

No. OW-604-MAE

TCM[®]

**OPERATION &
MAINTENANCE MANUAL**

WHEEL LOADER

E820-2



It is the responsibility of the Operator & Supervisor to read and understand this manual.

Protect the earth and be kind to your loader.

TCM CORPORATION

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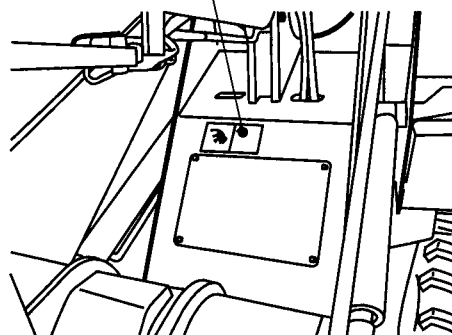
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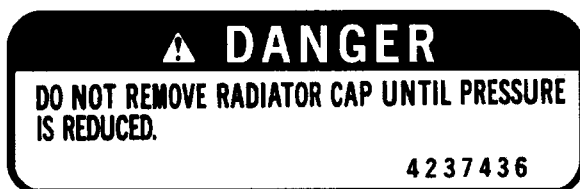
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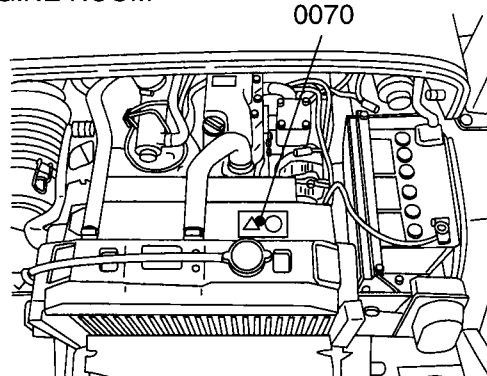
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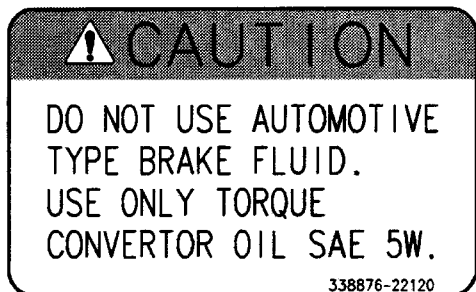
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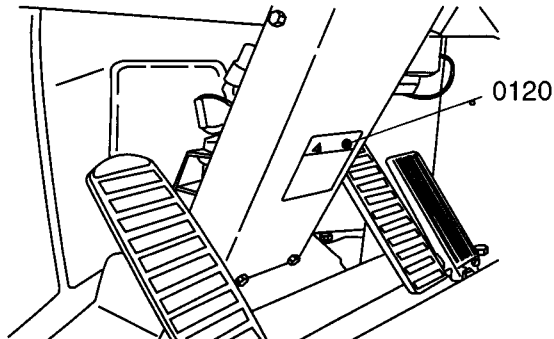
ENGINE ROOM



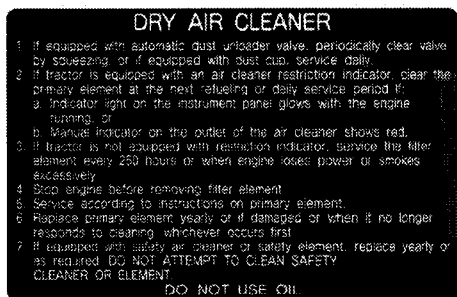
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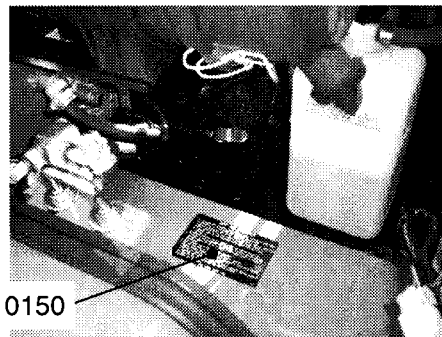
METER PANEL, UNDER



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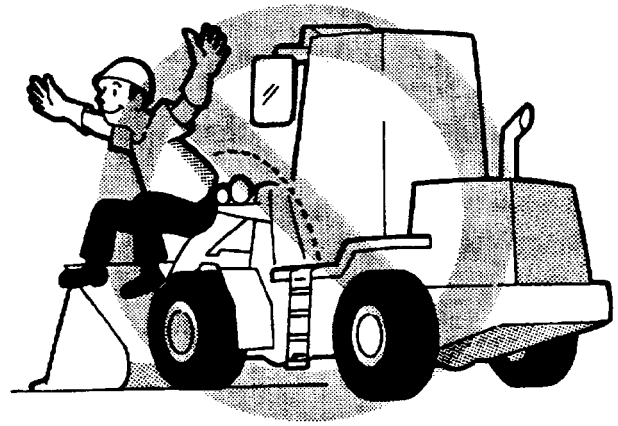


ENGINE ROOM



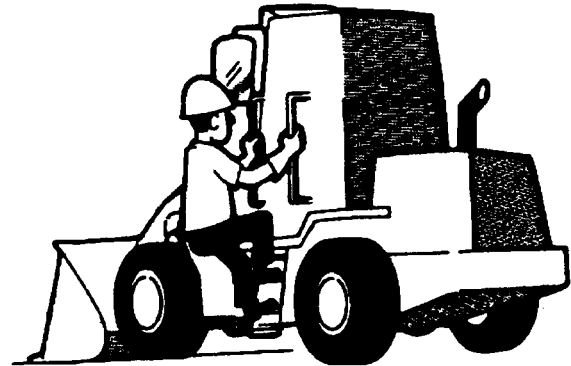
■ Use Handrails and Steps for Getting On and Off Machine

You must wait until machine fully stops before getting off. It is dangerous to get off when machine is moving even immediately before stopping. Never jump on or off.



