

ZEXEL Ass'y No.	104745-8690
Bosch Ass'y No.	9 460 613 182
Bosch Typecode	
Engine Type	4D56
Manufacturer	MITSUBISHI
Edition date	03.08.01 (2)

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)		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	750	750	750		
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.	52.6	52.1	53.1		
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	44	42.7	45.3		
P	Boost pressure	kgf/cm2	0.45	0.436	0.464		
P	Boost pressure	mmHg	330	320	340		
S	Average injection quantity	mm3/st.	62.6	62.1	63.1		
S	Difference in delivery	mm3/st.	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	1250	1250	1250		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
S	Average injection quantity	mm3/st.	76.6	76.1	77.1		
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	750	750	750		
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.	52.6	51.6	53.6		
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	44	42.7	45.3		
P	Boost pressure	kgf/cm2	0.45	0.436	0.464		
P	Boost pressure	mmHg	330	320	340		
C	Average injection quantity	mm3/st.	62.6	61.6	63.6		
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	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Average injection quantity	mm3/st.	77	74.5	79.5		
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1250	1250	1250		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Average injection quantity	mm3/st.	76.6	75.6	77.6		
C	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	2100	2100	2100		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Average injection quantity	mm3/st.	65	62.5	67.5		
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	2650	2650	2650		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
S	Average injection quantity	mm3/st.	27.9	24.9	30.9		
S	Difference in delivery	mm3/st.	8.5		8.5		
P	Basic		*				
P	Oil temperature	degC	55	52	58		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2950	2950	2950		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Average injection quantity	mm3/st.	5		5		
P	Oil temperature	degC	55	52	58		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2650	2650	2650		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Average injection quantity	mm3/st.	27.9	22.9	32.9		
C	Difference in delivery	mm3/st.	9		9		
P	Basic		*				
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	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		

S	Average injection quantity	mm3/st.	19.4	17.9	20.9		
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.	19.4	17.4	21.4		
C	Difference in delivery	mm3/st.	2.5		2.5		
P	Basic		*				
P	Oil temperature	degC	48	46	50		
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	kgf/cm2	0	0	0		
P	Boost pressure	mmHg	0	0	0		
C	Average injection quantity	mm3/st.	8		8		
		About					
P	Oil temperature	degC	50	48	52		

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.	75	65	85		
		About					
P	Oil temperature	degC	48	46	50		
	Remarks						
		IDLE					

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.	75	65	85		
		About					
P	Oil temperature	degC	48	46	50		
	Remarks						
		IDLE					

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	1250	1250	1250		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Overflow quantity with S/T ON	cm3/min	420	290	550		
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	1250	1250	1250		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
S	Pressure with S/T ON	kPa	549	520	578		
S	Pressure with S/T ON	kgf/cm2	5.6	5.3	5.9		
S	Pressure with S/T OFF	kPa	402	363	441		
		About					

S	Pressure with S/T OFF	kgf/cm2	4.1	3.7	4.5		
		About					
P	Basic		*				
P	Oil temperature	degC	50	48	52		
	Remarks						
		ON					

2.8 Timer

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1250	1250	1250		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
S	Timer stroke with S/T ON	mm	4.6	4.4	4.8		
S	Timer stroke with S/T OFF	mm	1.9	1.5	2.3		
		About					
P	Basic		*				
P	Oil temperature	degC	50	48	52		
	Remarks						
		ON					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	500	500	500		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Timer stroke with S/T ON	mm	1.2	0.6	1.8		
P	Oil temperature	degC	48	46	50		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1000	1000	1000		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Timer stroke with S/T ON	mm	3.5	2.9	4.1		
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1250	1250	1250		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Timer stroke with S/T ON	mm	4.6	4.2	5		
C	Timer stroke with S/T OFF	mm	1.9	1.3	2.5		

		About					
P	Basic		*				
P	Oil temperature	degC	50	48	52		
	Remarks						
		ON					

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	1500	1500	1500		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Timer stroke with S/T ON	mm	5.6	5	6.2		
C	Timer stroke with S/T OFF	mm	2.9	2.3	3.5		

		About					
P	Oil temperature	degC	50	48	52		

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	2100	2100	2100		
P	Boost pressure	kPa	73.3	72	74.6		
P	Boost pressure	kgf/cm2	0.75	0.736	0.764		
P	Boost pressure	mmHg	550	540	560		
C	Timer stroke with S/T ON	mm	7.8	7.2	8.4		
P	Oil temperature	degC	52	50	54		

