

INJECTION PUMP TEST SPECIFICATIONS

MANUFACTURER	MITSUBISHI	INJECTION PUMP		196000-3420				
ENGINE TYPE	4M40			VE4/10F2000RND291				
VEHICLE MODEL	CANTER	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)		6.30 ± 0.10		Dimension MS (mm)		0.65 ± 0.05		
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 6 ± 0.1 V to T.C.V.								
	Lever Position (deg)	Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Max. Spread in Delivery	
			(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	(mm ³)	(cc)
Full Load	41 ± 3°	1000	—	—	57.2 ± 0.5	11.4 ± 0.1	2.5	0.5
High Speed	(Idle - Full)	2200	—	—	41.8 ± 2.0	8.4 ± 0.4	—	—
3. ADJUSTMENT OF INTERNAL PRESSURE								
Applying 6 ± 0.1 V to T.C.V.								
Lever Position	Pump Speed (rpm)	Boost Pressure		Internal Pressure		Remarks		
		(kPa)	(mmHg)	(kPa)	(kgf/cm ²)			
Full	500	—	—	392.5 ± 29.5	4.0 ± 0.3	By the regulating valve		
	2000	—	—	750.5 ± 29.5	7.7 ± 0.3			
4. OVERFLOW QUANTITY CHECK								
Applying 6 ± 0.1 V to T.C.V.								
Lever Position	Pump Speed (rpm)	Boost Pressure		Overflow Quantity		Remarks		
		(kPa)	(mmHg)	(L/h)	(cc/1000st)			
Full	2250	—	—	21 - 46	156 - 341			
NOTE : The overflow valve belonging to the pump should be used checking.								
5. ADJUSTMENT OF TIMER								
Applying 6 ± 0.1 V to T.C.V.								
Lever Position	Pump Speed (rpm)	Boost Pressure		Piston Travel (mm)	Remarks			
		(kPa)	(mmHg)					
Full	800	—	—	1.80 ± 0.40				
	1600	—	—	5.55 ± 0.50				
	2000	—	—	8.20 ± 0.40				
NOTE : Hysteresis at each pump speed is less than 0.3 mm.								

6. ADJUSTMENT OF BOOST COMPENSATOR

— : Not Applicable

[illegible]

7. ADJUSTMENT OF FUEL DELIVERY

Applying 6 ± 0.1 V to T.C.V.

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	1000	—	—	57.2 ± 0.5	11.4 ± 0.1	2.5	0.5	By full load setting screw
	2200	—	—	41.8 ± 2.0	8.4 ± 0.4	—	—	By max. speed setting screw
	2450	—	—	24.8 ± 5.5	5.0 ± 1.1	—	—	
Idle	2450	—	—	Less than 1.0	Less than 0.2	—	—	
Full	100	—	—	66.0 ± 6.0	13.2 ± 1.2	6.0	1.2	By governor sleeve plug
	500	—	—	52.4 ± 2.0	10.5 ± 0.4	—	—	
	2000	—	—	50.0 ± 2.5 = A	10.0 ± 0.5 = A	6.0	1.2	
	2100	—	—	Less than A	Less than A	—	—	

8. SETTING OF LOAD SENSING TIMER

— : Not Applicable

Lever Position	Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Remarks
		(kPa)	(mmHg)	(mm ³ /st)	(cc/200st)	
Start of Load Sensing	—	—	—	—	—	—
End of Pressure Drop	—	—	—	—	—	—
Repeat Advance Angle	—	—	—	—	—	—
Check Points	1.	—	:	—	mm	—
	2.	—	:	—	mm	—
	3.	Dimension of Governor Shaft : L = 1.15 ± 0.85 mm				

9. SETTING ADJUSTING LEVER AT LOW SPEED

Applying 6 ± 0.1 V to T.C.V.

Lever Position (deg)	Pump Speed (rpm)	Boost Pressure (kPa)	Fuel Delivery		Max. Spread in Delivery		Remarks
			(mm ³ /st)	(cc/500st)	(mm ³)	(cc)	
31 ± 4° (Idle)	400	—	18.4 ± 1.5 = B	9.2 ± 0.8 = B	2.0	1.0	Lever setting
	500	—	(B – 10.0) ± 2.5	(B – 5.0) ± 1.3	—	—	
	700	—	Less than 1.0	Less than 0.5	—	—	

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.

Applying 0 V to T.C.V.

Lever Position	Pump Speed (rpm)	Boost Pressure		Measuring Value	Remarks
		(kPa)	(mmHg)		
Idle	400	—	—	0.96 ± 0.40 mm	Piston Travel
	400	—	—	0 mm ³ /st	Idle-up Quantity (0 cc/500st)

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

12. ADJUSTMENT OF T.C.V.

Applying 0 V to T.C.V.

Lever Position	Pump Speed (rpm)	Boost Pressure		Piston Travel (mm)	Remarks
		(kPa)	(mmHg)		
Full	800	—	—	1.20 ± 0.40	
	1000	—	—	2.00 ± 0.40	
	1200	—	—	2.40 ± 0.20	
	1600	—	—	3.65 ± 0.25	
	2000	—	—	6.75 ± 0.40	

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 SENSORApplying 0 V to T.C.V., Applying 5 ± 0.005 V to sensor.

Lever Position	Pump Speed (rpm)	Boost Pressure		Fuel Delivery		Sensor Output Voltage VA (V)	Remarks
		(kPa)	(mmHg)	(mm ³ /st)	(cc/500st)		
—	1200	—	—	34.2 ± 0.4	17.1 ± 0.2	2.48 ± 0.05	Set point
Idle	0	—	—	—	—	0.57 ± 0.37	Check point
Full	0	—	—	—	—	4.0 ± 0.31	Check point

16. FINAL CHECK AFTER ADJUSTMENT

1. Range of lever angle between idle and full lever position is $41 \pm 5^\circ$. (fig.1)
2. Resistance of pick-up tachometer must be 1300 - 1600 ohms.
3. 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)

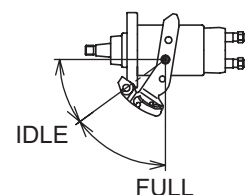
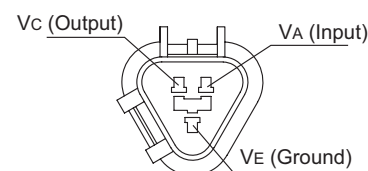


fig.1



RPS Connector