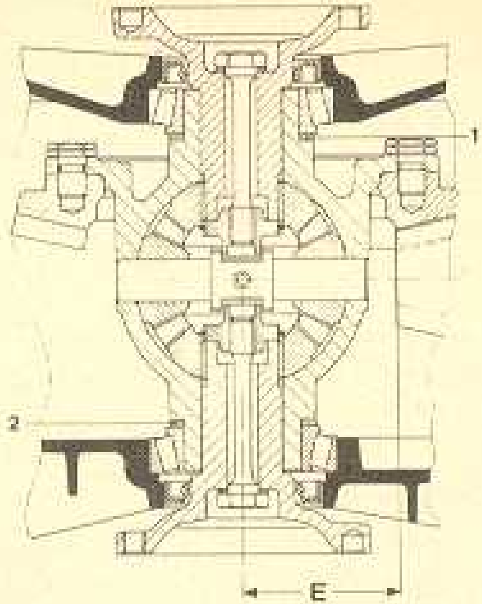
	Transm. Type 915	Transm. Type 930
Design dimension "R"	66.30 mm	82.29 mm
Deviation "r"	+ 0.10 mm	+ 0.02 mm
Adjustment dimension "E"	66.40 mm	82.31 mm
Dial gauge setting	66.30 mm	82.29 mm
Measured dimension (without shims)	– 0.29 mm	– 0.14 mm
Distance to face end of pinion shaft	66.01 mm	82.15 mm
Adjustment dimension "E"	66.40 mm	82.31 mm
Distance to face end of pinion shaft	– 66.01 mm	– 82.15 mm
Thickness of shims	0.39 mm*	0.16 mm*

* Round off the nearest 0.05 mm.

Shims are available 0.10, 0.15, and 0.20 mm thick.

Recheck adjustment dimension "E" after installation of shims; a deviation of ± 0.03 mm is permissible.

Adjusting ring gear



1 = shim S_1 2 = shim S_2 E = Adjusting distance

The backlash between pinion and ring gear can be adjusted only by changing thickness of shims S_1 and S_2 and, measured on ring gear at four different points, should be

0.12 to 0.18 mm for transmission type 915
0.16 to 0.20 mm for transmission type 930.

Perfect results require thoroughness and cleanliness for all assembling and measuring operations.

Pre-load and friction torque of taper roller bearings:

Transm. Type	Axial Preload (mm)	Friction Torque
915	0.30 to 0.40	350 to 650 Ncm (35 to 65 kpcm) FAG bearings 300 to 420 Ncm (30 to 42 kpcm) SKF bearings
930	0.2 to 0.33	440 to 680 Ncm (44 to 68 kpcm) FAG bearings 300 to 570 Ncm (30 to 57 kpcm) SKF bearings

Transmission tolerance survey

Measuring point	Type 915 Installation tolerance mm	Type 915 Wear limit mm	Type 930 Installation tolerance mm	Type 930 Wear limit mm
1. Backlash between gear I and II				
1st gear	0.17	0.22	0.055 – 0.13	0.22
2nd gear	0.17			
3rd gear	0.05 – 0.13			
4th gear	0.05 – 0.13			
5th gear	0.05 – 0.13			
2. Loose gears on pinion and drive shaft Axial clearance				
1st gear	0.3 – 0.4	0.5		
2nd gear	0.2 – 0.3	0.4		
3rd gear	0.2 – 0.3	0.4	same as 915	
4th gear	0.2 – 0.3	0.4		
5th gear	0.2 – 0.3	0.4		
3. Selector rods				
a) in guides radial clearance	0.195 – 0.236	0.4	same as 915	
b) Runout	—	0.1		

Measuring point	Type 915 Installation tolerance mm	Type 915 Wear limit mm	Type 930 Installation tolerance mm	Type 930 Wear limit mm
4. Selector forks in operating sleeve Axial clearance				
5th and reverse gear	0.1 – 0.3	0.5	same as 915	
1st and 2nd gear	0.1 – 0.3	0.5		
3rd and 4th gear	0.1 – 0.3	0.5		
5. Synchronizing rings Outside dia. installed				
1st gear	86.20 – 86.54	after	86.15 – 86.65	after
2nd gear	86.20 – 86.54	local wear	86.15 – 86.65	local wear
3rd gear	76.12 – 76.48	through of	76.20 – 76.55	through of
4th gear	76.12 – 76.48	molybdenum	76.20 – 76.55	molybdenum
5th gear	76.12 – 76.48	layer	—	layer
6. Drive shaft Max. runout at guidepin	max. 0.1	max. 0.1 (align)	same as 915	

Tightening torque for manual transmission — Type 915

Location	Designation	Threads	Material/ Strength	Torque Nm
Transmission case (oil drain)	Plug with magnet	M 24 × 1.5 tapered	MUK 7	24
Gear box (oil filter)	Plug	M 24 × 1.5 tapered	MUK 7	24
Gear box and transmission case, side and front transmission covers, shift cover, tensioning plate, transmission mounts	Nut	M 8 × 1.25	22 H	24
Front cover	Backup light switch	M 18 × 1.5	Ms	35
Drive shaft	Collared nut	M 30 × 1.5	C 35	230
Drive shaft	Castle nut	M 18 × 1.5	22 H	160
Drive pinion	Collared nut	M 24 × 1.5	8.8	250
Fork, gearshift	Nut	M 6 × 1.0	22 H	10
Shift lock, transmission case	Bolt	M 10 × 1.5	8.8	17
Transmission case	Vent	M 14 × 1.5	9 S 20 K	25
Selector forks, shift rod fork	Bolt	M 8 × 1.25	8.8	25
Ring gear with differential or limited slip differential	Bolt	M 12 × 1.25	12.9	160
Joint flange	Bolt	M 10 × 1.25	8.8	44
Starter	Cylinder head nuts	M 10 × 1.5	CK 35	48

Location	Designation	Threads	Material/ Strength	Torque Nm
Crankcase/ transmission	Nut	M 10 × 1.5	H 22	48
Release lever/ adjusting screw	Nut	M 8 × 1.25	04	11
Spring clamp/ speed sender	Bolt	M 6 × 1.0	8.8	9
Reversing lever pin/ gear box	Pin	M 8 × 1.25	9 S 20 K	25
Cooling pipe coil/ oil pump	Bolt	M 8	8.8	22
Cooling pipe coil/ gear box	Bolt	M 6	8.8	9
Guide tube for release bearing	Screw	M 6 × 1.0	8.8	9
Oil pump cover/ side transmission cover	Bolt	M 6	8.8	9
Shield/ side transmission cover	Screw	M 6	8.8	9
Drive gear/ differential	Screw	M 5	8.8	5.6

