ZEXEL
COMBINATIONS

Date: 28.09.15
Time: 16:18:40

Product: 104641-6741 9 461 620 831 FUEL-INJECTION PUMP

+ INJECTION-PUMP ASSEMBLY	104741-6742	9 460 612 257	
Manufacturer No.:	8970223182		
- FUEL-INJECTION PUMP	104641-6741	9 461 620 831	
- NAMEPLATE	146921-0400	9 461 621 471	
- PULSE GENERATOR	146672-1720	9 461 611 810	
-			
- ACTUATOR	146679-0820	9 461 613 759	
- NOZZLE AND HOLDER ASSY.	105118-7101	9 430 612 703	48-2031J
Nozzle and Holder:	8-97018-945-1		
Open Pre:MPa(Kgf/cm2):	16.7{170}/19.1{195}		
- NOZZLE-HOLDER	105048-2031	9 430 615 104	
- NOZZLE	105017-1140	9 432 610 404	NP-DSLA154PN114

ZEXEL Ass'y No.	104741-6742
Bosch Ass'y No.	9 460 612 257
Bosch Typecode	
Engine Type	4JB1-T
Manufacturer	ISUZU
Edition date	09.01.04

1 Adjustment conditions

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
	Test oil		ISO4113orSAEJ967d				
		1404 Test oil					
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)		R				
		Right					

2 Adjustment specification

2.1 Full load delivery

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1100	1100	1100		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
S	Average injection quantity	mm3/st.	67.7	67.2	68.2		
S	Difference in delivery	mm3/st.	5.5		5.5		
P	Basic		*				
	Remarks						
		Full					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	750	750	750		
P	Boost pressure	kPa	42.65	41.3	44		
P	Boost pressure	mmHg	320	310	330		
S	Average injection quantity	mm3/st.	50.5	50	51		
S	Difference in delivery	mm3/st.	4.5		4.5		
P	Basic		*				
	Remarks						
		CBS					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2300	2300	2300		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Average injection quantity	mm3/st.	23.4	19.9	26.9		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1900	1900	1900		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Average injection quantity	mm3/st.	72	67.5	76.5		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1100	1100	1100		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Average injection quantity	mm3/st.	67.7	66.7	68.7		
	Remarks						
		Full					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1100	1100	1100		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	53.8	50.3	57.3		

S = Setting value, C = Check value)
OT = Outside Tolerance (X is set)

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	750	750	750		
P	Boost pressure	kPa	42.65	41.3	44		
P	Boost pressure	mmHg	320	310	330		
C	Average injection quantity	mm3/st.	50.5	49.5	51.5		
	Remarks						
		CBS					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	600	600	600		
P	Boost pressure	kPa	18.65	17.3	20		
P	Boost pressure	mmHg	140	130	150		
C	Average injection quantity	mm3/st.	38.6	35.6	41.6		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	400	400	400		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	38.1	32.6	43.6		

2.2 Governing

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2300	2300	2300		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
S	Average injection quantity	mm3/st.	23.4	20.4	26.4		
P	Difference in delivery	mm3/st.	7		7		
P	Basic		*				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2500	2500	2500		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Average injection quantity	mm3/st.	12		12		

2.3 Idle

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	385	385	385		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	7	5	9		
S	Difference in delivery	mm3/st.	2		2		
P	Basic		*				

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	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	3		3		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	385	385	385		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	7	5	9		

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	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	85	80	90		
P	Basic		*				

2.5 Stop

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	385	385	385		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	0	0	0		
	Remarks						
		Magnet OFF					

2.6 Overflow

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1500	1500	1500		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Overflow quantity with S/T ON	cm3/min	561	432	690		

S = Setting value, C = Check value)
OT = Outside Tolerance (X is set)

C	Overflow quantity with S/T OFF	cm3/min	909	780	1038		

2.7 Pump chamber pressure

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1500	1500	1500		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
S	Pressure	kPa	490.5	471	510		
S	Pressure	kgf/cm2	5	4.8	5.2		
P	Basic		*				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1500	1500	1500		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Pressure with S/T OFF	kPa	490.5	471	510		
C	Pressure with S/T OFF	kgf/cm2	5	4.8	5.2		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1900	1900	1900		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Pressure with S/T OFF	kPa	617.5	588	647		
C	Pressure with S/T OFF	kgf/cm2	6.3	6	6.6		

