Service Manual

ZT 20D

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Section 2 - Care and Safety

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Section C - Electrics

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Publication No.
9803/9430-1



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Issued by JCB Technical Publications, JCB Service, World Parts Centre, Beamhurst, Uttoxeter, Staffordshire, ST14 5PA, England. Tel +44 1889 590312 Fax +44 1889 593377

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Safety Checklist

Safety - Yours and Others

INT-1-3-1_3

All machinary can be hazardous. When a machine is correctly operated and properly maintained, it is a safe machine to work with. But when it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

In this manual and on the machine you will find warning messages. Read and understand them. They tell you of potential hazards and how to avoid them. If you do not fully understand the warning messages, ask your employer or JCB distributor to explain them.

But safety is not just a matter of responding to the warnings. All the time you are working on or with the machine you must be thinking what hazards there might be and how to avoid them.

Do not work with the machine until you are sure that you can control it.

Do not start any job until you are sure that you and those around you will be safe.

If you are unsure of anything, about the machine or the job, ask someone who knows. Do not assume anything.

Remember

BE CAREFUL
BE ALERT
BE SAFE

General Safety

T1-007

⚠ WARNING

Operator Manual

You and others can be injured if you operate or maintain the machine without first studying the Operator Manual. Read the safety instructions before operating the machine. If you do not understand anything, ask your employer or JCB dealer to explain it. Keep the Operator Manual clean and in good condition. Do not operate the machine without an Operator Manual in the cab, or if there is anything on the machine you do not understand.

INT-1-3-2_2

⚠ WARNING

Care and Alertness

All the time you are working with or on the machine, take care and stay alert. Always be careful. Always be alert for hazards.

INT-1-3-5

⚠ WARNING

Clothing

You can be injured if you do not wear the proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job. Examples of protective clothing are: a hard hat, safety shoes, safety glasses, a well fitting overall, ear-protectors and industrial gloves. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained.

INT-1-3-6

⚠ WARNING

Alcohol and Drugs

It is extremely dangerous to operate machinery when under the influence of alcohol or drugs. Do not consume alcoholic drinks or take drugs before or while operating the machine or attachments. Be aware of medicines which can cause drowsiness.

INT-1-3-9_2

⚠ WARNING

Feeling Unwell

Do not attempt to operate the machine if you are feeling unwell. By doing so you could be a danger to yourself and those you work with.

8-1-2-4

⚠ WARNING

Mobile Phones

Switch off your mobile phone before entering an area with a potentially explosive atmosphere. Sparks in such an area could cause an explosion or fire resulting in death or serious injury.

Switch off and do not use your mobile phone when refuelling the machine.

INT-3-3-9

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Pre Start Cold Checks, Service Points and Fluid Levels

	Operation	Daily	50	200	300	400
ENGINE						
Engine coolant level	- Check	☐	☐	☐	☐	☐
Engine coolant (1)	- Change			☐		☐
Engine oil level	- Check	☐	☐	☐	☐	☐
Engine oil and filter(2)	- Change		☐	☐		☐
Radiator fins	- Clean/Check			☐		☐
Air screen	- Clean	☐	☐	☐	☐	☐
Air cleaner dust ejector	- Clean			☐	☐	☐
Air cleaner elements(3)	- Check/Clean	☐	☐	☐	☐	☐
Fuel tank level	- Check	☐	☐	☐	☐	☐
Fuel/Water seperator element	- Change			☐		☐
Fuel Filter	- Change					☐
Safety shut off system	- Check	☐	☐	☐	☐	☐
Fan belt	- Check and Adjust	☐	☐	☐	☐	☐
TRANSMISSION						
Grease fittings	- Lubricate		☐	☐	☐	☐
Wheel bolt torque	- Check	☐	☐	☐	☐	☐
Tyre pressure and condition	- Check	☐	☐	☐	☐	☐
Brake adjustment and balance	- Check and Adjust	☐	☐	☐	☐	☐
Steering free play	- Check and Adjust	☐	☐	☐	☐	☐
Grass build up from deck	- Clean	☐	☐	☐	☐	☐
Belts	- Check/Adjust/Replace	☐	☐	☐	☐	☐
Mower blades	- Check/Sharpen/ Replace	☐	☐	☐	☐	☐
HYDRAULICS						
Hydraulic oil level	- Check	☐	☐	☐	☐	☐
Hydraulic oil and filter(4)	- Change		☐		☐	
Security of mounting bolts and nuts	- Check	☐	☐	☐	☐	☐
ELECTRICS						
Battery electrolyte level (if applicable)	- Check					☐
Wiring for Chaffing/Routing	- Check		☐	☐	☐	☐
Battery Terminals for Condition and Tightness	- Check		☐	☐	☐	☐

(1) Recommended to be replaced every 200 hours or yearly.
(2) Change at initial 50 hour service then every 200 hours.
(3) Clean and inspect every 25 hours
(4) Change at initial 50 hour service then every 300 hours.

