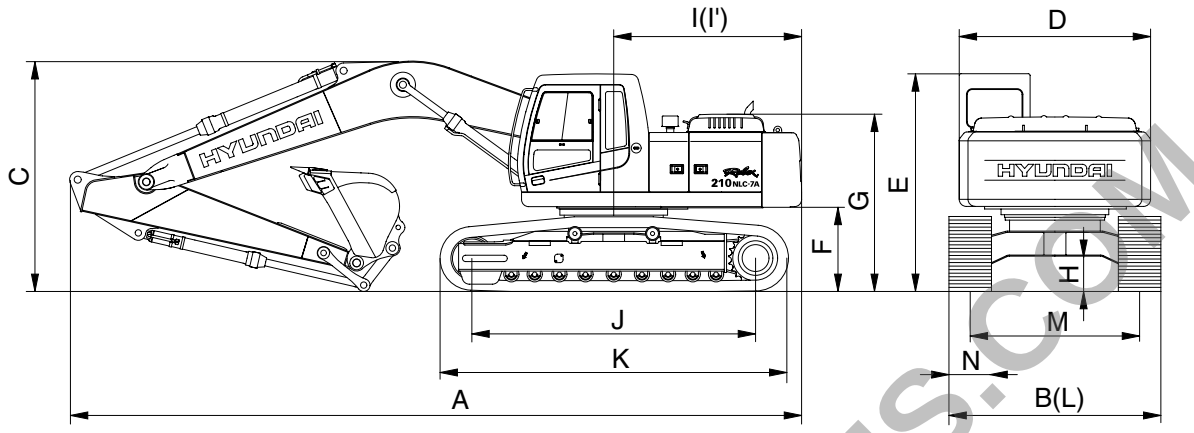
## 2. SPECIFICATIONS

### 1) 5.65m (18' 6") MONO BOOM




210N7A2SP02A

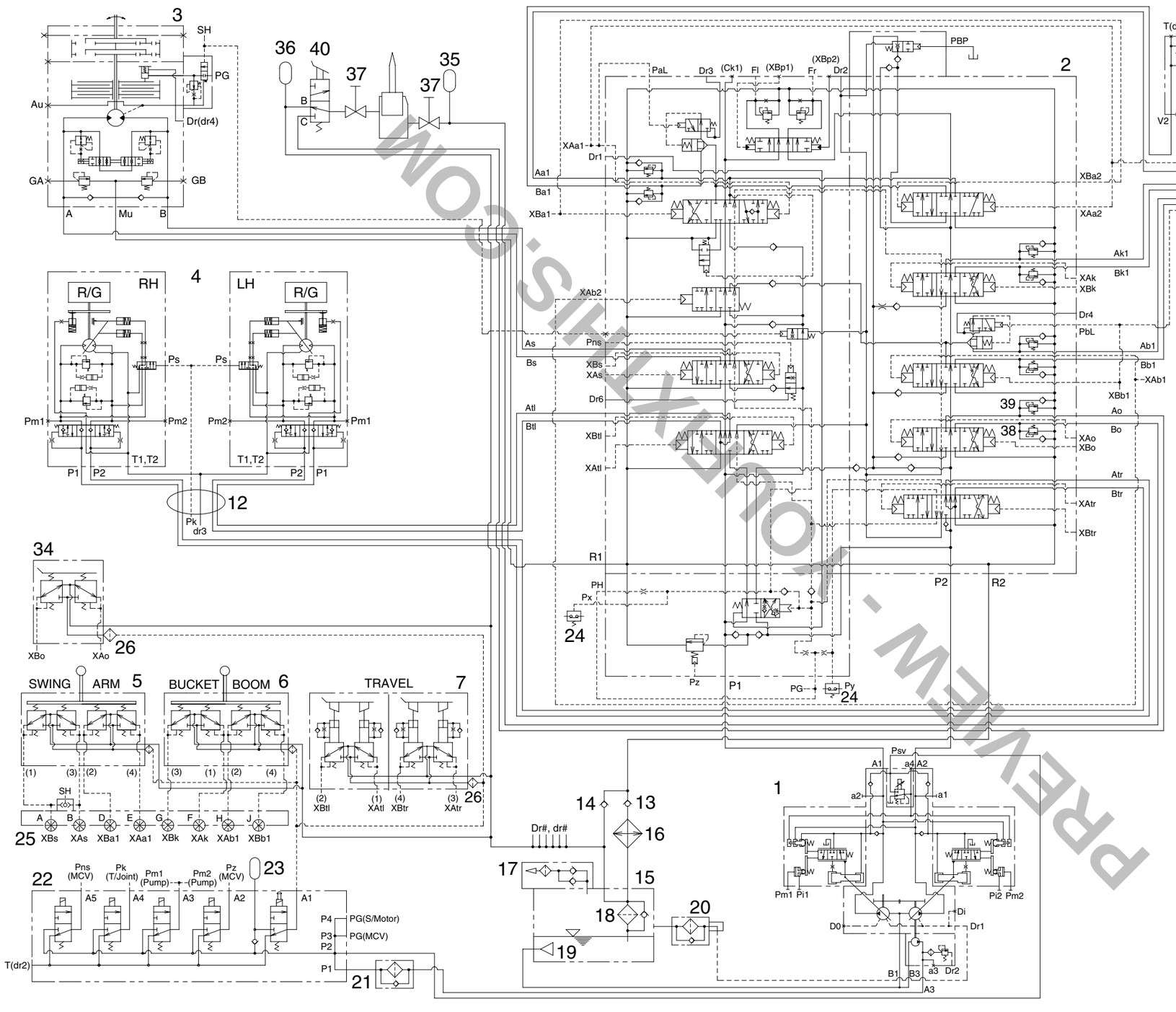
| Description | | Unit | Specification |
|---|---|---|---|
| Operating weight | | kg(lb) | 22000(48500) |
| Bucket capacity (SAE heaped), standard | | $m^3(yd^3)$ | 0.87(1.14) |
| Overall length | A | mm(ft-in) | 9540(31' 4") |
| Overall width, with 500mm shoe | B | | 2500( 8' 2") |
| Overall height | C | | 3070(10' 1") |
| Superstructure width | D | | 2530( 8' 4") |
| Overall height of cab | E | | 2920( 9' 7") |
| Ground clearance of counterweight | F | | 1060( 3' 6") |
| Engine cover height | G | | 2320( 7' 7") |
| Minimum ground clearance | H | | 480( 1' 7") |
| Rear-end distance | I | | 2770( 9' 1") |
| Rear-end swing radius | I' | | 2800( 9' 2") |
| Distance between tumblers | J | | 3650(12' 0") |
| Undercarriage length | K | | 4440(14' 7") |
| Undercarriage width | L | | 2500( 8' 2") |
| Track gauge | M | | 2000( 6' 7") |
| Track shoe width, standard | N | | 500(20") |
| Travel speed (Low/high) | | km/hr(mph) | 3.4/5.3(2.1/3.3) |
| Swing speed | | rpm | 12.0 |
| Gradeability | | Degree(%) | 35(70) |
| Ground pressure (500mm shoe) | | $kgf/cm^2(psi)$ | 0.56(7.96) |