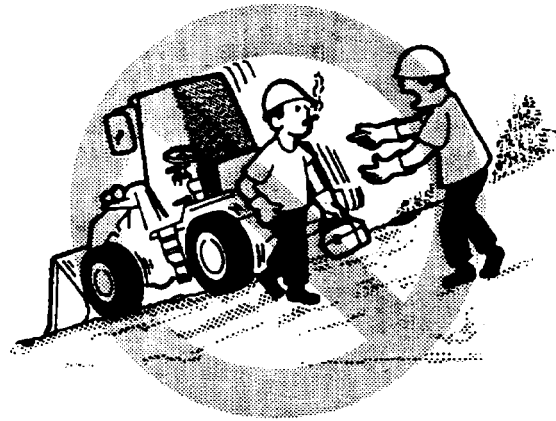
When you get off machine, always maintain three point contact with steps and handrails and face machine.

Be careful of slippery conditions on platforms, steps, handrails and on ground when leaving machine.



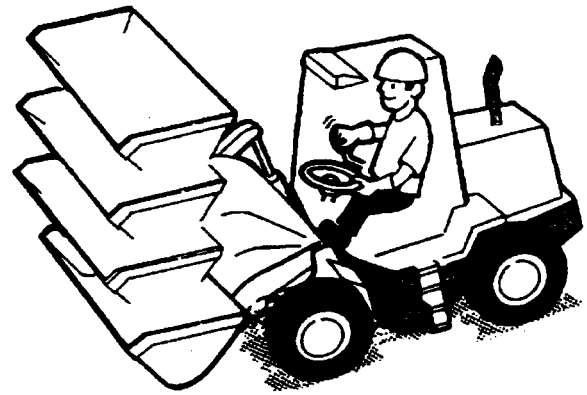
■ To Prevent Rolling, Always Make Sure Machine is Properly Secured Before Leaving Operator's Seat

- Select level surface when possible to park machine.
- Move Speed Shift to NEUTRAL.
- Apply parking brake.
- Lower bucket to ground.
- Stop engine.
- Move hydraulic control levers to relieve pressure.
- Set all control levers to hold position and apply each lever lock.
- Remove starting switch key so that prevent unauthorized starting or moving machine.
- Firmly place chocks against tires to prevent rolling, especially if parked on slope.
- Install all vandalism protection locks and covers.



■ **Operate Machine Only Operator's Seat**

Always sit in operator's seat when operating machine.
Do not operate any control lever while engine is stopping



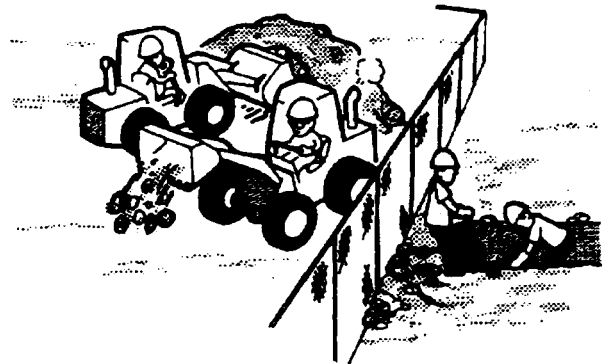
■ **Do not Allow People to Approach**

People will be in danger on work site. Do not allow any person other than guide to enter work site.



■ **Provide Protections Workers**

Do not allow person to approach operating machine.
Provide necessary protections for workers.
If necessary ask another person to direct and watch dangers.



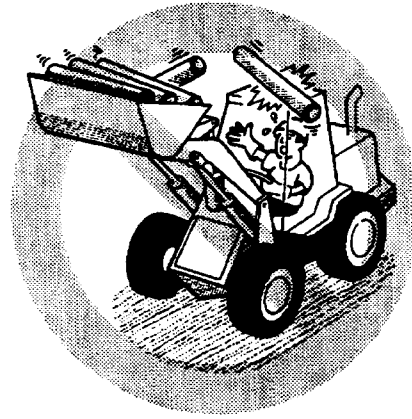
■ **Safety of Other Vehicles and Pedestrians**

When operating machine on road, take measures to protect pedestrians and passing vehicles from accident, such as, assigning signal person(s) or installing barrier. Signal person must be in direct communication with operator, and operator must work close attention to signals.



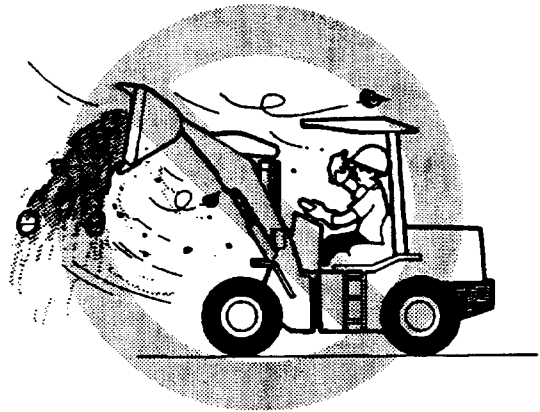
■ **Be Careful of Fall of Unstable Load**

When handling round or cylindrical objects, piled plates, and other unstable objects, they may fall onto operator's seat side in case bucket is raised high, resulting in serious injury or death. When handling unstable objects, exercise care so that bucket will not be raised excessively or tilted excessively backward.



