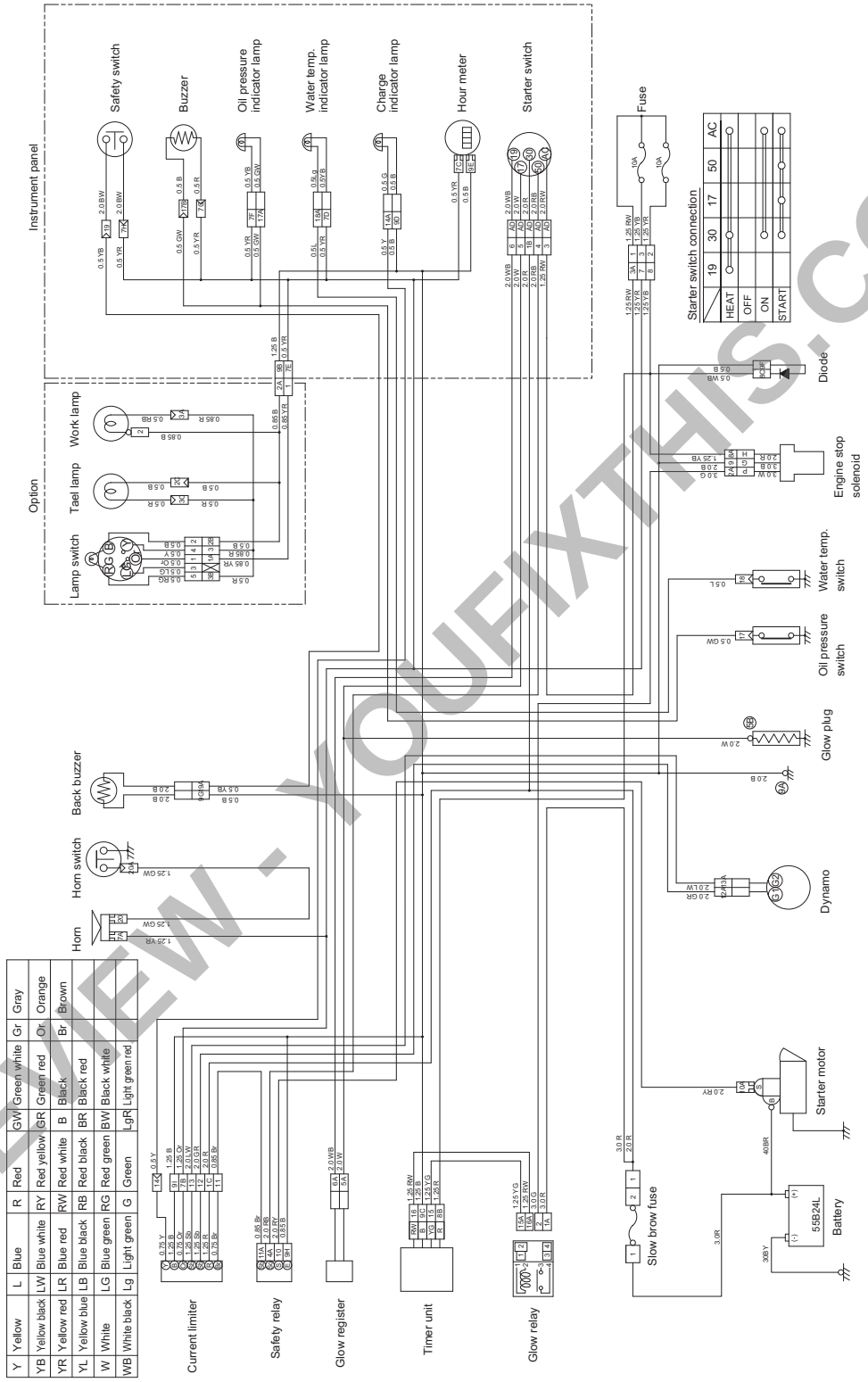
29.2 Wiring diagrams
C12R-A



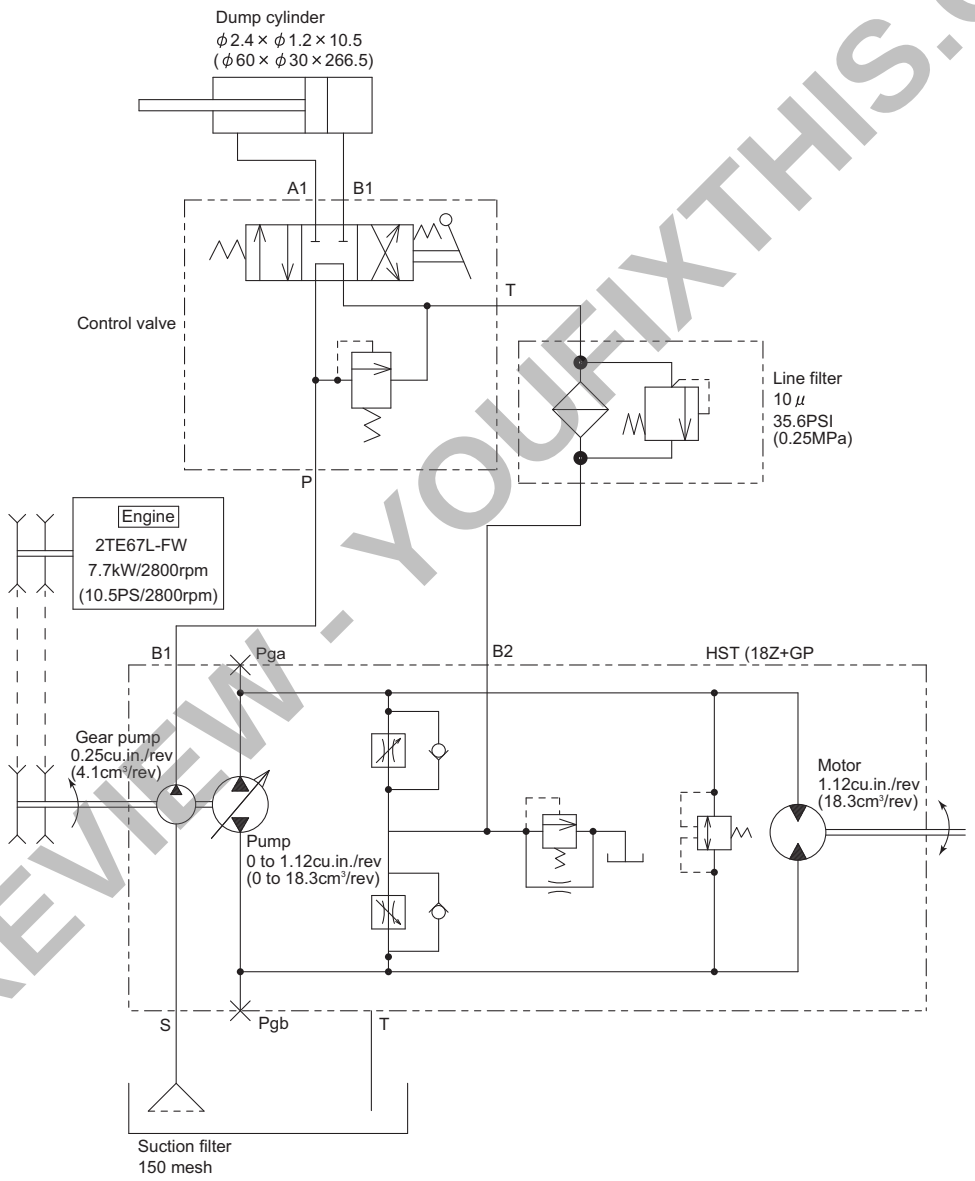
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29 Hydraulic and wiring diagrams