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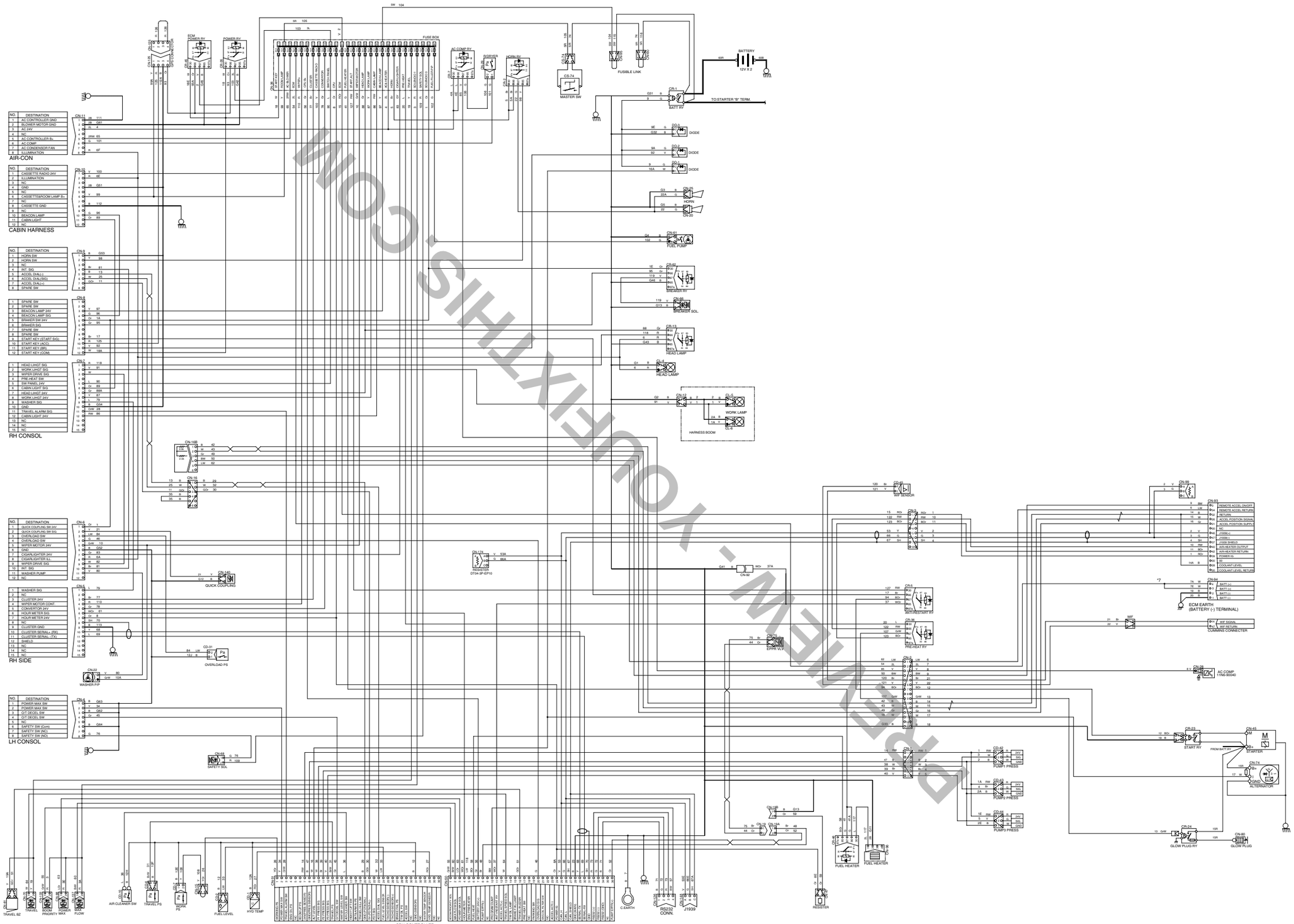
## GROUP 1 HYDRAULIC CIRCUIT




| | |
|---|---|
| 1 | Main pump |
| 2 | Main control valve |
| 3 | Swing motor |
| 4 | Travel motor |
| 5 | RCV lever(LH) |
| 6 | RCV lever(RH) |
| 7 | RCV pedal |
| 8 | Boom cylinder(LH) |
| 9 | Boom cylinder(RH) |
| 10 | Arm cylinder |
| 11 | Bucket cylinder |
| 12 | Turning joint |
| 13 | Check valve |
| 14 | Check valve |
| 15 | Hydraulic tank |
| 16 | Oil cooler |
| 17 | Air breather |
| 18 | Bypass valve |
| 19 | Strainer |
| 20 | Spin filter |
| 21 | Line filter |
| 22 | Solenoid valve |
| 23 | Accumulator |
| 24 | Pressure switch |
| 25 | Shuttle valve |
| 26 | Last guard filter |
| 30 | Boom safety valve(Option) |
| 31 | Arm safety valve(Option) |
| 32 | Pressure switch |
| 33 | Shut off valve |
| 34 | Breaker pedal(Option) |
| 35 | Accumulator |
| 36 | Accumulator |
| 37 | Stop valve |
| 38 | Port relief valve |
| 39 | Port relief valve |
| 40 | 3 way joint(Option) |

2107NA3HC01

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## 1. REMOVAL AND INSTALL

### 1) REMOVAL

(1) Lower the work equipment to the ground and stop the engine.

(2) Operate the control levers and pedals several times to release the remaining pressure in the hydraulic piping.

(3) Loosen the breather slowly to release the pressure inside the hydraulic tank.

**⚠ Escaping fluid under pressure can penetrate the skin causing serious injury.**

(4) Loosen the drain plug under the hydraulic tank and drain the oil from the hydraulic tank.

- Hydraulic tank quantity : 180 ℓ

(5) Remove socket bolts (13) and disconnect pipe (1,2).

(6) Disconnect pilot line hoses (4, 5, 6, 7, 8, 9, 10, 11).

(7) Remove socket bolts (12) and disconnect pump suction pipe (3).

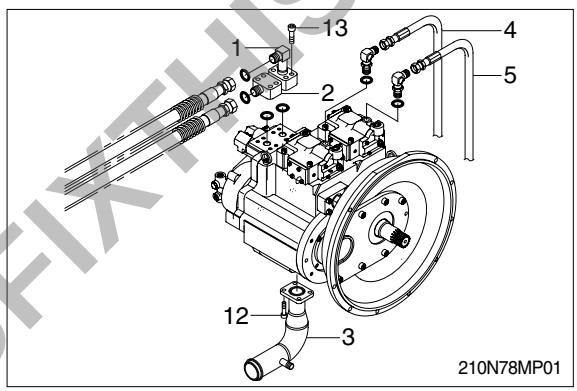
※ When pump suction pipe is disconnected, the oil inside the piping will flow out, so catch it in oil pan.

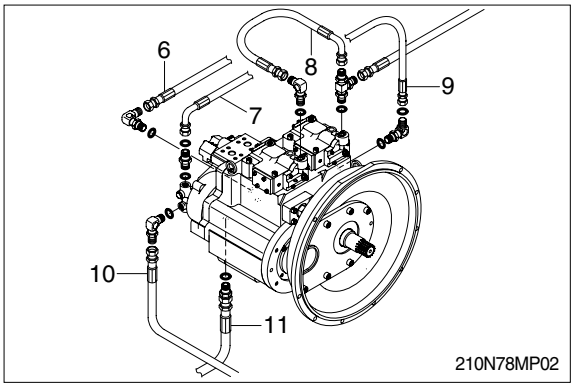
(8) Sling the pump assembly and remove the pump mounting bolts.

- Weight : 170kg (370lb)

※ Pull out the pump assembly from housing. When removing the pump assembly, check that all the hoses have been disconnected.




