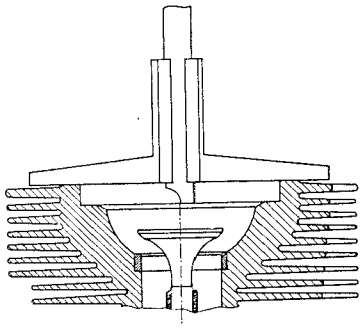
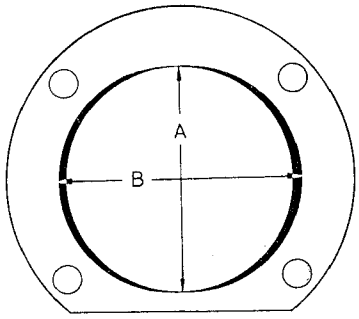
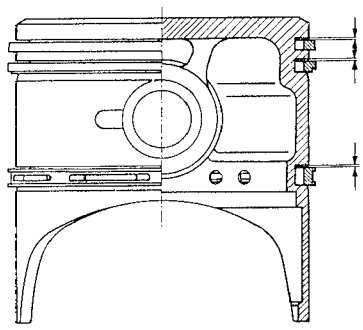
SUMMARY OF TOLERANCES AND WEAR LIMITS

GROUP E

Tolerances and Wear Limits

The figures given in these tables are valid for all Model 356 B 1600 and 1600 S Engines. Values which differ for particular engines are specifically noted.

ENGINE

Measuring point	Tolerance (new) mm	Wear limit mm	
1. Cylinder seat in cylinder head	9.500 – 9.600	10.000	
2. Cylinder ovality (see sketch) B minus A	–	0.020	
3. Piston / cylinder clearance Light alloy cylinder 1600 S Engine Cast iron cylinder 1600 Engine	 0.015 – 0.025 0.041 – 0.059	 0.10 0.20	———
4. Compression ring / groove clearance 1600 S Engine Ring 1. Ring 2.	 0.045 – 0.072 0.025 – 0.052	0.30	
5. Oil ring / groove clearance	0.025 – 0.052	0.30	

