

# Operation & Maintenance Manual

# WA500-3

## WHEEL LOADER

SERIAL NUMBERS **WA500-3 52001 - 52379**

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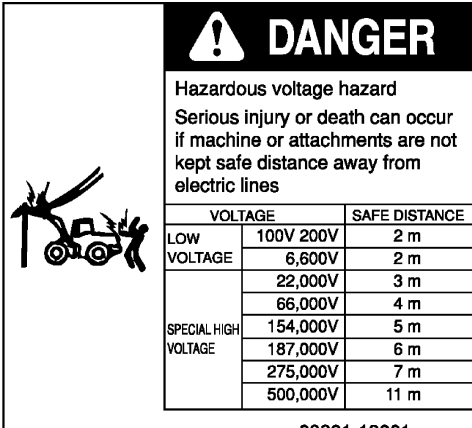
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(7) Caution for going close to electric cables (09801-13001)



VOLTAGE		SAFE DISTANCE
LOW VOLTAGE	100V 200V	2 m
	6,600V	2 m
	22,000V	3 m
SPECIAL HIGH VOLTAGE	66,000V	4 m
	154,000V	5 m
	187,000V	6 m
	275,000V	7 m
	500,000V	11 m

09801-13001

(8) Caution when coolant is at high temperature



**WARNING**

Hot water hazard.

To prevent hot water from spurting out:

- Turn engine off.
- Allow water to cool.
- Slowly loosen cap to relieve pressure before removing.

(9) Caution when oil is at high temperature



**WARNING**

Hot oil hazard.

To prevent hot oil from spurting out:

- Turn engine off.
- Allow oil to cool.
- Slowly loosen cap to relieve pressure before removing.

**ACTION IF FIRE OCCURS**

If a fire occurs, escape from the machine as follows.

- Turn the start switch OFF to stop the engine.
- Use the handrails and steps to get off the machine.

**WINDOW WASHER LIQUID**

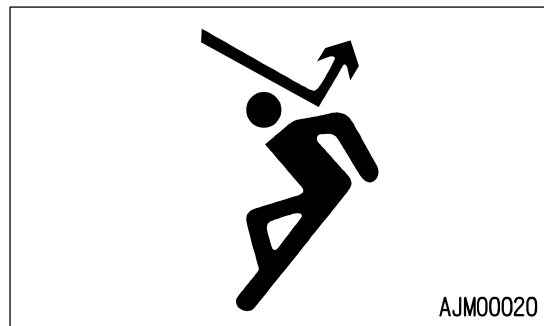
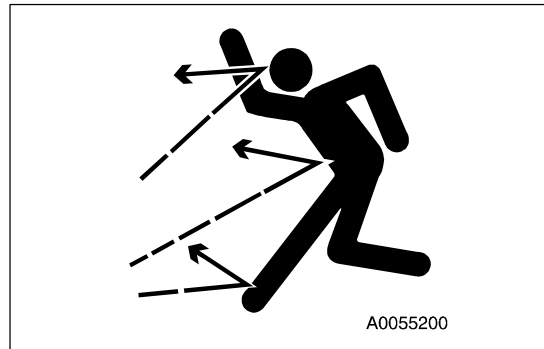
Use an ethyl alcohol base washer liquid.

Methyl alcohol base washer liquid may irritate your eyes, so do not use it.

**PRECAUTIONS WHEN USING ROPS (Roll Over Protective Structure)**

Install ROPS when working in places where there is danger of falling rocks, such as in mines and quarries, or in places where there is danger of rolling over.

- If ROPS is installed, do not remove it when operating the machine.
  - ROPS is installed to protect the operator when machine rolls over. When machine rolls over, ROPS supports its weight and absorbs its impact energy.
  - If the ROPS is welded, or holes are drilled in it, or it is modified in any other way, its strength may drop. Consult your Komatsu distributor before carrying out any modification.
  - If ROPS is damaged or deformed by falling objects or by rolling over, its strength will be reduced and it will not be able to fulfill its function properly. In such cases, always Komatsu contact your distributor for advice of the method of repair.
- Even if ROPS is installed, always fasten your seat belt properly when operating the machine. If you do not use your fasten your seat belt properly, it cannot display its effect.

**PRECAUTIONS FOR ATTACHMENTS, OPTIONS**

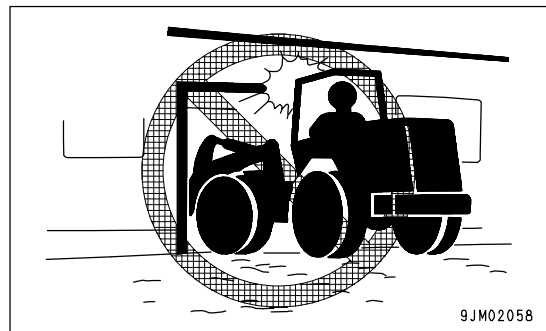
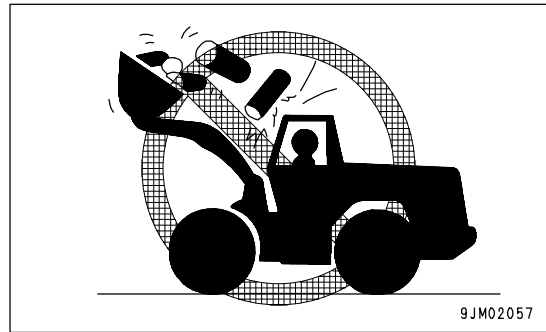
- When installing optional parts or attachments, there may be problems with safety or legal restrictions. Therefore contact your Komatsu distributor for advice.
- Any injuries, accidents, or product failures resulting from the use of unauthorized attachments or parts will not be the responsibility of Komatsu.
- When installing and using optional attachments, read the instruction manual for the attachment, and the general information related to attachments in this manual.

**UNAUTHORIZED MODIFICATION**

Any modification made without authorization from Komatsu can create hazards. Before making a modification, consult your Komatsu distributor.

- Komatsu will not be responsible for any injuries, accidents, product failures or other property damages resulting from modifications made without authorization from Komatsu.

- When handling unstable loads, such as round or cylindrical objects, or piled sheets, if the work equipment is raised high, there is danger that the load may fall on top of the operator's compartment and cause serious injury or damage.
- When handling unstable loads, be careful not to raise the work equipment too high or tip the bucket back too much.
- If the work equipment is suddenly lowered or suddenly stopped, the reaction may cause the machine to tip over. Particularly when carrying a load, be sure to operate the work equipment carefully.
- When operating in tunnels, under bridges, under electric wires, or other places where the height is limited, be extremely careful not to let the work equipment hit anything.
- To prevent accidents caused by hitting other objects, always operate the machine at a speed which is safe for operation, particular in confined spaces, indoors, and in places where there are other machines.



**METHODS OF USING BRAKE**

- When the machine is traveling, do not rest your foot on the brake pedal. If you travel with your foot resting on the pedal, the brake will always be applied, and this will cause the brakes to overheat and fail.
- Do not depress the brake pedal repeatedly if not necessary.
- When traveling downhill, use the braking force of the engine, and always use the right brake pedal at the same time.

**OPERATE CAREFULLY ON SNOW**

- Snow-covered or frozen surfaces are slippery, so be extremely careful when traveling or operating the machine, and do not operate the levers suddenly. Even a slight slope may cause the machine to slip, so be particularly careful when working on slopes.
- With frozen ground surfaces, the ground becomes soft when the temperature rises, and this may cause the machine to tip over.
- If the machine enters deep snow, there is a hazard that it may tip over or become buried in the snow. Be careful not to leave the road shoulder or to get trapped in a snow drift.
- When clearing snow, the road shoulder and objects placed beside the road are buried in the snow and cannot be seen. There is a hazard of the machine tipping over or hitting covered objects, so always carry out operations carefully.
- When traveling on snow-covered roads, always fit tire chains.
- When traveling on snow-covered slopes, never apply the foot brake suddenly. Reduce the speed and use the engine as a brake while applying the foot brake intermittently (depress the brake intermittently several times). If necessary, lower the bucket to the ground to stop the machine.

