

ZEXEL Ass'y No.	104761-2012
Bosch Ass'y No.	9 460 612 005
Bosch Typecode	
Engine Type	RD28-T
Manufacturer	NISSAN
Edition date	19.01.04 (5)

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					
	(Solenoid timer adjustment condition)		OFF				

2 Adjustment specification**2.1 Full load delivery**

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	600	600	600		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	31.1	30.6	31.6		
S	Difference in delivery	mm3/st.	2		2		
P	Basic		*				
P	Oil temperature	degC	50	48	52		
	Remarks						
		NA					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	600	600	600		
P	Boost pressure	kPa	16	14.7	17.3		
P	Boost pressure	mmHg	120	110	130		
S	Average injection quantity	mm3/st.	34.2	33.7	34.7		
S	Difference in delivery	mm3/st.	2		2		
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	500	500	500		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	31.1	29.1	33.1		
P	Oil temperature	degC	48	46	50		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	600	600	600		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	31.1	30.1	32.1		
C	Difference in delivery	mm3/st.	2.5		2.5		
P	Basic		*				
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	600	600	600		
P	Boost pressure	kPa	8.7	6.7	10.7		
P	Boost pressure	mmHg	65	50	80		
C	Average injection quantity	mm3/st.	31.1	30.1	32.1		
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	600	600	600		

P	Boost pressure	kPa	16	14.7	17.3		
P	Boost pressure	mmHg	120	110	130		
C	Average injection quantity	mm3/st.	34.2	33.2	35.2		
C	Difference in delivery	mm3/st.	2.5		2.5		
P	Basic		*				
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1200	1200	1200		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Average injection quantity	mm3/st.	45.2	42.7	47.7		
		About					
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1800	1800	1800		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Average injection quantity	mm3/st.	45	42	48		
		About					
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2200	2200	2200		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Average injection quantity	mm3/st.	43.6	40.6	46.6		
		About					
P	Oil temperature	degC	52	50	54		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2300	2300	2300		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Average injection quantity	mm3/st.	43.7	40.2	47.2		
		About					
P	Oil temperature	degC	52	50	54		

2.2 Governing

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2500	2500	2500		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
S	Average injection quantity	mm3/st.	20.5	19.5	21.5		
S	Difference in delivery	mm3/st.	4.5		4.5		
P	Basic		*				
P	Oil temperature	degC	55	52	58		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2500	2500	2500		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Average injection quantity	mm3/st.	20.5	19	22		
C	Difference in delivery	mm3/st.	5		5		
P	Basic		*				
P	Oil temperature	degC	55	52	58		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2800	2800	2800		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Average injection quantity	mm3/st.	4.5		4.5		
		About					
P	Oil temperature	degC	55	52	58		

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	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	14	13	15		
S	Difference in delivery	mm3/st.	1.7		1.7		
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	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	14	12	16		
C	Difference in delivery	mm3/st.	2.4		2.4		

P	Basic		*				
P	Oil temperature	degC	48	46	50		
CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	800	800	800		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	5		5		
P	Oil temperature	degC	50	48	52		

2.4 Partial injection quantity

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	600	600	600		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	29.2	22.7	35.7		
	About						
P	Oil temperature	degC	50	48	52		
P	Lever angle (shim thickness)	mm	5.6	5.55	5.65		
	Remarks						
	From idle						

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	900	900	900		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	19.5	12.5	26.5		
	About						
P	Oil temperature	degC	50	48	52		
P	Lever angle (shim thickness)	mm	5.6	5.55	5.65		
	Remarks						
	From idle						

2.5 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.	40	40			
P	Basic		*				
P	Oil temperature	degC	48	46	50		

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		
C	Average injection quantity	mm3/st.	40	40			
P	Oil temperature	degC	48	46	50		

2.6 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	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	6		6		
P	Oil temperature	degC	48	46	50		
	Remarks						
	Magnet OFF at idling position						

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	600	600	600		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	0	0	0		
P	Oil temperature	degC	50	48	52		
	Remarks						
	Magnet OFF at full-load position						

2.7 Overflow

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	900	900	900		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Overflow quantity with S/T OFF	cm3/min	390	260	520		
P	Oil temperature	degC	50	48	52		

2.8 Pump chamber pressure

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	900	900	900		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
S	Pressure with S/T ON	kPa	353	314	392		

