

SERVICE SPECIFICATIONS

REFER TO 2L, 3L ENGINE REPAIR MANUAL
(Pub. No. RM123E)

NOTE: The following pages contain only the points which differ form the above listed manual.

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SERVICE SPECIFICATIONS — Engine Mechanical

ENGINE MECHANICAL

Specifications

Engine tune-up	Coolant capacity (w/o Heater)				
	LJ		10.0 liters	10.6 US qts	8.8 Imp. qts
	LN 2L-T		8.2 liters	8.7 US qts	7.2 Imp. qts
	3L		8.1 liters	8.6 US qts	7.1 Imp. qts
	Coolant capacity (w/ Heater)				
	LJ		10.9 liters	11.5 US qts	9.6 Imp. qts
	LN 2L-T		9.1 liters	9.6 US qts	8.8 Imp. qts
	3L		9.0 liters	9.5 US qts	7.9 Imp. qts
	Coolant capacity (w/ Front and rear heaters)				
	LJ		11.5 liters	12.2 US qts	10.1 Imp. qts
	LN 2L-T		9.4 liters	9.9 US qts	8.3 Imp. qts
	3L		9.3 liters	9.8 US qts	8.2 Imp. qts
	Engine oil capacity (LJ 2L-T)				
	Drain and refill	w/ Oil filter change	6.7 liters	7.1 US qts	5.9 Imp. qts
		w/o Oil filter change	5.7 liters	6.0 US qts	5.0 Imp. qts
	Dry fill		7.4 liters	7.8 US qts	6.5 Imp. qts
	Engine oil capacity (LJ 3L)				
	Drain and refill	w/ Oil filter change	6.7 liters	7.1 US qts	5.9 Imp. qts
		w/o Oil filter change	5.7 liters	6.0 US qts	5.0 Imp. qts
	Dry fill		7.4 liters	7.8 US qts	6.5 Imp. qts
	Engine oil capacity (LN 2L-T)				
	Drain and refill	w/ Oil filter change	6.8 liters	7.2 US qts	6.0 Imp. qts
		w/o Oil filter change	5.8 liters	6.1 US qts	5.1 Imp. qts
	Dry fill		7.5 liters	7.9 US qts	6.6 Imp. qts
	Engine oil capacity (LN 3L)				
	Drain and refill	w/ Oil filter change	5.8 liters	6.1 US qts	5.1 Imp. qts
		w/o Oil filter change	4.8 liters	5.1 US qts	4.2 Imp. qts
	Dry fill		6.5 liters	6.9 US qts	5.7 Imp. qts
	Engine oil API grade				
	2L-T		CD or better		
	3L		CC, CD or better		
	Alternator drive belt				
	Deflection	New belt	7 — 10 mm	0.28 — 0.39 in.	
		Used belt	10 — 15 mm	0.39 — 0.59 in.	
	Tension (Reference)	New belt	40 — 60 kg		
		Used belt	20 — 35 kg		
	Battery specific gravity				
	When fully charged at 20°C (68°F)				
		80D26R	1.27 — 1.29		
		Others	1.25 — 1.27		
	Injection nozzle opening pressure				
		New nozzle	151 — 159 kg/cm ² (2,148 — 2,261 psi, 14,808 — 15,593 kPa)		
		Reused nozzle	145 — 155 kg/cm ² (2,062 — 2,205 psi, 14,220 — 15,200 kPa)		
	Valve clearance				
		Intake	0.20 — 0.30 mm	0.008 — 0.012 in.	
		Exhaust	0.40 — 0.50 mm	0.016 — 0.020 in.	

SERVICE SPECIFICATIONS — Engine Mechanical

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Specifications (Cont'd)

