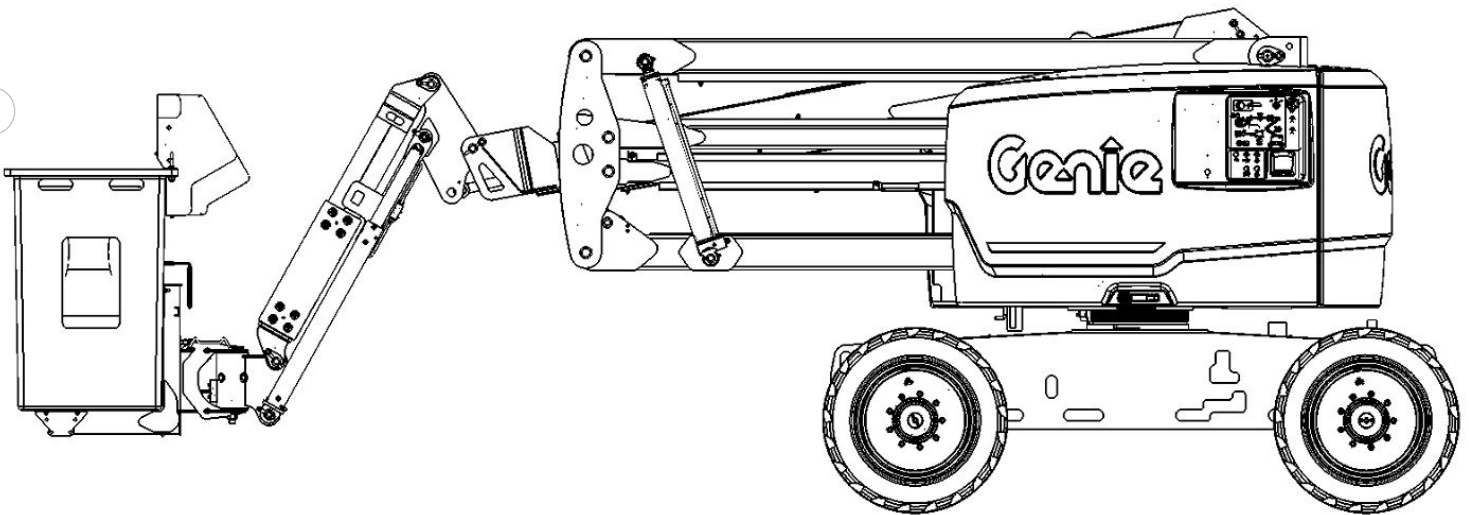




# TECH TIPS

Z45 SUB - DIAGNOSING FAULT CODES

NO. 171



**SERVICE CALL:**  
Z45 SUB - DIAGNOSING FAULT  
CODES



**MODEL(S):**  
Z45 SUB UNITS



**TOOLS NEEDED:**  
NONE

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## **DANGER**

Failure to obey the instructions and safety rules in the appropriate Operator's Manual and Service Manual for your machine will result in death or serious injury.

Many of the hazards identified in the Operator's Manual are also safety hazards when maintenance and repair procedures are performed.

## **DO NOT PERFORM MAINTENANCE UNLESS:**

- ✓ You are trained and qualified to perform maintenance on this machine.
- ✓ You read, understand and obey:
  - manufacturer's instructions and safety rules
  - employer's safety rules and worksite regulations
  - applicable governmental regulations
- ✓ You have the appropriate tools, lifting equipment and a suitable workshop.

The information contained in this Tech Tip is a supplement to the Service Manual. Consult the appropriate Service Manual of your machine for safety rules and hazards.



TECH TIP 171 | RELEASED 12.19.2023 | VERSION 1.0

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## TECH TIP#171

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| *Component ID and Fault Codes*

**STEP 1 - STEP 4**

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**COMPONENT LIST**

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**FAULT CODES**

## STEP 1

If there is a possible issue with a component on the Z45 SUB, a 3-5 digit fault code will display on the screen at the G-CON (lower controls).



## STEP 2

The first 1-3 numbers will reference the component ID. The component range will be 1 thru 263.

## STEP 3

The last 1-2 digits will reference the fault type. The range will be 1 through 31.

## STEP 4

In the following picture, the code shown is 7617.

