

Technical Data, Measures and Adjusting Values

Job No.

05-0

Valves

Model	Valve for	Valve head dia.	Stem dia.	Length	Height of valve head	Valve seat angle	Hardness on valve stem end
OM 636	intake	$\frac{32.3}{32.1}$	$\frac{8.970}{8.948}$	135.6	new 1.3-1.6 machining limit 1.0	90°+30'	HRc 55
	exhaust	$\frac{29.3}{29.1}$	$\frac{8.950}{8.928}$	135.1	new 1.36-1.6 machining limit 1.2		HRc 47
OM 621	intake	$\frac{36.2}{36.1}$	$\frac{9.940}{9.918}$	131-0.2	new 1.3-1.5 machining limit 1.0		*
	exhaust	$\frac{31.2}{31.1}$	$\frac{9.920}{9.898}$	131-0.2	new 1.8-2.0 machining limit 1.4		*

Note: Permissible out-of-true between valve stem and valve cone: max. 0.03 mm.
With the OM 621, the exhaust valves are sodium-filled (also see page 05-11/4).
*Hardness on the contact surface of the cap nut HRc 58.

Clearance between valve stem and valve guide

Model	Intake	Exhaust
OM 636	0.030-0.067	0.05-0.087
OM 621	0.060-0.097	0.08-0.117

Valve springs

Model	Outer dia. mm		Wire thickness mm	Length unten- sioned mm	Length, loaded pre-tensioned		Length, loaded block	
	top	bottom			mm	kg	mm	kg
OM 636	29.5	30.5	4.25	62	52	27.6	43	53 ± 5.3
OM 621 inner spring only for intake valve	19.5		2.0	37	28.2	4.9 ± 0.5	20.5	9.3 ± 0.9
OM 621 outer spring	30.6		4.0	47	38.4	23.1	29.9	45.9 + 4.5 - 2.2

Note: Mount the valve springs of the OM 636 in such a way that the small outer dia., top, is on the side of the valve spring retainer
Load tolerance, with new valve springs + 10 %
— 5 %
wear limit — 10 %

Valve tappets, OM 636

Standard version and repair sizes	Colour identification	Outer dia. of tappets	Tappet bore in cylinder crankcase	Running clearance of tappets
Standard	none	$\frac{25.993}{25.980}$	$\frac{26.000}{26.021}$	0.007 up to 0.041
Repair size I	red	$\frac{26.007}{25.994}$	$\frac{26.014}{26.035}$	
Repair size II	white	$\frac{26.021}{26.008}$	$\frac{26.028}{26.049}$	
Repair size III	amber	$\frac{26.043}{26.030}$	$\frac{26.050}{26.071}$	

Rocker arms and rocker arm seats, OM 636

Version	Standard	Repair size
Basic bore in rocker arm	$\frac{20.000}{20.021}$	$\frac{20.200}{20.221}$
Outer dia. of bushing	$\frac{20.056}{20.035}$	$\frac{20.256}{20.235}$
Overlap of bushing in rocker arm	0.014–0.056	
Inner dia. of bushing in rocker arm	rough-turned	finished
	$\frac{16.6}{16.7}$	$\frac{17.00}{17.018}$
Radial clearance of rocker arms on shaft	0.016–0.052	
Dia. of rocker arm shaft	$\frac{16.984}{16.966}$	
Bore in the rocker arm brackets	$\frac{16.985}{16.994}$	
Clearance of rocker arm shafts in the bore of the rocker arm brackets	0.001–0.028	

Rocker arms and rocker arm seats, OM 621

Basic bore in rocker arm	$\frac{14.000}{14.018}$
Outer dia. of bushing	$\frac{14.039}{14.028}$
Overlap of bushing in rocker arm	0.010–0.039
Inner dia. of bushing in rocker arm (finished)	$\frac{12.000}{12.018}$
Radial clearance of rocker arms on shaft	0.016–0.052
Dia. of rocker arm shaft	$\frac{11.984}{11.966}$
Bore in rocker arm brackets	$\frac{11.985}{12.000}$
Clearance of rocker arm shaft in bore of rocker arm brackets	0.001–0.034
Permissible deviation of parallelism between sliding surfaces of rocker arms and rocker arm shaft or bore in rocker arm, at a measuring length of 100 mm	0.1
Hardness at the sliding surfaces of the rocker arms	HRC 55–61
Permiss. deviation of parallelism between contact surface and bore of the rocker arm bracket, at a measuring length of 100 mm	0.05