**ATTACHMENTS**

- Appoint a leader before starting removal or installation operations for attachments.
- Place attachments that have been removed from the machine in a stable condition so that they do not fall. And take steps to prevent unauthorized persons from entering the storage area.



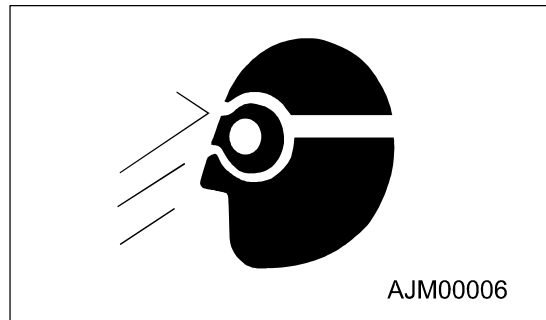
**NOISE**

If the noise from the machine is too loud, it may cause temporary or permanent hearing problems. When carrying out maintenance of the engine and you are exposed to noise for long periods of time, wear ear covers or ear plugs while working.

**PRECAUTIONS WHEN USING HAMMER**

When using a hammer, pins may fly out or metal particles may be scattered. This may lead to serious injury. Always do as follows.

- If hard metal parts such as pins, bucket teeth, cutting edges, or bearings are hit with a hammer, there is a hazard that pieces might be scattered and cause injury. Always wear safety goggles and gloves.
- When hitting pins or bucket teeth, there is a hazard that broken pieces might be sent flying and injure people in the surrounding area. Always check that there is no one in the surrounding area.
- There is a hazard that the pin hit with strong force may fly out and injure people in the surrounding area.



**REPAIR WELDING**

Welding operations must always be carried out by a qualified welder and in a place equipped with proper equipment. There is a hazard of gas, fire, or electrocution when carrying out welding, so never allow any unqualified personnel to carry out welding.

**REMOVING BATTERY TERMINAL**

When repairing the electrical system or when carrying out electrical welding, remove the negative (-) terminal of the battery to prevent the flow of current.

**METER DISPLAY PORTION**

See (A, C, D) "METER DISPLAY PORTION (PAGE 3-12)".

These consist of the meters (speedometer, fuel gauge, engine water temperature gauge, torque converter oil temperature gauge, service meter, transmission shift indicator) and the pilot lamps (turn signal indicator, head lamp Hi beam, preheating, front working lamp, rear working lamp, transmission cut-off, parking brake, transmission auto shift/manual selector).

**OPTION DISPLAY PORTION**

(F)

This consists of the monitor lamps and switches for the E.C.S.S., auto-greasing system, and remote positioner. For details of each system or component, see "ATTACHMENTS, OPTIONS (PAGE 6-1)".

**TESTING ACTUATION OF MACHINE MONITOR SYSTEM**

When the starting switch is turned to the ON position before starting the engine, all monitor lamps, gauges, and centralized warning lamps will light up for approx. 3 seconds, and the alarm buzzer will sound for approx. 1 second.

When this happens, 88 is displayed on the speedometer, and 8 is displayed on the transmission shift indicator.

Finally, there will be two beeps to indicate that the monitor check has been completed.

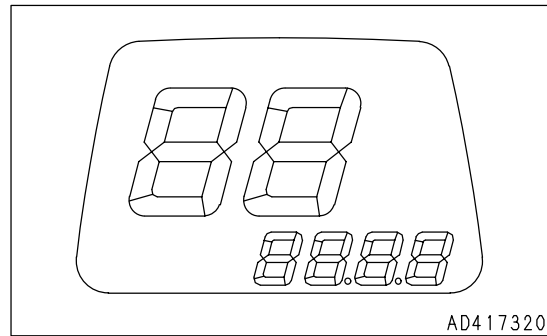
If the monitor lamps do not light up, there is probably a failure or disconnection, so please contact your Komatsu distributor for inspection.

When the starting switch is turned to the ON position, if the directional lever is not at the neutral position, the central warning lamp (CAUTION) will flash and the alarm buzzer will sound intermittently. If this happens, return the lever to the neutral position, and the lamps will go out and the buzzer will stop.

The monitor check cannot be carried out for at least 30 seconds after the engine has been stopped.

**SPEEDOMETER**

This meter (13) indicates the travel speed of the machine.



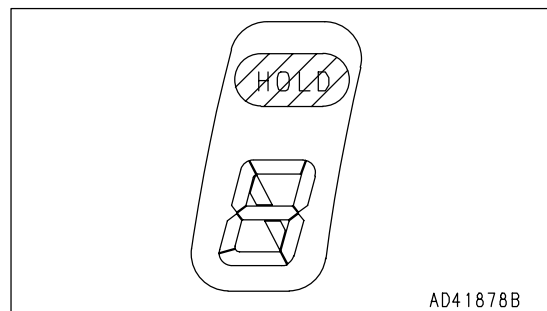
**TRANSMISSION SHIFT INDICATOR**

This indicator (14) shows the present speed range of the transmission.

When the directional lever is at the N position, N is displayed on the indicator.

When the directional lever is at the F or R position, the shift position of the speed control lever is displayed as a numeral.

When the auto shift is being used, the transmission speed range is displayed.



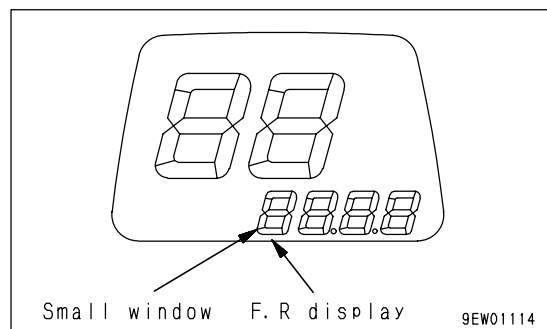
**WHEN USING JOYSTICK STEERING SYSTEM**

(If equipped)

This indicator (14) shows the present speed range of the transmission.

When the F. N. R. switch at the top of the joystick lever is set to the N position, N is displayed on the indicator. (F and R are displayed in the small window at the bottom of the speedometer.)

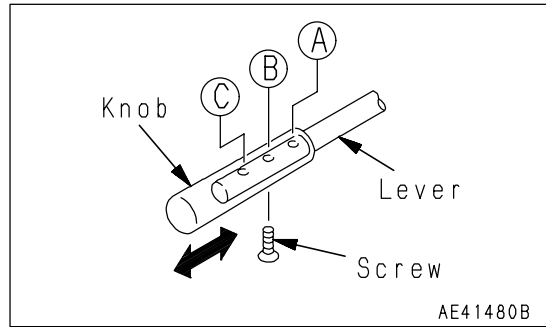
When the FNR switch on the head of the joystick lever is set to the F or R position, F or R is displayed in the small window at the bottom of the speedometer and the shift indicator displays the transmission speed range and N.



**REMARK**

The length of the lever can be adjusted to 3 stages (positions (A), (B), (C)). To adjust the length, remove the screw at the bottom of the lever knob, slide the knob to the desired position, then tighten the screw again.

(The lever is installed to position (B) when it is shipped from the factory.)

