ZEXEL Ass'y No.	101401-7140
Bosch Ass'y No.	9 400 610 411
Bosch Typecode	
Engine Type	4HF1
Manufacturer	ISUZU
Edition date	20.02.06 (2)

1 Adjustment conditions

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
	Test oil		ISO4113 or {SAEJ967d}				
		1404 Test oil					
P	Test oil temperature	degC	40	40	45		
	Nozzle and nozzle holder		105780-8140				
	Bosch type code		EF8511/9A				
	Nozzle		105780-0000				
	Bosch type code		DN12SD12T				
	Nozzle holder		105780-2080				
	Bosch type code		EF8511/9				
P	Opening pressure	MPa	17.2				
P	Opening pressure	kgf/cm2	175				
	Injection pipe	mm	6-2-600				
		Outer diameter - inner diameter - length (mm)					
	Overflow valve		131424-4920				
P	Overflow valve opening pressure	kPa	127	107	147		
P	Overflow valve opening pressure	kgf/cm2	1.3	1.1	1.5		
P	Tester oil delivery pressure	kPa	157	157	157		
P	Tester oil delivery pressure	kgf/cm2	1.6	1.6	1.6		
	Direction of rotation (viewed from drive side)		L				
		Left					

2 Adjustment specification

2.1 Injection timing adjustment

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Direction of rotation (viewed from drive side)		L				
		Left					
P	Injection order		1-3-4-2				
S	Pre-stroke	mm	4.1	4.05	4.15		
S	Rack position		R=E				
		Point E					
P	Beginning of injection position		NO.1				
		Governor side					
S	Difference between angles 1	deg.	90	89.5	90.5		
		Cal 1-3					
S	Difference between angles 2	deg.	180	179.5	180.5		
		Cal 1-4					
S	Difference between angles 3	deg.	270	269.5	270.5		
		Cyl.1-2					

2.2 Injection quantity adjustment

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Adjusting point		-				
P	Rack position		11.9				
P	Pump speed	r/min	1310	1310	1310		
S	Average injection quantity	mm3/st.	64.5	62.9	66.1		
S	Max. variation between cylinders	%	0	-4	4		
P	Basic		*				
P	Fixing the rack		*				
P	Standard for adjustment of the maximum variation between cylinders		*				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Adjusting point		H				
P	Rack position		9.8+-0.5				
P	Pump speed	r/min	285	285	285		
S	Average injection quantity	mm3/st.	15.5	14.2	16.8		
S	Max. variation between cylinders	%	0	-10	10		
P	Fixing the rack		*				

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

P	Standard for adjustment of the maximum variation between cylinders		*				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Adjusting point		A				
P	Rack position		R1(11.9)				
P	Pump speed	r/min	1310	1310	1310		
S	Average injection quantity	mm3/st.	64.5	63.5	65.5		
P	Basic		*				
P	Fixing the lever		*				

