

SPECIFICATIONS 1VD-FTV ENGINE MECHANICAL TORQUE SPECIFICATIONS

ENGINE

Part Tightened	N*m	kgf*cm	ft.*lbf
SST (attachment) x Cylinder head sub-assembly	13	133	10
No. 4 water by-pass x No. 2 water by-pass x Cylinder head cover sub-assembly	10	102	7
No. 4 water by-pass x Timing gear case sub-assembly	10	102	7
No. 2 engine room wire x No. 3 intake manifold	13	133	10

CAMSHAFT

Part Tightened	N*m	kgf*cm	ft.*lbf	in.*lbf
Service bolt x No. 4 camshaft	8.0	82		71
Service bolt x No. 1 camshaft	8.0	82		71
No. 1 camshaft bearing cap x Cylinder head sub-assembly	21	214	15	
No. 1 camshaft oil feed pipe sub-assembly x No. 3 camshaft bearing cap x Cylinder head sub-assembly	10	102	7	
No. 2 camshaft oil feed pipe sub-assembly x No. 3 camshaft bearing cap x Cylinder head sub-assembly	10	102	7	
No. 3 camshaft bearing cap x Cylinder head sub-assembly	10	102	7	
No. 1 camshaft oil feed pipe sub-assembly x No. 1 camshaft bearing cap	17	173	13	
No. 2 camshaft oil feed pipe sub-assembly x No. 1 camshaft bearing cap	17	173	13	
Pump drive shaft gear x No. 1 camshaft timing sprocket x No. 2 camshaft	24.5	250	18	
Taper screw plug x Timing chain cover sub-assembly	15	153	11	
No. 4 camshaft bearing cap x Cylinder head sub-assembly	21	214	15	
No. 3 camshaft oil feed pipe sub-assembly x No. 3 camshaft bearing cap x Cylinder head sub-assembly	10	102	7	
No. 4 camshaft oil feed pipe sub-assembly x No. 3 camshaft bearing cap x Cylinder head sub-assembly	10	102	7	
No. 3 camshaft bearing cap x Cylinder head sub-assembly	10	102	7	
No. 3 camshaft oil feed pipe sub-assembly x No. 1 camshaft bearing cap	17	173	13	
No. 4 camshaft oil feed pipe sub-assembly x No. 1 camshaft bearing cap	17	173	13	
No. 2 camshaft timing sprocket x No. 3 camshaft	24.5	250	18	
Taper screw plug x Timing chain cover sub-assembly	15	153	11	

CYLINDER HEAD GASKET

Part Tightened		N*m	kgf*cm	ft.*lbf
Cylinder head sub-assembly RH x Cylinder block sub-assembly	1st	80	816	59
	2nd	Turn 90°		
	3rd	Turn 90°		
	4th	Turn 90°		
Cylinder head sub-assembly LH x Cylinder block sub-assembly	1st	80	816	59
	2nd	Turn 90°		
	3rd	Turn 90°		
	4th	Turn 90°		

ENGINE ASSEMBLY

Part Tightened	N*m	kgf*cm	ft.*lbf	in.*lbf
No. 1 engine hanger x Cylinder head sub-assembly RH	24.5	250	18	
No. 2 engine hanger x Cylinder head sub-assembly LH	24.5	250	18	
Rear No. 1 engine mounting insulator x Manual transmission with transfer	59	602	44	

Part Tightened		N*m	kgf*cm	ft.*lbf	in.*lbf
Front engine mounting insulator LH x Engine mounting stabilizer x Transverse engine mounting bracket LH		71.5	729	53	
Front engine mounting insulator RH x Engine mounting stabilizer x Transverse engine mounting bracket RH		71.5	729	53	
Flywheel sub-assembly x Crankshaft		182	1856	134	
Front engine mounting insulator LH x Flame		74	755	55	
Front engine mounting insulator RH x Flame		74	755	55	
No. 2 engine room wire x Timing gear case sub-assembly		32	326	24	
No. 2 engine room wire x Starter assembly		21	214	15	
Starter hose bracket sub-assembly x Cylinder head sub-assembly RH		21	214	15	
No. 3 nozzle leakage pipe x Cylinder head sub-assembly RH	for union bolt	21	214	15	
	for bolt	10	102	7	
Cooler compressor assembly x Timing chain cover sub-assembly x Timing gear case sub-assembly x Chain cover and compressor bracket sub-assembly		24	245	18	
Vane pump assembly x Timing chain cover sub-assembly		29	296	21	
Battery carrier sub-assembly x Body	for bolt A	12.5	127	9	
	for bolt B	8.0	82		71
Fusible link block x Battery carrier sub-assembly		10	102	7	
Engine wire x Battery carrier sub-assembly		8.4	86		74
No. 2 fuse block x Body		10	102	7	
Battery clamp x Battery carrier sub-assembly	for bolt	8.0	82		71
	for nut	5.0	51		44
Hood sub-assembly x Hood hinge		20	204	15	

