Genie
A TEREX BRAND

Service and Repair Manual

Serial Number Range

Z®-45 DC
Z®-45 FE

from Z45EM-101

This manual includes:
Repair procedures
Fault Codes
Electrical and
Hydraulic Schematics

For detailed maintenance procedures, refer to the appropriate Maintenance Manual for your machine.

Original Instructions
Part No. 1297714GT
Rev B
October 2022

Specifications

Machine Specifications

Tires and Wheels	
Tire size	315/55 D20
Wheel diameter	20 in 50,8 cm
Wheel width	11 in 27,9 cm
Overall tire diameter	32.5 in 82,6 cm
Tire ply rating	12
Wheel lugs	9 @ 5/8 - 18
Lug nut torque, dry	125 ft-lbs 169,5 Nm
Lug nut torque, lubricated	94 ft-lbs 127,5 Nm

Fluid capacities	
Fuel tank	17 gallons 64,4 liters
Hydraulic tank	11.6 gallons 43,9 liters
Hydraulic system (including tank)	17 gallons 64,4 liters
Drive hubs	24 fl oz 710 cc
Turntable rotation drive hub	25.5 fl oz 750 cc

Drive hub oil type: SAE 90 multipurpose hypoid gear oil API service classification GL5

Batteries	
Type	AGM
Group	903-L16
Quantity	8
Ampere hour	370 AH
Reserve capacity @ 25A rate	817 minutes
Type	L16G-AC
Group	903
Quantity	8
Ampere hour	390 AH
Reserve capacity @ 25A rate	789 minutes
Battery box torque	128 ft-lbs 173,5 Nm

For operational specifications, refer to the Operator's Manual.

3 Working clockwise on the body hex fitting, make a second mark with a permanent ink marker to indicate the proper tightening position. Refer to Illustration 2.

Note: Use the JIC 37° Fitting table in this section to determine the correct number of flats, for the proper tightening position.

Note: The marks indicate the correct tightening positions have been determined. Use the second mark on the body hex fitting to properly tighten the joint after it has been loosened.

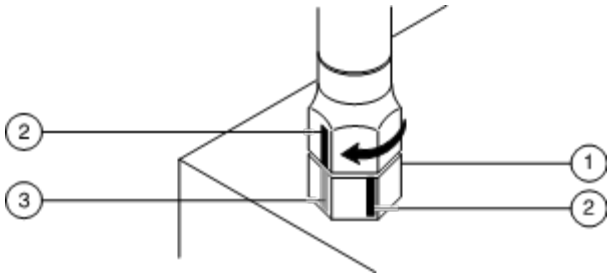


Illustration 2

1 body hex fitting
2 reference mark
3 second mark

4 Tighten the hex nut until the mark on the hex nut is aligned with the second mark on the body hex fitting.

5 Operate all machine functions and inspect the hose, fittings and related components to confirm there are no leaks.

1-2
How to Calibrate Booms Angle Sensors

Boom angle sensors are installed on the primary and secondary boom sections. They are used to detect whether the boom sections are stowed or not stowed. A two point calibration procedure captures the signal with the cylinder fully extended and fully retracted to an angle measurement that is scaled to degrees within the program. If either angle sensor is in the uncalibrated state, drive speed is limited to out-of-stowed speed.

Note: Start this procedure with the boom in a stowed position. Position the machine in a suitable location with sufficient vertical space. Refer to Navigation Menus, *Settings Menu*.

Note: The one point calibration is optional. It allows 2 MPH / 3.2 Km/h of travel in the stowed position if the machine needs to be immediately moved.

1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls.

2 Move and hold the drive enable toggle switch in the right direction while holding steer in the right direction.

3 When the display leaves SYSTEM READY mode, release the drive enable toggle switch and the steer joystick.

⊙ Result: The display will show FAULTS.

4 Momentarily activate steer in the right direction until SETTINGS is shown on the display.

5 Momentarily activate the drive enable toggle switch in the right direction until VALVE AND SENSOR SETTINGS is shown on the display.