Tightening torque for manual transmission — Typ 930

Location	Designation	Threads	Material/ Strength	Torque Nm
Drive shaft	Collared nut	M 30 × 1.5	8.8	210–230
Drive shaft	Collared nut	M 20 × 1.5	C 35 V	160–180
Drive pinion	Collared nut	M 24 × 1.5	8	240–260
Transmission case	Vent	M 14 × 1.5	9 S 20 K	20– 30
Joint rod, gearshift	Bolt	M 8 × 1.25	8.8	23– 26
Shift cover	mid-grip nut	M 8 × 1.25	× 12 CrNi 18.8	22– 25
Gear box	Backup light switch	M 18 × 1.5	Ms	25– 35
Gearshift, fork	Nut	M 6 × 1.0	8.8	9– 11
Tensioning plate, gear box and transmission case, front and side transmission covers	Bolt	M 8 × 1.25	8	22– 25
Shift lock, transmission case	Bolt	M 10 × 1.5	8.8	15– 18
Selector forks	Bolt	M 8 × 1.25	8.8	24– 26
Ring gear (differential)		M 12 × 1.25	11.9	135–140
Limited slip differential	Bolt	M 12 × 1.25	12.9	150–160
Joint flange	Expansion bolt	M 10 × 1.5	8.8	26– 30
Joint flange	Bolt	M 10 × 1.5	–	39– 46

Location	Designation	Threads	Material/ Strength	Torque Nm
Transmission case (oil drain)	Plug with magnet	M 24 × 1.5 (taper 1:16)	St 37	20–25
Gear box (oil filler)	Plug	M 30 × 1.5	5.8	20–25
Reverse gear additional lock	Plug	M 16 × 1.5	5.8	20–25
Guide tube (transmission case)	Screw	M 6 × 1.0	8.8	8–10
Clutch and gear ring mountings	Bolt	M 8 × 1.0	8.8	20–25
Starter mountings	Nut	M 10 × 1.5	8	46–50
Console to shift base	Screw	M 6	8.8	6.0
Shift base on tunnel	Bolt	M 8	8.8	21
Screw in shift rod head	Screw	M 8	8.8	15
Screw in shift clutch	Screw	M 8	8.8	15
Clamp	Bolt	M 8	8.8	25
Case cover/ limited slip differential	Screw	M 6	8.8	14

Front axle and steering specifications

	911 SC	911 SC–USA, Canada, Japan	Turbo
Wheel suspension	Independent employing control arms and shock absorber struts		
Springs	One round torsion bar in driving direction for each wheel 18.8 mm diameter		
Track width	1369 mm with rim 6 J × 15	1361 mm with rim 6 J × 15	1432 mm with rim 7 J × 16
Shock absorbers	Double action, hydraulic shock absorber struts		
Stabilizers			
front/rear dia. in mm	20/18	20/18	20/18

Adjustment of ZF rack and pinion steering

Frictional moment of steering: (measured on flange of steering gear with tie rods detached) 0.8 to 1.4 Nm = 8 to 14 kpcm

ZF steering specifications

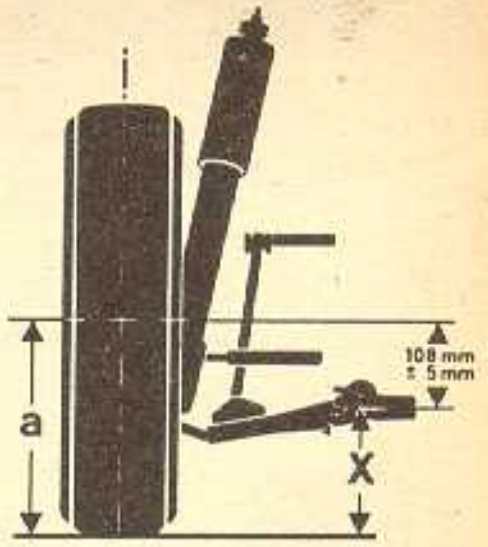
Steering ratio (in center): 17.78 : 1

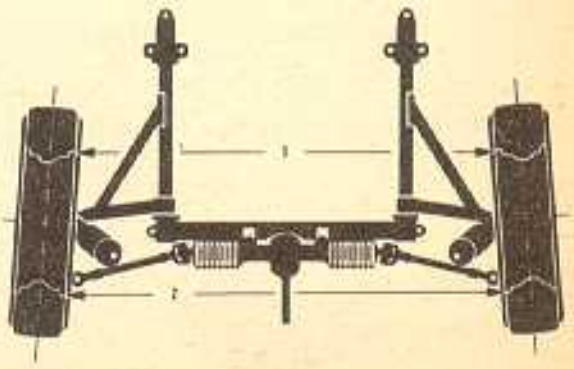
Number of steering wheel turns from lock to lock: approx. 3.0

Specifications and tolerances

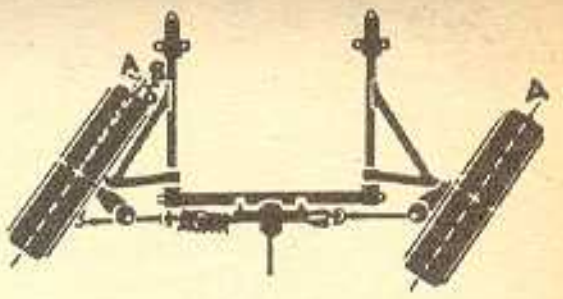
At curb weight according to DIN 70020
Car with full fuel tank, spare wheel and tools

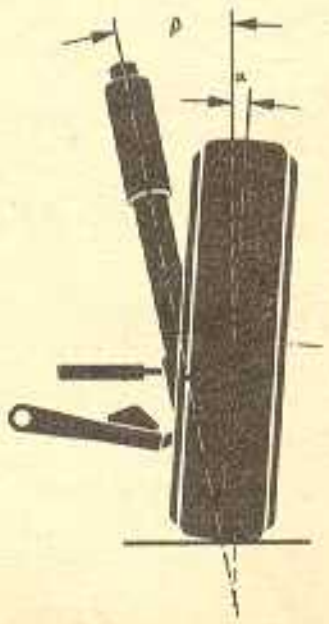
Designation	Adjustment data and tolerances	Max. difference between left and right
Front axle		
Height adjustment: Wheel center above middle of torsion bar		
911 SC	108 mm ± 5 mm	5 mm
911 SC – USA, Canada, Japan	99 mm ± 5 mm	5 mm
83 model onwards	108 mm ± 5 mm	5 mm
911 Turbo	94 mm ± 5 mm	5 mm
911 Turbo – USA, Canada, Japan	85 mm ± 5 mm	5 mm
83 model onwards	94 mm ± 5 mm	5 mm
Total toe (pressed with 150 N)	0°	—

