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85ZV-2

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OPERATION & MAINTENANCE MANUAL

WHEEL LOADER

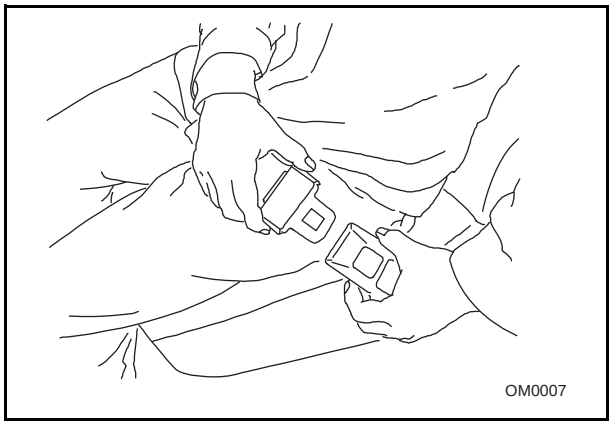
85ZV-2

Powered by CUMMINS QSC8.3 Engine

Serial No. 85C5-9201 and up

NOTICE

READ AND UNDERSTAND THIS MANUAL BEFORE OPERATING AND SAVE THIS MANUAL ON THE MACHINE



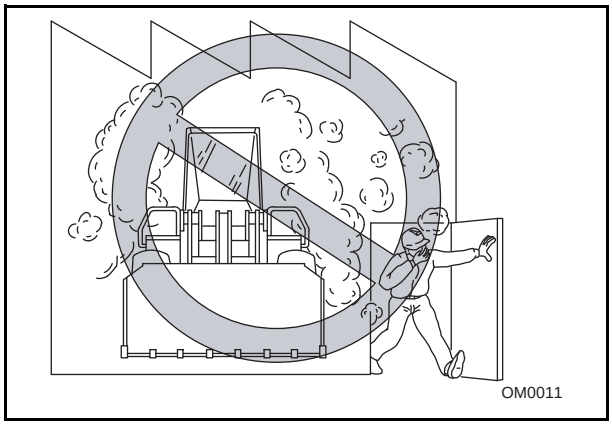
Adjust the seat, seat belt and steering column, mirrors, etc.

Properly fasten the seat belt.

OM0182

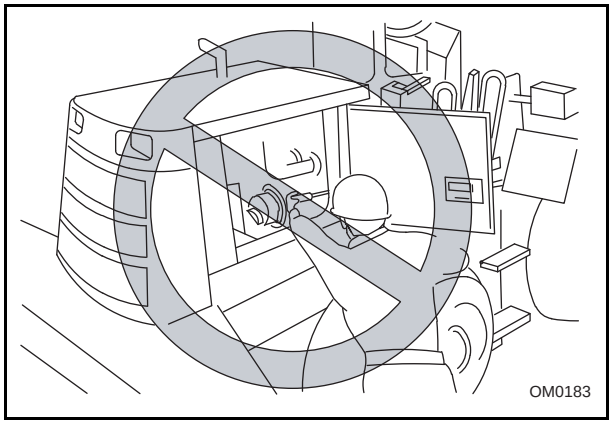
Do not start or operate the machine if a "DO NOT START" or a "DO NOT OPERATE" tag is on the key switch, steering wheel or controls.

Do not operate the engine where there are or can be combustible vapors. These vapors can be drawn through the air intake system and cause engine overspeeding, which can result in a fire, and explosion.



Do not start to work in an enclosed area if adequate ventilation is not provided. Fumes could build up during operation that could cause drowsiness, injury, or death.

Blow the horn for a few seconds just before starting the engine to alert bystanders.



Start the machine only from in the operator's seat.

- Do not reach through the window to start.
- Do not stand on the ground and start.
- Never attempt to start by shorting across the starter motor terminals since this can bypass the neutral start safety device.

If jumper cables are required to start the engine, follow the correct procedure in "Booster Batteries / Jumper Cables" page 2.103.

Do not operate the engine where there are or can be combustible vapors. These vapors can be drawn through the air intake system and cause engine overspeeding, which can result in a fire, and explosion.

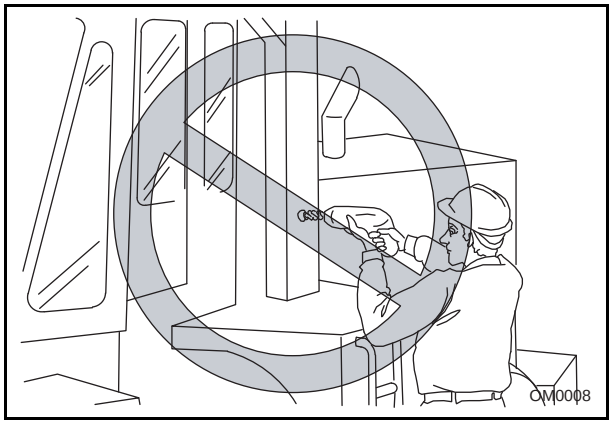
To prevent ignition, use the luminaire when checking oil, cooling water, fuel and battery electrolyte level.

Move ignitable things to a safe place when grinding welding or gas cutting.

Charge a battery at well ventilated place and keep fire away from it during charging.

Other Maintenance Safety Concerns

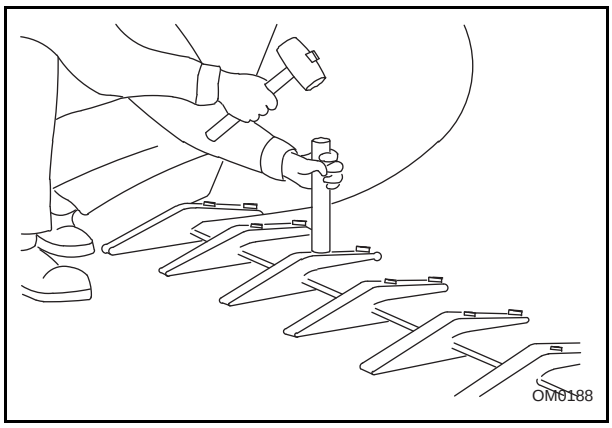
Periodically check the ROPS bolts (if equipped) to be sure they are in place and tight.



Never weld, drill or in any way modify the ROPS without approval from the manufacturer.

