

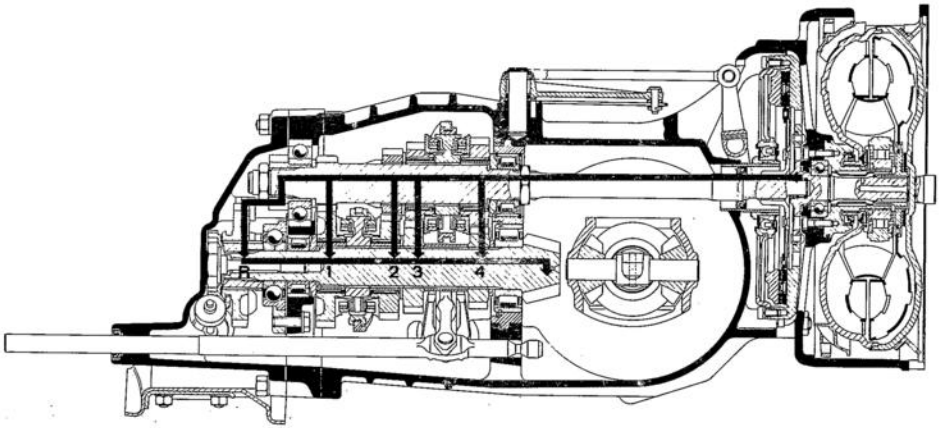
- | | |
|------------------------------|--------------------------------|
| 1 - Oil seal | 10 - Needle bearing cage |
| 2 - Expansion bolt | 11 - Axial needle bearing cage |
| 3 - Threaded stud | 12 - O-ring |
| 4 - Tapered roller bearing | 13 - Ring gear |
| 5 - Axle flange | 14 - Differential spider gear |
| 6 - Temperature sending unit | 15 - Differential side gear |
| 7 - Temperature switch | 16 - Roll pin |
| 8 - Thrust washer | 17 - Anchor piece |
| 9 - Reverse idler gear | 18 - Shaft |

Power Transfer

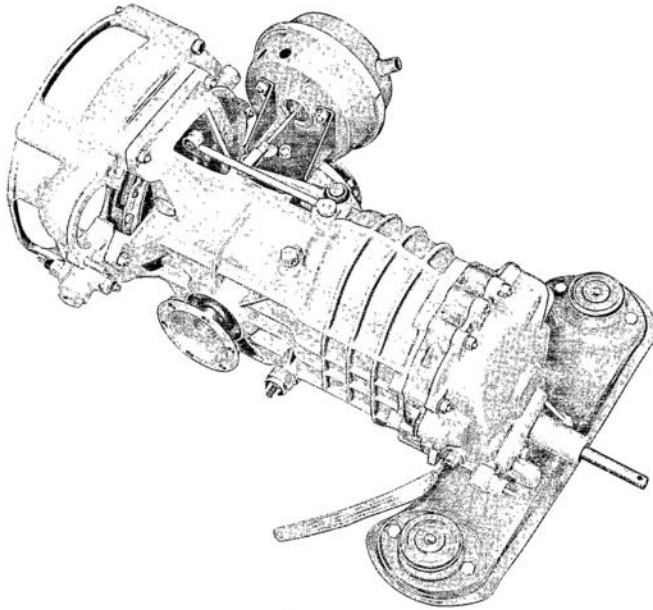
Power transfer from the engine through the torque converter and mechanical clutch is same in all driving ranges.

In ranges L and D, the power is transferred from the fixed gears on the input shaft, through the synchronization components and free-wheeling gears on the pinion shaft, to the pinion shaft. In ranges D3 and D4, the power transfers from the input shaft, through the synchronization components and free-wheeling gears, to the fixed gears on the pinion shaft. Reduction is accomplished by gears engaged in given driving range.

Reverse gear reduction is over two stages. The power flows from the input shaft, through the intermediate shaft, to the pinion.



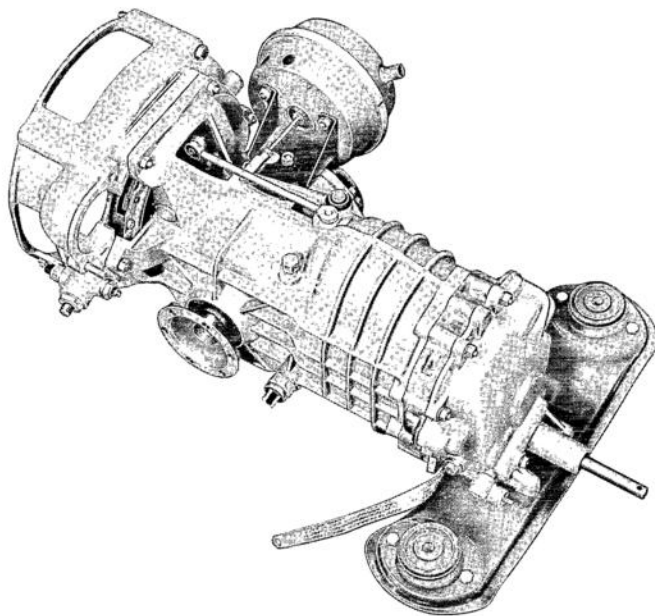
TYPE 925 SPORTOMATIC TRANSMISSION (1974 MODEL)



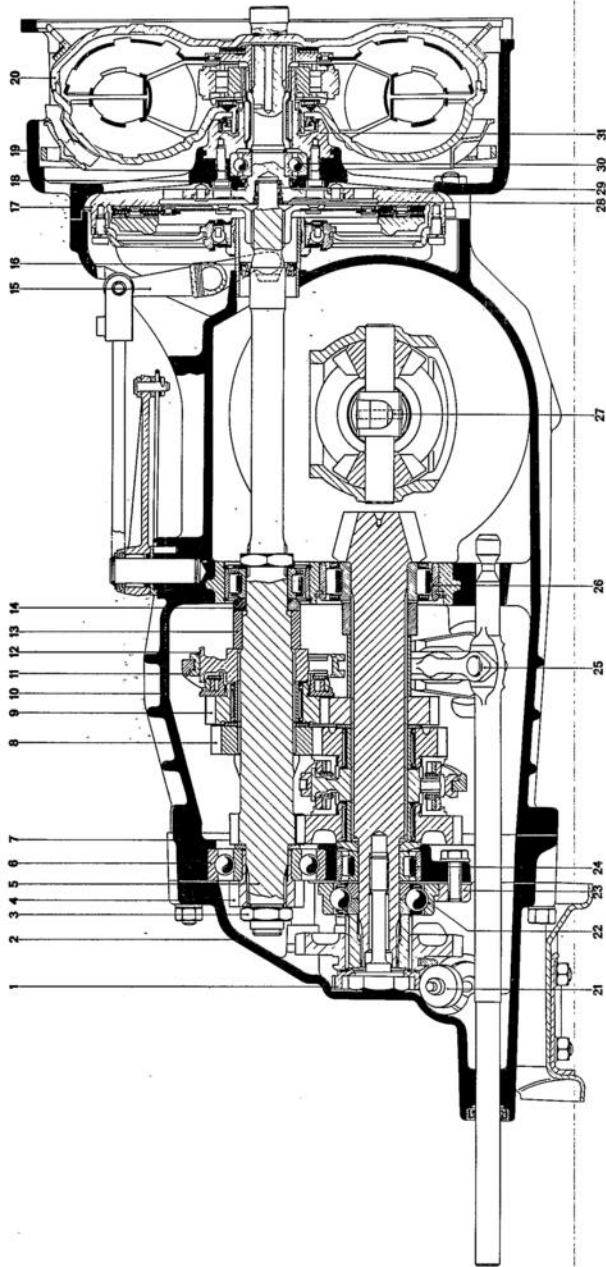
Beginning with 1974 models, Type 911 and 911 S vehicles can optionally be equipped with the Type 925/02 transmission.

This transmission version differs from that used in 1973 models only in the aspect of changed torque converter ratio (see Technical Data, page 0.2 - 2/6).

SPORTOMATIC 925 (1975 Models)

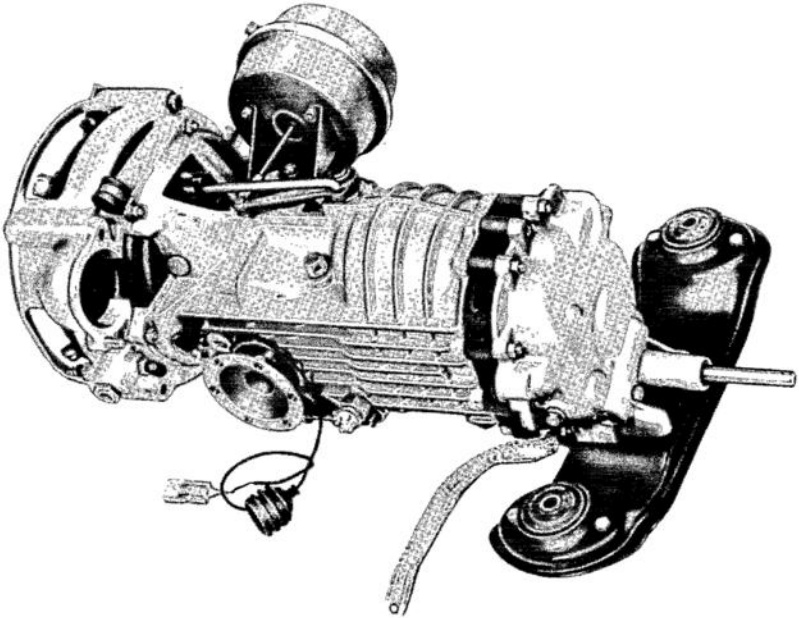


All 1975 models are available with a 3-speed sportomatic transmission (type 925/10) as optional extra equipment.



- | | | | |
|------|-----------------------------|------|--------------------------|
| 1 - | Speedometer drive gear | 17 - | Turbine shaft |
| 2 - | Front transmission cover | 18 - | Oil seal |
| 3 - | Flanged nut | 19 - | Torque converter housing |
| 4 - | Reverse gear | 20 - | Torque converter |
| 5 - | Main shaft | 21 - | Speedometer drive shaft |
| 6 - | Ball bearing | 22 - | Four-point ball bearing |
| 7 - | Intermediate plate | 23 - | Clamping plate |
| 8 - | 2nd gear (22:29 M) | 24 - | Roller bearing |
| 9 - | 3rd gear (27:25 V) | 25 - | Inner shift lever |
| 10 - | Transmission case | 26 - | Roller bearing |
| 11 - | 3rd gear shift fork | 27 - | Anchor block |
| 12 - | 3rd gear shift sleeve guide | 28 - | O-ring |
| 13 - | Spacer | 29 - | Needle bearing |
| 14 - | Washer | 30 - | Ball bearing |
| 15 - | Release lever | 31 - | Stator support |
| 16 - | Oil seal | | |

SPORTOMATIC 925 (1976 MODEL)



From 1976 models all cars can be delivered with a 3-speed sportomatic transmission as optional extra equipment. For engines with a swept volume of 2.7 liters transmission 925/09 (mechanical speedometer drive) and 925/12 (electronic speedometer transmitter) are installed.

The 3 liter Carrera engine requires a more powerful servo motor with a modified clutch linkage (Type 925/13). The torque converter has 4 additional drive shells.

SPORTOMATIC TRANSMISSION 925 (1976 MODEL)

The following transmissions are available from 1976 Models.