6 Momentarily activate the drive enable toggle switch in the right direction until CALIBRATE TILT SENSOR is shown on the display.

7 Momentarily activate steer in the right direction until BOOM ANGLE CALIBRATE is shown on the display.

8 Momentarily activate the drive enable toggle switch in the right direction to enter the BOOM ANGLE CALIBRATE screen.

9 Momentarily activate the drive enable toggle switch in the right direction to enter the sub-menu.

⊙ Result: The screen will display PRI SNSR MVXXXX, SEC SNSR MVXXXX. A flashing value indicates the mV (millivolt) value is within expected range.

10 Momentarily activate the drive enable toggle switch in the right direction to store the millivolt value.

⊙ Result: An alarm will sound for one second and the screen will display CALIBRATED.

11 Calibrate the boom elevated positions, fully raise the primary and secondary booms. Repeat steps 9 and 10 to store the millivolt value.

⊙ Result: An alarm will sound for two seconds and the screen will display CALIBRATED indicating both the primary and secondary angle sensors have been calibrated successfully.

To exit programming mode:

12 Move and hold the drive enable toggle in the left position until the display returns to SYSTEM READY mode.

3-2
Jib Boom Lift Cylinder

How to Remove the Jib Boom Lift Cylinder

Note: Perform this procedure with the boom in the stowed position.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the jib boom slightly and place blocks under the platform support. Lower the jib boom until the platform is resting on the blocks just enough to support the platform.

Note: Do not rest the entire weight of the boom on the blocks.

2 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

4 Use a soft metal drift to tap the jib boom lift cylinder rod-end pivot pin out enough to lower one of the leveling arms to the ground. Tap the pin the other direction and lower the opposite leveling arm. Do not remove the pin.

5 Support the jib boom lift cylinder with a suitable lifting device.

6 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the barrel-end pin and let the cylinder hang down.

⚠WARNING Crushing hazard. The jib boom may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead lifting device.

7 Attach a lifting strap from an overhead lifting device to the lug on the rod end of the jib boom lift cylinder.

8 Use a soft metal drift to remove the jib boom lift cylinder rod-end pin. Remove the jib boom lift cylinder from the machine.

⚠WARNING Crushing hazard. The jib boom lift cylinder may become unbalanced and fall when it is removed from the machine if it is not properly supported by the lifting device.

5-1
Secondary Boom

How to Disassemble the Secondary Boom

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the platform.

2 Remove the jib boom. Refer to Repair Procedure, *How to Remove the Jib Boom.*

3 Remove the primary boom. Refer to Repair Procedure, *How to Remove the Primary Boom*.

4 Remove the master cylinder. Refer to Repair Procedure, *How to Remove the Master Cylinder*.

5 Attach a lifting strap from an overhead lifting device to the lug on the rod end of the primary boom lift cylinder. Then raise the primary boom lift cylinder with the lifting device, to a vertical position.

6 Tag, disconnect and plug the hydraulic hoses at the primary boom lift cylinder. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

7 Remove the pin retaining fastener from the primary boom lift cylinder barrel-end pivot pin.

8 Use a slide hammer to remove the pin. Remove the primary boom lift cylinder from the machine.

⚠WARNING Crushing hazard. The primary boom lift cylinder could become unbalanced and fall if not properly supported by the lifting device.

