**SEBM036301**

# SHOP MANUAL

# KOMATSU

# PC130-7

| MACHINE MODEL | SERIAL NUMBER |
|---|---|
| **PC130-7** | **70001 and up** |

- This shop manual may contain attachiments and optional equipment that are not available in your area. Please consult your local Komatsu distributor for those items you may require.
  Materials and specifications are subject to change without notice.
- PC130-7 mounts the SAA4D95LE-3 engine.
  For details of the engine, see the 95-3 Series Engine Shop Manual.


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| ○ | 20-142 | (1) | ○ | 20-223 | (1) | ○ | 20-318 | (1) | ○ | 20-406 | (1) | ○ | 20-459 | (1) |
| ○ | 20-143 | (1) | ○ | 20-224 | (1) | ○ | 20-319 | (1) | ○ | 20-408 | (1) | ○ | 20-460 | (1) |
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| ○ | 20-145 | (1) | ○ | 20-226 | (1) | ○ | 20-321 | (1) | ○ | 20-410 | (1) | ○ | 20-462 | (1) |
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| ○ | 20-147 | (1) | ○ | 20-229 | (1) | ○ | 20-323 | (1) | ○ | 20-412 | (1) | ○ | 20-464 | (1) |
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| ○ | 20-149 | (1) | ○ | 20-231 | (1) | ○ | 20-325 | (1) | ○ | 20-414 | (1) | ○ | 20-466 | (1) |
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# 20 TESTING AND ADJUSTING

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★ Note the following when making judgements using the standard value tables for testing, adjusting, or troubleshooting.

1. The standard value for a new machine given in the table is the value used when shipping the machine from the factory and is given for reference. It is used as a guideline for judging the progress of wear after the machine has been operated, and as a reference value when carrying out repairs.
2. The service limit value given in the tables is the estimated value for the shipped machine based on the results of various tests. It is used for reference together with the state of repair and the history of operation to judge if there is a failure.
3. These standard values are not the standards used in dealing with claims.

⚠ When carrying out testing, adjusting, or troubleshooting, park the machine on level ground, inset the safety pins, and use blocks to prevent the machine from moving.

⚠ When carrying out work together with other workers, always use signals and do not let unauthorized people near the machine.

⚠ When checking the water level, always wait for the water to cool down. If the radiator cap is removed when the water is still hot, the water will spurt out and cause burns.

⚠ Be careful not to get caught in the fan, fan belt or other rotating parts.

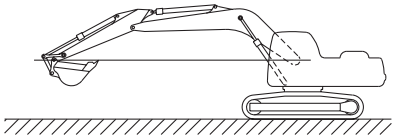
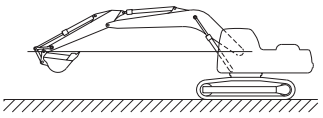
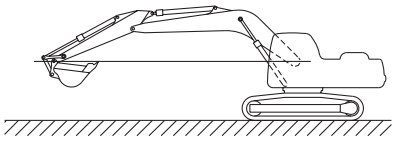
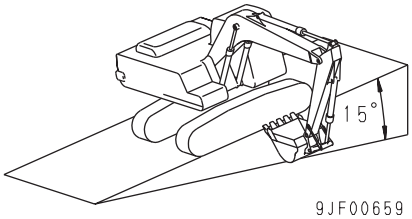
# STANDARD VALUE TABLE FOR ENGINE