The Component ID in this code is 76 and the Fault Code is 17.

Referencing the Component List below, 76 is the “Load Platform” or the load cell.

Using the list of fault codes on **Page 12**, fault number 17 shows a fault of: “Not Calibrated”.

Note: Missing numbers in the table indicates that the numbers have not been assigned to a component or fault (spare).



| Component ID | Engineering Reference Component                    |
|--------------|--|
| 1            | CAN Bus (Engine/Drive)                             |
| 4            | Secondary Boom Position Switches                   |
| 5            | Primary Boom Length Switches                       |
| 6            | Keyswitch  |
| 7            | Engine Warning Lamp (Engine DTC generated)         |
| 8            | Engine Stop Lamp (Engine DTC generated)            |
| 9            | Engine Fault                                       |
| 10           | Engine Start Switch (Ground Controls)              |
| 11           | Engine Start Switch (Platform Controls)            |
| 12           | CAN Bus (Machine)                                  |
| 13           | Jib Up/Down Toggle Switch (PCS)                    |
| 14           | Engine Alternator                                  |
| 15           | Foot Switch  |
| 16           | Speed Adjustment Toggle Switch or Dial             |
| 17           | AUX Relay/Pump                                     |
| 18           | Proportional Relief HV                             |
| 19           | AUX Toggle Switch                                  |
| 20           | Primary Boom Extend/Retract Joystick               |
| 21           | Primary Boom Up/Down Joystick                      |
| 22           | Primary Boom Up Valve Coil                         |
| 23           | Primary Boom Down Valve Coil                       |
| 24           | Primary Boom Angle                                 |
| 25           | Cable/Chain Tension                                |
| 26           | Primary Boom Extend Valve Coil                     |
| 27           | Primary Boom Retract Valve Coil                    |
| 28           | Primary Boom Angle Safety                          |
| 29           | LSB2RS/LSB4ES Limit Switch                         |
| 30           | Primary Boom Extend/Retract Toggle Switch          |
| 31           | Secondary Boom Up/Down Joystick                    |
| 32           | Secondary Boom Up Valve Coil                       |
| 33           | Secondary Boom Down Valve Coil                     |
| 34           | Inconsistent Primary Boom Extension Limit Switches |
| 35           | Ground Control Buttons                             |
| 36           | Jib Up Valve Coil                                  |
| 37           | Jib Down Valve Coil                                |
| 38           | Jib Level Angle                                    |
| 39           | Jib Level Flow Valve Coil                          |
| 40           | Jib Select Valve Coil                              |
| 41           | Turntable Rotate Joystick                          |
| 42           | Turntable Rotate CW Valve Coil                     |

|    |   |
|----|---|
| 43 | Turntable Rotate CCW Valve Coil                           |
| 44 | Drive Enable Toggle Switch                                |
| 45 | Platform Level Toggle Switch (Platform Controls)          |
| 46 | Platform Rotate CW (left) or CW/CCW Valve Coil            |
| 47 | Platform Rotate CCW(right) Valve Coil                     |
| 48 | Small Pump Enable Valve Coil                              |
| 49 | Large Pump Enable Valve Coil                              |
| 51 | Drive Joystick  |
| 52 | Drive Forward Valve Coil (EDC)                            |
| 53 | Drive Reverse Valve Coil (EDC)                            |
| 54 | Drive Brake Release Valve or Electric Brake               |
| 55 | High Drive Speed Valve Coil                               |
| 56 | Telematics Device   |
| 57 | Secondary Boom Up/Down Flow Control Valve Coil            |
| 58 | Secondary Boom Ext/Ret Flow Valve Coil                    |
| 59 | Secondary Boom Extend Valve Coil                          |
| 60 | Secondary Boom Retract Valve Coil                         |
| 61 | Steer Joystick (Rocker Switch and separate axis joystick) |
| 62 | Aircraft Proximity Override Toggle Switch                 |
| 63 | Jib Up/Down Joystick                                      |
| 64 | Hydraulic Pressure (Function pump output)                 |
| 65 | Jib Rotate Joystick                                       |
| 66 | Secondary Boom Angle                                      |
| 67 | Primary Boom Length Safety                                |
| 68 | Function Enable Switch                                    |
| 69 | AC Power Generator Output                                 |
| 70 | Pump Electric Motor Speed                                 |
| 71 | Estop Relay/Circuit                                       |
| 72 | Lift Guard Contact Alarm Switch                           |
| 73 | Engine Oil Pressure                                       |
| 74 | Engine Temperature  |
| 75 | SCON Controller (Operational/Safety Controller)           |
| 76 | Platform Load   |
| 77 | Platform Display VCON                                     |
| 78 | Platform Controller (PCON)                                |
| 79 | Ground Display DISCON                                     |
| 80 | Turntable Controller (TCON)                               |
| 81 | DCON Controller   |
| 82 | AUX Recovery during Load Sense Overload                   |
| 83 | Telematics Remote Disable                                 |