Engine tune-up (Cont'd)	New valve adjusting shim thickness		2.50 mm	0.0984 in.
			2.55 mm	0.1004 in.
			2.60 mm	0.1024 in.
			2.65 mm	0.1043 in.
			2.70 mm	0.1063 in.
			2.75 mm	0.1083 in.
			2.80 mm	0.1102 in.
			2.85 mm	0.1122 in.
			2.90 mm	0.1142 in.
			2.95 mm	0.1161 in.
			3.00 mm	0.1181 in.
			3.05 mm	0.1201 in.
			3.10 mm	0.1220 in.
			3.15 mm	0.1240 in.
			3.20 mm	0.1260 in.
			3.25 mm	0.1280 in.
			3.30 mm	0.1299 in.
	New valve adjusting shim thickness (cont'd)			
	Injection timing			
	Plunger stroke			
	2L-T Austria		Within the marks of belt case and pump flange. (See page EM-24)	
	Others		0.54 – 0.66 mm	0.0213 – 0.0260 in.
	3L		0.84 – 0.96 mm	0.0331 – 0.0378 in.
	Idle speed			
	2L-T		750 rpm	
	3L		700 rpm	
	Maximum speed			
	2L-T		4,800 rpm	
	3L Hong Kong, Singapore, Malaysia		4,400 rpm	
	Others		4,600 rpm	
	A/C idle-up setting speed		950 rpm	
	Injection order		1 – 3 – 4 – 2 (A – B – C – D)	
Compression pressure	Engine revolution at 250 rpm			
	2L-T	STD	31.0 kg/cm ² (441 psi, 3,040 kPa) or more	
	3L	STD	32.0 kg/cm ² (455 psi, 3,138 kPa) or more	
	2L-T, 3L	Limit	20.0 kg/cm ² (284 psi, 1,961 kPa)	
	Difference of pressure between each cylinder		5.0 kg/cm ² (71 psi, 490 kPa) or less	
Cylinder head	New cylinder head gasket thickness			
	Mark "B"		1.40 – 1.50 mm	0.0551 – 0.0591 in.
	Mark "D"		1.50 – 1.60 mm	0.0591 – 0.0630 in.
	Mark "F"		1.60 – 1.70 mm	0.0630 – 0.0669 in.
Camshaft	Cam lobe height			
	2L-T	STD	Intake	53.450 – 53.470 mm
			Exhaust	54.990 – 55.010 mm
			Intake	52.95 mm
			Exhaust	54.49 mm
	3L	STD	Intake	54.290 – 54.310 mm
			Exhaust	54.990 – 55.010 mm
			Intake	53.79 mm
			Exhaust	54.49 mm

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SERVICE SPECIFICATIONS – Engine Mechanical

Specifications (Cont'd)

Cylinder block	Cylinder bore diameter	2L-T	STD	Mark "1"	92.000 – 92.010 mm	3.6220 – 3.6224 in.
				Mark "2"	92.010 – 92.020 mm	3.6224 – 3.6228 in.
				Mark "3"	92.020 – 92.030 mm	3.6228 – 3.6232 in.
		3L	Limit	STD	92.23 mm	3.6311 in.
				O/S 0.50	92.73 mm	3.6508 in.
			STD	Mark "1"	96.000 – 96.010 mm	3.7795 – 3.7799 in.
		2L-T		Mark "2"	96.010 – 96.020 mm	3.7799 – 3.7803 in.
				Mark "3"	96.020 – 96.030 mm	3.7803 – 3.7807 in.
			Limit	STD	92.23 mm	3.6311 in.
		3L		O/S 0.50	92.73 mm	3.6508 in.
Piston and piston ring	Piston protrusion Piston diameter	2L-T	STD	Mark "1"	91.940 – 91.950 mm	3.6197 – 3.6201 in.
				Mark "2"	91.950 – 91.960 mm	3.6201 – 3.6205 in.
				Mark "3"	91.960 – 91.970 mm	3.6205 – 3.6209 in.
		3L	STD	O/S 0.50	92.440 – 92.470 mm	3.6394 – 3.6405 in.
				Mark "1"	95.940 – 95.950 mm	3.7772 – 3.7776 in.
				Mark "2"	95.950 – 95.960 mm	3.7776 – 3.7779 in.
		Piston oil clearance		Mark "3"	95.960 – 95.970 mm	3.7779 – 3.7783 in.
				O/S 0.50	96.440 – 96.470 mm	3.7968 – 3.7980 in.
			STD		0.050 – 0.070 mm	0.0020 – 0.0028 in.
		Piston ring groove clearance	Limit		0.14 mm	0.0055 in.
			STD	No. 1	0.028 – 0.077 mm	0.0011 – 0.0030 in.
				No. 2	0.070 – 0.115 mm	0.0028 – 0.0045 in.
		3L		Oil	0.030 – 0.070 mm	0.0012 – 0.0028 in.
			Limit		0.20 mm	0.008 in.
			STD	No. 1	0.028 – 0.077 mm	0.0011 – 0.0030 in.
		Limit		No. 2	0.060 – 0.105 mm	0.0024 – 0.0041 in.
				Oil	0.030 – 0.070 mm	0.0012 – 0.0028 in.
					0.20 mm	
Connecting rod	Rod bending	Limit per 100 mm (3.94 in.)			0.05 mm	0.0020 in.
					0.15 mm	0.0059 in.
	Twist	Limit per 100 mm (3.94 in.)			8.400 – 8.600 mm	0.3307 – 0.3386 in.
					8.20 mm	0.3228 in.
	Connecting rod bolt outer diameter		STD		29.008 – 29.020 mm	1.1420 – 1.1425 in.
	Bushing inside diameter		STD		0.004 – 0.012 mm	0.0002 – 0.0005 in.
	Piston pin oil clearance		Limit		0.05 mm	0.0020 in.
Crankshaft	Main journal diameter	STD			61.985 – 62.000 mm	2.4403 – 2.4409 in.
		U/S 0.25			61.745 – 61.755 mm	2.4309 – 2.4413 in.
		U/S 0.50			61.495 – 61.505 mm	2.4211 – 2.4215 in.
	Crank pin diameter	STD			54.988 – 54.000 mm	2.1649 – 2.1654 in.
		U/S 0.25			54.745 – 54.755 mm	2.1553 – 2.1557 in.
		U/S 0.50			54.495 – 54.505 mm	2.1455 – 2.1459 in.
	Circle runout		Limit		0.06 mm	0.0024 in.
	Main journal taper and out-of-round		Limit		0.02 mm	0.0008 in.
	Crank pin taper and out-of-round		Limit		0.02 mm	0.0008 in.

