

ZEXEL Ass'y No.	104740-0976
Bosch Ass'y No.	9 460 614 208
Bosch Typecode	
Engine Type	WLT
Manufacturer	MAZDA
Edition date	25.04.08 (8)

**1 Adjustment conditions**

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
	Test oil		ISO4113orSAEJ967 d				
		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)		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	750	750	750		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	47.9	47.4	48.4		
S	Difference in delivery	mm3/st.	4		4		
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	750	750	750		
P	Boost pressure	kPa	43.3	42	44.6		
P	Boost pressure	mmHg	325	315	335		
S	Average injection quantity	mm3/st.	64.1	63.6	64.6		
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	1000	1000	1000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
S	Average injection quantity	mm3/st.	76.3	75.8	76.8		
S	Difference in delivery	mm3/st.	6.5		6.5		
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	750	750	750		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	47.9	46.9	48.9		
C	Difference in delivery	mm3/st.	4.5		4.5		
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	750	750	750		
P	Boost pressure	kPa	43.3	42	44.6		
P	Boost pressure	mmHg	325	315	335		
C	Average injection quantity	mm3/st.	64.1	63.1	65.1		
C	Difference in delivery	mm3/st.	6		6		
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	1000	1000	1000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	76.3	75.3	77.3		
C	Difference in delivery	mm3/st.	7		7		
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	2000	2000	2000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	67.8	64.3	71.3		
		About					
P	Oil temperature	degC	50	48	52		

**2.2 Governing**

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2450	2450	2450		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
S	Average injection quantity	mm3/st.	23.5	20.5	26.5		
S	Difference in delivery	mm3/st.	7		7		
P	Basic		*				
P	Oil temperature	degC	55	52	58		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2450	2450	2450		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	23.5	13.5	33.5		
C	Difference in delivery	mm3/st.	7.5		7.5		
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	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	6		6		
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	390	390	390		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	11.4	10.4	12.4		
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	390	390	390		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	11.4	9.9	12.9		
C	Difference in delivery	mm3/st.	2.2		2.2		
P	Basic		*				
P	Oil temperature	degC	48	46	50		

**2.4 Partial injection quantity**

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.	17	15	19		
C	Difference in delivery	mm3/st.	3		3		
			About				
P	Oil temperature	degC	48	46	50		

**2.5 Start**

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	150	150	150		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
S	Average injection quantity	mm3/st.	70	55	90		
P	Basic		*				
P	Oil temperature	degC	48	46	50		
	Remarks						
			Full				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	150	150	150		
P	Boost pressure	kPa	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	70	50	90		
			About				
P	Oil temperature	degC	48	46	50		
	Remarks						
			Full				

**2.6 Stop**

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	370	370	370		
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	48	46	50		
	Remarks						
			Magnet OFF				

**2.7 Overflow**

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1000	1000	1000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Overflow quantity	cm3/min	400	270	530		
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	1000	1000	1000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
S	Pressure	kPa	510	481	539		
S	Pressure	kgf/cm2	5.2	4.9	5.5		
P	Basic		*				
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	500	500	500		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Pressure	kPa	373	324	422		
C	Pressure	kgf/cm2	3.8	3.3	4.3		

P	Oil temperature	degC	48	46	50		
<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	mmHg	600	590	610		
C	Pressure	kPa	510	471	549		
C	Pressure	kgf/cm2	5.2	4.8	5.6		
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	2000	2000	2000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Pressure	kPa	755	706	804		
C	Pressure	kgf/cm2	7.7	7.2	8.2		
P	Oil temperature	degC	50	48	52		

**2.9 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	1000	1000	1000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
S	Timer stroke	mm	4.8	4.6	5		
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	500	500	500		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Timer stroke	mm	2.2	1.4	3		
P	Oil temperature	degC	48	46	50		

<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	mmHg	600	590	610		
C	Timer stroke	mm	4.8	4.4	5.2		
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	2000	2000	2000		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Timer stroke	mm	9.4	8.6	10.2		
P	Oil temperature	degC	50	48	52		

**2.10 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		

**2.11 Compensator**

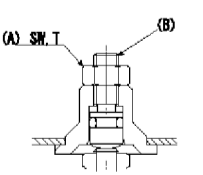
**2.11.1 Load-timer adjustment**

<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	750	750	750		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
S	Average injection quantity	mm3/st.	49	48.5	49.5		
S	Timer stroke TA	mm	2.9	2.7	3.1		
S	Timer stroke variation dT	mm	0.7	0.7	0.7		
		About					
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	750	750	750		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	49	48	50		
C	Timer stroke TA	mm	2.9	2.5	3.3		
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	750	750	750		
P	Boost pressure	kPa	80	78.7	81.3		
P	Boost pressure	mmHg	600	590	610		
C	Average injection quantity	mm3/st.	30	28.5	31.5		
C	Timer stroke TA	mm	1.9	1.1	2.7		
P	Oil temperature	degC	50	48	52		