		About					
S	Pressure with S/T ON	kgf/cm2	3.6	3.2	4		
		About					
S	Pressure with S/T OFF	kPa	431	402	460		
S	Pressure with S/T OFF	kgf/cm2	4.4	4.1	4.7		
P	Basic	*					
P	Oil temperature	degC	50	48	52		
	Remarks						
		OFF					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	900	900	900		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Pressure with S/T ON	kPa	353	304	402		

		About					
C	Pressure with S/T ON	kgf/cm2	3.6	3.1	4.1		
		About					
C	Pressure with S/T OFF	kPa	431	392	470		
C	Pressure with S/T OFF	kgf/cm2	4.4	4	4.8		
P	Basic	*					
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1200	1200	1200		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Pressure with S/T OFF	kPa	490	451	529		

		About					
C	Pressure with S/T OFF	kgf/cm2	5	4.6	5.4		
		About					
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2300	2300	2300		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Pressure with S/T OFF	kPa	765	726	804		

		About					
C	Pressure with S/T OFF	kgf/cm2	7.8	7.4	8.2		
		About					
P	Oil temperature	degC	52	50	54		

2.9 Timer

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	900	900	900		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
S	Timer stroke with S/T ON	mm	1.7	1.4	2		

		About					
S	Timer stroke with S/T OFF	mm	3.4	3.2	3.6		
P	Basic	*					
P	Oil temperature	degC	50	48	52		
	Remarks						
		OFF					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	900	900	900		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Timer stroke with S/T ON	mm	1.7	1.3	2.1		

		About					
C	Timer stroke with S/T OFF	mm	3.4	3.1	3.7		
P	Basic	*					
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1200	1200	1200		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Timer stroke with S/T OFF	mm	5.2	4.8	5.6		

		About					
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2300	2300	2300		
P	Boost pressure	kPa	66.7	65.4	68		
P	Boost pressure	mmHg	500	490	510		
C	Timer stroke with S/T OFF	mm	9.8	9.3	10.2		
P	Oil temperature	degC	52	50	54		

2.10 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		

2.11 Additional device adjustment**2.11.1 Additional device 1**

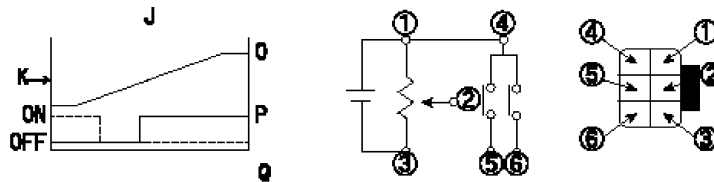
Name	POTENTIOMETER ADJUSTMENT
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N1=600r/min
 Q1=16.9+-1.0cm³/1,000st
 V1=3.2+-0.03V
 V2=(1.96)V
 V3=(8.96)V
 C1=-deg
 C2=0deg
 C3=42deg
 C4=(5.0deg)
 C5=Above 23.5deg
 G1=-V
 G2=-V
 Vi=10V

N	Q	V	C	
N1	Q1	V1	C1	A
D		V2	C2	B
E		V3	C3	B

Vi :
 P P1 {P2}

F	C, G
H	C4, G1
I	C5, G2



V1=3.2+-0.03V
 Vi=10V

Adjustment of the potentiometer

1. Determine the position of the control lever at the adjusting point. Fix with the dummy bolt contacting the lever.
2. In the fixed position, install the potentiometer so that the output voltage is V1 (supply voltage Vi).
3. After completing potentiometer installation, remove the dummy bolt.

N: Pump speed

Q: Injection quantity

V: Output voltage

P: Boost pressure

A: Adjusting point

B: Checking point

C: Control lever angle

D: Idle lever angle

E: Full speed lever angle

F: Conversion point

G: From idle

H: ON-->OFF

I: OFF-->ON

J: Connecting diagram for the potentiometer

K: Output

O: Output when (2) and (3) connected.