Stop the engine before opening the engine access panel.
Contact with belts, pulleys, or other moving parts will cause injuries.

During servicing, inspect the wiring harnesses, connections and wires and replace any that may be chafed, or tighten any that may be loose.



Keep the area clear of bystanders and wear eye protection when striking pins, teeth, or cutting edges during removal or installation. Metal pieces can fly off and cause injury. Use a brass drift or a dead blow hammer as required by the job.

Keep the area clear of bystanders and wear proper eye protection and protective clothing when grinding or welding.

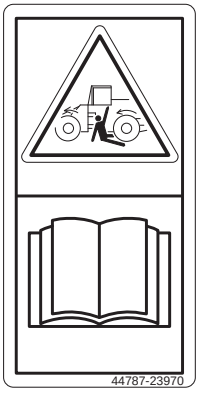
12.

⚠WARNING

Compressed spring may accidently be released and could result in death or serious injury.

Read Shop Manual before repairing this part.

13.



⚠WARNING

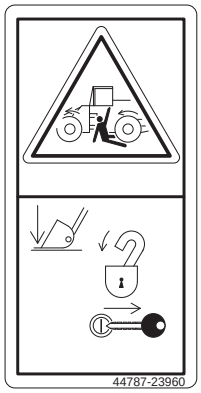
Machine movement, if engine starts in gear, could result in death or serious injury.

- Do not start engine by shorting across starter terminals.

- Do not start engine while standing on ground.

Make sure to start engine only from operator's seat with transmission in neutral and parking brake applied.

14.

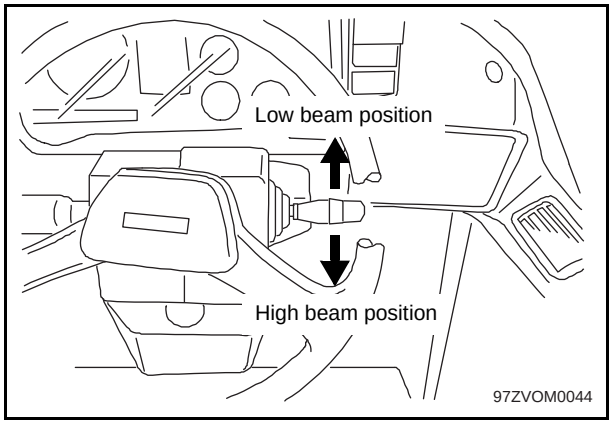


⚠WARNING

Accidental movement of machine could result in death or serious injury.

Before checking transmission oil:
- Park on level ground.
- Lower attachment to ground.
- Place transmission in neutral.
- Set parking brake.
- Tag "Do Not Operate."

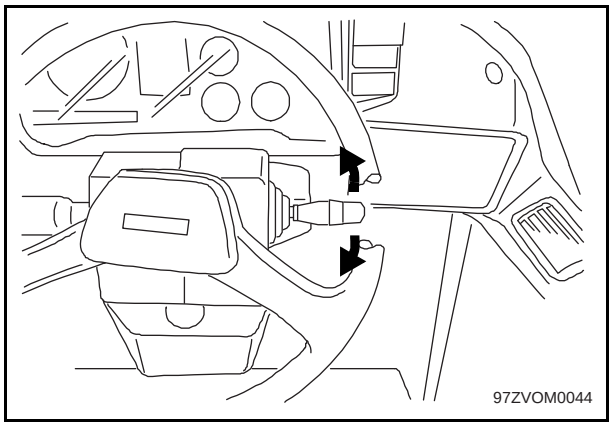
3. High-Low Beam Lever / Turn Signal Lever



This lever is used to change the head lights beam high and low. This lever also turns on the turn signals.

- The head lights are in the high beam position when the lever is pushed down (low position).

- The light switch can be operated regardless of the lever position.



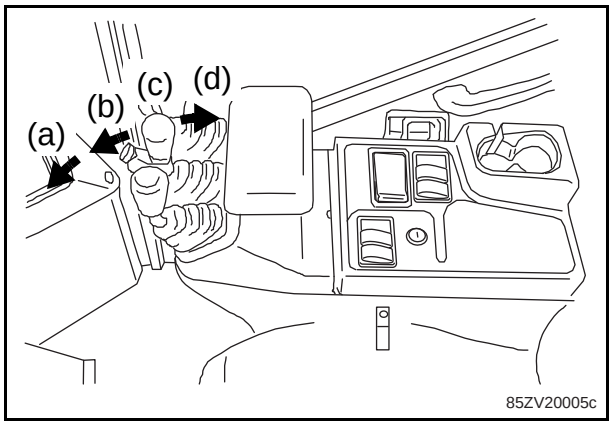
- Push the lever forward to turn on the left turn signal.

- Pull the lever backward to turn on the right turn signal.

- Return the lever to the center position when the turn is completed. The lever does not return automatically when the steering wheel is returned to center.

4. Boom Control Lever

Boom control lever is used to control the boom movement.



(a) Float
- Move the lever to full forward detent position. The boom will lower and move freely following the ground surface.

- An automatic boom height positioner is provided which will automatically release the detent and return the lever to the "Hold" position when a preset boom height is reached.

(b) Lower
- Move the lever forward. The boom will lower. When held in this position, down pressure will be applied to the attachment.

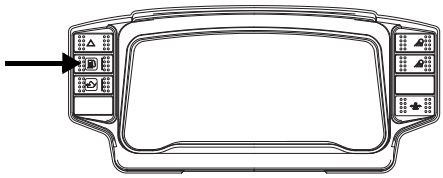
- An automatic boom height positioner is provided which will automatically release the detent and return the lever to the "Hold" position when a preset boom height is reached.

(c) Hold
- Return the lever to the center position. The boom will stop and remain in that position.

(d) Raise
- Move the lever rearward. The boom is raised. When pulled fully back it is held in a detonated position.

- An automatic boom height positioner is provided which will automatically release the detent and return the lever to the "Hold" position when a preset boom height is reached.