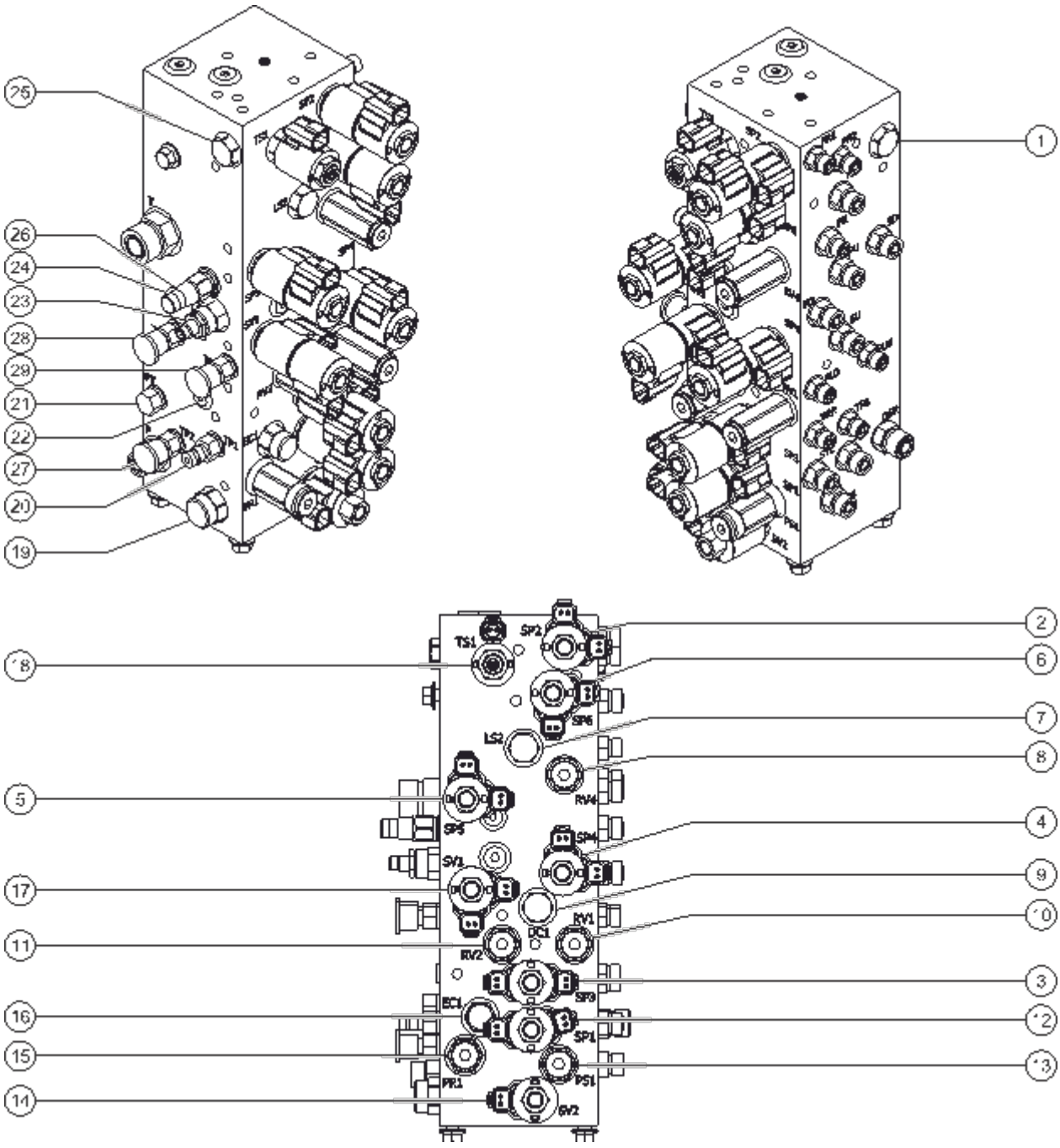
9 Tag, disconnect and plug the hydraulic hoses on both of the secondary boom lift cylinders. Cap the fittings on the cylinders.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

10 Remove the pin retaining fasteners from both sides of the secondary boom lift cylinder rod-end pivot pin and barrel-end pivot pin. Do not remove the pins.

11 Attach a strap from an overhead lifting device to the lug on the rod end of one of the secondary boom lift cylinders for support. Do not apply any lifting pressure.

