

| | |
|-----------------|---------------|
| ZEXEL Ass'y No. | 104740-2365 |
| Bosch Ass'y No. | 9 460 612 828 |
| Bosch Typecode | |
| Engine Type | CD20-T |
| Manufacturer | NISSAN |
| Edition date | 28.01.02 |

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 | 900 | 900 | 900 | | |
| P | Boost pressure | kPa | 0 | 0 | 0 | | |
| P | Boost pressure | mmHg | 0 | 0 | 0 | | |
| S | Average injection quantity | mm3/st. | 31.8 | 31.3 | 32.3 | | |
| S | Difference in delivery | mm3/st. | 2.5 | | 2.5 | | |
| P | Basic | | * | | | | |
| | Remarks | | | | | | |
| | | Full | | | | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|---------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 900 | 900 | 900 | | |
| P | Boost pressure | kPa | 43.35 | 42 | 44.7 | | |
| P | Boost pressure | mmHg | 325 | 315 | 335 | | |
| S | Average injection quantity | mm3/st. | 45.1 | 44.6 | 45.6 | | |
| S | Difference in delivery | mm3/st. | 2.5 | | 2.5 | | |
| P | Basic | | * | | | | |
| | Remarks | | | | | | |
| | | CBS | | | | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|---------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 2700 | 2700 | 2700 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Average injection quantity | mm3/st. | 21.4 | 13.9 | 28.9 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|---------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 2550 | 2550 | 2550 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Average injection quantity | mm3/st. | 37.5 | 36 | 39 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|---------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 2400 | 2400 | 2400 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Average injection quantity | mm3/st. | 45.9 | 42.4 | 49.4 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|---------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 2200 | 2200 | 2200 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Average injection quantity | mm3/st. | 47.6 | 44.1 | 51.1 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|---------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 1800 | 1800 | 1800 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Average injection quantity | mm3/st. | 51.3 | 48.3 | 54.3 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|----------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 1400 | 1400 | 1400 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Average injection quantity | mm ³ /st. | 51.6 | 48.6 | 54.6 | | |

| 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 | mm ³ /st. | 31.8 | 30.8 | 32.8 | | |
| | Remarks | | | | | | |
| | Full | | | | | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|----------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 900 | 900 | 900 | | |
| P | Boost pressure | kPa | 43.35 | 42 | 44.7 | | |
| P | Boost pressure | mmHg | 325 | 315 | 335 | | |
| C | Average injection quantity | mm ³ /st. | 45.1 | 44.1 | 46.1 | | |
| | Remarks | | | | | | |
| | CBS | | | | | | |

| 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 | mm ³ /st. | 35.7 | 33.7 | 37.7 | | |

| 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 | mm ³ /st. | 36.1 | 33.6 | 38.6 | | |

2.2 Governing

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|----------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 2550 | 2550 | 2550 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| S | Average injection quantity | mm ³ /st. | 37.5 | 36.5 | 38.5 | | |
| P | Basic | | * | | | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|----------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 2950 | 2950 | 2950 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Average injection quantity | mm ³ /st. | 6 | | 6 | | |

2.3 Idle

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|----------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 350 | 350 | 350 | | |
| P | Boost pressure | kPa | 0 | 0 | 0 | | |
| P | Boost pressure | mmHg | 0 | 0 | 0 | | |
| S | Average injection quantity | mm ³ /st. | 10.5 | 9.5 | 11.5 | | |
| S | Difference in delivery | mm ³ /st. | 2 | | 2 | | |
| P | Basic | | * | | | | |

| 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 | mm ³ /st. | 3 | | 3 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|----------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 350 | 350 | 350 | | |
| P | Boost pressure | kPa | 0 | 0 | 0 | | |
| P | Boost pressure | mmHg | 0 | 0 | 0 | | |
| C | Average injection quantity | mm ³ /st. | 10.5 | 9 | 12 | | |

2.4 Partial injection quantity

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|----------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 700 | 700 | 700 | | |
| P | Boost pressure | kPa | 0 | 0 | 0 | | |
| P | Boost pressure | mmHg | 0 | 0 | 0 | | |
| C | Average injection quantity | mm ³ /st. | 14.8 | 8.3 | 21.3 | | |