SERVICE SPECIFICATIONS – Engine Mechanical, Turbocharger System**A-5****Torque Specifications**

Part tightened		kg-cm	ft-lb	N·m
Camshaft bearing cap x Cylinder head		255	18	25
Camshaft oil seal retainer x Cylinder head		185	13	18
Cylinder head x Cylinder block	1st	800	58	78
	2nd	90° turns		
	3rd	90° turns		
Cylinder head cover x Cylinder head		50	43 in.-lb	4.9
RH engine hanger x Cylinder head		380	27	37
Exhaust manifold x Cylinder head		530	38	52
Heat insulator x Exhaust manifold		120	9	12
Intake manifold x Cylinder head		240	17	24
EGR pipe x Intake manifold (Austria)		130	9	13
EGR valve adaptor x EGR valve (Austria)		195	14	19
LH engine hanger x Cylinder head		380	27	37
Water outlet housing x Cylinder head		195	14	19
No. 2 timing belt cover x Cylinder head		185	13	18
Connecting rod cap x Connecting rod	1st	350	25	34
	2nd	120° turns		

TURBOCHARGER SYSTEM**Specifications**

Turbocharger	Turbocharging pressure	0.61 – 0.81 kg/cm ² (8.7 – 11.5 psi, 60 – 79 kPa)
	Impeller wheel axial play	0.13 mm (0.0051 in.) or less
	Impeller wheel radial play	0.18 mm (0.0071 in.) or less

Torque Specifications

Part tightened	kg-cm	ft-lb	N·m
Turbine outlet elbow x Turbocharger	260	19	25
Turbo water pipe x Turbocharger	80	69 in.-lb	7.8
Turbocharger x Exhaust manifold	530	38	52
Turbo oil pipe x Turbocharger	195	14	19
Turbo oil pipe x Cylinder block	260	19	25
Exhaust manifold stay x Cylinder block	195	14	19
Exhaust manifold stay x Turbocharger	195	14	19
Turbocharger heat insulator x Turbocharger	120	9	12
Intake pipe x Intake manifold	120	9	12

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SERVICE SPECIFICATIONS – Fuel System