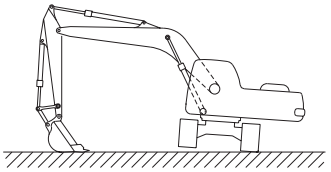
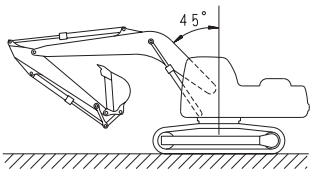
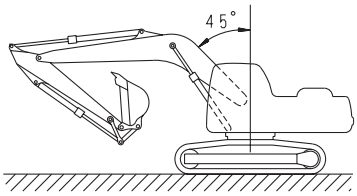
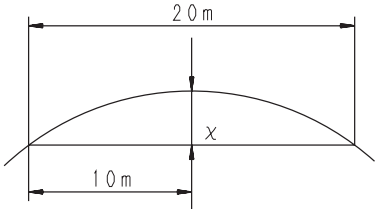
| Model name | | | PC130-7 | |
|---|---|---|---|---|
| Engine | | | SAA4D95LE-3 | |
| Item | Measurement condition | Unit | Standard value | Permissible value |
| Engine speed | High idling | rpm | 2,350 ± 100 | 2,350 ± 100 |
| | Low idling | | 1,100 ± 50 | 1,100 ± 50 |
| | Rated speed | | 2,200 | — |
| Exhaust gas color | During sharp acceleration | Bosch index | Max. 4.5 | Max. 6.5 |
| | During high idling | | Max. 1.0 | Max. 2.0 |
| Valve clearance (Cooled) | Intake valve | mm | 0.35 | — |
| | Exhaust valve | | 0.50 | — |
| Compression pressure | Oil temperature: 40 – 60 °C (Engine speed) | MPa {kg/cm$^2$} (rpm) | Min. 2.9 {Min. 30} (320 – 360) | 2.0 {20} (320 – 360) |
| Blow-by pressure | Coolant temperature: Within operating range At rated output | kPa {mm$H_2O$} | Max. 0.49 {Max. 50} | 0.98 {100} |
| Oil pressure | Coolant temperature: Within operating range | MPa {kg/cm$^2$} | | |
| | At high idling (SAE30) | | 0.34 – 0.59 {3.5 – 6.0} | 0.25 {2.5} |
| | At high idling (SAE10W) | | 0.29 – 0.54 {3.0 – 5.5} | 0.21 {2.1} |
| | At low idling (SAE30) | | Min. 0.1 {Min. 1.0} | 0.07 {0.7} |
| | At high idling (SAE10W) | | Min. 0.08 {Min. 0.8} | 0.07 {0.7} |
| Oil temperature | Through speed range (In oil pan) | °C | 90 – 110 | 120 |
| Fuel injection timing | Before top dead center (BTDC) | ° | 6 ± 0.75 | 6 ± 0.75 |
| Fan belt tension | Deflection under finger pressure of 58.8 N {6 kg} | mm | 6 – 10 | 6 – 10 |
| Air conditioner compressor belt tension | Deflection under finger pressure of 58.8 N {6 kg} | mm | 6 – 10 | 6 – 10 |

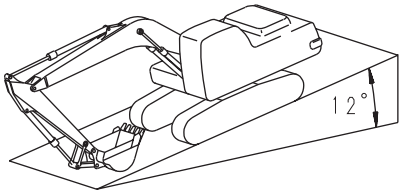
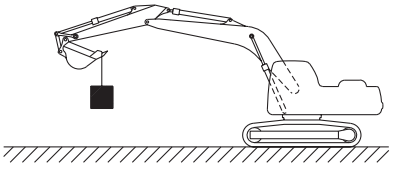
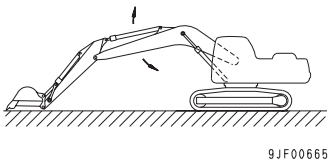
# STANDARD VALUE TABLE FOR CHASSIS