29.1 Hydraulic diagrams C12R-A

Dump speed (sec.)	Up	3.9
	Down	2.8
Relief pressure (PSI (MPa))	Control valve	2233 to 2318 (15.4 to 16.0)
	HST (High)	3959 to 4002 (27.4 to 27.7)
	HST (Low)	58 to 87 (0.4 to 6.0)



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- To disconnect the terminals, begin with the negative terminal (ground side); to connect the terminals, begin with the positive terminal. If a tool touches both the positive terminal and the machine, hazardous sparks may be generated.
- If a terminal is loose, hazardous sparks may be generated due to poor contact, which could cause ignition and explosion. Be sure to securely connect the terminals.

18.4 Troubleshooting (depending on model)

Electrical equipment

- Contact your dealer about the measures shown in parentheses in the list below.
- If there is any abnormality or trouble whose cause is unknown other than those shown below, ask your dealer for repair.

Problem		Cause	Measure
Electrical equipment	Turning starter switch to "START" dose not start starter motor.	• Defective wiring system • Defective starter switch • Insufficiently charged battery • Defective starter motor	• Check and repair wiring system. • Replace starter switch. • Recharge battery. • (Check and repair.)
	Maximum engine speed does not provide enough brightness of lamps.	• Defective wiring system • Defective generator or regulator	• Check terminals for looseness and disconnection. Repair terminal, if necessary. • (Check and repair.)
	During engine operation, lamp is extremely bright, and frequently burns out.	• Defective regulator	• (Replace regulator).
	Electrolyte leaks from battery.	• Defective diode	• (Repair).
	Speed of starter motor is too low.	• Defective wiring system • Insufficiently charged battery • Defective starter motor	• Check and repair wiring system. • Recharge battery. • (Check and repair.)

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23 Maintenance table

Daily and periodic inspection are important to keep the machine in its best condition. The following is a summary of inspection and servicing items by inspection interval. Periodic inspection intervals vary depending on the use, loads, fuels and lube oils used and handling conditions. The following should be treated only as a general standard.
When the time for an inspection approaches, study the relevant pages in the Operation & Maintenance Manual. Keep a record of daily operation and the results of maintenance work.

23.1 List of periodic inspection and servicing

◇: Check ○: Supply ❶: Replace first time ●: Replace □: Adjust (clean) ■: Oil and grease

Check & service items Machine		Daily	Every 50h	Every 250h	Every 500h	Every 1000h **
General	Falling off or breakage of parts	◇				
	Retighten bolts and nuts	◇				
	Engine condition	◇				
	Clean	□				
Lube oil	*Swing gear case oil		❶	○		●
	Travel reduction gear oil		❶	○	●	
	*Transmission oil	◇	❶			●
	*Differential gear oil		❶			●
Hydraulic system	Hydraulic oil	◇				●
	Suction filter					□
	Return filter		❶			●
	*HST Filter		❶		●	
	Hydraulic pump	◇				
Grease	Greasing points	■				
	*Swing gears and Swing bearings		■			
Undercarriage	Crawler tension	◇				

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27 Specifications

27.1 Specifications

Item			Unit	C12R-A	C30R-2A	C50R-3B
Engine	Type		-	2TE67L-FW	3TNV88-FFW	4TNV106-NTB
	Rated output		kW	7,7	24,6	67,7
	Rated speed		rpm	2800	3000	2500
Operating mass			kg	1100	2365	5575
Loading capacity			kg	1150	2500	3500
Drive system			-	HST	HST	HST
Travel speed			km/h	0~5,5	0~11	0~10
Maximum gradient			°	30°	30°	30°
Dimensions	Overall length		mm	2650	3200	4540
	Overall width		mm	950	1655	2000
	Overall height		mm	2250	2255	3470
	Track gauge		mm	230	320	450
	Minimum ground clearance		mm	150	265	450
Wagon	Inside dimensions	Length	mm	1470	1685	2500
		Width	mm	860	1410	1850
		Height	mm	315	370	300
	Capacity	Struck	m3	0,40	0,88	2,3
		Heaped	m3	0,52	1,24	1,4
	Maximum dump angle		°	56	58	65
Ground pressure		Loaded	kg/cm²	0,41	0,57	0,31
		Unloaded	kg/cm²	0,20	0,27	0,17