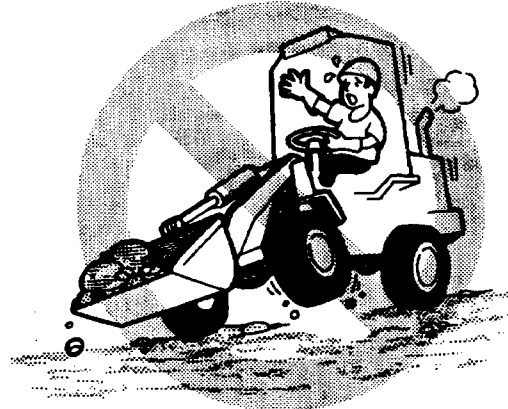
■ **Pay Attention to Wind Direction**

Entry of soil or dust into eyes causes an unexpected accident. Pay attention to wind direction. When loading/unloading, be sure to position bucket leeward so as to avoid dust blowing onto you.



■ **Avoid One-Sided Load**

Load bucket at center. Avoid one-sided loading. When surface is rough, drive machine carefully so as to keep load evenly in stabilized state.



■ **Stay Safe Distance from Slide Areas**

Pay attention to loosening of ground on cliff or road shoulder and do not approach such spot carelessly. Make sure footing is firm enough to avoid cave in. Machine may turn over because of landslide or dropping of wheel.




Safety Maintenance

1. Basic Understanding

■ Read “Maintenance” Section in This Manual and Fully Understand Contents.

Before maintain machine, carefully read manual (Maintenance section) and fully understands contents.

Any description marked with  in chapter is very important part for safety.

Be sure to observe these cautions.

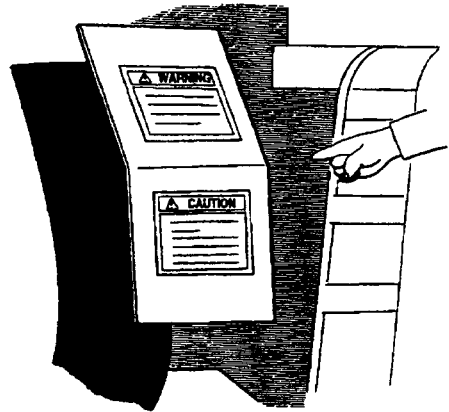


■ Read and Obey Safety Signs

Safety signs attached to machine provide important precautions for prevent personal injury.

Read safety signs before maintenance.

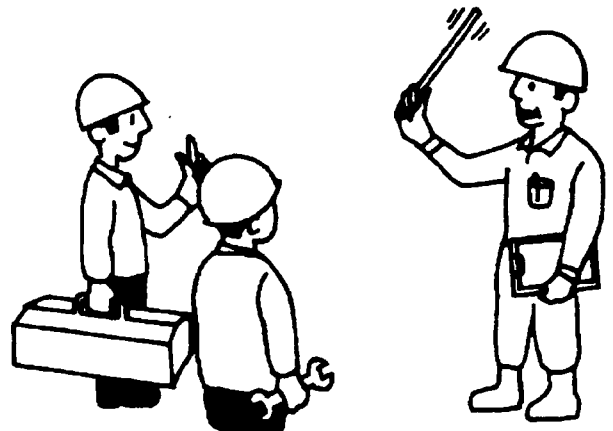
(See “Safety Signs”.)



■ When Working With Others

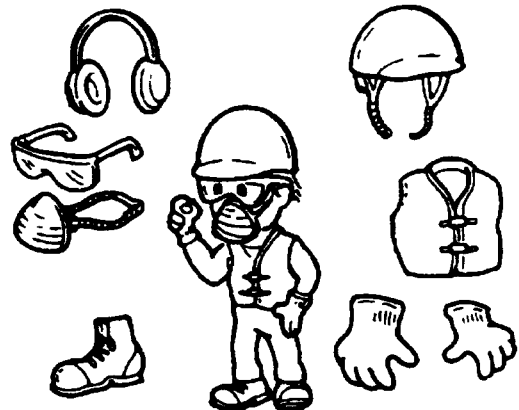
Follow job instruction when you work jointly with others on repair of machine or mounting/dismounting attachment.

Know what other people are doing.



■ Wear Protective Clothing

Wear hard hat, safety glasses, safety shoes, working gloves and other protective equipment, as required by job conditions.



■ Tire Maintenance

Tire and rim servicing can be dangerous, and should be done by well trained personnel using proper tools and procedures. Call your authorized dealer or qualified repair service to inspect rim and tire assembly and make necessary repairs.

For handling tires, be sure to see “**Precautions for Tire Maintenance**” .



● Monitor Lamps (Warning Indicator Lamps)

IMPORTANT

When trouble occurs in respective sections shown on monitor, sensor is activated and indicator light comes on. When indicator light comes on, stop engine immediately or run it at low idle and take appropriate corrective action.

① Engine Oil Pressure

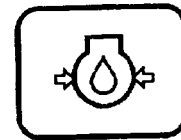
This indicator lamp shows that engine oil pressure is low. When oil pressure is low, monitor lamp comes on.

When indicator lamp comes on during operation, engine seizure may occur. Stop operation immediately, move machine to safe place and then stop engine to inspect it.

(Inspection)

- Check engine oil level. If it is not sufficient, supply engine oil.
- Check oil filter element for clogging. If replacement period has passed, replace oil filter element and oil.
- Check for oil leakage. If it is found, make repairs.
- Check sensor and oil filter switch for trouble.

If indicator lamp is still ON, contact with your TCM dealer.