2.8 Timer

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1500	1500	1500		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
S	Timer stroke	mm	4.5	4.3	4.7		
P	Basic		*				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	385	385	385		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Timer stroke with S/T ON	mm	1.2		1.2		
	Remarks						
		IDLE					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	750	750	750		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Timer stroke with S/T ON	mm	1	1			

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1100	1100	1100		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Timer stroke with S/T OFF	mm	0.5		0.5		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1250	1250	1250		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Timer stroke with S/T OFF	mm	1.5	0.9	2.1		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1500	1500	1500		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Timer stroke with S/T OFF	mm	4.5	4.2	4.8		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1900	1900	1900		
P	Boost pressure	kPa	72	70.7	73.3		
P	Boost pressure	mmHg	540	530	550		
C	Timer stroke with S/T OFF	mm	7	6.6	7.4		

2.9 Magnet

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
C	Max. applied voltage	V	8	8	8		
P	Test voltage	V	13	12	14		

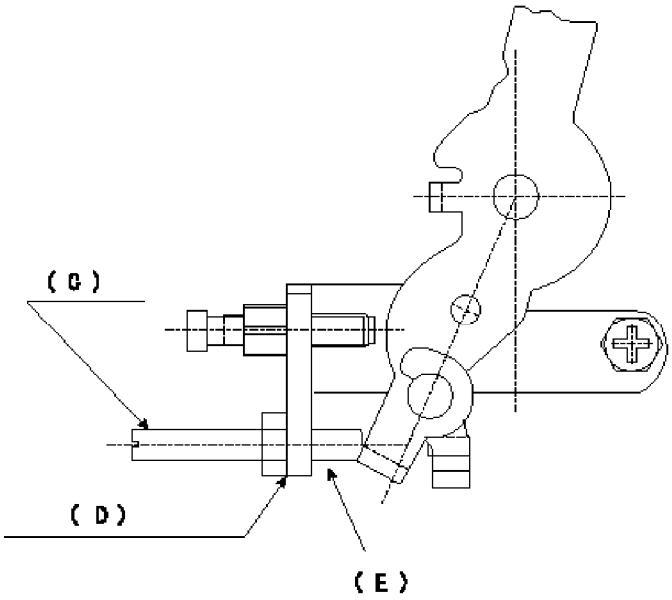
2.10 Additional device adjustment

2.10.1 Additional device 1

Name	POTENTIOMETER ADJUSTMENT

N1=750r/min
N2=385r/min
V1=2.98+-0.03V
V2=0.8+-0.45V
Q1=13.8+-1cm3/1,000st
Q2=7.0+-2cm3/1,000st Idle
P1=72.0kPa
P2=540mmHg