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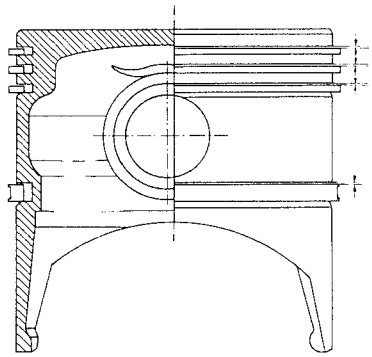
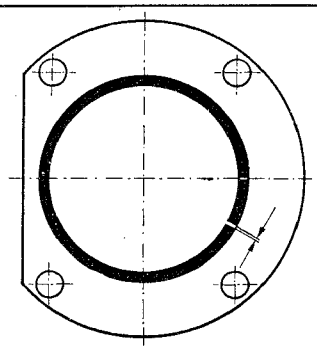
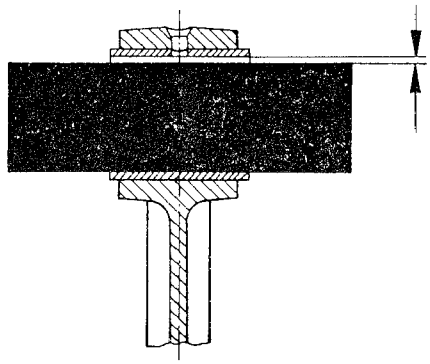
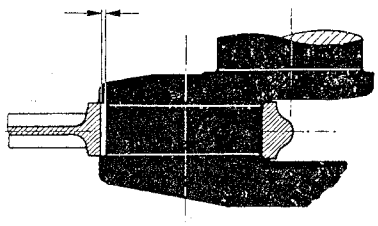
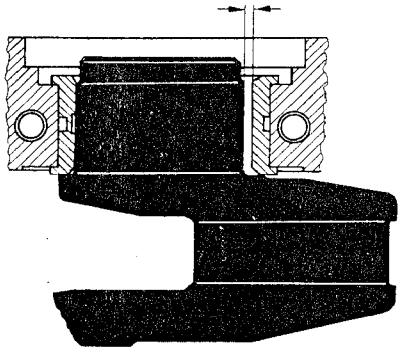
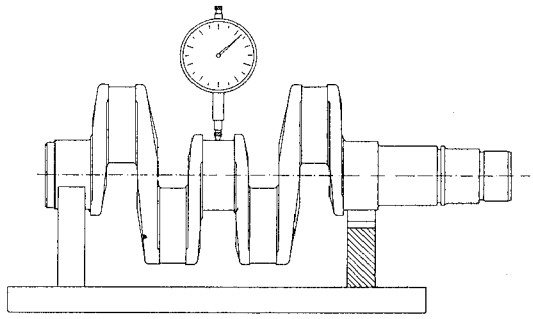
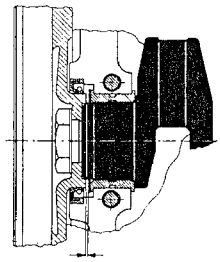
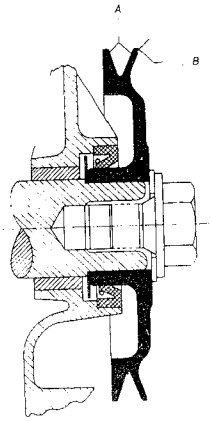
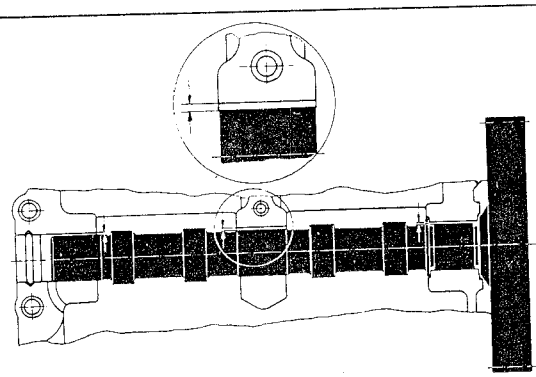
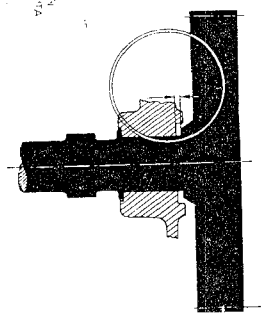
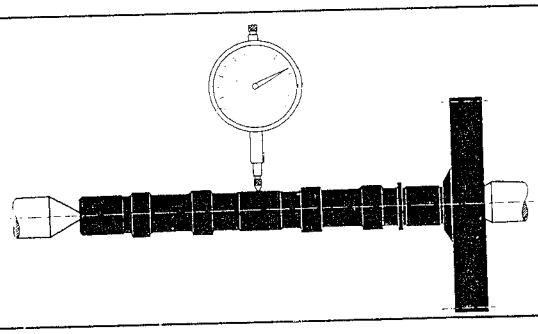
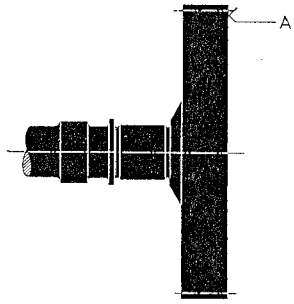
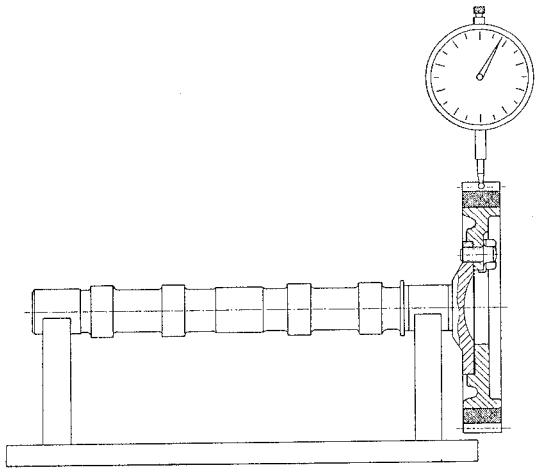
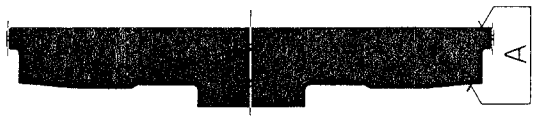
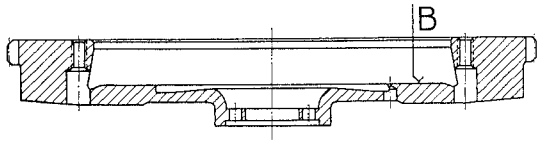
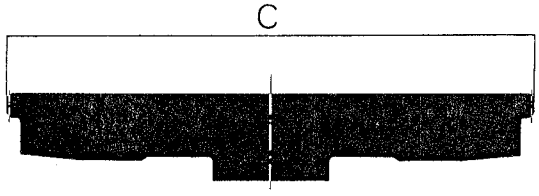
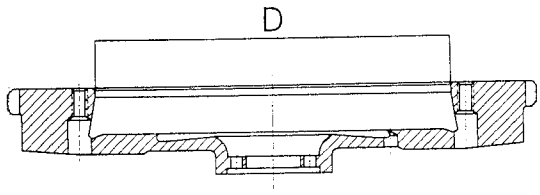