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# GROUP 2 TIGHTENING TORQUE

## 1. MAJOR COMPONENTS

| No. | Descriptions | | Bolt size | Torque | |
|---|---|---|---|---|---|
| | | | | kgf · m | lbf · ft |
| 1 | Engine | Engine mounting bolt, nut(Front) | M20 × 2.5 | 55 ± 3.5 | 398 ± 25 |
| 1 | | Engine mounting bolt, nut(Rear) | M24 × 3.0 | 90 ± 7.0 | 651 ± 51 |
| 2 | | Radiator mounting bolt | M12 × 1.75 | 12.8 ± 3.0 | 92.6 ± 21.7 |
| 3 | | Coupling mounting socket bolt | M18 × 2.5 | 32 ±1.0 | 231 ±7.2 |
| 4 | | Main pump housing mounting bolt | M10 × 1.5 | 4.8 ± 0.3 | 34.7 ± 2.2 |
| 5 | Hydraulic system | Main pump mounting socket bolt | M20 × 2.5 | 42 ± 4.5 | 304 ± 32.5 |
| 6 | | Main control valve mounting nut | M12 × 1.75 | 12.2 ± 1.3 | 88.2 ± 9.4 |
| 7 | | Fuel tank mounting bolt | M20 × 2.5 | 45 ± 5.1 | 325 ± 36.9 |
| 8 | | Hydraulic oil tank mounting bolt | M20 × 2.5 | 46 ± 5.1 | 333 ± 36.9 |
| 9 | | Turning joint mounting bolt, nut | M12 × 1.75 | 12 ± 1.3 | 86.8 ± 9.4 |
| 10 | Power train system | Swing motor mounting bolt | M20 × 2.5 | 57.9 ± 8.7 | 419 ± 62.9 |
| 11 | | Swing bearing upper part mounting bolt | M20 × 2.5 | 57.8 ± 6.4 | 418 ± 46.3 |
| 12 | | Swing bearing lower part mounting bolt | M20 × 2.5 | 57.8 ± 6.4 | 418 ± 46.3 |
| 13 | | Travel motor mounting bolt | M16 × 2.0 | 23 ± 2.5 | 166 ± 18.1 |
| 14 | | Sprocket mounting bolt | M16 × 2.0 | 26 ± 2.5 | 188 ± 18.1 |
| 15 | Under carriage | Carrier roller mounting bolt, nut | M16 × 2.0 | 29.7± 4.4 | 215 ± 31.8 |
| 16 | | Track roller mounting bolt | M20 × 2.5 | 54.7 ± 5.0 | 396 ± 36.2 |
| 17 | | Track tension cylinder mounting bolt | M16 × 2.0 | 29.7 ± 4.5 | 215 ± 32.5 |
| 18 | | Track shoe mounting bolt, nut | M20 × 1.5 | 78 ± 8.0 | 564 ± 57.9 |
| 19 | | Track guard mounting bolt | M20 × 2.5 | 57.9 ± 8.7 | 419 ± 62.9 |
| 20 | Others | Counterweight mounting bolt | M36 × 3.0 | 308 ± 46 | 2228 ± 333 |
| 21 | | Cab mounting bolt | M12 × 1.75 | 12.8 ± 3.0 | 92.6 ± 21.7 |
| 22 | | Operator's seat mounting bolt | M 8 × 1.25 | 4.05 ± 0.8 | 29.3 ± 5.8 |

※ For tightening torque of engine and hydraulic components, see engine maintenance guide and service manual.

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## 3. ERROR CODES TABLE

| Error code No. | Description |
|---|---|
| 1 | Short circuit in accel actuator system |
| 2 | Potentiometer circuit is shorted to Vcc(5V) or battery + |
| 3 | Short circuit in pump EPPR valve system |
| 4 | Short circuit in boom down EPPR valve system |
| 5 | Short circuit in travel speed solenoid system |
| 6 | Short circuit in power boost solenoid system |
| 7 | Short circuit in max flow solenoid system |
| 10 | Short circuit in hour-meter system |
| 11 | Accel dial circuit is shorted to Vcc(5V) or battery + |
| 12 | P1 pressure sensor circuit is shorted to power supply(24V) line |
| 13 | P2 pressure sensor circuit is shorted to power supply(24V) line |
| 14 | P3 pressure sensor circuit is shorted to power supply(24) line |
| 15 | Boom down pressure circuit is shorted to power supply(24V) line |
| 16 | Accel actuator circuit is open or shorted to ground |
| 17 | Potentiometer circuit is open or shorted to ground |
| 18 | Pump EPPR valve circuit is open or shorted to ground |
| 19 | Boom down EPPR valve circuit is open or shorted to ground |
| 20 | Travel speed solenoid circuit is open or shorted to ground |
| 21 | Power boost solenoid circuit is open or shorted to ground |
| 22 | Max flow solenoid circuit is open or shorted to ground |
| 25 | Hour-meter circuit is open or shorted to ground |
| 26 | Accel dial circuit is open or shorted to ground |
| 27 | P1 pressure sensor circuit is open or shorted to ground |
| 28 | P2 pressure sensor circuit is open or shorted to ground |
| 29 | P3 pressure sensor circuit is open or shorted to ground |
| 30 | Boom down pressure sensor circuit is open or shorted to ground |
| 31 | Engine preheater circuit is open or shorted to ground |
| 32 | Travel alarm buzzer circuit is open or shorted to ground |
| 33 | Alternator circuit is open or shorted to ground |
| 34 | Controller input voltage is below 18V |
| 35 | Controller input voltage is over 38V |
| 36 | Communication error with cluster |
| 37 | Engine speed sensor circuit is open or shorted to ground |
| 38 | Anti-restart relay circuit is open or shorted to ground |
| 39 | Accel actuator does not stop at a target position |
| 40 | There is more than 500rpm difference between target speed and actual speed |

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## 4. TROUBLESHOOTING

### 1) GENERAL COMMENTS

(1) When any abnormal phenomenon is noticed, investigate whether it is a failure of the control valve itself or a problem in the pump proper, pilot pump or circuit.
For this purpose, the pilot pressure, pump discharge pressure, load pressure, etc. should be measured.
Additionally, even when partial disassembly and checking is carried out, follow the previously mentioned disassembly and assembly procedures.

(2) Since dust is very harmful to hydraulic components, pay full attention to dust prevention.
Even for partial disassembly dust prevention measures should be carried out.

(3) Handle movable parts carefully. Even for a small damage, correction using an oilstone should be carried out.

(4) Carefully carry out your investigation, paying due attention not to damage the sealing faces of O-rings. Such damage will cause both internal and external oil leakage.

### 2) TROUBLESHOOTING

| Phenomenon | Possible cause | Remedy |
|---|---|---|
| Machine cannot travel or swing or functions poorly at low speed(Insufficient force) or generally responds slowly. | · Main relief valve malfunctions. | · Measure pressure of main relief valve. |
| | - Dirt is jammed between main plunger and seat. | - Disassemble valve and clean parts. Replace assembly, if damaged severely. |
| | - Dirt is jammed between poppet and seat. | - Same as above. |
| | - Main plunger is stuck. | - Correct stuck section with oilstone. |
| | - Spring is broken or fatigued. | - Remove spring. |
| | - Restriction in main plunger is clogged. | - Remove dirt. |
| | - Adjusting screw is loose. | - Readjust it and tighten locknut to specified torque. |
| | · Orifice just before control valve in pilot line is clogged. | · Remove dirt. |
| Cylinder falls significantly under its own weight when the spool is in neutral. | · Clearance between spool and casing is excessive. | · Replace spool. |
| | · Spool does not return to correct neutral position. | · Measure secondary pilot pressure. |
| | - Dirt is jammed between casing and spool, or casing and spool are stuck together. | - Disassemble valve and clean parts. Correct stuck section with oilstone. |
| | - Spring is broken or fatigued. | - Replace spring. |
| | - Pilot line is clogged with dirt. | - Remove dirt. |
| | · Main relief valve malfunctions. | · Measure pressure of main relief valve. |
| | · Port relief valve malfunctions. | · Measure pressure of main relief valve. |
| | · Lock valve assembly malfunctions. | · Replace lock valve assembly. |
| | · Lockvalve poppet malfunctions | |
| | - Dirt is jammed between poppet and casing. | - Disassemble poppet and clean parts |
| | - Poppet is stuck. | - Correct stuck section with oilstone. |
| | - Spring is broken or fatigued. | - Replace spring. |