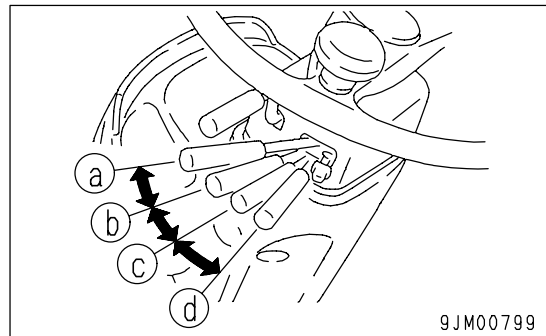


**AUTOMATIC SHIFT**

Automatic gear shifting can be carried out in the 2nd through 4th speed range of the four forward and reverse speeds depending on the travel conditions.

- Position (a): 1st
- Position (b): 2nd
- Position (c): 3rd
- Position (d): 4th

The range of speeds during automatic gear shifting is determined by the position of the gearshift lever as shown in the chart on the right.



Gear shift lever position	4		○	→	○	→	○
	3		○	→	○		
	2		○				
		1	2	3	4		
Automatic speed range							

AD41887B

- 8. Check for damage to gauges, lamps on the instrument panel and loose bolts.  
Check for damage to the panel, gauges and lamps. If any abnormality is found, replace the parts. Clean off any dirt on the surface. Tighten any loose bolts.
- 9. Check for loose air cleaner mounting bolts.  
Check for the loose bolts. If loose, tighten them.
- 10. Check for loose battery terminals.  
Tighten any loose terminal.
- 11. Check for damage to the seat belt and mounting clamps.

 **WARNING**

Even if there appears to be no abnormality with the seat belt, replace it once every three years.

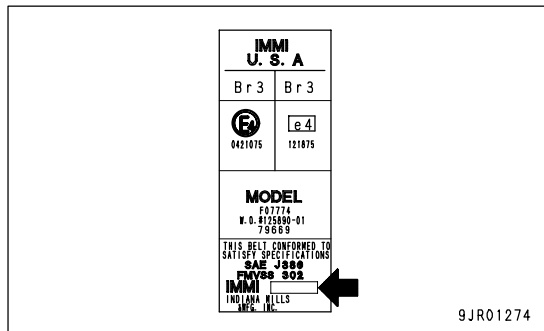
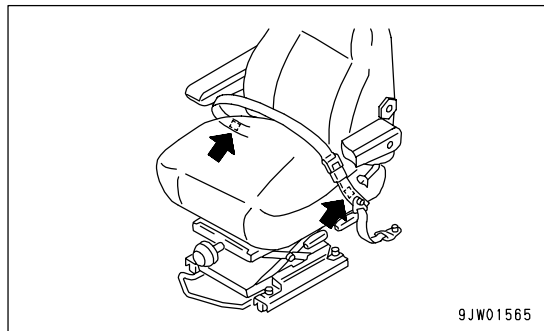
**REMARK**

The date of manufacture of the seat belt is marked on the belt at the place indicated by the arrow in the diagram on the right.

Check that there are no loose bolts on the equipment mounting the seat belt to the machine, and tighten if necessary.

Tightening torque: 24.5 ± 4.9 N·m (2.5 ± 0.5 kgf·m, 18.1 ± 3.6 lbf)

If the belt is damaged or fluff is starting to form, or if there is any damage or deformation of the seat belt holders, replace the seat belt.



- 12. Check for loose ROPS mounting bolts.  
Check for any loose or damaged bolts.  
If any loose bolts are found tighten them to 927 ± 103 N·m (94.5 ± 10.5 kgf·m, 683.5 ± 75.9 lbf).  
If any bolts are damaged, replace them with genuine Komatsu bolts.
- 13. Clean cab window.  
Clean the cab window to ensure good visibility when operating the machine.

**WRIST REST HEIGHT ADJUSTMENT LEVER**

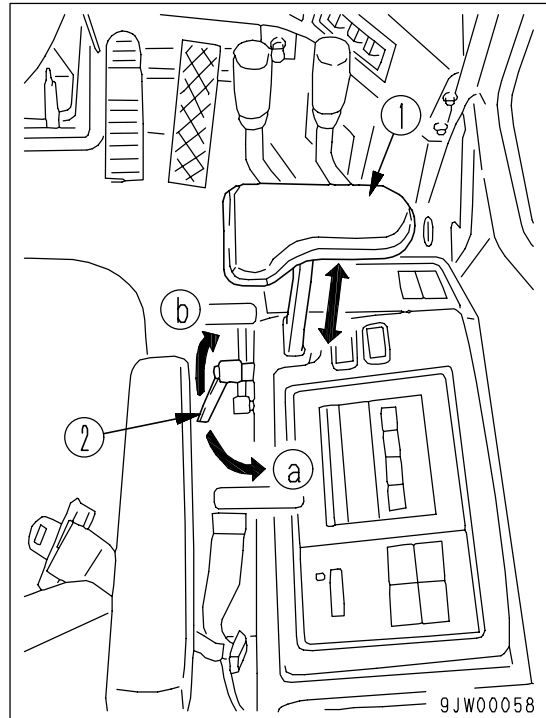
The height of lift rest (1) can be adjusted easily with adjustment lever (2). Turn adjustment lever (2) in the loosening direction and adjust the height of lift rest (1) properly, then turn adjustment lever (2) to the fixing direction.

Position (a): Loosening direction

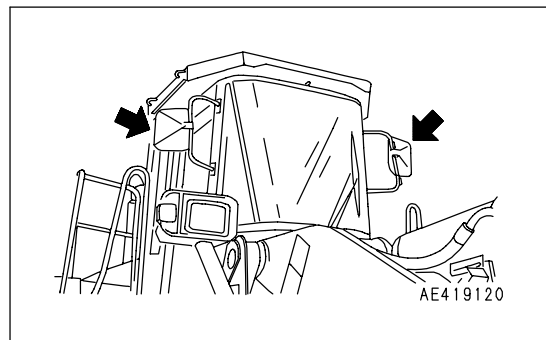
Position (b): Fixing direction

**REMARK**

If adjustment lever (2) is pulled towards the seat, the lever becomes free and faces directly down.

**ADJUST REAR VIEW MIRROR**

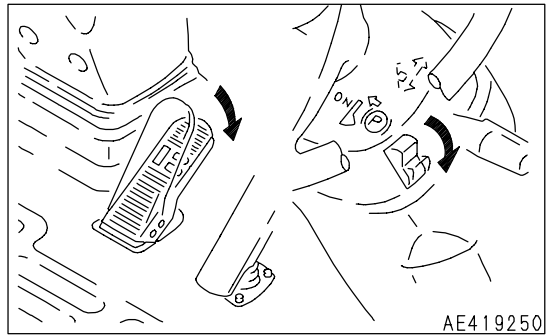
Sit in the operator's seat and adjust the rear view mirror so that you can see properly to the rear.



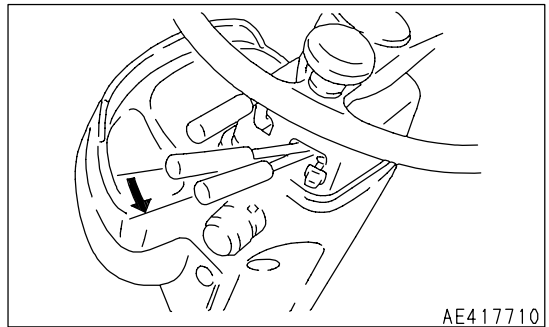
- 4. Depress right brake pedal (8) and turn parking brake switch (9) to the OFF (RELEASE) position to release the parking brake. Keep right brake pedal (8) depressed.