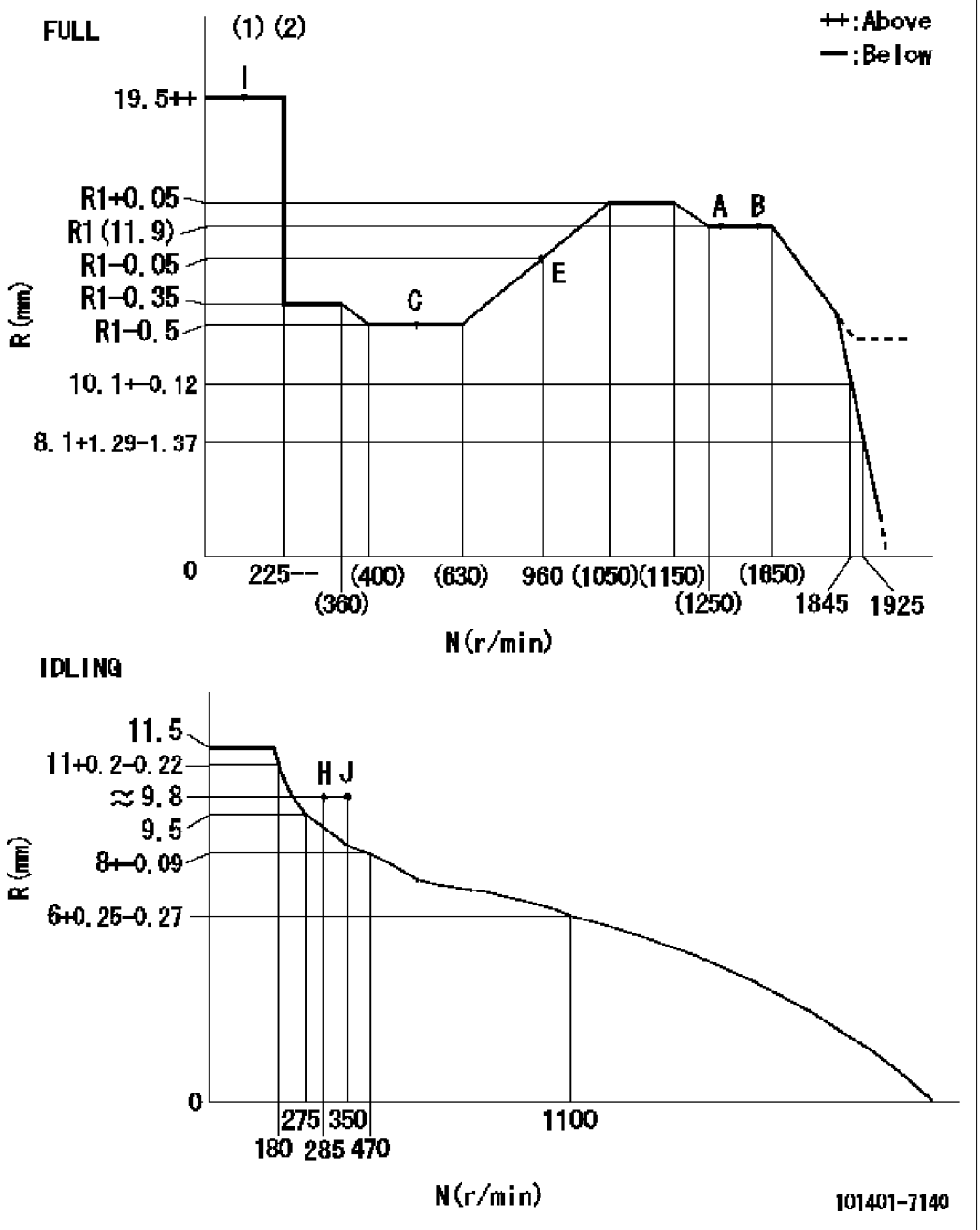
CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Adjusting point		B				
P	Rack position		R1				
P	Pump speed	r/min	1600	1600	1600		
S	Average injection quantity	mm3/st.	67.5	63.5	71.5		
P	Fixing the lever		*				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Adjusting point		C				
P	Rack position		R1-0.5				
P	Pump speed	r/min	500	500	500		
S	Average injection quantity	mm3/st.	44.7	40.7	48.7		
P	Fixing the lever		*				

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Adjusting point		E				
P	Rack position		R1-0.05				
P	Pump speed	r/min	960	960	960		
S	Average injection quantity	mm3/st.	58.5	54.5	62.5		
P	Fixing the lever		*				

2.3 Governor adjustment

Name	



T1=L31	N:Pump speed R:Rack position (mm) (1)Torque cam stamping: T1 (2)Tolerance for racks not indicated: +-0.05mm.

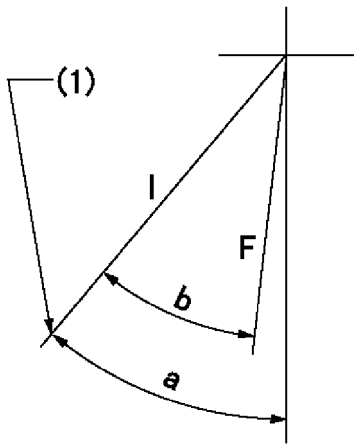
2.4 Timer adjustment

CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	-				
S	Advance angle	deg.	0	0	0		
	Remarks						
		Measure speed (beginning of operation).					