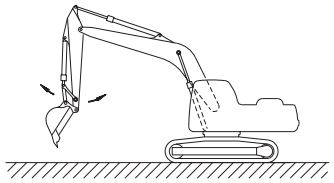
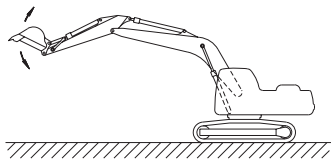
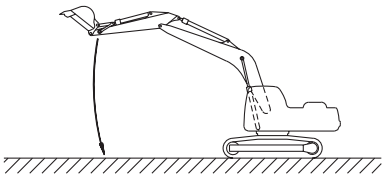
| Model name | | | | PC130-7 | |
|---|---|---|---|---|---|
| Category | Item | Measurement condition | Unit | Standard value | Permissible value |
| Engine speed | Pump relief | • Engine coolant temperature: Within operating range<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Arm OUT relief | rpm | 2,120 ± 100 | 2,120 ± 100 |
| | Pump relief + One-touch power maximizing | • Engine coolant temperature: Within operating range<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Arm OUT relief + One-touch power maximizing switch ON | rpm | 2,180 ± 100 | 2,180 ± 100 |
| | During auto-deceleration | • Engine speed: High idling<br>• Auto-decelerator switch: ON<br>• All control levers in neutral | rpm | 1,400 ± 100 | 1,400 ± 100 |
| Control valve spool stroke | Boom control valve | • Engine: Stopped | mm | 8.0 ± 0.5 | 8.0 ± 0.5 |
| | Arm control valve | IN | | 9.5 ± 0.5 | 9.5 ± 0.5 |
| | | OUT | | 8.0 ± 0.5 | 8.0 ± 0.5 |
| | Bucket control valve | | | 8.0 ± 0.5 | 8.0 ± 0.5 |
| | Swing control valve | | | 8.0 ± 0.5 | 8.0 ± 0.5 |
| | Travel control valve | | | 8.0 ± 0.5 | 8.0 ± 0.5 |
| Control lever stroke | Boom control lever | • Engine: Stopped<br>• Center of lever grip<br>• Read max. value to stroke end (Exclude play in neutral position). | mm | 85 ± 10 | 85 ± 10 |
| | Arm control lever | | | 85 ± 10 | 85 ± 10 |
| | Bucket control lever | | | 85 ± 10 | 85 ± 10 |
| | Swing control lever | | | 85 ± 10 | 85 ± 10 |
| | Travel control lever | | | 112 ± 15 | 112 ± 15 |
| | Play of control lever | | | 10 ± 15 | 10 ± 15 |
| Operating effort of control lever | Boom control lever | • Hydraulic oil temperature: Within operating range<br>• Engine speed: High idling<br>• Center of lever grip<br>• Tip of pedal<br>• Read max. value to stroke end | N {kg} | 15.7 ± 3.9 {1.6 ± 0.4} | Max. 24.5 {Max. 2.5} |
| | Arm control lever | | | 15.7 ± 3.9 {1.6 ± 0.4} | Max. 24.5 {Max. 2.5} |
| | Bucket control lever | | | 12.7 ± 2.9 {1.3 ± 0.3} | Max. 21.6 {Max. 2.2} |
| | Swing control lever | | | 12.7 ± 2.9 {1.3 ± 0.3} | Max. 21.6 {Max. 2.2} |
| | Travel control lever | | | 24.5 ± 5.9 {2.5 ± 0.6} | Max. 39.2 {Max. 4.0} |
| | Travel control pedal | | | 80.4 ± 20.1 {8.2 ± 2.0} | Max. 107.9 {Max. 11} |

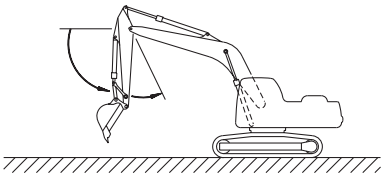
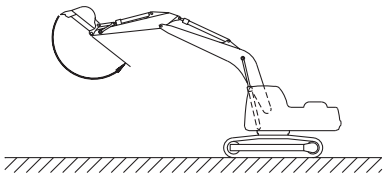
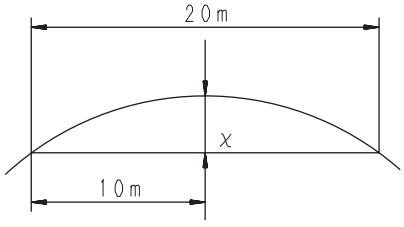
| Model name | | | | | PC130-7 | |
|---|---|---|---|---|---|---|
| Category | Item | Measurement condition | | Unit | Standard value | Permissible value |
| Oil pressure | Unload pressure | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Pump outlet pressure when all levers are in neutral | | MPa {kg/cm²} | 2.9 ± 0.5<br>{30 ± 5} | 2.9 ± 0.5<br>{30 ± 5} |
| | Boom relief pressure | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Pump outlet pressure when measured circuit is relieved | At normal relief | MPa {kg/cm²} | $31.9^{+2.0}_{0}$<br>$\{325^{+20}_{0}\}$ | 33.3 – 36.8<br>{340 – 375} |
| | | | At power max. | | 34.8 ± 1.0<br>{355 ± 10} | 36.3 – 39.2<br>{370 – 400} |
| | Arm relief pressure | | At normal relief | | $31.9^{+2.0}_{0}$<br>$\{325^{+20}_{0}\}$ | 33.3 – 36.8<br>{340 – 375} |
| | | | At power max. | | 34.8 ± 1.0<br>{355 ± 10} | 36.3 – 39.2<br>{370 – 400} |
| | Bucket relief pressure | | At normal relief | | $31.9^{+2.0}_{0}$<br>$\{325^{+20}_{0}\}$ | 33.3 – 36.8<br>{340 – 375} |
| | | | At power max. | | 34.8 ± 1.0<br>{355 ± 10} | 36.3 – 39.2<br>{370 – 400} |
| | Swing relief pressure | | | | 28.9 ± 1.5<br>{295 ± 15} | 28.9 – 32.9<br>{295– 335} |
| | Travel relief pressure | | | | 34.8 ± 1.0<br>{355 ± 10} | 36.3 – 39.2<br>{370 – 400} |
| | Control circuit basic pressure | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Outlet pressure of self-reducing pressure valve when all levers are in neutral | | MPa {kg/cm²} | 3.23 ± 0.2<br>{33 ± 2} | 2.84 – 3.43<br>{29 – 35} |
| | LS differential pressure | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Pump pressure - LS pressure | When all levers are in neutral | MPa {kg/cm²} | $2.7^{+1.0}_{-0.7}$<br>$\{28^{+10}_{-7}\}$ | $2.7^{+1.0}_{-0.7}$<br>$\{28^{+10}_{-7}\}$ |
| | | | When travel system runs idle at Hi | | 2.2 ± 0.1<br>{22.5 ± 1} | 2.2 ± 0.1<br>{22.5 ± 1} |