|     |   |
|-----|---|
| 84  | Turntable Chassis Angle (Operational or Operational & Safety) |
| 85  | Turntable Chassis Angle (Safety)                              |
| 86  | Pressure Comp Functional Enable 1 Relay                       |
| 87  | Pressure Comp Functional Enable 2 Relay                       |
| 88  | Function Enable Valve Coil                                    |
| 89  | Fuel Level  |
| 90  | Jib Boom Length Safety  |
| 91  | Jib Retract Limit Switch                                      |
| 92  | Turntable Rotate Flow Valve Coil                              |
| 93  | Turntable Chassis Angle SCON                                  |
| 94  | Primary Boom Length   |
| 95  | Engine RPM Speed  |
| 96  | Low Oil Pressure or Engine Overtemp                           |
| 97  | Motor Braking (Drive Motor Overspeed)                         |
| 98  | Platform Level Angle  |
| 99  | Primary Boom Extend/Retract Flow Valve Coil                   |
| 100 | Platform Level Up Valve Coil                                  |
| 101 | Platform Level Down Valve Coil                                |
| 102 | Load Sense Function Cutout Relay                              |
| 103 | Load Sense Engine Cutout Relay                                |
| 104 | Left Front (or just Front) Steer Angle                        |
| 105 | Right Front Steer Angle                                       |
| 106 | Left Rear (or just Rear) Steer Angle                          |
| 107 | Right Rear Steer Angle  |
| 108 | JIB rotate CW Valve Coil                                      |
| 109 | JIB rotate CCW Valve Coil                                     |
| 110 | Platform Rotate Toggle Switch (Platform Controls)             |
| 111 | Front Axle Extension Angle                                    |
| 112 | Rear Axle Extension Angle                                     |
| 113 | Jib Rotate Toggle Switch (Platform Controls)                  |
| 114 | Axle Extend / Retract Toggle Switch                           |
| 115 | Axle Extend / Retract Valve Coil                              |
| 116 | Model Configuration   |
| 117 | Drive Power P38 SCON  |
| 118 | Turntable Rotate Power P39 SCON                               |
| 119 | Secondary Boom Down and Extend Valve Power P30                |
| 121 | Valve Power P6R1 SCON   |
| 122 | Engine Power P6R2 SCON  |
| 123 | Enable Input Power P7 SCON                                    |
| 124 | Enable Output Power P7R SCON                                  |