FUEL SYSTEM

Specifications

Fuel heater	Resistance	at 20°C (68°F)	Approx. 0.7 Ω
Injection pump	Part No.		
	2L-T	Austria	22100 – 5B280
		Others	22100 – 5B270
	3L	Hong Kong, Singapore, Malaysia	22100 – 5B030
		Others w/o HAC w/o Tacho.	22100 – 54850
		w/o HAC w/ Tacho.	22100 – 54860
		w/ HAC w/o Tacho.	22100 – 54870
		w/ HAC w/ Tacho.	22100 – 54880
	Direction of rotation		Clockwise as seen from drive side
	Injection order		1 – 3 – 4 – 2 (A – B – C – D)
	PIJ opening pressure (2L-T Austria only)		123 – 127 kg/cm ² (1,749 – 1,806 psi, 12,054 – 12,446 kPa)
	PIJ adjusting shim thickness (2L-T Austria only)		0.500 mm 0.0197 in.
			0.550 mm 0.0217 in.
			0.600 mm 0.0236 in.
			0.650 mm 0.0256 in.
			0.700 mm 0.0276 in.
			0.750 mm 0.0295 in.
			0.800 mm 0.0315 in.
			0.850 mm 0.0335 in.
			0.900 mm 0.0354 in.
			0.950 mm 0.0374 in.
			1.000 mm 0.0394 in.
			1.025 mm 0.0404 in.
			1.050 mm 0.0413 in.
			1.075 mm 0.0423 in.
			1.100 mm 0.0433 in.
			1.125 mm 0.0443 in.
			1.150 mm 0.0453 in.
			1.175 mm 0.0463 in.
			1.200 mm 0.0472 in.
			1.225 mm 0.0482 in.
			1.250 mm 0.0492 in.
			1.275 mm 0.0502 in.
			1.300 mm 0.0512 in.
			1.325 mm 0.0522 in.
			1.350 mm 0.0531 in.
			1.375 mm 0.0541 in.
			1.400 mm 0.0551 in.
			1.425 mm 0.0561 in.
			1.450 mm 0.0571 in.
			1.475 mm 0.0581 in.
			1.500 mm 0.0591 in.
			1.525 mm 0.0600 in.
			1.550 mm 0.0610 in.
			1.575 mm 0.0620 in.
			1.600 mm 0.0630 in.
			1.625 mm 0.0640 in.
			1.650 mm 0.0650 in.
			1.675 mm 0.0659 in.
			1.700 mm 0.0669 in.
			1.725 mm 0.0679 in.
			1.750 mm 0.0689 in.

SERVICE SPECIFICATIONS – Fuel System

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Specifications (Cont'd)

Injection pump (cont'd)	PIJ adjusting shim thickness (2L-T Austria only) (cont'd)	1.775 mm	0.0699 in.
		1.800 mm	0.0709 in.
		1.825 mm	0.0719 in.
		1.850 mm	0.0728 in.
		1.875 mm	0.0738 in.
		1.900 mm	0.0748 in.
		1.925 mm	0.0758 in.
		1.950 mm	0.0768 in.
		1.975 mm	0.0778 in.
		2.000 mm	0.0787 in.
		2.050 mm	0.0807 in.
		2.100 mm	0.0827 in.
		2.150 mm	0.0846 in.
		2.200 mm	0.0866 in.
		2.250 mm	0.0886 in.
		2.300 mm	0.0906 in.
		2.350 mm	0.0925 in.
		2.400 mm	0.0945 in.
		2.450 mm	0.0965 in.
		2.500 mm	0.0984 in.
	Spring free length		
	Delivery valve spring	24.4 mm	0.961 in.
	Plunger spring	30.0 mm	1.181 in.
	Coupling spring	16.0 mm	0.630 in.
	Pneumatic bellows spring (w/ HAC only)	35.0 mm	1.378 in.
	Boost compensator spring (2L-T only)		
	Austria	22.3 mm	0.878 in.
	Sub		
	Main	24.1 mm	0.949 in.
	Others	19.4 mm	0.764 in.
	PIJ piston lift gap (2L-T Austria only)	0.175 – 0.475 mm	0.00689 – 0.01870 in.
	Plunger stroke (2L-T Austria only)	0.60 – 0.80 mm	0.0236 – 0.0315 in.
	Boost compensator adjusting shim A thickness (2L-T only)	1.1 mm	0.039 in.
		1.3 mm	0.051 in.
		1.5 mm	0.059 in.
		1.7 mm	0.067 in.
		1.9 mm	0.075 in.
		2.1 mm	0.083 in.
		2.3 mm	0.090 in.
		2.5 mm	0.098 in.
		2.7 mm	0.106 in.
		2.9 mm	0.114 in.
		3.1 mm	0.122 in.
		3.3 mm	0.130 in.
	Boost compensator adjusting shim B thickness (2L-T Austria only)	12.90 mm	0.508 in.
		13.15 mm	0.518 in.
		13.40 mm	0.528 in.
	Boost compensator sub spring constant (2L-T Austria only)	1.2 kg/cm ²	1.04 lb/in.
		1.4 kg/cm ²	1.22 lb/in.