**REMARK**

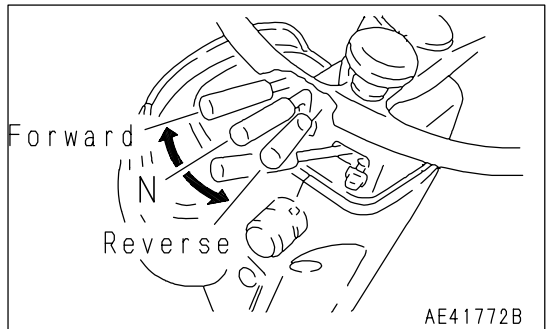
If the parking brake is still actuated when parking brake switch (9) is at the OFF (RELEASE) position, turn the parking brake switch ON, then turn it OFF again.



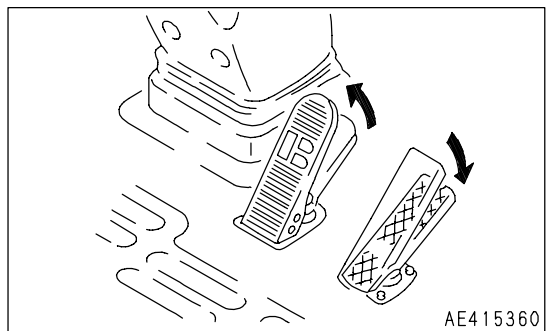
- 5. Set gearshift lever (10) to the desired position.



- 6. Set directional lever (11) to the desired position.

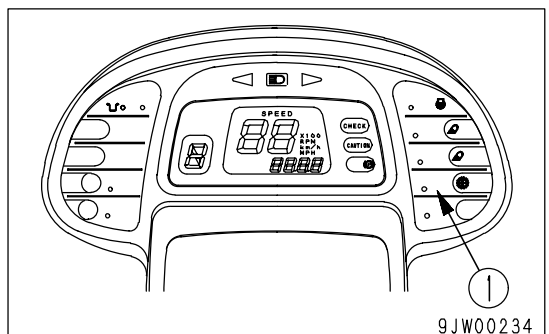


- 7. Release right brake pedal (8), then depress accelerator pedal (3) to move the machine off.



**REMARK**

When moving the machine off on a hill, turn transmission cut-off switch (1) OFF, depress left brake pedal (2), operate the gearshift lever to the low speed range, then depress accelerator pedal (3) and gradually release left brake pedal (2) to let the machine move off. This makes it possible to prevent the machine from rolling back.



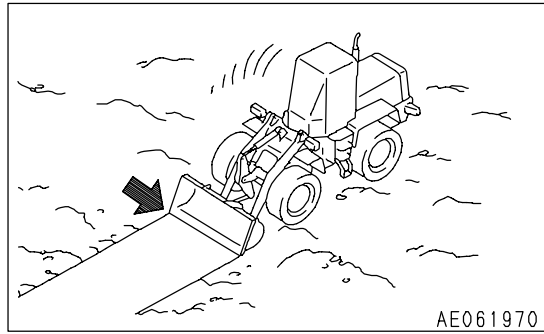
### LEVELING OPERATIONS

#### NOTICE

Always operate the machine in reverse when carrying out leveling operations.

If it is necessary to carry out leveling operations when traveling forward, do not set the bucket dumping angle to more than 20 degrees.

1. Scoop soil into the bucket. Move the machine backward while spreading soil from the bucket little by little.
2. Go over the spread soil with the bucket teeth touching the ground and level the ground by back-dragging.
3. Scoop some more soil into the bucket, put the lift arm control lever in FLOAT position, level the bucket at ground level, and smooth the ground by moving backward.



### PUSHING OPERATION



Never set the bucket to the DUMP position when carrying out pushing operation.

When carrying out pushing operations, set the bottom of the bucket parallel to the ground surface.

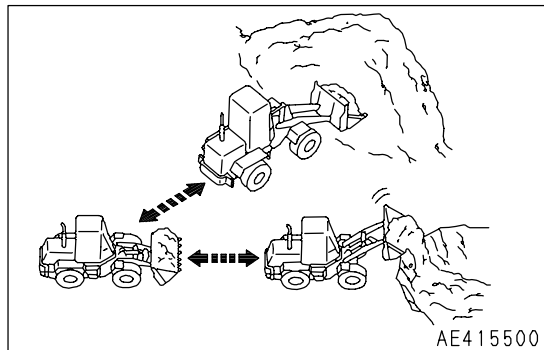
### LOAD AND CARRY OPERATIONS



When carrying a load, lower the bucket to lower the center of gravity when traveling.

The load and carry method for wheel loaders consists of a cycle of scooping -> hauling -> loading (into a hopper, truck, etc.). Always keep the travel path properly maintained.

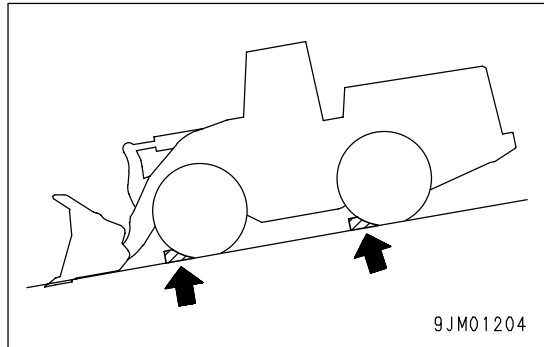
When using the load and carry method, see "PRECAUTIONS FOR USING LOAD AND CARRY METHOD (PAGE 3-80)".



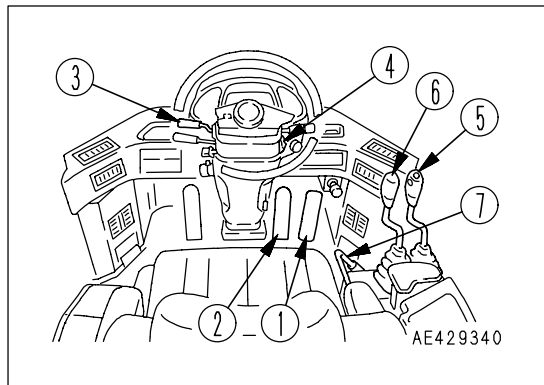
### PARKING MACHINE

#### WARNING

- Avoid stopping suddenly. Give yourself ample room when stopping.
- Do not park the machine on slopes.  
If the machine has to be parked on a slope, set it facing directly down the slope, then dig the bucket into the ground and put blocks under the tires to prevent the machine from moving.
- If the control lever is touched by accident, the work equipment or the machine may move suddenly, and this may lead to a serious accident. Before leaving the operator's compartment, always set the safety lock lever securely to the LOCK position.
- Even if the parking brake switch is turned ON, there is danger until the parking brake pilot lamp lights up, so keep the brake pedal depressed.



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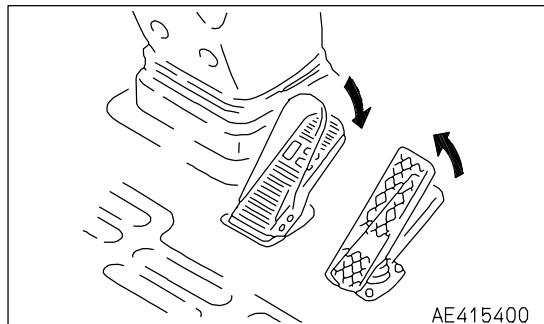


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#### NOTICE

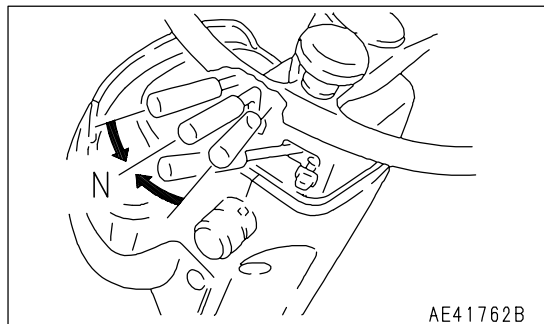
Never use the parking brake switch to brake the machine when traveling except in an emergency. Apply the parking brake only after the machine has stopped.