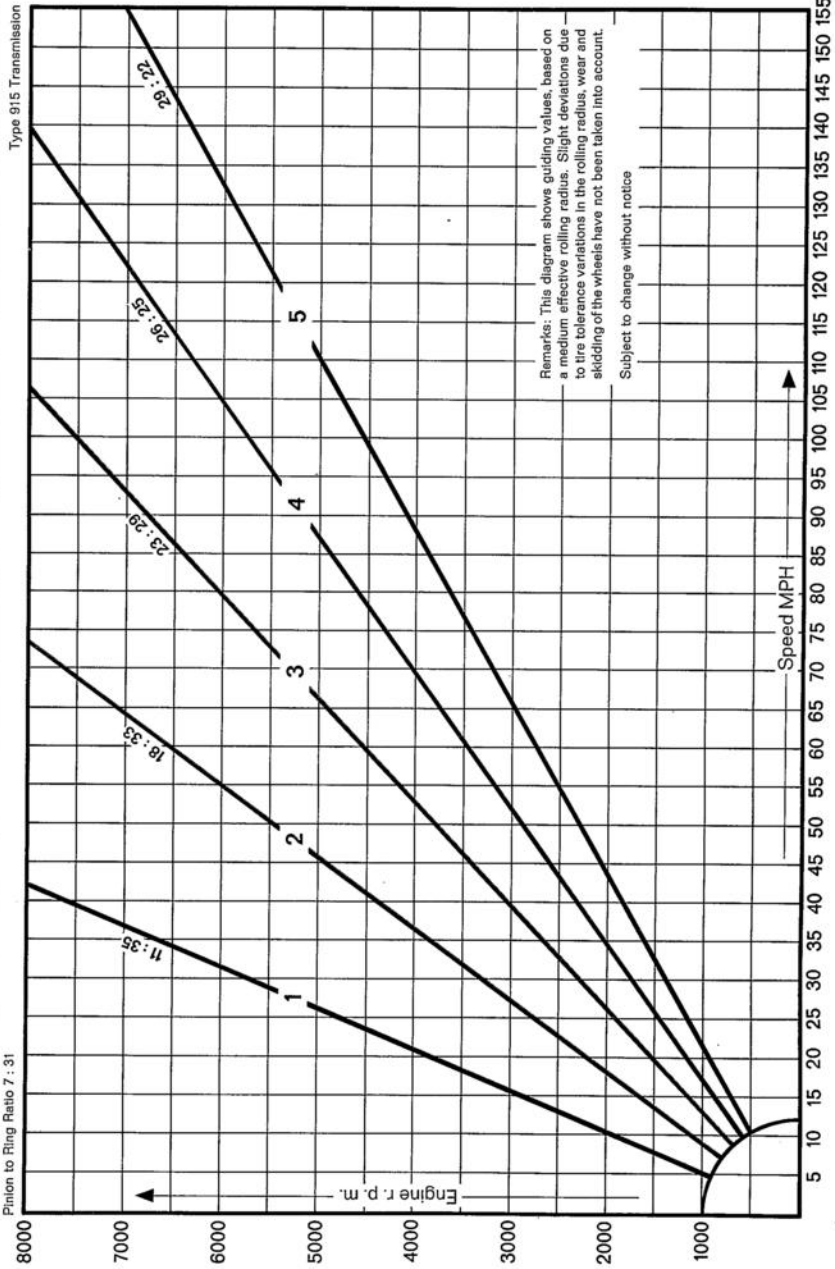
Transmission	No. of Speeds	For Model
925/09 (mech. speedometer)	3	911
925/12 (electronic speedometer)	3	911 and 911 S USA
925/13 (stronger converter drive)	3	Carrera 3.0

SPORTOMATIC TRANSMISSION 925 (1977 Models)

From 1977 Models the following transmission types are installed.

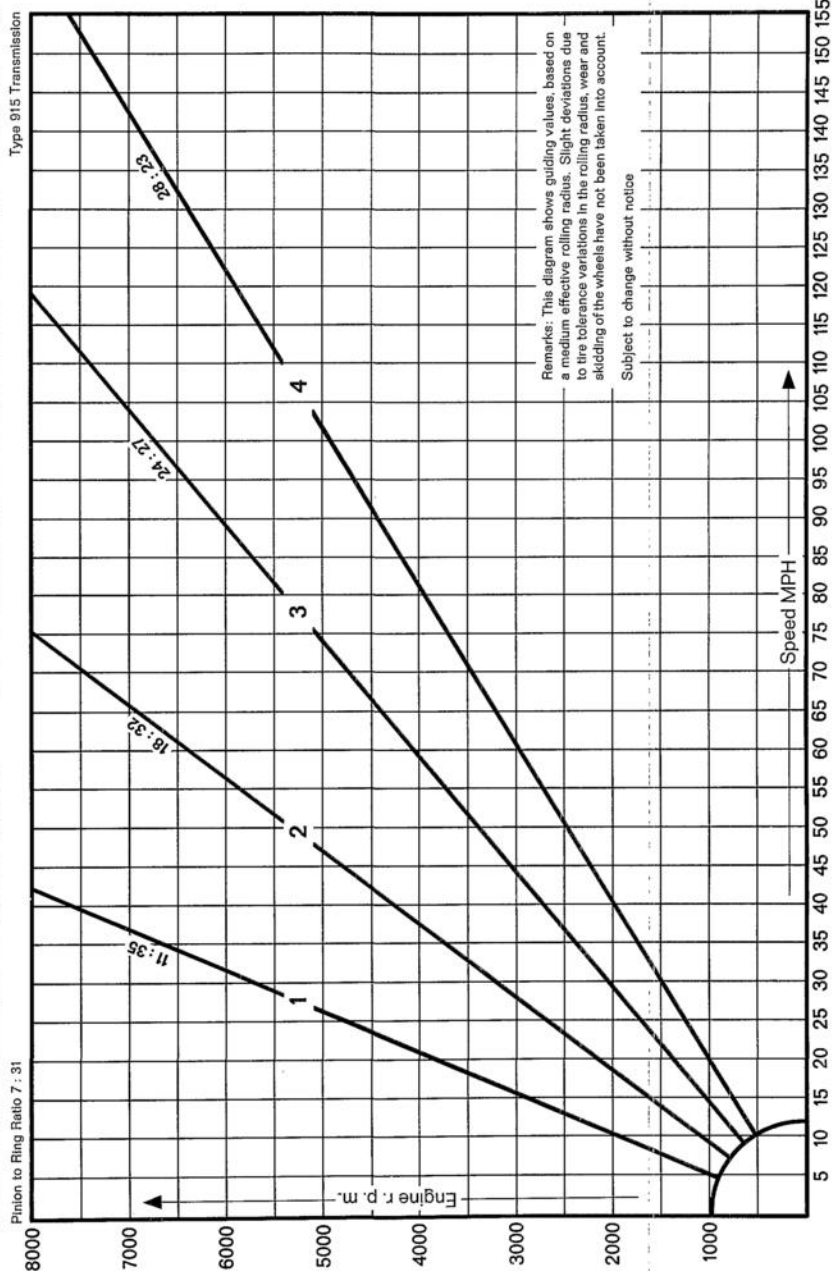
Transmission Type	No. of Gears	Installed in
925/15	3	911
925/16	3	Carrera 3.0
925/17	3	911 S USA and 911 S Japan

Transmission Diagram 5-speed-transmission



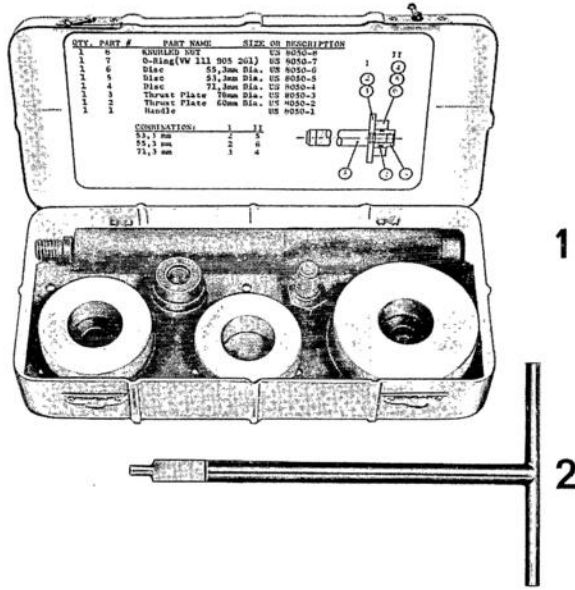
Transmission Diagram

4-speed-transmission



DISASSEMBLING AND ASSEMBLING TRANSMISSION HOUSING

TOOLS



Nr.	Description	Special Tool	Remarks
1	Driver Set	US 8050	
2	T-handle	P 366	

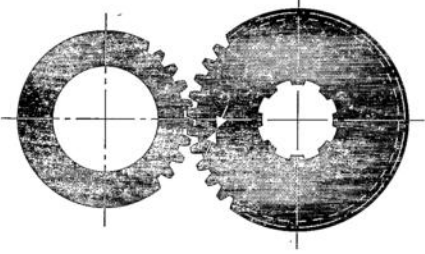
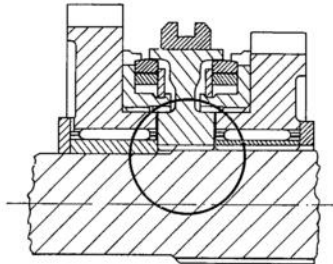
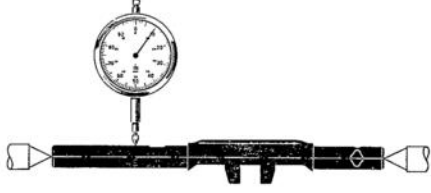
TIGHTENING TORQUES

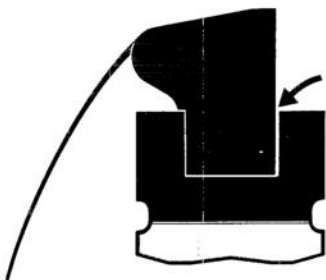
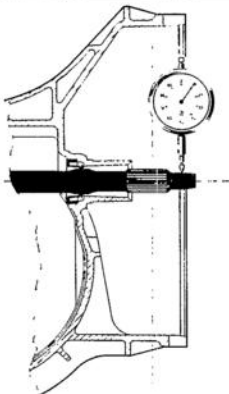
Location	Description	Thread	Grade	Nm	ft lbs
Transmission housing (Oil drain)	Magnetic plug	M24 Tapered	St 37	20 - 25	14.5 - 18.1
Transmission housing (oil filler)	Oil filler plug	M 24 Tapered	St 37	20 - 25	14.5 - 18.1
Transmission housing - side and front cover, guide fork cover	Nut, center lock type	M 8 x 1, 25	x 12 CrNi 18-8	22 - 25	15.9 - 18.1
Front cover	Backup light switch	M 18 x 1, 5	Ms	25 - 35	18.1 - 25.3
Input shaft	Flange nut	M 30 x 1, 5	8. 8	160 - 180	115.7 - 130.2
Input shaft	Castellated nut	M 18 x 1, 5	6. 8	120 - 140	86.8 - 101.3
Retaining plate and transmission support attachment	Nut	M 8 x 1, 25	8	21 - 23	15.2 - 16.6
Pinion shaft	Flange nut	M 24 x 1, 5	8	240 - 260	173.6-188.1
Guide fork, shifting	Nut	M 6 x 1, 0	8	8 - 9	5.8 - 6.5
Shift detent, transmission housing	Nut	M 10 x 1, 5	8. 8	15 - 18	10.8 - 13.0
Transmission housing	Breather	M 16 x 1, 5	9 S 20 K	20 - 30	14.5 - 21.7
Shift forks	Nut	M 8 x 1, 25	8. 8	24 - 26	17.4 - 18.8
Ring gear (differential)	Bolt	M 12 x 1, 25	11.9	115 - 120	83.2 - 86.8
Ring gear (self-locking differential)			11.9 12.9	140 - 150 150 - 160	101.3-108.5 108.5-115.7
Axle flange	Expansion bolt/Bolt		8. 8	26 - 30/ 39 - 46	18.8 - 21.7/ 28.2 - 33.3
Starter	Nut	M 10 x 1, 5	8	46 - 48	33.3 - 34.7
Pressure line (input shaft)	Bolt, M 6x35	M 6 x 1, 0	8. 8	8 - 9	5.8 - 6.5
Front cover	Plug for pressure relief valve	M 12 x 1, 5	9 S 20 K	22 - 25	15.9 - 18.1
Oil pump cover	Self-locking nut	M 6 x 1, 0	x 12 CrNi 18.8	9 - 10	6.5 - 7.2
Pickup tube	Allen bolt M 6 x 15	M 6 x 1, 0	8. 8	8 - 9	5.8 - 6.5
Pressure line	Bolt, M 6 x 12	M 6 x 1, 0	8. 8	8 - 9	5.8 - 6.5
Guide tube release bearing	Phillips head ctsk. screw	M6x1.0	8. 8	8 - 9	5.8 - 6.5

