



TECHNICAL DATA - ENGINE

SECTION TDL - M111 ELISE

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GENERAL

Type designation	- std	K16 (18K4F)
	- 111S	K16 (18K4K)
Configuration & no. of cylinders		in-line 4
Capacity		1796 cm ³ (70.71 in ³)
Bore		80.00 mm (3.150 in)
Stroke		89.30 mm (3.516 in)
Valve actuation	- std	Belt driven twin overhead camshafts with hydraulic tappets
	- 111S	As std. with variable valve control (VVC) on inlet camshaft
Compression ratio		10.5:1
Firing order		1,3,4,2
Spark plugs		RC8 PYP or CSP 9652
Spark plug gap		0.9 ± 0.1 mm (0.035 in)
Maximum engine speed		7000 rpm
Fuel system	- std	Multi-point grouped fuel injection with MEMS 1.9 engine management
	- 111S	Sequential fuel injection with MEMS 2J engine management
Fuel requirement		Unleaded 95 RON minimum
Max power (88/195/EEC)	- std	88 kW (118 bhp) @ 5,500 rpm
	- 111S	107 kW (143 bhp) @ 7,000 rpm
Max torque (88/195/EEC)	- std	165 Nm (122 lbf.ft) @ 3,000 rpm
	- 111S	174 Nm (128 lbf.ft) @ 4,500 rpm

CYLINDER HEAD

Material		Aluminium alloy
Head face maximum warpage		0.05 mm
Cylinder head height	- new	118.95 to 119.05 mm
	- reface limit	0.20 mm

CAMSHAFTS & VALVE TIMING**Std**

Open duration		244° (at crankshaft)
Inlet valve opens		12° BTDC
Inlet valve closes		52° ABDC
Exhaust valve opens		52° BBDC
Exhaust valve closes		12° ATDC
Valve overlap		24°
Valve lift	- inlet	8.8 mm
	- exhaust	8.8 mm

111S

Open duration	- inlet (variable)	220° to 295°
	- exhaust	252°
Inlet valve opens		0° BTDC at minimum period
Inlet valve closes		40° ABDC at minimum period
Exhaust valve opens		51° BBDC
Exhaust valve closes		21° ATDC
Valve overlap (variable)		21° to 58°
Valve lift	- inlet	9.5 mm
	- exhaust	9.2 mm

VALVES

Angle of valve seats and faces		45°
Stem diameter	- inlet	5.952 - 5.967 mm
	- exhaust	5.947 - 5.962 mm



Stem clearance in guide - inlet	- new	0.033 - 0.063 mm
	- service limit	0.070 mm
	- exhaust	0.038 - 0.078 mm
	- service limit	0.110 mm
Valve clearance		Hydraulically controlled.
Valve stem fitted height - new		38.93 - 39.84 mm
	- service limit	40.10 mm

VALVE GUIDES

Inside diameter	6.000 - 6.025 mm
Fitted height	6.0 mm

VALVE SEATS

Seat face angle	45°
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VALVE SPRINGS

Std

Free length	50.0 mm
Fitted length	37.0 mm
Load at fitted length	250 ± 12 N
Load at full lift	450 ± 18 N

VVC

Free length	47.6 mm
Fitted length	37.0 mm
Load at fitted length	210 ± 13 N
Load at full lift	440 ± 22 N

CRANKSHAFT

Crankshaft endfloat - new	0.10 - 0.25 mm	
	- service limit	0.34 mm
Thrust washer thickness	2.61 - 2.65 mm	
Main journal diameter	47.979 - 48.007 mm (for grading see Section EE)	
Maximum out of round	0.010 mm	
Big end journal diameter	47.986 - 48.007 mm (for grading see Section EE)	
Maximum out of round	0.010 mm	
Big end clearance	0.021 - 0.049 mm	

PISTON RINGS

New ring to groove clearance	- top compression	0.040 - 0.072 mm
	- second compression	0.030 - 0.062 mm
	- oil control	0.010 - 0.180 mm
New ring gap, 20mm from bore top	- top compression	0.20 - 0.35 mm
	- second compression	0.28 - 0.48 mm
	- oil control	0.15 - 0.40 mm

PISTON

Piston diameter (8mm from bottom, 90° to pin)	- grade A	79.975 - 79.990 mm
	- grade B	79.991 - 80.005 mm
Clearance in bore (20mm from bottom of bore)		0.01 - 0.04 mm

CYLINDER BLOCK

Cylinder liner bore (65mm from top)	- red grade A	80.000 - 80.015 mm
	- blue grade B	80.016 - 80.030 mm



OIL PUMP

Outer rotor to housing clearance	0.28 - 0.36 mm
Inner rotor tip clearance	0.05 - 0.13 mm
Rotor end float	0.02 - 0.06 mm

COOLANT THERMOSTAT

Nominal setting	85 - 91°C
Thermostat starts opening	88°C
Thermostat fully open	100°C