1. Release accelerator pedal (1), then depress brake pedal (2) to stop the machine.



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2. Place directional lever (3) in N (neutral) position.



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## COLD WEATHER OPERATION

### PRECAUTIONS FOR LOW TEMPERATURE

If the temperature becomes low, it becomes difficult to start the engine, and the coolant may freeze, so do as follows.

### FUEL AND LUBRICANTS

Change to fuel and oil with low viscosity for all components.

For details of the specified viscosity, see "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-9)".

### COOLANT



#### WARNING

- Antifreeze is toxic. Be careful not to get it into your eyes or on your skin. If it should get into your eyes or on your skin, wash it off with large amounts of fresh water and see a doctor at once.
- When changing the coolant or when handling coolant containing antifreeze that has been drained when repairing the radiator, please contact your Komatsu distributor or request a specialist company to carry out the operation. Antifreeze is toxic. Do not let it flow into drainage ditches or spray it onto the ground surface.
- Antifreeze is flammable. Do not bring any flame close. Do not smoke when handling antifreeze.

### NOTICE

- Use Komatsu Supercoolant wherever available, or use permanent type antifreeze coolant.
- Never use methanol, ethanol, or propanol-based antifreeze.
- Do not use any water leakage prevention agent, either alone, or in combination with antifreeze.
- Do not mix one brand of antifreeze with a different brand.

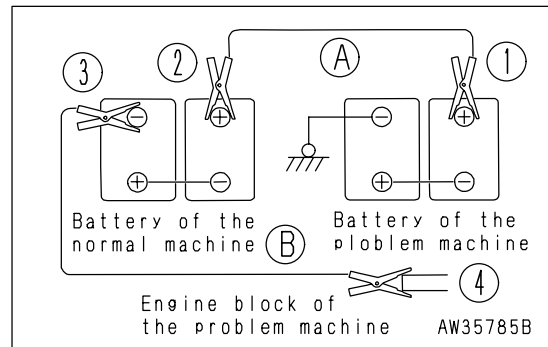
For details of the antifreeze mixture when changing the coolant, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-21)".

### CONNECTING THE BOOSTER CABLE

Keep the starting switch of the normal machine and problem machine in the OFF position.

Connect the booster cable as follows, in the order of the numbers marked in the diagram.

1. Connect one clip of booster cable (A) to the positive (+) terminal of the problem machine.
2. Connect the other clip of booster cable (A) to the positive (+) terminal of the normal machine.
3. Connect one clip of booster cable (B) to the negative (-) terminal of the normal machine.
4. Connect the other clip of booster cable (B) to the engine block of the problem machine.



### STARTING ENGINE



### CAUTION

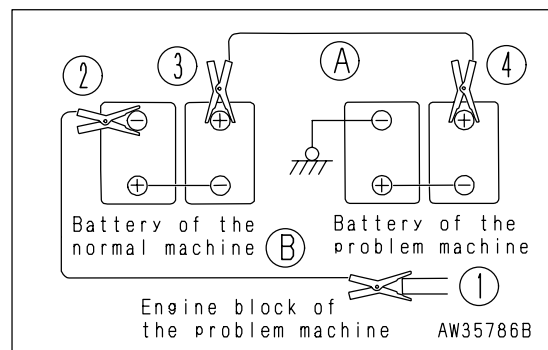
Always check that the safety lock lever is set to the LOCK position, regardless of whether the machine is working normally or has failed. Check also that all the control levers are at the HOLD or neutral position.

1. Make sure the clips are firmly connected to the battery terminals.
2. Start engine of the normal machine and run it at high idling speed.
3. Turn the starting switch of the problem machine to the START position and start the engine.  
If the engine doesn't start at first, wait for at least 2 minutes before trying again.

### DISCONNECTING THE BOOSTER CABLE

After the engine has started, disconnect booster cables in the reverse order in which they were connected.

1. Remove one clip of booster cable (B) from the engine block of the problem machine.
2. Remove the other clip of booster cable (B) from the negative (-) terminal of the normal machine.
3. Remove one clip of booster cable (A) from the positive (+) terminal of the normal machine.
4. Remove the other clip of booster cable (A) from the positive (+) terminal of the problem machine.



## TRANSMISSION CONTROL SYSTEM

Error Code	Item	Problem system	
		Short circuit	Disconnection
10	Back-up lamp relay	o	o
11	None	–	–
12	F ECMV Sol.	o	o
13	R ECMV Sol.	o	o
14	1st ECMV Sol.	o	o
15	2nd ECMV Sol.	o	o
16	3rd ECMV Sol.	o	o
17	4th ECMV Sol.	o	o
18	None	–	–
19	Joystick direction switch signal	o	o
20	Direction switch signal	o	o
21	Range switch signal	o	o
22	Travel speed sensor	x	o
23	Engine speed sensor	o	o
24	Abnormality in EEPROM	o	o
25	Transmission oil pressure sensor	o	x
26	F ECMV fill switch	o	x
27	R ECMV fill switch	o	x
28	1st ECMV fill switch	o	x
29	2nd ECMV fill switch	o	x
30	3rd ECMV fill switch	o	x
31	4th ECMV fill switch	o	x
32	F or R ECMV fill switch	x	o
33	1st, 2nd 3rd, or 4th ECMV fill switch	x	o

## E.C.S.S. CONTROL SYSTEM

Error Code	Item	Problem system	
		Short circuit	Disconnection
d0	ECSS relay	o	o

## WEAR PARTS

Wear parts such as the filter element, air cleaner element, bucket tooth, etc. are to be replaced at the time of periodic maintenance or before their abrasion limits.

The wear parts should be changed correctly in order to use the machine economically.

For part change, Komatsu genuine parts of excellent quality should be used.

When ordering parts, please check the part number in the parts book.

## WEAR PARTS LIST

The parts in parentheses are to be replaced at the same time.

Item	Part No.	Part Name	Q'ty	Replacement frequency
Engine oil filter	600-211-1340	Cartridge	1	EVERY 500 HOURS
Fuel filter	600-319-3110	Cartridge	1	EVERY 500 HOURS
Transmission oil filter	424-16-11140	Element	1	EVERY 500 HOURS
	(424-16-11630)	(O-ring)	(4)	
	(424-16-11130)	(O-ring)	(2)	
Corrosion resistor	600-411-1161	Cartridge	1	EVERY 1000 HOURS
Hydraulic filter	07063-01383	Element	1	EVERY 2000 HOURS
	(07000-15210)	(O-ring)	(1)	
Air cleaner	600-185-6100	Element ass'y	1	-
	600-185-6110	Outer element ass'y	1	
Air conditioner air filter	421-07-12312	Element	2	-
1-piece bucket tooth	425-70-13212	Tooth	6	-
	02091-11610	Bolt	18	
	02290-11625	Nut	18	
	155-70-14240	Shim (0.5 mm)	12	
	155-70-14230	Shim (1.0 mm)	6	
1-piece corner tooth	425-70-13232	Right corner tooth	1	-
	425-70-13222	Left corner tooth	1	
	02091-11600	Bolt	2	
	09218-12723	Nut	2	
	01643-32780	Washer	2	
	02091-11610	Bolt	4	
	02290-11625	Nut	4	
	425-70-13250	Shim (0.5 mm)	4	
425-70-13260	Shim (1.0 mm)	2		
Tip tooth	426-847-1110	Tooth	8	-
	(426-847-1130)	Pin	8	
Segment edge	425-838-1110	Edge	7	-
	02091-12015	Bolt	14	
	01643-33380	Washer	14	
	02290-12031	Nut	14	

## WHEN REQUIRED

### CHECK, CLEAN, OR REPLACE AIR CLEANER ELEMENT

#### WARNING

- If inspection, cleaning, or maintenance is carried out with the engine running, dirt will get into the engine and damage it. Always stop the engine before carrying out these operations.
- When using compressed air, there is danger that dirt may be blown around and cause serious injury. Always use protective glasses, dust mask, and other protective equipment.

