

INJECTION PUMP TEST SPECIFICATIONS

196000-5560

MANUFACTURER	TOYOTA	INJECTION PUMP		196000-556#				
ENGINE TYPE	14Z			VE6/12F1100RND556				
VEHICLE MODEL	FORK LIFT	ROTATION	Clockwise viewed from drive side		GOVERNOR TYPE	All speed		
RATED VOLTAGE	12V	INJECTION ORDER	A - B - C - D - E - F		INJECTION INTERVAL	60° ± 30'		
Dimension KF (mm)	5.80 ± 0.10		Dimension MS (mm)		0.70 ± 0.10			
Dimension K (mm)	3.00 ± 0.15		Dimension PS (mm)		0.17 ± 0.05			
1. TEST CONDITIONS								
Nozzle	093400-0540 (DN12SD12A)		Feed Pressure		19.6 kPa (0.2 kgf/cm ²)			
Nozzle Opening Pressure	14.7 ± 0.5 MPa (150 ± 5 kgf/cm ²)		High Pressure Pipe		Ø2 × Ø6 × 840 mm			
Test Oil	SAE J967 (ISO4113)		Fuel Temperature		40 - 45 °C (104 - 113°F)			
NOTE : Apply 14 volts DC across the fuel cut solenoid during adjustment.								
2. PRE-ADJUSTMENT OF INTERNAL PRESSURE								
Lever Position	Pump Speed (rpm)	Boost Pressure		Internal Pressure		Remarks		
		(kPa)	(mmHg)	(kPa)	(kgf/cm ²)			
Full	1100	—	—	529.5 ± 29.5	5.4 ± 0.3	Tighten the main shaft		
3. PRE-ADJUSTMENT								
Lever Position	Lever Position (deg)	Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Max. Spread in Delivery	
			(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	(mm ³)	(cc)
Low Speed	- 15.5 ± 5° (Idle position)	395	—	—	3.7 ± 2.0	1.9 ± 0.4 (cc/500st)	3.0	1.5
Full Load	10.5 ± 5°	800	—	—	42.3 ± 0.5	8.5 ± 0.1	3.0	0.6
High Speed	(Full position)	1130	—	—	21.1 ± 3.0	4.2 ± 0.6	—	—
4. PRE-SETTING OF LOAD SENSING TIMER								
Item	Pump Speed (rpm)	Lever Position	Adjustment Value	Remarks				
Pre-setting of timer	900	Full	0.0mm	Do not advance the injecton timing				
Start of Load Sensing	900	—	Piston travel 0.03 - 0.10mm	Main shaft set, Check the reference measurement value when the injection quantity lever opening is at 25.0 ± 2.0mm ² /st (5.0 ± 0.4cc/200st). Set the lever at the point when internal pump pressure begins to rise.				
5. ADJUSTMENT OF INTERNAL PRESSURE								
Lever Position	Pump Speed (rpm)	Boost Pressure		Internal Pressure		Remarks		
		(kPa)	(mmHg)	(kPa)	(kgf/cm ²)			
Full	650	—	—	446.5 ± 29.5	4.0 ± 0.3			
	1100	—	—	538.5 ± 29.5	5.5 ± 0.3			
6. OVERFLOW QUANTITY CHECK								
Lever Position	Pump Speed (rpm)	Boost Pressure		Overflow Quantity		Remarks		
		(kPa)	(mmHg)	(L/h)	(cc/1000st)			
Full	400	—	—	32 - 58	1330 - 2420			
NOTE : The overflow valve belonging to the pump should be used checking.								