6. (FE) Fuel Efficient Mode Switch



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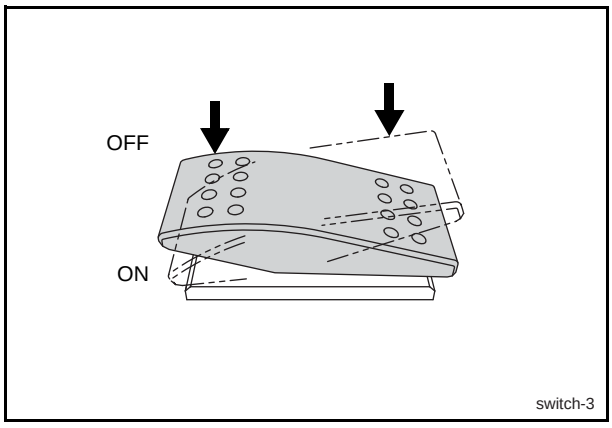
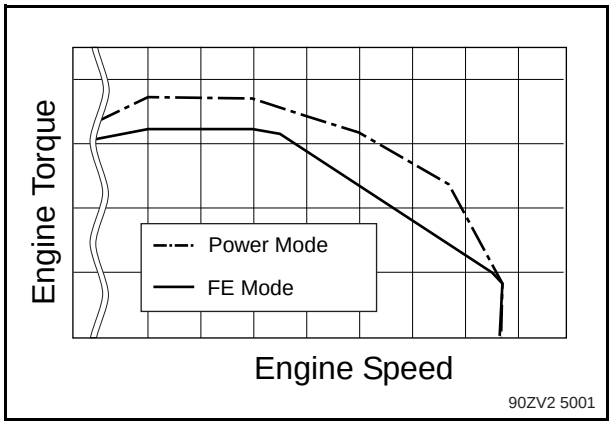




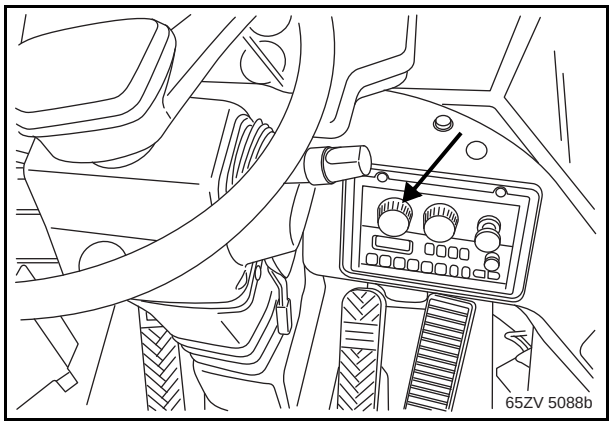
The operator can select either "Power" or "Fuel Efficient" (FE) engine mode.

Power mode provides added power for extreme applications.

Fuel efficient mode offers better fuel economy for standard applications.

When this switch is turned "ON" the switch lamp lights up and the engine power is reduced to provide better fuel economy.

7. Front Wiper Switch



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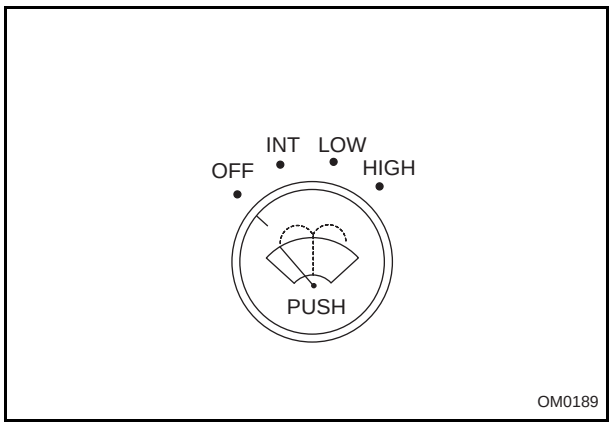
Front wiper switch is used to wipe the front windshield and spray solvent.



OFF :

INT : Intermittent

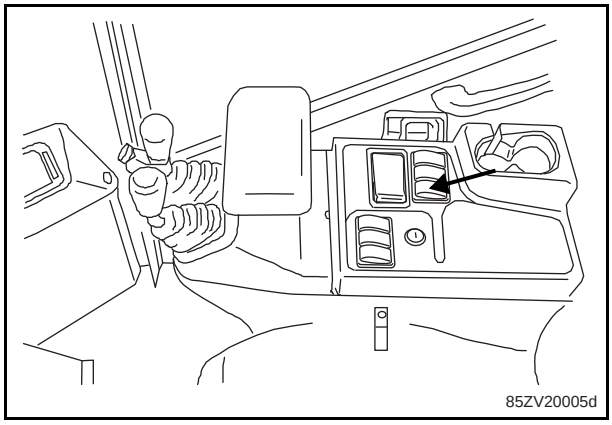
LOW : Low speed

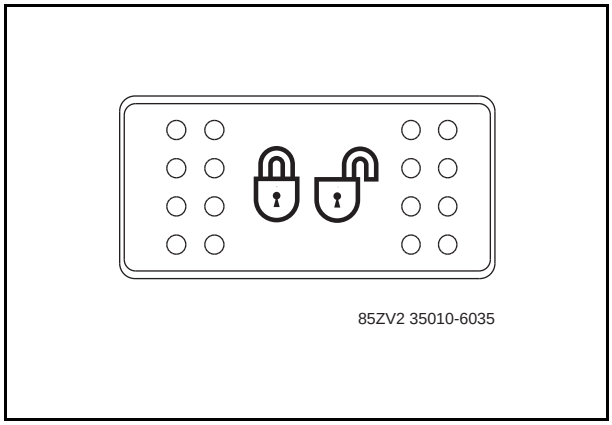
HIGH : High speed

PUSH : Spraying solvent on the windshield

21. Quick Coupler Lock Pin Switch (option)

Quick coupler lock pin switch is used to lock/unlock the quick coupler for 2-way piping specification machine with quick coupler.





(🔒) The lock pin is fixed.
(N) In neutral position (when the switch is kept parallel.), the lock pin is held on the position.
(🔓) The lock pin is disconnected.