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

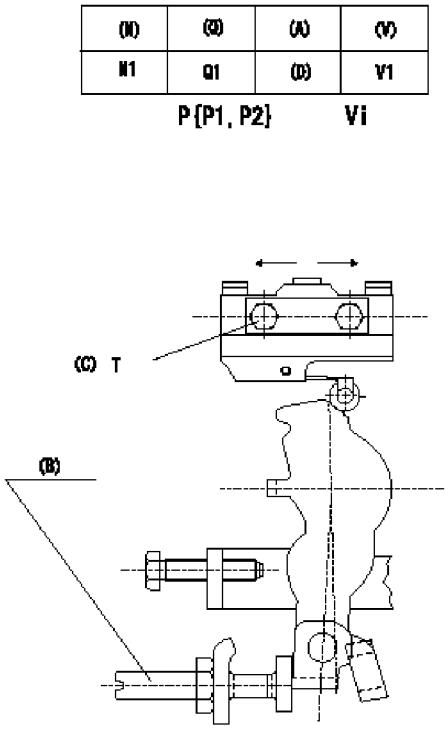


N1=750r/min
Q1=13.8+-1cm3/1,000st
V1=2.98+-0.03V

Adjusting method [applied voltage Vi, dummy bolt (C)]
1. Hold the dummy bolt (C) against the control lever at position N = N1, Q = Q1.
Fix using the lock nut.
2. When adjusting the potentiometer, position the control lever against the dummy bolt (C) and ad just the potentiometer so that the output voltage is V1 (V).
3. Remove the dummy bolt (C) after the completion of adjustment.
Confirm that the potentiometer output voltage is within the above mentioned standards between t he control lever's adjusting point and the idling position.
N:Pump speed
V:Output voltage
Q:Injection quantity
P:Boost pressure
A:Adjusting point
B:Checking point
Q2:Idle
Q3:Full speed
(C): Dummy bolt
(D): Bracket for mounting the dummy bolt
(E): Part numbers of the dummy bolt and the nut
146526-3300 (bolt) 42L
013020-6040 (nut)

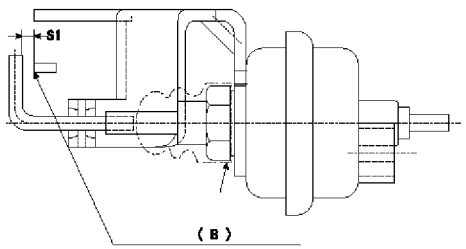
2.10.2 Additional device 2

Name	MICROSWITCH ADJUSTMENT

N1=-r/min Q1=-cm3/1,000st V1=4.4+-0.05V V1=4.4+-0.05V T=2~3N-m{0.2~0.3kgf-m} Vi=10V	
P1=80.0kPa P2=600mmHg T=2~3N-m{0.2~0.3kgf-m}	1. Fix the dummy bolt B so that the potentiometer output voltage V1. 2. Move the microswitch in the direction of the arrow and fix it where it turns OFF. 3. Loosen dummy bolt B. Confirm that the potentiometer output voltage (V) is V1 where the micro switch turns from ON to OFF. After completing adjustment, remove the dummy bolt. (N): Speed of the pump (Q) Injection quantity (A) Microswitch operating direction (V) Output voltage (D) ON to OFF (P) Boost pressure (C) Microswitch fixing bolt Vi:Applied voltage

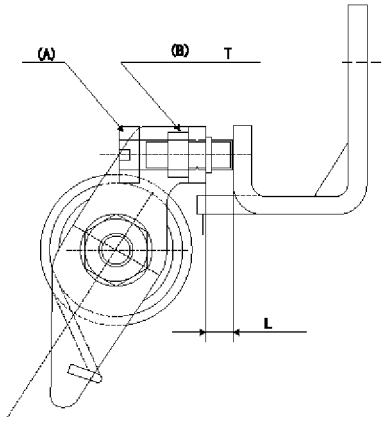
2.10.3 Additional device 3

Name	V-FICD ADJUSTMENT

S1=1+1mm	
S1=1+1mm P1=-53.3kPa P2=-400mmHg	Adjustment of the V-FICD 1. Mount the V-FICD after adjustment of the micro-switch and the potentiometer. Make the clearance between the control lever (A) and the actuator rod S1 mm. Adjust the actuator rod. 2. Apply negative pressure of P1kPa {P2 mmHg} to the actuator. Confirm the full stroke. (B): Control lever (idling position)

2.10.4 Additional device 4

Name	STARTING I/Q ADJUSTMENT

L=3~6mm T=3.4~4.9N-m(0.35~0.5kgf-m)	
	Starting injection quantity adjustment Adjust the adjusting bolt A so that the starting injection quantity adjustment is within the standards . Fix using nut (B).

3 Assembly dimension

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
S	K dimension	mm	3.1	3	3.2		
S	KF dimension	mm	5.5	5.4	5.6		
S	MS dimension	mm	1	0.9	1.1		
S	BCS stroke	mm	2.7	2.6	2.8		
S	Pre-stroke	mm	0.45	0.43	0.47		
S	Control lever angle alpha	deg.	24	20	28		
S	Control lever angle beta	deg.	47	42	52		