General Specifications	Type 915 Transmission			
	911 T	911 E	911 S	Carrera 2.7
<u>Gear Ratios</u>				
1st gear		11/35 = 3.182		11/35 = 3.182
2nd gear		18/32 = 1.778		20/32 = 1.600
3rd gear		24/27 = 1.125		25/26 = 1.040
4th gear		28/23 = 0.821		29/22 = 0.759
Reverse		12/21 = 3.325 20/38		12/21 = 3.325 20/38
1st gear		11/35 = 3.182		11/35 = 3.182
2nd gear		18/33 = 1.834		18/33 = 1.834
3rd gear		23/29 = 1.261		23/29 = 1.261
4th gear		26/25 = 0.962		27/25 = 0.925
5th gear		29/22 = 0.759		29/21 = 0.724
Reverse		12/21 = 3.325 20/38		12/21 = 3.325 20/38
<u>Climbing Ability</u> (calculated) Vehicle weight: empty according to DIN + 1/2 load				
1st gear	84 %	92 %	100 %	> 100 %
2nd gear	37 %	39 %	41 %	43.5 %
3rd gear	20 %	20.5 %	21.5 %	23 %
4th gear	12 %	12 %	12 %	12.5 %
1st gear	84 %	92 %	100 %	> 100 %
2nd gear	38.5 %	41 %	43 %	52.5 %
3rd gear	23.5 %	24.5 %	26 %	30.5 %
4th gear	16 %	16 %	17 %	20 %
5th gear	10.5 %	10.5 %	10.5 %	12.5 %

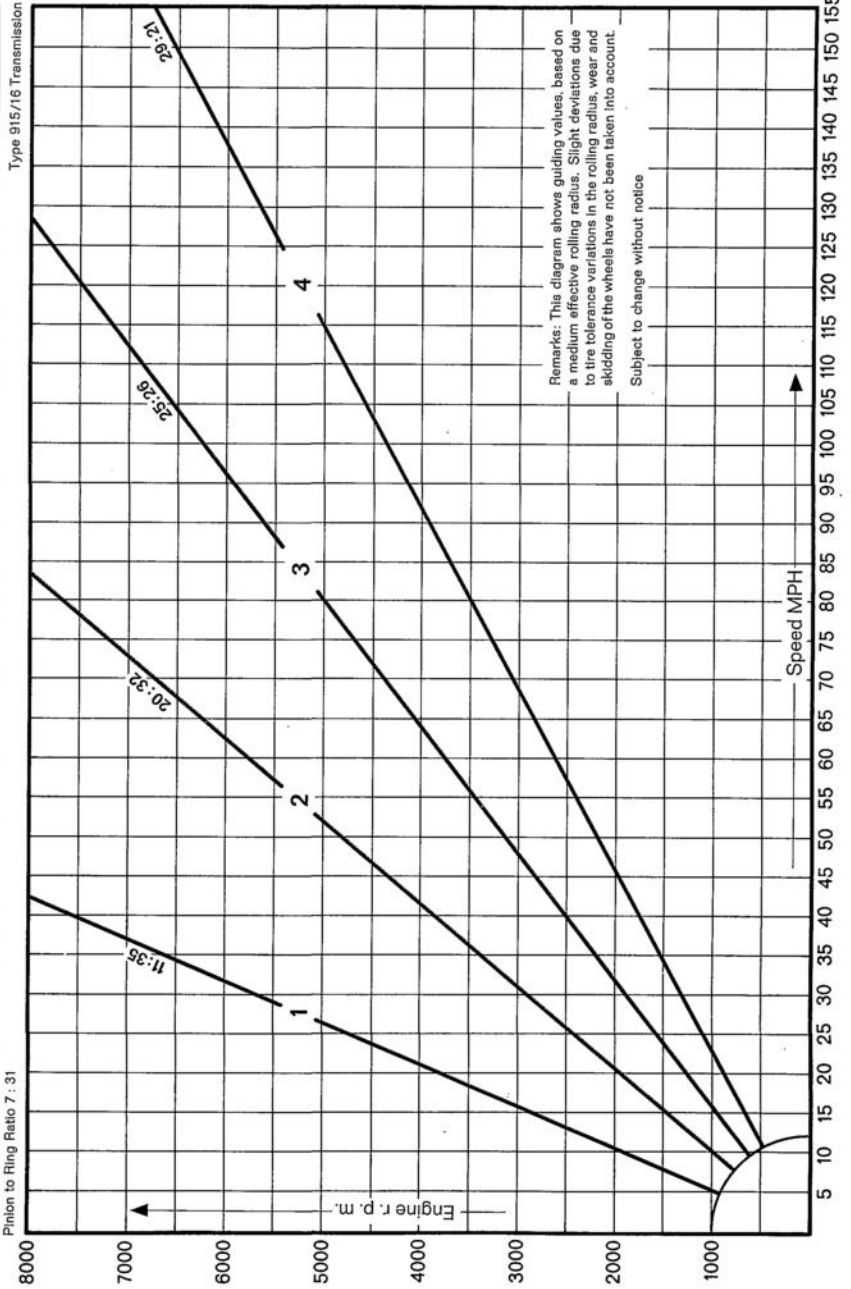
General Specifications	Type 915 Transmission			
	911 T	911 E	911 S	Carrera 2.7
Rear Axle Drive	Spiral bevel gears, differential			
Final drive ratio	7/31 = 4.429			
Power transfer	double-joint drive shafts, to rear wheels			
Transaxle Weight	54 kg, ready with oil and starter 56 kg, ready with oil and starter			
4-speed transmission				
5-speed transmission				
<u>Filling Capacities</u> Transmission and differential	approx. 3 ltr. (6.3 US pints) SAE 90 transmission oil, MIL-L 2105 B or MIL-L 2105 specification			

Table of Tolerances for Type 915 Transmission

Measuring point	Installed tolerances (new) mm	Wear Limit mm	
1. Backlash between Gear I and II 1st gear 2nd gear 3rd gear 4th gear 5th gear	0.06-0.12	0.22	
2. Free gears on pinion and input shafts 1st gear 2nd gear 3rd gear 4th gear 5th gear	0.3-0.4 0.2-0.3 0.2-0.3 0.2-0.3 0.2-0.3	0.5 0.4 0.4 0.4 0.4	
3. Shift rods a. Side play in bushings	0.195 - 0.236	0.4	
b. Runout	--	0.10	

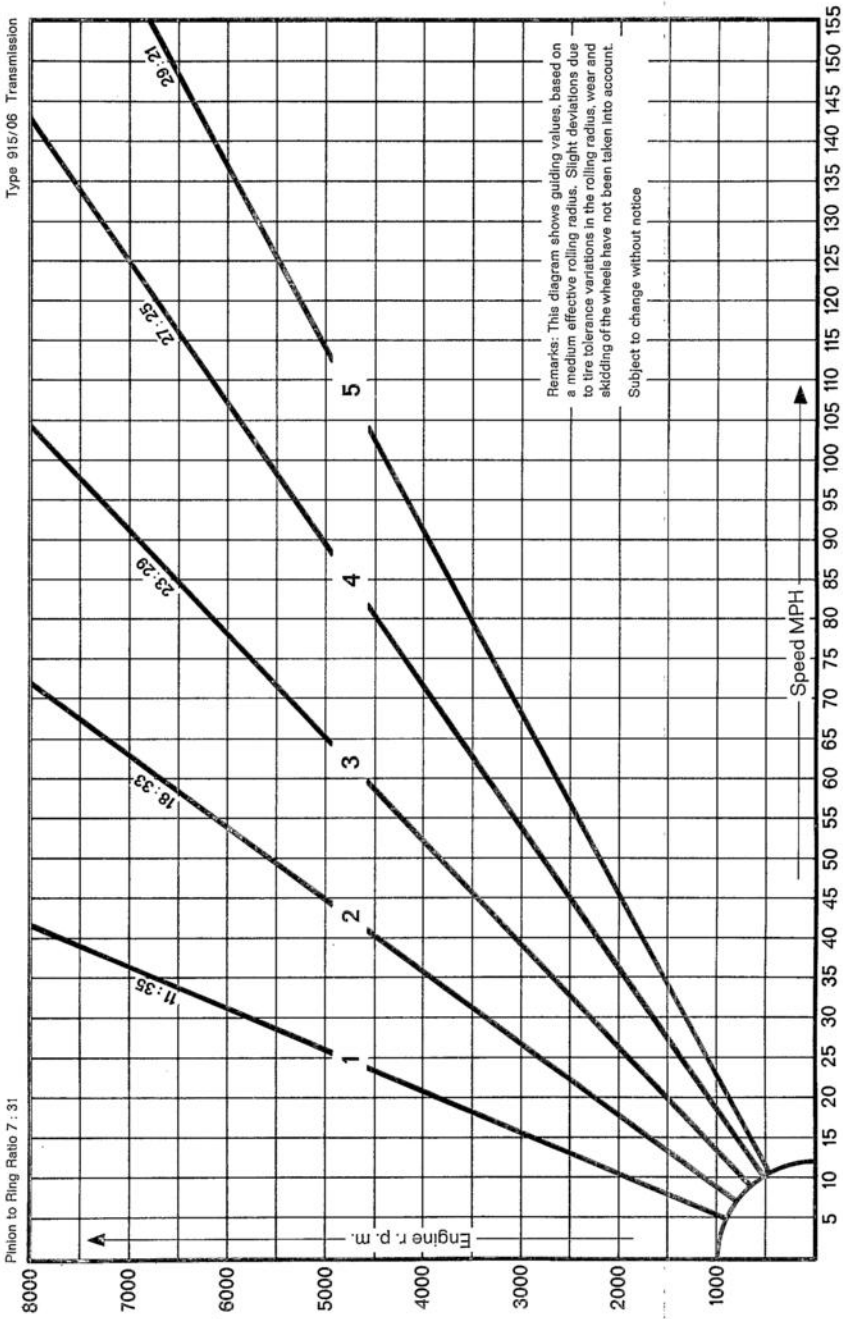
Measuring point	Installed tolerances (new) mm	Wear Limit mm	
4. Side-play between shift fork and shift sleeve: 5th and reverse gear 1st and 2nd gear 3rd and 4th gear	0.1-0.3 0.1-0.3 0.1-0.3	0.5 0.5 0.5	
5. Outside diameter of synchronizing rings: (installed) 1st gear 2nd gear 3rd gear 4th gear 5th gear	86.37 ± 0.17 86.37 ± 0.17 76.3 ± 0.18 76.3 ± 0.18 76.3 ± 0.18	When molybdenum coat (a) is worn off at any point	
6. Input shaft a. Runout at the pilot journal	0.1 max.	0.1 max. (straighten)	