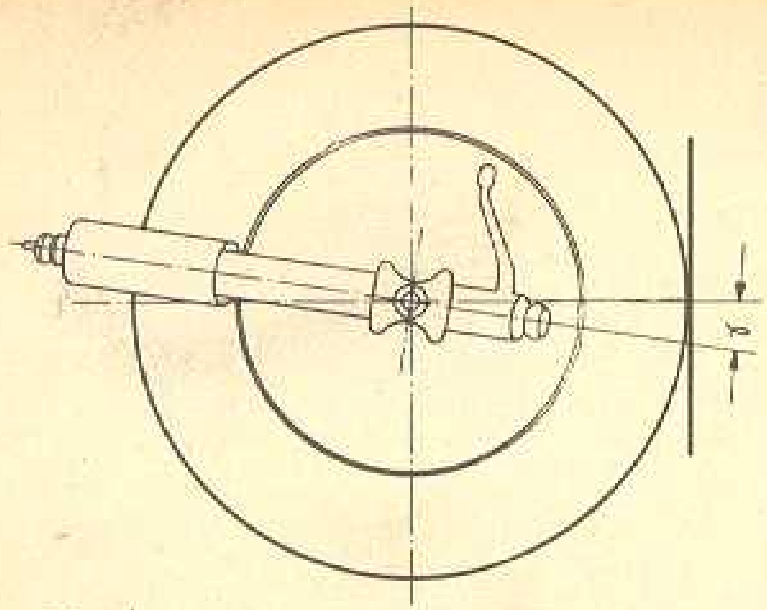




Designation	Adjustment data and tolerance	Max. difference between left and right
Difference angle at 20° lock	0° to + 30'	Can only be influenced by exchanging steering arm
A' = Parallel to A B = Centerline of wheel γ = Difference angle		
Camber of front wheels (wheels pointing straight ahead)		
α = Camber angle 911 SC, Turbo	0° ± 10'	10'
911 SC, Turbo USA, Canada, Japan	+ 30' ± 10'	10'
83 model onwards	0° ± 10'	
β = Inclination of kingpin	11°	







Designation	Adjustment data and tolerances	Max. difference between left and right
γ = Caster	6° 5' ± 15'	30'
Caster results from total camber difference at 20° left lock and 20° right lock × 1.5		

These wheel alignment specifications can also be applied to earlier models.

Tightening torque for front axle

Location	Designation	Threads	Material/ Strength	Torque Nm
Support to spring strut	Nut	M 14 × 1.5	8	80
Support to body	Bolt	M 10	8.8	47
Plug for spring strut cartridge	Plug			120 + 20
Steering gear	Bolt	M 10	8.8	47
Joint pivot of steering tie rod to joint bush (steering gear)	Bolt	M 10	8.8	47
Ball joint of steering tie rod to steering arm	Castle nut	M 10 × 1	8	45
Ball joint and joint pivot to steering tie rod (locknut)	Nut	M 14 × 1.5		45
Auxiliary carrier to body	Bolt	M 12 × 1.5	8.8	90
Stabilizer to auxiliary carrier strut	Bolt	M 8	8.8	25
Auxiliary carrier strut, splash guard and stabilizer to body	Bolt	M 10	8.8	47
Auxiliary carrier strut and splash guard to auxiliary carrier	Nut	M 10	8	28

Location	Designation	Threads	Material/ Strength	Torque Nm
Control arm to body	Bolt	M 10	8.8	47
Ball joint to control arm	Slotted nut	M 45 × 1.5	8.8	250
Ball joint to spring strut	Universal stopnut	M 8	8	22
Brake disc to wheel hub	Nut	M 8	8.8	23
Shield for brake disc	Bolt	M 8	8.8	10
Caliper to steering knuckle	Bolt	M 12 × 1.5	8.8	70
Nut on steering knuckle	Screw	M 7	10.9	15
Brake pipe connection	Coupling nut	M 10 × 1		12
Wheel to wheel hub	Wheel nut	M 14 × 1.5		130

Tightening torque for steering

Location	Designation	Threads	Material/ Strength	Torque Nm
Steering gear	Bolt	M 10	8.8	47
Pivot bush to rack	Bellows holder (slotted nut)	M 16 × 1.5		70
Joint pivot (steering tie rod) to pivot bush	Bolt	M 10	8.8	47
Ball joint to steering arm	Castle nut	M 10 × 1	8	45
Ball joint and pivot to steering tie rod (locknut)	Nut	M 14 × 1.5		45
Steering coupling to steering shaft	Bolt	M 8	8.8	25
Steering shaft to steering gear	Bolt	M 8	8.8	25
Steering shaft bearing	Bolt	M 8	8.8	25
Universal joint to steering shaft (lubricated with Optimoly HT)	Bolt	M 8	8.8	20
Coupling flange to drive pinion	Self-locking nut	M 10	8	45
Case cover to steering gear	Bolt	M 8	8.8	15
Steering wheel	Nut	M 18 × 1.5	8	50
Centering bolt for steering lock	Stud	M 8	10.9	2–3
Locknut for centering bolt	Nut	M 8	8	18

Rear axle specifications

	911 SC	911 SC USA, Canada, Japan	Turbo
Wheel suspension	Independent, employing trailing arms, wheels driven by propeller shafts		
Springs	One round torsion bar in lateral direction for each wheel		
Torsion bar dia.	24.1 mm	24.1 mm	26 mm
Track width	1379 mm with rim 7 J × 15	1367 mm with rim 7 J × 15	1501 mm with rim 8 J × 16
Shock absorbers	Double action, hydraulic shock absorbers		
Stabilizers front/rear dia. in mm	20/18	20/18	20/18

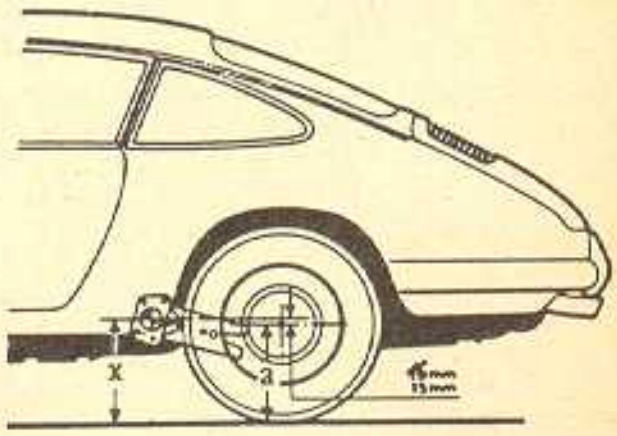
Specifications and tolerances

(at curb weight according to DIN 70020; car with full fuel tank, spare wheel and tools)

Designation	Adjustment data and tolerances	
Torsion bar specification Inclination of spring strut		
Coupe 911 SC	35°	with Bielstein-shock absorbers 34°
Coupe 911 SC USA, Canada, Japan	40°	with Bielstein-shock absorbers 39°