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Millimeters to inches

1mm = 0.03937in

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 0.039 | 0.079 | 0.118 | 0.157 | 0.197 | 0.236 | 0.276 | 0.315 | 0.354 |
| 10 | 0.394 | 0.433 | 0.472 | 0.512 | 0.551 | 0.591 | 0.630 | 0.669 | 0.709 | 0.748 |
| 20 | 0.787 | 0.827 | 0.866 | 0.906 | 0.945 | 0.984 | 1.024 | 1.063 | 1.102 | 1.142 |
| 30 | 1.181 | 1.220 | 1.260 | 1.299 | 1.339 | 1.378 | 1.417 | 1.457 | 1.496 | 1.536 |
| 40 | 1.575 | 1.614 | 1.654 | 1.693 | 1.732 | 1.772 | 1.811 | 1.850 | 1.890 | 1.929 |
| 50 | 1.969 | 2.008 | 2.047 | 2.087 | 2.126 | 2.165 | 2.205 | 2.244 | 2.283 | 2.323 |
| 60 | 2.362 | 2.402 | 2.441 | 2.480 | 2.520 | 2.559 | 2.598 | 2.638 | 2.677 | 2.717 |
| 70 | 2.756 | 2.795 | 2.835 | 2.874 | 2.913 | 2.953 | 2.992 | 3.032 | 3.071 | 3.110 |
| 80 | 3.150 | 3.189 | 3.228 | 3.268 | 3.307 | 3.346 | 3.386 | 3.425 | 3.465 | 3.504 |
| 90 | 3.543 | 3.583 | 3.622 | 3.661 | 3.701 | 3.740 | 3.780 | 3.819 | 3.858 | 3.898 |

Kilogram to Pound

1kg = 2.2046lb

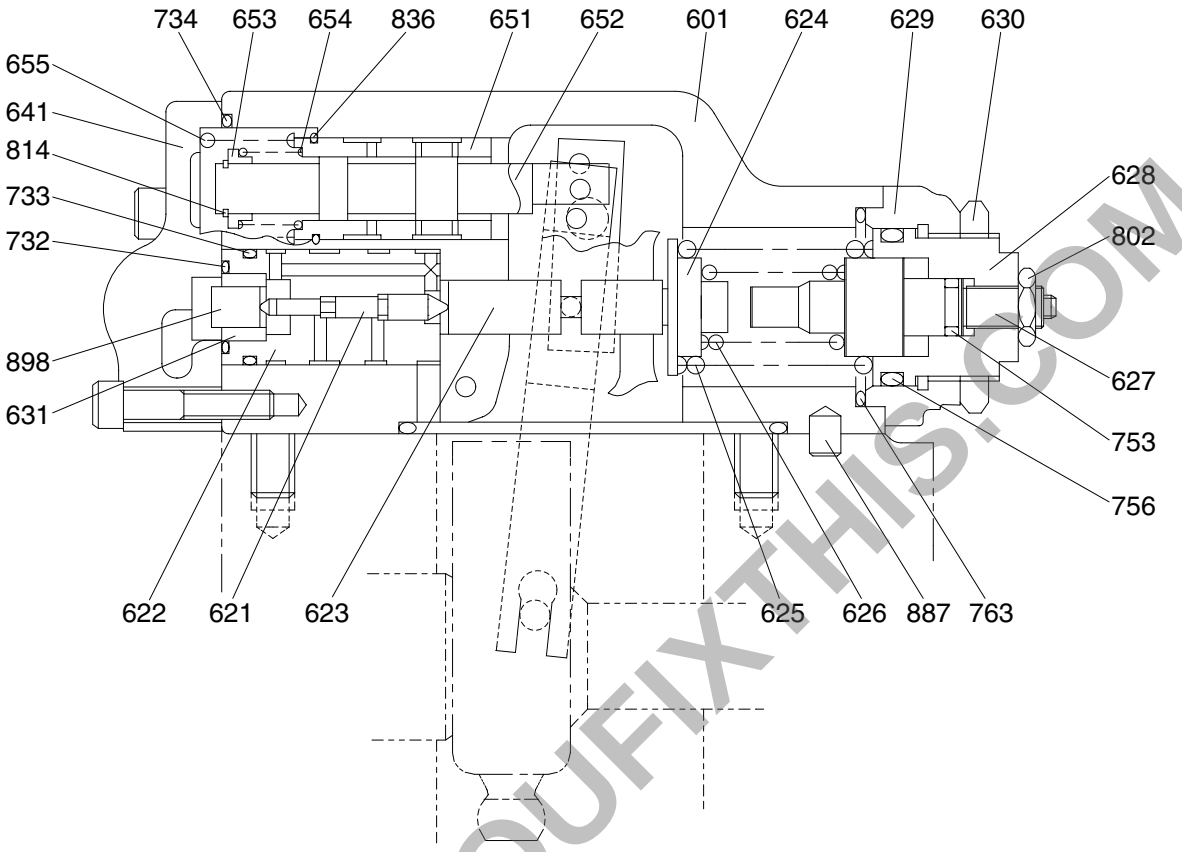
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 2.20 | 4.41 | 6.61 | 8.82 | 11.02 | 13.23 | 15.43 | 17.64 | 19.84 |
| 10 | 22.05 | 24.25 | 26.46 | 28.66 | 30.86 | 33.07 | 35.27 | 37.48 | 39.68 | 41.89 |
| 20 | 44.09 | 46.30 | 48.50 | 50.71 | 51.91 | 55.12 | 57.32 | 59.5. | 61.73 | 63.93 |
| 30 | 66.14 | 68.34 | 70.55 | 72.75 | 74.96 | 77.16 | 79.37 | 81.57 | 83.78 | 85.98 |
| 40 | 88.18 | 90.39 | 92.59 | 94.80 | 97.00 | 99.21 | 101.41 | 103.62 | 105.82 | 108.03 |
| 50 | 110.23 | 112.44 | 114.64 | 116.85 | 119.05 | 121.25 | 123.46 | 125.66 | 127.87 | 130.07 |
| 60 | 132.28 | 134.48 | 136.69 | 138.89 | 141.10 | 143.30 | 145.51 | 147.71 | 149.91 | 152.12 |
| 70 | 154.32 | 156.53 | 158.73 | 160.94 | 163.14 | 165.35 | 167.55 | 169.76 | 171.96 | 174.17 |
| 80 | 176.37 | 178.57 | 180.78 | 182.98 | 185.19 | 187.39 | 189.60 | 191.80 | 194.01 | 196.21 |
| 90 | 198.42 | 200.62 | 202.83 | 205.03 | 207.24 | 209.44 | 211.64 | 213.85 | 216.05 | 218.26 |

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## REGULATOR(2/2)




SECTION A-A

210N7A2RG02A

| | | | | | |
|---|---|---|---|---|---|
| 412 | Hexagon socket screw | 631 | Sleeve, pf | 730 | O-ring |
| 413 | Hexagon socket screw | 641 | Pilot cover | 732 | O-ring |
| 436 | Hexagon socket screw | 642 | Adjust screw(QMC) | 733 | O-ring |
| 438 | Hexagon socket screw | 643 | Pilot piston | 734 | O-ring |
| 496 | Plug | 644 | Spring seat(Q) | 735 | O-ring |
| 601 | Casing | 645 | Adjust stem(Q) | 753 | O-ring |
| 611 | Feed back lever | 646 | Pilot spring | 755 | O-ring |
| 612 | Lever(1) | 647 | Stopper | 756 | O-ring |
| 613 | Lever(2) | 648 | Piston(QMC) | 763 | O-ring |
| 614 | Center plug | 651 | Sleeve | 801 | Nut |
| 615 | Adjust plug | 652 | Spool | 802 | Nut |
| 621 | Compensator piston | 653 | Spring seat | 814 | Snap ring |
| 622 | Piston case | 654 | Return spring | 836 | Snap ring |
| 623 | Compensator rod | 655 | Set spring | 858 | Snap ring |
| 624 | Spring seat(C) | 656 | Block cover | 874 | Pin |
| 625 | Outer spring | 708 | O-ring | 875 | Pin |
| 626 | Inner spring | 722 | O-ring | 876 | Pin |
| 627 | Adjust stem(C) | 723 | O-ring | 887 | Pin |
| 628 | Adjust screw(C) | 724 | O-ring | 897 | Pin |
| 629 | Cover(C) | 725 | O-ring | 898 | Pin |
| 630 | Lock nut | 728 | O-ring | 924 | Set screw |