Transmission Diagram 4-speed-transmission



Transmission Diagram

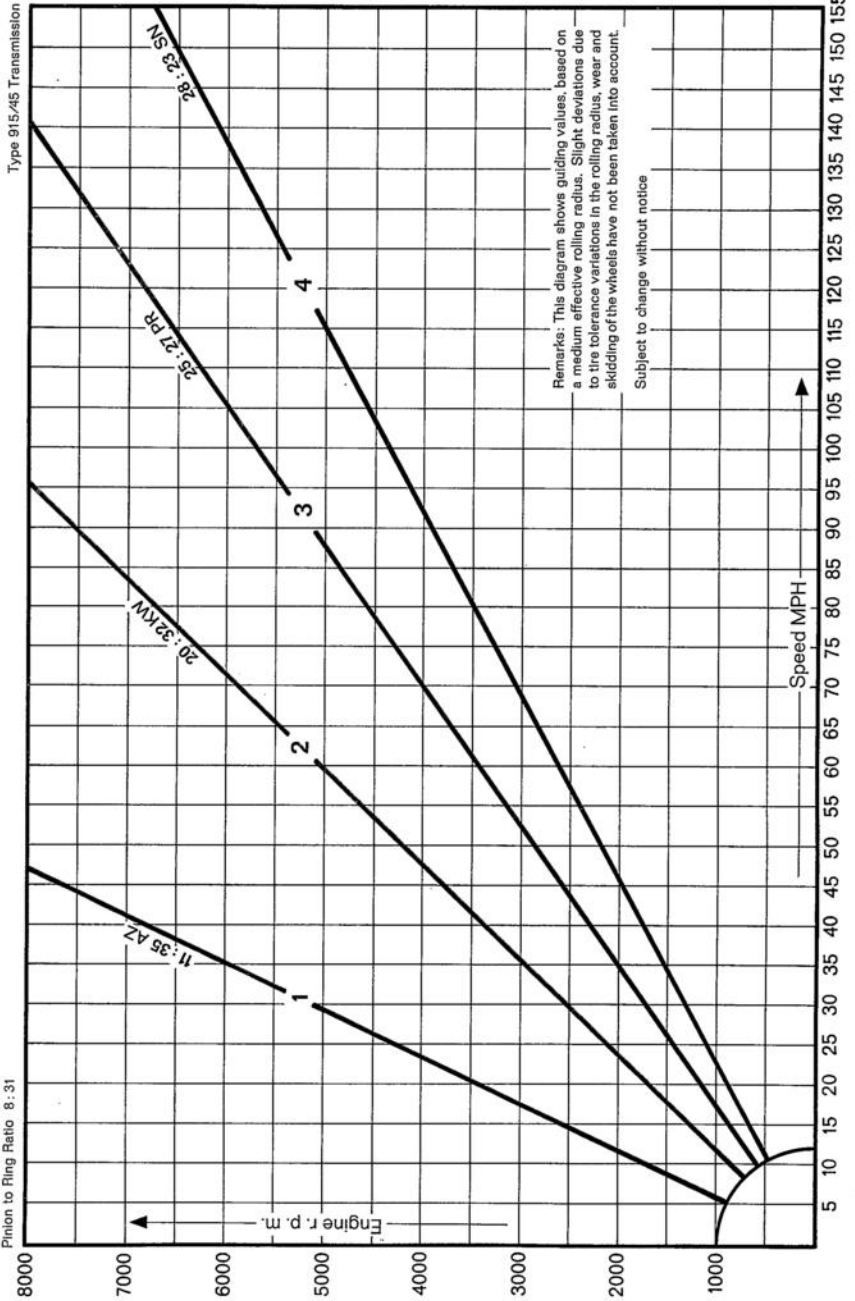
5-speed-transmission



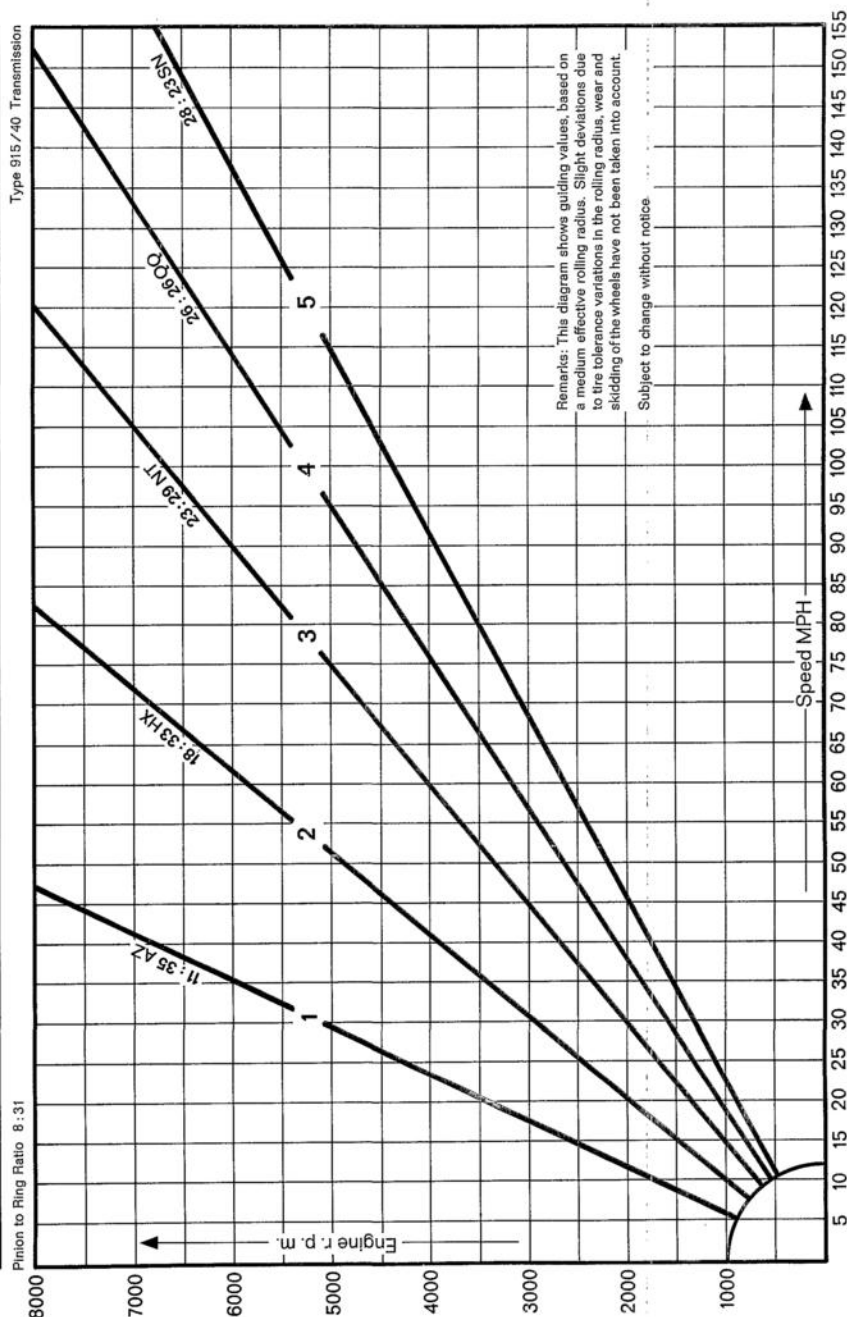
General Data	Type 915 Transmission (1974 model)		
	911	911 S	Carrera
<u>Gear Ratios</u> Type 915/16 transmission: 1st gear 2nd gear 3rd gear 4th gear Reverse gear	AZ 11/35 = 3.182 KW 20/32 = 1.600 PQ 25/26 = 1.040 TL 29/21 = 0.724 12/21 = 3.325 20/38		
Type 915/06 transmission: 1st gear 2nd gear 3rd gear 4th gear 5th gear Reverse gear	AZ 11/35 = 3.182 HX 18/33 = 1.834 RP 23/29 = 1.261 TL 27/25 = 0.926 29/21 = 0.724 12/21 = 3.325 20/38		
<u>Climbing Ability</u> (calculated) Vehicle Weight: empty according to DIN + 1/2 load			
1st gear 2nd gear 3rd gear 4th gear	>100 % 40 % 22 % 12 %	>100 % 39 % 22 % 11 %	>100 % 43 % 23 % 11 %
1st gear 2nd gear 3rd gear 4th gear 5th gear	>100 % 48 % 29 % 19 % 12 %	>100 % 47 % 29 % 18 % 11 %	>100 % 52 % 30 % 19 % 11 %

General Data	Type 915 Transmission (1974 model)		
	911	911 S	Carrera
Rear axle drive	spiral bevel gears, differential $7/31 = 4.429$ double-joint half-axes, to rear wheels		
Final drive ratio			
Power transfer			
<u>Transaxle Weight</u> 4-speed transmission 5-speed transmission	54 kg (119 lb), ready with oil and starter 55 kg (121 lb), ready with oil and starter		
<u>Filling Capacities</u> Transmission and differential	approx. 3 ltr. (3.17 US gts.) SAE 90 transmission oil, MIL-L 2105 or MIL-L 2105 B specification		
Transmission and differential, limited slip	approx. 3 ltr. (3.17 US gts.) SAE 90 transmission oil, M 2 C 119 A		

