1. SUGGESTION FOR NEW MACHINE

1) It takes about 100 operation hours to enhance its designed performance.

2) Operate according to below three steps and avoid excessive operation for the initial 100 hours.

Service meter	Load
Until 10 hours	About 60 %
Until 100 hours	About 80 %
After 100 hours	100 %

※ **Excessive operation may deteriorate the potential performance of machine and shorten lifetime of the machine.**

3) Be careful during the initial 100 hours operation

(1) Check daily for the level and leakage of coolant, engine oil, hydraulic oil and fuel.

(2) Check regularly the lubrication and fill grease daily all lubrication points.

(3) Tighten bolts.

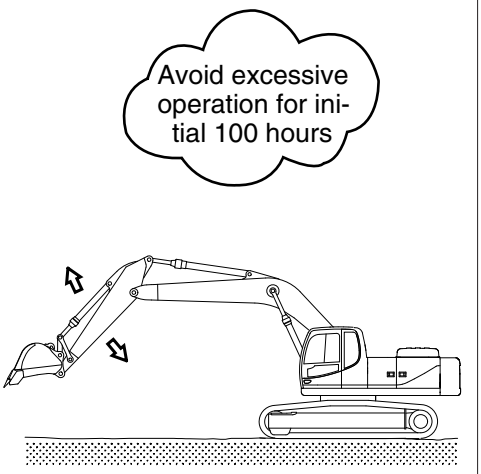
(4) Warm up the machine fully before operation.

(5) Check the gauges occasionally during the operation.

(6) Check if the machine is operating normally during operation.

4) Replace followings after initial 250 hours of operation

Checking items	Hours
Engine oil	250
Engine oil filter element	
Fuel filter	
Prefilter	
Hydraulic oil return filter element	
Hydraulic oil tank drain filter cartridge	
Line filter element	
Travel reduction gear oil	



38094OP01A

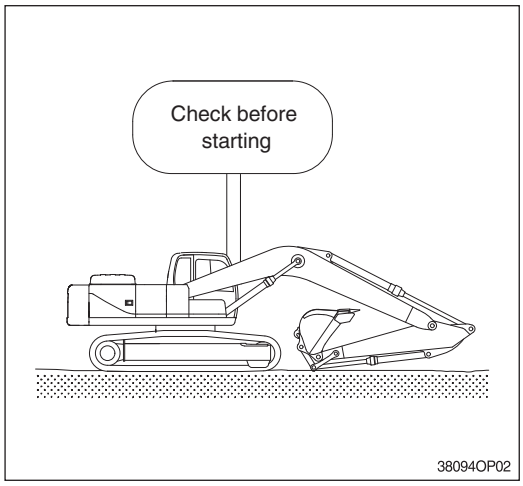
2. CHECK BEFORE STARTING THE ENGINE

1) Look around the machine and under the machine to check for loosen nut or bolts, collection of dirt, or leakage of oil, fuel or coolant and check the condition of the work equipment and hydraulic system. Check also loosen wiring, and collection of dust at places which reach high temperature.

※ **Refer to the daily check on page 6-10.**

2) Adjust seat to fit the contours of the operator's body for the pleasant operation.

3) Adjust the rear view mirror.



3. STARTING AND STOPPING THE ENGINE

1) CHECK INDICATOR LIGHTS

(1) Check if all the operating levers are in the neutral position.

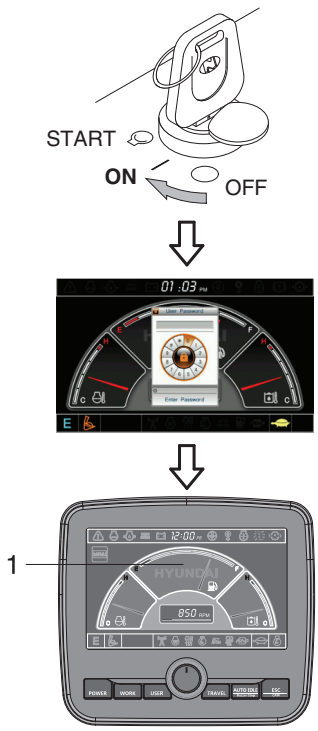
(2) Turn the starting switch to the ON position. The buzzer sounds for 4 seconds and the Hyundai logo is displayed on the cluster.

※ **If the ESL mode is enabled, enter the password to start the engine.**

※ **If the password has failed 5 times, please wait 30 minutes before re-attempting to enter the password.**

※ **See page 3-17.**

(3) After the initialization of the cluster, the operating screen is displayed on the LCD (1).
Also, the self-diagnostic function is carried out.