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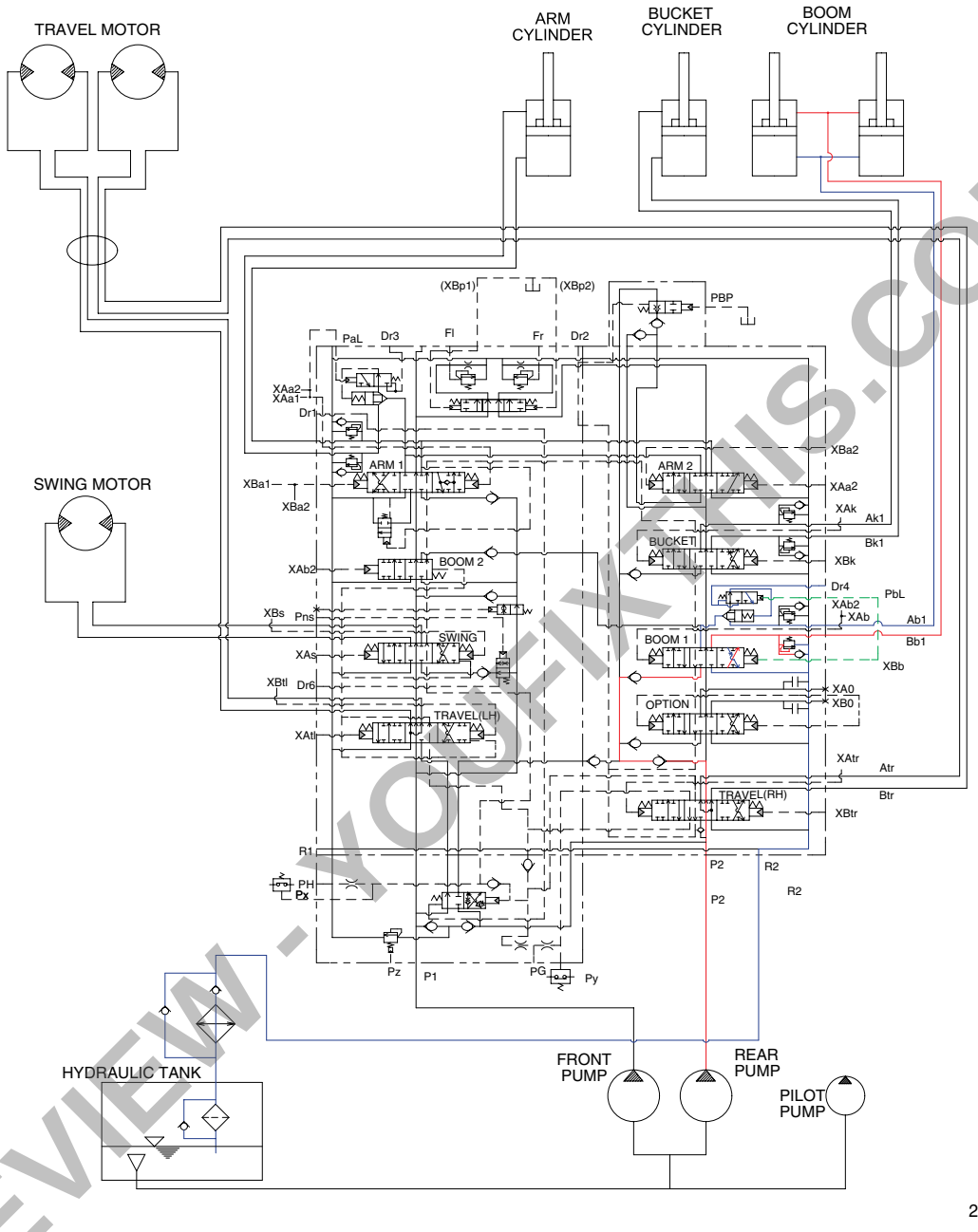
| Phenomenon | Possible cause | Remedy |
|---|---|---|
| Machine cannot travel or swing or functions poorly at low speed(Insufficient force) or generally responds slowly. | · Main relief valve malfunctions.<br>- Dirt is jammed between main plunger and seat.<br>- Dirt is jammed between poppet and seat.<br>- Main plunger is stuck.<br>- Spring is broken or fatigued.<br>- Restriction in main plunger is clogged.<br>- Adjusting screw is loose.<br>· Orifice just before control valve in pilot line is clogged. | · Measure pressure of main relief valve.<br>- Disassemble valve and clean parts. Replace assembly, if damaged severely.<br>- Same as above.<br>- Correct stuck section with oilstone.<br>- Remove spring.<br>- Remove dirt.<br>- Readjust it and tighten locknut to specified torque.<br>· Remove dirt. |
| Cylinder falls significantly under its own weight when the spool is in neutral. | · Clearance between spool and casing is excessive.<br>· Spool does not return to correct neutral position.<br>- Dirt is jammed between casing and spool, or casing and spool are stuck together.<br>- Spring is broken or fatigued.<br>- Pilot line is clogged with dirt.<br>· Main relief valve malfunctions.<br>· Port relief valve malfunctions.<br>· Lock valve assembly malfunctions.<br>· Lockvalve poppet malfunctions<br>- Dirt is jammed between poppet and casing.<br>- Poppet is stuck.<br>- Spring is broken or fatigued. | · Replace spool.<br>· Measure secondary pilot pressure.<br>- Disassemble valve and clean parts. Correct stuck section with oilstone.<br>- Replace spring.<br>- Remove dirt.<br>· Measure pressure of main relief valve.<br>· Measure pressure of main relief valve.<br>· Replace lock valve assembly.<br>- Disassemble poppet and clean parts<br>- Correct stuck section with oilstone.<br>- Replace spring. |

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## 2. BOOM DOWN OPERATION




21073HS10

When the right control lever is pushed forward, the boom spools in the main control valve are moved to the down position by the pilot oil pressure from the remote control valve.

The oil from the rear pump flows into the main control valve and then goes to the small chamber of boom cylinders. At the same time, the oil from the large chamber of boom cylinders returns to the hydraulic tank through the boom spool in the main control valve.

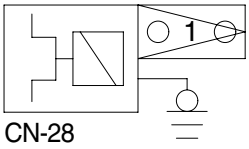
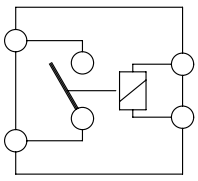
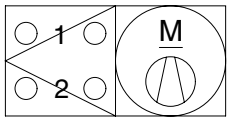
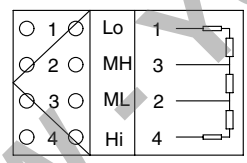
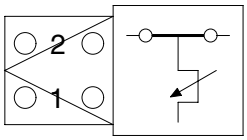
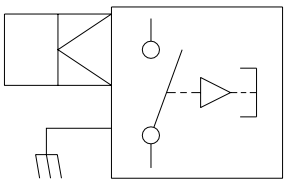
When the down speed of boom is faster, the oil returned from the large chamber of boom cylinder combines with the oil from the rear pump, and flows into the small chamber of the cylinder.

This prevents cylinder cavitation by the negative pressure when the rear pump flow can not match the boom down speed. And the excessive pressure in the boom cylinder rod end circuit is prevented by the relief valve.