NOTE

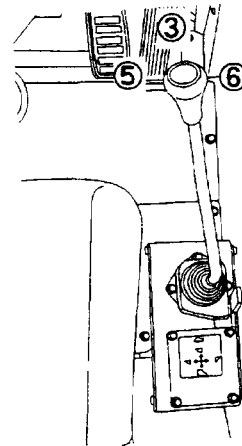
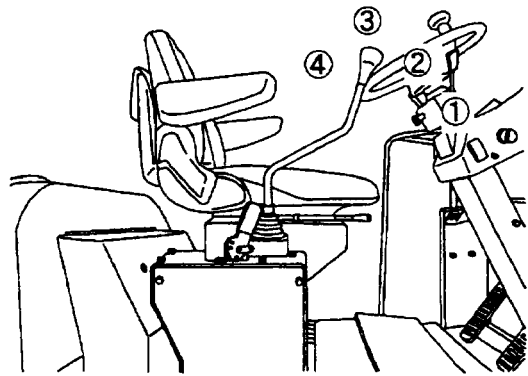
This indicator lamp comes on when starter switch is set to "ON/HEAT" position. After engine start, indicator lamp goes out if oil pressure is proper.

- Working Device Control Lever
- Control of Lift Arm

! WARNING

DO NOT place lever at "FLOAT" position when bucket is loaded. If lever is at "FLOAT", dropping speed cannot be controlled.

- ① **FLOAT** Push lever fully forward, it stops at "FLOAT" and lift arm moves freely with any external force remaining applied. Unless lever is held at "FLOAT", it returns to ③ "NEUTRAL" when released.
- ② **LOWER** Push lever forward, and lift arm is lowered. Release lever, and it returns to ③ "NEUTRAL".
- ③ **NEUTRAL**..... Lift arm and bucket remain at stop position. When you have stopped operation of "LOWER", "RAISE", or "TILT", "DUMP", lever returns to this position.
- ④ **RAISE** Pull lever backward, and lift arm is raised. Release lever, and it returns to ③ "NEUTRAL".



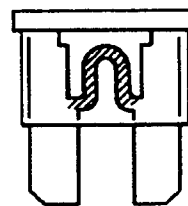
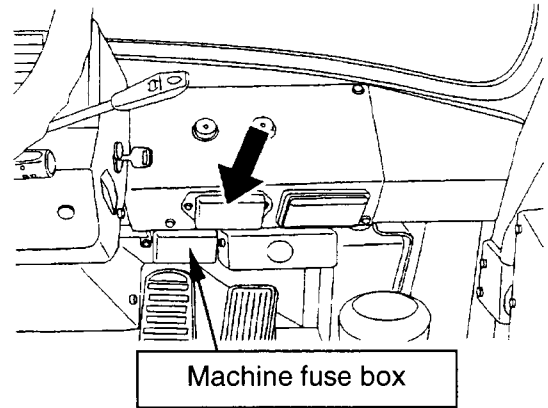
■ Fuse Box (Used Exclusively for Cab)

IMPORTANT

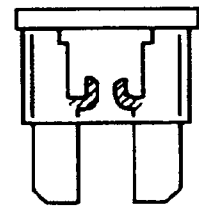
Before replacing fuses, be sure to turn off power (set starter switch to "OFF").

● Fuse Capacity and Circuit Name

NO	Fuse Capacity	Circuit Name
①	15A	Front wiper/washer
②		Radio
③		Front working lights
④		Room light
⑤		Rear wiper/washer
⑥		Optional power supply



(Right)



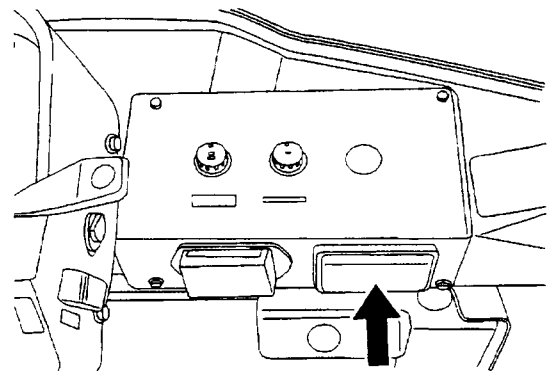
(Fuse has blown out.)

■ Ashtray

Ashtray is provided at right of operator's seat. Pull cover and use ashtray. If ashtray is not used, push it in.

CAUTION

Clean ashtray before it is filled with stubs. If a stub drops to catch fire, it is dangerous.



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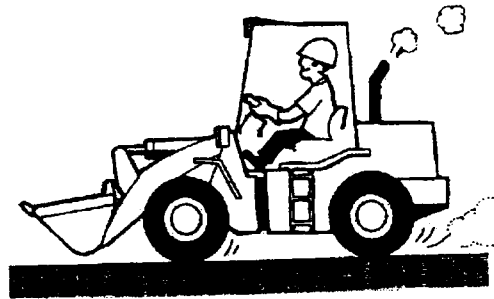
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■ Test Operating before Operation

Operate machine for trial in safe place and check for traveling of machine and for operation of various sections.

After warming up, operate working device control lever to move boom up and down, tilt bucket and carry out dumping several times.

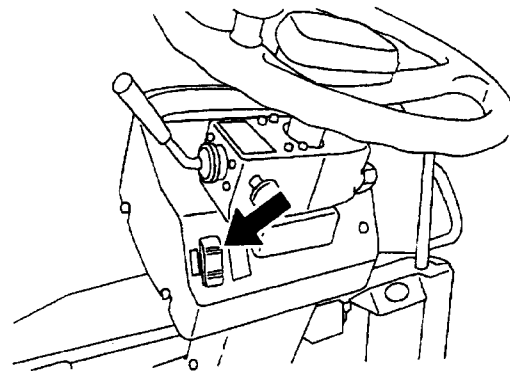
During this procedure, make sure that machine operates normally and each section is normal. Travel machine on a dry ground and apply service brake. Make sure that service brake is fully applied and that braking force is uniform on both sides.



