

# TECHNICAL DATA

## 01-50 TECHNICAL DATA

ENGINE TECHNICAL DATA . . . . . 01-50-1

### ENGINE TECHNICAL DATA

A3U015001001W01

01-50

Item		Engine			
		ZM		FS	
		MTX	ATX	MTX	ATX
<b>MECHANICAL</b>					
Drive belt deflection	Generator	New	5.5—7.0 {0.22—0.27}	6.5—7.5 {0.26—0.29}	
		Used	6.0—7.5 {0.24—0.29}	7.0—9.0 {0.28—0.35}	
		Limit	8.0 {0.31}	10.0 {0.39}	
	P/S, P/S+A/C	New	7.0—8.0 {0.28—0.31}	7.5—9.0 {0.30—0.35}	
		Used	9.0—10.0 {0.36—0.39}	8.0—9.5 {0.32—0.37}	
		Limit	11.5 {0.45}	11.0 {0.43}	
Drive belt tension	Generator	New	500—740 {50—76, 110—160}	690—830 {70—85, 160—180}	
		Used	500—700 {50—72, 110—150}	500—680 {50—70, 110—150}	
		Limit	340 {35, 77}	390 {40, 88}	
	P/S, P/S+A/C	New	590—680 {60—70, 140—150}	590—780 {60—80, 140—170}	
		Used	430—490 {43—50, 95—110}	500—680 {50—70, 110—150}	
		Limit	250 {25, 55}	390 {40, 88}	
Valve clearance [Engine cold]	IN	0.25—0.31 {0.010—0.012} (0.28±0.03 {0.011±0.001})	0.225—0.295 {0.0089—0.0116} (0.26±0.035 {0.010±0.0014})		
	EX	0.25—0.31 {0.010—0.012} (0.28±0.03 {0.011±0.001})	0.225—0.295 {0.0089—0.0116} (0.26±0.035 {0.010±0.001})		
Compression pressure (kPa {kgf/cm <sup>2</sup> , psi} [rpm])	Standard	1,373 {14.0, 199} [300]	1,177 {12.0, 171} [300]		
	Minimum	981 {10.0, 142} [300]	824 {8.4, 119} [300]		
	Maximum difference between cylinders	196 {2.0, 28}			
Tensioner spring free length		(mm {in})	61.8 {2.43}	36.6 {1.44}	
Pushing distance of the camshaft oil seal		(mm {in})	0—0.4 {0—0.01} (from the edge of the cylinder head)	0.3—0.7 {0.012—0.027} (from the edge of the cylinder head)	
Pushing distance of the front oil seal		(mm {in})	0.5—1.0 {0.020—0.039} (from the edge of the oil pump body)	0—0.5 {0—0.01} (from the edge of the oil pump body)	
Pushing distance of the rear oil seal		(mm {in})	0—0.5 {0—0.01} (from the edge of the rear cover)		
Cylinder head bolt length	(mm {in})	Standard	99.2—99.8 {3.91—3.92}	104.2—104.8 {4.103—4.125}	
		Maximum	100.5 {3.956}	105.5 {4.153}	
Idle speed		(rpm)	650—750		
Ignition timing		(BTDC/rpm)	6—18°/650—750		
Idle-up speed <sup>*1</sup>	(rpm)	E/L ON <sup>*2</sup>	650—750		
		A/C ON <sup>*3</sup>	700—800		
		P/S ON <sup>*4</sup>	700—800		
Idle mixture	HC concentration		within the regulation		
	CO concentration		within the regulation		

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Item				Engine							
				ZM		FS					
				MTX	ATX	MTX	ATX				
<b>LUBRICATION SYSTEM</b>											
Oil pressure		(kPa {kgf/cm <sup>2</sup> , psi})	300—390 {3.0—4.0, 43—56} [at 3,000 rpm]		400—490 {4.0—5.0, 57—71} [at 3,000 rpm]						
Oil capacity (approximate quantity)	Total (dry engine)		(L {US qt, Imp qt})		3.4 {3.6, 3.0}		3.7 {3.9, 3.3}				
	Oil replacement		(L {US qt, Imp qt})		3.0 {3.2, 2.6}		3.3 {3.5, 2.9}				
	Oil and oil filter replacement		(L {US qt, Imp qt})		3.2 {3.4, 2.8}		3.5 {3.7, 3.1}				
Engine oil				API Service SG (Energy Conserving <b>II</b> ), SH (Energy Conserving <b>II</b> ), SJ or ILSAC (GF- <b>I</b> , GF- <b>II</b> )							
Viscosity	Above -25 °C {-13 °F}			SAE 10W-30							
	Below 0 °C {32 °F}			SAE 5W-30							
Oil pump	Inner rotor tooth tip to outer rotor clearance	(mm {in})	Standard	0.02—0.18 {0.0008—0.0070}		0.130—0.206 {0.00512—0.0081}					
			Maximum	0.22 {0.087}		0.30 {0.012}					
	Outer rotor to body clearance	(mm {in})	Standard	0.09—0.18 {0.0036—0.0070}		0.113—0.186 {0.00445—0.00732}					
			Maximum	0.22 {0.087}							
	Side clearance	(mm {in})	Standard	0.03—0.11 {0.0012—0.0043}		0.035—0.095 {0.0014—0.0037}					
			Maximum	0.14 {0.005}							
	Pressure spring free length			(mm {in})		45.94 {1.809}		—			
Pressing force at pressure spring height H			(N {kgf, lbf})		H: 33.50mm {1.319 in}		—		97.7—107.4 {9.96—10.96, 21.92—24.11}		
Front oil seal	Pushing distance of the front oil seal (from the edge of the oil pump body)		(mm {in})		0.5—1.0 {0.020—0.039}		0—0.5 {0—0.01}				
<b>COOLING SYSTEM</b>											
Coolant capacity (approximate quantity)		(L {US qt, Imp qt})		6.0 {6.4, 5.3}		7.5 {8.0, 6.6}					
Radiator cap valve opening pressure		(kPa {kgf/cm <sup>2</sup> , psi})		94—122 {0.95—1.25, 13.6—17.7}							
Thermostat	Initial-opening temperature		(°C {°F})		83.5—88 {183—190}		80—84 {176—183}				
	Full-opening temperature		(°C {°F})		100 {212}		95 {203}				
	Full-open lift		(mm {in})		8.5 {0.33} min.						
Cooling fan motor current		(A)		2.4—4.4		5.2—7.2		2.4—4.4		5.2—7.2	
<b>FUEL SYSTEM</b>											
Fuel line hold pressure		(kPa {kgf/cm <sup>2</sup> , psi})		More than 150 {1.5, 22.0}							
Fuel pump maximum pressure		(kPa {kgf/cm <sup>2</sup> , psi})		450—630 {4.5—6.5, 64—92}							
Fuel injector	Leakage			Less than 1 drop/2 minutes							
	Volume		(ml {cc, fl oz}/15 sec.)		38.1—40.4 {38.1—40.4, 1.29—1.36}		68—75 {68—75, 2.30—2.53}				
	Resistance			(ohms)		Approx. 13.8		14.2—14.8			
<b>CHARGING SYSTEM</b>											
Battery	Electrolyte gravity			1.27—1.29 [20 °C {68 °F}]							
	Back-up current*5			(mA)		Max. 20					
	Test load chart (A)	Battery type	50D20L		150						
			75D23L		—		195				
	Slow charge (A)	Battery type (5-hour rate)	50D20L (40)		4.0—5.0						
			75D23L (52)		—		5.5—6.5				
Quick charge (A/30 min)	Battery type (5-hour rate)	50D20L (40)		25							
		75D23L (52)		—		35					