23°
W 30mm BAR

Designation	Adjustment data and tolerances	Max. difference between left and right
Targa	+ 0.5°	
Air conditioner	+ 0.5°	
Turbo	33°	
Turbo – USA, Canada, Japan	37°	
Camber of rear wheels		
911 SC	– 1° ± 10'	20'
Turbo	– 30' ± 10'	20'
911 SC/Turbo USA, Canada, Japan	0° ± 10'	20'
83 model onwards	– 1° ± 10'	20'
Track for all types	+ 10' ± 10' each wheel	20'
Height adjustment		
Wheel center below center of cross tube		
911 SC	16 mm ± 5 mm	8 mm
Turbo	12 mm ± 5 mm	8mm
911 SC/Turbo USA, Canada, Japan	37 mm ± 5 mm	8 mm
83 model onwards		
911 SC	16 mm ± 5 mm	
911 Turbo	12 mm ± 5 mm	



Tightening torque for bolts and nuts for rear axle

Location	Designation	Threads	Material	Tightening torque Nm
Bearing cover to body	Hexagon head bolt	M 10	8.8	47
Control arm to cross tube	Hexagon head bolt	M 14 × 1.5	10.9	60
Spring strut to control arm	Eccentric	M 12 × 1.5	8.8	60
Spring strut to control arm	Hexagon head bolt	M 12 × 1.5	10.9	95
Brake caliper to control arm	Hexagon socket screw	M 12 × 1.5	8.8	60
Shock absorber to control arm	Hexagon head bolt	M 14 × 1.5	8.8	125
Shock absorber to body	Hexagon nut	M 10 × 1	8	25
Brake line	Coupling nut	M 10 × 1		14
Stabilizer to body	Hexagon head bolt	M 8	8.8	25
Axle shafts to transmission and drive shaft	Fillister head bolt	M 10 M 8	12.9 12.9	83 42
Stabilizer to stabilizer suspender	Hexagon nut	M 12 × 1.5	8/8.8	85
Stabilizer suspender to rear axle trailing arm	Hexagon head bolt	M 12 × 1.5	8.8	85
Wheel to wheel hub	Wheel nut	M 14 × 1.5		130
Wheel hub to drive shaft	Castle nut	M 20 × 1.5	10.9	300 – 320
Brake disc to wheel hub	Countersunk bolt	M 6	8.8	5
Adjusting lever to spring strut	Hexagon head bolt	M 16 × 1.5	10.9	245
Adjusting lever to spring strut	Eccentric bolt	M 16 × 1.5	10.9	245

Brakes – Specifications

Description	Remarks, specifications 911 SC	Turbo	Wear limit 911 SC	Turbo
Brake booster				
Tandem master cyl. dia.	20.64 mm	23.81 mm		
Brake booster dia.	7"	8"		
Play on brake pedal with brakes bled and engine stopped	10 mm	10 mm		
Brake circuit division	front axle/ rear axle	front axle/ rear axle		
Front wheel brakes				
Brake disc outside dia.	282.5 mm inboard venting	304 mm inboard venting perforated evolent-shaped inboard venting ports		
Effective brake disc dia.	228 mm	247 mm		
Brake disc thickness (new)	20.5 mm	32 mm		

Description	Remarks, specifications 911 SC	Turbo	Wear limit 911 SC	Turbo
Min. brake disc thickness* after machining	19.1 mm	30.6 mm	18.5 mm	30 mm
Max. brake disc surface-to-valley surface finish after machining	0.006 mm	0.006 mm		
Max. brake disc thickness tolerance	0.02 mm	0.02 mm		
Max. brake disc lateral runout	0.05 mm	0.05 mm		
Max. lateral runout installed	0.1 mm	0.1 mm		
Pistons in brake caliper	48 mm dia. 2 pistons per caliper	38 mm dia. 4 pistons per caliper		
Brake pad area per wheel	76 cm^2	94 cm^2		
Brake pad thickness	10 mm	13 mm	2 mm	2 mm
Brake pad recess play	brake liner has easy movement in recess	0.4 – 0.6 mm		
Rear wheel brakes				
Brake disc outside dia.	290 mm inboard venting	309 mm inboard venting perforated evolent-shaped inboard venting ports		
Effective brake disc dia.	244 mm	251 mm		

Description	Remarks, specifications 911 SC	Turbo	Wear limit 911 SC	Turbo
Brake disc thickness (new)	20 mm	28 mm		
Min. brake disc thickness* after machining	18.6 mm	26.6 mm	18 mm	26 mm
Max. brake disc peak-to-valley surface finish after machining	0.006 mm	0.006 mm		
Max. brake disc thickness tolerance	0.02 mm	0.02 mm		
Max. brake disc lateral runout	0.05 mm	0.05 mm		
Max. lateral runout installed	0.1 mm	0.1 mm		
Pistons in caliper	38 mmdia. 2 pistons per caliper	30 mm dia. 4 pistons per caliper		
Brake pad area per wheel	52.5 cm^2	94 cm^2		
Brake pad thickness	10 mm	13 mm	2 mm	2 mm
Brake pad recess play	Brake pads move easily in recess	0.4 – 0.6 mm		
Parking brake				
Brake drum dia.	180 mm	180 mm	181 mm	181 mm
Brake shoe width	25 mm	25 mm		
Liner area per wheel	85 cm^2	85 cm^2		
Brake liner thickness	4.5 mm	4.5 mm	2 mm	2 mm

Caliper version

911 SC: gray cast iron front and rear Turbo: light alloy front and rear

* Brake disc should only be machined symmetrically, i.e. uniform on both sides.

Machining specifications and wear limits for brake discs and parking brake

Vehicle type	Type of brake disc	Location of brake disc	Distance "a" (in ref. to new brake disc thickness)	New brake disc thickness	Min. thickness of brake disc after machining	Wear limit of brake disc (for symmetric wear)
911 SC	Vented brake disc	Front wheel	35.25 ± 0.1 mm	20.5 – 0.2 mm	19.1 mm	18.5 mm
Turbo	Vented, perforated brake disc	Front wheel	35.7 + 0.25 mm* – 0.35 mm	32 – 0.2 mm	30.6 mm	30 mm
			from mod. 1981 56.7 ± 0.1 mm	32 – 0.2 mm	30.6 mm	30 mm
911 SC	Vented brake disc	Rear wheel	76 + 0.2 mm	20.0 – 0.2 mm	18.6 mm	18.0 mm
Turbo	Vented, perforated brake disc	Rear wheel	76 + 0.2 mm	28 – 0.2 mm	26.6 mm	26 mm

All	Thickness tolerance of brake discs	max. 0.02 mm
All	Lateral runout of brake discs	max. 0.05 mm
All	Surface finish of brake discs after machining	max. 0.006 mm

* From brake flange bearing surface on wheel hub (brake disc, ring, brake flange assembly) to inside brake disc friction surface.