Subject to technical modifications

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13 Operating Instructions for C12R-A

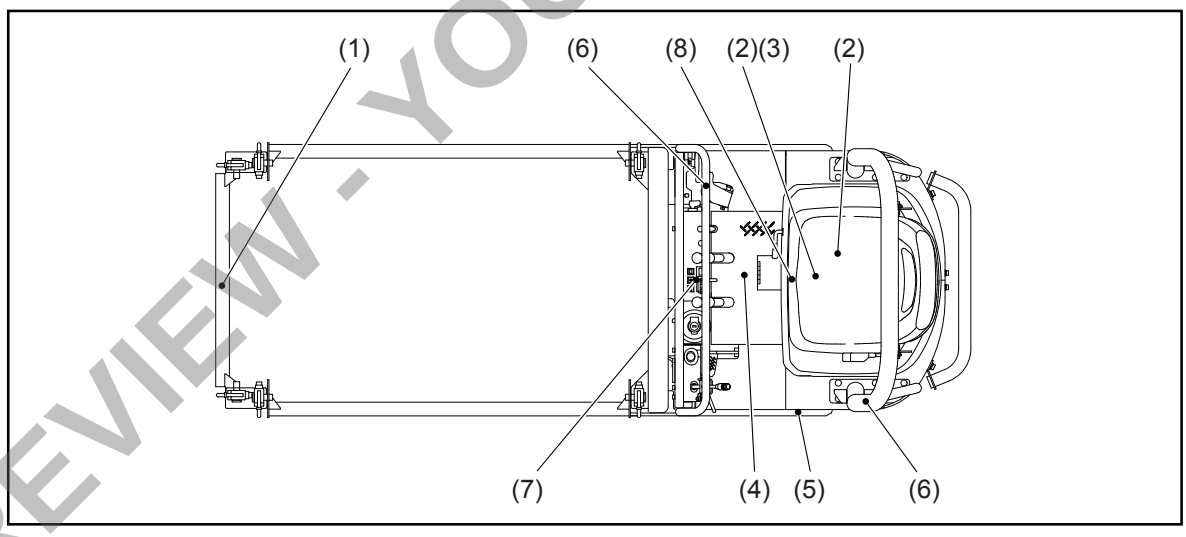
13.1 Checking before starting the engine

Visual inspection around the machine

⚠ WARNING

- **If there are any combustibles in any heat build-up areas, or if there are any fuel and/or oil leaks, a fire can result.**
- **Check for possible fire causes carefully. If there is anything abnormal, be sure to take corrective action or contact your dealer.**

Before starting the engine, visually check the outside and underside of the machine as follows:
Check bolts and nuts for loose connections; check the fuel, oil, and water for leaks; and also check the wagon and the hydraulic system to see that they are in good condition. In addition, check the electrical wiring for loose connections and for dust deposits in the heat build-up areas.