| Model name | | | | PC130-7 | |
|---|---|---|---|---|---|
| Category | Item | Measurement condition | Unit | Standard value | Permissible value |
| Swing | Overrun of swing |  9JF00656<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Quantity of overrun of swing circle when it stops after 1 turn<br>• ( ): Qty of overrun of periphery of swing circle | deg (mm) | 75 ± 10 {730 ± 100} | Max. 90 (Max. 870) |
| | Time taken to start swinging |  9JF00656<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Time taken to swing 90° and 180° after starting<br>90° | sec | 2.9 ± 0.3 | Max. 3.5 |
| | | 180° | | 4.0 ± 0.4 | Max. 8.5 |
| | Time taken to swing |  9JF00656<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Time taken to swing 5 turns after swinging 1 turn | sec | 28.6 ± 4.8 | 28.6 ± 5.8 |
| | Hydraulic drift of swing |   9JF00659<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine: Stopped<br>• Set upper structure at 90° to machine body on slope of 15°.<br>• Make match marks on inner race and outer race of swing circle.<br>• Measure deviation of match marks in 15 minutes. | mm | 0 | 0 |

| Model name | | | | | PC130-7 | |
|---|---|---|---|---|---|---|
| Category | Item | Measurement condition | | Unit | Standard value | Permissible value |
| Swing | Leakage from swing motor | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Swing lock switch: LOCK<br>• Measure leakage for 1 minutes while swing circuit is relieved. | | ℓ/min | Max. 3 | Max. 6 |
| Travel | Travel speed (Idle run) |  <br>9JF00660<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Measure time taken to rotate track shoe 5 turns after 1 turn. | Lo | sec | 46.1 ± 9.2 | 46.1 ± 9.2 |
| | | | Hi | | 21.9 ± 2.2 | 23.1 ± 3.0 |
| | Travel speed (Actual travel) |  <br>9JF00661<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Hard and level place<br>• Measure time taken to travel 20 m after running up 10 m. | Lo | | 27.6 ± 5.1 | 27.6 ± 7.1 |
| | | | Hi | | 13.2 ± 1.2 | 13.2 ± 1.7 |
| | Travel deviation |  <br>9JF00661<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Travel speed: Lo<br>• Hard and level place<br>• Measure travel deviation in travel of 20 m after running up 10 m.<br>  <br>9JF00662 | | mm | Max. 200 | Max. 220 |