Caution!

Refinishing and wear specifications listed above are based on the assumption that remaining thickness of the brake pad is not less than 2.0 mm.

This pad thickness is required to assure perfect operation of brakes. (Installation of cross spring assures this.)

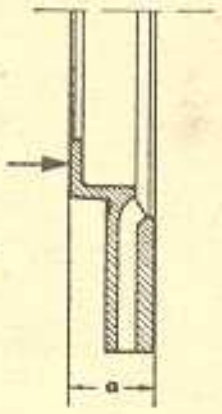
Only balanced brake discs are supplied. Brake discs are balanced by special clips in the cooling vents.

Caution! Never remove balance clips.

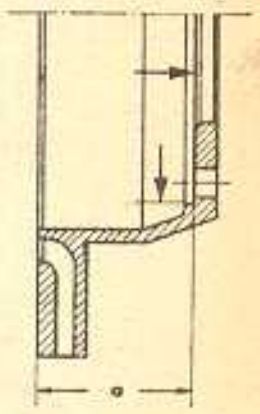
Caution!

Machine brake disc symmetrically, i.e. uniformly on both sides. Arrows indicate brake disc reference or mounting points.

Front wheel brake disc



Rear wheel brake disc



Parking brake

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

Caution!

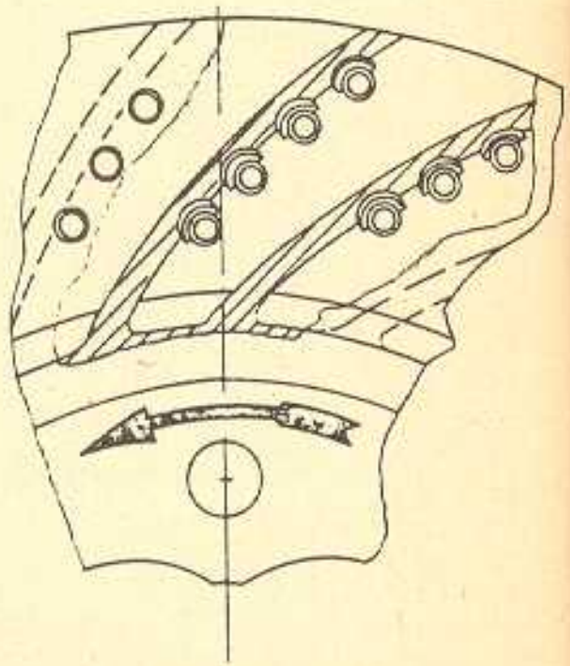
Parking brake liners must be at least 2.0 mm thick.

Arrangement of brake disc venting ports (assembly information)

The inboard venting ports of brake discs **on Turbo** are arranged in evolvent-shape. Don't mix up left and right sides when assembling.

Identification: Evolvent shape and part number.

Part number is located on brake disc.



← Forward direction

Left side part number:

3rd group number
uneven

Right side part number:

3rd group number
even

Examples:

930 351 **04700** = left side

930 351 **04800** = right side

Brake circuit failure indicator

Each of both brake circuits has a stop light switch on the brake master cylinder, which also acts as a brake function warning switch.

An indicator lamp installed in the instrument panel comes on when a brake circuit fails.

After repairing the brake system the brake indicator lamp must be switched off by disconnecting the battery.

Tightening torque for hydraulic and mechanical brake parts

Location	Designation	Threads	Material	Tightening torque Nm
Nut on steering knuckle	Fillister head screw	M 7	10.9	15
Brake caliper to steering knuckle	Fillister head screw/ hexagon head bolt	M 12 × 1.5	8.8	70
Brake flange to wheel hub	Hexagon head bolt	M 8	8.8	23
Brake disc to brake flange	Hexagon head bolt	M 6	8.8	10
Brake disc to wheel hub	Hexagon head bolt	M 8	8.8	23
Guard to steering knuckle	Hexagon head bolt	M 8	8.8	10
Guard and brake backplate to trailing arm	Fillister head screw	M 8	8.8	25
Guard to brake backplate	Hexagon head bolt	M 8	8.8	25
Brake disc to wheel hub	Countersunk screw	M 6	8.8	5
Brake caliper to trailing arm	Fillister head screw/ hexagon head screw	M 12 × 1.5	8.8	60
Wheel to wheel hub	Wheel nut	M 14 × 1.5	F 53/10 K	130

Location	Designation	Threads	Material	Tightening torque Nm
Brake master cylinder to vacuum booster	Hexagon nut	M 8	8	25
Stop light switch to master cylinder	Stop light switch	M 10 × 1		15 + 4
Brake booster to console	Hexagon nut	M 8	8	25
Brake fluid tank	Hexagon head bolt	M 6	8.8	2
Pivot and joint shell to push rod	Hexagon nut	M 10	8	35
Brake booster to trunk floor	Hexagon nut	M 8	8	25
Strut to console	Hexagon head bolt	M 10	8.8	46
Brake lines to master cylinder, branch brake hoses and brake calipers	Coupling	M 10 × 1		14
Branch to cover and rear axle cross tube	Hexagon head bolt	M 6	8.8	6
Bleeder screws on brake calipers (Turbo)	Bleeder screw	M 10 × 1		8 – 11
Brake caliper sections to bridge (Turbo)	Fillister head bolt	M 12 × 1.5	8.8	60
Spring plate to bridge (Turbo)	Countersunk screw	M 5		4
Ring adapter to brake caliper (Turbo)	Hollow union bolt	M 10 × 1		16
Bleeder valve in brake caliper	Bleeder screw			3

Rims and tires

Type	Standard rims		tires	Optional extra* rims		tires
911 SC	front rear	LM g 6 J × 15 LM g 7 J × 15	185/70 VR 15 215/60 VR 15	front rear	LM gs 6 J × 16 LM gs 7 J × 16	205/55 VR 16 225/50 VR 16
				Winter tires**		
				5½ J × 15***		165 R 15 M+S***
				5½ J × 14		185 R 14 M+S
				5½ J × 15*** 6 J × 15 7 J × 15 6 J × 15 front/ 7 J × 15 rear		185/70 R 15 M+S
				6 J × 16 6 J × 16 front/ 7 J × 16 rear		205/55 R 16 M+S
Turbo	front rear	LM gs 7 J × 16 LM gs 8 J × 16	205/55 VR 16 225/50 VR 16			
				Winter tires**		
				6 J × 15 7 J × 15 6 J × 15 front/ 7 J × 15 rear		185/70 R 15 M+S
				6 J × 16 7 J × 16 6 J × 16 front/ 7 J × 16 rear		205/55 R 16 M+S

Tire inflation pressure (reference values)

(measured on cold tires)

	911 SC	Turbo	Turbo – USA, Canada, Japan
Front	2.0 bar	2.0 bar	2.0 bar
Rear	2.4 bar	3.0 bar	2.4 bar
Spare wheel	2.2 bar	2.2 bar	2.2 bar

These values also apply to winter tires.