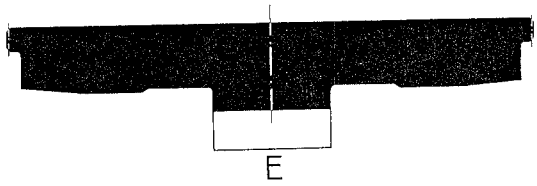
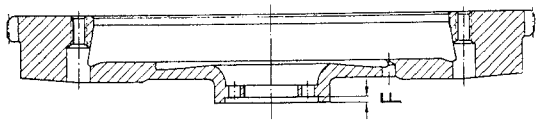
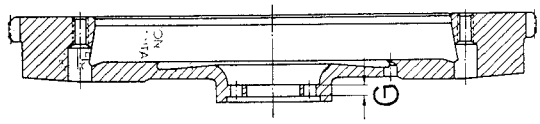
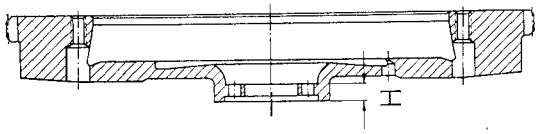
Measuring point		Tolerance (new) mm	Wear limit mm	
6. Compression ring / groove clearance 1600 Engine	Ring 1. Ring 2. Ring 3.	0.075 – 0.107 0.060 – 0.080 0.035 – 0.062	0.30	
7. Oil ring / groove clearance		0.025 – 0.052	0.30	
8. Piston ring gap, all rings 1600 S Engine 1600 Engine		0.10 – 0.45 0.25 – 0.50	0.95 0.95	
9. Weight difference for pistons of one engine		max. 10 g *)	—	———
10. Weight difference for connecting rods of one engine		max. 15 g *)	—	———
11. Piston pin / connecting rod clearance		0.020 – 0.036	0.050	
12. Connecting rod bearing clearance		0.040 – 0.092	0.130	