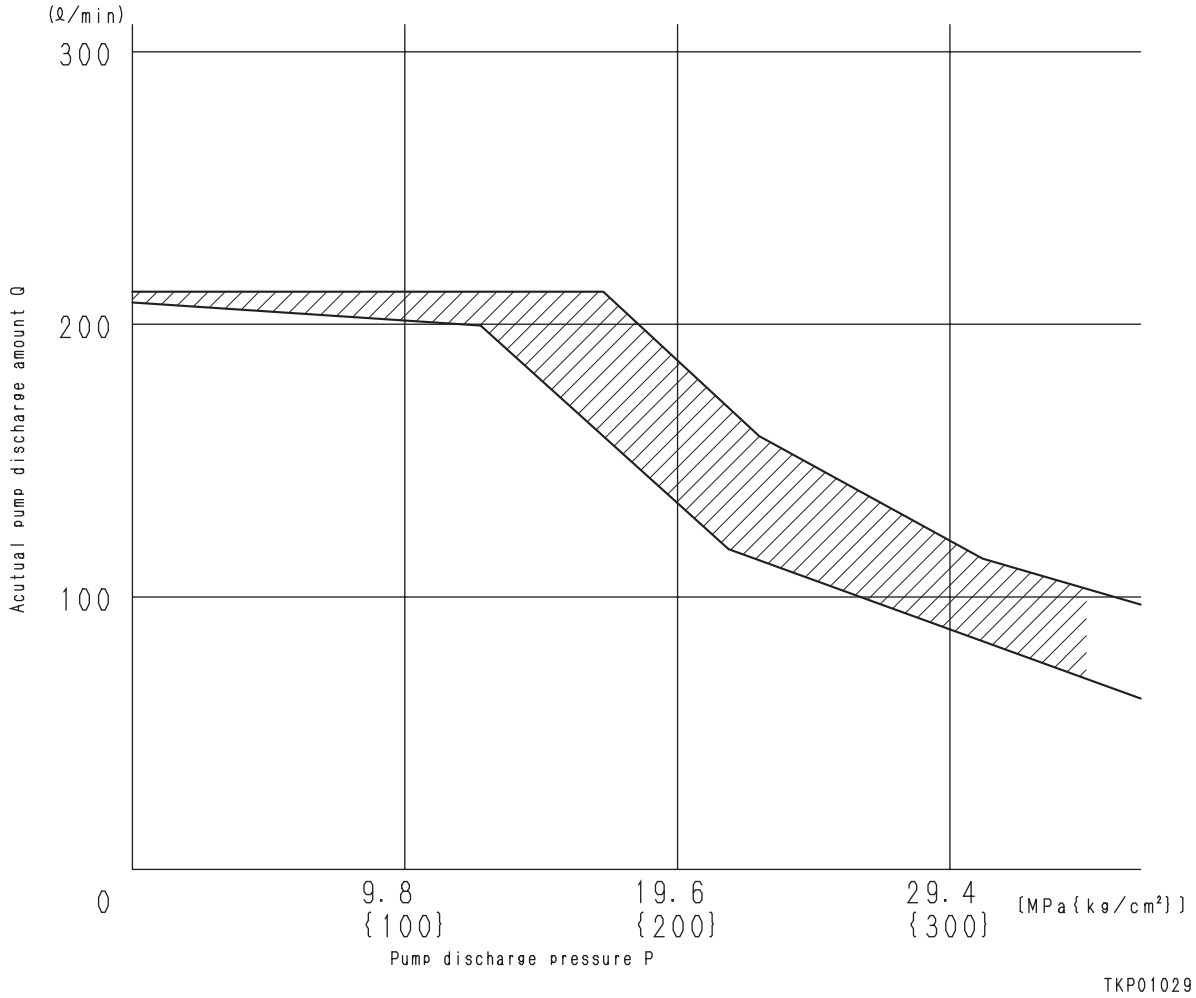
| Model name | | | | | PC130-7 | |
|---|---|---|---|---|---|---|
| Cate-gory | Item | | Measurement condition | Unit | Standard value | Permissible value |
| Travel | Hydraulic drift of travel | |  9JF00663<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine: Stopped<br>• Stop machine on slope of 12 degrees with sprocket on upper side.<br>• Measure hydraulic drift of travel in 5 minutes. | mm | 0 | 0 |
| | Leakage from travel motor | | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Lock sprocket.<br>• Measure leakage for 1 minutes while travel circuit is relieved. | ℓ/min | Max. 5 | Max. 10 |
| Work equipment | Hydraulic drift of work equipment | Whole work equipment (Hydraulic drift of tooth tip) |  9JF00664<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Level and flat place<br>• Bucket: Full of dirt and sand or filled with rated load (1,080 kg)<br>• Level boom top, retract arm cylinder fully, and extract bucket cylinder fully.<br>• Engine: Stopped<br>• Work equipment control lever: Neutral<br>• Start measuring hydraulic drift just after setting machine and measure every 5 minutes for 15 minutes. | mm | Max. 460 | Max. 700 |
| | | Boom cylinder (Retraction of cylinder) | | | Max. 10 | Max. 12 |
| | | Arm cylinder (Extension of cylinder) | | | Max. 80 | Max. 90 |
| | | Bucket cylinder (Retraction of cylinder) | | | Max. 22 | Max. 40 |
| | Work equipment speed | Boom speed |  9JF00665<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Measure time taken to move bucket between RAISE stroke end and ground touch point of bucket. | RAISE | sec | 3.7 ± 0.4 | Max. 4.3 |
| | | | | LOWER | | 2.6 ± 0.5 | Max. 3.2 |