#### CHECKING

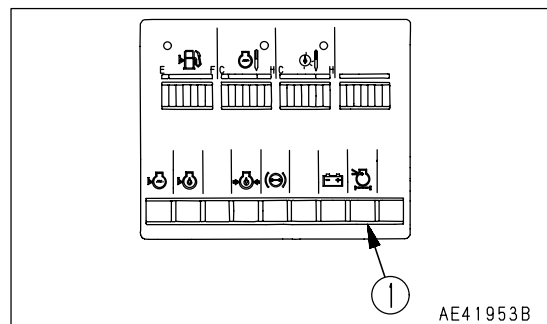
If air cleaner clogging caution lamp (1) on the maintenance monitor flashes, clean the air cleaner element.

#### NOTICE

Do not clean the air cleaner element before the air cleaner clogging caution lamp flashes.

If the air cleaner element is cleaned frequently before the air cleaner clogging caution lamp flashes, the proper performance of the air cleaner is not provided and the cleaning efficiency is lowered.

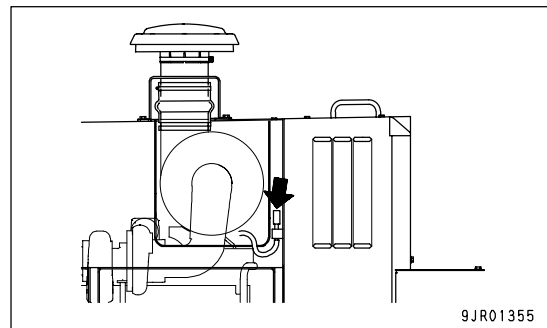
In addition, dust sticking to the cleaner element falls on the inner element side while cleaning the element.



#### REMARK

A dust indicator (with 5-stage display) is installed to the side of the air cleaner. This displays the condition of the clogging of the air cleaner.

This makes it possible to check the clean status of the element and the replacement time.



## CLEAN RADIATOR FINS AND OIL COOLER FINS



### WARNING

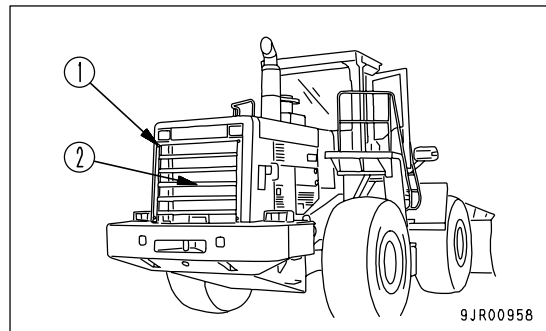
If compressed air, high-pressure water, or steam hits your body directly or dirt is sent flying by the compressed air, high-pressure water, or steam, there is danger of personal injury. Always wear protective glasses, dust mask, and other protective equipment.

Carry out this procedure if there is any mud or dirt stuck to the radiator or oil cooler.

1. Remove bolt (1) and open radiator grill (2).
2. Use the steam jet nozzle to blow out the mud, dirt, or leaves clogging the radiator fins or cooler fins.  
Steam or water can be used instead of compressed air.

### NOTICE

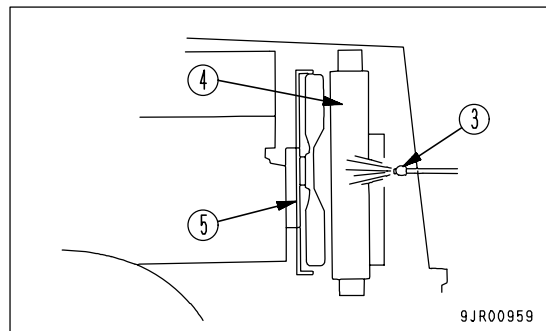
If the steam jet nozzle is brought too close to the fins, it may damage the fins, so keep the nozzle a suitable distance away from the fins when cleaning.



3. Check the rubber hose. Replace with a new one if the hose is found to have cracks or to be hardened by ageing.  
Also, check hose clamps for looseness.

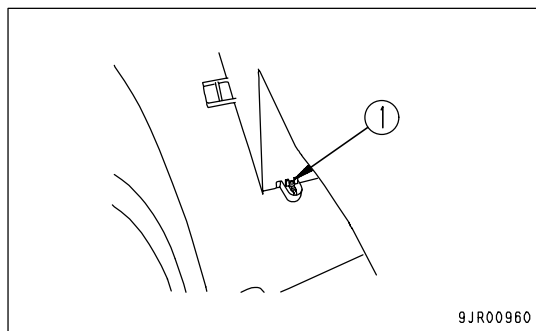
4. When washing, use a diameter of  $\varnothing$  2 mm for nozzle (3) and keep the pressure of the high-pressure water to a maximum of 4 MPa (40 kgf/cm<sup>2</sup>, 568 PSI).

If the mud and dirt cannot be removed by cleaning only from the radiator grill side, remove fan net (5) and clean also from radiator (4) side.



**EVERY 50 HOURS SERVICE****DRAIN WATER, SEDIMENT FROM FUEL TANK**

Loosen valve (1) on the right side of the tank so that the sediment and water will be drained together with fuel.



## EVERY 500 HOURS SERVICE

Maintenance for every 50, 100 and 250 hours service should be carried out at the same time.

### REPLACE FUEL FILTER CARTRIDGE

#### WARNING

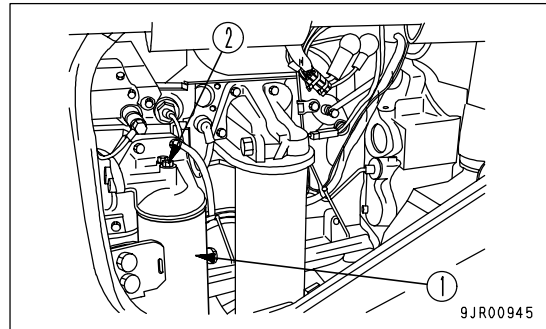
- Immediately after the engine is stopped, all parts are at high temperature, so do not replace the filter immediately. Wait for the engine to cool down before starting the operation.
- The inside of fuel piping system of the engine is under high-pressure when the engine is running. When replacing the filter, wait for at least 30 seconds after the engine stops to let the internal pressure go down before replacing the filter.
- Do not bring any fire or spark close.
- Be careful when opening the air bleed plug at the fuel filter head and the air bleeder of the supply pump. The system is still under pressure and fuel may spurt out.

#### NOTICE

- Genuine Komatsu fuel filter cartridges use a special filter that has highly efficient filtering ability. When replacing the filter cartridge, always use a genuine Komatsu part.
- The common rail fuel injection system used on this machine consists of more precise parts than the conventional injection pump and nozzle. If any part other than a genuine Komatsu filter cartridge is used, dust or dirt may get in and cause problems with the injection system. Always avoid using substitute parts.
- When carrying out inspection or maintenance of the fuel system, pay more attention than normal to the entry of dirt. If dirt is stuck to any part, use fuel to wash it off completely.

- Filter wrench

1. Set the container to catch the fuel under the filter cartridge.
2. Using a filter wrench, turn filter cartridge (1) counterclockwise to remove it.
3. Clean the filter holder.

