

TS90, TS100, TS110 REPAIR MANUAL CONTENTS

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SECTION 1

GENERAL INFORMATION

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SECTION 1 - GENERAL INFORMATION

ENGINE SPECIFICATIONS

Model		TS80	TS90	TS90	TS100	TSS110
(T=Turbocharged)		N/A	N/A	N/A	TURBO	TURBO
Emissionised		NO	NO	YES	YES	YES
No of Cylinders		4 (450 NF)	4 (450 NA)	4 (450 NE)	4 (450 T/PF)	4 (450 T/PD)
Bore	mm	111.8	111.8	111.8	111.8	111.8
	ins	4.4	4.4	4.4	4.4	4.4
Stroke	mm	127.0	127.0	127.0	127.0	127.0
	ins	5.0	5.0	5.0	5.0	5.0
Displacement	cu cm	4987	4987	4987	4987	4987
	cu in	304	304	304	304	304
Compression Ratio		17:5-1	17:5-1	17:5-1	17:5-1	17:5-1
Cylinder Bore Compression at cranking speed of 200 R.P.M	bar	25.5	25.5	25.5	25.5	25.5
	lbs in ²	375	375	375	375	375
Firing Order		1342	1342	1342	1342	1342
Idle Speed	Revs/min ± 50	750	750	750	750	750
Maximum no Load Speed	Revs/min	2320	2320	2320	2320	2320
Rated Engine Speed		2170	2170	2170	2170	2070

SECTION 1 - GENERAL INFORMATION

CYLINDER BLOCK

Taper of Cylinder Bore	0.025mm (0.001 in) Repair Limit 0.127mm (0.005 in) Wear Limit
Cylinder Bore out of Round	0.03mm (0.0015 in) Repair Limit 0.127mm (0.005 in) Wear Limit
Cylinder Bore Diameters	111.778-111.841mm (4.4007-4.4032 in)
Rear Oil Seal Bore Diameter	140.77-140.87mm (5.542-5.546 in)
Block to Head Surface Flatness	0.08mm (0.003 in) in any 152mm (6 in) 0.03mm (0.001 in) in any 25.40mm (1 in)

CYLINDER HEAD

Valve Guide Bore Diameter	9.469-9.495mm (0.3728-0.3738 in)
Head to Block Surface Flatness	0.03mm (0.001 in) in any 25.4mm (1 in), or 0.127mm (0.005in) overall limit

EXHAUST VALVES

Face Angle	44°15'-44°30' Relative to the Head of Valve
Stem Diameter	Std :9.401-9.421mm (0.3701-0.3709 in) 0.076mm (0.003 in) Oversize :9.477-9.497mm (0.3731-0.3739 in) 0.38mm (0.015 in) Oversize :9.781-9.802mm (0.3851-0.3859 in) 0.030 in (0.76mm) Oversize :10.163-10.183mm (0.4001-0.4009 in)
Head Diameter	42.88-43.13mm (1.688-1.698 in)
Stem to Guide Clearance	0.048-0.094mm (0.0019-0.0037 in)
Lash Clearance (Cold)	0.43-0.53mm (0.017-0.021 in)

INTAKE VALVES

Face Angle	29°15'-29°30' Relative to Head of Valve
Stem Diameter	Std :9.426-9.446mm (0.3711-0.3719 in) 0.076mm (0.003 in) Oversize :9.502-9.522mm (0.3741-0.3749 in) 0.381mm (0.015 in) Oversize :9.807-9.827mm (0.3861-0.3869 in) 0.762mm (0.030 in) Oversize :10.188-10.208mm (0.4011-0.4019 in)
Head Diameter	47.37-47.63mm (1.865-1.875 in)
Stem to Guide Clearance	0.023-0.069mm (0.0009-0.0027 in)
Lash Clearance (Cold)	0.36-0.46mm (0.014-0.018 in)

VALVE SPRINGS

Number per Valve	1
Free Length	60.7mm (2.39 in)
Length, loaded at 27.7-31.3kg (61.69 lb)	48.26mm (1.900 in)
Length, loaded at 61-69kg (135-153 lb)	35.69mm (1.405 in)

SECTION 1 - GENERAL INFORMATION

VALVE TIMING

Intake Opening	12° Before Top Dead Centre
Intake Closing	38° After Bottom Dead Centre
Exhaust Opening	48° Before Bottom Dead Centre
Exhaust Closing	12° After Top Dead Centre

VALVE INSERTS

Insert Oversize	Exhaust Valve Insert Counter bore Diameter in Cylinder Head	Intake Valve Seat Insert Counter bore Diameter in Cylinder Head
0.254mm (0.010 in)	44.17-44.20mm (1.739-1.740 in)	50.01-50.04mm (1.969-1.970 in)
0.508mm (0.020 in)	44.42-44.45mm (1.749-1.750 in)	50.27-50.29mm (1.979-1.980 in)
0.762mm (0.030 in)	44.68-44.70mm (1.759-1.760 in)	50.52-50.55mm (1.989-1.990 in)

VALVE SEATS

Exhaust Valve Seat Angle	45°00' - 45°30'
Intake Valve Seat Angle	30°00' - 30°30'
Interference Valve Face Angle to Valve Seat Angle	0°30' - 1°15'
Concentricity With Guide Diameter	0.051mm (0.002 in) Total Indicator Reading Max
Seat Width Exhaust Valve	1.8-2.3mm (0.072-0.092 in)
Intake Valve	1.9-2.5mm (0.078-0.098 in)

CAMSHAFT IDLER GEAR

Number of teeth	47
End Play	0.076-0.35mm (0.003-0.014 in)
Bushing Inside Diameter	50.813-50.838mm (2.005-2.0015 in)
Adaptor Outside Diameter	50.762-50.775mm (1.9985-1.9990 in)
Backlash with Crankshaft Gear	0.15-0.46mm (0.006-0.018 in)
Backlash with Camshaft Gear	0.025-0.381mm (0.001-0. 015 in)
Backlash with Fuel Injection Pump	0.10-0.15mm (0.004-0.006 in)

CAMSHAFT GEAR

Number of Teeth	52
Timing Gear Backlash	0.025-0.38mm (0.001-0.015 in)

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