# SERVICE MANUAL

## E37C

Mini Excavator

**Part number 48127448**
English
May 2017

NEW HOLLAND CONSTRUCTION

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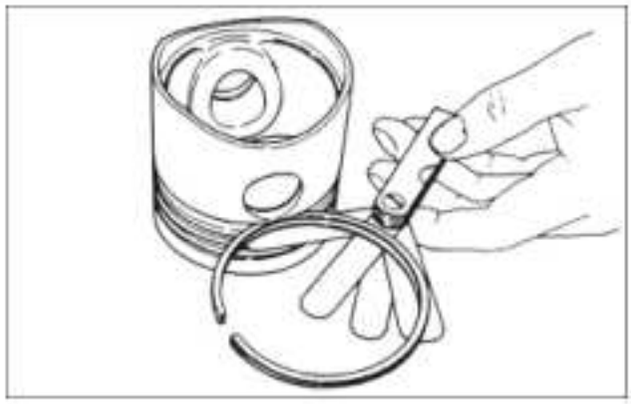
8. Using a micrometer, measure the thickness of each piston ring. Refer to **Piston - Service limits (10.105)** for specifications. Record the measurements.

***NOTE:*** *on an engine with low hours, the pistons, piston rings and cylinders may be reused if they are found to be within specifications.*
*On an engine with high hours, the pistons rings should be replaced and the cylinder honed (refer to* ***Crankcase - Inspect (10.001)****) or replaced. The piston should be replaced as necessary.*

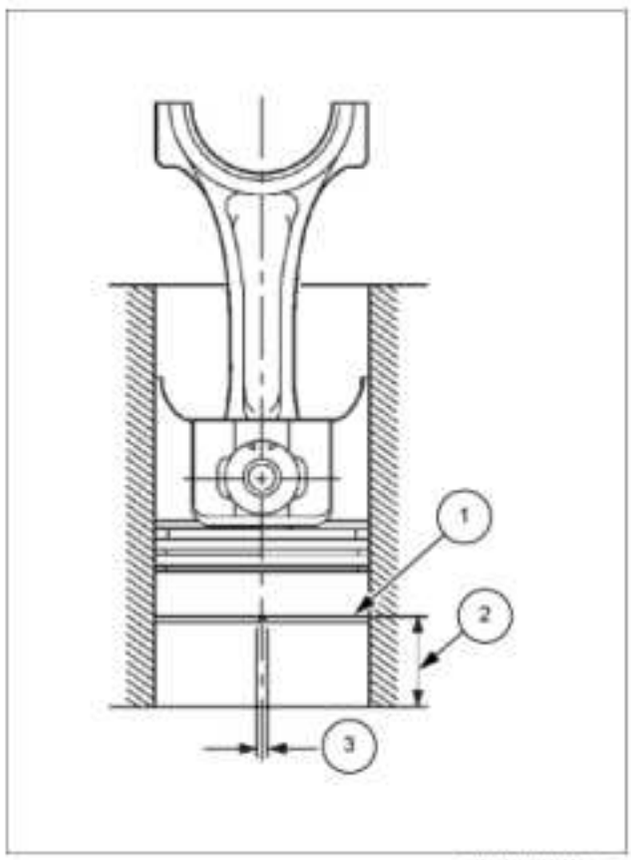
9. Place each compression piston ring in the groove as shown. Use a feeler gauge to measure the clearance between the piston ring and the piston ring land. Record the measurements. Refer to **Piston - Service limits (10.105)** for specifications. Replace the piston if not within specification.

10. To measure piston ring end gap, insert each compression piston ring **(1)**, one at a time, into the cylinder. Use a piston with the piston rings removed to slide the ring into the cylinder bore until it is approximately **30 mm (1.18 in) (2)** from the bottom of the bore. Remove the piston. Measure the end gap **(3)** of each piston ring. Record the measurements. Refer to **Piston - Service limits (10.105)** for specifications.