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					Engine			
					ZM		FS	
					MTX	ATX	MTX	ATX
Generator	Rotor resistance (Between slip rings)			(ohms)	2.5—2.9			
	Brush length	Standard		(mm {in})	18.5 {0.73}			
		Minimum		(mm {in})	5.0 {0.20}			
	Brush spring force	Standard		(N {kgf, lbf})	4.8—6.0 {0.48—0.62, 1.06—1.36}			
		Minimum		(N {kgf, lbf})	2.2 {0.22, 0.48}			
	Standard voltage (V)	Ignition switch ON	Terminal	B	B+			
				P	Approx. 1			
		D	Approx. 0					
	Idle [20 °C {68 °F}]	Terminal	B	13—15				
			P	Approx. 3—8				
D			*					
Generated current (Reference) (A)	Engine speed (rpm)	1,000	Terminal B current	0—60* <sup>6</sup>		0—59* <sup>6</sup>		
		2,000	Terminal B current	0—68* <sup>6</sup>		0—77* <sup>6</sup>		
<b>IGNITION SYSTEM</b>								
Ignition coil	Resistance [20°C{68°F}] (kilohms)	Secondary coil			8.0—12.0		7.2—10.8	
		Insulation resistance of case			10000			
High-tension lead	Resistance (kilohms)	No.1 lead			3.3—7.8		5.6—12.1	
		No.3 lead			2.9—6.9		1.9—4.0	
Spark plug	Type	NGK			ZFR5F-11* <sup>7</sup> , ZFR6F-11* <sup>8</sup>		BKR5E-11* <sup>7</sup> , BKR6E-11* <sup>8</sup>	
		DENSO			KJ16CR11* <sup>7</sup> , KJ20CR11* <sup>8</sup>		K16PR-U11* <sup>7</sup> , K20PR-U11* <sup>8</sup>	
		CHAMPION			—		RC10YC4* <sup>7</sup> , RC8YC4* <sup>8</sup>	
		MAZDA			—		BP13 18 110* <sup>7</sup> , BP14 18 110* <sup>8</sup>	
	Plug gap (mm {in})				1.0—1.1 {0.040—0.043}			
	Resistance (kilohms)	NGK			3.0—7.5			
		DENSO						
		CHAMPION			—		5—15	
MAZDA								
Tightening torque (N·m {kgf·m, ft·lbf})				15—22 {1.5—2.3, 11—16}				
<b>STARTING SYSTEM</b>								
Starter	Commutator diameter	Standard		(mm {in})	29.4 {1.16}			
		Minimum		(mm {in})	28.8 {1.14}			
	Brush length	Standard		(mm {in})	12.3 {0.48}			
		Minimum		(mm {in})	7.0 {0.28}			
	Brush spring force	Standard		(N {kgf, lbf})	180—243 {18.3—24.8, 40.3—54.5}			
		Minimum		(N {kgf, lbf})	57.7 {5.88, 12.9}			
	Pinion gap (mm {in})				3.0 {0.12}			
	No load test	Voltage (V)			11			
Current (A)			Below 90					

01-50

\* : Turn the following electrical loads on and verify that the voltage reading increases.

- Headlights
- Blower motor
- Rear window defroster

\*1 : Excludes temporary idle speed drop just after the loads (E/L, A/C, P/S) are turned on.

\*2 : Headlight, fan switch (3rd or higher) and cooling fan are turned on.

\*3 : A/C switch and fan switch are turned on.

## TECHNICAL DATA

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- \*4 : Steering wheel fully turned.
- \*5 : Back-up current is the constant flow of current present (for the audio unit, clock, PCM, etc.) when the ignition switch is at off and with the ignition key removed.
- \*6 : Must not be 0 A
- \*7 : Standard plug
- \*8 : Cold type plug