Transmission Diagram 911 S 4-speed-transmission



Transmission Diagram 911 S 5-speed-transmission



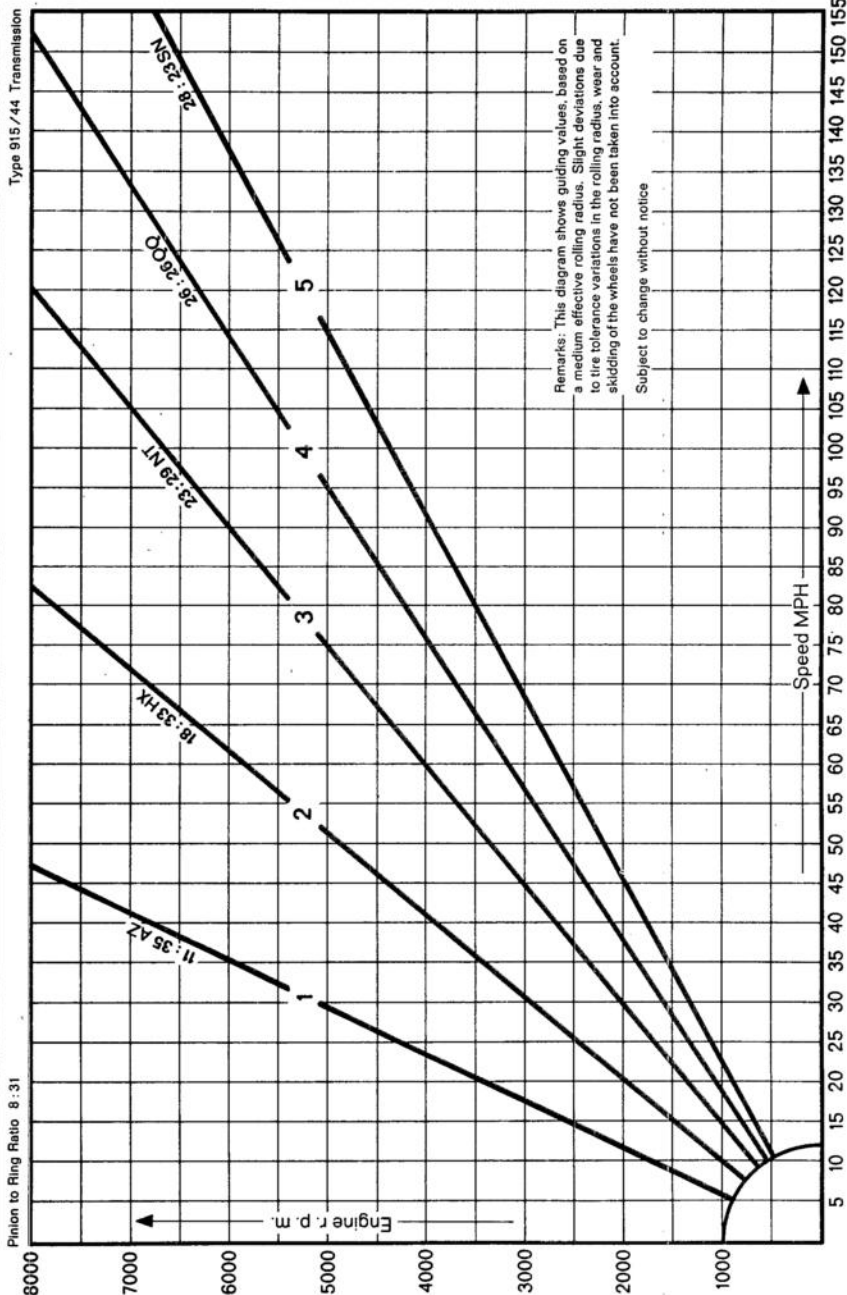
General Data	Manual Transmission 915 (1975 Models)
	911 S, Carrera
<u>Ratios</u>	
1st gear	AZ 11/35 = 3.181
2nd gear	KW 20/32 = 1.800
3rd gear	PR 25/27 = 1.080
4th gear	SN 28/23 = 0.821
Reverse	12/21 20/38 = 3.325
1st gear	AZ 11/35 = 3.181
2nd gear	HX 18/33 = 1.833
3rd gear	NT 23/29 = 1.261
4th gear	QQ 26/26 = 1.000
5th gear	SN 28/23 = 0.821
Reverse	12/21 20/38 = 3.325
Final drive	8/31 = 3.875
<u>Capacities</u>	
Transmission and differential	Approx. 3 liters (3.17 US qt.) of SAE 90 transmission oil meeting Specifications MIL-L-2105 or MIL-L-2105 B

General data	Manual transmission 915 - 1976, 1977, 1978 and 1979 models
Ratios	915/44 915/61
1st gear	AZ 11 : 35 = 3.181
2nd gear	HX 18 : 33 = 1.833
3rd gear	NT 23 : 29 = 1.261
4th gear	QQ 26 : 26 = 1.000
5th gear	SN 28 : 23 = 0.821
Reverse	12 : 21 x 20 : 38 = 3.325
Final drive ratio	8 : 31 = 3.875
Capacity	approx. 3 ltr./3.15 US qt of SAE 90 transmission oil meeting API Classification GL 5 (or MIL-L 2105 B)
Transmission weight	56 kg/123 lb ready for installation with oil and starter

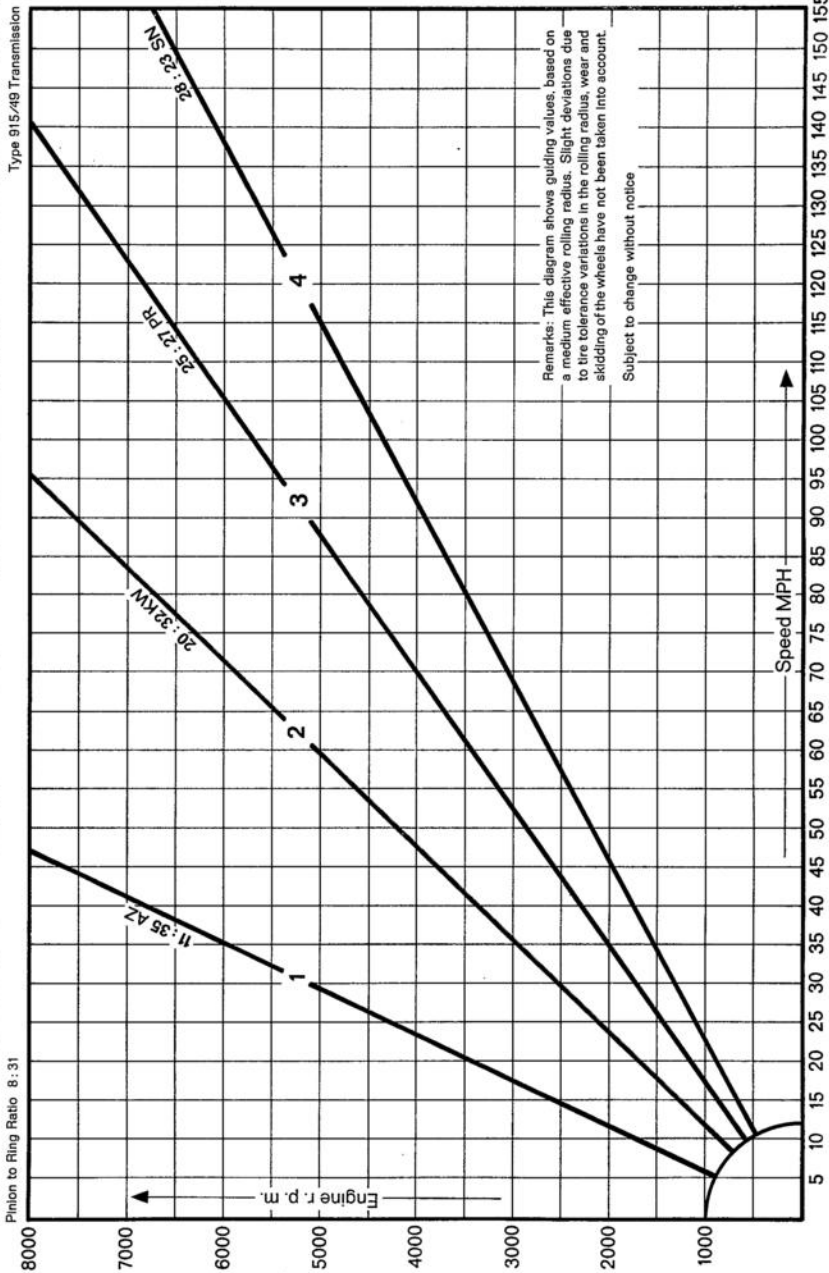
General data	Manual transmission 915 - 1980 model and 1981 models
Ratios	915/63
1st gear	11 : 35 = 3.181
2nd gear	18 : 32 = 1.778
3rd gear	23 : 29 = 1.261
4th gear	26 : 26 = 1.000
5th gear	28 : 23 = 0.821
Reverse	12 : 21 x 20 : 38 = 3.325
Final drive ratio	8 : 31 = 3.875
Capacity	approx. 3 ltr./3.15 US qt of SAE 90 transmission oil meeting API Classification GL 5 (or MIL-L 2105 B)
Transmission weight	56 kg/123 lb ready for installation with oil and starter

5-speed-transmission

Transmission Diagram

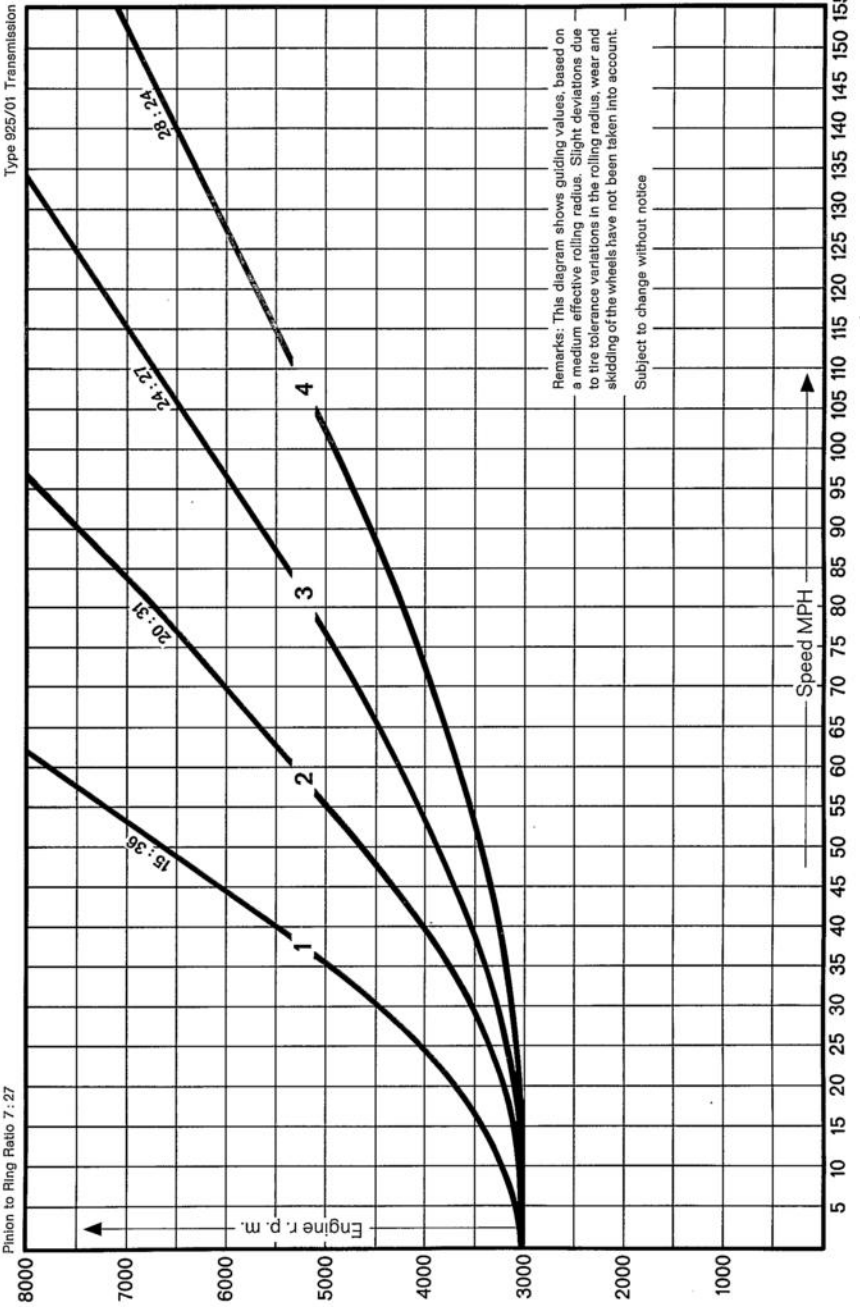


Transmission Diagram 4-speed-transmission



Transmission Diagram

Sportomatic



General Data	925/00 911 T	925/00 911 E	925/01 911 S
Gear ratios *	(15/36) = 2.400 : 1 (20/31) = 1.550 : 1 (24/27) = 1.125 : 1 (28/24) = 0.858 : 1 (15/21 - 21/38) = 2.533 : 1		
Torque converter ratio	2.19 : 1		2.1 : 1
Final drive ratio *	(7/27) = 3.857 : 1		
Filling Capacities	Approx. 3.0 ltr (3.17 US qts)		
Transmission and differential	SAE 90 transmission oil, specification Mil-L 2105 or Mil-L 2105B		
Engine	approx. 10 ltr. (10.5 US qts)	approx. 11 ltr (11.6 US qts) w/oil cooler	
Two-start speed in L-range	approx. 35 kmh (22 mph)		
Stallspeed	2500 - 2700 rpm		2900 - 3100 rpm