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| Part name | Symbol | Specifications | Check |
|---|---|---|---|
| Aircon compressor |  CN-28 | 24V 79W | ※Check contact<br>Normal : 13.4 Ω |
| Start relay |  CR-23 | 24V 300A | ※Check contact<br>Normal : 0.94 Ω (For terminal 1-2) |
| Blower motor |  | 24V 9.5A | ※Check resistance<br>Normal : 2.5 Ω (For terminal 1-2) |
| Aircon resistor |  | - | ※Check resistance<br>Normal : 1.12 Ω (For terminal 4-2)<br>2.07 Ω (For terminal 2-3)<br>3.17 Ω (For terminal 3-1) |
| Duct sensor |  | 1℃ OFF<br>4℃ ON | ※Check resistance<br>Normal : 0 Ω (For terminal 1-2),<br>the atmosphere temp :<br>Over 4℃ |
| Door switch |  CS-1 | 24V 2W | ※Check resistance<br>Normal : About 5M Ω |

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| Fault code No. | Reason | Effect (only when fault code is active) |
|---|---|---|
| 585 | Starter relay driver circuit - Voltage below normal, or shorted to low source. Low voltage detected at starter lockout circuit. | Engine power derate. The ECU uses an estimated turbocharger speed. |
| 595 | Turbocharger 1 speed - Data valid but above normal operational range - Moderately severe level. High turbocharger speed has been detected. | Amber lamp will light until high battery voltage condition is corrected. |
| 599 | Auxiliary commanded dual output shutdown - Special instructions. | None or possible engine noise associated with higher injection pressures (especially at idle or light load). Engine power is reduced. |
| 687 | Turbocharger 1 speed - Data valid but below normal operational range - Moderately severe level. Low turbocharger speed detected by the ECU. | Engine can run rough. Possibly poor starting capability. Engine runs using backup speed sensor. Engine power is reduced. |
| 689 | Engine crankshaft speed/position - Data erratic, intermittent, or incorrect. Loss of signal from crankshaft sensor. | Engine power derate. |
| 691 | Turbocharger 1 compressor inlet temperature circuit - Voltage above normal, or shorted to high source. High signal voltage detected at turbocharger compressor inlet air temperature circuit. | Engine power derate. |
| 692 | Turbocharger 1 compressor inlet temperature circuit - Voltage below normal, or shorted to low source. Low signal voltage detected at turbocharger compressor inlet air tempera | Engine will run derated. Excessive black smoke, hard start, and rough idle possible. |
| 731 | Engine speed / position camshaft and crankshaft misalignment - Mechanical system not responding properly or out of adjustment. mechanical misalignment between the crankshaft and camshaft engine speed sensors. | Possible no noticeable performance effects, engine dying, or hard starting. |
| 757 | Electronic control module data lost - Condition exists. Severe loss of data from the ECU. | Possible poor starting. Engine power derate. |
| 778 | Engine camshaft speed / position sensor - Data erratic, intermittent, or incorrect. The ECU has detected an error in the camshaft position sensor signal. | Possible engine power derate. |
| 779 | Auxiliary equipment sensor input 3 - Root cause not known. | Possible no noticeable performance effects or engine dying or hard starting. Fault information, trip information, and maintenance monitor data may be inaccurate. |
| 1117 | Power supply lost with ignition on - Data erratic, intermittent, or incorrect. Supply voltage to the ECU fell below 6.2 volts momentarily, or the ECU was not allowed to power down correctly (retain battery voltage for 30 seconds after key OFF). | Engine will shut down. |
| 1633 | OEM datalink cannot transmit - Data erratic, intermittent, or incorrect. Communications within the OEM datalink network is intermittent. | Engine will only idle. |
| 2185 | Sensor supply 4 circuit - Voltage above normal, or shorted to high source. High voltage detected at +5 volt sensor supply circuit to the accelerator pedal position sensor. | Engine will only idle. |

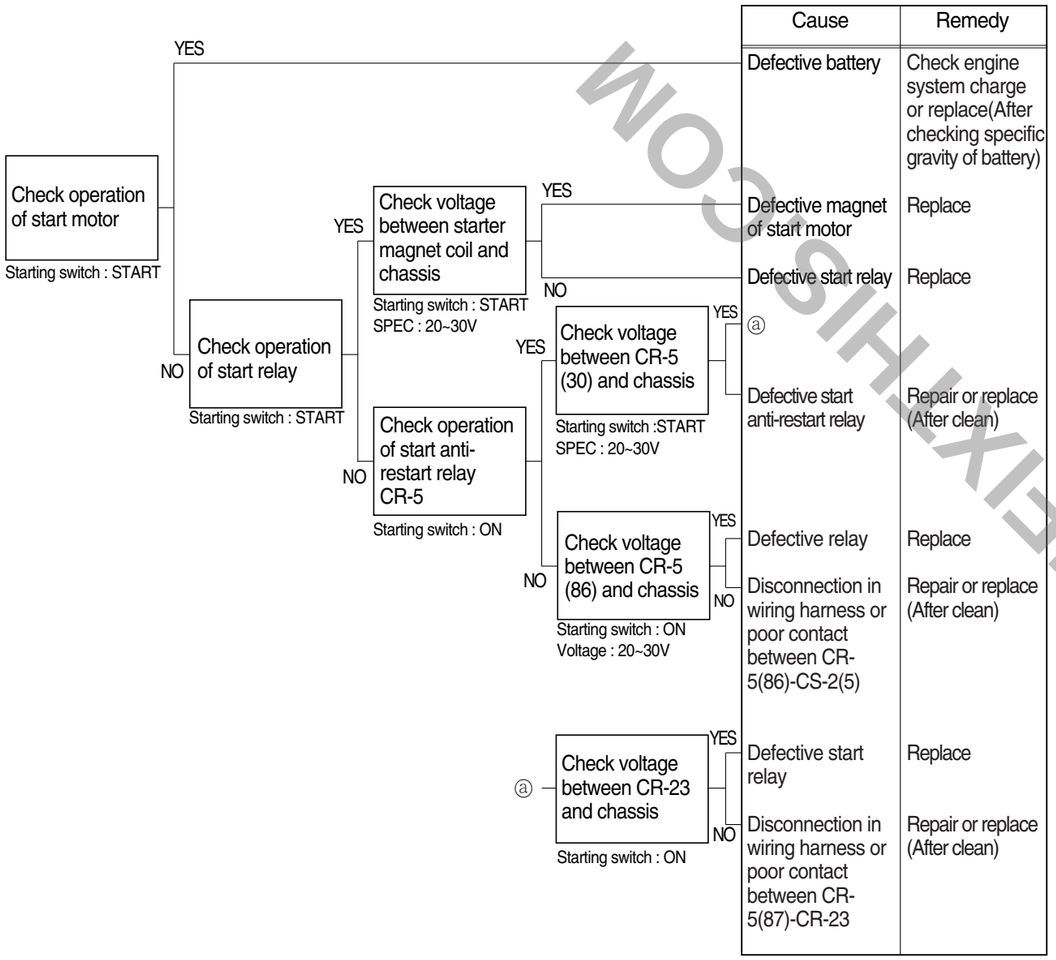
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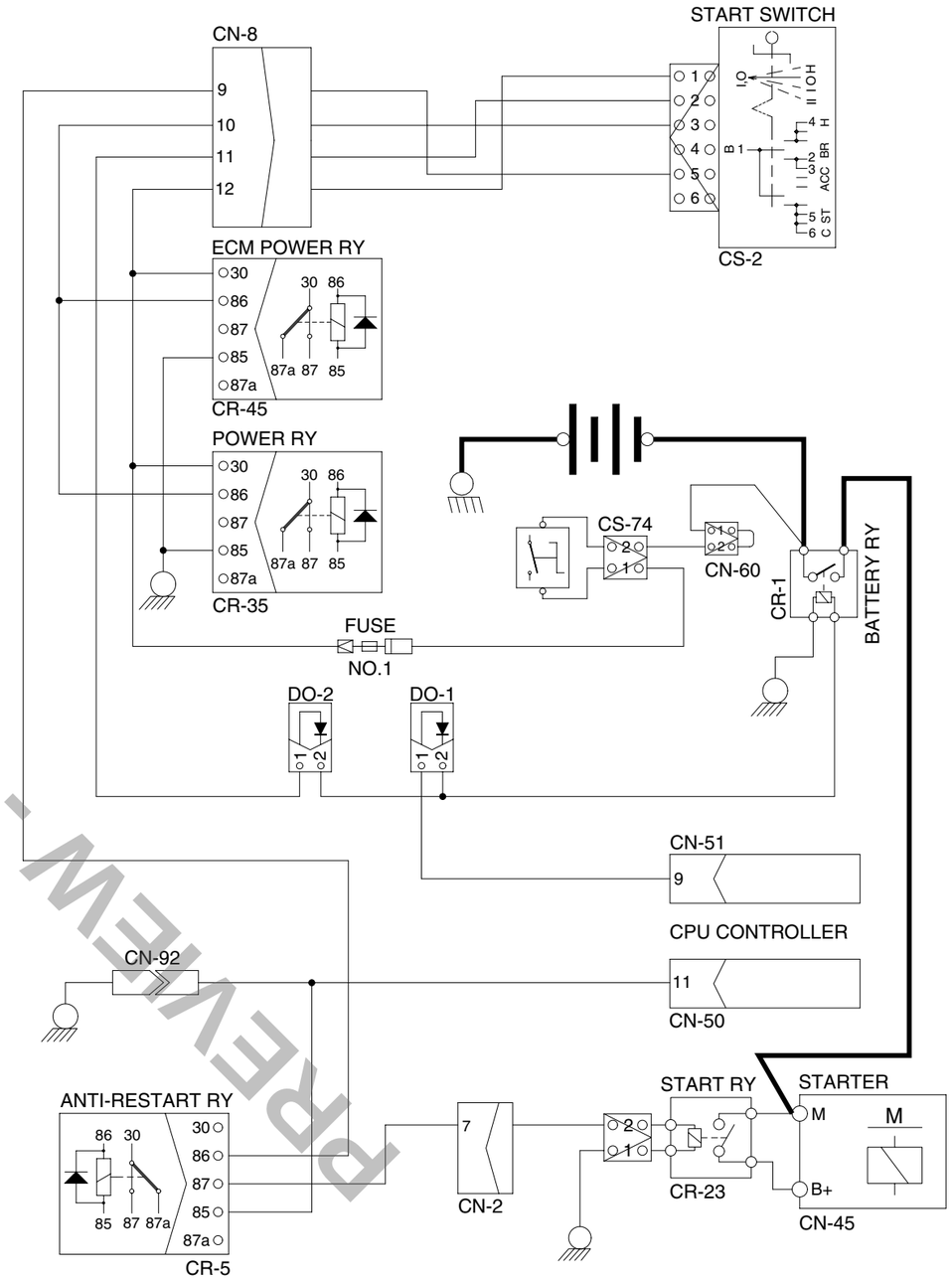
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## 12. WHEN ENGINE DOES NOT START