21094OP04

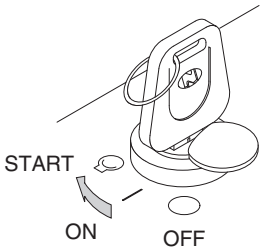
2) STARTING ENGINE IN NORMAL TEMPERATURE

※ **Sound the horn to warn the surroundings after checking if personnel or obstacles are in the area.**

(1) Turn the starting switch to START position to start the engine.

※ **If the engine does not start, allow the starter to cool for about 2 minutes before attempting to start the engine again.**

(2) Release the starting switch instantly after the engine starts to avoid possible damage to the starting motor.



21094OP55

3) STARTING ENGINE IN COLD WEATHER

※ **Sound horn to warn surroundings after checking if there are obstacles in the area.**

※ **Replace the engine oil and fuel referring to recommended oils at page 2-35.**

※ **Fill the anti-freeze solution to the coolant as required.**

※ **If you turn ON the starting switch, the fuel warmer is automatically operated to heat the fuel by sensing the coolant temperature.**

(1) Check if all the levers are in the neutral position.

(2) Turn the accel dial switch to low idle position.

(3) Turn the starting switch to the ON position, and wait 1~2 minutes. More time may take according to ambient temperature.

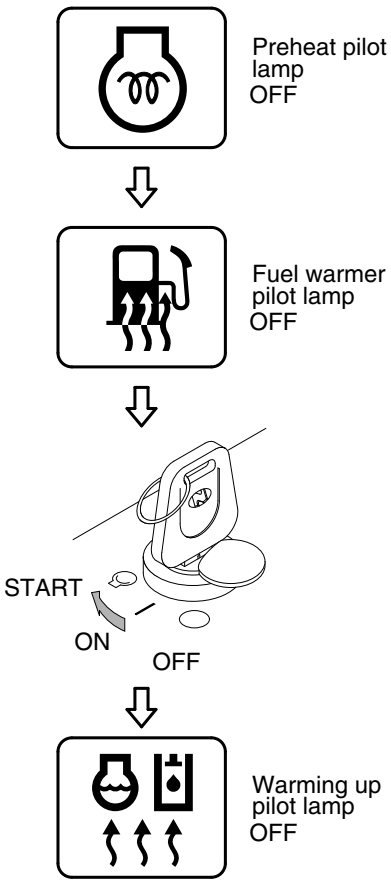
(4) Wait for five minutes to warm up the engine after the preheating pilot lamp off, and than turn the starting switch to the START position to start the engine.

※ **If the engine does not start, allow the starter to cool for about 2 minutes before attempting to start the engine again.**

(5) Release the starting switch immediately after starting engine.

(6) If the temperature of the coolant is lower than 30˚C the warming up automatically starts.

※ **Do not operate the working devices, or convert the operation mode into other mode during the warming up.**



4) INSPECTION AFTER ENGINE START

Inspect and confirm the following after engine starts.

(1) Is the level gauge of hydraulic oil tank in the normal level?

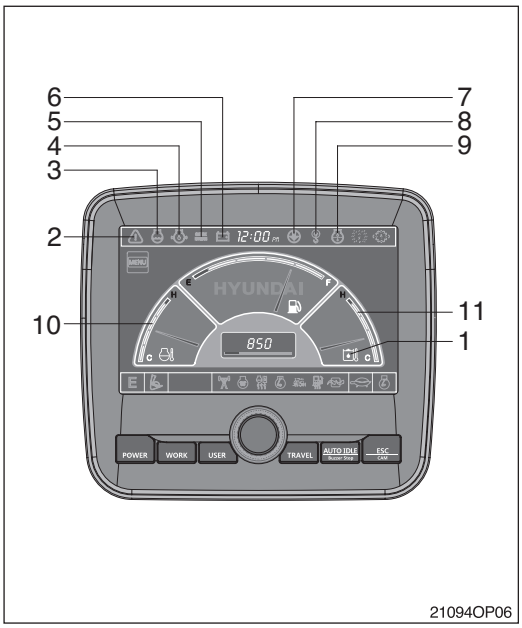
(2) Are there leakages of oil or water?

(3) Are all the warning lamps OFF (1–9)?

(4) Are the water temperature gauge (10) and hydraulic temperature gauge (11) indicators in the operating range?

(5) Are the engine sound and the color of exhaust gas normal?

(6) Are the sound and vibration normal?

