0316C–03

TORQUE SPECIFICATION

3RZ–FE:

Part Tightened	N·m	kgf·cm	ft·lbf
Generator assy x Generator bracket No. 1	59	600	43
Generator assy x Fan belt adjusting bar	29	300	22
Compressor mounting bracket (w/ A/C)	39	398	29
Power steering idle pulley sub–assy	39	398	29
Engine under cover sub–assy No. 1 x Frame assy	29	296	21
Cylinder head cover sub–assy x Cylinder head sub–assy	5.5	55	48 in.·lbf
Ignition coil No. 1 x Cylinder head cover sub–assy (Unleaded gasoline)	9.0	90	78 in.·lbf
Engine hanger No. 2 x Cylinder head sub–assy	42	420	30
Engine mounting bracket front No. 1 RH x Cylinder block sub–assy	51	520	38
Water by–pass pipe No. 2 x Cylinder head sub–assy (w/ oil cooler)	20	200	14
Water by–pass pipe No. 2 x Cylinder block sub–assy (w/ oil cooler)	20	200	14
Exhaust manifold x Cylinder head sub–assy	49	500	36
Exhaust manifold heat insulator No. 1 x Exhaust manifold	12	115	8
Water outlet x Cylinder head sub–assy	20	200	14
Cylinder head plate rear x Cylinder head sub–assy	14	135	10
Water by–pass pipe No. 1 x Cylinder block sub–assy	37	380	28
Water by–pass pipe No. 1 x Timing gear case sub–assy	20	200	14
Engine mounting bracket front No. 1 LH x Cylinder block sub–assy	51	520	38
Oil level gage guide x Engine mounting bracket front No. 1 LH	20	200	14
Intake manifold x Cylinder head sub–assy	29	300	22
Engine wire x Intake manifold	13	133	10
Wire harness clamp bracket x Cylinder head cover sub–assy	6.7	68	59in.·lbf
Wire harness clamp bracket x Cylinder head sub–assy	13	133	10
Wire harness clamp bracket x Cylinder block sub–assy	21	214	16
Fuel pipe sub–assy No. 1 x Cylinder block sub–assy	20	204	15
Fuel pipe sub–assy No. 1 x Fuel delivery pipe sub–assy	29	300	21
Accelerator auto–drive clamp support x Cylinder head cover sub–assy (LHD)	12	122	9
Throttle cable clamp No .3 x Cylinder head cover sub–assy (A/T)	12	122	9
Throttle cable clamp No. 2 x Cylinder head cover sub–assy (A/T)	12	122	9
Pump bracket x Cylinder head sub–assy	39	398	29
Power steering idle pulley sub–assy x Cylinder head sub–assy	19	194	14
Rear end plate x Water by–pass pipe No. 1	20	200	14
Rear end plate x Cylinder block sub–assy	18	185	13
Engine mounting insulator front No. 1 RH & LH x Frame assy	38	387	28
Engine wire x Generator assy	9.8	100	7
Engine wire x Body	8.3	85	73 in.·lbf
Throttle cable clamp No. 1 x Cylinder head sub–assy	24	245	18
Hood sub–assy x Hood hinge assy RH & LH	13	130	10
Hood support RH & LH x Body	18	180	13
Engine under cover assy rear x Frame assy	29	296	21
Balanceshaft drive gear sub–assy x No. 1 balanceshaft	25	250	18
Chain tensioner assy No. 2 x Cylinder head block sub–assy	18	185	13
Chain vibration damper No. 3 x Cylinder block sub–assy	18	185	13
Chain vibration damper No. 2 x Cylinder block sub–assy	27	270	20
Chain vibration damper No. 1 x Cylinder block sub–assy	29	300	22
Chain tensioner slipper x Cylinder block sub–assy	27	270	20
Camshaft sub gear x No. 2 camshaft	5.0	51	44 in.·lbf
No. 2 camshaft (camshaft bearing cap) x Cylinder head sub–assy	16	160	12

