FUEL

030YI–03

SERVICE DATA

14B

Injection pump (Overhaul)	Part No. w/o HAC, w/o Engine speed sensor	22100–5C680
	w/o HAC, w/o Engine speed sensor	22100–5C690 for supply part
	w/o HAC, w/ Engine speed sensor	22100–56450
	w/ HAC, w/o Engine speed sensor	22100–56460
	w/ HAC, w/ Engine speed sensor	22100–56470
	w/ HAC, w/ Engine speed sensor	22100–56480 for supply part
	w/ HAC, w/ Engine speed sensor	22100–56490 for supply part
	Direction of rotaition	Clockwise as seen from drive side
	injection order	1 – 3 – 4 – 2 (A – B – C – D)
	Plunger spring deviation Maximum	2.0 mm (0.079 in.)
	Spring free length	
	Delivery valve spring	19.4 mm (0.764 in.)
	Plunger spring	32.4 mm (1.276 in.)
	Coupling spring	15.4 mm (0.606 in.)
	Pneumatic bellows spring (w/ HAC)	30.0 mm (1.181 in.)
	Roller height variation Maximum	0.02 mm (0.0008 in.)
	Fuel cut solenoid resistance at 20˚C (68˚F)	9.5 – 11.9 Ω
	Engine speed sensor resistance at 20˚C (68˚F)	650 – 970 Ω
	Timer adjusting screw protrusion pre–setting	7.5 – 8.0 mm (0.295 – 0.315 in.)
	Plunger spring shim thickness	0.5 mm (0.020 in.) 0.8 mm (0.031 in.) 1.0 mm (0.039 in.) 1.2 mm (0.047 in.) 1.5 mm (0.059 in.) 1.8 mm (0.071 in.) 2.0 mm (0.079 in.)
	Plunger adjusting shim thickness	1.9 mm (0.075 in.) 2.0 mm (0.079 in.) 2.1 mm (0.083 in.) 2.2 mm (0.087 in.) 2.3 mm (0.091 in.) 2.4 mm (0.094 in.) 2.5 mm (0.098 in.) 2.6 mm (0.102 in.) 2.7 mm (0.106 in.) 2.8 mm (0.110 in.) 2.9 mm (0.114 in.)
	Flyweight holder thrust clearance	0.15 – 0.35 mm (0.0059 – 0.0138 in.)
	Governor gear adjusting washer thickness	1.05 mm (0.0413 in.) 1.25 mm (0.0492 in.) 1.45 mm (0.0571 in.) 1.65 mm (0.0650 in.) 1.85 mm (0.0728 in.)
	Governor shaft protrusion	0.5 – 2.0 mm (0.020 – 0.079 in.)
Injection pump (Adjustment)	Preparations of pump tester	
	Test nozzle type	DN12SD12 (DENSO)
	Test nozzle opening pressure	14,220 – 15,200 kPa (145 – 155 kgf/cm^2, 2,062 – 2,205 psi)
	Injection pipe	
	Outside diameter	6.0 mm (0.236 in.)
	Inside 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 (104 – 113°F)
	Fuel feeding pressure	20 kPa (0.2 kgf/cm^2, 2.8 psi)
	Fuel cut solenoid voltage	6 V

Injection pump (Adjustment) (Cont'd)

Pump inner pressure (Adjusting lever maximum position)		
	Pump rpm 400	216 – 275 kPa (2.2 – 2.8 kgf/cm^2, 31 – 40 psi)
	1,700	667 – 726 kPa (6.8 – 7.4 kgf/cm^2, 97 – 105 psi)
Overflow volume (Adjusting lever maximum position)		
	Pump rpm 400	650 – 1,083 cc/min. (39.7 – 66.1 cu in./min.)
Timer piston stroke (w/ HAC)	Pump rpm 1,200	0.20 – 1.20 mm (0.0079 – 0.0472 in.)
	1,400	3.20 – 4.20 mm (0.1260 – 0.1654 in.)
	1,700	4.76 – 5.24 mm (0.1874 – 0.2064 in.)
Timer piston stroke (w/o HAC)	Pump rpm 1,200	0.9 – 1.9 mm (0.0354 – 0.0748 in.)
	1,500	3.1 – 4.1 mm (0.1220 – 0.1614 in.)
	1,700	4.76 – 5.24 mm (0.1874 – 0.2064 in.)
Timer spring free length		56.5 mm (2.224 in.)
		57.1 mm (2.248 in.)
		57.8 mm (2.276 in.)