■ Speed Change

 **WARNING**

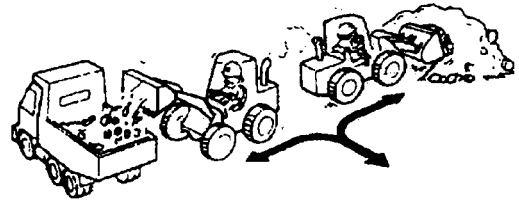
- Use “work mode” for excavation and loading.
- Use “travel mode” for high-speed traveling and light work.
- To travel on common roads, set a safe speed according to particular road conditions.
- Thoroughly understand relationship between traveling speed and stopping distance, and determine traveling speed according to working conditions and condition of traveling road.
- Enter “traveling mode” before traveling on a slope. Avoid entering “traveling mode” in middle of a slope.



Speed is automatically changed. By operating travel mode selector switch, two "modes" can be selected for forward and backward movement. Speed can be changed without stopping machine.

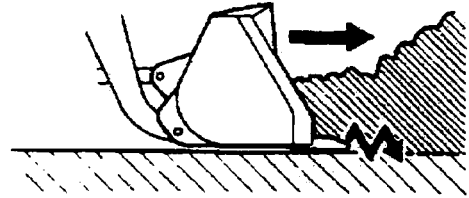
● **T-Pattern**

Park truck in parallel with stockpile.
Work between stockpile and truck.



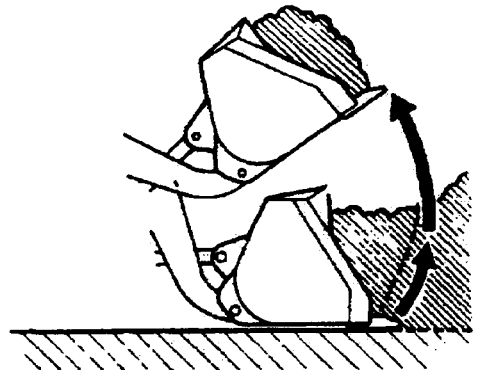
■ **Loading Truck with Deposites**

1. Level bucket and lower to ground.
Move machine forward, crowding bucket straight into pile.



2. Move forward moving cutting edge of bucket in vertical direction with working device control lever, and load bucket adjusting lift arm and bucket.

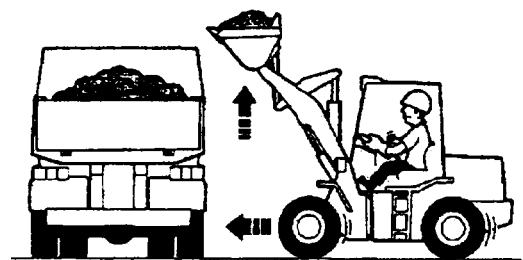
3. When bucket is loaded, place control lever in TILT BACK position and raise it high enough to clear material being loaded.
After filling bucket, move machine backward.



4. Carry loaded bucket approx. 40cm (16in) from ground level.

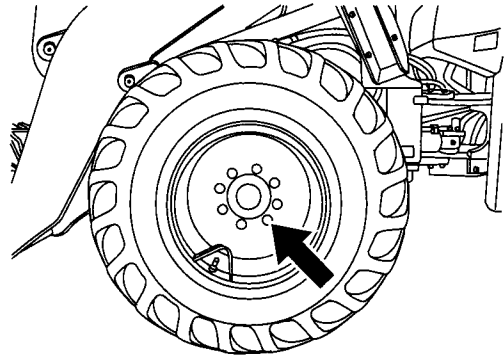
5. Park truck at position at which turning and traveling machine is minimized.
Move machine in direction of square to truck.

6. Travel forward to truck while raising bucket to clear truck sideboard.



■ **Remove Tire**

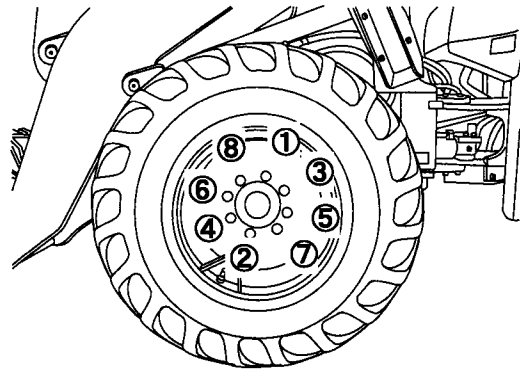
1. Lower working device on ground and apply parking brake.
2. Loosen all hub bolts by 1 turn.
3. Jack up machine and hold.
4. Remove hub bolts to replace tires.



■ **Install Tire**

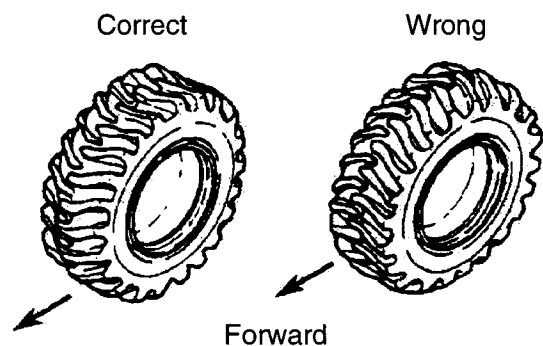
1. Tighten hub bolts lightly, while tires are raised up.
Order of tightening is shown in right figure.
2. After tightening hub bolts temporarily, lower machine.
3. Retighten them to specific torque.

Tighten torque: 588 - 637 N·m



■ **Tread Pattern Direction**

Pay attention to installing direction.



Handling of Quick Coupler

Mounting of the quick coupler on the tip of the lift arm enables simple and quick replacement of an attachment such as a bucket.

WARNING!