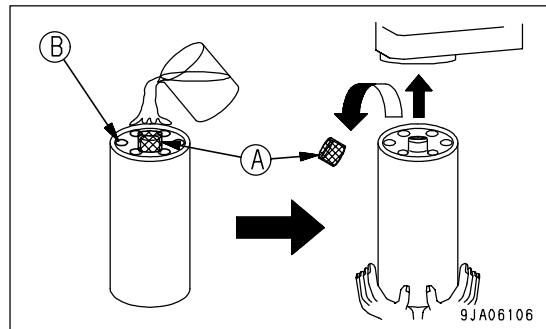


#### NOTICE

When filling the filter cartridge with fuel, carry out the filling operation with cap (A) fitted.

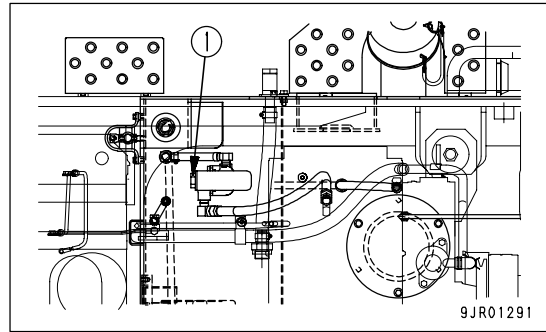
Cap (A) acts to prevent the entry of dirt or dust into the filter cartridge.

4. Fill the filter cartridge with clean fuel through the 8 small holes (B) in the new filter cartridge.
5. Coat the packing surface of the filter cartridge with oil.
6. Remove filter cartridge cap (A) and install to the filter holder.



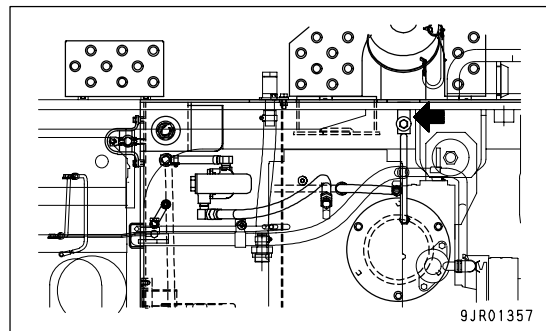
## CLEAN FUEL STRAINER

1. Remove plug (1), then remove the strainer together with the plug.
2. Remove the dirt stuck to the strainer and strainer case, then wash with clean diesel oil or flushing oil. If the strainer is damaged, replace it with a new part.
3. Insert the strainer, then install plug (1).  
If the plug O-ring is damaged or deteriorated, replace it with a new part.  
Tightening torque for plug: 78.4 N·m (8 kgf·m, 57.9 lbft)



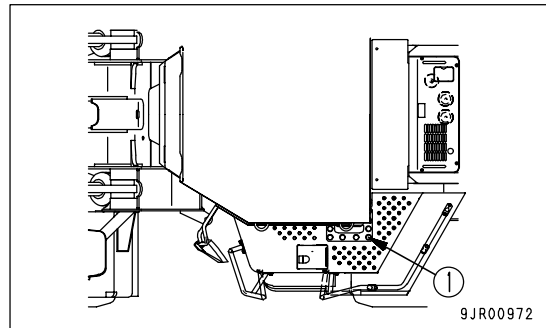
## WASH FUEL TANK BREATHER

Remove all mud and dirt from around the breather, then remove the breather, immerse it in cleaning fluid and clean it. Be careful not to let dirt enter through the mount while the breather is removed.



## TIGHTEN ROPS CANOPY

Check that there are no loose mounting bolts (1) on the ROPS canopy. Tighten any loose bolts.  
Tightening torque:  $927 \pm 103$  N·m ( $94.5 \pm 10.5$  kgf·m,  $684 \pm 76$  lbft)



**EVERY 8000 HOURS SERVICE**

Maintenance for every 50, 250, 500, 1000, 2000 and 4000 hours service should be carried out at the same time.

**REPLACE HIGH-PRESSURE PIPING CLAMP**

Ask your Komatsu distributor to carry out this work.

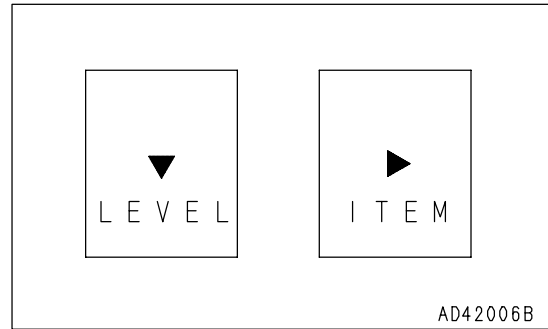
**REPLACE FUEL SPRAY PREVENTION CAP**

Ask your Komatsu distributor to carry out this work.

4. Press the LEVEL and ITEM keys at the same time to set to the setting mode.
5. Press the ITEM key one or more times to select the item to be set.

**REMARK**

Each time the ITEM key is pressed, the setting item is changed: a → b → c → a.

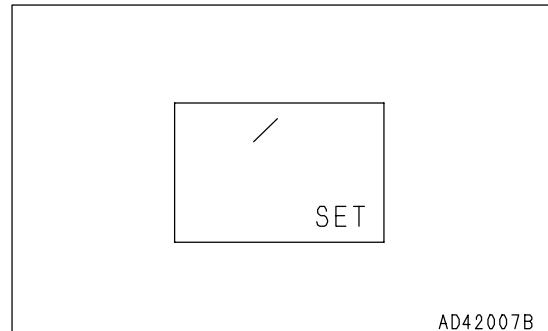


6. When the item to be set flashes, press the LEVEL key.  
The set item and numeral are displayed alternately (a →→ 0 →→ a →→ 0).
7. Refer to the setting code table and press the ITEM key one or more times to select the code number to be set.

**REMARK**

Each time the ITEM key is pressed, the code number (numeric portion) goes up by 1.

8. When the code number that is to be set flashes, press the SET key to carry out the setting.

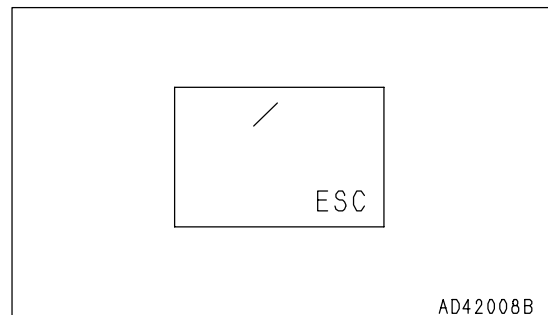


9. Repeat Steps 6 to 8 to set all of the items a, b, and c. After completing the setting, press the ESC key to leave the setting mode.

**REMARK**

Even if it is desired to change only one item, always carry out the setting according to Steps 4 to 8. After completing the setting, always press the ESC key to leave the setting mode.

If the power is then turned ON, the count for the greasing interval will start immediately after the ESC key is pressed. Part of the display segment flashes to indicate that the system is counting. After setting, the set value is retained in memory even if the power is turned OFF.