- Before disconnecting the connector, always turn the starting switch OFF.
- Before carrying out below procedure, check all the related connectors are properly inserted.
- After checking, insert the disconnected connectors again immediately unless otherwise specified.




| Cause | Remedy |
|---|---|
| Defective battery | Check engine system charge or replace(After checking specific gravity of battery) |
| Defective magnet of start motor | Replace |
| Defective start relay | Replace |
| ⓐ | |
| Defective start anti-restart relay | Repair or replace (After clean) |
| Defective relay | Replace |
| Disconnection in wiring harness or poor contact between CR-5(86)-CS-2(5) | Repair or replace (After clean) |
| Defective start relay | Replace |
| Disconnection in wiring harness or poor contact between CR-5(87)-CR-23 | Repair or replace (After clean) |




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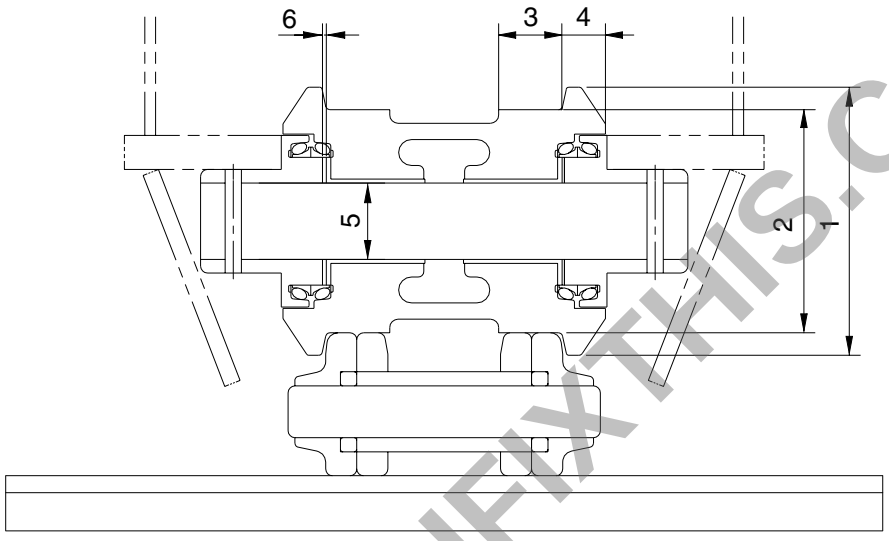
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# GROUP 3 TRACK AND WORK EQUIPMENT