LM g = Cast light alloy
LM gs = Forged light alloy

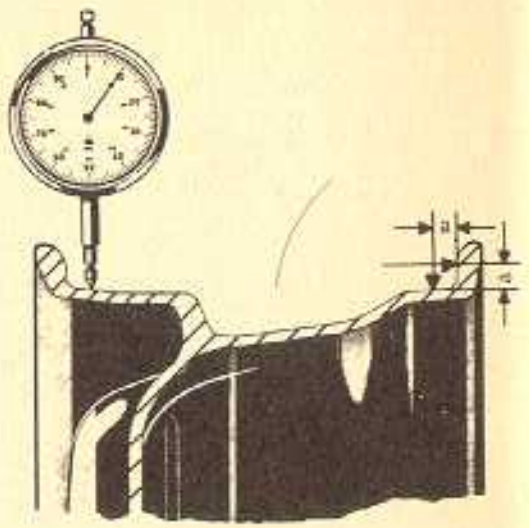
* Other wheel rim/tire combinations are possible in addition to optional extra tires (Technical Information).

** SR or HR version.

*** Not recommended.

Checking wheel rims

Refer to drawing for lateral and radial runout measuring points on inside of rim.



Max. permissible lateral and radial runout of light alloy rim = 1.0 mm

Max. permissible lateral and radial runout of rim + tire = 1.5 mm

Note:

Straigthening of deformed rims is not permitted.

Distance "a" = 8 mm

Check rim flanges of light alloy wheel rims for wear. Inner rim flange is more subject to wear.

Use a conventional 8 mm radius gage to check, but first remove any sharp edges and burrs.

Wear limit 1 mm. If necessary, replace wheel rim.

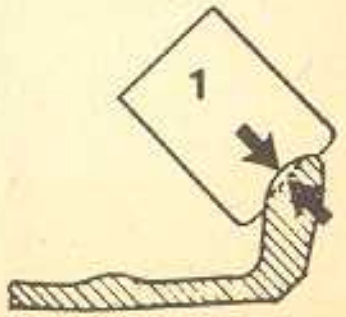
Checking rim flange shape:

——— New condition

- - - - Worn

◗ ◖ Max. wear 1 mm

1 8 mm radius gage



Ignition timing values 911 SC and 911 Turbo

Engine type	911 SC (USA/Japan)	911 SC	911 Turbo (Europe, R.o.W.)
Ignition timing	5° BTDC	25° BTDC	29° BTDC
at engine speed (rpm)	900 ± 50	4000	4000
Vacuum control detached	yes	yes	yes
Ignition timing control	19°...25° BTDC	not above 25° BTDC	0° ± 2° BTDC
at engine speed (rpm)	6000	6000	1000 ± 50
Vacuum control detached	yes	yes	no

911 SC and 911 Turbo

Spark plug survey

		911 SC USA/Japan	911 Turbo All
Spark plugs	Bosch	WR 5 DC	W3 DP or DPO
	Bosch	WR 5 DP	(W280 P21)
	Beru	14-5 DU	
Electrode gap		0.7 + 0.1 mm	0.6 + 0.1 mm

	911 SC R.d.W.
Spark plugs Bosch	WR 3 CC
Bosch	WR 3 CP
Electrode gap	0.7 + 0.1 mm

Battery charge condition

	Normal Climates Density	Temperature Protection	Tropics Density
Discharged (dead)	1.12	−11° C	1.08
Half charged	1.20	−27° C	1.16
Charged	1.28	−68° C	1.23

Fuse and relay chart for 911 SC

Fused equipment	Amps
1 Fog lights	25
2 License plate lights, fog light indicator lamp and relay	5
3 Front and rear right marker lights	5
4 Front and rear left marker lights, engine compartment light	5
5 Right low beam headlight	8
6 Left low beam headlight	8
7 Right high beam headlight	8
8 Left high beam headlight, high beam indicator lamp	8
9 Right front turn signal	5
10 Left front turn signal	5
11 Flasher, backup lights	16
12 Rear window defogger relay, heater blower, rear window defogger indicator lamp, automatic heater control	25
13 Windshield wipers, washer pump, cigar lighter	25
14 Electric sliding roof, rear window wiper, outside mirror	16
15 Stop light, tempostat	8
16 Fuel pump	25
17 Hazard lights, windshield defogger	16
18 Courtesy light, clock, glove box light, trunk light	5
19 Headlight cleaners	25
20 Air conditioner blower	25
21 Electric window controls	25
Fuses in engine compartment	
1 Rear window defogger, rear wiper return	25
2 Heater blower	25
3 Heater blower relay	5

Relays in fuse box

I Air conditioner
II Fog lights
III Horn
IV Tempostat
V Window controls
VI Not occupied
VII Fuel pump

Relays in engine compartment

I Single-step rear window defogger
II Heater blower
III Double-step rear window defogger

Fuse and relay chart for 911 Turbo

Fused equipment	Amps
1 Fog lights	16
2 License plate lights, fog light indicator lamp and relay	5
3 Front and rear right marker lights	5
4 Front and rear left marker lights, engine compartment light	5
5 Right low beam headlight	8
6 Left low beam headlight	8
7 Right high beam headlight	8
8 Left high beam headlight, high beam indicator lamp	8
9 Right front turn signal	5
10 Left front turn signal	5
11 Flasher relay, backup lights, outside mirror	16
12 Electric sliding roof, rear window wiper	25
13 Windshield wipers, washer pump, cigar lighter	25
14 Blower, relay and indicator lamp for windshield and rear window defoggers, automatic rear window control	16
15 Stop light	8
16 Fuel pumps	25
17 Hazard lights, windshield defogger	16
18 Courtesy light, clock, glove box light, trunk light	5
19 Headlight cleaners	25
20 Air conditioner blower	25
21 Electric window controls	25
In engine compartment	
Rear window defogger, rear wiper return	25

Relays in fuse box

I Air conditioner
II Fog lights
III Horn
IV Not occupied
V Window controls
VI Fuel pump 1
VII Fuel pump 2

Relays in engine compartment

II Air sensor and charge pressure safety switch
III Rear window defogger
IV Delay relay