| Model name | | | | | | PC130-7 | |
|---|---|---|---|---|---|---|---|
| Cate-gory | Item | | Measurement condition | | Unit | Standard value | Permissible value |
| Work equipment | Work equipment speed | Arm speed |  9JF00666 • Hydraulic oil temperature: 45 – 55 °C • Engine speed: High idling • Working mode: A • Measure time taken to move arm between OUT stroke end and IN stroke end (between starting points of cushion). | CURL | sec | 3.2 ± 0.4 | Max. 4.4 |
| | | | | DUMP | | 3.1 ± 0.3 | Max. 3.7 |
| | | Bucket speed |  9JF00667 • Hydraulic oil temperature: 45 – 55 °C • Engine speed: High idling • Working mode: A • Measure time taken to move bucket between DUMP stroke end and CURL stroke end | CURL | sec | 2.9 ± 0.3 | Max. 3.7 |
| | | | | DUMP | | 2.3 ± 0.2 | Max. 2.9 |
| | Time lag | Boom time lag |  9JF00668 • Hydraulic oil temperature: 45 – 55 °C • Engine speed: Low idling • Working mode: A • Lower boom from RAISE stroke end and measure time taken to start raising front of machine after bucket touches ground. | | sec | Max. 3.0 | Max. 4.0 |

| Model name | | | | | PC130-7 | |
|---|---|---|---|---|---|---|
| Category | Item | | Measurement condition | Unit | Standard value | Permissible value |
| Work equipment | Time lag | Arm time lag |  9JF00669<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: Low idling<br>• Working mode: A<br>• Move IN arm from OUT stroke end and measure time taken to start moving arm again after it is stopped.<br>• For measuring posture, see WORK EQUIPMENT 6. | sec | Max. 2.0 | Max. 3.0 |
| | | Bucket time lag |  9JF00670<br>• Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: Low idling<br>• Working mode: A<br>• Curl bucket from DUMP stroke end and measure time taken to start moving bucket again after it is stopped.<br>• For measuring posture, see WORK EQUIPMENT 7. | sec | Max. 2.0 | Max. 3.0 |
| | Oil leakage | Cylinder | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Relieve cylinder to be measured or travel circuit and measure leakage in 1 minute. | cc/min | Max. 3.5 | Max. 15 |
| | | Center swivel joint | | | Max. 10 | Max. 50 |
| Compound operation performance | Travel deviation in compound operation of work equipment and travel | | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine speed: High idling<br>• Working mode: A<br>• Travel speed: Lo<br>• Hard and level place<br>• Measure travel deviation in travel of 20 m after running up 10 m.<br>  9JF00662 | mm | Max. 500 | Max. 500 |

| Model name | | | | PC130-7 | |
|---|---|---|---|---|---|
| Category | Item | Measurement condition | Unit | Standard value | Permissible value |
| PC flow control characteristics | Time taken to swing 90° in compound operation of raising boom and starting swinging | • Hydraulic oil temperature: 45 – 55 °C<br>• Engine: High idling<br>• Working mode: A<br>• Bucket: Filled with rated load<br>• Hard and level place<br>• Set arm vertically and lower back of bucket to ground.<br>• Raise boom and start swinging simultaneously from above posture and measure time taken to pass 90° point. | sec | 4.0<br>(Reference value) | |
| Pump performance | Hydraulic pump capacity | • See graph. | ℓ/min | See graph. | |

| Model name | | | | PC130-7 | |
|---|---|---|---|---|---|
| Cate-gory | Item | Measurement condition | Unit | Standard value | Permissible value |
| Pump performance | Hydraulic pump performance | | | | |