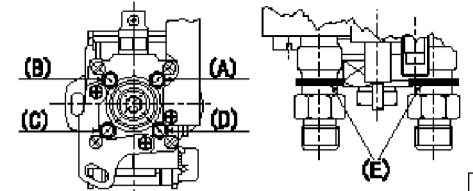
**2.11.2 BCS adjustment**

Name		BOOST COMPENSATOR ADJUSTMENT	
SW=10mm T=6~9N-m(0.6~0.9kgf-m)			
N1=750r/min N2=750r/min P1=43.3kPa(325mmHg) P2=0kPa(0mmHg) T=6~9N-m(0.6~0.9kgf-m)		<p>BCS adjustment procedure</p> <ol style="list-style-type: none"> <li>1. At full boost pressure, set so that the full injection quantity is within the specifications (adjusting point).</li> <li>2. Perform boost compensator intermediate operation point adjustment (pump speed N1, boost pressure P1).</li> <li>3. When injection quantity at boost pressure P2 and pump speed N2 is not as specified, loosen nut (A) and adjust position of screw (B) so that injection quantity is as specified. The screw position should be within +/-1 turn of initial position.</li> <li>4. The nut tightening torque is T.</li> </ol>	

**2.12 Additional device adjustment**

2.12.1 Additional device 1

Name CONTROL STANDARD AT IDLING



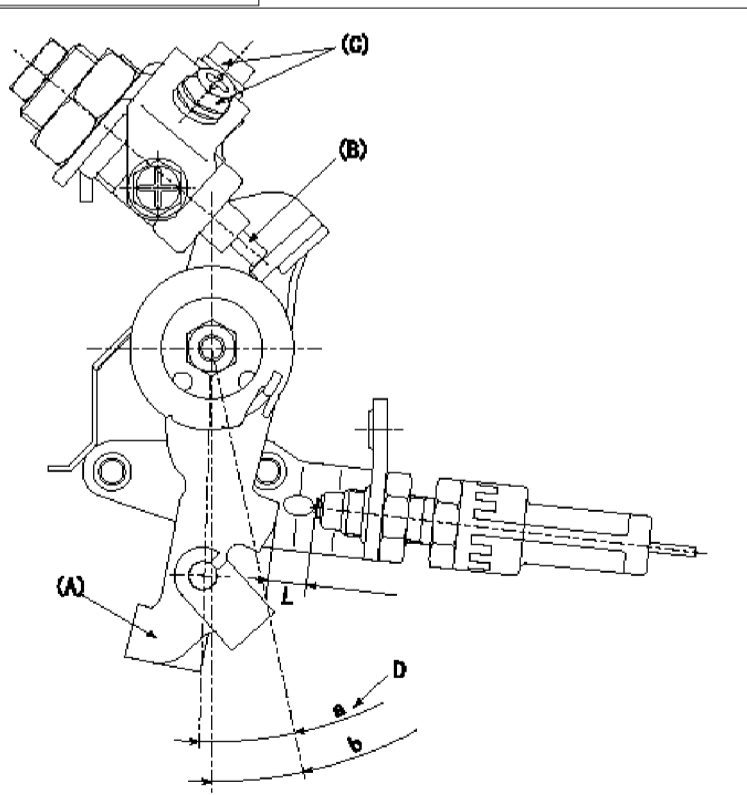
	(H)		(J)	(K)			
				(A)	(B)	(C)	(D)
(F)	L	(O)	(L)	(T)	(T)	(U)	(U)
		(P)	(L)	(T)	(U)	(U)	(T)
	M	(O)	(L)	(S)	(S)	(U)	(U)
		(P)	(L)	(S)	(S)	(U)	(T)
	N	(O)	(L)	(S)	(S)	(U)	(U)
		(P)	(L)	(S)	(S)	(U)	(T)
(G)	L	(O)	(L)	(U)	(T)	(U)	(U)
		(P)	(L)	(U)	(T)	(U)	(T)
	M	(O)	(L)	(U)	(S)	(U)	(U)
		(P)	(L)	(U)	(S)	(U)	(T)
	(I)	(O)	(L)	(S)	(S)	(U)	(U)
		(P)	(L)	(S)	(S)	(U)	(T)
			(I)	(S)	(S)	(U)	

