

Adjustment and Assembly Data

Job-No.

00 — 2

All measurements in millimeters unless indicated otherwise
Tightening Torques at the end of each Group

Engine — Group 01-24

A. Crankcase and Cylinder Head

Overhaul Stages of Cylinder Bores

Standard size	Intermediate stage	1st Overhaul stage	2nd Overhaul stage	3rd Overhaul stage
$\frac{85.000}{85.022}$	$\frac{85.250}{85.272}$	$\frac{85.500}{85.522}$	$\frac{86.000}{86.022}$	$\frac{86.500}{86.522}$

Machining Tolerances of Cylinder Bores

Out-of-round tolerance of cylinder bores	0.013
Conicity tolerance of cylinder bores	0.013
Departure of cylinder bores from vertical to crankshaft axis related to cylinder height	0.05
Permissible roughness of cylinder walls	0.005
Permissible undulation of cylinder walls	0.0025

Available Piston Sizes

Standard size	Intermediate	1st Overhaul stage	2nd Overhaul stage	3rd Overhaul stage
84.96	85.21	85.46	85.96	86.46
84.97	85.22	85.47	85.97	86.47
84.98	85.23	85.48	85.98	86.48

Piston Measurements

Piston clearance	0.04
Piston diameter	Cylinder bore less piston clearance
Permissible weight variation of pistons in any one engine	4 g

Machining Tolerances for the Separating Surfaces of Crankcase and Cylinder Head

		Crankcase	Cylinder Head
Height		238.4 — 238.5	84.80 — 85.00
Permissible stock removal		0.3	0.5
Permissible out-of-level	longitudinal	0.03	0.1
	lateral	0	0
Deviation in parallelity between upper and lower separating surface		0.1	0.1
Test pressure (hot water, 70° C.)		2 atm.	2 atm.

Overhaul Stages of Valve Guides and Cylinder Head Bores

Overhaul stage	Color code	Valve guide					Bores in cylinder head	Valve guide force-fit size in cylinder head
		External diameter	Internal diameter		Length			
			Inlet	Exhaust	Inlet	Exhaust		
Standard size	plain	$\frac{14.013}{14.007}$	$\frac{9.000}{9.015}$	$\frac{10.000}{10.015}$	67	68	$\frac{14.000}{14.006}$	+0.007
	red	$\frac{14.019}{14.013}$					$\frac{14.006}{14.012}$	
	white	$\frac{14.025}{14.019}$					$\frac{14.012}{14.018}$	
	yellow	$\frac{14.031}{14.025}$					$\frac{14.018}{14.024}$	
	blue	$\frac{14.037}{14.031}$					$\frac{14.024}{14.030}$	
	brown	$\frac{14.043}{14.037}$					$\frac{14.030}{14.036}$	
1st Overhaul stage	red	$\frac{14.225}{14.207}$					$\frac{14.200}{14.218}$	
2nd Overhaul stage	white	$\frac{14.425}{14.407}$					$\frac{14.400}{14.418}$	

Overhaul Stages of Valve Seat Rings and Bores in Cylinder Head

	Overhaul stage	Milled out well in cylinder head	Diameter of valve seat ring	Height of valve seat ring	Depth in cylinder head t^{**}	Depth in cylinder head t_1^{**}	Force-fit size of valve seat rings in relation to cylinder head
Inlet	Standard size	$\frac{48.000}{48.016}$	$\frac{48.160}{48.150}$	$\frac{8.000}{7.910}$	$\frac{10.00}{10.10}$	2	+ 0.134 to + 0.160
	1st Overhaul stage	$\frac{48.500}{48.516}$	$\frac{(49.300)^*}{48.660}$ $\frac{48.650}{48.650}$	$\frac{8.000}{7.910}$	$\frac{10.00}{10.10}$	2	
Exhaust	Standard size	$\frac{42.000}{42.016}$	$\frac{42.145}{42.135}$	$\frac{9.500}{9.410}$	$\frac{27.50}{27.60}$	$\frac{17.70}{18.30}$	+ 0.119 to + 0.145
	1st Overhaul stage	$\frac{42.500}{42.516}$	$\frac{(43.300)^*}{42.645}$ $\frac{42.635}{42.635}$	$\frac{9.500}{9.410}$	$\frac{27.50}{27.60}$	$\frac{17.70}{18.30}$	

* Unfinished size ** see Figures 01 — 5/8 and 01 — 5/9

Valve Seat Machining

Valve seat angle in cylinder head	90°—30°			
Valve seat width	1.25—1.75			
Valve seat backing off	with milling cutter 120° or 150°		with backing-off cutter minimum 0.1	
Permissible deepening of valve seat well	Inlet		1	
	Exhaust		1.3	
Permissible depth of valve disk in relation to cylinder head separating surface	for new valve seats		for reconditioned valve seats	
	Inlet	Exhaust	Inlet	Exhaust
for new valves	0.8	16	1.8	17.3
for reground valves	1.5	16.7	2.5	18

Compression Ratio and Compression Space

Cylinder Head		Standard compression	Optional lower compression according to SA 10 250
Compression ratio	maximum	7.8 : 1	7.0 : 1
	standard	7.5 : 1	6.8 : 1
	minimum	7.25 : 1	6.6 : 1
Height of compression space		17.7 — 18.3	17.7 — 18.3
Total compression space with cylinder head fitted		69.8 — 75.8 cc.	78.5 — 84.5 cc.
Compression space in cylinder head with valves and spark plugs fitted		62.3 — 63.3 cc.	70.3 — 71.3 cc.