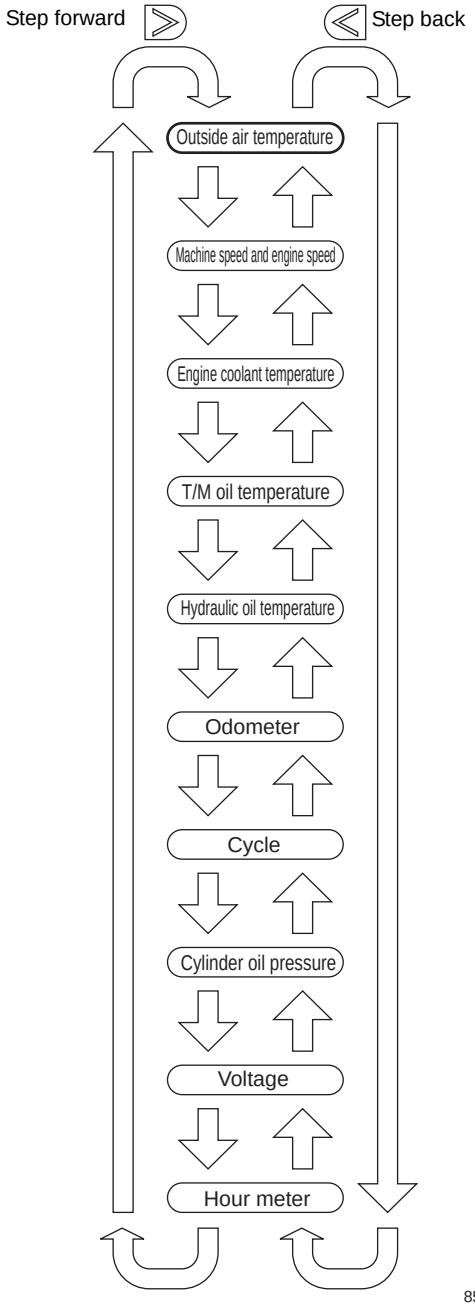
NOTE
During the operation of the switch, keep the bucket control lever on the "Roll Back" position.

Information Monitor

Information monitor display

When the starter switch is ON, the outside air temperature is displayed.

Every time the [⩥ (step forward)] button is pressed or every time the [⩤ (step back)] button is pressed, the displayed contents are changed over in sequence as below.



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1. Outside air temperature

90ZV-262024

The monitor displays the current outside air temperature when the starter switch is ON.

Press the [◎] button to change over the display unit from "ºC" to "ºF". Press the [◎] button again to return the display unit from "ºF" to "ºC".

2. Machine speed and engine speed

90ZV-262025

Press the [◎] button to change the display unit from "km/h" to "mile/h"

Press the [◎] button again to return the display unit from "mile/h" to "km/h".

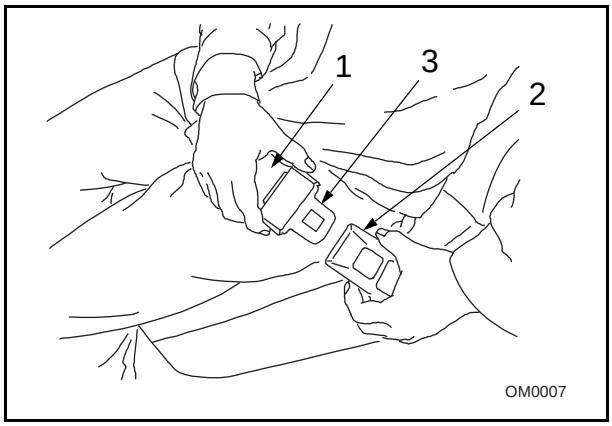
For speed to be accurate, the correct tire size must be entered into the main MCU via this MODM unit.

Seat Belt

⚠ WARNING

Improper use or maintenance of seat belt could result in death or serious injury.

- Inspect seat belt and mounting hardware before operating machine and replace any defective components.
- Always fasten seat belt when operating machine.
- Properly adjust seat belt at beginning of each shift or when operator changes.



1. Pull at seat belt (1) and fasten it along your body without kinking or twisting it.
2. Hold buckle (2) and insert belt end (3) into buckle (2). Be sure it locks securely.
3. For releasing the seat belt, press the "press button" in buckle (2) and remove belt end (3) from buckle (2).

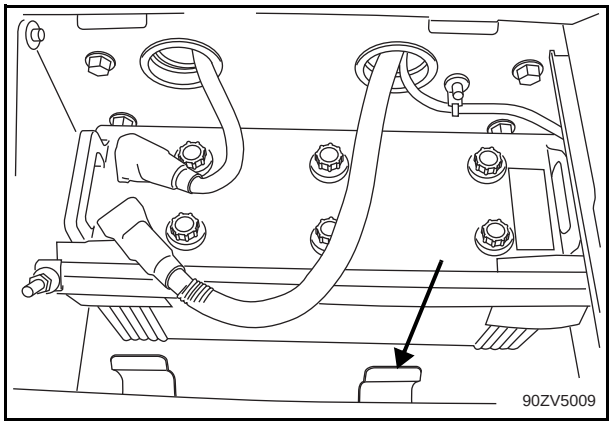
The tether is inside the seat boot.

No adjustment necessary.

2.54
OPERATOR'S AREA
Radio - AM / FM Cassette (24Volt Type) (option) (~December, 2009)

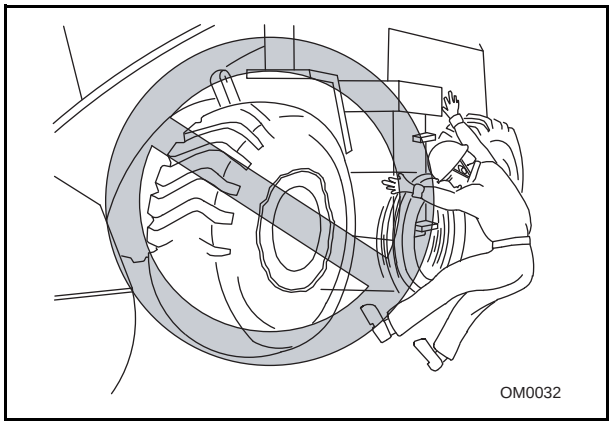
Symbol	Name of part	Function	Operation method	Description	Remarks
18	5 DD Preset 5 Dolby button	In radio mode: Recalling and storing preset memories	PUSH	Push the button for less 2 sec. to recall preset stations. Pushing the button for 2 sec. or longer will generate a beep sound and the currently tuned station will be stored.	
		In cassette tape mode: Turning on/ off	PUSH	Every time the button is pushed, DOLBY will be turned on or off alternately. Pushing the button for 2 sec. or longer will generate a beep sound and the currently tuned station will be stored.	
19	6 ▶▶I APC Preset 6 APC button	In radio mode: Recalling and storing preset memories	PUSH	Push the button for less 2 sec. to recall preset stations. Pushing the button for 2 sec. or longer will generate a beep sound and the currently tuned station will be stored.	
		In cassette tape mode: APC FF	PUSH	Push the button to search for the beginning of the next music track. In APC FF mode, pushing the button again will search for the next-alternate music. (Every time the button is pushed after that, the number of music tracks to search for will be increased by 1.)	
		In CD mode: TRACK UP QUE	PUSH	Push the button for less 2 sec. to search for the next music track. Push the button for 2 sec. or longer to wind forward the music.	No beep sounds
20	Tape insertion slot	Cassette tape insertion slot		Insert the cassette tape with the open side of the cassette tape faced rightward to play the cassette tape.	Auto metal
21	LCD indicator	indicator		Displays time, frequency, etc.	
	Beep tone (guide tone)			A beep sound will be generated when functions are changed depending on the push time of the button. (Approx. 2KHz, 50ms)	