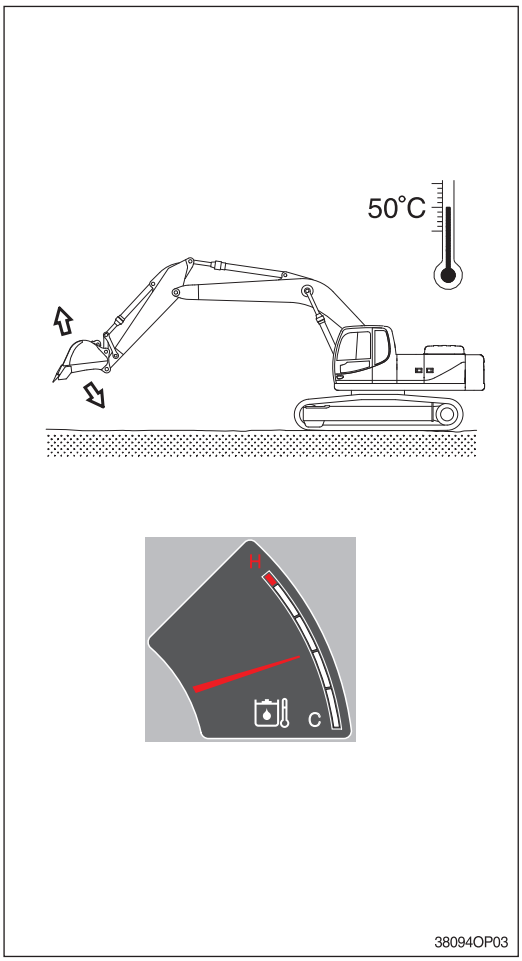


※ **Do not increase engine speed quickly after starting, it can damage engine or turbocharger.**

※ **If there are problems in the control panel, stop the engine immediately and correct problem as required.**

5) WARMING UP OPERATION

※ **The most suitable temperature for the hydraulic oil is about 50°C (122°F).**
It can cause serious trouble in the hydraulic system by sudden operation when the hydraulic oil temperature is below 25°C (77°F).
Then temperature must be raised to at least 25°C (77°F) before starting work.



(1) Run the engine at low idling for 5 minutes.

(2) Speed up the idling and run the engine at midrange speed.

(3) Operate bucket lever for 5 minutes.

※ **Do not operate anything except bucket lever.**

(4) Run the engine at the high speed and operate the bucket lever and arm lever for 5–10 minutes.

※ **Operate only the bucket lever and arm lever.**

(5) This warming up operation will be completed by operation of all cylinders several times, and operation of swing and traveling.

※ **Increase the time for warming up during winter.**

6) TO STOP THE ENGINE

※ **If the engine is abruptly stopped before it has cooled down, engine life may be greatly shortened. Consequently, do not abruptly stop the engine apart from an emergency.**

※ **In particularly if the engine has overheated, do not abruptly stop it but run it at medium speed to allow it to cool gradually, then stop it.**

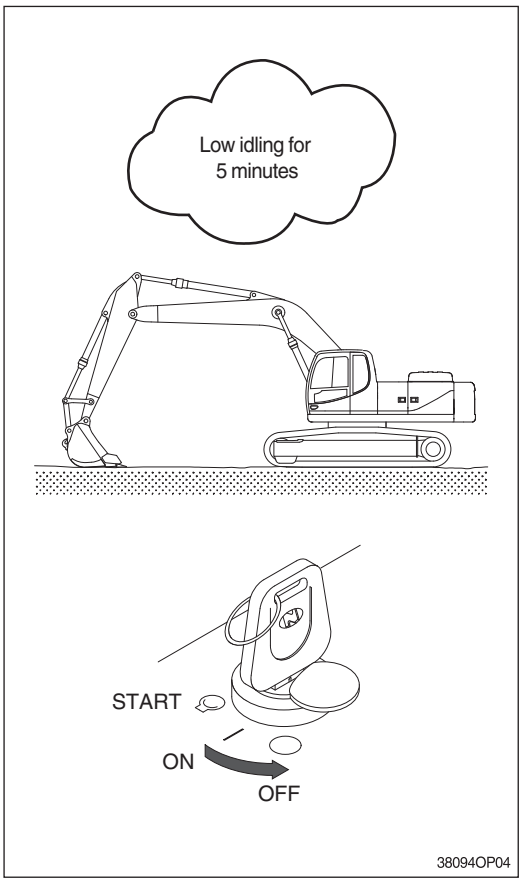
(1) Lower the bucket to the ground then put all levers in the neutral position.

(2) Run the engine at low idling speed for about 5 minutes.

(3) Return the key of starting switch to the OFF position.

(4) Remove the key to prevent other people using the machine and LOCK safety lever.

(5) Lock the cab door.



4. MODE SELECTION SYSTEM

1) STRUCTURE OF MECHATRONICS SYSTEM

CAPO, Computer Aided Power Optimization system, is the name of mode selection system developed by Hyundai.

※ **Please refer to page 3-12 for below modes setting.**

(1) Power mode

Power mode designed for various work loads supports high performance and reduces fuel consumption.