* In parenthesis; number of teeth

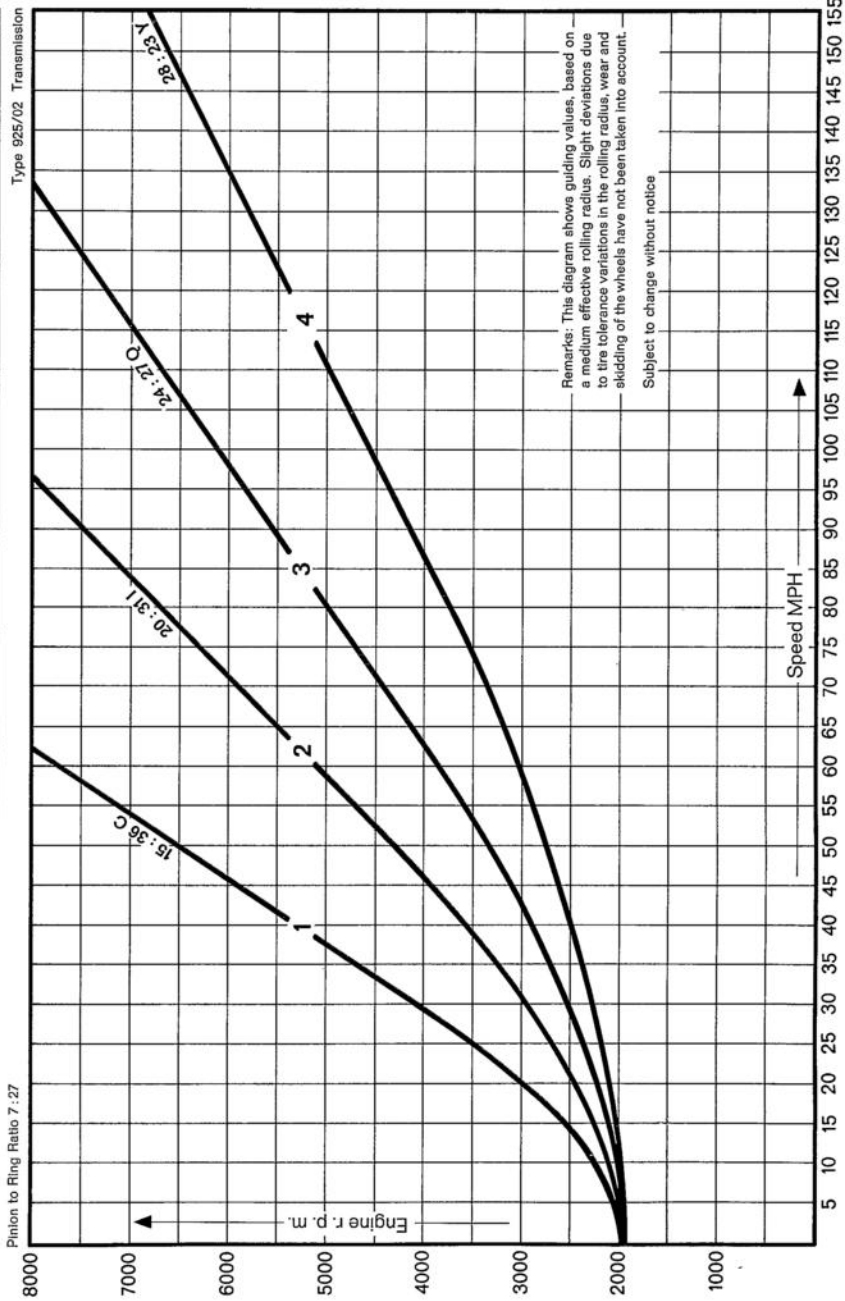
TIGHTENING TORQUES - SPORTOMATIC 925

Location	Description	Thread	Grade	mkp	ft. lbs.
Transmission housing (at stud for side and front cover, and fork piece)	Nut	M8 x 1.25	6.8	2.1-2.3	15.2-16.6
	Mid grip nut	M8 x 1.25	x12 CrNi 18.8	2.2-2.5	15.9-18.1
Transmission housing (oil filler plug)	Plug	M24 x 1.5 (1:16 taper)	St 37	2.0-2.5	14.5-18.1
Transmission housing (oil drain plug)	Plug with magnet	M24 x 1.5 (1:16 taper)	St 37	2.0-2.5	14.5-18.1
Transmission housing (breather)	Breather	M14x1.5 (1:16 taper)	9S 20K	2.0-3.0	14.5-21.7
Transmission housing	Backup light switch	M18x1.5	Ms	3.5-4.0	25.3-28.9
Transmission housing	Bypass switch	M18x1.5	Ms	3.5-4.0	25.3-28.9
Transmission housing (starter attachment)	Nut	M10x1.5	8.8	4.6-4.8	33.3-34.7
Transmission housing (vacuum servo unit carrier and attachment)	Nut	M8x1.25	6.8	2.1-2.3	15.2-16.6
Torque converter housing (attachment to transmission housing)	Nut	M8x1.25	6.8	2.1-2.3	15.2-16.6
	Nut	M10x1.5	8.8 (SW15)	4.6-4.8	33.3-34.7
Torque converter housing (attachment of freewheeling support)	Allen-head bolt	M6x1.0	10.9	1.2-1.4	8.7-10.1
Torque converter housing	Threaded coupling	M24x1.5	6 S	3.0-3.5	21.7-25.3
Torque converter housing	Temperature sensor	M14x1.5	Ms	2.5-3.0	18.1-21.7
Torque converter housing	Temperature switch	M14x1.5	Ms	2.5-3.0	18.1-21.7
Torque converter housing (clutch pressure plate)	Allen-head bolt	M6x1.0	10.9	1.2-1.4	8.7-10.1
Torque converter coupling plate	2-point bolt	M8x1.25	8.8	2.4-2.6	17.4-18.8

Location	Description	Thread	Grade	mkp	ft. lbs.
Intermediate plate (clamping plate)	Bolt	M8x1.25	8.8	2.1-2.3	15.2-16.6
Intermediate plate	Bellcrank shaft	M8x1.25	9 S 20 K	2.1-2.3	15.2-16.6
Intermediate plate (shift detent)	Cover plug	M14x1.5	4.6	2.2-2.5	15.9-18.1
Transmission front cover (speedometer drive retainer)	Bolt	M8x1.25	8.8	1.6-1.8	11.6-13.0
Transmission front cover (9 mm dia ball - parking lock)	Cover plug	M12x1.5	5.8	3.0-3.5	21.7-25.3
Angular drive in retaining bushing	Hollow bolt	M24x1.5	6.8	2.2-2.4	15.9-17.4
Input shaft	Nut	M24x1.5	6.9	10-12	72.3-86.8
Input shaft	Flanged nut	M18x1.5	5.8	11-13	79.6-94.0
Pinion shaft	Stretch bolt	M12x1.5	10.9	11-12	79.6-86.8
Selector forks	Bolts	M8x1.25	8.8	2.2-2.6	15.9-18.8
Differential (ring gear attachment)	Bolt	M12x1.25	11.9	11.5-12	83.2-86.8
U-joint flange (in differential)	Stretch bolt	M10x1.5	8.8	3.5-4.0	25.3-28.9
Transmission front cover (transmission carrier attachment)	Nut	M8x1.25	6.8	2.1-2.3	15.2-16.6

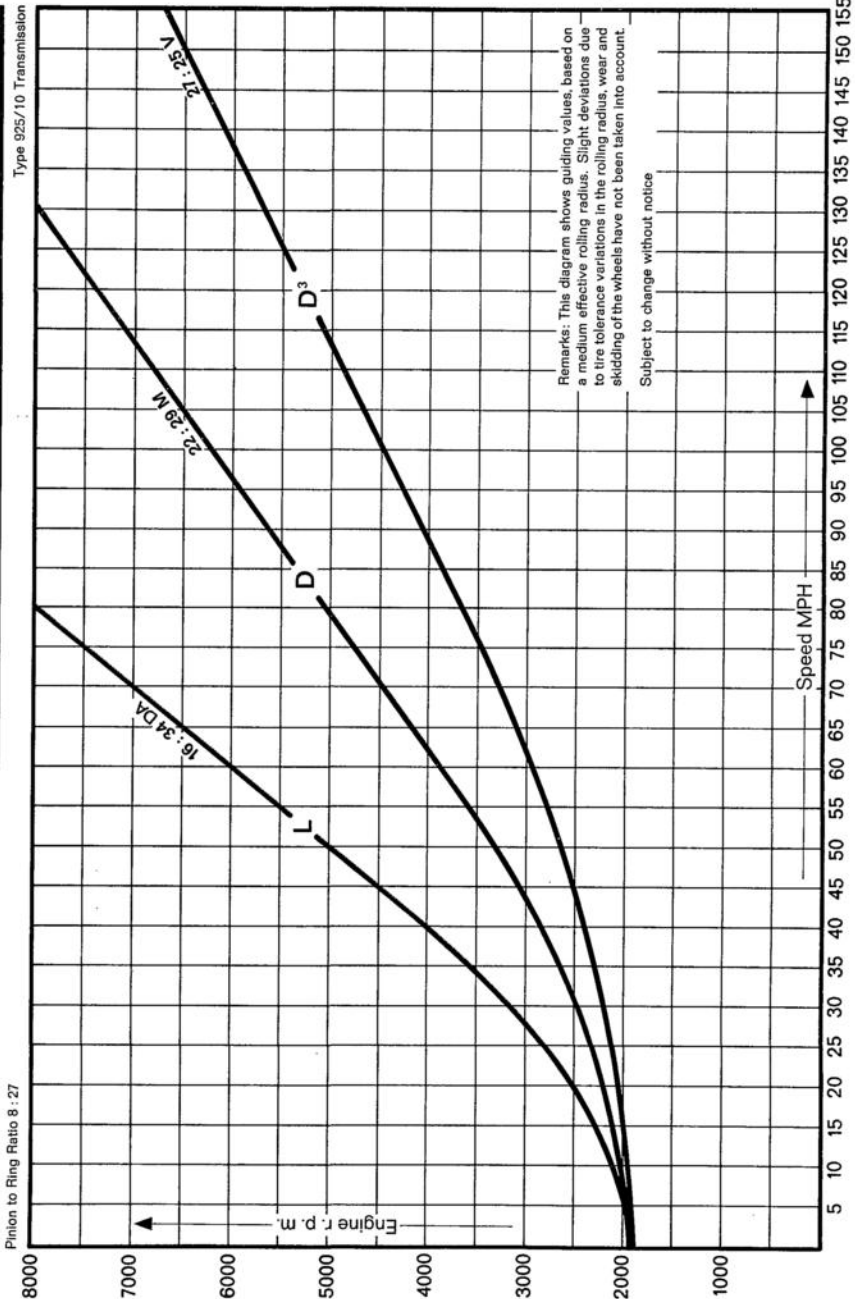
Sportomatic

Transmission Diagram



General Data	Sportomatic (1974 model)	
<u>Climbing ability - percent</u>	925/02	
	911	911 S
1st gear	57 (73)	56 (67)
2nd gear	32 (40)	32 (39)
3rd gear	21 (28)	20 (27)
4th gear	12 (19)	11 (19)
	() in parentheses: brief climbing ability	
<u>Gear Ratios</u>		
1st gear	15/36 = 2.400	
2nd gear	20/31 = 1.550	
3rd gear	24/27 = 1.125	
4th gear	12/21 = 0.821	
Reverse gear	12/21 = 2.534 21/38	
Torque converter ratio	1.7 - 1.9	
Final drive ratio	7/27 = 3.857	
<u>Filling Capacities:</u>		
Transaxle	approx. 2.5 ltr. (2.6 US gts.) SAE 90 transmission oil MIL-L 2105 or MIL-L 2105 B	
Engine	approx. 13 ltr. (13.7 US gts.)	
Tow-start speed in "L" (Low)	approx. 35 kmh (22 mph)	
Stall speed	1850 - 2250	1750 - 2150
Clutch speed (at full power)	3250 $\pm$ 200	3080 $\pm$ 200