Full load injection volume (w/ HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder
Plus 21 – 31°	1,100	200	13.0 – 13.6 cc (0.79 – 0.83 cu in.)

Full load injection volume (w/o HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder
Plus 21 – 31°	1,100	200	12.4 – 13.0 cc (0.76 – 0.79 cu in.)

Maximum speed (w/ HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder
Plus 21 – 31°	2,075	200	3.4 – 5.8 cc (0.21 – 0.35 cu in.)
	2,250	200	1.2 cc (0.07 cu in.) or less

Maximum speed (w/o HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder
Plus 21 – 31°	2,075	200	1.8 – 4.2 cc (0.11 – 0.26 cu in.)
	2,250	200	1.2 cc (0.07 cu in.) or less

Injection volume (w/ HAC)

Adjusting lever angle	Pump rpm	HAC vacuum kPa (mmHg, in.Hg)	No. of measuring strokes	Injection volume of each cylinder	Variation limit
Plus 21 – 31°	100	97.3 kPa (730 mm Hg, 28.73 in.Hg)	200	12.6 – 17.4 cc (0.77 – 1.06 cu in.)	1.4 cc (0.09 cu in.)
	500	97.3 kPa (730 mm Hg, 28.73 in.Hg)	200	9.3 – 10.9 cc (0.57 – 0.67 cu in.)	0.7 cc (0.04 cu in.)
	700	97.3 kPa (730 mm Hg, 28.73 in.Hg)	200	10.6 – 12.2 cc (0.65 – 0.74 cu in.)	0.7 cc (0.04 cu in.)
	900	97.3 kPa (730 mm Hg, 28.73 in.Hg)	200	12.1 – 13.7 cc (0.74 – 0.84 cu in.)	0.7 cc (0.04 cu in.)
	1,100	97.3 kPa (730 mm Hg, 28.73 in.Hg)	200	13.0 – 13.6 cc (0.79 – 0.83 cu in.)	0.7 cc (0.04 cu in.)
		70.7 kPa (530 mm Hg, 20.88 in.Hg)	200	7.8 – 9.8 cc (0.48 – 0.60 cu in.)	–
	1,700	97.3 kPa (730 mm Hg, 28.73 in.Hg)	200	10.0 – 11.6 cc (0.61 – 0.71 cu in.)	0.7 cc (0.04 cu in.)

Injection pump (Adjustment) (Cont'd)

Injection volume (w/o HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder	Variation limit
Plus 21 – 31°	100	200	12.6 – 17.4 cc (0.77 – 1.06 cu in.)	1.4 cc (0.09 cu in.)
	500	200	9.1 – 10.3 cc (0.56 – 0.63 cu in.)	0.7 cc (0.04 cu in.)
	700	200	10.3 – 11.5 cc (0.63 – 0.70 cu in.)	
	900	200	11.7 – 12.9 cc (0.71 – 0.79 cu in.)	
	1,100	200	12.4 – 13.0 cc (0.76 – 0.79 cu in.)	
	1,700	200	10.5 – 11.7 cc (0.64 – 0.71 cu in.)	

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 (0.157 in.) 4.1 mm (0.161 in.) 4.2 mm (0.165 in.) 4.3 mm (0.169 in.) 4.5 mm (0.177 in.) 4.7 mm (0.185 in.)

Idle speed pre–setting (w/ HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder
Minus 12 – 22°	325	200	q = 3.8 – 4.2 cc (0.23 – 0.26 cu in.)

Idle speed pre–setting (w/o HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder
Minus 12 – 22°	350	200	q = 4.0 – 4.4 cc (0.24 – 0.27 cu in.)

Dash pot injection volume (w/ HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder
Minus 12 – 22°	325	200	q plus 0.14 – 0.46 cc (0.01 – 0.03 cu in.)

Dash pot injection volume (w/o HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder
Minus 12 – 22°	350	200	q plus 0.14 – 0.46 cc (0.01 – 0.03 cu in.)