Grease Gun Holder



Grease gun holder is provided in the left side battery box. It is used for keeping the grease gun on the machine when not in use.

Check Tire for Damage, Air and Tread Depth



⚠ WARNING

Improper service or changing tires and rims could cause explosion resulting in serious injury or death.

Do not service or change tire and rims unless properly trained and equipped.

Contact your nearest Kawasaki dealer or tire manufacturer's local dealer for tire servicing or changing.

⚠ WARNING

Overheated tire could explode causing serious injury or death.

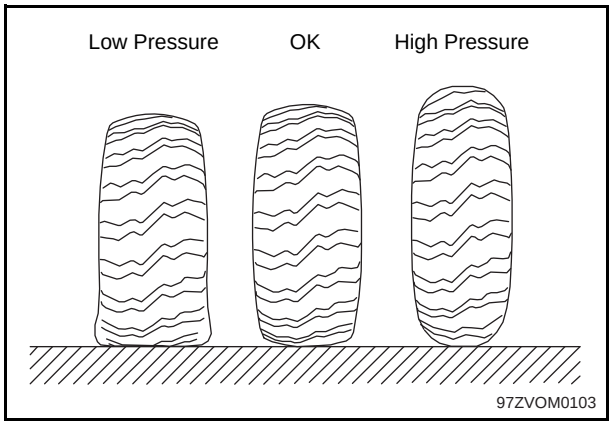
If overheated tire is suspected, do not approach tire to distance of less than 15 m.

Stay away until tire and rim cool down.

⚠ WARNING

Serious injury may result from tire failure due to underinflation/overloading or excessive speed.

Consult your tire dealer or Kawasaki dealer.



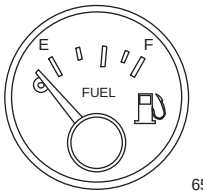
Tire performance and its life depend greatly on the tire air pressure.

It is important to keep the tire pressure at the recommended level.

Under the abnormal condition, check and adjust the air pressure to the standard value.

Refer to "Check Tire Air Pressure" page 3.25 for the adjusting procedure.

Check Fuel Level



1. Check the fuel level with the fuel gauge on the instrument panel.

2. Add fuel to fill the tank if the gauge shows below "F".

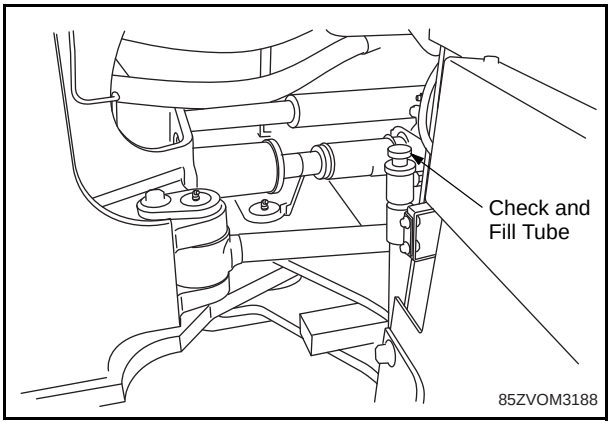
   Refer to "Recommended Lubricants" page 3.58 for the proper fuel.

Check Transmission Oil Level

⚠ DANGER

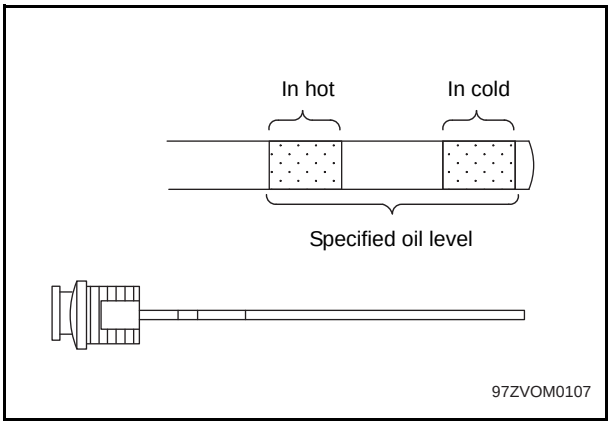
There is no room in articulation are when machine is turning.
Crushing will result in serious injury or death.

When checking oil level:
- Low attachment to ground.
- Put transmission shift lever in neutral.
- Apply parking brake.
- Place "DO NOT OPERATE" tag on steering wheel.
- Make sure nobody is on machine.



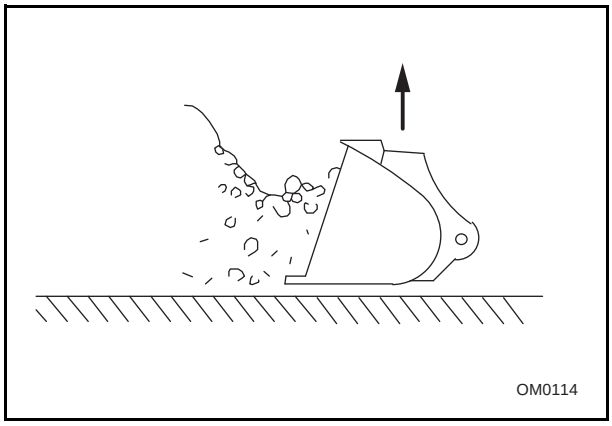
1. Park the machine on level ground, apply the parking brake, and lower the attachment to the ground.