Manifolds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SP5
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SV1
RV1
EC1
RV2
SP3
EC1
SP1
PR1
PS1
SV2

How to Test a Coil Diode

Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

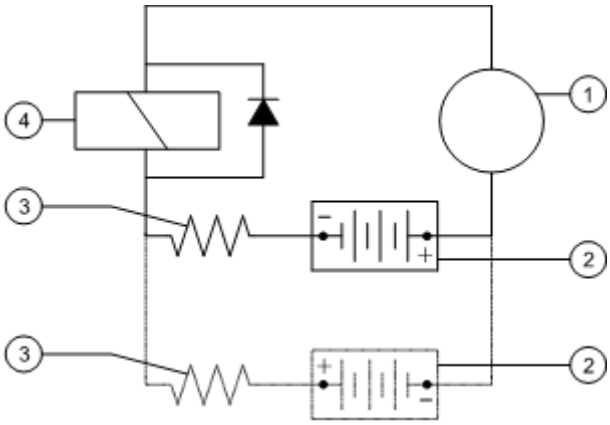
1 Test the coil for resistance. Refer to Repair Procedure, *How to Test a Coil*.

2 Connect a 10W resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

Resistor 10Ω

Genie part number 27287

Note: The battery should read 9V DC or more when measured across the terminals.



1 multimeter
2 9v DC battery
3 10Ω resistor
4 coil

Note: Dotted lines in illustration indicate a reversed connection as specified in step 6.

3 Set a multimeter to read DC current.

Note: The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

4 Connect the negative lead to the other terminal on the coil.

5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the current reading.

6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.

7 Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

Control System Fault Codes

Error Source		Error Type				
ID	**Component**	**ID**	**Name**	**Cause**	**Effect**	**Solution**
15	**FOOT SWITCH**	21	Fault	Stuck ON (on @ power up)	Platform controlled functions disabled	Release foot switch and recycle power Verify: (when activated) • 24V supply on C11-1 (P22PWR WH) • 24V on C11-2, PCON C46-6 GY (C56FTS RD) when pressed, 0V when not pressed
		28	Timeout	ON for > Timeout Time (default is 2 min)		
16	**SPEED ADJUSTMENT TOGGLE SWITCH**	27	Active at startup	Stuck ON (on @ power up)	Toggle Switch function s operate at 50% speed	Verify: · 24V supply on toggle switch center (RD C134PWR) · 24V on pos 3, C48-11 VCON (C194DEC WH/BK) when pressing down on the switch · 24V on C48-10 (C194INC WH/RD) when pressing up on the switch (B- otherwise)
18	**PROPORTIONAL RELIEF VALVE**	21	Fault	Open or short circuit	Warning: Will cause poor operating efficiency	Verify no open/short circuit across C28-2 RRDCON, C1-6, C3-3 (V191PCE WH/RD)
19	**AUX PUMP TOGGLE SWITCH**	27	Active at startup	Stuck ON (on @ power up)	AUX functions disabled	Verify: (when activated) · 24V created by AUX toggle switch TS1 at platform or ground controls(they are wired in parallel) · 24V at C35-11 to RRDCON C28-33 (C27AUX RD) to 24V when switch is activated · 24V across AUX Relay CR3-86 & CR3-85 (DC units only)
21	**PRIMARY UP/DOWN JOYSTICK**	11	Shorted to Supply	5V	Primary Boom disabled	Verify: · 5V at JC7-2 (P162PJW OR) · B- at JC7-1 (JSGND BR) · 500 to 4500 mV at JC7-3 & PCON C46-11 (C195STC BL/WH) through joystick motion
		16	Value at 0 V	0V		
		17	Not Calibrated	Not between 2000 & 3000 mV at startup		
22	**PRIMARY UP VALVE**	25	Value too high	Open Circuit or Ohms > 60	Associated Function disabled	· Check Ohms · Verify no open/short circuit across PCON C20-5 BK & B- (V01PBU RD)
		26	Value too low	Short or Ohms <5		