## OPERATION METHOD OF JOYSTICK STEERING SYSTEM


**CAUTION**

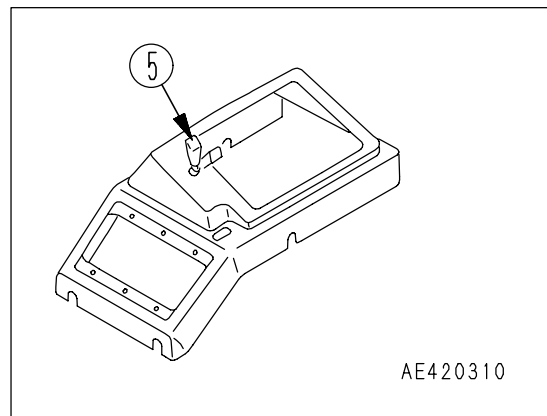
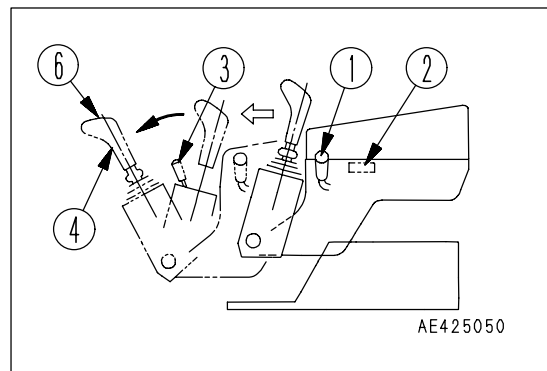
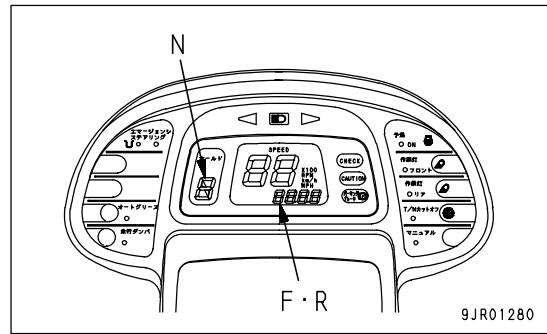
When operating with joystick lever (4), always adjust the angle of the steering wheel so that it is possible to see the FNR display on the machine monitor.

1. Sit on the operator's seat and pull up lever (1) to unlock the joystick console, then slide the latter from the rear position to the forward stroke end, then lock it securely.

Under this condition, safety switch (2) is turned on. Adjust joystick (4) to the angle for easy operation with console box adjustment lever (3). (See "ADJUSTMENT OF JOYSTICK CONSOLE (PAGE 6-21)".)

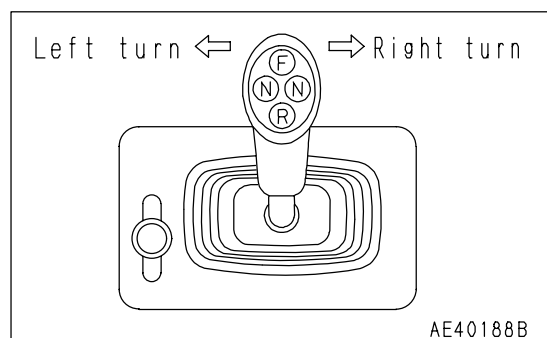
2. Fasten the seat belt.
3. Confirm that joystick (4) operates normally and the directinal lever of the transmission is a the neutral position and the periphery of the vehicle is safe. Then, start the engine.
4. Turn on joystick ON/OFF switch (5).

FNR button (6) on joystick (4) head is set to the neutral position automatically.



5. If joystick (4) is turned to the right the machine turns to the right, and if the former is turned to the left, the latter turns to the left. The more the joystick is turned sharply, the more the machine turns quickly.
6. After the machine turns to the desired angle, return the joystick to the neutral position.
7. When returning the machine in the straight position, turn the joystick in the opposite direction from the neutral position (If it was turned to the right, turn it to the left).

Even when the joystick is returned to the neutral position, the machine remains at the same angle of articulation. It does not return to the straight travel position.



**(E) Seat height adjustment**

Move lever (2) up/down, then move the seat up or down as desired. Since lever (2) is also used for adjusting seat angle, set the seat to the desired height while adjusting the angle.

Adjustment range: 60 mm (2.4 in)

**(F) Adjusting headrest height**

Move the headrest up and down to the desired height.

Adjustment range: 50 mm (2.0 in)

**(G) Adjusting headrest angle**

Rotate the headrest to the front or rear.

**(H) Adjusting armrest angle**

Adjust angle of armrest by rotating knob (5) (left side only).

Adjustment range: 30 degrees (forward tilt: 25 degrees, backward tilt: 5 degrees)

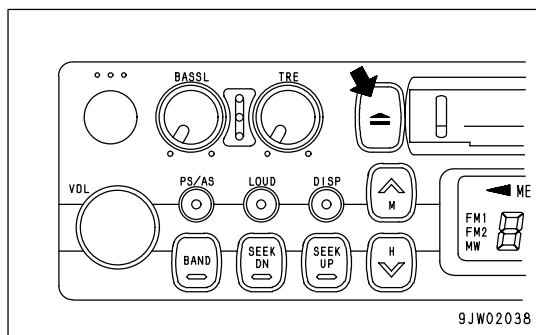
Also, when armrest is turned, it will spring up. (Both left and right sides)

**(I) Lumbar support**

Turn grip (6) to provide suitable support for the lumbar region.

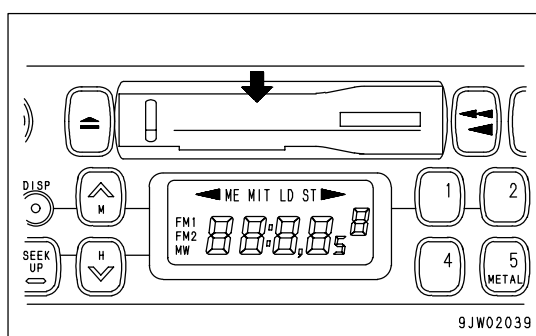
**TAPE EJECT BUTTON**

This button (7) is used to stop the tape and to eject the cassette. When this button is pressed, the tape is ejected and the radio plays.



**CASSETTE DOOR**

Set the cassette with the exposed portion of the tape on the right side and insert it through the cassette door (8).



**FAST FORWARD, REWIND BUTTONS**

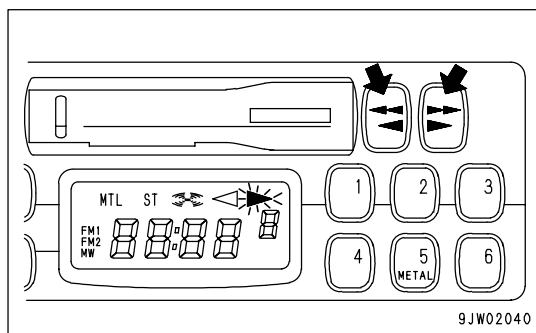
These buttons (9) are used to fast-forward or rewind the tape.

- Fast-forward/rewind

If you press the button pointing in the same direction as the lighted arrow indicating the direction of play, the tape will be fast-forwarded; if you press the button pointing in the opposite direction, the tape will rewind.

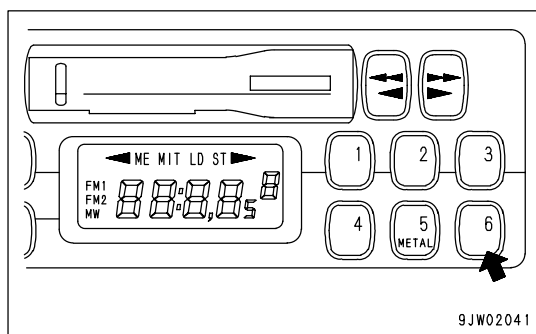
To stop the tape, lightly press the button that is not locked. The fast-forward or rewind operation will be canceled.

If the fast forward and rewind buttons are pressed at the same time, the tape will change sides.



**PRESET BUTTONS**

These buttons (10) are used to call up the broadcast station frequencies preset in memory for each of buttons No. 1 to No. 6. It is possible to preset 18 stations (FM: 12; AM: 6) with these buttons.



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