***NOTE:*** *always check the piston ring end gap when installing new piston rings. Refer to* ***Piston - Service limits (10.105)****ol to adjust the piston ring end gap on new piston rings.*



SML18MEX0427AA 4




SML18MEX0428BB 5

11. Repeat the above steps for each cylinder and piston assembly.



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# Wiring harnesses - Electrical schematic sheet 01 - Legend

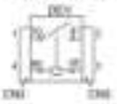
## Schematic symbols



Inline connector

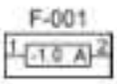

Ground

GND100

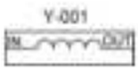

Device connector



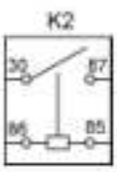
Ring terminal



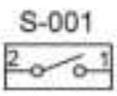
Fuse



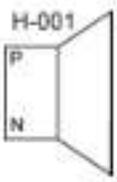
Solenoid



Relay



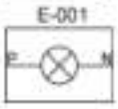
Switch



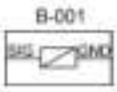
Speaker



Resistor



Lamp



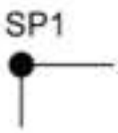
Sensor



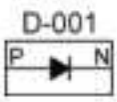
Receptacle connector



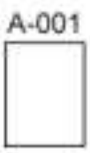
Plug connector



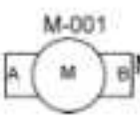
Splice



Diode



Module



Motor



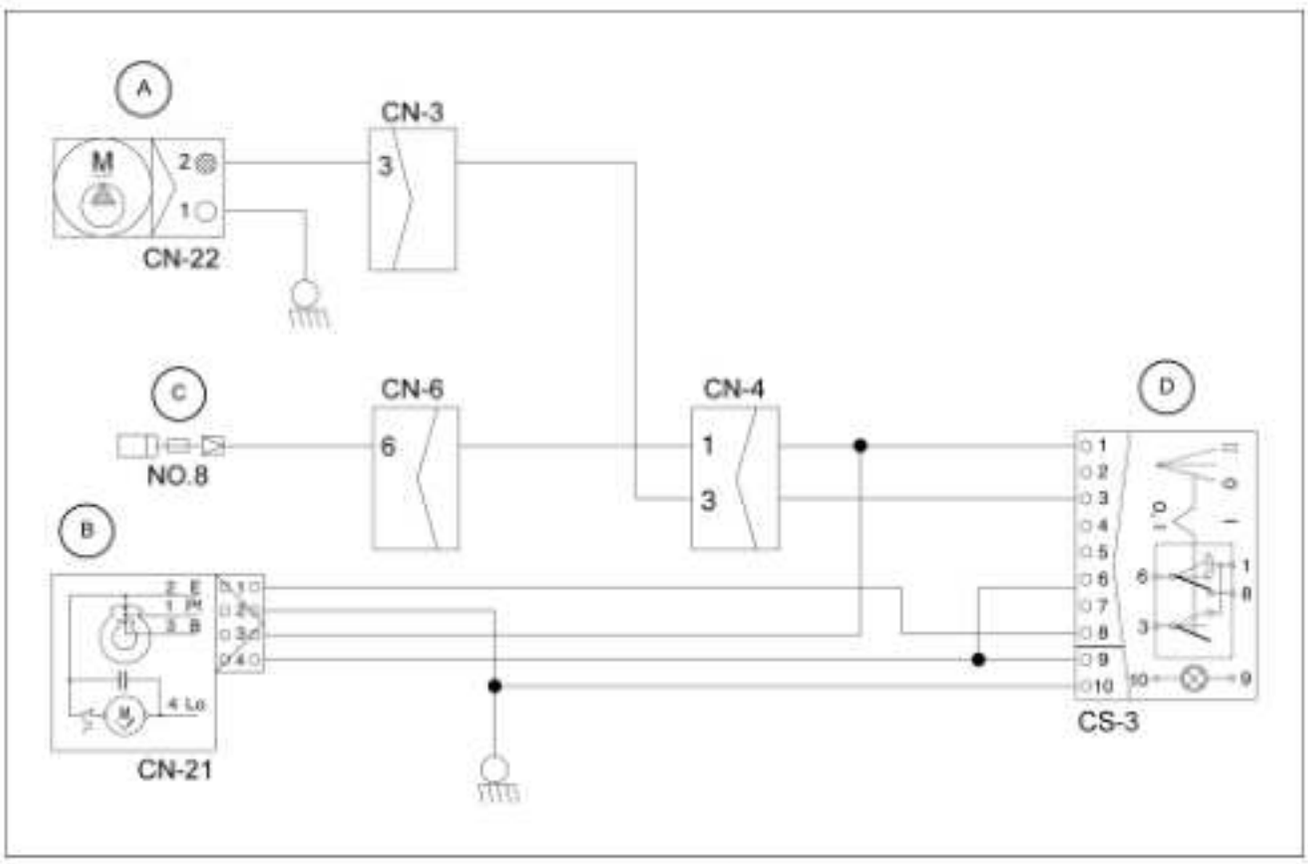
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# Windshield wiper motor - Service instruction - Troubleshooting