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SERVICE SPECIFICATIONS – Fuel System

Injection Pump Adjustment

Preparation of pump tester	Test nozzle type			DN12SD12		
	Test nozzle opening pressure			145 – 155 kg/cm ² (2,062 – 2,205 psi, 14,220 – 15,200 kPa)		
	Injection pipe					
	Outer diameter			6.0 mm	0.236 in.	
	Inner diameter			2.0 mm	0.079 in.	
	Length			840 mm	33.07 in.	
	Minimum bending radius			25 mm (0.98 in.) or more		
	Fuel temperature			40 – 45°C		
Fuel feeding pressure			0.2 kg/cm ² (2.8 psi, 20 kPa)			
Fuel cut solenoid voltage			6 V			
Full load injection volume pre-setting	Item		Adjusting lever position	Pump rpm	No. of measuring strokes	Injection volume cc (cu in.)
	2L-T	Austria	Maximum speed side	1,400	200	14.04 – 14.36 (0.86 – 0.88)
		Others	Maximum speed side	1,200	200	13.94 – 14.26 (0.85 – 0.87)
	3L	Hong Kong, Singapore, Malaysia	Maximum speed side	1,200	200	10.96 – 11.28 (0.67 – 0.69)
		Others	Maximum speed side	1,200	200	11.56 – 11.88 (0.71 – 0.72)
Maximum speed pre-setting	Item		Adjusting lever position	Pump rpm	No. of measuring strokes	Injection volume cc (cu in.)
	2L-T	Austria	Maximum speed side	2,450	200	4.3 – 6.3 (0.26 – 0.38)
		Others	Maximum speed side	2,400	200	4.3 – 6.3 (0.26 – 0.38)
	3L	Hong Kong, Singapore, Malaysia	Maximum speed side	2,200	200	4.6 – 6.2 (0.28 – 0.38)
		Others	Maximum speed side	2,300	200	4.6 – 6.2 (0.28 – 0.38)
Pump inner pressure	Pump rpm		Inner pressure kg/cm ² (psi, kPa)			
	500		3.2 – 3.8 (46 – 54, 314 – 373)			
	2,100		6.6 – 7.2 (94 – 102, 647 – 706)			
Overflow volume	Pump rpm		Overflow volume cc/min. (cu in./min.)			
	2,200		370 – 800 (22.6 – 48.8)			

SERVICE SPECIFICATIONS – Fuel System

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Injection Pump Adjustment (Cont'd)

Automatic timer	Item		Pump rpm	Piston stroke mm (in.)		
	2L-T	Austria	800	1.2 – 2.0 (0.047 – 0.079)		
			1,200	2.5 – 3.3 (0.098 – 0.130)		
			2,000	5.4 – 6.0 (0.213 – 0.236)		
			2,300	5.4 – 6.0 (0.213 – 0.236)		
		Others	800	1.4 – 2.2 (0.055 – 0.087)		
			1,200	3.0 – 3.8 (0.118 – 0.150)		
			1,800	5.5 – 6.3 (0.217 – 0.248)		
			2,300	6.7 – 7.5 (0.264 – 0.295)		
	3L		800	0.6 – 1.4 (0.024 – 0.055)		
			1,200	1.8 – 2.6 (0.071 – 0.102)		
			2,000	4.4 – 5.2 (0.173 – 0.205)		
2,300			4.7 – 5.5 (0.185 – 0.217)			

Full load injection volume	Item		Adjusting lever angle position	Pump rpm	No. of measuring strokes	Injection volume cc (cu in.)
	2L-T	Austria	Plus 23.5–33.5°	1,400	200	14.04 – 14.36 (0.86 – 0.88)
		Others	Plus 23.5–33.5°	1,200	200	13.94 – 14.26 (0.85 – 0.87)
	3L	Hong Kong, Singapore, Malaysia	Plus 23.5–33.5°	1,200	200	10.96 – 11.28 (0.67 – 0.69)
		Others	Plus 23.5–33.5°	1,200	200	11.56 – 11.88 (0.71 – 0.72)