ENGINE UNIT

Part Tightened		N*m	kgf*cm	ft.*lbf	in.*lbf
No. 1 camshaft bearing cap x Cylinder head sub-assembly		21	214	15	
No. 1 camshaft oil feed pipe sub-assembly x No. 3 camshaft bearing cap x Cylinder head sub-assembly		10	102	7	
No. 2 camshaft oil feed pipe sub-assembly x No. 3 camshaft bearing cap x Cylinder head sub-assembly		10	102	7	
No. 3 camshaft bearing cap x Cylinder head sub-assembly		10	102	7	
No. 1 camshaft oil feed pipe sub-assembly x No. 1 camshaft bearing cap		17	173	13	
No. 2 camshaft oil feed pipe sub-assembly x No. 1 camshaft bearing cap		17	173	13	
No. 4 camshaft bearing cap x Cylinder head sub-assembly		21	214	15	
No. 3 camshaft oil feed pipe sub-assembly x No. 3 camshaft bearing cap x Cylinder head sub-assembly		10	102	7	
No. 4 camshaft oil feed pipe sub-assembly x No. 3 camshaft bearing cap x Cylinder head sub-assembly		10	102	7	
No. 3 camshaft bearing cap x Cylinder head sub-assembly		10	102	7	

Part Tightened		N*m	kgf*cm	ft.*lbf	in.*lbf
No. 3 camshaft oil feed pipe sub-assembly x No. 1 camshaft bearing cap		17	173	13	
No. 4 camshaft oil feed pipe sub-assembly x No. 1 camshaft bearing cap		17	173	13	
No. 2 vacuum transmitting pipe sub-assembly x Timing gear case sub-assembly		6.0	61		53
Stud bolt x Timing gear case sub-assembly	for Front Side	6.0	61		53
	for Rear Side	10	102	7	
Timing gear case sub-assembly x Cylinder block sub-assembly	for 14 mm head bolt (When "dry") The case is "dry" when there is absolutely no engine oil on the 14 mm head bolts and cylinder head set bolt holes.	46	469	34	
	for 14 mm head bolt (When "wet") The case is "wet" when there is engine oil on the 14 mm head bolts and cylinder head set bolt holes.	42	428	31	
	for 12 mm head bolt A and B	29	296	21	
	for nut	29	296	21	
Injection pump drive gear x Injection pump shaft sprocket sub-assembly		24.5	250	18	
Idle gear thrust plate x No. 1 idle gear x No. 1 idle gear shaft		47	479	35	
Injection pump drive gear x Fuel supply pump assembly		68	693	50	
No. 2 camshaft timing sprocket x No. 3 camshaft		24.5	250	18	
Pump drive shaft gear x No. 1 camshaft timing sprocket x No. 2 camshaft		24.5	250	18	
No. 2 chain vibration damper x Timing gear case sub-assembly		21	214	15	
No. 2 chain tensioner assembly x Timing gear case sub-assembly		10	102	7	
No. 1 chain vibration damper x Timing gear case sub-assembly		21	214	15	
No. 1 chain tensioner assembly x Timing gear case sub-assembly		10	102	7	
No. 1 crankshaft position sensor plate x Crankshaft		10	102	7	
Timing chain cover sub-assembly x Timing gear case sub-assembly		24.5	250	18	
Crankshaft pulley x Crankshaft		114.5	1168	84	
No. 1 nozzle holder clamp x Cylinder head sub-assembly RH		25	255	18	
No. 2 nozzle leakage pipe x Injector assembly	for Bank 1	18	184	13	
No. 2 nozzle leakage pipe x Cylinder head sub-assembly RH		21	214	15	
Stud bolt x Oil pan sub-assembly	27 mm (1.063 in.) bolt length	5.2	53		46
	34 mm (1.34 in.) bolt length	7.5	76		66
Straight screw plug x Oil pan sub-assembly	using a 10 mm hexagon wrench of straight screw plug	50	510	37	
	using a 14 mm hexagon wrench of straight screw plug	86	877	63	
Turbo oil pipe flange x Oil pan sub-assembly		10	102	7	
Oil cooler hose drain cock assembly x Oil pan sub-assembly		20	204	15	
No. 1 oil pan baffle plate x Oil pan sub-assembly		10	102	7	
Scavenging pump pipe x Oil pan sub-assembly		10	102	7	
Oil pan drain plug x No. 2 oil pan sub-assembly		38	387	28	
No. 2 turbo oil pipe x Oil pan sub-assembly		10	102	7	
Water by-pass pipe sub-assembly x	for union bolt	35	357	26	