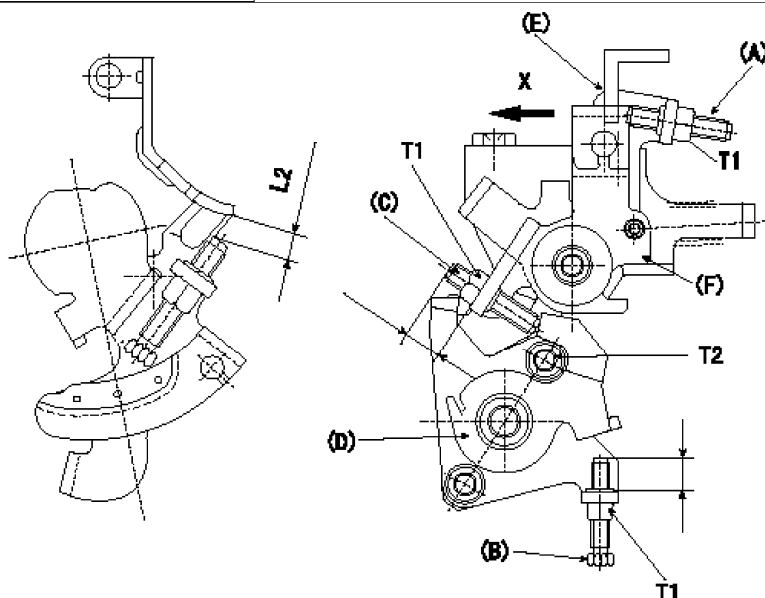
P: When (4) or (6) connected: switch OFF to ON.

Q: When (4) or (6) connected: switch ON to OFF.

2.11.2 Additional device 2

Name	M-CSD ADJUSTMENT
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T1=6~9N-m(0.6~0.9kgf-m)
 T2=5~7N-m(0.5~0.7kgf-m)
 L2=6+-0.05mm



a=3deg
 b=0deg
 L1=2.5mm
 L2=6+-0.05mm
 L3=(1.7)mm

M-CSD adjustment**1. CSD adjustment**

Turn the lever (D) clockwise and adjust screw (B) so that the timer piston advance angle is a (L1). Then fix using the nut.

2. With intermediate lever screw (C)'s fixing lever (D) positioned as in 1., pull the intermediate lever in direction X. After confirming that it contacts the stop position, adjust so that screw (C) contacts lever (D) and then fix using the nut.

(Intermediate lever status in 2.: full speed, indicates timer's a advance.

Confirm that the timer piston advances to b deg when the intermediate lever is returned.

3. Fast idle adjustment

Pull the intermediate lever in direction x to contact the stopper and adjust the screw (A) so that the gap between the idle set bracket and the idle screw is L2. Fix using the nut.

The gap between the control lever at the idle position and the screw (A) must be L3.

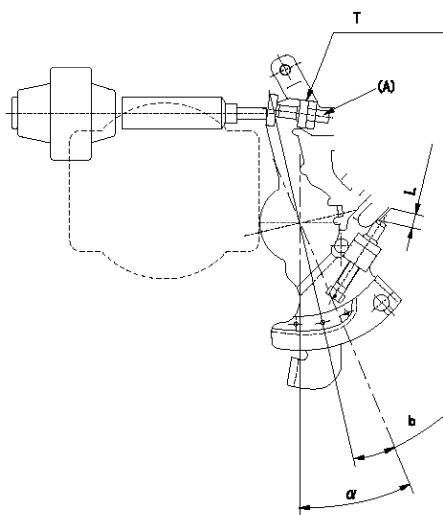
(E) control lever

(F) intermediate lever

2.11.3 Additional device 3

Name	DASHPOT ADJUSTMENT
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T=5.0~7.0N-m{0.5~0.7kgf-m}
 b=7.4deg
 L=3.8+-0.05mm



L=3.8+-0.05mm
 t=1.8+-0.5sec

Adjustment of the dash pot

1. Insert a block gauge L (thickness gauge) between the idle set bracket and the idle screw.

2. In the above condition, adjust so that the dashpot adjusting screw (A) contacts the pushrod. Then, fix using the nut.

Record the dashpot return time t.

a = alpha

3 Assembly dimension

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
S	K dimension	mm	3.3	3.2	3.4		
S	KF dimension	mm	7.22	7.12	7.32		
S	MS dimension	mm	1.8	1.7	1.9		
S	BCS stroke	mm	2.9	2.9	2.9		
S	Control lever angle alpha	deg.	23	19	27		
S	Control lever angle beta	deg.	42	37	47		