Maximum speed	Item		Adjusting lever angle position	Pump rpm	No. of measuring strokes	Injection volume cc (cu in.)	
	2L-T	Austria	Plus 23.5–33.5°	2,450	200	4.3 – 6.3 (0.26 – 0.38)	
				2,250		8.3 – 10.5 (0.51 – 0.64)	
				2,750		1.3 (0.8) or less	
		Others	Plus 23.5–33.5°	2,400	200	4.3 – 6.3 (0.26 – 0.38)	
				2,250		7.1 – 9.3 (0.43 – 0.57)	
				2,750		1.3 (0.8) or less	
		3L	Hong Kong, Singapore, Malaysia	Plus 23.5–33.5°	2,200	200	4.6 – 6.2 (0.28 – 0.38)
					2,000		8.44 – 10.44 (0.52 – 0.64)
					2,400		1.3 (0.8) or less
	Others		Plus 23.5–33.5°	2,300	200	4.6 – 6.2 (0.28 – 0.38)	
				2,100		9.08 – 11.08 (0.55 – 0.68)	
				2,550		1.3 (0.8) or less	

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SERVICE SPECIFICATIONS – Fuel System

Injection Pump Adjustment (Cont'd)

Injection volume	Item		Adjusting lever angle position	Pump rpm	No. of measuring strokes	Injection volume cc (cu in.)	Variation limit cc (cu in.)	
	2L-T	Austria	Plus 23.5—33.5°	1,400	200	13.94 — 14.26 (0.85 — 0.87)	0.4 (0.02)	
				100		13.60 — 18.40 (0.83 — 1.12)	1.2 (0.07)	
				1,200		13.70 — 15.10 (0.84 — 0.92)	0.5 (0.03)	
				1,800		12.30 — 13.70 (0.75 — 0.84)	0.5 (0.03)	
				2,000		11.60 — 12.80 (0.71 — 0.78)	0.5 (0.03)	
		Others	Plus 23.5—33.5°	1,200	200	13.94 — 14.26 (0.85 — 0.87)	0.4 (0.02)	
				100		13.60 — 18.40 (0.83 — 1.12)	1.2 (0.07)	
				1,800		12.10 — 13.10 (0.74 — 0.80)	0.5 (0.03)	
		3L	Hong Kong, Singapore, Malaysia	Plus 23.5—33.5°	1,200	200	10.96 — 11.28 (0.67 — 0.69)	0.4 (0.02)
					100		11.60 — 16.40 (0.71 — 1.00)	1.2 (0.07)
	500				9.64 — 11.04 (0.59 — 0.67)		0.5 (0.03)	
	1,900				9.39 — 10.69 (0.57 — 0.65)		0.5 (0.03)	
	Others		Plus 23.5—33.5°	1,200	200	11.56 — 11.88 (0.71 — 0.72)	0.4 (0.02)	
				100		11.60 — 16.40 (0.71 — 1.00)	1.2 (0.07)	
				500		10.44 — 11.44 (0.64 — 0.70)	0.5 (0.03)	
				2,000		10.19 — 11.09 (0.62 — 0.68)	0.5 (0.03)	
	Governor sleeve plug head thickness				3.0 mm	0.118 in.		
					3.1 mm	0.122 in.		
					3.2 mm	0.126 in.		
					3.3 mm	0.130 in.		
					3.4 mm	0.134 in.		
					3.5 mm	0.138 in.		
					3.6 mm	0.142 in.		
					3.7 mm	0.146 in.		
					3.8 mm	0.150 in.		
					3.9 mm	0.154 in.		
					4.0 mm	0.158 in.		
					4.1 mm	0.161 in.		
					4.2 mm	0.165 in.		