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Fluids, Lubricants and Capacities

Table 2.

Item	Capacity Litres	Fluid / Lubricant	International Specification
Fuel Tanks	44.8 litres (9.9 gal)	Diesel Oil	⇨ *Types of Fuel (3-23)*
Engine (Oil)	2.4 litres (0.5 gal)	JCB Extreme Performance Oil 15W-40 above -15°C (above 5°F)	SAE15W/40, ACEA E5/B3/A3,API CH-4/SG
Hydraulic (Oil)	3.8 litres (0.8 gal)	JCB High Performance 20W/50 -15°C to -25°C (5°F to 13°F)	API CC/SE (recommended)
Engine Coolant All Other Grease		JCB Universal Antifreeze/water ⇨ *Coolant Mixtures (3-11)* JCB MPL Grease	ASTM D3306-74 Lithium based no 2 consistency

Initial Hydraulic Oil and Filter Change.....50 hours

Hydraulic Oil and Filter Change, Thereafter.....300 hours

Initial Engine Oil and Filter Change.....50 hours

Engine Oil and Filter Change, Thereafter.....200 hours

Note: *Change intervals stated above are for normal usage. Due to adverse operating conditions that may be experienced (extremely dusty or muddy), change intervals may need to be more frequent.*

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Changing the Oil and Filter

⚠ WARNING

Hot oil and engine components can burn you. Make sure the engine is cool before doing this job.

Used engine crankcase lubricants contain harmful contaminants. In laboratory tests it was shown that used engine oils can cause skin cancer.

8-3-1-4

⚠ CAUTION

Keep your face away from the drain hole when removing the drain plug.

2-3-3-4

Change the engine oil after 50 hours of operation. Change the oil each subsequent 200 hours of operation after the initial change.

⚠ CAUTION

The oil filter canister will contain some oil which could spill out when you remove the canister.

MD-3-2-1

1 Run the engine to warm the oil.

2 Park the mower on level ground.

3 Stop the engine, put the motion control arms in the park position and remove the key.

4 Remove the oil drain screw and drain the oil into a suitable container while the engine is still warm.

5 Clean the area around the oil filter to keep dirt and debris from the engine and rotate the oil filter counter clockwise to remove it. Wipe off the surface where the filter mounts.

6 Coat a film of clean engine oil on the seal of the new filter.

7 Install a new filter rotating it clockwise until the seal contacts the mounting surface. Rotate the filter 3/4 of a turn more by hand.

8 Clean and refit the drain plug.

9 Remove the dipstick and refill with fresh oil.

10 Wipe off any spilt oil. Check for leaks.Make sure that the filler cap is correctly refitted

11 Check the oil level.

12 Run the engine for about 3 minutes, stop engine, and check for leakage around filter.

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Greasing

Daily

You must grease the machine regularly to keep it working efficiently. Regular greasing will also lengthen the machine's working life.

Greasing should be done with a grease gun. Normally two strokes of the gun should be enough. Stop greasing when fresh grease appears at the joint.

WARNING

You will be working close into the machine for these jobs. Lower the attachments if possible. Remove starter key and disconnect the battery. This will prevent the engine being started.

8-3-1-3

For the types of grease to use at each point, ⇨ ***Fluids, Lubricants and Capacities (3-10)***.Do not mix different types of grease, keep them separate.

Note: *Some optional attachments may need greasing more often. See* ***Optional Attachments****.*

Item	Grease	Frequency
1	Deck belt tensioner	25 Hours
2	Pump belt idler	25 Hours
3	Push link pivots	40 Hours
4	Lift link pivots	40 Hours
5	Front Wheel axles	40 Hours

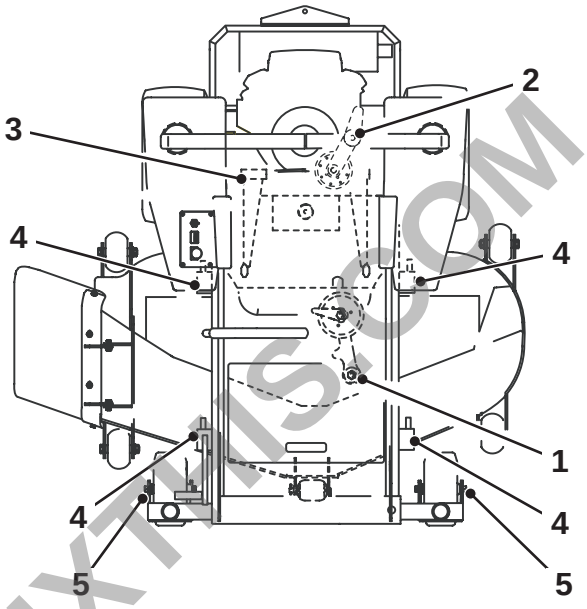


Fig 1.