Part Tightened		N·m	kgf·cm	ft·lbf
Camshaft (camshaft bearing cap) x Cylinder head sub–assy		16	160	12
Camshaft timing gear x Camshaft		74	750	54
Chain tensioner assy No.1 x Cylinder head sub–assy		21	210	15
Ignition coil bracket x Cylinder head sub–assy (Leaded gasoline)		20	200	14
Engine wire x Ignition coil bracket (Leaded gasoline)		8.2	84	73 in.·lbf
Cylinder head sub–assy x Cylinder block sub–assy	1st	39	400	29
	2nd	Turn 90°	Turn 90°	Turn 90°
	3rd	Turn 90°	Turn 90°	Turn 90°
Cylinder head sub–assy x Timing gear case sub–assy		21	210	15
Intake air surge tank x Intake manifold		21	210	15
Surge tank stay No.1 x Intake air surge tank		20	200	14
Surge tank stay No.1 x Engine mounting bracket front No.1 LH		20	200	14
EGR Pipe sub–assy No.1 x Cylinder head sub–assy (w/ EGR)		18	185	13
EGR Pipe sub–assy No.1 x EGR Valve assy (w/ EGR)		19	195	14
EGR Pipe sub–assy No.1 x Exhaust manifold (w/ EGR)		20	200	14
Exhaust pipe assy front x Exhaust manifold		62	630	46
Drive plate & ring gear sub–assy x Crankshaft (A/T)		74	750	54
Flywheel sub–assy x Crankshaft (M/T)	1st	27	270	20
	2nd	Turn 90°	Turn 90°	Turn 90°

5L–E:

Part Tightened		N·m	kgf·cm	ft·lbf
Injection pump assy x Timing gear case		21	210	15
Injection pump stay No.1 x Injection pump assy		26	270	19
Injection pump stay No.1 x Cylinder block		26	270	19
Generator x Engine	w/o A/C Bolt A	65	640	48
(See page 14–77)	Bolt B	18	185	13
	w/ A/C Bolt A	65	640	48
	Bolt B	18	185	13
Nut A x Idler pulley (See page 14–77)		39	400	29
Vane pump x Pump bracket	Bolt A	48	489	35
(See page 14–77)	Nut B	64	653	47
Cylinder head cover x Cylinder head		12	120	9
Engine hanger No.2 x Cylinder head		37	380	27
Engine mounting bracket front No.1 RH x Cylinder block		39	400	29
Oil pressure switch x Cylinder block		15	155	11
Exhaust manifold x Cylinder head		52	530	38
Exhaust manifold heat insulator x Exhaust manifold	Bolt A	18	185	13
(See page 14–91)	Bolt B	19	195	14
Generator bracket No.1 x Cylinder block		39	400	29
Fan belt adjusting bar x Cylinder block		45	460	33
Compressor mounting bracket No.1 x Cylinder head		85	870	63
Engine mounting bracket front No.1 LH x Cylinder block		39	400	29
Pump bracket x Cylinder block	Bolt A	78	795	58
(See page 14–91)	Bolt B	57	581	42
Cylinder block water drain cock x Cylinder block		49	500	36
Engine coolant temperature sensor x Cylinder block		20	200	15
Water by–pass hose union x Timing gear case		39	400	29
Intake manifold x Cylinder head		24	240	17
Water outlet housing x Cylinder head		19	195	14
Engine mounting insulator x Frame		38	387	28
Vane pump pulley x Vane pump		43	440	32
Compressor and magnetic clutch x Compressor mounting bracket No.1		25	250	18

Part Tightened		N·m	kgf·cm	ft·lbf
Idle pulley bracket x Cylinder block		47	475	34
Air cleaner case x Body		12	122	9
Engine under cover rear x Frame		29	296	21
Engine under cover No.1 x Frame		29	296	21
No.1 idler pulley x Timing gear case		44	450	33
Timing chain or belt cover x Timing gear case		11	105	8
Radiator hose hose clamp x Timing chain or belt cover		6.5	66	58 in.·lbf
Crankshaft pulley x Crankshaft		235	2,400	173
Vane pump drive pulley x Crankshaft pulley		19	195	14
Fluid coupling assy x Water pump		19	185	14
Camshaft bearing cap x Cylinder head		25	255	18
Camshaft oil seal retainer x Cylinder head		18	185	13
Timing belt No. 2 cover x Cylinder head		18	185	13
Camshaft timing pulley x Camshaft		98	1,000	72
Cylinder head x Cylinder block	1st	78	800	58
	2nd	Turn 90°	Turn 90°	Turn 90°
	3rd	Turn 90°	Turn 90°	Turn 90°
Rear end plate x Cylinder block		18	185	13
Flywheel x Crankshaft		123	1,250	90

1KZ–TE:

Part Tightened		N·m	kgf·cm	ft·lbf
Generator assy	Bolt A	62	632	46
	Bolt B	21	210	15
Cooler compressor idler pulley adjusting nut		39	400	29
Engine under cover sub–assy No. 1 x Body		29	300	21
Injection pump stay x Cylinder block	Bolt A	21	210	15
	Bolt B	21	210	15
	Bolt C	32	330	24
Glow plug assy x Cylinder head		13	130	10
Cylinder head cover sub–assy x Cylinder head		9	92	80 in.·lbf
Engine hanger No. 1 x Cylinder head		41	420	30
Engine hanger No. 2 x Cylinder head		20	200	14
Rear end plate		8	82	71 in.·lbf
Engine oil level sensor x Oil pan sub–assy No. 2		8	82	71 in.·lbf
Oil pan cover sub–assy No. 1 x Oil pan sub–assy No. 2		9	92	80 in.·lbf
Engine mounting bracket front No. 1 LH x Cylinder block		68	693	50
Engine mounting bracket front No. 1 RH x Cylinder block		68	693	50
Intercooler support bracket No. 2 x Cylinder head		18	185	13
Intercooler support bracket x Cylinder head		18	185	13
Generator bracket No. 1 x Cylinder block		21	210	15
Fan belt adjusting bar x Generator		21	210	15
Oil level gage guide x Water inlet		8	82	71 in.·lbf
Water by–pass pipe sub–assy x Cylinder head		8	82	71 in.·lbf
Ventilation pipe x Cylinder block		13	133	10
Water by–pass pipe sub–assy No. 2 x Cylinder head		8	82	71 in.·lbf
Crank position sensor x Cylinder block		5	51	44
Water temperature sender gage assy x Cylinder block		20	204	15
Diesel engine engine coolant temperature sensor x Cylinder block		20	204	15
Water outlet x Cylinder head		13	130	9
Intake manifold x Cylinder head		29	296	21
Crankshaft pulley set bolt		365	3,725	125
Vacuum pump assy x Timing gear case assy		21	210	15

Part Tightened		N·m	kgf·cm	ft·lbf
Camshaft drive gear x Timing gear case assy		13	130	9
Vane pump assy x Cylinder block		39	398	29
Vane pump oil reservoir x Cylinder head		18	184	13
Compressor and magnetic clutch x Cylinder head		25	250	18
Fluid coupling assy x Water pump assy		18	184	13
Fan shroud x Radiator assy		5	51	44
Hood sub–assy x Body	Bolt	13	130	8
	Nut	18	180	13
Engine under cover assy rear x Body		29	300	21
Timing belt idler sub–assy x Cylinder block		35	350	25
Chain tensioner assy No. 1 x Cylinder block		13	133	9
Timing chain or belt cover sub–assy x Oil seal retainer		6	61	53 in.·lbf
Camshaft bearing cap assy x Cylinder head		18	185	13
Camshaft timing pulley x Camshaft		98	1,000	72
Cylinder head bolt x Cylinder block	1 st	40	408	30
	2 nd	Turn 90 °	Turn 90 °	Turn 90 °
Compressor mounting bracket No. 1 x Cylinder head		25	250	18
Exhaust manifold x Cylinder head		52	530	38
Turbo oil inlet pipe x Cylinder block	Union bolt	26	260	19
	Bolt	12	125	9
Turbocharger stay		24	245	18
Turbine outlet elbow x Turbocharger sub–assy		39	390	28
Turbo water pipe sub–assy No. 1 x Turbocharger sub–assy	Nut	12	120	9
	Bolt	8	80	69 in.·lbf
Exhaust manifold insulator No. 1 x Exhaust manifold		6	65	56 in.·lbf
Turbo insulator No. 1 x Exhaust manifold		6	65	56 in.·lbf
Injection pipe set x Nozzle holder and nozzle set		15	150	11
Injection pipe set x Injection or supry pump assy		15	150	11
Pipe clamp x Cylinder head		6	65	53 in.·lbf
Drive plate & ring gear sub–assy x Crank shaft		178	1,815	132
Flywheel sub–assy x Crank shaft		178	1,815	132

1KD–FTV:

Part Tightened	N·m	kgf·cm	ft·lbf
Compression gauge attachment x Glow plug hole	13	133	10
Engine under cover sub–assy No. 1 x Frame assy	29	296	21
Timing belt No. 1 cover x Timing belt No. 2 cover	6.0	6	53 in.·lbf
Water hose clamp x Cylinder head	18	184	13
Fanshroud x Radiator assy	5.0	51	44 in.·lbf
Fan w/ fluid coupling assy x Water pump assy	18	184	13
Radiator reserve tank x Radiator assy and fanshroud	5.0	51	44 in.·lbf
Intercooler protector x Intercooler assy	6.0	61	53 in.·lbf
Engine under cover sub–assy No. 1 x Frame assy	29	296	21
Engine oil level sensor x Oil pan sub–assy	3.5	55	48 in.·lbf
Oil pan cover sub–assy No. 1 x Oil pan sub–assy	9.0	92	80 in.·lbf
Crank position No. 2 sensor x Timing gear case	8.0	82	71 in.·lbf
Crank position sensor x Timing gear case	8.0	82	71 in.·lbf
Water temperature sender gage assy x Cylinder head	20	204	15
Vacuum pump assy x Timing gear case	21	214	16
Timing belt idler sub–assy No. 1 x Cylinder block	35	357	26
Intercooler support bracket No. 2 x Cylinder head	18	183	13
Engine mounting bracket front No. 1 x Cylinder block	68	693	50
Water by–pass pipe No. 2 x Cylinder block	8.0	82	71 in.·lbf

Part Tightened	N·m	kgf·cm	ft·lbf
Water by–pass pipe sub–assy No. 2 x Cylinder head	8.0	82	71 in.·lbf
Exhaust manifold heat insulator No. 1 x Exhaust manifold	12	122	9.0
Turbo insulator No. 1 x Turbo assy	12	122	9.0
Oil level gage guide x Water inlet	8.0	82	71 in.·lbf
Ventilation pipe x Cylinder head	20	204	15
Compressor mounting bracket No. 1 x Cylinder block	21	214	16
Compressor mounting bracket No. 1 x Idle pulley assy	45	459	33
Compressor mounting bracket No. 1 x Generator bracket	21	214	16
Viscous heater bracket sub–assy x Cylinder head	47	479	35
Viscous w/ magnet clutch heater assy x Viscous heater bracket sub–assy	45	459	33
Viscous w/ magnet clutch heater assy x Viscous heater bracket No. 2	45	459	33
Diesel engine coolant temperature sensor x Cylinder block	20	204	15
Glow plug assy x Cylinder head	13	133	10
Glow plug assy x Glow plug connector No. 1	2.2	22	19 in.·lbf
Water outlet x Cylinder head	19	194	14
Intake manifold x Cylinder head	29	296	21
Common rail assy x Cylinder head	38	387	28
Timing belt No. 1 cover x Timing belt No. 2 cover	6.0	61	53 in.·lbf
Water hose clamp x Cylinder head	18	184	13
Rear end plate x Cylinder block	8.0	82	71 in.·lbf
Engine assembly x Frame assy	38	387	28
Vane pump assy x Timing gear case ass	39	398	29
Vane pump oil reservoir x Timing gear case assy and Intake manifold	18	184	13
Air cleaner assy x Body	12	122	9.0
Intercooler Protector x Intarcooler assy	6.0	61	53 in.·lbf
Chain tensioner assy No. 1 x Cylinder block	13	133	10
Fanshroud x Radiator assy	5.0	51	44 in.·lbf
Fan / fluid coupling assy x Water pump assy	18	184	13
Radiator reserve tank assy x Radiator assy and fanshroud	5.0	51	44 in.·lbf
Timing belt No. 2 cover x Timing gear case	10	102	7.0
Timing belt idler sub–assy No. 1 x Cylinder block	35	357	26
Camshaft timing pulley x Camshaft	98	1,000	72
Cylinder head cover sub–assy No. 2 x Cylinder head			
Bolt A	18	184	13
Bolt B and C	8.0	82	71 in.·lbf
Camshaft bearing cap x Cylinder head	19	194	14
Nozzle holder clamp x Cylinder head	22	220	16
Cylinder head x Cylinder block			
1st	85	867	63
2nd	Turn 90°	Turn 90°	Turn 90°
3rd	Turn 90°	Turn 90°	Turn 90°
Turbochrger sub–assy x Exhaust manifold	52	530	38
Ventilation pipe x Cylinder head	20	204	15
Viscous heater bracket sub–assy x Cylinder head	47	479	35
Viscous heater bracket sub–assy x Cooler compressor assy	25	250	18
Viscous heater bracket sub–assy x Viscous w/ magnet clutch heater assy	45	459	33
Viscous w/ magnet clutch heater assy x Viscous heater bracket No. 2	25	250	18
Crankshaft pulley x Crankshaft	365	3,722	270
Engine rear oil seal retainer x Cylinder block and oil pan sub–assy			
Bolt A	13	133	9.6
Bolt B	16	163	12

Part Tightened	N·m	kgf·cm	ft·lbf
Rear end plate x Cylinder block	8.0	82	71 in.·lbf
Flywheel sub–assy x Crankshaft	178	1,815	132