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 | mm ³ /st. | 65 | 60 | 70 | | |
| P | Basic | | * | | | | |

2.6 Stop

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------------------|----------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 350 | 350 | 350 | | |
| P | Boost pressure | kPa | 0 | 0 | 0 | | |
| P | Boost pressure | mmHg | 0 | 0 | 0 | | |
| C | Average injection quantity | mm ³ /st. | 0 | 0 | 0 | | |
| | Remarks | | | | | | |
| | | Magnet OFF | | | | | |

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 | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Overflow quantity | cm ³ /min | 366 | 246 | 486 | | |

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 | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| S | Pressure | kPa | 382.5 | 353 | 412 | | |
| S | Pressure | kgf/cm ² | 3.9 | 3.6 | 4.2 | | |
| P | Basic | | * | | | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------|---------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 600 | 600 | 600 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Pressure | kPa | 313.5 | 284 | 343 | | |
| C | Pressure | kgf/cm ² | 3.2 | 2.9 | 3.5 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------|---------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 900 | 900 | 900 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Pressure | kPa | 382.5 | 353 | 412 | | |
| C | Pressure | kgf/cm ² | 3.9 | 3.6 | 4.2 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------|---------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 1400 | 1400 | 1400 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Pressure | kPa | 490.5 | 461 | 520 | | |
| C | Pressure | kgf/cm ² | 5 | 4.7 | 5.3 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------|---------------------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 2200 | 2200 | 2200 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Pressure | kPa | 667 | 628 | 706 | | |
| C | Pressure | kgf/cm ² | 6.8 | 6.4 | 7.2 | | |

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 | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| S | Timer stroke | mm | 2.2 | 2 | 2.4 | | |
| P | Basic | | * | | | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------|-------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 600 | 600 | 600 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Timer stroke | mm | 0.7 | | 0.7 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------|-------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 900 | 900 | 900 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Timer stroke | mm | 2.2 | 1.9 | 2.5 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------|-------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 1400 | 1400 | 1400 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Timer stroke | mm | 5.1 | 4.6 | 5.6 | | |

| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
|-----|----------------|-------|-----------|------|------|---------------|----|
| P | Pump speed | r/min | 1800 | 1800 | 1800 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |

| | | | | | | | |
|------------|--------------------|-------------|------------------|-------------|-------------|----------------------|-----------|
| C | Timer stroke | mm | 7.4 | 6.8 | 8 | | |
| CAT | Designation | Unit | Set value | min. | max. | Actual values | OT |
| P | Pump speed | r/min | 2200 | 2200 | 2200 | | |
| P | Boost pressure | kPa | 66.65 | 65.3 | 68 | | |
| P | Boost pressure | mmHg | 500 | 490 | 510 | | |
| C | Timer stroke | mm | 8.1 | 7.6 | 8.6 | | |

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

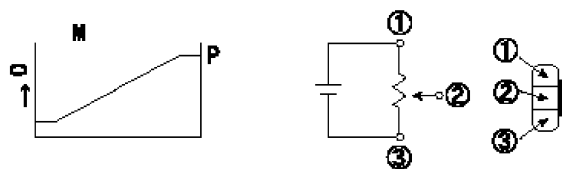
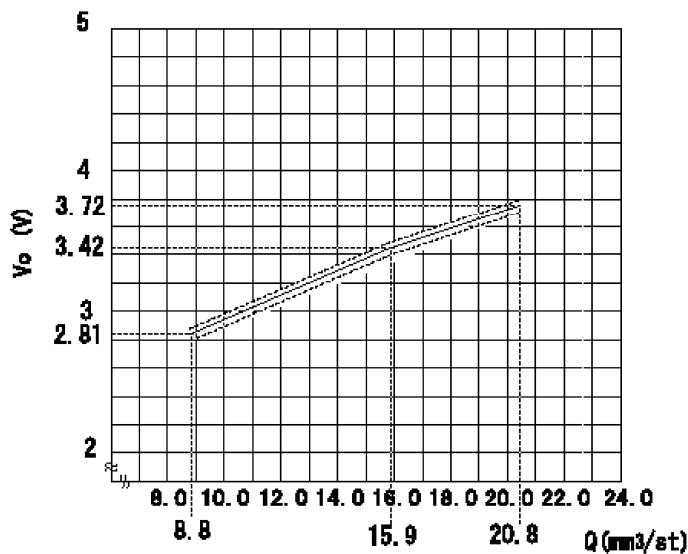
2.11.1 Additional device 1