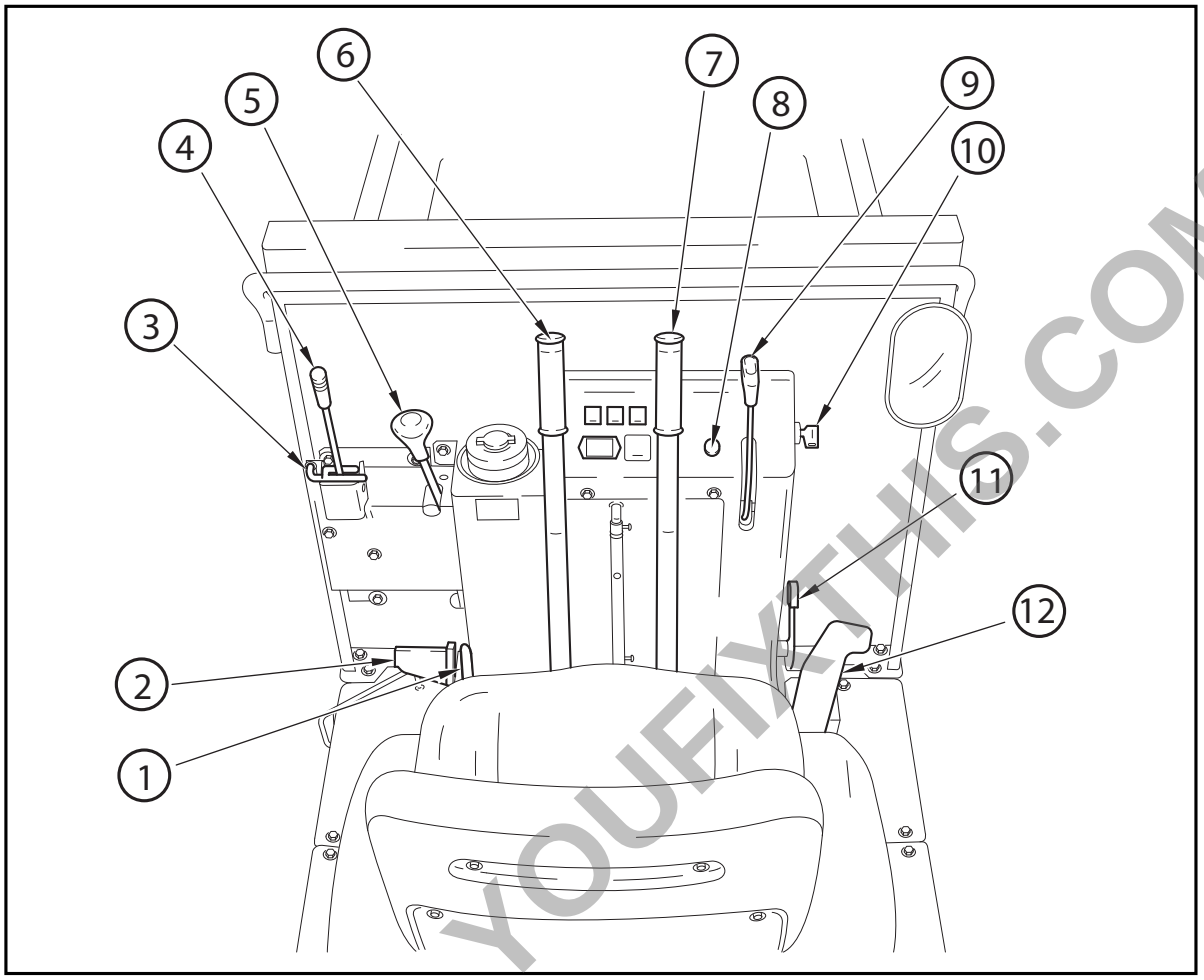
Check the following points before initial start-up for the day:

1) Checking the wagon, hydraulic cylinder, pins, and hoses for damage, wear and loose connections.
2) Removing dust deposits from around the engine, battery, and radiator.
3) Checking the engine and its accessories for oil or water leakage.

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9.2 Controls and switches C12R-A



1) Brake lock lever
2) Brake pedal
3) Dump lever stopper
4) Dump lever
5) Accelerator lever
6) Steering lever (G)
7) Steering lever (D)
8) Horn switch
9) Front / rear lever
10) Starter switch
11) Travel speed select lever
12) Travel pedal

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5 Basic precautions

⚠ WARNING

It is the user's responsibility to determine if an application presents any dangerous phenomena, for example: toxic gases, ground conditions requiring special precautions and measures to be taken to eliminate or reduce risks.