2.9 Magnet

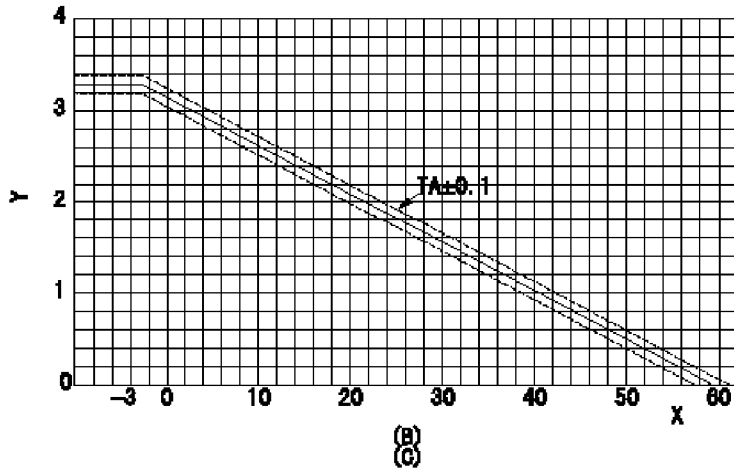
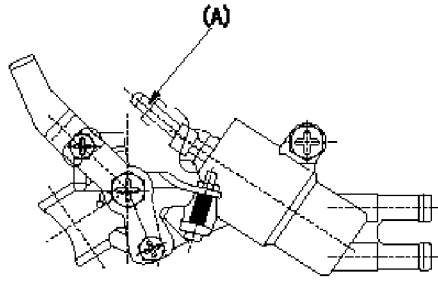
CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
C	Max. applied voltage	V	8	8	8		
P	Test voltage	V	13	12	14		

2.10 Additional device adjustment

2.10.1 Additional device 1

Name W-CSD ADJUSTMENT

(B)=TA(mm)
 (C)=TA=-0.0526t+3.14(-3<=t(degC))
 X=t(degC)
 Y=TA(mm)



Adjustment of the W-CSD

1. Adjustment of the advance angle of the timer

(1) Determine the timer advance angle using the following graph.

(2)(1) Adjust with the screw (A) so that the timer advance angle determined in the item (1) is obtained.

X: Temperature t (deg C)

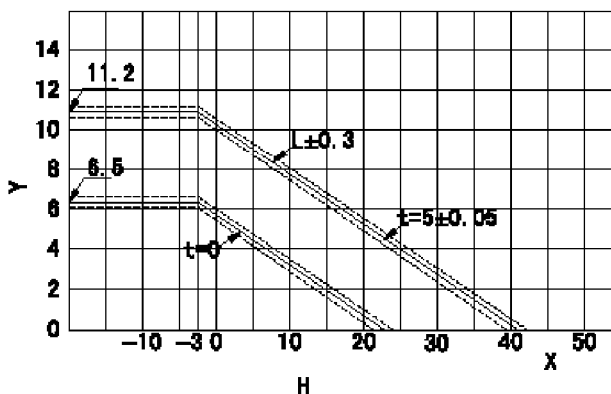
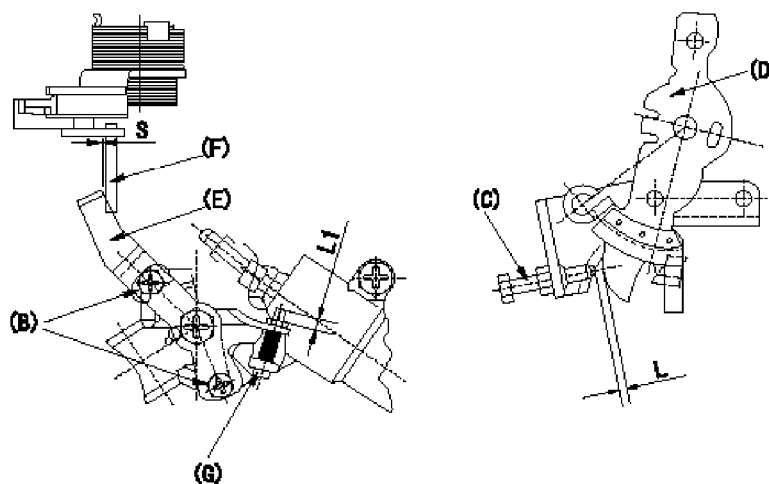
Y: Timer stroke TA (mm)

(B): Timer stroke TA (mm):

2.10.2 Additional device 2

Name W-FICD LEVER ADJUSTMENT

L=L±0.05mm
S=5±0.05mm



L=L±0.05mm
S=5±0.05mm
T=3.4~4.9N-m(0.35~0.5kgf-m)
a=30degC
L1=3mm

2. Adjustment of the W-FICD
(1) Insert a block gauge L determined from the graph below between the control lever (D) and the idling stopper bolt (C).
(2) Insert a shim S between the W-FICD lever (E) and the control lever (F). Adjust the W-FICD lever (E) so that it contacts the control lever (F) and fix it using bolt (B).
TT
Note:
a) The temperature of wax at the time of adjustment must not exceed a.
b) After completion of the adjustment, confirm that allowance for adjustment of the screw (G) is at least L1.
Y: Control lever L mm
X: Temperature t (deg C)
H: Control lever gap: L (mm)

2.10.3 Additional device 3

Name POTENTIOMETER ADJUSTMENT

V1=1.8±0.03V
V2=8.81±1.1V
Vi=10V

C	N	V	Q	
C1		V1		A
C2		V2		B
Vi				

C: Position of the control lever
N: Pump speed (r/min)
V: Output voltage (V)
Q: Injection quantity (mm³/st)
A: Adjusting point
B: Checking point
C1: Idling
C2: Full speed
Vi: Applied voltage input

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	5.8	5.7	5.9		
S	MS dimension	mm	1.1	1	1.2		

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

S	BCS stroke	mm	5.7	5.5	5.9		
S	Control lever angle alpha	deg.	59	55	63		
S	Control lever angle beta	deg.	42	37	47		