Name POTENTIOMETER ADJUSTMENT

$V_1=0.82\pm 0.55V$
 $V_2=8.25\pm 1.65V$
 $V_i=10V$
 $J=V\pm 0.03=0.08650Q+2.0447(Q<16\text{ mm}^3/\text{st})$
 $V\pm 0.03=0.05980Q+2.4718(16\text{ mm}^3/\text{st}\leq Q)$

| | | |
|---|-----|-------|
| A | C/L | V_o |
| | I | V_1 |
| | F | V_2 |

E : J V_i



$N_1=700\text{r/min}$
 $\alpha=14.7\text{deg}$
 $L=9.4\text{mm}$

Adjustment of the potentiometer

At pump speed N_1 and a control lever position a from idle (gap L_1), calculate the injection quantity and convert it to a voltage value. Then adjust the potentiometer.

A: Potentiometer performance standards

C/L: control lever position

V_o : Output voltage

E: Conversion formula (J)

I: Idle

F: Full speed

V_i : Applied voltage

Q: Injection quantity (mm³/st)

M: Connecting diagram for the potentiometer

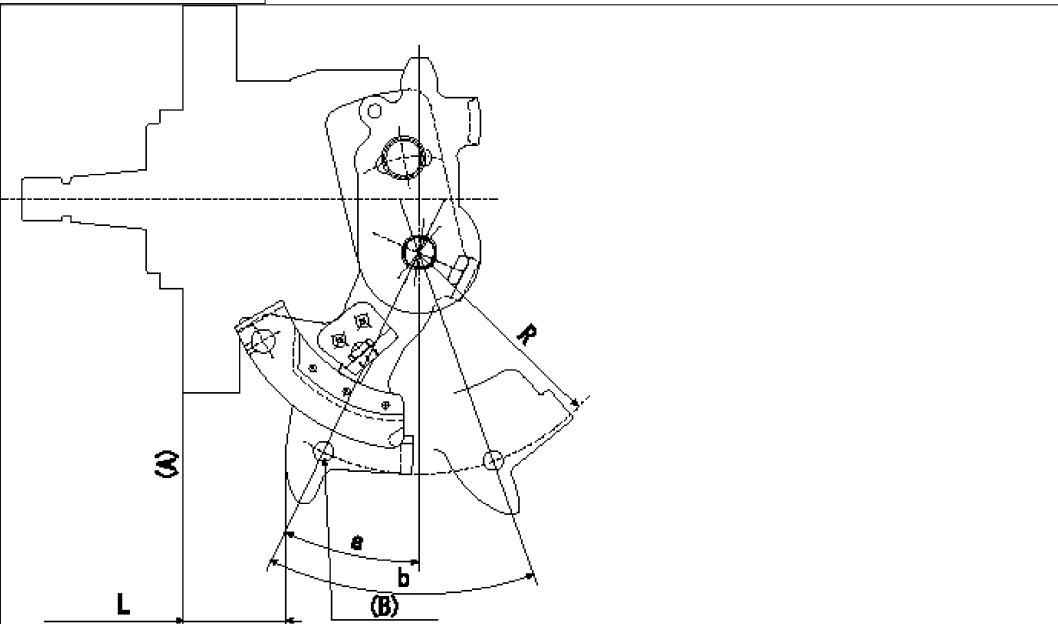
O: Output

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

2.11.2 Additional device 2

Name CONTROL LEVER ANGLE

R=61.5mm
L=25.7~29.7mm



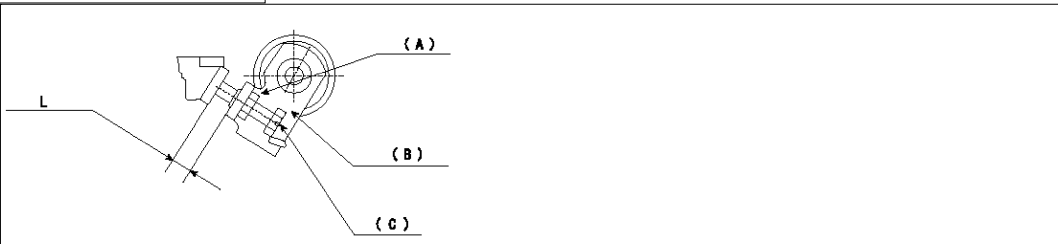
R=61.5mm
L=25.7~29.7mm

Control lever angle measurement
 1. Measure the dimension L from the lever tip to the flange face (A).
 2. Measure the lever angle from the pin hole R (plate).
 (B): lever angle measuring hole
 Alpha = a
 beta: b

2.11.3 Additional device 3

Name STARTING I/Q ADJUSTMENT

L=5~10mm



Starting injection quantity adjustment
 Adjust adjusting bolt so that the starting injection quantity is within the standard.
 Fix using nut.
 (A): Lock nut.
 (B): Stopping lever
 (C): Adjustment bolt

2.11.4 Additional device 4

| Name | M-CSD ADJUSTMENT |
|--|---|
| <p>T1=6~9Nm(0.6~0.9kgfm) T2=5~7Nm(0.5~0.7kgfm) T3=2~3Nm(0.2~0.3kgfm) L1=1+0.1mm L2=1~2mm L4=7.1+0.5mm</p> | |