|     |   |
|-----|---|
| 125 | Primary Boom Down Power P9A   |
| 126 | IGN/Fuel Power P9B SCON   |
| 127 | Primary Boom Extend Power P10   |
| 128 | Primary Boom Up Power P11   |
| 129 | Axle Retract Power P12 SCON   |
| 132 | Platform Level Power P22  |
| 133 | Primary Boom Up/Down Valve Power P22R   |
| 134 | Valve Power P7R DCON  |
| 135 | Wall Powered Charger<br>Faults and Error Codes                                  |
| 136 | Pump AC Motor Controller  |
| 137 | Left Front AC Drive Controller  |
| 138 | Right Front AC Drive Controller   |
| 139 | Left Rear AC Drive Controller   |
| 140 | Right Rear AC Drive Controller  |
| 141 | Boom Safety   |
| 142 | Primary Boom Maximum Angle Safety (PBMAS)                                       |
| 143 | Primary Boom Maximum Length Safety (PBMLS)                                      |
| 144 | Axle Not Extended and Boom is Not Stowed  |
| 145 | Axles Extension   |
| 146 | Axle Not Extended and in Drive Disable Zone                                     |
| 147 | Secondary Boom Not Retracted and Chassis Tilted                                 |
| 148 | P85PWR Sensor Power   |
| 149 | P109PWR Sensor Power  |
| 150 | P26PWR Sensor Power   |
| 151 | Primary Boom UP/DOWN Flow Valve Coil (Fine)                                     |
| 152 | Primary Boom UP/DOWN Flow Valve Coil  |
| 153 | Primary Boom Lockout P1 Valve Coil  |
| 154 | Primary Boom Lockout P2 Valve Coil  |
| 155 | JIB Extend/Retract Joystick   |
| 156 | JIB Extend/Retract Flow Valve Coil  |
| 157 | JIB Extend Valve Coil   |
| 158 | JIB Retract Valve Coil  |
| 160 | Left Front Steer Valve Coil (Left)<br>Steer Left for Two Wheel Steer w/tie rod  |
| 161 | Right Front Steer Valve Coil (Left)<br>Steer Left for Two Wheel Steer w/tie rod |
| 162 | Left Rear Steer Valve Coil (Left)   |
| 163 | Right Rear Steer Valve Coil (Left)  |
| 164 | Platform Rotate Joystick  |
| 165 | Left Front Steer Valve Coil (Right)   |



|     |  |
|-----|--|
| 166 | Right Front Steer Valve Coil (Right)             |
| 167 | Left Rear Steer Valve Coil(Right)                |
| 168 | Right Rear Steer Valve Coil (Right)              |
| 169 | Secondary Boom Angle Safety                      |
| 170 | LSB2RO/LSB4EO Cross-Check                        |
| 171 | RSB1AO Active Cross-Check                        |
| 172 | LTB1LO Active Cross-Check                        |
| 173 | RSB1AO/LSB1DO Cross-Check                        |
| 174 | LTB1LO/LSB3RO Cross-Check                        |
| 175 | LTB1LO/LSB4EO Cross-Check                        |
| 176 | RSP1AO Active Cross-check                        |
| 177 | RSS1AO Active Cross-check                        |
| 178 | RSJ1AO Active Cross-check                        |
| 179 | Platform Level Loop Lock Valve Coil              |
| 180 | JIB Level Loop Lock Valve Coil                   |
| 181 | Axle Retract Enable Valve Coil                   |
| 182 | LSS1RS   |
| 183 | LSS1RO   |
| 184 | Chassis tilted and Primary Boom max Angle        |
| 185 | ESTOP RELAY SOURCE                               |
| 186 | ESTOP RELAY RETURN                               |
| 187 | Jib Rotate Limit Switch                          |
| 188 | LSB3RO/LSB4EO Cross-check                        |
| 189 | Lift Pump Motor                                  |
| 190 | Right Rear Drive Motor                           |
| 191 | Left Rear Drive Motor                            |
| 192 | Right Front Drive Motor                          |
| 193 | Left Front Drive Motor                           |
| 194 | Right Rear Brake Coil                            |
| 195 | Left Rear Brake Coil                             |
| 196 | Right Front Brake Coil                           |
| 197 | Left Front Brake Coil                            |
| 198 | Right Rear Speed Sensor                          |
| 199 | Left Rear Speed Sensor                           |
| 200 | Right Front Speed Sensor                         |
| 201 | Left Front Speed Sensor                          |
| 202 | Right Rear Motor Controller Control Output (any) |
| 203 | Left Rear Motor Controller Control Output (any)  |
| 204 | Main Battery Power Pack (DC Machine)             |
| 205 | Drive Power Contactor                            |
| 206 | TCON Bank Power                                  |