Chain tightener, OM 621

Radial clearance of pressure pin in chain tightener housing		0.05–0.06 mm				
Ball	ball dia.	5.0 mm				
	ball travel	0.25–0.40 mm				
Distance between flange surface of chain tightener housing and pressure pin for tightener with	flange seal	76 mm				
	O-ring seal	74 mm x				
Pressure spring for chain tightener						
Outer dia.	Wire thickness	Length untensioned	Length, loaded pre-tensioned		Length, loaded block	
mm	mm	mm	mm	kg	mm	kg
11.3	1.3	91	50	4.2	44	4.8 +0.5 -0.3

Idler sprocket and idler sprocket bearing, OM 621

Dia. of pivot pin in cylinder head	$\frac{9.995}{9.986}$			
Bore in idler sprocket bearing	$\frac{10.000}{10.015}$			
Dia. of pivot pin in idler sprocket	$\frac{19.980}{19.959}$			
Bore in idler sprocket	$\frac{24.000}{24.021}$			
Outer dia. of bushing	$\frac{24.035}{24.048}$			
Overlap of bushing	0.014–0.048			
Bore in bushing (finished)	$\frac{20.000}{20.021}$			
Radial clearance of idler sprocket bearing on pivot pin in cylinder head	0.005–0.029			
Radial clearance of the idler sprocket	0.020–0.062			
Vertical and lateral out-of-true of the idler sprocket, max.	0.02			
Pressure spring for the idler sprocket bearing				
Outer dia. mm	Wire thickness mm	Length, untensioned mm	Length, loaded block mm kg	
11.6–12.1	1.4	17.75	9	5.76–6.66

Guide sprocket, OM 621

Inner dia. of sprocket		$\frac{20.000}{20.021}$
Outer dia. of bearing bushing		$\frac{20.035}{20.048}$
Overlap of bearing bushing		0.014–0.048
Inner dia. of bearing bushing (finished)		$\frac{16.000}{16.018}$
Pivot pin dia.	at running surface of guide sprocket	$\frac{15.984}{15.973}$
	at press fit	$\frac{16.018}{16.007}$
Radial clearance of guide sprocket		0.016–0.045

Alignment of sprocket wheel, OM 621

The misalignment of all sprocket wheels, starting from the intermediate sprocket, must not exceed 0.1 mm. When measuring the misalignment, press all sprockets rearwards against stop.

Drive for injection pump and oil pump, OM 621

Dia. of bearing seats of intermediate shaft	front	rear
	$\frac{19.986}{19.959}$	$\frac{29.960}{29.927}$
Bore in front bearing bushing	$\frac{20.020}{20.033}$	
Bore in rear bearing bushing	$\frac{30.020}{30.041}$	x
Outer dia. of rear bearing bushing	$\frac{36.045}{36.034}$	
Bore in cylinder crankcase for rear bearing bushing	$\frac{36.000}{36.025}$	
Outer dia. of front bearing bushing	$\frac{30.009}{29.996}$	
Bore in cylinder crankcase for front bearing bushing	$\frac{30.000}{30.021}$	
Outer dia. of the helical gear	$\frac{13.968}{13.950}$	
Bore in bearing bushing for helical gear	$\frac{14.000}{14.018}$	
Radial clearance of intermediate gear shaft	front	rear
	0.040–0.074	0.060–0.114 x
Axial clearance of intermediate gear shaft	0.05–0.12	
Radial clearance of helical gear	0.032–0.068	
Axial clearance of helical gear	0.1–0.25	
Backlash between helical gear and intermediate gear shaft	0.05–0.15	
Misalignment of all sprockets, starting from sprocket on the intermediate shaft	0.1	

Timing gears, OM 636

Backlash between	
Crankshaft gear and camshaft gear 0.03–0.04	Intermediate gear and injection pump gear 0.05–0.07
Permissible lateral out-of-true of all timing gears	0.03