- When dismantling and mounting an attachment, do not allow people to enter between the quick coupler and the front attachment. Make sure that the area around the vehicle is clear of people before moving the vehicle.
- Disconnect and connect the hydraulic hose after the oil temperature declines.
- Wipe up any spilled hydraulic fluid since it can cause a fire.



Advice

Place a front attachment to be dismantled on a board such as a pallet to the greatest extent practicable. If the board is unstable, use a supporting wood to keep it level.

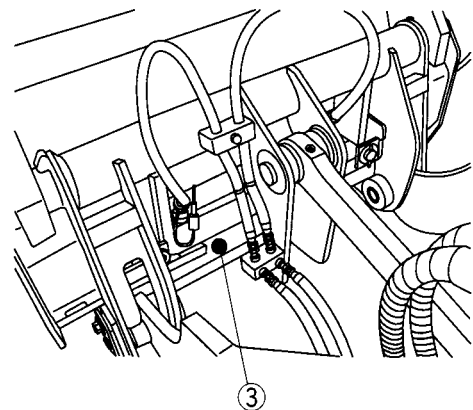
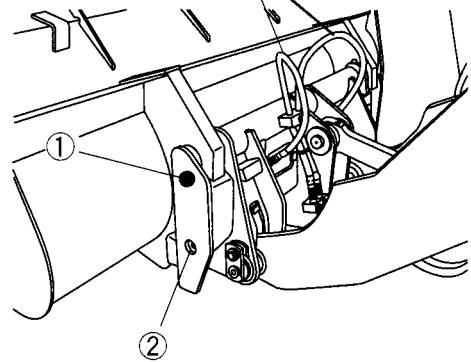
■ Quick coupler - HYD. Type

(Option)

- ① Master frame
- ② Coupler pins (right and left)
- ③ Clamp cylinder
- ④ Plates (right and left)

This is a quick coupler of hydraulic type which enables dismantling and mounting of a front attachment such as a bucket with one touch simple operation. Manipulation of the operation lever of the operational equipment (for triple or quadruple type) operates the clamp cylinder, and expand and contract the coupler pins on the right and left sides .

Hydraulic hose on vehicleMagnification of ①

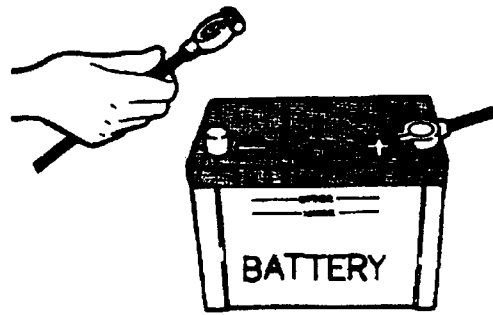


■ Use Nonflammable Oil to Clean Parts

Use nonflammable oil to clean parts. Do not use it for cleaning, gasoline is highly flammable.

■ Precautions for Welding

- Turn off starter switch.
- Do not apply 200V or higher voltage continuously.
- Take ground within 1 m from welding section.
- Do not locate seals or bearings in between weld and ground
- Remove negative ⊖ terminal of battery to stop flow of electricity.

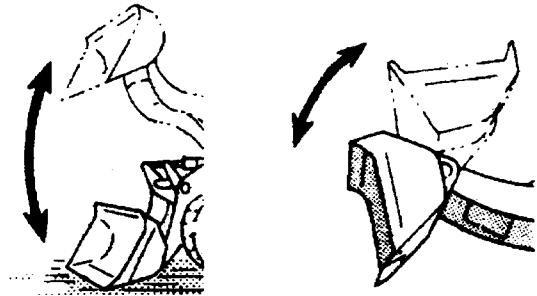


■ Air Bleeding

When oil in hydraulic oil tank or filters are replaced or when hydraulic cylinder or pipes are replaced, run engine at low speed after reassembly to bleed air from circuit.

1. Extend and retract respective cylinders 4-5 times so that they will not reach stroke end (stop cylinder travel approx. 10cm (3.9in) before stroke end).
2. Then move respective cylinders up to stroke ends 3-4 times.

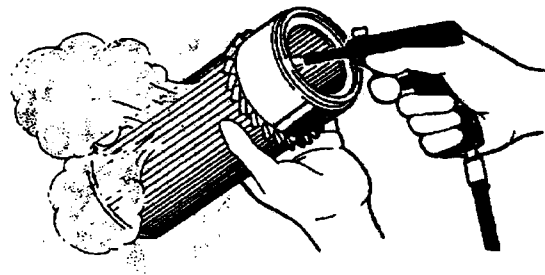
When greasing, wipe away the pushed-out old grease fully. Especially on a section where the adhered sand or dust causes the increased wear of rotary unit, wipe away the old grease carefully.



■ Precautions for Work in Dusty Place

Be careful of following when machine is operated in dusty place.

- Shorten service intervals for air cleaner element and radiator fins.
- Replace fuel filter in good time as well.
- Clean starter and alternator so that dust will not accumulate.



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■ Check and Adjust Tension of Fan Belt

WARNING

DO NOT check and adjust fan belt while engine is running.

IMPORTANT

- Excessive belt tension damages belt and bearing.
- **DO NOT** oil or lubricate belt. Belt will slip to shorten its life.
- Check pulleys for damage, as well as groove and belt for abrasion. Check to see if belt is in contact with bottom of groove.
- If belt is elongated to lose adjusting allowance, is cracked or damaged, replace it. When belt has been replaced, check the belt tension again after operation.

Fan pulley

Check fan belt for looseness and damage.

1. Push middle portion between fan pulley and alternator pulley at finger pressure of approx. 6~7kg (13~15 lbf) and check that flexure belt.

Flexure : 10 –12mm (0.39 – 0.47in)

2. If belt needs adjustment, loosen bolt ① and lock nut ②, move alternator and adjust flexure of belt. Don't push alternator directly with steel bar, etc. but push it via a wood piece, etc.
3. After adjustment, tighten bolt ① and nut ② securely.

