

ZEXEL Ass'y No.	104746-5113
Bosch Ass'y No.	9 460 614 880
Bosch Typecode	
Engine Type	4JB1-TC
Manufacturer	ISUZU
Edition date	24/08/04

**1 Adjustment conditions**

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
	Test oil		ISO4113orSAEJ967 d				
		...					
P	Test Oil Temperature	degC	45	45	50		
	Nozzle		105780-0060				
	Bosch type code		NP-DN0SD1510				
	Nozzle holder		105780-2150				
P	Opening Pressure	MPa	13	13	13.3		
P	Opening Pressure	kgf/cm2	133	133	136		
	Injection pipe		157805-7320				
P	Injection pipe	mm	2-6-450				
			Inside diameter - outside diameter - length (mm)				
	Joint assembly		157641-4720				
	Tube assembly		157641-4020				
P	Transfer pump pressure	kPa	20	20	20		
P	Transfer pump pressure	kgf/cm2	0.2	0.2	0.2		
	Direction of rotation (viewed from drive side)		L				
			Left				

**2 Adjustment specification****2.1 Full load delivery**

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	500	500	500		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	57.6	57.1	58.1		
S	Difference in delivery	mm3/st.	5		5		
P	Basic		*				
P	Oil temperature	degC	48	46	50		
	Remarks						
			NA				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	800	800	800		
P	Boost pressure	kPa	52	50.7	53.3		
P	Boost pressure	kgf/cm2	0.53	0.516	0.544		
P	Boost pressure	mmHg	390	380	400		
S	Average injection quantity	mm3/st.	63.1	62.6	63.6		
S	Difference in delivery	mm3/st.	5.5		5.5		
P	Basic		*				
P	Oil temperature	degC	50	48	52		
	Remarks						
			CBS				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	800	800	800		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
S	Average injection quantity	mm3/st.	68.6	68.1	69.1		
S	Difference in delivery	mm3/st.	6		6		
P	Basic		*				
P	Oil temperature	degC	50	48	52		
	Remarks						
			Full				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	500	500	500		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	57.6	56.6	58.6		
C	Difference in delivery	mm3/st.	5		5		
P	Basic		*				

P	Oil temperature	degC	48	46	50		
	Remarks						
		NA					
<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	800	800	800		
P	Boost pressure	kPa	52	50.7	53.3		
P	Boost pressure	kgf/cm2	0.53	0.516	0.544		
P	Boost pressure	mmHg	390	380	400		
C	Average injection quantity	mm3/st.	63.1	62.1	64.1		
C	Difference in delivery	mm3/st.	5.5		5.5		
P	Basic		*				
P	Oil temperature	degC	50	48	52		
	Remarks						
		CBS					

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	800	800	800		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	68.6	67.6	69.6		
C	Difference in delivery	mm3/st.	6		6		
P	Basic		*				
P	Oil temperature	degC	50	48	52		
	Remarks						
		Full					

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1000	1000	1000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	79.7	73.2	86.2		
		About					
P	Oil temperature	degC	50	48	52		

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1250	1250	1250		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	87.9	81.4	94.4		
		About					
P	Oil temperature	degC	50	48	52		

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1700	1700	1700		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	98.5	92	105		
		About					
P	Oil temperature	degC	50	48	52		

## 2.2 Governing

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	2075	2075	2075		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
S	Average injection quantity	mm3/st.	34	31	37		
S	Difference in delivery	mm3/st.	7		7		
P	Basic		*				
P	Oil temperature	degC	52	50	54		

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	2300	2300	2300		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	3		3		
P	Oil temperature	degC	52	50	54		

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	2075	2075	2075		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		

P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	34	31	37		
C	Difference in delivery	mm3/st.	7		7		
P	Basic		*				
P	Oil temperature	degC	52	50	54		

## 2.3 Idle

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	375	375	375		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	13.9	11.9	15.9		
S	Difference in delivery	mm3/st.	2		2		
P	Basic		*				
P	Oil temperature	degC	48	46	50		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	375	375	375		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	13.9	11.9	15.9		
C	Difference in delivery	mm3/st.	2		2		
P	Basic		*				
P	Oil temperature	degC	48	46	50		

## 2.4 Start

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	100	100	100		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	60	60	100		
		About					
P	Oil temperature	degC	48	46	50		
	Remarks						
		Full					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	100	100	100		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	60	60	100		
		About					
P	Oil temperature	degC	48	46	50		
	Remarks						
		Full					

## 2.5 Stop

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	375	375	375		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	0	0	0		
P	Oil temperature	degC	48	46	50		
	Remarks						
		Magnet OFF at idling position					