Bulb Chart — 911 SC and 911 Turbo

Location	Wattage	Base DIN (SAE)	Remarks
Main headlights H 4	60/55 W	P 43 t-38	
Additional headlights H 3 Front fog lights H 3	55 W	PK 22 S	
Main headlights "AS"	45/40 W	P 45 t	Japan
Stop/tail lights	21/5 W	BAY 15 d	
Turn signals Backup lights Rear fog lights	21 W	BA 15 s	
Side marker lights License plate light	4 W	BA 9 s	
Trunk light	10 W	BA 15 s	
Passenger compartment light Engine compartment light	10 W	SV 8.5-8	
Lamps for instruments and ashtray	2 W	BA 7 s	
Glass base indicator lamp	1.2 W	W 2 × 4.6 d	
License plate light	5 W	BA 15 s	
Side turn signals	5 W	3.5 × 9.5	
Sealed beam headlights (RHD)	60/50 W	(6014)	USA
Sealed beam halogen headlights	60/50 W	(6014)	USA
Stop/tail lights Turn signal/marker lights	32/3 cp	(1034)	USA
Turn signals Backup lights	32 cp	(1073)	USA
Sign light	1.2 W	2.9 × 4.6	USA
Side marker/ license plate light	2 cp	(1895)	USA

Dimensions at curb weight according to DIN

		911 SC	Turbo
Wheelbase	mm	2272	2272
Front track width	mm	1369 (1361)	1432
Rear track width	mm	1379 (1367)	1501
Lenght	mm	4291	4291
Width	mm	1652	1775
Height	mm	1320 (1340)	1310 (1328)

USA values in brackets

Weights

		911 SC R. o. W.	911 SC USA	Turbo R. o. W.	Turbo Canada
Curb weight acc. to DIN	kg	1160	1250	1300	1300
Gross vehicle weight	kg	1500	1550	1680	1600
Max. axle load, front/rear	kg	650/930	650/950	700/1050	675/1000
Max. trailer load					
without brakes**	kg	480	480	—	—
with brakes**	kg	800	800	—	—
Max. roof load (only coupe)*	kg	35	35	35	35

* But without exceeding the gross vehicle weight.
** For gradients up to 16 %.

Filling capacities

	911 SC	Turbo
Engine	Brand name heavy duty oil of API Classification SE or SF. SAE 10 W/50, 15 W/40 or 20 W/50 multigrade oil for year around operation. Latter oil not for constant temperatures below – 15° C. Only use brand name oils which had been tested and approved by Porsche. Only when multigrade oil is not available and operating conditions are normal, may brand name single-grade oils be used, but then oil must be changed at specified intervals to avoid damage as specified by the season of the year. Use SAE 30 in summer and SAE 20 W in winter (adequate only for temperatures below +5° C).	
Total oil volume of system	ltr. approx. 13	13
Oil change volume	ltr. approx. 10	10
Manual transmission*	ltr. approx. 3	3.7
Fuel tank	ltr. approx. 80	80
Brake fluid tank	ltr. approx. 0.2	0.2
Washing fluid tank	ltr. approx. 8.5	8.5

* SAE 90 of Specification API-GL 5 (or Mil-L 2105 B)

Performances, consumption of fuel and oil

		911 SC	911 Turbo
Top speed with manual transmission	km/h	235 (225 USA)	260
Acceleration 0 – 100 km/h	s	6.8 (7.0 USA)	5.4
Kilometer from standing start	s	26.8 (27.5 USA)	24
Fuel consumption (acc. DIN 70030, part 1)			
at 90 km/h	l/100 km	8.0	8.1
at 120 km/h	l/100 km	9.7	15.3
City test	l/100 km	13.4	20.0
Oil consumption	l/1000 km	approx. 1.5	1.0 – 2.0

Specifications for Air Conditioner

Refrigerant	1350 grams of R 12
Refrigerating oil in compressor	120 ± 20 cc Suniso No. 5 GS
Burst-type seal on tank	Seal bursts at pressure of approx. 40 bar
Power consumption of compressor clutch	Approx. 50 watts

Tightening Torque

Location	Threads	Torque Nm
Compressor – suction conn. – pressure conn.	7/8" × 14 UNF 3/4" × 16 UNF	29 – 37 20 – 28
Condenser – rear	3/4" × 16 UNF	20 – 28
Condenser – front	5/8" × 18 UNF	14 – 20
Fluid tank	5/8" × 18 UNF	14 – 20
Expansion valve Pressure connection	5/8" × 18 UNF	14 – 20
Expansion valve Evaporator connection	3/4" × 16 UNF	20 – 28
Evaporator suction pipe	7/8" × 14 UNF	29 – 37

Safety Regulations for Handling Refrigerant R 12

The employed R 12 refrigerant is known as a safety refrigerant. This means, this refrigerant is not flammable, not explosive, not poisonous, not attacktive, odorless and tasteless. You should still conform with the following points in spite of this.

1. Avoid any contact with refrigerant in liquid or gas state. Concerned skin must be treated as for frostbite. Wear goggles for protection of eyes. Visit a physician immediately, if refrigerant gets in the eyes in-spite of the goggles.
2. System must be discharged when working on an air conditioner. Refrigerant gas must not be discharged in closed rooms. There is danger of asphyxiation in workpits due to fact that it is heavier than air.
3. Never weld on parts of a closed air conditioner or in the immediate vicinity. Regardless of whether the system is filled with refrigerant or not, heat will cause very high pressure which could lead to damage in the system or even an explosion. R 12 is absolutely not poisonous at normal temperatures, however will decompose when in contact with an open flame or at high temperatures and be converted into hydrochloric gas and hydrogen floride. These decomposition products will contain, among others, chloric gas and carbonyl chloride. Precautions must be taken, since these products could be dangerous to health.
4. Refrigerant bottles must not be thrown or, in filled state, be subjected to rays of sunshine or other sources of heat for longer periods of time. The maximum permissible temperature of 45° C for a filled refrigerant bottle must not be exceeded.

Control Dimensions for Floor Assembly 911 SC

Dimension	Description	mm
A	Control arm take-up front inside	565.5 ± 1
B	Auxiliary platform take-up	726 ± 1
C	Front floor plate measuring points	1200 ± 2
D	Rear floor plate measuring points	850 ± 2
E	Engine mounts	752 ± 1
F	Front floor plate – inside control arm take-up measuring point	1327 ± 3
G	Rear floor plate – auxiliary platform take-up measuring point	1868 ± 3
H	Axle tube/transmission take-up – front floor plate measuring point	1550 ± 3
I	Axle tube/transmission take-up – inside engine mount bolting points	1323 ± 5
K	Rear floor plate – inside engine mount bolting measuring point	1557 ± 5
L	Front floor plate – inside control arm take-up measuring point	1041 ± 3
M	Front floor plate – rear floor plate measuring point	1215 ± 2
N	Rear floor plate – engine mount bolting measuring point	1355 ± 3
O	Axle tube/transmission take-up – inside engine mount bolting points	1220 ± 3

All dimensions are measured horizontally from centerline of hole.