Idle speed (w/ HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder	Variation limit
Minus 12 – 22°	325	200	1.1 – 2.7 cc (0.07 – 0.16 cu in.)	0.5 cc (0.03 cu in.)

Idle speed (w/o HAC)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder	Variation limit
Minus 12 – 22°	350	200	1.3 – 2.9 cc (0.08 – 0.18 cu in.)	0.5 cc (0.03 cu in.)

Adjusting lever moving angle	38 – 48°

S05C–B

Injection pump (Overhaul)	Camshaft protruding length	STD	16 – 17 mm (0.63 – 0.66 in.)
	Camshaft end play	STD	0.03 – 0.05 mm (0.0012 – 0.0019 in.)
	Protruction of adjusting nut A		–0.4 – 0.2 mm (–0.0015 – 0.007 in.)
	Damper thrust clearance	STD	0.02 – 0.10 mm (0.0008 – 0.0039 in.)
	Bearing bolt	STD free play	1.5 – 2.0 mm (0.060 – 0.078 in.)
		Fitting dimension	49.7 – 50.1 mm (1.957 – 1.972 in.)
		Thrust clearance B	0.08 – 0.12 mm (0.0032 – 0.0047 in.)
	Timer hub screw	Oil volume	140 – 160 cm^3 (8.54 – 9.76 cu in.)
Injection pump (Adjustment)	Governor adjustment		L1 = L2 = 25.5 mm (1.00 in.)
	Injection timing	Injection interval	89° 45' – 90° 15'
		Injection order	1 – 3 – 4 – 2

S05C–TA

Injection pump (Overhaul)	Camshaft protruding length	STD	16 – 17 mm (0.63 – 0.66 in.)
	Camshaft end play	STD	0.03 – 0.05 mm (0.0012 – 0.0019 in.)
	Protruction of adjusting nut A		–0.4 – 0.2 mm (–0.0015 – 0.007 in.)
	Damper thrust clearance	STD	0.02 – 0.10 mm (0.0008 – 0.0039 in.)
	Bearing bolt	STD free play	1.5 – 2.0 mm (0.060 – 0.078 in.)
		Fitting dimension	49.7 – 50.1 mm (1.957 – 1.972 in.)
		Thrust clearance B	0.08 – 0.12 mm (0.0032 – 0.0047 in.)
	Timer hub screw	Oil volume	140 – 160 cm^3 (8.54 – 9.76 cu in.)
Injection pump (Adjustment)	Governor adjustment		L1 = L2 = 25.5 mm (1.00 in.)
	Injection timing	Injection interval	89° 45' – 90° 15'
		Injection order	1 – 3 – 4 – 2

W04D–J

Injection pump (Overhaul)	Camshaft end play	STD	0.03 – 0.05 mm (0.0012 – 0.0019 in.)
		Service limit	0.10 mm (0.0039 in.)
	Protruction of adjusting nut A		–0.4 – 0.2 mm (–0.0015 – 0.007 in.)
	Damper thrust clearance	STD	0.02 – 0.10 mm (0.0008 – 0.0039 in.)
	Bearing bolt	STD free play	1.5 – 2.0 mm (0.060 – 0.078 in.)
		Fitting dimension	49.7 – 50.1 mm (1.957 – 1.972 in.)
		Thrust clearance B	0.08 – 0.12 mm (0.0032 – 0.0047 in.)
	Timer cover clearance	Cover side	0.12 – 0.22 mm (0.00472 – 0.00866 in.)
		Gear side	0.02 – 0.12 mm (0.00079 – 0.00472 in.)
Injection pump (Adjustment)	Governor adjustment		L1 = L2 = 23.5 mm (0.925 in.)
	Preparations of pump tester		
	Test nozzle type		12SD12
	Test nozzle opening pressure		17.160 MPa (175 kgf/cm^2, 2,489 psi)
	Injection pipe		
	Outside diameter		6.0 mm (0.24 in.)
	Inside diameter		2.0 mm (0.08 in.)
	Length		600 mm (23.6 in.)
	Injection timing	Injection interval	89° 45' – 90° 15'
		Injection order	1 – 3 – 4 – 2
	Tappet top clearance		More than 0.2 mm (0.0079 in.)