| | |
|---|---|
| E37C Cab - Tier IV final engine | NA |

## Wiper motor malfunction

- Before disconnecting the connector, always turn OFF the starter switch.
- Before carrying out below procedure, check all the related connectors are properly inserted and short fuse No. 8 is not blown out.
- After checking, insert the disconnected connectors again immediately unless otherwise specified.




SMIL17MEX1104FB 1

A. Washer pump
B. Wiper motor
C. Fuse
D. Wiper and washer switch

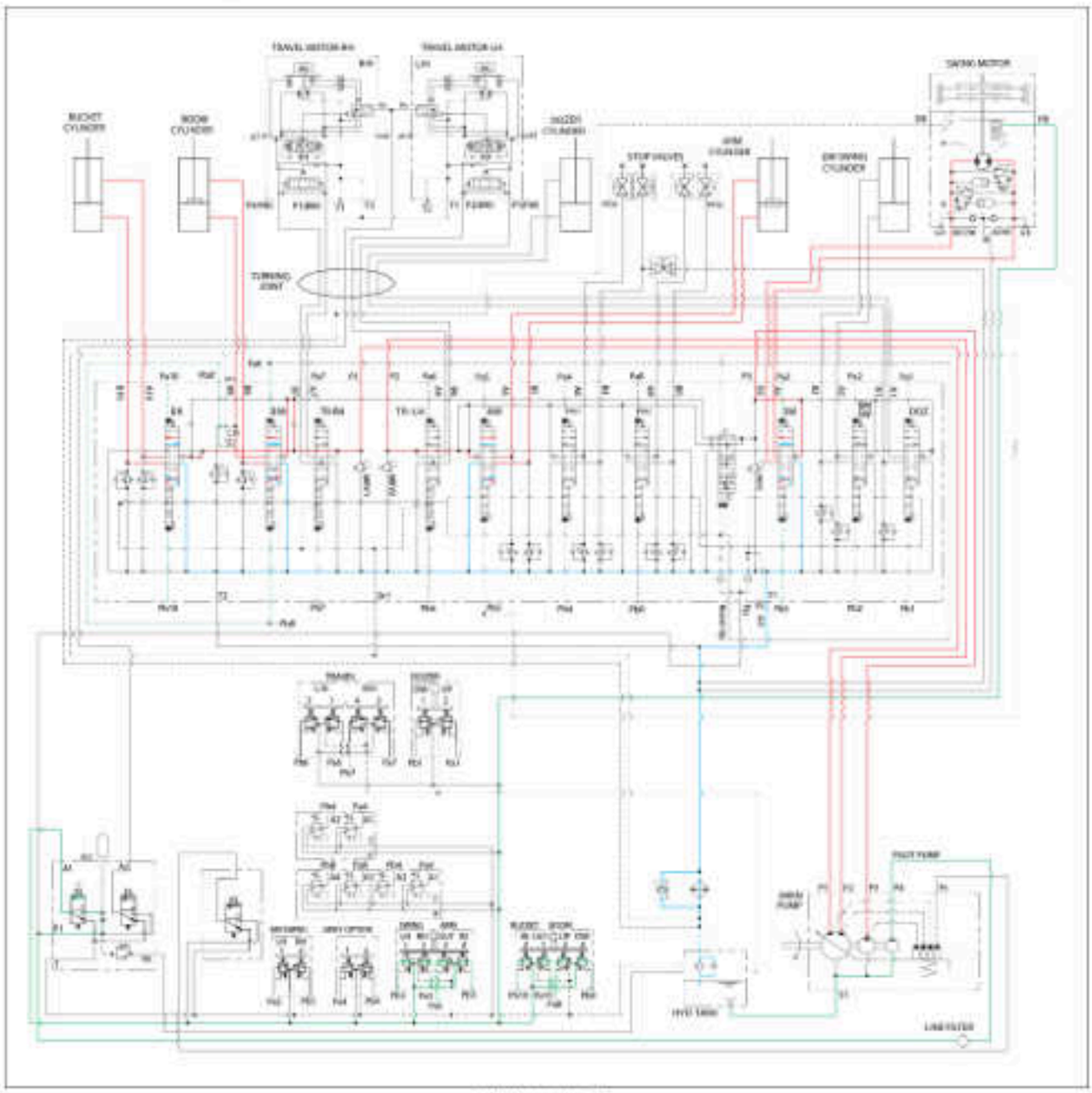
1. Measure the voltage between terminal 1 of the connector **CS-3** the ground.
   A. If the voltage is within **10 – 12.5 V**, proceed to step 2.
   B. If the voltage is not within **10 – 12.5 V**, check the fuse. Replace it.
2. Turn ON the wiper switch.
   Measure the voltage between terminal 6 of the connector **CS-3** and ground.
   A. If the voltage is within **10 – 12.5 V**, proceed to step 3.
   B. If the voltage is not within **10 – 12.5 V**, the wiper switch is defective. Replace it (refer to **Wiper switches - Replace (55.518)**).
3. Turn ON the starter switch.
   Measure the voltage between terminal 3 of the connector **CN-21** and ground.