SERVICE SPECIFICATIONS — Fuel System

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Injection Pump Adjustment (Cont'd)

Full-load minimum injection volume	Item		Pump rpm		No. of measuring strokes		Injection volume cc (cu in.)				
	2L-T	Austria	1,400		200		8.8 – 10.0 (0.54 – 0.61)				
		Others	500		200		10.6 – 11.4 (0.65 – 0.70)				
Boost compensator characteristic	Item		Pump rpm		Boost pressure kg/cm ² (psi, kPa)		No. of measuring stroke		Injection volume cc (cu in.)		
	2L-T	Austria	500		0 (0, 0)		200		10.8 – 11.6 (0.65 – 0.71)		
		Others	1,200		0.41 (5.9, 40)		200		12.9 – 13.5 (0.79 – 0.82)		
Boost compensator characteristic tendency	Item		Pump rpm	Boost pressure kg/cm ² (psi, kPa)		No. of measuring strokes		Injection volume cc (cu in.)		Hysterises cc (cu in.)	
	2L-T	Austria	1,400	0.74 (10.5, 73)		200	13.84 – 14.36 (0.84 – 0.88)		–		
			1,400	0.68 (9.6, 66)			13.94 – 14.26 (0.85 – 0.87)		–		
			500	0.41 (5.9, 40)			14.60 – 15.40 (0.89 – 0.94)		0.3 (0.02) or less		
			500	0 (0, 0)			10.80 – 11.60 (0.66 – 0.71)		–		
		Others	1,200	0.74 (10.5, 73)		200	13.84 – 14.36 (0.84 – 0.88)		–		
			1,200	0.63 (9.0, 62)			13.94 – 14.26 (0.85 – 0.87)		–		
			1,200	0.41 (5.9, 40)			12.90 – 13.50 (0.79 – 0.82)		0.3 (0.02) or less		
			1,200	0.14 (2.0, 14)			11.20 – 12.00 (0.68 – 0.73)		–		
	Load sensing timer (w/o HAC)	Item		Pump rpm	No. of measuring stroke .		Injection volume cc (cu in.)			Remark	
		2L-T		1,200	200		Measured value at step at (b) minus 0.6 (0.04) ± 0.4 (0.02)			Set to starting point	
		3L		1,200	200		Measured value at step at (b) minus 1.0 (0.06) ± 0.4 (0.02)				
Item			Pump rpm	No. of measuring strokes		Injection volume cc (cu. in.)		Remark			
2L-T			1,200	200		8.10–8.50 (0.49–0.52)		Check ending point			
3L		Hong Kong, Singapore, Malaysia		1,200	200		8.12–8.52 (0.50–0.52)				
		Others		1,200	200		8.72–9.12 (0.52–0.56)				
Item			Pump rpm		Timer piston fluctuation mm (in.)						
2L-T			1,200		1.44 – 1.84 (0.057 – 0.072)						
3L			1,200		0.62 – 1.02 (0.024 – 0.040)						

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SERVICE SPECIFICATIONS – Fuel System

Injection Pump Adjustment (Cont'd)

Idle speed	Item		Adjusting lever angle position	Pump rpm	No. of measuring strokes	Injection volume cc (cu in.)	Variation limit cc (cu in.)	Remarks
	2L-T	Austria	Minus 13.5 – 21.5°	375	200	q = 2.4 – 2.6 (0.15 – 0.16)	—	Pre-set
				350		q plus 0.5 (0.03) or more	—	—
				450		q minus 1.1–2.1 (0.07 – 0.13)	—	—
				375		3.0 – 4.0 (0.18 – 0.24)	0.34 (0.02)	Adjust
		Others	Minus 13.5 – 21.5°	375	200	q = 1.5 – 2.5 (0.09 – 0.15)	—	Pre-set
				350		q plus 0.5 (0.03) or more	—	—
				450		q minus 0.7–1.7 (0.04 – 0.10)	—	—
				375		1.8 – 2.8 (0.11 – 0.17)	0.34 (0.02)	Adjust
	3L		Minus 12.5 – 22.5°	350	200	1.8 – 2.8 (0.11 – 0.17)	0.34 (0.02)	Adjust
525				1.2 (0.07) or less		—	—	
Dash pot	Item		Pump rpm	No. of measuring strokes		Injection volume cc (cu in.)	Remarks	
	2L-T	Austria	600	200		q = 0.5 – 0.7 (0.03 – 0.04)	Lever set	
			600	200		q plus 0.2 – 0.4 (0.01 – 0.02)	Adjust	
		Others	600	200		q = 0.6 – 0.8 (0.04 – 0.05)	Lever set	
			600	200		q plus 0.2 – 0.4 (0.01 – 0.02)	Adjust	
Cold start system	Item		Fuel temp. °C (°F)		Timer piston stroke mm (in.)			
	2L-T	Austria	25 (77)		0.7 – 0.9 (0.028 – 0.035)			
		Others	25 (77)		1.3 – 1.5 (0.051 – 0.059)			
Fast idle	Item		Fuel temp. °C (°F)		Clearance mm (in.)			
	2L-T		20 (68)		2.5 (0.098)			
			50 (122)		0 (0)			
Adjusting lever	Item		Lever moving angle					
	2L-T		41 – 51°					
	3L		43 – 49°					