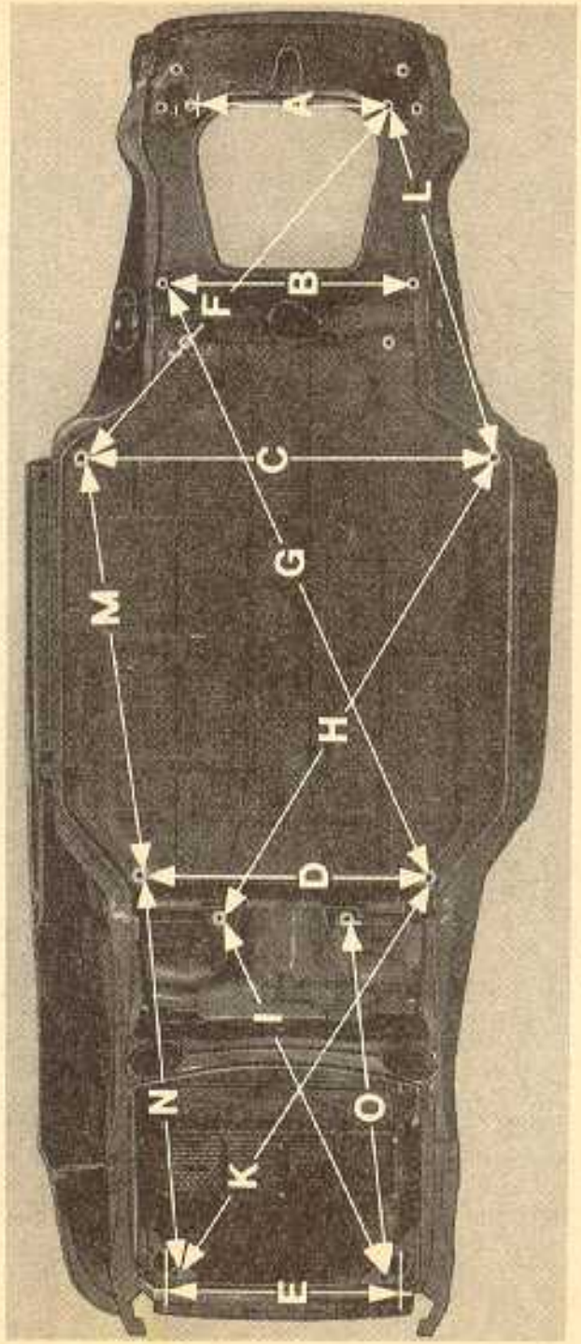
Note:
Dimensions to bolting points of engine mounts are to be measured direct (inclined dimensions).

Important:
The difference between left and right for length dimensions must not exceed specified tolerances.

Control Dimensions for Floor Assembly — 911 Turbo

Dimension	Description	mm
A	Control arm take-up front inside	565.5 ± 2
B	Auxiliary platform take-up	726 ± 1
C	Front floor plate measuring points	1200 ± 2
D	Rear floor plate measuring points	850 ± 2
E	Engine mounts	752 ± 3
F	Front floor plate – inside control arm take-up measuring point	1327 ± 3
G	Rear floor plate – auxiliary platform take-up measuring point	1868 ± 3
H	Axle tube/transmission take-up – front floor plate measuring point	1528.5 ± 3
I	Axle tube/transmission take-up – inside engine mount bolting points	1374 ± 3
K	Rear floor plate – inside engine mount bolt measuring point	1582 ± 3
L	Front floor plate – inside control arm take-up measuring point	1041 ± 3
M	Front floor plate measuring point – rear floor plate measuring point	1215 ± 2
N	Rear floor plate – inside engine mount bolt measuring point	1384 ± 3
O	Axle tube/transmission take-up – inside engine mount bolting points	1273 ± 3

Control Points



Maintenance Schedule

The recommended service intervals apply under normal driving conditions and do not take into consideration all of the optional equipment available. Dusty areas require more frequent checking and possibly replacement of the air filter cartridge. Tire, clutch, and brake wear as well as the condition of the oil in the engine in particular depend greatly on the driving habits and are adversely influenced by extreme operating conditions; this might necessitate shorter intervals for checking and replacement and applies logically also for the item "check battery acid level".

Also, the new moving components of the chassis require an certain running-in period. We recommend, therefore, having an alignment check performed after the first 2000 to 3000 miles / 3000 to 5000 km.

Maintenance service should be carried out at least once a year and precautionary measures against corrosion should be taken before winter. The brake fluid should be renewed every two years.

Service items apply to both 911 SC and 911 Turbo unless model is specified.

300 to 1200 miles/ 500 to 2000 km		then at and every 12000 miles / 20000 km
■	Check valve clearance. At first service, check rocker arm shafts for tightness (when engine cold).	■
	Replace air filter cartridge and check hose connections for tightness. Replace filter cartridge in air pump. **911 SC:** Clean flame protection cartridge in crankcase. **911 Turbo:** Lubricate throttle valve shaft and check for smooth action.	■
	Replace spark plugs.	■

	Lubricate control mechanism joints (also necessary after every engine wash). Check control mechanism for smooth action.	■
	Check brake fluid level in reservoir. Check brake pad wear, push rod play between brake pedal and brake booster, free travel of hand and foot brake. Check all pipes, hoses and hose connections for damage and corrosion. Check entire brake system for possible leaks. Check foot and hand brake (road test or testbed run).	■
■	Check clutch play and pedal travel.	■
	Lubricate clutch release lever and secondary spring.	■
■	**911 Turbo:** Check exhaust flange for tightness and entire exhaust system for possible leaks.	■
■	Check condition and tension of V-belts and/or toothed belts.	■
■	Change engine oil, replace engine oil filter. Clean magnetic bolts. Check transmission oil.	■
	Change transmission oil. Clean magnetic bolts.	every 80000 km
■	Check engine, oil reservoir, filter bracket, front oil cooler and transmission for leaks.	■

300 to 1200 miles/ 500 to 2000 km		then at and every 12000 miles / 20000 km
	911 Turbo: Check action of supercharger pressure safety switch.	■
	Steering: Check all connections to steering gear, track rods, pull rods and joints for tightness and good function. Also check bellows for leaks (remove cover plate).	■
■	Check front wheel bearing play.	
■	**911 Turbo:** Check rear wheel bearing play.	■
	Fuel system: Replace fuel filter, check fuel line connections for tightness and leaks. Also check function of fuel pump safety switches.	■
■	Check tire pressure.	■
	Check ignition timing. Check idling setting with exhaust gas analyzer (engine oil temperature of approx. 90° C).	■
	Check battery acid level; check headlight adjustment and operation of turn indicators, stop and rear lights, windshield wipers and horns. Check adjustment of spray nozzles, top up washer reservoir (anti-freeze!).	■
	Treat seals on doors, covers and Targa top and remove abraded rubber. Check door catches, lubricate door hinges.	■
	Check function of heating, ventilation or air-conditioning (driver's and passenger's side).	■