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## Combined swing, boom, arm and bucket circuits

When the swing, boom, arm and bucket functions are operated, simultaneously each spool in the main control valve is moved to the functional position by the pilot oil pressure from the remote control valve.
The oil from the P2 pump flows into the arm cylinder through, arm spool.
The oil from the P1 pump flows into the boom cylinders and bucket cylinder through the boom spool, bucket spool.
The oil from the P3 pump flows into the swing motor through the swing spool.
The upper-structure swings and the boom, arm and bucket are operated.



Pressure line

Pilot pressure line

Tank line

Secondary pilot pressure line

Pilot tank line



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| Symptoms and conditions of failures | | Defective start | | | | | Engine stall after start | | | Defective rotation control | | | | | | Insufficient engine output | | | Noise/vibration | | | | Lubricant | | | | Cool-ing wa-ter | | Intake | | Exhaust | | | | Fuel | | | Electrics/electronics | | | | | | Action | Reference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Starter not rotate | | Starter rotates | | | Exhaust fume | | | | Without load | | | | At work | Exhaust color | | | | | | | | | | | | | | At work | | | | | | | | | | | | | | |
| Cause | | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | BB | CC | DD | EE | FF | GG | HH | II | LL | M-M | NN | OO | PP | QQ | | |
| UU | Fuel injection pump with injection timing excessively advanced | | | | | | | | | | | | | | | | | | x | | | x | | | | | | | | | x | x | | | | | | | | | | | Inspection and adjustment | See **Fuel injection system - Adjust (10.218)** |
| | Fuel injection pump with injection timing excessively retarded | | | | | | | | | | | | | | | | x | x | | | | | | | | | | | | | x | x | | x | x | | | | | | | | Inspection and adjustment | See **Fuel injection system - Adjust (10.218)** |
| | Incorrect fuel | | | | | | | | | | | | | | | x | x | x | | x | | | | | | | | | | | x | x | | | | x | x | | | | | | | Usage of correct fuel | |
| | Water entered into fuel system | | | x | x | | | | x | | | | | x | x | | x | | | x | | | | | | | | | | | x | | | | | | | | | | | | Drainage of fuel filter | See **Fuel-water separator filter - Replace (10.206)** |
| | Fuel filter clogged | | | x | | x | x | | | | | x | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Cleaning or replacement | See **Fuel-water separator filter - Replace (10.206)** |
| | Air entered into fuel system | | | x | x | | x | | | | | | | x | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Bleeding | See **Fuel-water separator filter - Replace (10.206)** |
| | Fuel pipe clogged, cracked | | | x | | | x | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Cleaning or replacement | |
| | Insufficient fuel feeding to fuel supply pump | | | x | x | | x | | | | | x | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Check of fuel tank cock, fuel filter, fuel pipe, fuel feed pump | |
| | Uneven injection quantity of fuel injection pump | | | | | | | | | | | | | x | x | | x | x | | x | | x | | | | | | | | | x | x | | x | | | | | | | | | | Inspection and adjustment | See **Fuel injectors - Test (10.218)** |
| | Fuel injection quantity too much | | | | | | | | | | | | | | | | | | | | | | x | | | | x | | | x | | x | x | x | x | | | | | | | | | Inspection and adjustment | See **Fuel injectors - Test (10.218)** |