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Mower Troubleshooting

The following troubleshooting guide is for the mower deck and its drive. This assumes the power unit engine is running to prescribed specifications. Consult the mower repair reference for all system checks.

Before attempting repair or test, observe the general condition of the power unit and mower. Make certain the power unit is operating properly and the mower is setup correctly. The following information may give you some hints in what to look for when attempting to solve a problem with the mower. If the problem cannot be easily solved, contact your JCB dealer.

Symptom	Problem	Correction
Excessive Vibration.	Loose spindle/blade fasteners.	Re-torque or replace as necessary.
	Blade interference with grass buildup in deck.	Clean the underside of the deck.
	Blades out of balance.	Balance blades according to
	Blade(s) broken or worn badly.	Replace mowing blades in sets of 3.
	Engine mounting bolts are loose.	Tighten the engine mounting bolts.
	Engine/Idler/Blade pulley loose.	Tighten the pulley.
	Engine Pulley damaged.	Contact JCB Dealer.
	Failed spindle bearing	Replace Bearings.
Uneven Cutting Height.	Blades blunt.	Sharpen or replace blades.
	Cutting blade(s) is/are bent.	Install new cutting blades.
	Deck is not level.	Level Deck.
	Anti-scalp not set correctly.	Adjust height of anti-scalp wheel.
	Grass buildup under deck.	Clean underside of deck.
	Incorrect tyre pressure.	Adjust pressures to 12 psi (0.8 bar) rear and 15 psi. (1.0 bar) front.
	Blade spindle bent.	Contact JCB Dealer.
	Ground speed too fast	Cut at slower speed.
Blades Wear Too Fast.	Cutting in sandy conditions.	Increase deck mowing height.
	Cutting in rocky conditions.	Increase deck mowing height.
	Heat treat has been removed by sharpening with grinder.	Replace mowing blades in sets of 3.
Not Cutting Clean.	Blades dull.	Sharpen or replace blades.
	Blades installed upside down.	Install blades correctly.
	Blade RPM too low.	Use full throttle position.
	Mower deck not level.	See cutting heights or Tyres under inflated. Adjust pressures to 12 psi (0.8 bar) rear and 15 psi. (1.0 bar) front.

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Consumables

Sealing and Retaining Compounds

T11-001_3

Table 1.

Type	Description	Part No.	Quantity
JCB Multi-Gasket	A medium strength sealant suitable for all sizes of gasket flanges, and for hydraulic fittings of 25-65 mm diameter.	4102/1212	50 ml
JCB High Strength Threadlocker	A high strength locking fluid for use with threaded components. Gasketing for all sizes of flange where the strength of the joint is important.	4102/0551	50 ml
JCB Retainer (High Strength)	For all retaining parts which are unlikely to be dismantled.	4101/0651	50 ml
JCB Threadlocker and Sealer	A medium strength locking fluid for sealing and retaining nuts, bolts, and screws up to 50 mm diameter, and for hydraulic fittings up to 25 mm diameter.	4101/0250	10 ml
		4101/0251	50 ml
JCB Threadlocker and Sealer (High Strength)	A high strength locking fluid for sealing and retaining nuts, bolts, and screws up to 50 mm diameter, and for hydraulic fittings up to 25 mm diameter.	4101/0550	10 ml
		4101/0552	200 ml
JCB Threadseal	A medium strength thread sealing compound.	4102/1951	50 ml
JCB Activator	A cleaning primer which speeds the curing rate of anaerobic products.	4104/0251	200 ml (Aerosol)
		4104/0253	1 ltr (Bottle)
JCB Cleaner/Degreaser	For degreasing components prior to use of anaerobic adhesives and sealants.	4104/1557	400 ml (Aerosol)
Direct Glazing Kit	For one pane of glass; comprises of: – 1 x Ultra Fast Adhesive (310 ml) – 1 x Active Wipe 205 (30 ml) – 1 x Black Primer 206J (30 ml) – plus applicator nozzle etc.	993/55700	
Ultra Fast Adhesive	For direct glazing.	4103/2109	310 ml
Active Wipe 205	For direct glazing.	4104/1203	250 ml
Black Primer 206J	For direct glazing.	4201/4906	30 ml
Clear Silicone Sealant	To seal butt jointed glass.	4102/0901	
Plastic to Metal Bonder	To seal plastic to metal joints.	4103/0956	50 g
Black Polyurethane Sealant	To finish exposed edges of laminated glass.	4102/2309	310 ml