## 1. TRACK

### 1) TRACK ROLLER




210N77MS17

Unit : mm

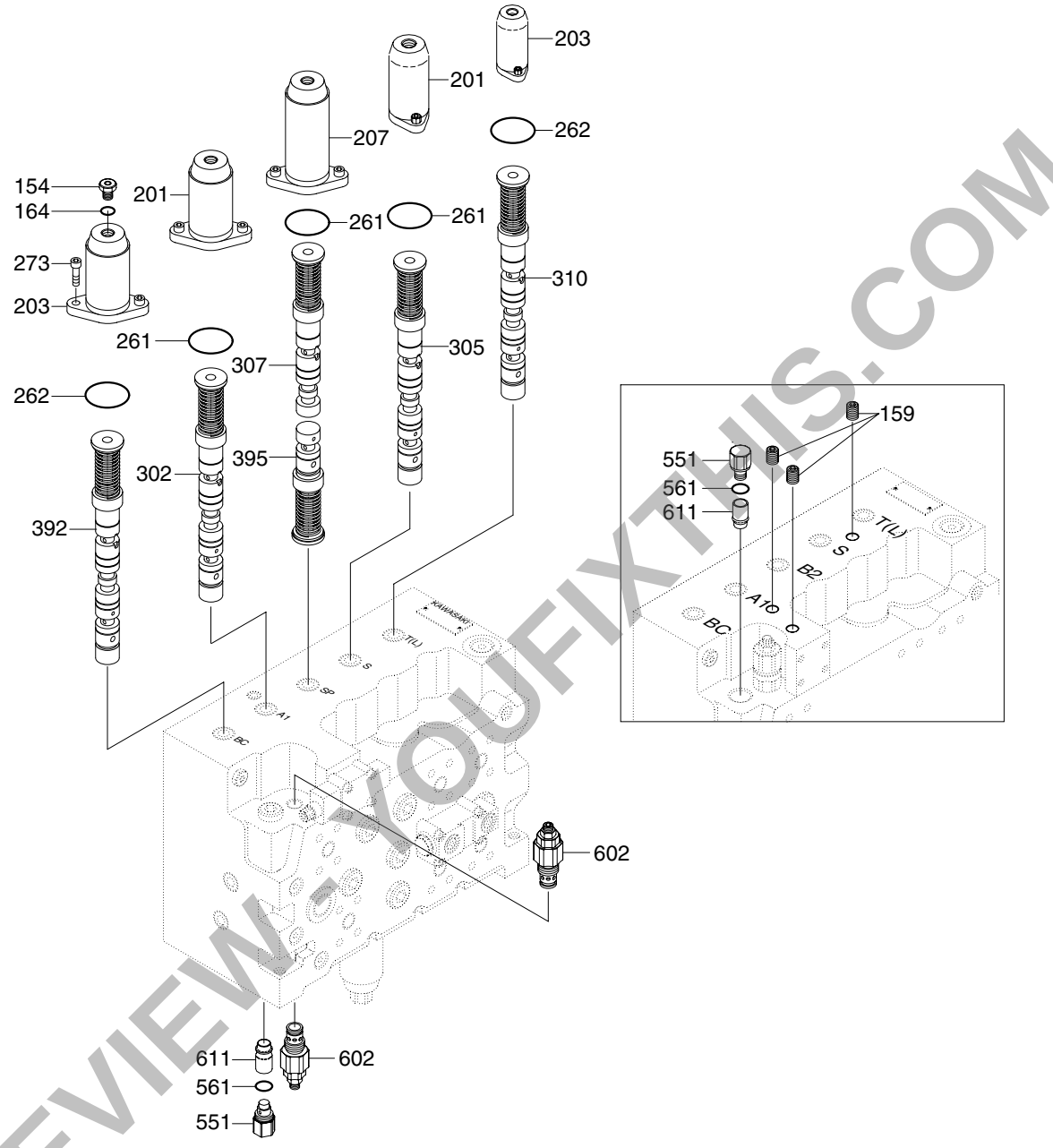
| No. | Check item | Criteria | | | | Remedy |
|---|---|---|---|---|---|---|
| 1 | Outside diameter of flange | Standard size | | Repair limit | | Rebuild or replace |
| | | ø 200 | | - | | |
| 2 | Outside diameter of tread | ø 160 | | ø 148 | | |
| 3 | Width of tread | 48 | | 54 | | |
| 4 | Width of flange | 21.5 | | - | | |
| 5 | Clearance between shaft and bushing | Standard size & tolerance | | Standard clearance | Clearance limit | Replace bushing |
| | | Shaft | Hole | | | |
| | | ø 70 -0.29 -0.33 | ø 70.1 +0.046 | 0.39 to 0.476 | 2.0 | |
| 6 | Side clearance of roller (Both side) | Standard clearance | | Clearance limit | | Replace |
| | | 0.2 to 1.2 | | 2.0 | | |

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## STRUCTURE(2/5)




| | | | | | |
|---|---|---|---|---|---|
| 154 | Plug | 262 | O-ring | 395 | Spool |
| 159 | Plug | 273 | Socket screw | 551 | Plug |
| 164 | O-ring | 302 | Arm1 spool | 561 | O-ring |
| 201 | Cover | 305 | Swing spool | 602 | Port relief valve |
| 203 | Cover | 307 | Boom2 spool | 611 | Nega con relief valve |
| 207 | Cover | 310 | Travel spool | | |
| 261 | O-ring | 392 | Bypass cut spool | | |

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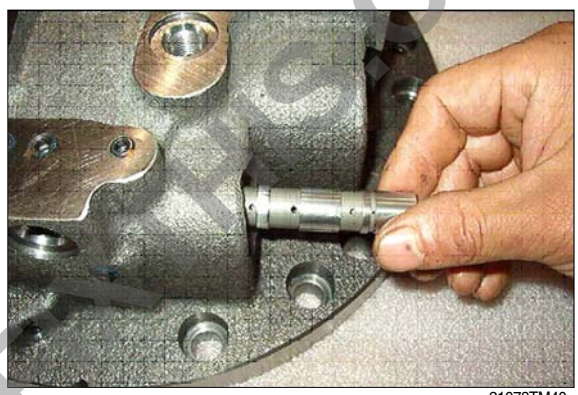


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13) Disassemble spool(59), spool(47), O-ring (51), guide(48) and snap ring(53) on rear cover, respectively.

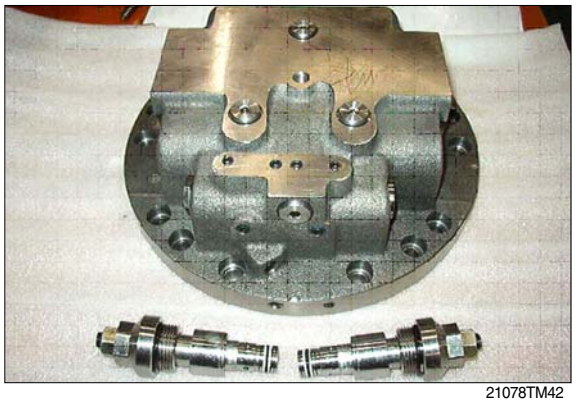


21078TM40



21078TM41

14) Using a torque wrench, disassemble relief assembly(46) on rear cover.



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## 1. REMOVAL AND INSTALL

### 1) BUCKET CYLINDER

#### (1) Removal

※ Expand the arm and bucket fully, lower the work equipment to the ground and stop the engine.

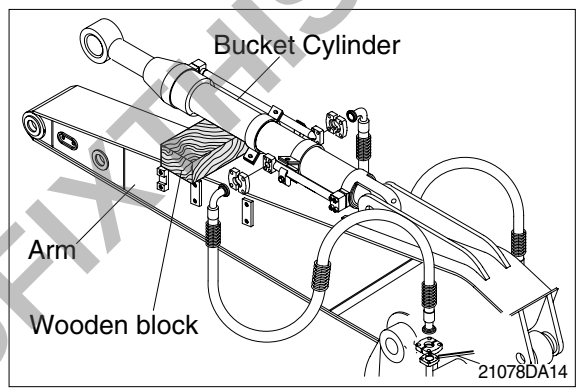
※ Operate the control levers and pedals several times to release the remaining pressure in the hydraulic piping.

⚠ Loosen the breather slowly to release the pressure inside the hydraulic tank.

※ Escaping fluid under pressure can penetrate the skin causing serious injury. Fit blind plugs in the hoses after disconnecting them, to prevent dirt or dust from entering.

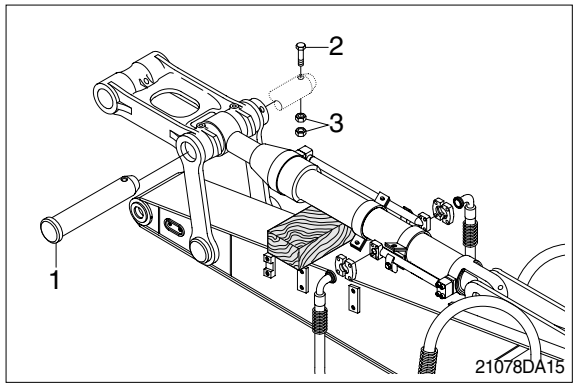



① Set block between bucket cylinder and arm.

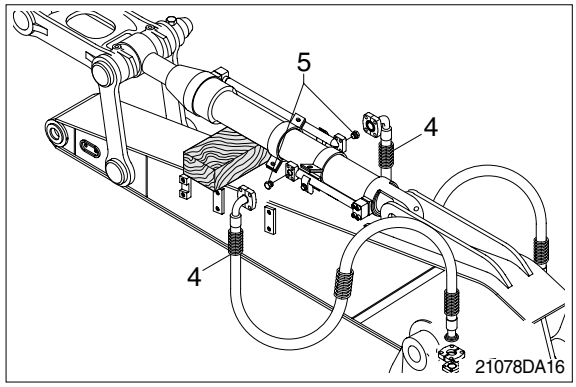



② Remove bolt(2), nut(3) and pull out pin (1).

※ Tie the rod with wire to prevent it from coming out.




③ Disconnect bucket cylinder hoses(4) and put plugs(5) on cylinder pipe.




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