ISUZU

WORKSHOP MANUAL

ISUZU MOTORS LIMITED

AA-6HK1T, BB-6HK1T

ENGLISH - 9806-2200 - ISSUE 1 - MAY 05

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Service Standards

ITEMS		SERVICE STANDARD	SERVICE LIMIT
Cylinder Head			
Lower Face Warpage	mm (in)	0.05 (0.002) or less	0.20 (0.008) Do not regrind the lower face.
Valve Guide			
Valve Stem Clearance			
Intake	mm (in)	0.04 – 0.06 (0.0016 – 0.0024)	0.20 (0.008)
Exhaust	mm (in)	0.06 – 0.10 (0.0024 – 0.0039)	0.25 (0.010)
Valve Stem Outside Diameter			
Intake	mm (in)	7.95 – 7.96 (0.3130 – 0.3134)	7.89 (0.3106)
Exhaust	mm (in)	7.92 – 7.94 (0.3118 – 0.3126)	7.89 (0.3106)
Valve Guide Upper End Height	mm (in)	14.1 (0.56)	—
Valve and Valve Seat Insert			
Valve Thickness			
Intake	mm (in)	1.71 (0.067)	1.30 (0.051)
Exhaust	mm (in)	1.75 (0.069)	1.30 (0.051)
Valve Depression			
Intake	mm (in)	1.0 (0.039)	2.5 (0.098)
Exhaust	mm (in)	1.3 (0.051)	2.8 (0.110)
Valve Contact Width			
Intake	mm (in)	2.5 (0.098)	3.2 (0.126)
Exhaust	mm (in)	2.0 (0.079)	2.8 (0.110)
Valve Face Angle			
Intake	deg	30	—
Exhaust	deg	45	—
Valve Spring			
Spring Height			
Intake	mm (in)	65.9 (2.59)	64.6 (2.54)
Exhaust	mm (in)	68.1 (2.68)	66.7 (2.63)
Spring Squareness			
Intake	mm (in)	2.9 (0.114)	3.0 (0.118)
Exhaust	mm (in)	3.0 (0.118)	3.0 (0.118)
Intake Valve Spring Tension/ Compression Height	N (kg / lb)	348 (35.5 / 78) / 46	
Exhaust Valve Spring Tension/ Compression Height	N (kg / lb)	383 (39.0 / 86) / 46	

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ITEMS			SERVICE STANDARD	SERVICE LIMIT
Rocker Arm Shaft and Rocker Arm				
Rocker Arm Shaft Run-Out		mm (in)		0.30 (0.012)
Rocker Arm Shaft Outside Diameter		mm (in)	21.979 – 22.000 (0.865 – 0.866)	21.85 (0.860)
Rocker Arm Inside Diameter		mm (in)	22.010 – 22.035 (0.867 – 0.868)	
Rocker Arm Shaft and Rocker Arm Clearance		mm (in)	0.010 – 0.056 (0.0004 – 0.0022)	0.20 (0.008)
Rocker Arm Pin and Roller Clearance		mm (in)	0.068 – 0.099 (0.0027 – 0.0039)	0.50 (0.02)
Valve Cap Worn		mm (in)		0.10 (0.004)
Camshaft				
Camshaft Journal Diameter		mm (in)	39.950 – 39.975 (1.5728 – 1.5738)	39.85 (1.5689)
Cam Lobe Height	Intake	mm (in)	7.851 (0.3091)	7.351 (0.2894)
	Exhaust	mm (in)	9.540 (0.3756)	9.040 (0.3559)
Camshaft Run-Out		mm (in)	0.025 (0.001)	0.05 (0.002)
Camshaft Bearing Inside Diameter		mm (in)	40.00 – 40.037 (1.575 – 1.576)	
Camshaft Bearing Clearance		mm (in)	0.025 – 0.087 (0.001 – 0.003)	0.15 (0.006)
Crankshaft				
Crankshaft End Play		mm (in)	0.040 – 0.205 (0.0026 – 0.008)	0.54 (0.021)
Crankshaft Run-Out		mm (in)	0.06 (0.002) or less	0.45 (0.016)
Crankshaft Journal Diameter			See section 6A crankshaft journal diameter in this manual.	
Crankshaft Journal and Bearing Clearance		mm (in)		
No. 4 Bearing			0.093 – 0.124 (0.00366 – 0.00488)	0.14 (0.0055)
Other Bearings			0.063 – 0.094 (0.00248 – 0.00370)	0.14 (0.0055)
Crankshaft Journal and Crankpin Uneven Wear		mm (in)		0.05 (0.0020)