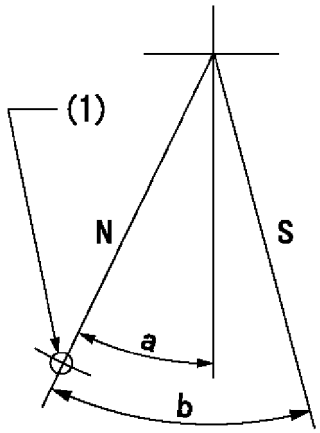
CAT	Designation	Unit	Set value	min.	max.	Actual values	OT
P	Pump speed	r/min	-				
S	Advance angle	deg.	5	4.5	5.5		
	Remarks						
		Measure the actual speed, stop					

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

2.5 Speed control lever angle

Name	
a=41deg+-5deg b=34deg+-3deg	
	F:Full speed I:Idle (1)Stopper bolt set position 'H'

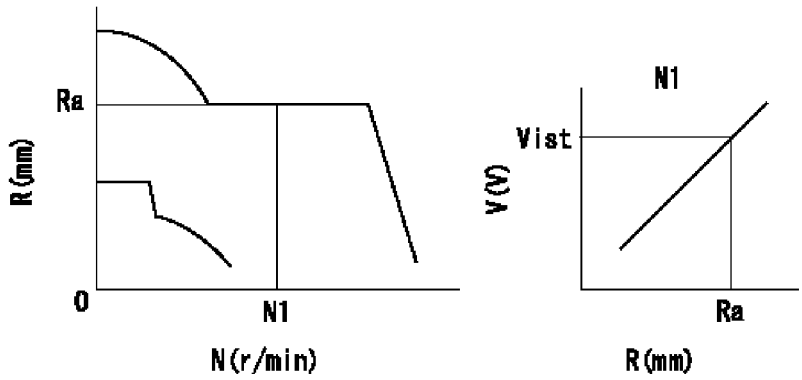
2.6 Stop lever angle

Name	
a=20deg+-5deg b=29deg+-5deg	
aa=64mm	N:Pump normal S:Stop the pump. (1)Use the hole at R = aa