Periodic Maintenance/500 Hours or 6 Months

At the same time carry out “Periodic Maintenance/100 Hours or 1 Month” and “Periodic Maintenance/250 Hours or 3 Months”.

Inspection window at left side of machine

■ Replace Fuel Filter Element



WARNING

Each section is hot right after engine has stopped. Wait until each section is cooled down before replacing fuel filter.

DO NOT put fire near machine.

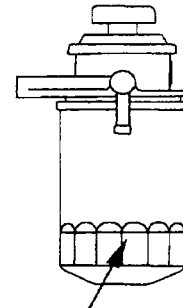
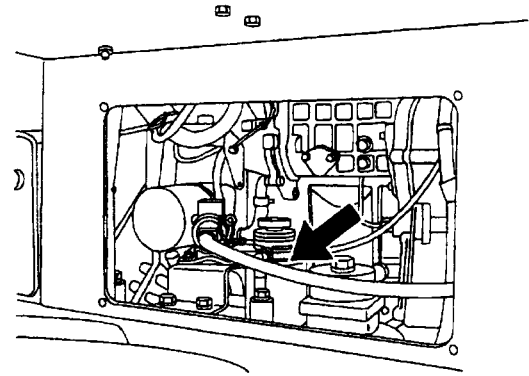
Spilt oil may cause fire. Wipe it off completely.

Before replacing fuel filter, set starter switch to “OFF” or disconnect ground harness of battery.

When cleaning with compressed air, wear protective glasses. Use compressed air of 200Kpa (30 PSI) or less.

IMPORTANT

After cleaning, DO NOT reuse fuel filter.



Filter element

Fuel filter separates and removes sediment and moisture from fuel. Fuel filter may become clogged with foreign substances during a long time operation. Fuel filter must be replaced at fixed intervals to prevent such clogging.

1. Place a container to receive drained oil under fuel filter.
2. Turn filter element counterclockwise (as viewed from below) to remove it. If it is difficult to remove filter element, use a filter wrench.
3. Apply fuel thinly to packing surface of new filter element.
4. Clean filter mounting and install a new filter element by turning it clockwise. When packing surface is in contact with seal surface of filter mounting, tighten filter element by about 2/3 turns. If tightened excessively, packing is damaged to cause oil leakage. Be careful not to tighten filter element excessively.

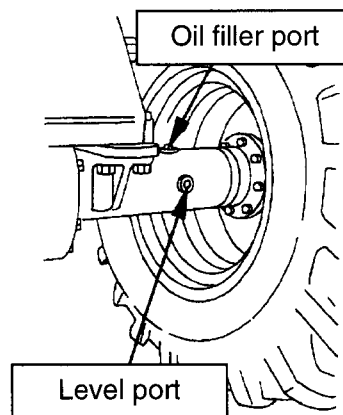
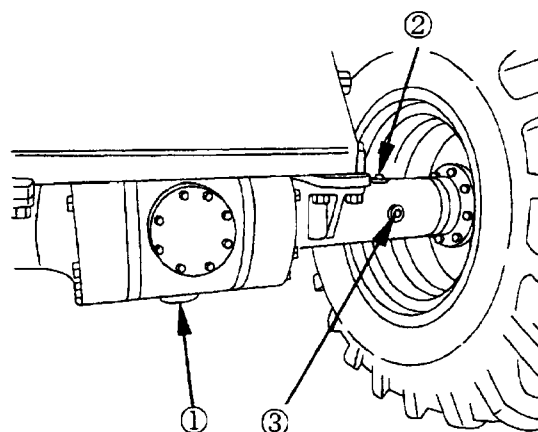
Change Axle Oil

! WARNING

- Oil is hot right after operation. Wait until oil is cooled down before changing it.

- Front axle**
If oil can be changed only when lift arm and bucket are lifted, lock working equipment control lever and safety bar, stop engine and apply chocks against tires to prevent moving to tires. Moreover, use a support stand, to prevent working equipment from lowering.
- Rear axle**
When tires removed and then oil is changed, axle height must be same at right and left horizontally. Use a support stand, etc. to make a stable condition.

- Place a container under drain plug ① to receive drained oil.
- Remove right and left oil filler port plugs ② and then remove drain plug ① to drain the oil.
- After draining, clean drain plug ①, Apply seal tape around plug and tighten it.
- Remove right and left level plugs ③ and then supply oil through oil filler port up to specified quantity. Supply oil until oil comes out a little from right and left level ports.



Required oil q'ty L (gal)	
Front axle	Rear axle
9.5 (2.5)	9.5 (2.5)

■ Clean Fuel Tank

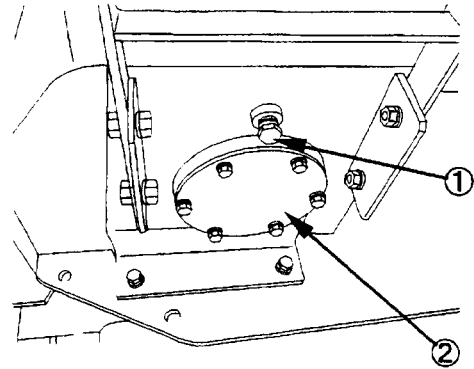


WARNING

Fuel is flammable. When servicing fuel system, turn OFF starting switch key and keep open flames away from machine. Spilt fuel will cause fire, wipe it away completely.

If engine does not start smoothly or output is insufficient due to poor fuel supply, check and clean fuel tank.