|     |   |
|-----|---|
| 207 | PCON Bank Power   |
| 208 | Left Front Steer Valve Coil (Left or Right) can't tell left or right  |
| 209 | Right Front Steer Valve Coil (Left or Right) can't tell left or right |
| 210 | Left Rear Steer Valve Coil (Left or Right) can't tell left or right   |
| 211 | Right Rear Steer Valve Coil (Left or Right) can't tell left or right  |
| 212 | Scissor Height  |
| 213 | Scissor Height Safety   |
| 214 | Scissor Lift Pressure   |
| 215 | Scissor Lift Pressure Safety  |
| 216 | OUTRIGGER SYSTEM  |
| 217 | OUTRIGGER LEFT FRONT COIL   |
| 218 | OUTRIGGER RIGHT FRONT COIL  |
| 219 | OUTRIGGER LEFT REAR COIL  |
| 220 | OUTRIGGER RIGHT REAR COIL   |
| 221 | OUTRIGGER LEFT FRONT PRESSURE TRANSDUCER / LIMIT SWITCH               |
| 222 | OUTRIGGER RIGHT FRONT PRESSURE TRANSDUCER / LIMIT SWITCH              |
| 223 | OUTRIGGER LEFT REAR PRESSURE TRANSDUCER / LIMIT SWITCH                |
| 224 | OUTRIGGER RIGHT REAR PRESSURE TRANSDUCER / LIMIT SWITCH               |
| 225 | OUTRIGGER EXTEND COIL   |
| 226 | OUTRIGGER RETRACT COIL  |
| 227 | PLATFORM DECK EXTEND  |
| 228 | PLATFORM DECK RETRACT   |
| 229 | PLATFORM DECK ENABLE  |
| 230 | OSCILLATE SYSTEM  |
| 231 | OSCILLATE LEFT COIL   |
| 232 | OSCILLATE RIGHT COIL  |
| 233 | BATTERY TEMPERATURE   |
| 234 | PLATFORM UP COIL  |
| 235 | PLATFORM DOWN COIL  |
| 236 | MOTOR CONTROLLER ENABLE   |
| 237 | MOTOR CONTROLLER THROTTLE   |
| 238 | ACCUMULATOR COIL  |
| 239 | ACCUMULATOR PRESSURE  |
| 240 | OSCILLATE LIMIT SWITCH LEFT SENSE AXLE                                |
| 241 | OSCILLATE LIMIT SWITCH RIGHT SENSE AXLE                               |
| 242 | VEHICLE HORN  |
| 243 | CHASSIS ALARM   |
| 244 | PLATFORM ALARM  |
| 245 | BOOST CHARGER   |

|     |  |
|-----|--|
| 246 | GLOW PLUG                                |
| 247 | BRAKE RELEASE SWITCH                     |
| 248 | UP LIMIT INPUT                           |
| 249 | DOWN LIMIT INPUT                         |
| 250 | GCON BANK POWER                          |
| 251 | GROUND CONTROL (GCON)                    |
| 252 | BATTERY MANAGEMENT SYSTEM                |
| 253 | CAPACITOR CHARGE                         |
| 254 | BATTERY CHARGE VOLTAGE                   |
| 255 | Right Rear Drive Motor Temperature       |
| 256 | Left Rear Drive Motor Temperature        |
| 257 | Right Front Drive Motor Temperature      |
| 258 | Left Front Drive Motor Temperature       |
| 259 | Right Rear Drive Controller Temperature  |
| 260 | Left Rear Drive Controller Temperature   |
| 261 | Right Front Drive Controller Temperature |
| 262 | Left Front Drive Controller Temperature  |
| 263 | Platform Recirculation Coil              |

## Fault Codes

| Fault Type | Engineering Name                                    |
|------------|---|
| 09         | SHORTED TO 0V                                       |
| 10         | Envelope Exceeded                                   |
| 11         | Shorted to Supply Voltage                           |
| 12         | Sensor Value Too High                               |
| 13         | Not Detected  |
| 14         | Cross-Check Failure                                 |
| 15         | Sensor Value Too Low                                |
| 16         | Sensor Value at Zero                                |
| 17         | Not Calibrated                                      |
| 18         | Speed Not Calibrated                                |
| 19         | Value Out of Expected Range                         |
| 20         | Generic Warning                                     |
| 21         | Generic Fault                                       |
| 22         | Sensor not detecting movement while being commanded |
| 23         | Too High  |
| 24         | Too Low   |
| 25         | Resistance too high                                 |
| 26         | Resistance too Low                                  |
| 27         | ACTIVE "ON" at Startup                              |
| 28         | Time Out  |
| 29         | Software Version Mismatch                           |
| 30         | Calibration Mismatch                                |
| 31         | Setup Invalid                                       |



FOR FURTHER ASSISTANCE,  
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