## 2.6 Overflow

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1350	1350	1350		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Overflow quantity	cm3/min	1240	1010	1470		
		About					
P	Oil temperature	degC	50	48	52		

## 2.7 Pump chamber Pressure

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1350	1350	1350		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		

S	Pressure	kPa	471	442	500		
S	Pressure	kgf/cm2	4.8	4.5	5.1		
P	Basic		*				
P	Oil temperature	degC	50	48	52		
<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1350	1350	1350		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Pressure	kPa	471	442	500		
C	Pressure	kgf/cm2	4.8	4.5	5.1		
P	Basic		*				
P	Oil temperature	degC	50	48	52		

**2.8 Timer**

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1350	1350	1350		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
S	Timer Stroke	mm	1.8	1.6	2		
P	Basic		*				
P	Oil temperature	degC	50	48	52		

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1020	1020	1020		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Timer Stroke	mm	0.5		0.5		
P	Oil temperature	degC	50	48	52		

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1350	1350	1350		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Timer Stroke	mm	1.8	1.6	2		
P	Basic		*				
P	Oil temperature	degC	50	48	52		

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1500	1500	1500		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Timer Stroke	mm	3	2.6	3.4		
		About					
P	Oil temperature	degC	50	48	52		

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
P	Pump speed	r/min	1800	1800	1800		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	kgf/cm2	0.82	0.806	0.834		
P	Boost pressure	mmHg	600	590	610		
C	Timer Stroke	mm	4.5	4.2	4.9		
P	Oil temperature	degC	50	48	52		

**2.9 Magnet**

<b>CAT</b>	<b>Designation</b>	<b>Unit</b>	<b>Set value</b>	<b>min.</b>	<b>max.</b>	<b>Actual values</b>	<b>OT</b>
C	MAX applied voltage	V	8	8	8		
P	Test voltage	V	13	12	14		

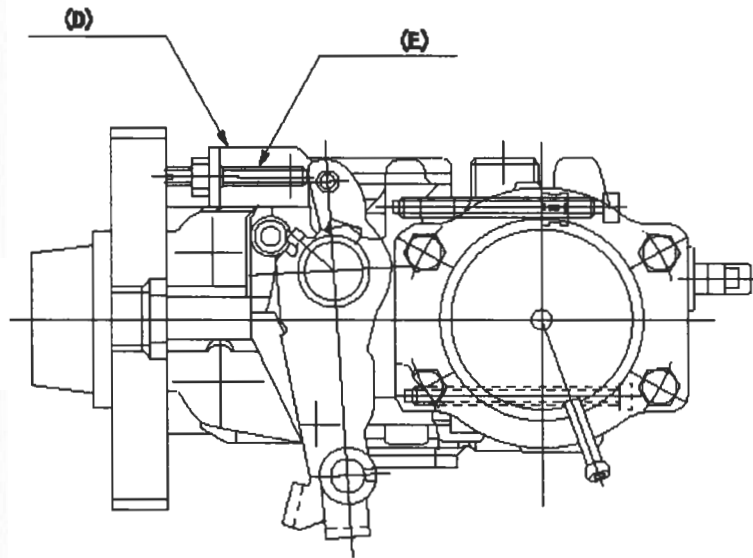
**2.10 Additional device adjustment**

2.10.1 Additional device 1

Name POTENTIOMETER ADJUSTMENT

N1=1080r/min  
 Q1=27.5+-1.0cm<sup>3</sup>/1,000st  
 V1=3.56+-0.03V  
 P1=0kPa  
 P2=0mmHg  
 N2=375r/min  
 Q2=13.9+-2.0cm<sup>3</sup>/1,000st(IDLE)  
 Q3=Full speed  
 V2=(0.93+-0.45)V  
 V3=(7.43+-0.83)V