	Part Tightened	N*m	kgf*cm	ft.*lbf	in.*lbf
Cylinder block sub-assembly	for bolt	10	102	7	
Ventilation tube sub-assembly x Cylinder head sub-assembly LH		29	296	21	
Ventilation tube sub-assembly x Oil pan sub-assembly		29	296	21	
No. 2 oil cooler hose clamp x Timing chain cover sub-assembly		10	102	7	
No. 2 oil cooler hose clamp x V-ribbed belt tensioner assembly		10	102	7	
Crankshaft position sensor x Timing chain cover sub-assembly		5.0	51		44
Camshaft position sensor x Timing chain cover sub-assembly		5.0	51		44
Oil filter outlet pipe sub-assembly x Oil pan sub-assembly		10	102	7	
Transverse engine mounting bracket RH x Cylinder block sub-assembly		80	816	59	
Transverse engine mounting bracket LH x Cylinder block sub-assembly		80	816	59	
No. 3 vacuum transmitting pipe sub-assembly x Cylinder block sub-assembly		6.0	61		53
No. 3 vacuum transmitting pipe sub-assembly x Oil pan sub-assembly		6.0	61		53
Chain cover and compressor bracket sub-assembly x Timing chain cover sub-assembly		21	214	15	
Idler pulley assembly x Timing chain cover sub-assembly	w/o Air Conditioning System	24.5	250	18	
Idler pulley assembly x Chain cover and compressor bracket sub-assembly	w/o Air Conditioning System	24.5	250	18	
No. 2 exhaust manifold heat insulator x Exhaust manifold LH		25	255	18	
No. 1 water outlet pipe x No. 2 water outlet pipe		21	214	15	
No. 1 water outlet pipe x Cylinder head sub-assembly LH		21	214	15	
Water by-pass outlet sub-assembly x Cylinder head sub-assembly RH		21	214	15	
Water outlet x Engine water pump assembly		21	214	15	
Engine coolant temperature sensor x Water outlet		19.6	200	14	
No. 3 engine hanger x Timing gear case sub-assembly		43	438	32	
Intercooler support bracket x No. 3 engine hanger		21	214	15	
No. 2 intercooler support bracket x Timing gear case sub-assembly		43	438	32	

CYLINDER HEAD

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder head stud bolt x Cylinder head sub-assembly	12	122	9
No. 1 straight screw plug with head x Cylinder head sub-assembly	25	255	18
Nozzle holder clamp seat x Cylinder head sub-assembly	10	102	7

CYLINDER BLOCK

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder block straight screw plug x Cylinder block sub-assembly	38	387	28
Cylinder block stud bolt x Cylinder block sub-assembly	using an E7 "TORX" wrench of cylinder block stud bolt	10	102
	using an E8 "TORX" wrench of cylinder block stud bolt	10	102
No. 1 oil nozzle sub-assembly x Cylinder block sub-assembly	10	102	7

Part Tightened			N*m	kgf*cm	ft.*lbf
Cylinder block stiffening plate x Crankshaft bearing cap x Cylinder block sub-assembly	for bolt A 11 mm (0.433 in.) diameter x 106 mm (4.17 in.) bolt length	1st	35	357	26
		2nd	Turn 90°		
		3rd	Turn 90°		
	for bolt B 10 mm (0.394 in.) diameter x 90.5 mm (3.56 in.) bolt length	1st	60	612	44
		2nd	Turn 90°		
	for bolt C 10 mm (0.394 in.) diameter x 22 mm (0.866 in.) bolt length		56	571	41
Connecting rod cap x Connecting rod		1st	35	357	26
		2nd	Turn 90°		

HINT:

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