Transmission Diagram Sportomatic

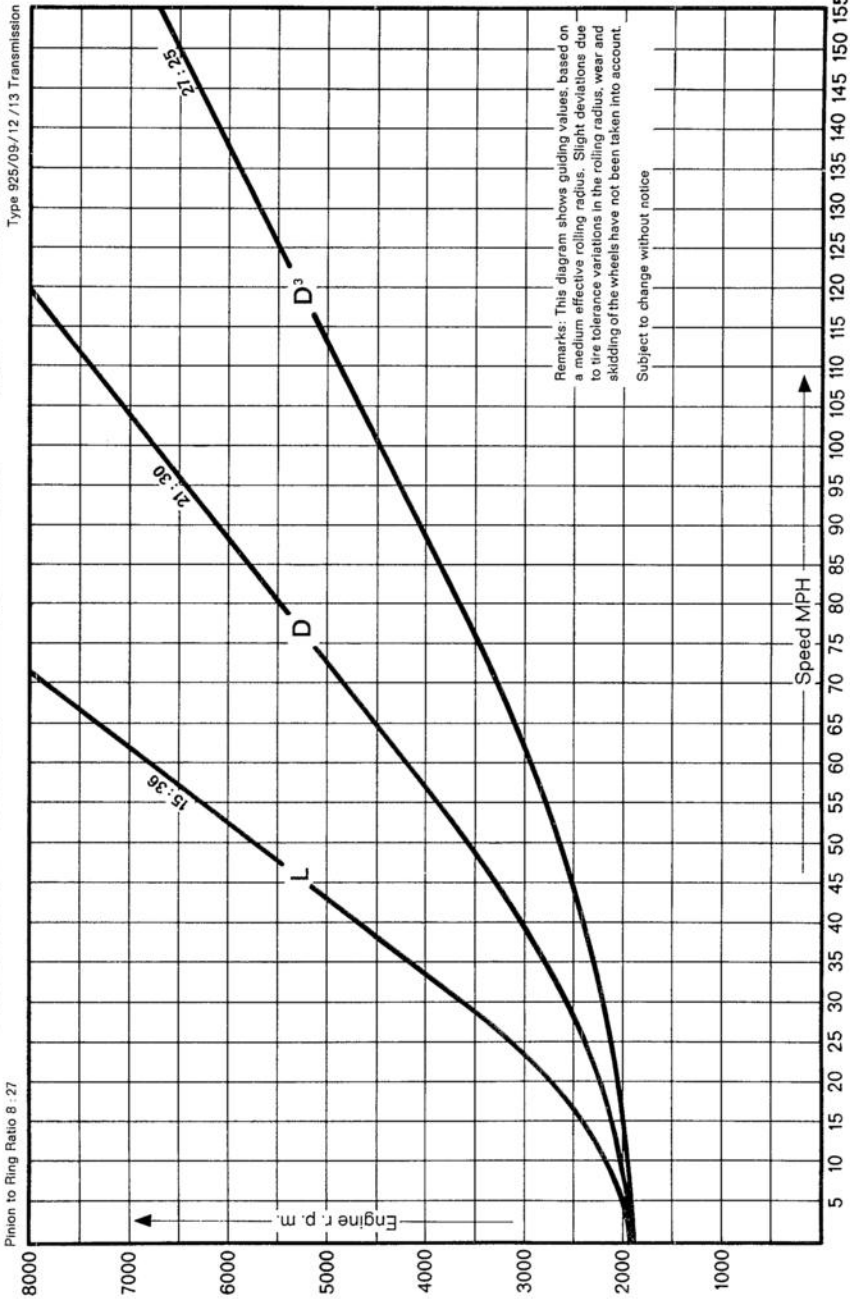


General Data	Sportomatic 925 (1975 Models)	
Ratios	925/10	
1st gear	DA	$16/34 = 2.125$
2nd gear	M	$22/29 = 1.318$
3rd gear	V	$27/25 = 0.926$
Reverse	$15/21$ $21/38 = 2.534$	
Converter	1.7 - 1.9	
Final drive	$8/27 = 3.375$	
Capacities		
Transmission with final drive	Approx. 2.5 liters (2.65 US qt.) of SAE 90 transmission oil meeting Specifications of MIL-L-2105 or 2105 B	
Towing speed in range "L" to start	Approx. 22 mph	
Stall speed (rpm)	1900 ± 200	California 1850 ± 200
Clutch speed (rpm)	3100 ± 200	3000 ± 200

General Data	Sportomatic 925 1976 and 1977 Models	
Ratios	925/12 1976 Mod.	925/17 1977 Mod.
1st speed	C 15 : 36 = 2.400	
2nd speed	K 21 : 30 = 1.429	
3rd speed	V 27 : 25 = 0.926	
Reverse	15 : 21 x 21 : 38 = 2.534	
Final Drive Ratio	8 : 27 = 3.375	
Gearbox and Final Drive Capacity	about 2,5 ltr. / 2,6 U.S. qt of SAE 90 Gear Lube meeting Specifications MIL-L 2105 or MIL-L 2105 B	
Speedometer	Electronic	
Converter Ratio	1,9	
Tow-Start Speed in Range "L"	about 25 mph	
Stall Speed (rpm)	1900 $\pm$ 200	
Transmission Weight (ready for installation with converter, starter and oil)	about 71 kg/156 lb	
Contact Pressure of Pressure Plate	7845 - 8630 N (800 - 880 kp)	6400 - 7100 N (652 - 724 kp)

Sportomatic

Transmission Diagram

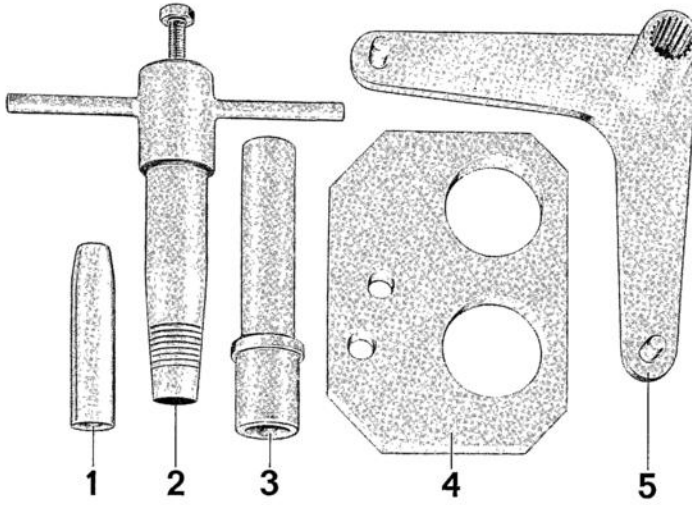


SPECIAL TOOLS - SPORTOMATIC

P 361	Mandrel
P 362	Mandrel
P 358 a	Installer
P 370	Centering mandrel
P 359	Installer
P 351	Assembly plate
P 37	Input shaft holder
P 353 a	Remover
P 260	Support plate
P 218	Mandrel
P 262	Pilot mandrel
P 371	Thrust piece
P 372	Centering mandrel
P 360	Installer
P 364	Assembly sleeve
P 254	Puller and installer
P 256 a	Input shaft lock
P 252	Socket, 32 mm
P 255	Guide sleeve
P 265 b	Thrust piece
P 263	Thrust piece
P 264 b	Installer
P 258	Mandrel
P 258 b	Bushing
P 258 c	Gauge block
P 357 a	Holder
P 357	Dial gauge holder, spacer, feeler tip (w/o clamping adapter)
VW 401	Press plate
VW 402	Press plate
VW 412	Thrust piece
VW 426	Thrust sleeve
VW 405	V-block
VW 407	Thrust piece
=	New special tools

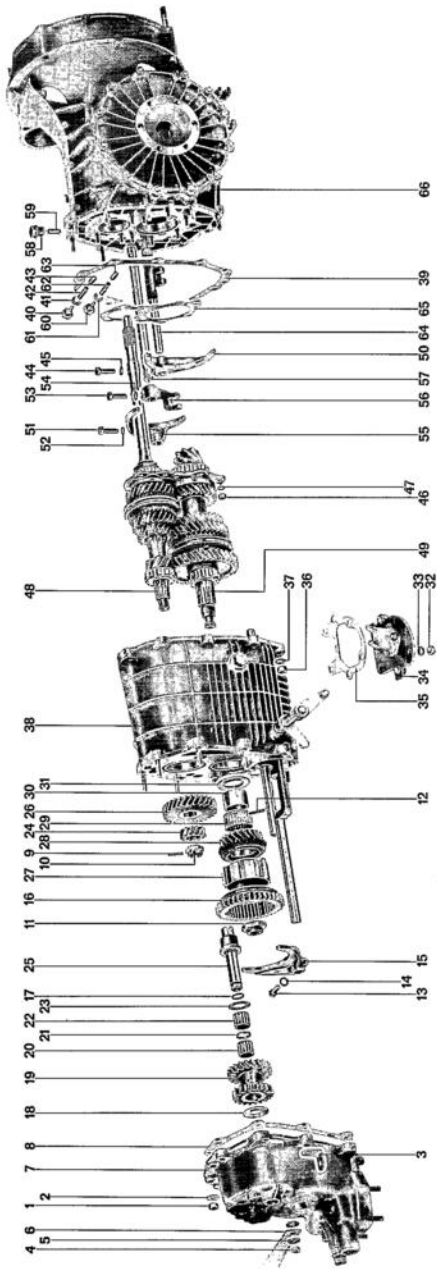
TRANSMISSION

TOOLS



No.	Description	Special Tool	Remarks
1	Sleeve	P 382	
2	Puller	P 386	
3	Driver	P 381	
4	Shift rod holder	P 260 a	
5	Input shaft holder	P 37 a	

Disassembling and Assembling Manual Transmission



Nr.	Description	Qty	Note when		Special instructions see
			Removing	Installing	
1	Self-locking nut	8		Replace if necessary, torque to specification.	
2	Washer	7			
3	Clutch cable bracket	1			
4	Self-locking nut	1		Replace if necessary, torque to specification.	
5	Washer	2		Place one on each side of ground strap.	
6	Ground strap	1			
7	Front transmission cover	1			
8	Gear housing gasket	1		Replace.	
9	Roll pin	1	Drive out.	Replace if necessary.	
10	Castellated nut	1		Torque to specification.	3.1-1/13
11	Flange nut	1		Replace, torque to specification.	3.1-1/13
12	Roll pin	1	Drive out.	Replace if necessary.	
13	Bolt	1		Torque to specification.	
14	Spring washer	1		Replace if necessary.	
15	Shift fork, 5th and reverse gear	1		Readjust.	3.1-2/2

Nr.	Description	Qty	Note when		Special instructions see
			Removing	Installing	
16	Sliding gear, 5th and reverse gear	1		Check for wear.	
17	O-ring	1		Replace, oil lightly.	
18	Thrust washer	1			
19	5th and Reverse idler gear	1		Check for wear.	
20	Needle bearing cage	1		Check for wear.	
21	Intermediate ring	1			
22	Needle bearing cage	1		Check for wear.	
23	Thrust needle bearing cage	1		Check for wear.	
24	Reverse speed, Gear I	1		Replace in pairs only.	
25	Shaft for 5th and Reverse idler gear	1	Remove together with fixed Gear I of 5th speed.	Install together with fixed Gear I of 5th speed.	
26	Gear I, fixed, 5th speed	1		Small flange faces gear housing. Replace in pairs only.	
27	Guide sleeve	1		Check for wear.	
28	Gear II, free, 5th speed	1		Check synchronization. Replace in pairs only.	3.1-8/4
29	Needle bearing cage	1	Mark position for installation.	Install with same gear.	
30	Bushing	1	Mark position for installation.	Install with same gear.	