2. Check the oil level with engine at low idle.



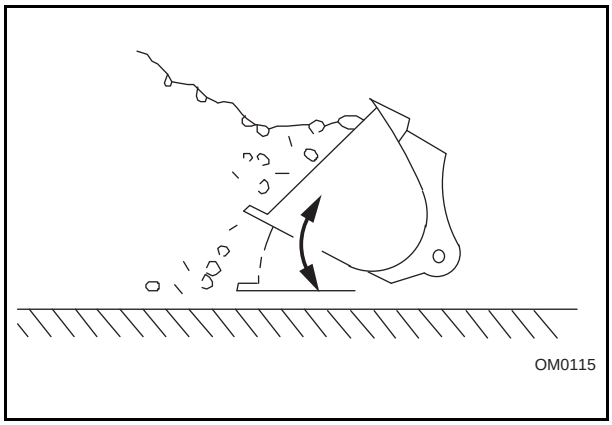
3. At low oil temperature, use the side of dipstick marked "COLD". Normal oil level is within shaded area as shown.

4. Drive the bucket straight into the material. Use approximately 1/2 - full engine speed.



5. Move the boom control lever to the "Raise" detent position and run the machine forward slowly in 1st or 2nd speed.

   Reduce wheel slippage by slightly reducing engine speed.

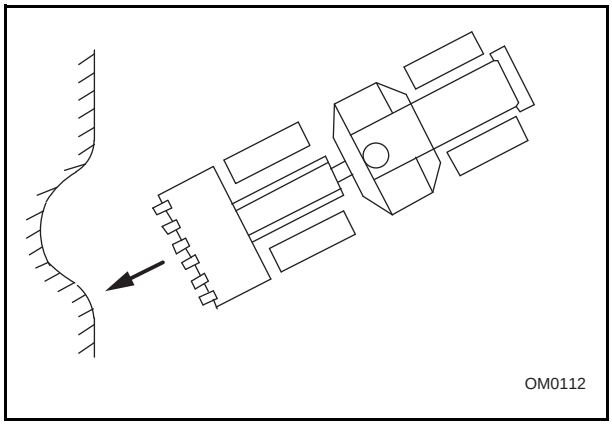


6. Move the bucket control lever to the "Roll Back" and the "Hold" position several times to get more material in the bucket.

7. When the bucket is filled, move the bucket control lever to the "Roll Back" position.

8. Release the bucket control lever to the "Hold" position and the boom will rise.

9. Reverse the machine.



10. On later passes, aim the center of the bucket at the protruding portion of the material.

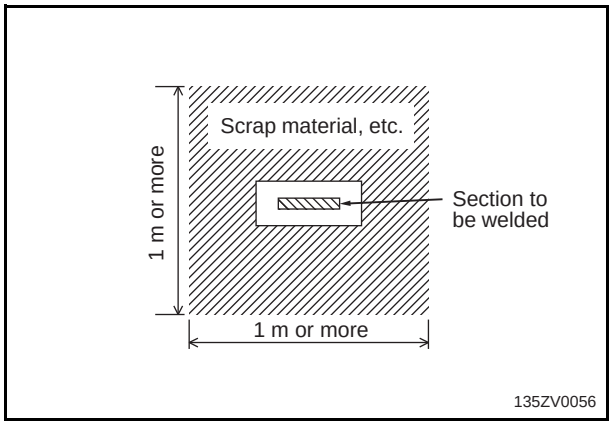
11. Start the machine being boosted as described on "Starting the Engine" page 2.79.

12. As soon as the engine starts, disconnect the jumper cables in the reverse order (Step 8, Step 7, Step 6, Step 5).

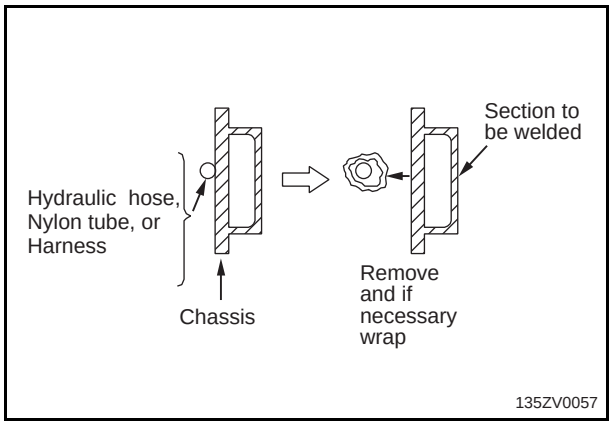
13. Remove the damp cloth and replace the protective covers over the battery terminals and close the battery box covers.

14. Test the starting / charging system to determine the cause of the problem and correct it.

NOTE
The weld spattered on the plated sections causes corrosion.



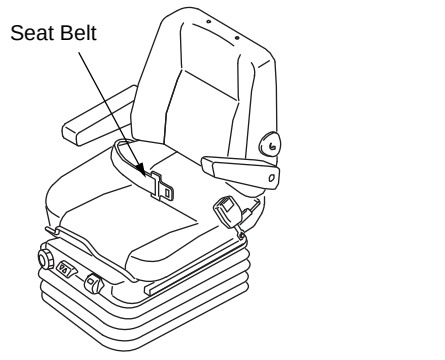
- Cover the hydraulic units, electrical units, harnesses, hydraulic hoses, nylon tubes, etc. with heat-resistant cloth (glass wool or canvas) or scrap material to protect them from spatter.



- Hydraulic hoses, nylon tubes, or harnesses are easily damaged by the heat during welding. To protect them from the heat, remove them from the section to be welded to make enough clearance.

NOTE
You must change the welding rod grade depending on the welding part and place. Should you have any question regarding the welding repair service, please contact KCM dealer in your area during business hours.

Check and/or Replace Seat Belt



1. Inspect the condition of seat belt and all mounting hardware frequently.
2. Replace seat belt or any part of the mounting hardware if it is damaged.
3. Replace seat belt every three years regardless of its condition or appearance.