- PC-EPC current: 400 mA
- Pump speed: 2,000 rpm

| Check point | Test pump discharge pressure (MPa{kg/cm2}) | Standard discharge (ℓ/min) | Lower limit of discharge (ℓ/min) |
|---|---|---|---|
| Any point | P | Q (See graph) | Q (See graph) |

★ Avoid measuring near a broken point of the graph, since the error becomes large at that point.
★ When measuring without removing the pump from the machine, if the engine speed cannot be set to the specified speed with the fuel control dial, calculate the pump discharge pressure at the specified speed from the engine speed and pump discharge at the time of measurement.

# TESTING AND ADJUSTING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# TOOLS FOR TESTING, ADJUSTING, AND TROUBLESHOOTING

| Testing and adjusting item | Symbol | | Part No. | Part name | Q'ty | Remarks |
|---|---|---|---|---|---|---|
| Measuring exhaust gas color | A | 1 | 799-203-9000 | Handy smoke checker | 1 | Pollution level: 0 – 70% (With standard color)<br>(Pollution level x 1/10 ≒ Bosch index) |
| | | 2 | Commercially available | Smoke meter | 1 | |
| Adjusting valve clearance | B | | Commercially available | Feeler gauge | 1 | (Air intake side: 0.35 mm, Exhaust side: 0.50 mm) |
| Measuring compression pressure | C | | 795-502-1205 | Compression gauge | 1 | 0 – 6.9MPa {0 – 70kg/cm$^2$} |
| | | | 795-502-1370 | Adapter | 1 | For 95E-3 engine |
| | | | 6204-11-3880 | Gasket | 1 | |
| Measuring blow-by pressure | D | | 799-201-1504 | Blow-by checker | 1 | — |
| Measuring engine oil pressure | E | 1 | 799-101-5002 | Hydraulic tester | 1 | Pressure gauge: 2.5,5.9,39.2,58.8MPa {25,60,400,600kg/cm$^2$} |
| | | | 790-261-1203 | Digital hydraulic tester | 1 | Pressure gauge: 58.8MPa {600kg/cm$^2$} |
| | | 2 | 799-401-2320 | Hydraulic tester | 1 | Pressure gauge: 0.98MPa {10kg/cm$^2$} |
| | | 3 | 799-401-3500 | Adapter | 1 | Size: 06 |
| | | 4 | 799-101-5220 | Nipple | 1 | Size: 10 x 1.25mm |
| | | | 07002-11023 | O-ring | 1 | |
| Measuring fuel injection timing | F | 1 | 795-102-2103 | Spring pusher | 1 | For delivery valve method |
| | | 2 | Commercially available | Dial gauge | 1 | |
| Measuring clearance of swing circle bearing | G | | Commercially available | Dial gauge | 1 | — |
| Testing and adjusting oil pressure in work equipment, swing, and travel circuits | H | 1 | 799-101-5002 | Hydraulic tester | 1 | * Same as E1 |
| | | | 790-261-1203 | Digital hydraulic tester | 1 | |
| | | 2 | 799-101-5220 | Nipple | 1 | * Same as E4 |
| | | | 07002-11023 | O-ring | 1 | |
| Measuring control circuit basic pressure | J | 1 | 799-101-5002 | Hydraulic tester | 1 | * Same as E1 |
| | | | 790-261-1203 | Digital hydraulic tester | 1 | |
| | | 2 | 799-101-5230 | Nipple | 1 | Size: 14 x 1.5mm |
| | | | 07002-11423 | O-ring | 1 | |
| Testing and adjusting oil pressure in pump PC control circuit | K | 1 | 799-101-5002 | Hydraulic tester | 1 | * Same as H (Only quantity is different) |
| | | | 790-261-1203 | Digital hydraulic tester | 1 | |
| | | 2 | 799-101-5230 | Nipple | 2 | |
| | | | 07002-11423 | O-ring | 2 | |