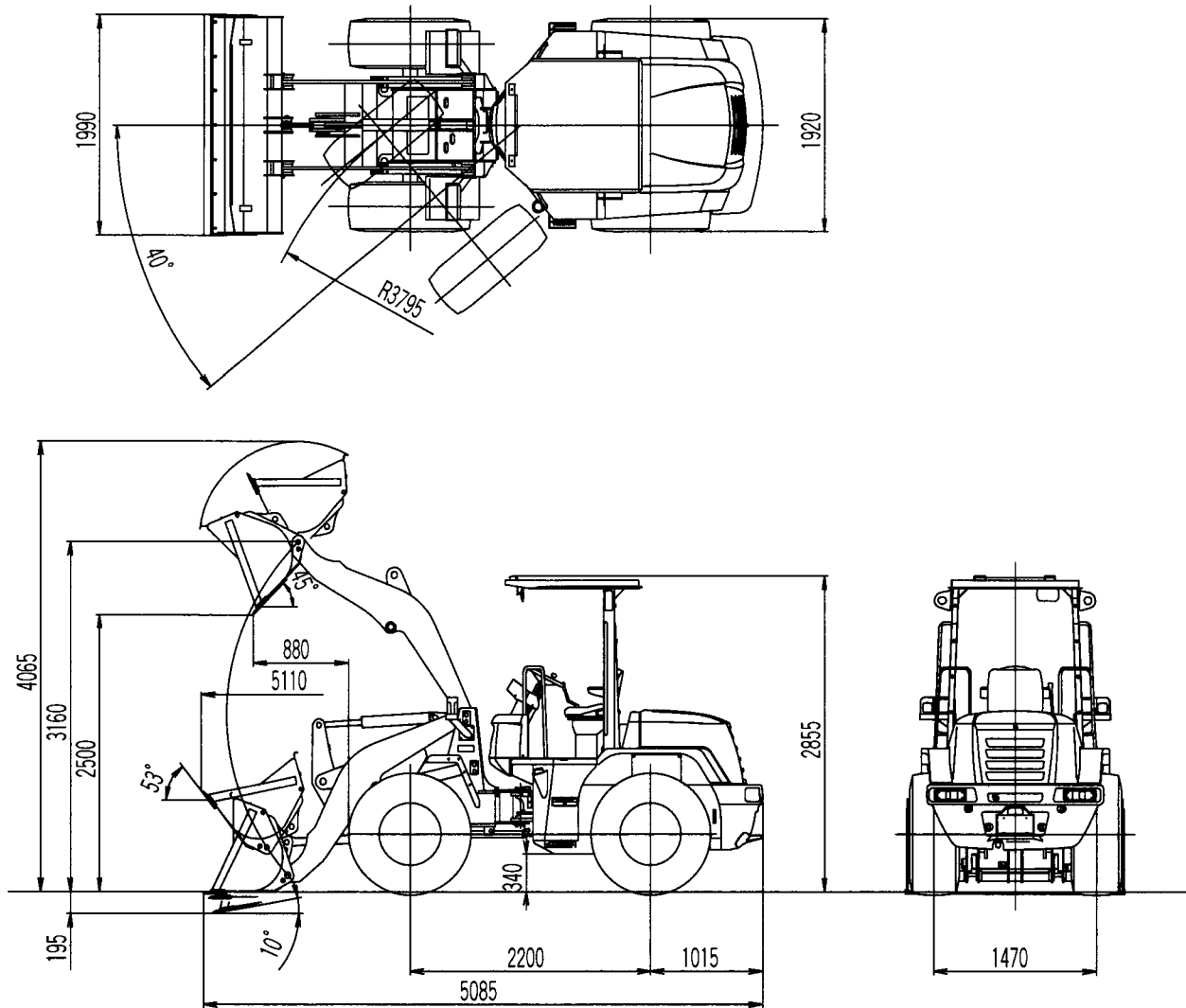
1. Place a container under drain plug ① to receive drained fuel.
2. Remove drain plug ① and drain fuel.
3. Remove lower cover ②.
4. Clean inside of tank with non-flammable solvent and remove dust accumulated in bottom of tank.
5. Apply seal tape around drain plug ① and tighten it.
6. Install cover ② and supply fuel. Replace O-ring of cover ②, if it is damaged.
7. Bleed fuel system of air and make sure that fuel does not leak. Refer to "Bleed air from fuel system".



Specifications

■ Specifications

● E820-2



Bucket capacity (with BOC)		0.9m ³ (1.18 yd ³)	
Operating weight		5,260kg (11,600lbs)	
Engine	Maker/Model	KUBOTA V3300-DI	
	Flywheel power/Rated speed	44.1kW (59.2HP)/ 2,200rpm	
	Piston displacement	3,318 cc (202.5in ³)	
	Fuel tank capacity(Light oil)	75 L (19.8U.S.gal)	
Performance	Operating load	1,440kg (3,180lbs)	
	Max. drawbar pull	4,750kg (10,770lbs)	
	Travel speed	1st gear F&R	12.0km/h (7.5mph)
		2nd gear F&R	34.0km/h (21.4 mph)
	(2 forward & 2 reverse)		
	Gradeability	30°	
Turning radius (center of outside wheel)	3,795mm (149.5in)		
Articulation angle		40°	

Overall length (with BOC at ground)	5,085mm (200.2in)
Overall width (Bucket)	1,990mm (78.3in)
Overall height (Canopy)	2,855mm (112.4in)
Wheelbase	2,200mm (86.6in)
Ground clearance	340mm (13.4in)
Dumping clearance (with BOC)	2,500mm (98.4in)
Dumping reach (with BOC)	880mm (34.6in)
Bucket hinge pin height (Max.)	4,065mm (160.0in)
Battery	24V-306×2
Transmission control HST	HST (Electrical)
Tire size/Pressure (standard)	17.5/65-20-10PR 38PSI

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