Follow safety rules at your workplace

- The operation and servicing of this machine is restricted to qualified persons.
- When operating or servicing the machine, follow all the safety rules, precautions and procedures.
- Any work performed by a team or with a signal person should be conducted in accordance with signals agreed on beforehand.

⚠ DANGER

The machines are not equipped to operate in explosive environments.

Install safety devices

- Make sure that all guards and covers are installed in their correct position. If any of them are damaged, repair them immediately.
- The proper use of all safety devices, such as lock lever, should be well understood by the machine operator.
- Never remove the safety devices. Always make sure that they operate properly. Incorrect operation of the safety devices could cause serious bodily injury.

Fasten the seatbelt

- For your safety, a rollover protection structure (ROPS) and a falling object protective structure (FOPS) with a safety belt are installed. (Depending on model)
- Always fasten the seatbelt and adjust snugly before you operate the machine.
- The seatbelt must be replaced after an accident.
- In addition the seat and seat mounting must be checked by your dealer after an accident has occurred.
- If the seat and seat mounting are damaged, they must be replaced.

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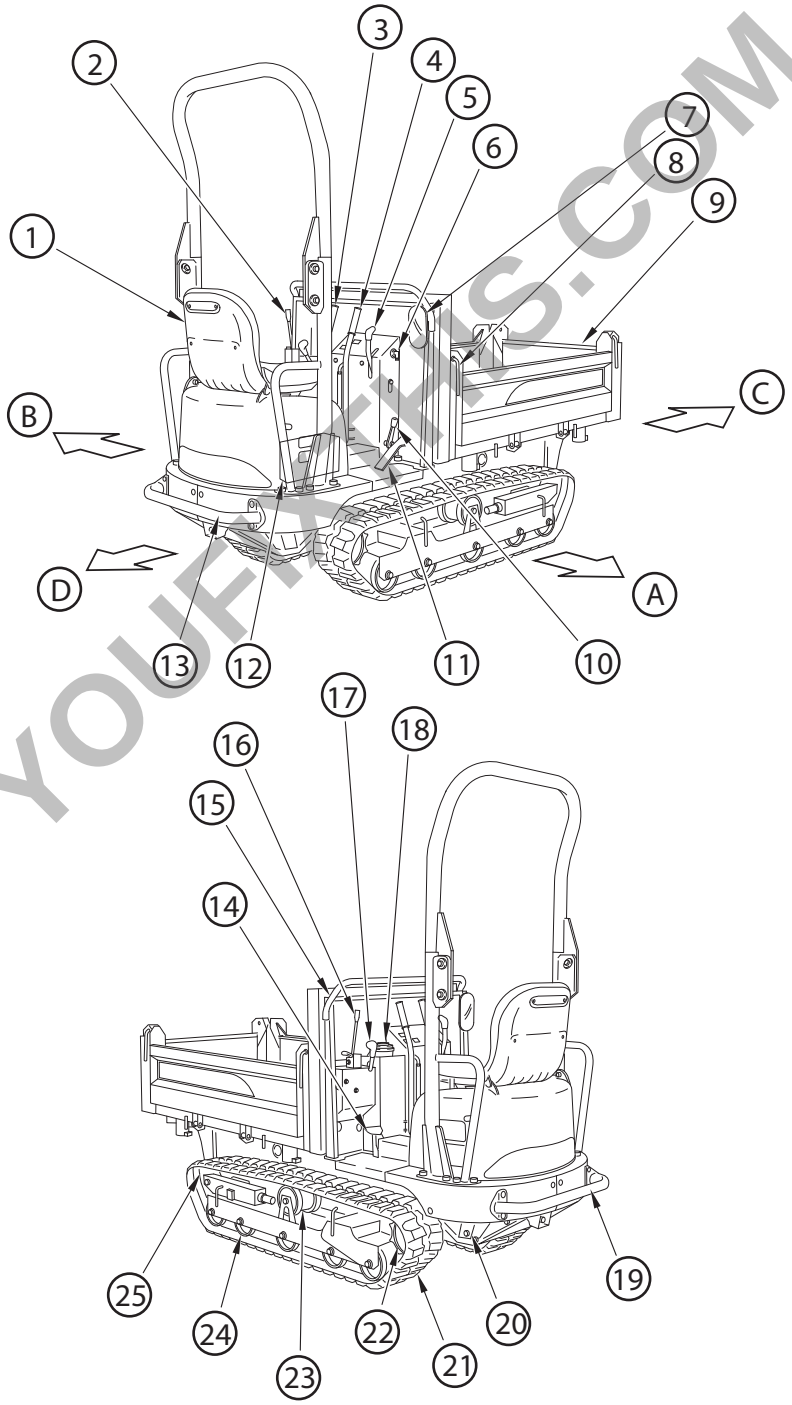
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9 Identification of important parts