Clean or Replace Air Cleaner Element

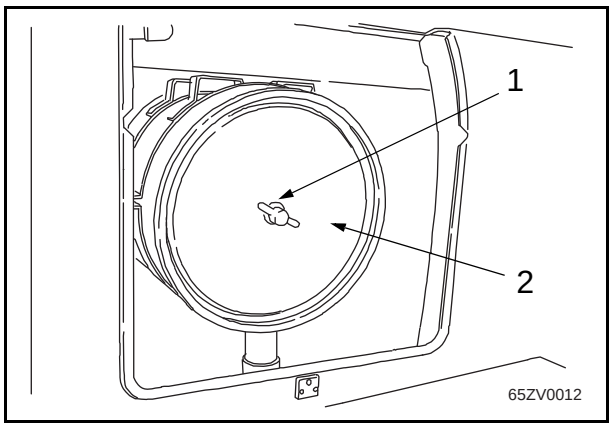
When the warning monitor lamp lights up, clean or replace the air cleaner element.

IMPORTANT

Improper procedure of cleaning air cleaner may cause severe engine damage.

- Do not clean or replace air filters while engine is running.
- Clean only outer element. Never clean inner element.
- Clean or replace element only when indicator lamp comes on.
- Never clean the elements by bumping or hitting them against a solid surface.

1. Park the machine on level ground, apply the parking brake, lower the attachment to the ground, and stop the engine.



2. Remove cover (2) by loosening wing nut (1).
3. Remove the outer element.

Every 10 Hours or Daily

⚠ WARNING

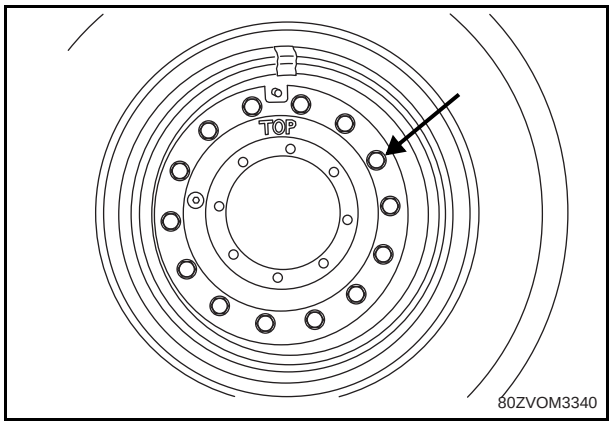
Improper inspection or maintenance could result in death or serious injury.

Read, understand, and follow all warnings and instructions contained in "Safe Maintenance" page 1.12 before performing any inspection or maintenance procedures.

See "Check before Operation" page 2.69 and "Check after Starting the Engine" page 2.83.

Check Tightness of Wheel Bolts

1. Park the machine on level ground, apply the parking brake, lower the attachment to the ground, and stop the engine.



2. Check the wheel bolts are tightened to 892 N-m.

3. Retighten if necessary.

Check and Adjust Air Conditioner Belt

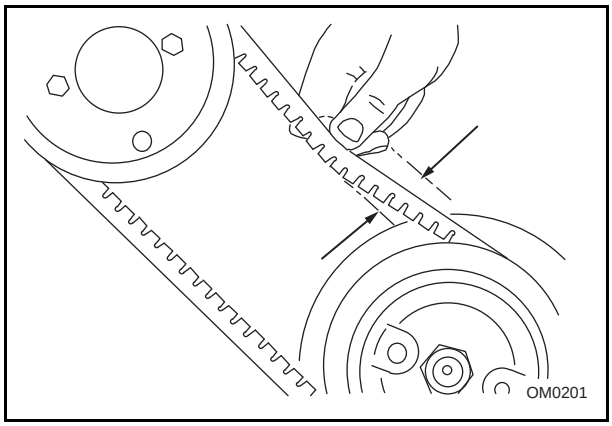
⚠ CAUTION

Contact with moving belts or pulleys may cause injuries.

Stop engine before opening engine access panel.

1. Park the machine on level ground, apply the parking brake, lower the attachment to the ground, and stop the engine. Remove the key and page "Do Not Start" tag on the instrument panel.

2. Open the engine access panel.



3. Visually inspect the compressor belt on both top and bottom sides for looseness and damage.

4. If the belt is too stretched to permit adjustment or shows cuts or cracks, replace it and adjust the tension correctly.

5. Measure the belt tension using a belt tension gauge so that it is applied 353±88 N (initial tension : 559±108 N).

Every 1000 Hours or 6 Months

⚠ WARNING

Improper inspection or maintenance could result in death or serious injury.

Read, understand, and follow all warnings and instructions contained in "Safe Maintenance" page 1.12 before performing any inspection or maintenance procedures.

Every 1000 hours or 6 months, whichever comes first, perform the following inspection and maintenance in addition to the "Daily", "50 hours", "250 hours", and "500 hours" inspection and maintenance.

Replace Transmission Oil

⚠ WARNING

Accidental movement of machine could result in death or serious injury.

When inspecting or servicing machine in articulation area:
- Lower attachment to ground.
- Put transmission shift lever in neutral.
- Apply parking brake.
- Make sure nobody is on machine.
- Place "DO NOT START" or "DO NOT OPERATE" tag on steering wheel.

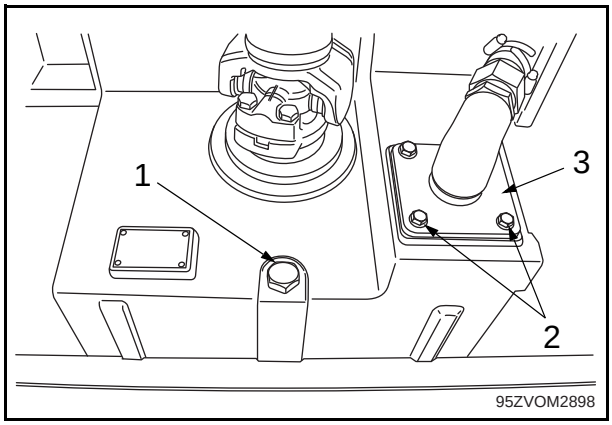
⚠ CAUTION

Transmission oil may be hot and may cause burns.

Avoid contact with transmission oil.