Control System Fault Codes

Error Source		Error Type				
ID	**Component**	**ID**	**Name**	**Cause**	**Effect**	**Solution**
135	**WALL POWERED CHARGER FAULT CODES**	51	DC-DC failure: LLC excessive leakage fault	Internal charger fault		Remove AC and battery for minimum 30 seconds and retry charger
		52	PFC failure: PFC excessive leakage fault			
		53	PFC has taken too long to boost			
		54	The charger has been unable to calibrate the current offset			
		55	The output relay voltage too high when relay is closed			
135	**WALL POWERED CHARGER ERROR CODES**	0	No Response	No CAN communication	Display fault, but battery BDI% value will be less accurate	Verify: · 24V supply on (+) Terminal · B- on (-) Terminal · 60 Ohm resistance across CAN +/- C22-6 and C22-10 · Make sure charger is plugged in to the machine
		1	High battery voltage error	Battery voltage is too high to charge		· Check the battery voltage and cable connections · Check battery size and condition. (This error will automatically clear once the condition has been corrected)
		2	Low battery voltage error detected prior to starting a charge cycle	Battery Voltage is too low to charge		
		3	Charge timeout	Charge Timeout caused by battery pack not reaching required voltage within safe time limit. Possible causes: Charger output reduced due to high temperatures. Poor battery health. Very deeply discharged battery. Poorly connected battery. Extra loads.		· Operate at lower ambient temperature · Replace battery pack · Check DC connections (This error will automatically clear once the charger is reset by cycling DC)
		4	Battery defective	Battery could not be trickle charged up to the minimum voltage.		· Check for shorted or damaged cells · Replace battery pack · Check DC connections (This error will automatically clear once the charger is reset)

Control System Fault Codes

Error Source		Error Type				
ID	**Component**	**ID**	**Name**	**Cause**	**Effect**	**Solution**
140	**Pump & Drive Controllers:** **136=Pump [ECON]** **137=Left Front [LF]** **138=Right Front [RF]** **139=Left Rear [LR]** **140=Right Rear [RR]**	68	**VCL Runtime Error** 1. VCL code encountered a runtime VCL error. 2. See Monitor menu » Controller: VCL Error Module and VCL Error. This error can then be compared to the runtime VCL module ID and error code definitions found in the specific OS system information file.		ShutdownMotor; ShutdownMainContactor; ShutdownEMBrake; ShutdownThrottle; ShutdownInterlock; ShutdownDriver1,2,3 &4; ShutdownPD; FullBrake.	Set: Runtime VCL code error condition. Clear: Edit VCL application software to fix this error condition; flash the new compiled software and matching parameter defaults; cycle key switch.
		71	**OS General** 1. Internal controller fault.		ShutdownMotor; ShutdownMainContactor; ShutdownEMBrake; ShutdownThrottle; ShutdownInterlock; ShutdownDriver1,2,3 &4; ShutdownPD; FullBrake.	Set: Internal controller fault detected. Clear: Cycle key switch.
		72	**PDO Timeout** 1. Time between CAN PDO messages received exceeded the PDO Timeout Period.		ShutdownThrottle; CAN NMT State set to Pre-operational.	Set: Time between CAN PDO messages received exceeded the PDO Timeout Period. Clear: Cycle key switcg or receive CAN NMT message.
		73	**Stall Detected** 1. Stalled motor. 2. Motor encoder failure. 3. Bad crimps or faulty wiring. 4. Problems with power supply for the motor encoder. 5. See Monitor menu » Motor: Motor RPM.		ShutdownEMBrake; Motor disabled; Control Mode changed to LOS (Limited Operating Strategy).	Set: No motor encoder movement detected. Clear: Cycle key switch.

Schematics

Observe and Obey:

- ☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section.

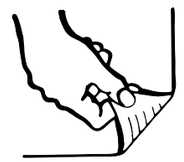
Electrical Schematics

⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

Hydraulic Schematics

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

Electrical Schematic, Chassis and Turntable



Electrical Schematic, Front Motor Controllers