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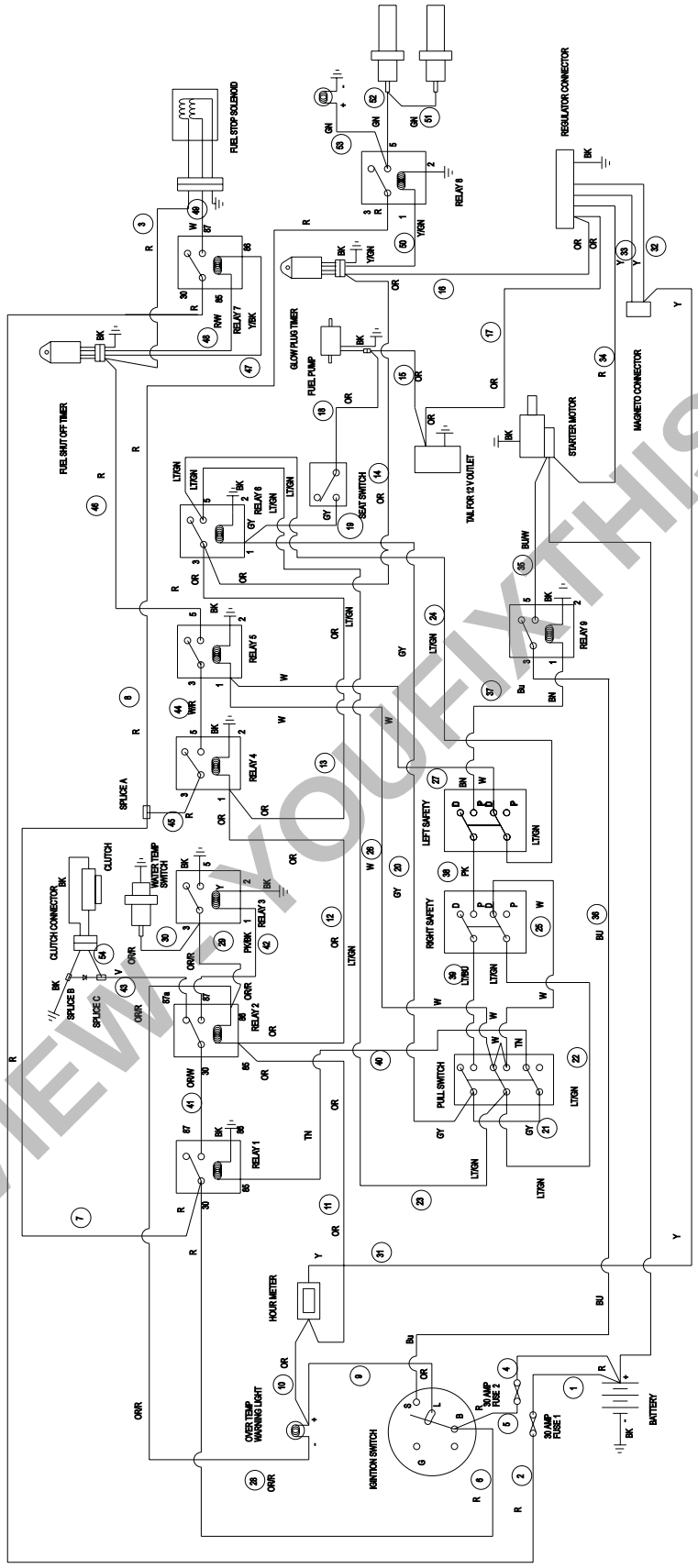