* Pistons and connecting rods should be paired so that their combined weights give a minimum difference within one engine.

Measuring point	Tolerance (new) mm	Wear limit mm	
13. Crankshaft main bearing clearance (installed in crankcase)			
a) Bearing 1	0.028 – 0.078	0.170	
b) Bearing 2 and 3	0.046 – 0.100	0.170	
c) Bearing 4	0.040 – 0.104	0.170	
14. No. 2 and No. 4 main bearing journals (with No. 1 and No. 3 on knife edges) deflection	max. 0.020	0.030	
15. Crankshaft end play	0.130 – 0.180	0.300	
16. Main bearing journal ovality	–	0.020	———
17. Connecting rod journal ovality	–	0.020	———
18. Crankcase bores for main bearings			
a) Bearings 1, 2 and 3 dia.	60.235 – 60.245	–	See table of dimensions page E 81
b) Bearing 4 dia.	50.000 – 50.025	–	

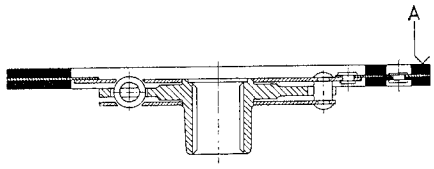
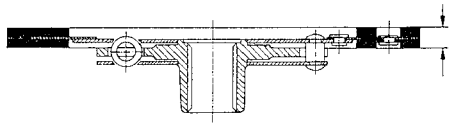
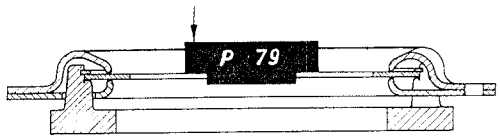
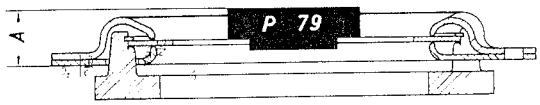
Measuring point		Tolerance (new) mm	Wear limit mm	
19. V-belt pulley	eccentricity wobble	A max. 0.250 B max. 0.250	— —	
20. Crankcase bore for camshaft	dia.	24.020 – 24.041	24.070	———
21. Camshaft clearance		0.020 – 0.054	0.120	
Thrust bearing end play		0.040 – 0.080	0.100	
Deflection at center bearing camshaft mounted on centers		0.020	0.025	

Measuring point	Tolerance (new) mm	Wear limit mm	
22. Timing gear bolted and pinned to camshaft wobble	max. 0.100	–	
Tooth clearance	0.015 – 0.040	–	
Timing gear bolted and pinned to camshaft eccentricity	0.025	0.040	
23. Flywheel (measured at rim) wobble A	max. 0.300	–	
(measured on clutch surface) wobble B	max. 0.040	–	
(measured at rim) eccentricity C	max. 0.20	–	

Measuring point	Tolerance (new) mm	Wear limit mm	
(measured in clutch plate recess) eccentricity D	max. 0.100	–	
when mounted on crankshaft (combined out of balance force)	max. 5 cmg	–	———
Hub outer dia. E	59.900 – 60.100	59.700	
Depth of recess to web F	3.10 – 3.15	–	
Web thickness G	6.3 – 6.85	min. 4.800	
Width of oil seal surface H	9.250 – 10.250	–	
Turning down of damaged tooth edges	–	max. 2.000	———
24. Valve stem dia. Intake Exhaust	9.990 – 9.978 9.970 – 9.958	9.940 *) 9.940 *)	See page E 48

* Valid only if stem to guide clearance limit is not exceeded.

CLUTCH

Measuring point	Tolerance (new) mm	Wear limit mm	
1. Clutch plate wobble A	max. 0.5	–	
2. Clutch plate with linings compressed thickness	8.2 – 8.6	7.5	
3. Clutch pedal free travel	20 – 25	–	———
4. Clutch mounted on stand VW 254, gauge ring P 79 installed. wobble	0.8	1.2	
5. Clutch mounted on stand VW 254, gauge ring P 79 installed. Height of top of gauge ring over mounting surface.	26 – 1.5	26 + 1.5	
6. Complete clutch assembly out of balance	max. 15 cmg	–	———