Nr.	Description	Qty	Note when		Special instructions see
			Removing	Installing	
31	Thrust washer	1			
32	Self-locking nut	4		Replace if necessary, torque to specification.	
33	Washer	4			
34	Cover with guide fork	1			
35	Gasket	1		Replace.	
36	Self-locking nut	10		Replace if necessary, torque to specification.	
37	Washer	10			
38	Gear housing	1	Move selector fork rod for 5th speed and reverse into neutral and remove.		
39	Gasket	1		Replace.	
40	Nut	1		Torque to specification.	
41	Seal	1		Replace.	
42	Spring	1			
43	Short detent	1		Check for free movement.	
44	Nut	1		Torque to specification.	
45	Spring washer	1		Replace if necessary.	
46	Nut	10		Torque to specification.	
47	Lock washer	10		Replace.	

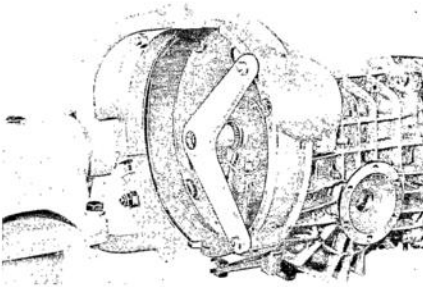
Nr.	Description	Qty	Note when		Special instructions see
			Removing	Installing	
48	Input shaft	1	Remove together with pinion shaft, 1st and 2nd speed selector fork, and complete 3rd and 4th speed shift rod.		3.1-1/10
49	Pinion shaft	1			
50	1st and 2nd speed selector fork	1		Check for wear, readjust.	3.1-2/1
51	Bolt	1		Torque to specification.	
52	Spring washer	1		Replace if necessary.	
53	Bolt	1		Torque to specification.	
54	Spring washer	1		Replace if necessary.	
55	3rd and 4th speed selector fork	1		Check for wear, readjust.	
56	Shift guide	1		Check for wear, readjust.	
57	3rd and 4th speed shift rod	1			
58	Plug	1		Torque to specification.	
59	Short detent	1		Check for free movement.	
60	Bolt	1		Torque to specification.	

Nr.	Description	Qty	Note when		Special instructions see
			Removing	Installing	
61	Seal	1	Replace.		
62	Spring	1			
63	Short detent	1	Check for free movement.		
64	1st and 2nd speed selector fork rod	1			
65	Shim	X	Note thickness and quantity.	Recompute if necessary.	
66	Transmission housing	1			

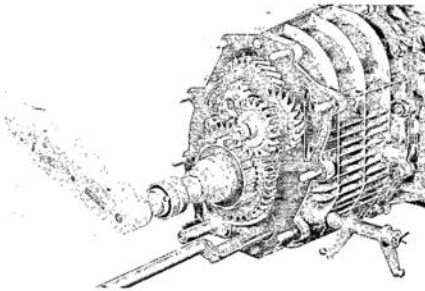
DISASSEMBLING AND ASSEMBLING MANUAL TRANSMISSION

Disassembling

1. Block input shaft with special tool P 37a, engage 5th gear.

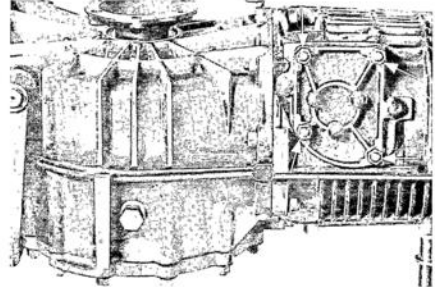


2. Remove castellated nut from input shaft, and flange nut from pinion shaft.



3. Mark needle bearing of 5th speed free gear; it must be reassembled with same gear.

4. Remove guide fork cover with gasket.



5. Remove nuts from gear housing. Pull housing and selector fork rod (5th and reverse speed), and selector fork rod with selector shaft off the studs (tap lightly with a plastic mallet, if necessary).

Note

Selector fork rod for 5th and reverse speed must be in neutral. Otherwise the gear housing will bind against the rod and cannot be removed.

6. Remove shift detent plug (3rd and 4th gear).
Take out spring and detent.

10. Remove detent.

7. Remove bolt from selector fork of 1st and
2nd gear, gently spread clamping piece with
screwdriver.

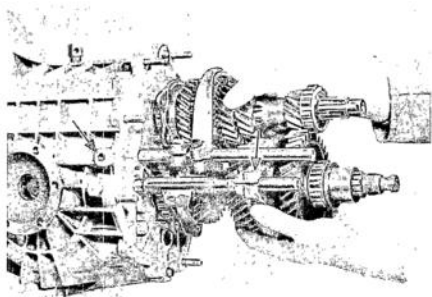
11. Remove plug from shift detent (1st and
2nd gear) and take out spring and detent.

8. Remove retaining plates for input and
pinion shafts.

12. Take out selector fork rod 1st and 2nd
gear.

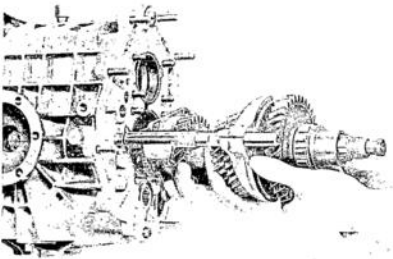
9. Take input and pinion shafts with complete
selector fork rod (3rd and 4th speed) and
selector fork (1st and 2nd gear) out of their
seats.

13. Note the number and thickness of shims
between transmission housing and retaining
plates for reinstallation.



Assembling

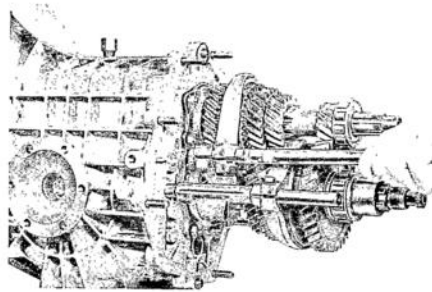
1. Place the same number and thickness of shims on the transmission housing studs as noted during disassembly or as determined while adjusting the pinion.
2. Insert 1st and 2nd speed selector fork rod.
3. Insert 1st and 2nd speed shift detent and spring.
4. Torque bolt to specification.
5. Insert pinion shaft with 1st and 2nd speed selector fork so that the pinion comes barely to rest in the bearing race of the transmission housing.



Note

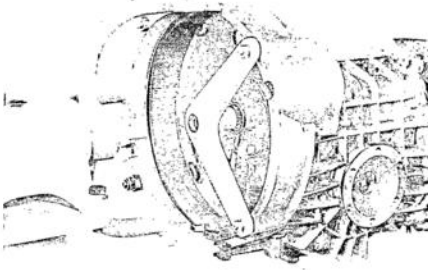
To keep the selector fork from binding on the selector fork rod, slightly open the selector fork clamping piece with a screwdriver.

6. Insert input shaft and push into place together with the pinion shaft.
7. Torque clamping plate nuts to specification.
8. Lightly tighten selector fork bolt (1st and 2nd speed).
9. Insert detent from the top.
10. Unscrew bolts for 3rd and 4th speed selector fork and fork clamping piece. Push fork and clamping plate back so that the selector fork and rod can be installed.



11. Lightly tighten selector fork and fork piece bolts.
12. Insert shift detent and spring, torque plug to specification.
13. Adjust selector forks (see 3.1-2/1).
14. Place transmission housing gasket on the studs.
15. Install gear housing together with selector fork rod (5th speed and reverse) and selector shaft. Tighten to correct torque.
16. Push selector fork rod in the ball sleeve, and selector shaft into the shift pawl guides.
17. Install guide fork cover and gasket. Tighten to correct torque.
18. Install idler gear shaft turning the shaft until the pin in the gear housing prevents it from turning.
19. Install reverse speed Gear I and start castellated nut on threads.
20. Install thrust washer for 5th speed free gear.
21. Install needle bearing with 5th speed free gear.
22. Install guide sleeve for 5th and reverse speed, start flange nut on threads.
23. Install thrust needle bearing cage, idler gear with needle bearing cages and intermediate piece and thrust washer on the idler shaft.
24. Slide 5th speed and reverse sliding gear with selector fork on guide sleeve and selector fork rod. Slightly open the selector fork clamping piece for easier assembly.
25. Lightly tighten selector fork bolt.
26. Apply light coat of oil to the O-ring and install.

27. Block input shaft with special tool P 37a, and engage 5th gear. Tighten input shaft castellated nut and pinion shaft flange nut to correct torque.



28. Adjust 5th and reverse speed selector fork (see page 3.1-2/2).
29. Secure castellated nut with roll pin; and flange nut by notching.
30. Insert actuating pin for backup light switch with recessed end toward switch.
31. Place gear housing gasket on studs. Install front transmission cover, and tighten nuts to correct torque.

Effective with the listed transmission numbers, the input shaft oil seal can be replaced without the need for disassembling the transmission.

Transmission Type

915/02
915/12
915/08
Special transmissions

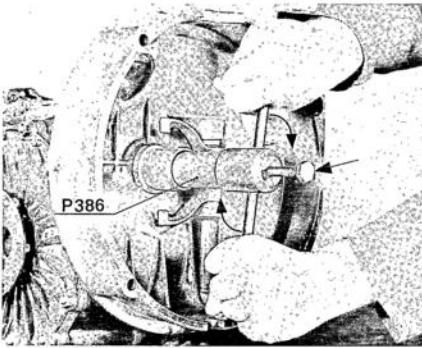
from transmission No.

733 7375
723 0507
783 0838
793 1031

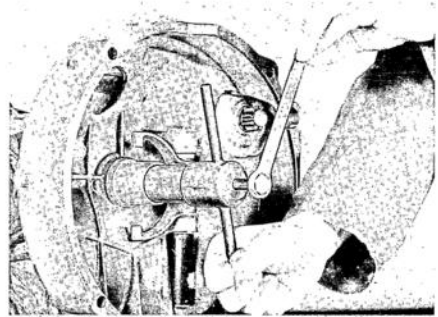
Removal

1. Remove transaxle and detach transmission from engine.

2. Screw puller P 386 firmly into the oil seal.



3. Pull oil seal out by turning the hex. bolt in the puller.



NOTE:

If the (garter) spring should slide off during removal of the seal, pull it off the input shaft with the aid of a wire hook.