7. ADJUSTMENT OF TIMER								
Lever Position	Pump Speed (rpm)	Boost Pressure		Piston Travel (mm)	Remarks			
		(kPa)	(mmHg)					
Full	900	—	—	0.66 ± 0.40				
	1100	—	—	1.92 ± 0.40				
	1200	—	—	3.44 ± 0.40				
NOTE : Hysteresis at each pump speed is less than 0.3 mm.								
8. ADJUSTMENT OF BOOST COMPENSATOR — : Not Applicable								
Lever Position	Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Max. Spread in Delivery		Remarks
		(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	(mm ³)	(cc)	
—	—	—	—	—	—	—	—	—
9. ADJUSTMENT OF FUEL DELIVERY								
Lever Position	Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Max. Spread in Delivery		Remarks
		(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	(mm ³)	(cc)	
Full	800	—	—	42.3 ± 0.5	8.5 ± 0.1	3.0	0.6	By full load setting screw
	1130	—	—	21.1 ± 3.0	4.2 ± 0.6	—	—	By max. speed setting screw
	1100	—	—	35.2 ± 3.0	7.0 ± 0.6	—	—	
	1250	—	—	Less than 1.5	Less than 0.3	—	—	
Full	100	—	—	72.0 ± 10.0	14.4 ± 2.0	—	—	By governor sleeve plug
	275	—	—	22.9 ± 3.5	4.6 ± 0.7	—	—	End of fuel quantity increase
	500	—	—	33.3 ± 2.0	6.7 ± 0.4	3.5	0.7	
	1050	—	—	45.7 ± 2.0	9.1 ± 0.4	5.0	1.0	

10. SETTING OF LOAD SENSING TIMER

1. Change of Piston Travel : ^{More than} 0.30 mm (Pump speed 1100 rpm)

Remarks: The change in volume associated with piston travel when the injection volume is 22.5mm³/st (4.5cc/200st).
The injection quantity at the point when internal pump pressure begins to rise while dropping the adjusting lever from the full position to the idle position.

2. Piston Travel at End of Pressure Drop : 3.00 ± 0.40 mm (Pump speed 1100 rpm)

Remarks: In the idle lever position

3. Dimension of Governor Shaft : L = 1.15 ± 0.85 mm

9. SETTING OF ADJUSTING LEVER AT LOW SPEED

Lever Position (deg)	Pump Speed (rpm)	Boost Pressure (kPa)	Fuel Delivery		Max. Spread in Delivery		Remarks
			(mm ³ /st)	(cc/500st)	(mm ³)	(cc)	
- 15.5 ± 5° (Idle position)	395	—	3.7 ± 2.0	1.9 ± 1.0	3.0	1.5	Lever setting
	275	—	20.3 ± 4.0	10.2 ± 2.0	—	—	
	535	—	Less than 3.0	Less than 1.5	—	—	

10. SETTING OF ADJUSTING LEVER AT PARTIAL RANGE

— : Not Applicable

Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Remarks
	(kPa)	(mmHg)	(mm ³ /st)	(cc/500st)	
—	—	—	—	—	—

11. CHARACTERISTIC OF A.C.S.D.

Lever Position	Pump Speed (rpm)	Boost Pressure		Measuring Value	Remarks
		(kPa)	(mmHg)		
Idle	395	—	—	1.62 ± 0.1 mm	Piston Travel (Absolute)

Fuel temperature : 39 - 41°C (102 - 106°F)

12. ADJUSTMENT OF T.C.V.

— : Not Applicable

Lever Position	Pump Speed (rpm)	Boost Pressure		Piston Travel (mm)	Remarks
		(kPa)	(mmHg)		
—	—	—	—	—	—

13. SETTING OF DIAPHRAGM FOR HEATER & POWER STEERING

— : Not Applicable

Pump Speed (rpm)	Vacuum Pressure		Fuel Delivery		Remarks
	(kPa)	(mmHg)	(mm ³ /st)	(cc/500st)	
—	—	—	—	—	—

14. ADJUSTMENT OF POWER CONTROL

— : Not Applicable

Lever Position	Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Remarks
		(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	
—	—	—	—	—	—	—

15. ADJUSTMENT OF THROTTLE POSITION SENSOR

— : Not Applicable

Lever Position	Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Sensor Output Voltage (V)	Remarks
		(kPa)	(mmHg)	(mm ³ /st)	(cc/500st)		
—	—	—	—	—	—	—	—

16. FINAL CHECK AFTER ADJUSTMENT

- Lever position at idle is $-15.5 \pm 5^\circ$ and $10.5 \pm 5^\circ$ at full.
- After adjustment has been completed, delivery quantity must be $4.5 \text{ mm}^3/\text{st}$ ($0.9 \text{ cc}/200\text{st}$) or less when voltage at fuel cut solenoid is reduced to zero.
(Pump Speed $N_p = 200 \text{ rpm}$)
- Resistance of pick-up tachometer must be $835 \pm 185 \text{ ohms}$. {20 - 40 °C (68 - 104 °F)}