Fig 32. Electrical Schematic/Wiring Diagram- Actual

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Hydraulic System

JCB ZT 20D

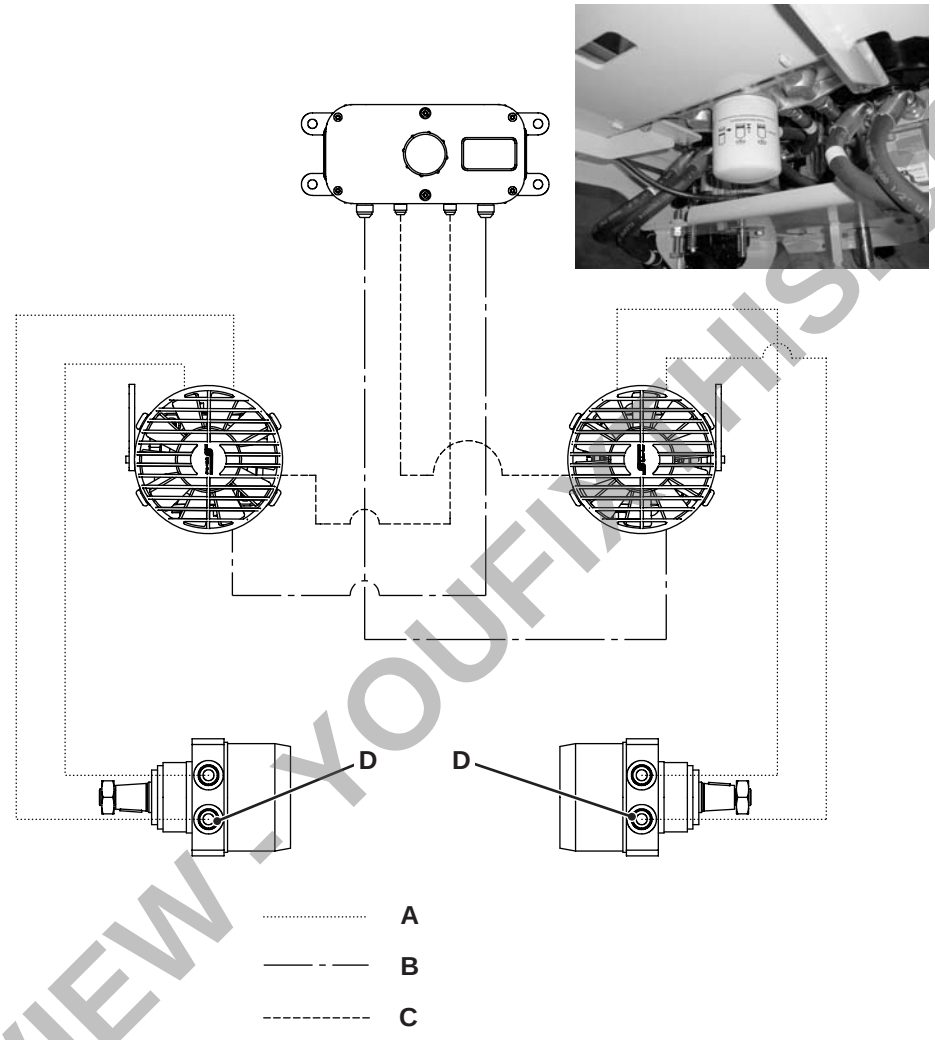


Fig 1.

The oil filler mounts to the bottom of the hydraulic tank

A High Pressure
B Charge Pump Inlet
C Case Drain

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Special Torques

Description	Torque
Mowing Blade Bolt - 9/16-12 x 1 3/4 Grade 8	170 Nm (125 lbf ft)
Spindle Pulley Nut - 3/4-16 UNF	109 Nm (80 lbf ft)
Engine Fasteners, M10	39 Nm (29 lbf ft)
Engine Fasteners , M8	20 Nm (15 lbf ft)
ROPS Fasteners - 1/2-13 Bolts & Nuts	109 Nm (80 lbf ft)
Spindle Housing Nuts - 7/16-20 UNF	54 Nm (40 lbf ft)
PTO Clutch Bolt - 7/16-20 x 2 1/4	61 Nm (45 lbf ft)
Steering Dampener Nuts - M8-1.25	33 Nm (24 lbf ft)
Fuel Tank Bolts 3/8-16	8.5 Nm (6 lbf ft)
Wheel Motor End Cover Bolts - 3/8-24 Gr. 8	68 Nm (50 lbf ft)
Hydraulic Pump ByPass Valve	12 Nm (9 lbf ft)
Hydraulic Pump End Cap Bolts	22 Nm (16 lbf ft)
Hydraulic Pump Charge Pump Screws	12 Nm (9 lbf ft)
High Pressure Pump/Motor Hoses/Fittings (MUST be lightly oiled)	82 Nm (60 lbf ft)

Important: *DO NOT use the pulley nut to hold the spindle while tightening the blade as the pulley nut could be over torqued. This could cause spindle spacer and bearing damage.*

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