1. If the machine is cold operate the machine for a few minutes to bring the transmission oil temperature about 30~40ºC.

2. Park the machine on level ground, turn "ON" the parking brake switch, lower the attachment to the ground, and stop the engine.



3. Remove drain plug (1) with a 36 mm wrench.

4. Drain oil into a suitable container (about 38 liters).

   Properly dispose of or recycle the waste oil.

5. Loosen four bolts (2) with a 14 mm wrench.

4. Drain the oil (about 47 liters) into a suitable container.

5. Dispose of the waste oil properly.

⚠ CAUTION

Used oil may cause skin disease.

Do not allow used oil to remain on skin for prolonged periods of time.

Clean skin thoroughly with soap and water.

6. Install the drain plug.

7. Refill the recommended oil through level plug hole (1) until the oil comes out from the hole.

   Refer to "Recommended Lubricants" page 3.58.

8. Install and tighten the level plug.

9. Replace the rear differential oil following the same steps.

   Required oil volume for the rear differential is about 50 liters.

10. After replacing the filter and/or oil, reset the interval timer for the replacement. Go to the timer reset screen of the MODM, and reset the corresponding replacement interval.

    Refer to "Replacement Monitor" page 2.38.

Replace Planetary Gear Oil

⚠ CAUTION

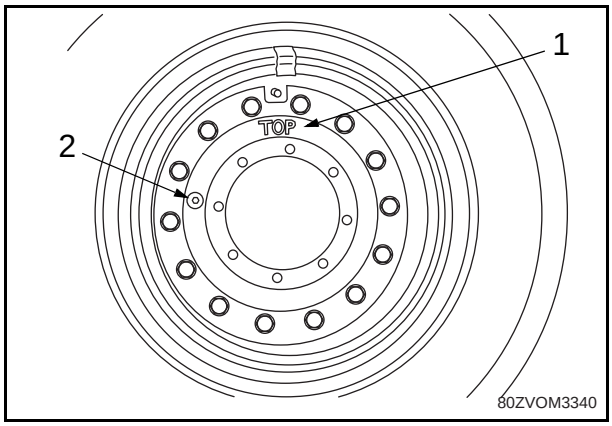
The axles are pressurized through the hydraulic tank.

When removing the oil level check plug a large volume of hot oil could spray out. It causes serious burns.

Before removing the oil level check plug, push down on the hydraulic tank cap or the breather valve to release the air pressure inside the hydraulic tank.

Do not touch the parts or oil when it is hot.

1. Replace the planetary gear oil on all four wheels.



2. Move the machine on level ground so that "TOP" mark (1) on the planetary gear housing comes to the top.

3. Turn "ON" the parking brake switch, lower the attachment to the ground, and stop the engine.

⚠ WARNING

If the boom is raised to ease access securely block or brace the boom to prevent accidental lowering.

Coolant Specification

The machine is originally filled with Long Life Coolant (non-Amin type ethylene glycol) which need not be replaced for the first two years or 3000 hours.

Do not use Amin type Long Life Coolant in cooling system. It may cause a corrosion against radiator or heater core.

If standard antifreeze (not Long Life Coolant) is used for the replacement, it should be replaced every six months.

Recommended Mixture of Antifreeze

Expected Minimum Ambient Temperature		-35ºC	-30ºC	-25ºC	-20ºC	-15ºC
Pure Water	(liter)	14.6	16.1	17.7	19.2	20.8
Antifreeze	(liter)	16.4	14.9	13.3	11.8	10.2
Mixture Ratio (%)		53	48	43	38	33

- Too much antifreeze in the coolant mixture may cause engine overheating.

  Keep 33 % antifreeze mixture (same as the mixture for a minimum ambient temperature of -15 ºC) if the engine overheats in a high ambient temperature.

- Do not use hard water or water with high levels of calcium and magnesium ions as the coolant water.

IMPORTANT
Do not mix different brands of antifreeze because they each contain special additives. Careless mixing often diminishes the effect of these additives and causes packing damage or water leakage.

Error log monitor failure code (Output side)

Code	Failure	Detection condition
CN512	F solenoid valve malfunction	F solenoid valve is short-circuited or disconnected
CN514	R solenoid valve malfunction	R solenoid valve is short-circuited or disconnected
CN516	1st solenoid valve malfunction	1st solenoid valve is short-circuited or disconnected
CN518	2nd solenoid valve malfunction	2nd solenoid valve is short-circuited or disconnected
CN521	3rd solenoid valve malfunction	3rd solenoid valve is short-circuited or disconnected
CN524	4th solenoid valve malfunction	4th solenoid valve is short-circuited or disconnected
CN526	D solenoid valve malfunction	D solenoid valve is short-circuited or disconnected
CN528	H solenoid valve malfunction	H solenoid valve is short-circuited or disconnected
CN531	LU solenoid valve malfunction	LU solenoid valve is short-circuited or disconnected
CN534	Auto brake solenoid valve malfunction	Auto brake solenoid valve is short-circuited or disconnected
CN536	Speed change control solenoid valve malfunction (1)	Speed change control solenoid valve is short-circuited
CN537	Speed change control solenoid valve malfunction (2)	Speed change control solenoid valve is disconnected
CN621	S/S solenoid valve R malfunction (1)	S/S solenoid valve R is short-circuited
CN622	S/S solenoid valve R malfunction (2)	S/S solenoid valve R is disconnected
CN623	S/S solenoid valve L malfunction (1)	S/S solenoid valve L is short-circuited
CN624	S/S solenoid valve L malfunction (2)	S/S solenoid valve L is disconnected
CN631	Pressure increase solenoid valve malfunction	Pressure increase solenoid valve is short-circuited or disconnected
CN641	Ride control solenoid valve malfunction	Ride control solenoid valve is short-circuited or disconnected
CN681	Efficient loading system selection solenoid valve malfunction	Efficient loading system selection solenoid valve is short-circuited or disconnected
CN693	Lower kickout relay malfunction (1)	Lower kickout relay (coil) is short-circuited
CN694	Lower kickout relay malfunction (2)	Lower kickout relay (coil) is disconnected
CN712	Cooling fan solenoid valve malfunction (1)	Cooling fan solenoid valve is short-circuited
CN713	Cooling fan solenoid valve malfunction (2)	Cooling fan solenoid valve is disconnected
CN721	Hour meter drive malfunction	Hour meter drive is short-circuited