| | Defective spray of fuel injection nozzle | | | | | | | | | | | | | x | x | | x | x | | x | | x | | | | | | | | | x | x | | x | | | | | | | | | | Inspection and adjustment | See **Fuel injectors - Test (10.218)** |
| | Priming not available | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Valve in priming pump pinched dust (disassembled cleaning) | See **Fuel injection system - Exploded view (10.218)** |
| | Strainer at feed pump inlet clogged | | | | | x | | | | | | x | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | Cleaning of strainer | |
| | Operation defect of CSD valve | | | x | | x | | | | | | | | | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | Replace the pump. Replace the CSD valve. | |
| | Sealing defect of fuel tank | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | x | | | | | | | Check of fuel tank and cap, as well as installation of genuine parts | |
| VV | Air filter clogged | | | | | | | | x | | | x | | | | | x | | | x | | | x | | | | | | x | | | x | | x | | | | | | | | | | Cleaning of air filter | See **Air cleaner - Cleaning (10.202)** |
| | Engine operation at high temperature or high land | | | | | | | | | | | | | | | | x | | | | | | | | | | x | | x | | x | | | | x | | | | | | | | | Consideration of matching output reduction with load | |
| | Exhaust pipe clogged | | | | | | | x | | | | x | | | | | x | | | x | | | | | | | | | | | x | | x | | | | | | | | | | Cleaning of exhaust pipe | |
| W-W | Fuse meltdown, disconnection | x | x | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | x | | Inspection and replacement of fuse. Repair or replacement of harness | For harness inspection method, see **Engine wiring harness - Static description (55.015)** |
| | Starter fault | | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Repair or replacement of starter | See **Engine starter - Remove (55.201)** |
| | Alternator fault | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | Repair or replacement of alternator | See **Alternator - Remove (55.301)** |
| | Wiring disconnection | x | x | x | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | x | x | x | | Repair or replacement of harness disconnection | |
| | Wiring short-circuit (insulator broken), electric power load of added device too big | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | Inspection, repair or replacement of harnesses Review of added devices | |
| | Battery voltage descent | | x | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Inspection and charging of battery | See **Battery - Check (55.302)** |
| | Key switch fault, disconnection | x | | | | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | Repair or replacement of harness Key switch replacement | For harness inspection method, see **Engine wiring harness - Static description (55.015)** |
| | Instantaneous interruption of key switch | | | | x | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Key switch replacement | |
| | Failure, disconnection, short-circuit of starter relay | | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Repair or replacement of harness Replacement of starter relay | For harness inspection method, see **Engine wiring harness - Static description (55.015)** |
| | Main relay fault (Error other than contact sticking that ECU can't detect) | x | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | x | | | | | Repair or replacement of harness Replacement of main relay | For harness inspection method, see **Engine wiring harness - Static description (55.015)** |



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