SERVICE SPECIFICATIONS – Fuel System, Cooling System**A-13****Torque Specifications**

Part tightened	kg-cm	ft-lb	N·m
Retaining nut x Holder body (2L-T Austria)	675	49	66
Distributive head plug x Distributive head	700	51	69
Pilot injection actuator x Distributive head (2L-T Austria)	900	65	88
Governor cover x Injection pump body	85	74 in.-lb	8.3
Fuel cut solenoid x Distributive head	225	16	22
Pickup sensor x Injection pump body	210	15	21
Fuel inlet pipe x Injection pump	250	18	25
Fuel outlet pipe x Injection pump	250	18	25
Injection pump x Timing belt case	210	15	21
Pump stay x Injection pump	185	13	18
Pump stay x Cylinder block	185	13	18
Injection pipe x Injection nozzle	250	18	25
Injection pipe x Injection pump	250	18	25
Injection pump drive pulley x Injection pump	650	47	64
Crankshaft timing pulley x Crankshaft	1,700	123	167

COOLING SYSTEM**Specifications**

Engine coolant capacity		See page A-2
Radiator cap	Relief valve opening pressure STD	0.75 – 1.05 kg/cm ² (10.7 – 14.9 psi, 74 – 103 kPa)
	Limit	0.6 kg/cm ² (8.5 psi, 59 kPa)
Thermostat	Valve opening temperature	86 – 90°C 187 – 194°F
	Valve lift at 100°C (212°F)	8 mm (0.31 in.) or more

Torque Specifications

Part tightened	kg-cm	ft-lb	N·m
Cylinder block x Drain plug	300	22	29
Water outlet x Water outlet housing	195	14	19

A-14 SERVICE SPECIFICATIONS – Lubrication System, Starting System, Charging System**LUBRICATION SYSTEM****Specifications**

Engine oil capacity		See page A-2
Oil pressure	at idling at 3000 rpm	0.3 kg/cm ² (4.3 psi, 29 kPa) or more 3.0 – 5.5 kg/cm ² (43 – 78 psi, 294 – 539 kPa)

Torque specifications

Part tightened	kg-cm	ft-lb	N·m
Engine oil drain plug	400	29	39
Oil cooler x Oil filter bracket	145	10	14
Oil cooler bracket x Cylinder block Bolt	195	14	19
Oil cooler bracket x Cylinder block Nut	210	15	21
Relief valve plug x Oil filter bracket	370	27	36
Union x Oil filter bracket (2L-T)	500	36	49
Union bolt x Oil filter bracket (LJ 2L-T)	200	14	20
Alternator x Engine RH mounting bracket 14 mm head bolt	510	37	50
Alternator x Fan belt adjusting bar 12 mm head bolt	130	9	12

STARTING SYSTEM

Pre-heating system	Light lighting time	See page ST-3 Approx. 6 seconds
	Supper glow type	
	Fixed delay type	
	Water temp. sensor resistance	
	at -20°C (-4°F)	
	at 0°C (32°F)	
	at 20°C (68°F)	
	at 40°C (104°F)	10 – 20 kΩ
	at 60°C (140°F)	4 – 7 kΩ
	at 80°C (176°F)	2 – 3 kΩ
		0.9 – 1.3 kΩ
		0.4 – 0.7 kΩ
		0.2 – 0.4 kΩ

CHARGING SYSTEM

Drive belt deflection and tension		See page A-2
Battery specific gravity when fully charged at 20°C (68°F)		
	80D26R	1.27 – 1.29
	Others	1.25 – 1.27
Alternator regulator	Regulating voltage	
	w/o IC regulator at 25°C (77°F)	13.8 – 14.4 V
	w/ IC regulator at 25°C (77°F)	13.9 – 15.1 V
	at 115°C (239°F)	13.5 – 14.3 V