Camshaft and camshaft bearings

OM 636		1st, 2nd and 3rd bearing		Width of fitted bearing	Width of the 1st bearing pin (fitted bearing)	Bearing clearances			
		pin dia. of camshaft	bearing inner dia.			radial	axial		
Standard		<u>27.960</u> 27.939	<u>28.000</u> 28.021	<u>39.920</u> 39.881	<u>40.000</u> 40.025	0.040 up to 0.082	0.080 up to 0.144		
Repair size I		<u>27.710</u> 27.689	<u>27.750</u> 27.771	<u>40.170</u> 40.131	<u>40.250</u> 40.275				
Standard size		outer dia. of bear.	1 <u>50.521–50.502</u>		2 <u>50.018–50.002</u>		3 <u>49.018–49.002</u>		
Repair size I			<u>50.539–50.520</u>		<u>50.033–50.017</u>		<u>49.033–49.017</u>		
Permissible out-of-true of the centre bearing seat, the camshaft, the basic cam circles and the camshaft gear seat, when supported on the outer bearings 0.025									
Hardness values of bearing pins and basic cam circles			Rockwell 45–60			Scleroscope 58–73			
Hardness values of cam lobes and lift			Rockwell 50–60			Scleroscope 63–73			
OM 621 Camshaft with Code No.	Camshaft Bearing Pin for	1st bearing (opposite flywheel side)		2nd bearing		3rd bearing (flywheel side)			
		shaft dia.	bearing dia.	shaft dia.	bearing dia.	shaft dia.	bearing dia.		
		Standard size		<u>34.975</u> 34.959	<u>35.000</u> 35.025	<u>44.975</u> 44.959	<u>45.000</u> 45.025	<u>45.975</u> 45.959	<u>46.000</u> 46.025
		Intermediate size		<u>34.875</u> 34.859	<u>34.900</u> 34.925	<u>44.875</u> 44.859	<u>44.900</u> 44.925	<u>45.875</u> 45.859	<u>45.900</u> 45.925
Repair size I		<u>34.725</u> 34.709	<u>34.750</u> 34.775	<u>44.725</u> 44.709	<u>44.700</u> 44.775	<u>45.725</u> 45.709	<u>45.750</u> 45.775		
01	x	Standard size		<u>34.975</u> 34.959	<u>35.000</u> 35.025	<u>44.975</u> 44.959	<u>45.000</u> 45.025	<u>45.975</u> 45.959	<u>46.000</u> 46.025
		Intermediate size		<u>34.875</u> 34.859	<u>34.900</u> 34.925	<u>44.875</u> 44.859	<u>44.900</u> 44.925	<u>45.875</u> 45.859	<u>45.900</u> 45.925
Repair size I		<u>34.725</u> 34.709	<u>34.750</u> 34.775	<u>44.725</u> 44.709	<u>44.700</u> 44.775	<u>45.725</u> 45.709	<u>45.750</u> 45.775		
02	Standard size		<u>34.975</u> 34.959	<u>35.000</u> 35.025	shaft dia. <u>45.975</u> 45.959		bearing dia. <u>46.000</u> 46.025		
	Intermediate size		<u>34.875</u> 34.859	<u>34.900</u> 34.925	<u>45.875</u> 45.859		<u>45.900</u> 45.925		
12	Standard size		<u>34.975</u> 34.959	<u>35.000</u> 35.025	<u>46.475</u> 46.459		<u>46.500</u> 46.525		
	Intermediate size		<u>34.875</u> 34.859	<u>34.900</u> 34.925	<u>46.375</u> 46.359		<u>46.400</u> 46.425		
	Repair size I		<u>34.725</u> 34.709	<u>34.750</u> 34.775	<u>46.225</u> 46.209		<u>46.250</u> 46.275		
Permiss. out-of-true of the centre bearing seat, the basic cam circles and the camshaft sprocket seat, when supported on the outer bearings					0.025				
Hardness of bearing pins and basic cam circles					Brinell HB 217–248				
					Scleroscope 36–40				
Hardness of cam lobes and lift					Brinell, min. HB 500				
					Scleroscope, min. 64				
Width of bearing pin (fitted bearing)					<u>34.000</u> 34.039				
Width of 1st camshaft bearing (fitted bearing)					<u>33.950</u> 33.911				
Bearing clearance					radial			0.025–0.066	
					axial			0.050–0.128	