2.7 Additional device adjustment

2.7.1 Additional device 1

Name	RACK SENSOR

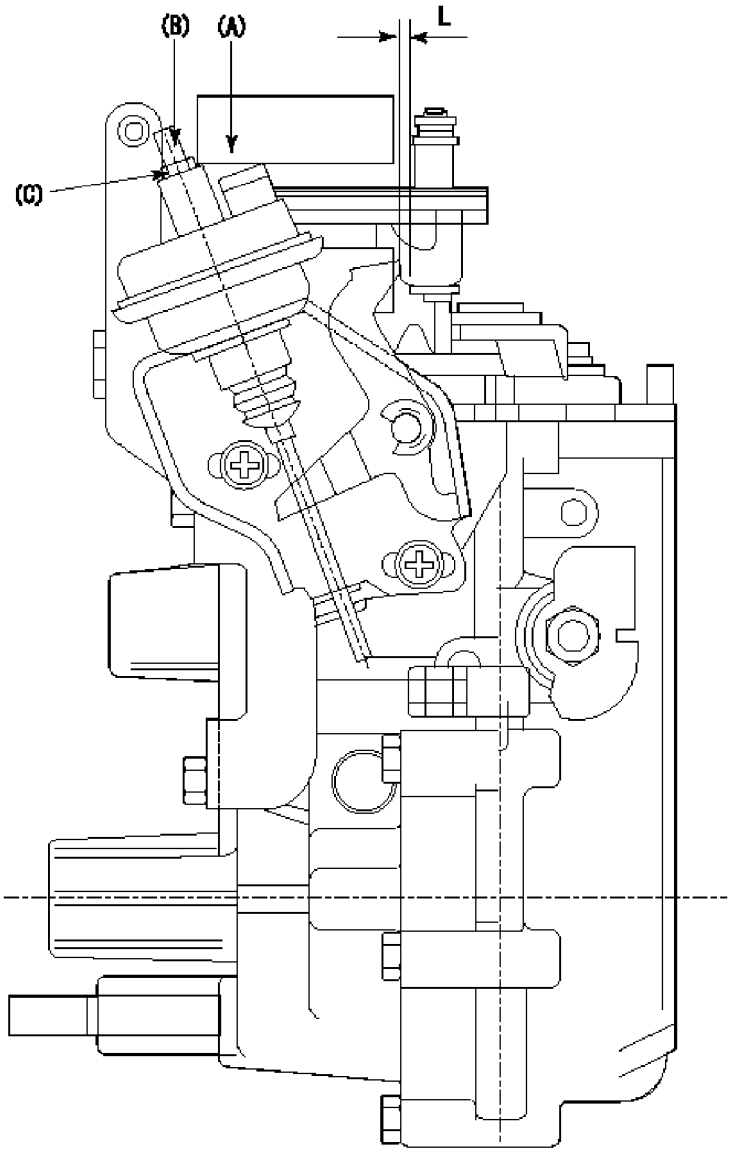


V1=5+-0.01V N1=960r/min Ra=R1(11.9)-0.05mm Vist=2.61+-0.28V	Rack sensor adjustment 1. Flange type rack sensor (rack sensor adjustment -5*20) (1)These types of rack sensors do not need adjustment. Confirm the performance with the follo wing procedures. (2)Mount the rack sensor main body to the pump main body. (3)Fix the pump lever at full. (4)At supply voltage V1, pump speed N1 and rack position Ra, confirm that the amp's output volt age is Vist. (5)Move the pump lever two or three times. (6)Set again to full. (7)Confirm that the amplifier output voltage is Vist. (8)Fix the caution plate to the upper part of the rack sensor. (For those without the caution plate instructions, make sure the nameplate of the rack sensor car ries the "Don't hold here" caution.) (9)Apply red paint to the rack sensor mounting bolts (2 places).

2.7.2 Additional device 2

Name	FICD

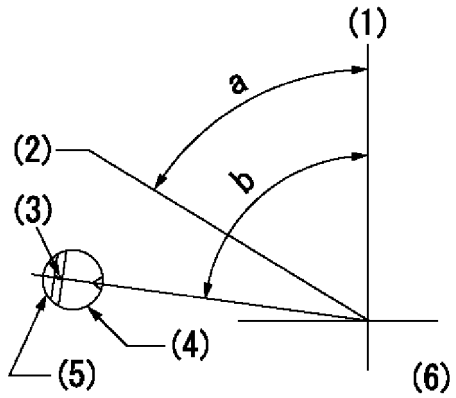
L=(5)mm



P1=53.3kPa(400mmHg) P2=53.3kPa(400mmHg) Na=440r/min Ra=9.2+-0.1mm T1=1.2~1.6N-m(0.12~0.16kgf-m)	(A) applied negative pressure (B) Screw (c) Nut 1. Set the actuator as described below. (1)Confirm that there is clearance between the actuator lever and the speed lever. (2)Loosen the nut (C). (3)Push in the screw (B). (4)Apply P1 from the actuator (A) part. (5)Pull out the screw (B) slowly. (6)Tighten and fix the nut (C) when pump speed is Na and the rack position is Ra. (7)Torque the nut (C) to T1. (8)Apply P2 several times. (9)Confirm that the actuator functions normally. (10)Confirm that there is a clearance between the actuator lever and the speed lever at that time.

2.8 Timing setting

Name	

a=(60deg) b=(85deg)	
aa=7deg	(1)Pump vertical direction (2)Position of gear's standard threaded hole at No 1 cylinder's beginning of injection (3)Stamping position on the A/T outer rim (4)Pump bracket check hole position. (5)At the No 1 cylinder's beginning of injection, align with the projection seen through the bracket's check hole and mark the A/T's bevel C1. (6)B.T.D.C.: aa