N	V	Q	
N1	V1	Q1 P:P1 {P2}	B
N2	V2	Q2	C
N3	V3	Q3	C



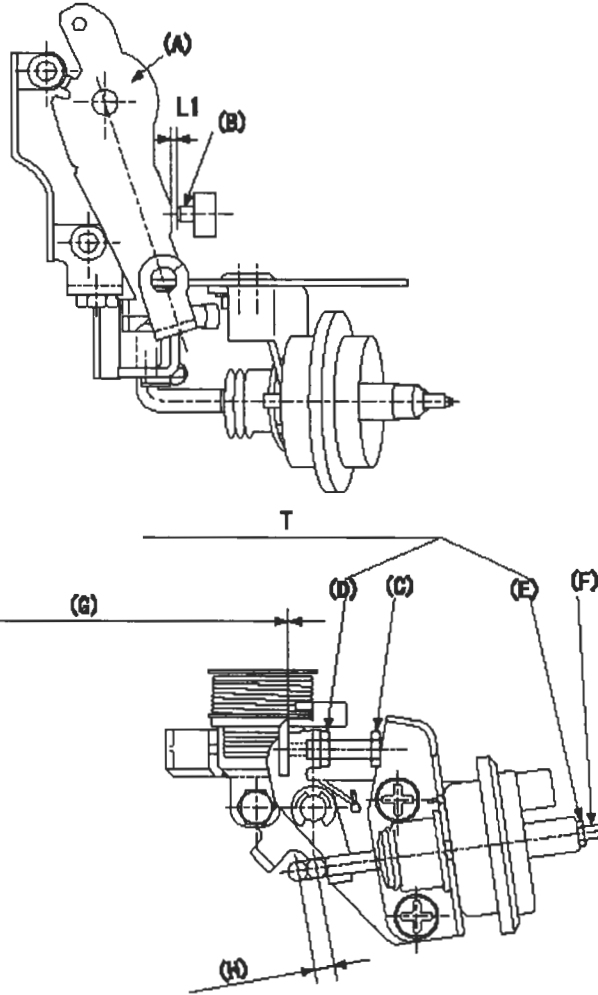
N1=1080r/min  
 Q1=27.5+-1.0cm<sup>3</sup>/1,000st  
 V1=3.56+-0.03V  
 Vi=10V

Adjustment of the potentiometer  
 Adjustment method [supply voltage Vi, dummy bolt (A)]  
 1. Hold the dummy bolt (A) against the control lever at position N = N1, Q = Q1.  
 Fix using the lock nut.  
 2. When adjusting the potentiometer, position the control lever to contact the dummy bolt (A).  
 Adjust the potentiometer so that the output voltage V is V1.  
 3. Remove the dummy bolt (A) after the completion of adjustment.  
 Confirm that the potentiometer output voltage is as specified above at the control lever idle position and the full position.  
 N: Pump speed  
 V: Output voltage  
 Q: Injection quantity  
 P: Boost pressure  
 B: Adjusting point  
 C: Checking point  
 (D): dummy bolt shape differs.  
 (E): Part numbers of the dummy bolt and the nut  
 146526-3300 (bolt) 42L  
 013020-6040 (nut)

## 2.10.2 Additional device 2

Name V-FICD ADJUSTMENT

T=3.4~4.9Nm(0.35~0.50kgfm)



L1=0.90±0.1mm  
 L2=Above0.5mm  
 P1=-53.3kPa  
 P2=-400mmHg

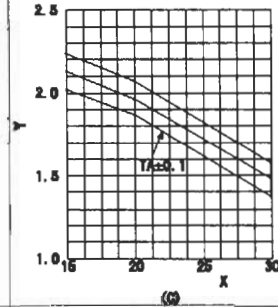
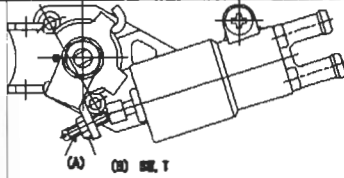
## Adjustment of the V-FICD

1. Insert the shim of L1 between the control lever (A) and the idle adjusting screw (B). Adjust using the FICD adjusting screw (C) so that the actuator moves through its full stroke, then fix using the nut (D). If adjustment with the FICD adjusting screw (C) is not possible, adjust by moving the actuator stroke with (E) and (F).
2. Apply P1{P2} to the actuator. Confirm that it moves through its full stroke. After releasing, confirm that the clearance between the control lever (A) and the adjusting screw (C) is L2 or more.  
 (G): exceeds L2 after releasing actuator  
 (H): stroke L3

2.10.3 Additional device 3

Name W-CSD ADJUSTMENT

SW=SW8  
 T=3.4~4.9Nm(0.35~0.5kgfm)  
 (C):TA(mm)=-0.0328t+2.62(-20degC  
 <=t<=20degC)  
 TA(mm)=-0.0492t+2.95(20degC<=  
 t<=60degC)



Adjustment of the W-CSD

Adjustment of the timer advance angle

1. Determine the timer advance angle using the graph.

Adjust with the screw so that the timer advance angle determined in item 2.1 is obtained.

X:Temperature (deg C)

Y:Timer stroke TA (mm)

(C): Timer stroke TA(mm):

3 Assembly dimension

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
S	K dimension	mm	3.6	3.5	3.7		
S	KF dimension	mm	7.76	7.66	7.86		
S	MS dimension	mm	0.5	0.4	0.6		
S	BCS stroke	mm	1.6	1.4	1.8		
S	Pre-stroke	mm	0.2	0.18	0.22		
S	Control lever angle alpha	deg.	18	14	22		
S	Control lever angle beta	deg.	39	34	44		
		About					