| <p>L1=1+0.1mm L2=1~2mm L3=0.82+0.2mm L4=7.1+0.5mm</p> | <p>M-CSD adjustment</p> <ol style="list-style-type: none"> Fixing intermediate lever screw (A) [roller (E) must not contact intermediate lever (D)] (1) Hold the control lever (C) in the idle position. (2) Insert a block gauge (thickness gauge) L1 between the intermediate lever D and the bracket K. Adjust the distance between screw A and the control lever to L2 and fix using the nut. Adjust screw (A) and fix using nut (B). Fixing the M-CSD stopper (I) Pull the CSD lever F in the direction X until it contacts the stopper I and tighten the socket head bolt J when the timer stroke is L3. Screw (G) adjustment (1) Adjust using the screw G so that the roller E contacts the intermediate lever D, then fix using the nut H. (2) Pull the CSD lever F in the direction X until it contacts the stopper I and confirm that the control lever shim thickness (lever position) is L4. Note: Use screw (A) to fine-adjust the lever position. [Maintain a gap L2 between the screw (A) and the control lever (C).] |

2.11.5 Additional device 5

| Name | DASHPOT ADJUSTMENT |
|---|--|
| <p>SW1=22mm SW2=10mm T1=15~20Nm{1.5~2.0kgfm} T2=6~9Nm{0.6~0.9kgfm} L=4.6+0.05mm</p> | |
| <p>L=4.6+0.05mm T3=4.9~7.0Nm{0.5~0.7kgfm}</p> | <p>Adjustment of the dash pot</p> <ol style="list-style-type: none"> Insert a block gauge L (thickness gauge) between the idle set screw (C) and the control lever (D). In the above condition, adjust the dashpot adjusting screw (A) so that it contacts the pushrod, and then fix it using the locknut (B). <p>T3T3 Note: (1) The adjusting screw (A) and pushrod contact faces must be smooth. (2) Confirm that the control lever (D) returns to the idling position. (E): 5 locations (F): 4 locations</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 | 6.29 | 6.19 | 6.39 | | |
| S | MS dimension | mm | 0.9 | 0.8 | 1 | | |
| S | Control lever angle alpha | deg. | 25 | 23 | 27 | | |
| S | Control lever angle beta | deg. | 44 | 39 | 49 | | |
| S | Control lever angle gamma | deg. | 14.7 | 14.2 | 15.2 | | |