

INJECTION PUMP TEST SPECIFICATIONS

196000-1754

MANUFACTURER	TOYOTA	INJECTION PUMP		196000-175#				
ENGINE TYPE	5L			VE4/10F2200RND175				
VEHICLE MODEL	HIACE S.B.W	ROTATION	Clockwise viewed from drive side	GOVERNOR TYPE	All speed			
RATED VOLTAGE	12V	INJECTION ORDER	A - B - C - D	INJECTION INTERVAL	90° ± 30'			
Dimension KF (mm)	6.40 ± 0.10		Dimension MS (mm)	0.45 ± 0.10				
Dimension K (mm)	3.30 ± 0.10		Dimension PS (mm)	—				
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 X Ø6 X 840 mm				
Test Oil	SAE J967 (ISO4113)		Fuel Temperature	40 - 45 °C (104 - 113°F)				
NOTE : Apply 6 volts DC across the fuel cut solenoid during adjustment.								
2. PRE-ADJUSTMENT Applying 0 V to T.C.V.								
	Lever Position (deg)	Pump Speed (rpm)	Absolute Pressure		Fuel Delivery		Max. Spread in Delivery	
			(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	(mm ³)	(cc)
Full Load	28.5 ± 5°	1200	101.3 ± 0.2	760.0 ± 1.5	63.6 ± 0.5	12.7 ± 0.1	2.0	0.4
High Speed	(Full position)	2450	101.3 ± 0.2	760.0 ± 1.5	27.0 ± 2.5	5.4 ± 0.5	—	—
3. ADJUSTMENT OF INTERNAL PRESSURE Applying 0 V to T.C.V.								
Lever Position	Pump Speed (rpm)	Absolute Pressure		Internal Pressure		Remarks		
		(kPa)	(mmHg)	(kPa)	(kgf/cm ²)			
Full	500	101.3 ± 0.2	760.0 ± 1.5	343.5 ± 29.5	3.5 ± 0.3	By the regulating valve		
	2100	101.3 ± 0.2	760.0 ± 1.5	647.0 ± 29.0	6.6 ± 0.3			
4. OVERFLOW QUANTITY CHECK Applying 0 V to T.C.V.								
Lever Position	Pump Speed (rpm)	Absolute Pressure		Overflow Quantity		Remarks		
		(kPa)	(mmHg)	(L/h)	(cc/1000st)			
Full	2200	101.3 ± 0.2	760.0 ± 1.5	22 - 48	167 - 364			
NOTE : The overflow valve belonging to the pump should be used checking.								
5. ADJUSTMENT OF TIMER Applying 0 V to T.C.V.								
Lever Position	Pump Speed (rpm)	Absolute Pressure		Piston Travel (mm)	Remarks			
		(kPa)	(mmHg)					
Full	800	101.3 ± 0.2	760.0 ± 1.5	2.05 ± 0.40	Max. piston travel			
	1200	101.3 ± 0.2	760.0 ± 1.5	3.81 ± 0.40				
	1900	101.3 ± 0.2	760.0 ± 1.5	6.89 ± 0.40				
	2200	101.3 ± 0.2	760.0 ± 1.5	7.30 ± 0.24				
NOTE : Hysteresis at each pump speed is less than 0.3 mm.								

6. ADJUSTMENT OF DAC								Applying 0 V to T.C.V.	
Lever Position	Pump Speed (rpm)	Absolute Pressure		Fuel Delivery		Max. Spread in Delivery		Remarks	
		(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	(mm ³)	(cc)		
Full	1200	101.3 ± 0.2	760.0 ± 1.5	63.6 ± 0.5	12.7 ± 0.1	2.0	0.4		
	1200	85.3 ± 0.2	640.0 ± 1.5	57.0 ± 1.5	11.4 ± 0.3	—	—		
7. ADJUSTMENT OF FUEL DELIVERY								Applying 0 V to T.C.V.	
Lever Position	Pump Speed (rpm)	Absolute Pressure		Fuel Delivery		Max. Spread in Delivery		Remarks	
		(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	(mm ³)	(cc)		
Full	1200	101.3 ± 0.2	760.0 ± 1.5	63.6 ± 0.5 = A	12.7 ± 0.1 = A	2.0	0.4	By full load setting screw	
	2450	101.3 ± 0.2	760.0 ± 1.5	27.0 ± 2.5	5.4 ± 0.5	—	—	By max. speed setting screw	
	2300	101.3 ± 0.2	760.0 ± 1.5	42.3 ± 4.0	8.5 ± 0.8	—	—		
	2700	101.3 ± 0.2	760.0 ± 1.5	Less than 5.0	Less than 1.0	—	—		
	100	101.3 ± 0.2	760.0 ± 1.5	80.0 ± 10.0	16.0 ± 2.0	7.0	1.4	By governor sleeve plug	
	500	101.3 ± 0.2	760.0 ± 1.5	55.2 ± 2.0	11.0 ± 0.4	2.5	0.5		
	2000	101.3 ± 0.2	760.0 ± 1.5	60.8 ± 1.8	12.2 ± 0.4	2.5	0.5		
8. SETTING OF LOAD SENSING TIMER								Applying 0 V to T.C.V.	
Lever Position	Pump Speed (rpm)	Absolute Pressure		Fuel Delivery		Remarks			
		(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)				
Start of Load Sensing	1200	101.3 ± 0.2	760.0 ± 1.5	(A - 5.0) ± 2.0	(A - 1.0) ± 0.4	By governor shaft			
End of Pressure Drop	1200	101.3 ± 0.2	760.0 ± 1.5	44.6 ± 1.0	8.9 ± 0.2	Check			
Check Points	1. Piston Travel at End of Pressure Drop : 2.17 ± 0.50 mm (Pump speed 1200 rpm) 2. Dimension of Governor Shaft : L = 1.25 ± 0.75 mm								

15. ADJUSTMENT OF THROTTLE POSITION SENSOR							— : Not Applicable
Lever Position	Pump Speed (rpm)	Absolute Pressure		Fuel Delivery		Sensor Output Voltage (V)	Remarks
		(kPa)	(mmHg)	(mm ³ /st)	(cc/500st)		
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16. FINAL CHECK AFTER ADJUSTMENT							
<p>1 . Range of lever angle between idle and full lever position is $45 \pm 3^\circ$.</p> <p>2 . After adjustment has been completed, delivery quantity must be 0 mm³/st (0 cc/200st) when voltage at fuel cut solenoid is reduced to zero. (Pump Speed Np = 100 rpm)</p>							