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ITEMS	SERVICE STANDARD	SERVICE LIMIT
Piston and Piston Ring		
Piston Grade	Non	
Cylinder Liner and Piston Clearance mm (in)	0.122 – 0.156 (0.0048 – 0.0061)	—
Piston Ring and Piston Ring Groove Clearance mm (in)		
1st Compression Ring	0.057 – 0.097 (0.0022 – 0.0038)	0.20 (0.008)
2nd and 3rd Compression Ring	0.085 – 0.120 (0.0033 – 0.0047)	0.2 (0.008)
Oil Ring	0.02 – 0.06 (0.0008 – 0.0024)	0.15 (0.006)
Piston Ring Gap mm (in)		
1st Compression Ring	0.18 – 0.28 (0.0071 – 0.0110)	1.20 (0.047)
2nd and 3rd Compression Ring	0.35 – 0.50 (0.0138 – 0.0197)	1.20 (0.047)
Oil Ring	0.15 – 0.35 (0.0059 – 0.0138)	1.20 (0.047)
Piston Pin		
Piston Pin Diameter mm (in)	35.995 – 36.000 (1.4171 – 1.4173)	35.95 (1.4154)
Piston Pin Hole Diameter mm (in)	36.004 – 36.012 (1.4175 – 1.4178)	
Piston Pin and Piston Pin Hole Clearance mm (in)	0.004 – 0.017 (0.00016 – 0.00067)	
Connecting Rod		
Connecting Rod Alignment mm (in)	0.05 (0.002) or less	0.20 (0.008)
Connecting Rod Small End Bushing Diameter mm (in)	36.012 – 36.022 (1.4178 – 1.4182)	
Piston Pin and Connecting Rod Small End Bushing Clearance mm (in)	0.012 – 0.027 (0.00047 – 0.00106)	0.05 (0.002)
Crankpin and Bearing Clearance mm (in)	0.037 – 0.076 (0.0015 – 0.0030)	0.10 (0.004)
Connecting Rod Big End and Crankpin Side Face Clearance mm (in)	0.17 – 0.30 (0.0067 – 0.0118)	0.35 (0.014)
Flywheel		
Flywheel Friction Surface Roughness mm (in)	Less than 0.05 (0.0020)	

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11. Alternator

Condition	Possible Cause	Correction
Battery dead	Loose alternator drive belt	Adjust
	Low battery fluid	Replenish
	Defective battery terminals	Replace
	Blown fuse	Replace
	Poor contact between the fuse holder and fuse	Repair
	Low battery fluid specific gravity	Adjust
	Broken or poorly connected starter switch and regulator terminal wire	Repair
	Broken or poorly connected regulator terminal and alternator terminal wire	Repair
	Defective alternator ground circuit	Repair
	Defective voltage regulator	Replace
	Defective diode	Replace
	Grounded or broken alternator stator coil	Repair or replace
	Broken rotor coil	Replace
	Excessive electrical load	Check the alternator output at normal operating speed
Battery overcharged	Poor connections or open circuit	Correct
	Poor ground connection of voltage regulator	Correct
	Voltage set of regulator too high	Replace
	Defective voltage regulator	Replace
Flashing charge light or fluctuating ammeter indication	Loose belt	Adjust
	Defective starter switch contacts	Replace
	Broken or poorly connected wiring	Replace or reconnect
Charge light on but dim during operation	Loose starter switch terminal wiring	Retighten
	Excessive resistance of alternator and fuse holder terminal wire	Replace the wire with a larger one
	Defective starter switch contacts	Replace
Alternator noise	Defective alternator bearing	Replace or regrease
	Exposed stator coil wires	Replace
	Short circuit of the stator coil	Replace
Charge circuit fuse blown	Grounded terminal wiring	Repair
	Defective alternator end flame diode	Replace the end flame assembly
	Out of voltage regulator adjustment	Replace
	Reversed battery connections	Correct

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Injection Pump Calibration Data

Test Conditions

Injection nozzle	ZEXEL No. 105780-0000
Injection nozzle holder	ZEXEL No. 105780-2080
Injection starting pressure	17.2 MPa
Injection line dimensions	Inside diameter = 3 mm Outside diameter = 8 mm Length = 600 mm
Transfer pump pressure	255 kPa
Test diesel fuel	ISO4113 or SAE standard test oil (SAEJ967d)
Fuel temperature	39 – 41°C (109.2 – 114.8°F)
Pump rotation	Clockwise viewed from the drive side
Overflow valve opening pressure	255 kPa (2.6 kg/cm^2 / 37.0 psi)

CAUTION:
Strictly observe the above test conditions during injection pump fuel injection volume adjustment.
Failure to observe the test conditions will result in misadjustment of the injection pump fuel injection volume.
Misadjustment of the fuel injection volume will result in serious engine damage.

Injection Timing

Pre-stroke	2.9 ± 0.03 mm (0.114 ± 0.001 in.)
Injection order	1 – 5 – 3 – 6 – 2 – 4 Plungers are numbered from the drive side.
Tappet clearance	Manually rotate the camshaft several times to make sure that it rotates smoothly.

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Troubleshooting

Condition	Possible Cause	Correction
No output	Bad terminal connection	Repair
	Open or shorted circuit	Repair
	Open field coil	Replace
	Defective diode	Replace
	Defective IC regulator	Replace
Low output	Loose terminal connection	Tighten
	Loose cooling fan belt	Adjust belt tension
	Defective diode	Replace
	Shorted field coil	Replace
	Shorted stator coil	Replace
	Defective regulator	Replace
	Defective battery	Replace
	Poor terminal contact	Repair
Overcharging	Defective regulator	Replace
	Defective battery	Replace
Unstable current	Poor terminal contact	Repair
	Loose cooling fan belt	Adjust belt tension
	Short field coil	Replace
	Shorted stator coil	Replace
	Intermittent contact in wiring	Replace
	Poor terminal contact	Repair
	Defective regulator	Replace
Abnormal noise	Improper alternator installation	Correct
	Defective bearing	Replace
	Contact between the rotor core and stator core	Replace the rotor core and/or stator core
	Defective diode	Replace
	Shorted stator coil	Replace

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