9.1 Overview of the machine C12R-A

A = Right
B = Left
C = Front
D = Rear

1) Operator's seat
2) Dump lever
3) Steering lever (G)
4) Steering lever (D)
5) Front / rear lever
6) Starter switch
7) Rearview mirror
8) Open / close lever
9) Wagon
10) Travel speed select lever
11) Travel pedal
12) Battery
13) Bumper
14) Brake pedal
15) Handrail
16) Dump lever
17) Accelerator lever
18) Fuel tank
19) Bumper
20) Transmission
21) Rubber crawler
22) Sprocket
23) Carrier roller
24) Track roller
25) Idler



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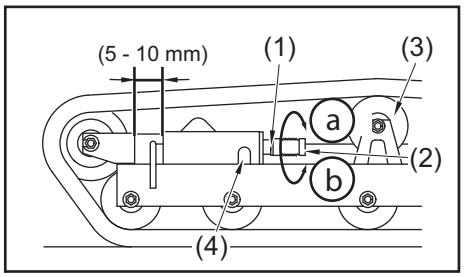
Removing the rubber crawler

⚠ WARNING

- **It is very dangerous to loosen the rubber crawler by any procedure other than that described below.**
- **If the tension of the rubber crawler cannot be loosened, ask your dealer to repair or replace the rubber crawler.**

⚠ CAUTION

- **Take great care in handling rubber crawlers, because they are very heavy.**
- **Be careful not to get injured, because the clearance between the rubber crawler and the wagon is small.**
- Prepare a jack and some wooden blocks.



1) Loosen the lock nut (1) and then the adjusting bolt (2), and press the idler (3) in.
2) With the idler (3) pressed in, if the distance shown in the figure at the right exceeds the specified range, mud may be caught in the idler fork. Remove the cover (4) and clean the idler fork to remove the mud.
3) Jack up the machine so that a clearance can be created between the core metal protrusion of the rubber crawler and the track rollers, and put wooden blocks between the frame and the ground.
4) Remove the rubber crawler from the idler first, and then from the sprocket.

Installing the rubber crawler

- Prepare two crowbars.

1) Engage the rubber crawler with the sprocket.
2) Place the rubber crawler on the idler, and at the same time, install the core metal protrusion of the rubber crawler beyond the carrier roller.
3) Press the lower side of the rubber crawler toward the center of the machine, and place the core metal of the rubber crawler so that it is adjacent to the idler.
4) Insert a crowbar into the sprocket hole and touch the end of the crowbar to the side face of the idler (on the inner side of the machine). While pressing the crowbar toward the inside of the machine, insert another crowbar between the core metal of the rubber crawler and the idler. Then, pry and move the crowbar toward the idler gradually until the core metal protrusion covers the idler.

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