Standards for idle difference in delivery control  
 After idle adjustment, measure the idle injection quantities of (A) to (D).  
 Install the colored rings to the delivery valve holders (A) to (D) in accordance with the table.  
 (A): A cylinder (B) :B cylinder (C) : C cylinder (D): D cylinder  
 (E): Collar ring  
 (F): (A) >= (C)  
 (G): (C) > (A)  
 (H): (A) - (C) or (C) - (A)  
 (I): 0.2, 0.1(mm3/st)  
 (J): (B) - (D) or (D) - (B)  
 (K): Ring color  
 (L): At least 0.6 mm3/st  
 (M): 0.3, 0.4, 0.5 (mm3/st)  
 (N): 0.2, 0.1, 0.0 (mm3/st)  
 (O): (B) >= (D)  
 (P): (D) > (B)  
 (T): Yellow  
 (U): White  
 (V): Red

2.12.2 Additional device 2

Name DASHPOT ADJUSTMENT

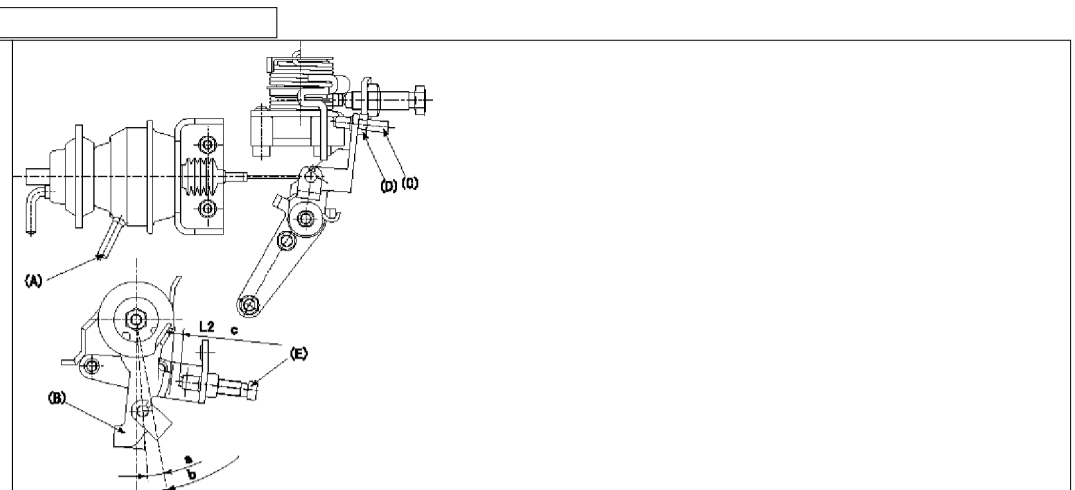
L=8.1+0.05mm  
 a=14.1deg  
 b=12.5+4deg



L=8.1+0.05mm  
 T=T=6~9N-m(0.6~0.9kgf-m)  
 a=14.1deg  
 b=12.5+4deg

Adjustment of the dash pot  
 1. Hold the control lever (A) at position a (clearance L).  
 2. In the above condition, adjust the position of the dash pot so that the end of the dash pot (B) c  
 ontacts the control lever (A) and fix using the nut (C). (Tightening torque T)  
 D:Dash pot contact position  
 b:Angle alpha

**2.12.3 Additional device 3**

<p>Name   WIRE</p> <p>L2=3.4+0.5(mm)  a=8(deg)  b=12.5+4(deg)  c=5.9(deg)</p>	
<p>L1=34.1+3.5-5.5mm  L2=3.4+0.5mm  P1=-66.6kPa(-500mmHg)  T=6~9Nm(0.6~0.9kgfm)  b=12.5+4deg</p>	<p>Confirmation of the wire length:  Accelerator wire: Idle-full stroke: L1  Adjustment of the double stage actuator:  (1)Apply negative pressure P1 to the actuator through the negative pressure inlet port (A).  (2)In status (1) above, adjust the screw C so that the control lever B's position is a ( the distance between the control lever and the idle screw E is L2. Fix using nut D and torque to T.  b:Alpha = 12.5+4 deg</p>

**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	6.01	5.91	6.11		
S	MS dimension	mm	0.9	0.8	1		
S	BCS stroke	mm	6.8	6.6	7		
S	Pre-stroke	mm	0.03	0.01	0.05		
S	Control lever angle alpha	deg.	12.5	8.5	16.5		
S	Control lever angle beta	deg.	39	36	42		