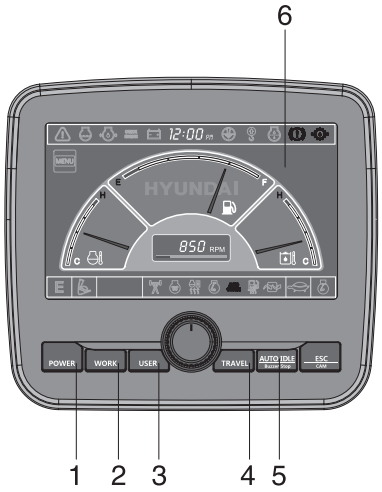
- P mode: Heavy duty power
- S mode: Standard power
- E mode: Economy power

(2) Work mode

One of the two work modes can be selected for the optimal work condition of the machine operation.

① **General work mode** (bucket)
When the key switch is turned on, this mode is selected automatically.

② **Work tool mode** (breaker, crusher)
It controls the pump flow and system pressure for the optimal operation of breaker or crusher.



1 Power mode switch
2 Work mode switch
3 User mode switch
4 Travel mode switch
5 Auto idle mode switch
6 LCD

21094OP10

(3) User mode

① The user mode is useful for setting the user preferable power quickly (engine speed, power shift and idle speed).

② There are two methods for use of user mode.

a. In operation screen

The user mode switch is used to memorize the current machine operating status and activate the memorized user mode.

See page 3-10.

b. In menu

Engine high idle rpm, auto idle rpm and pump torque (power shift) can be modulated and memorized separately in menu status.

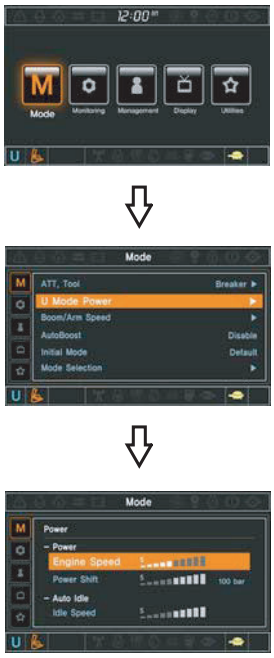
1 Each memory mode has a initial set which are mid-range of max engine speed, power shift and auto idle speed.

2 High idle rpm, auto idle rpm and EPPR pressure can be adjusted and memorized in the U mode.

※ **Refer to page 3-12 for setting the user mode (available on U mode only).**

- **LCD segment vs parameter setting**

21094OP11



21094OP12

Step (▮)	Engine speed (rpm)	Idle speed (rpm)	Power shift (bar)
1	1450	700	0
2	1500	750	3
3	1550	800	6
4	1600	850	9
5	1650	900	12
6	1700	One-touch decel low idle (950)	16
7	1750	Auto decel rpm (1000)	20
8	1800	1050	26
9	1850	1100	32
10	1900	1150	38

(4) Travel mode

: Low speed traveling.

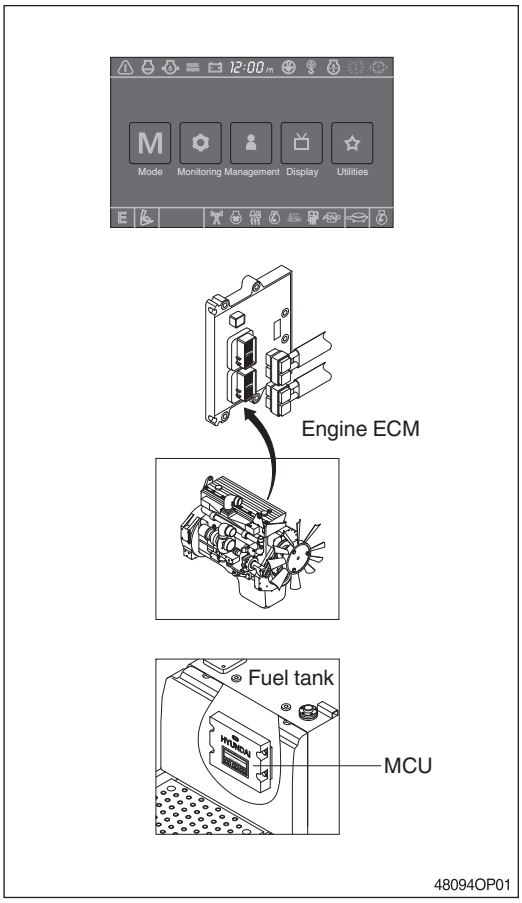
: High speed traveling.

(5) Auto idle mode

- Pilot lamp ON: Auto idle function is activated.
- Pilot lamp OFF: Auto idle function is cancelled.

(6) Monitoring system

Information of machine performance as monitored by the CPU controller can be displayed on the **LCD.** Refer to page 3-11.



(7) Self-diagnostic system

① **MCU (Machine Control Unit)**

The MCU diagnoses machine status and problems and displays fault codes in the cluster (fault codes detected by MCU are composed of HCESPN and FMI).

② **Engine ECM (Electronic Control Module)**

If the engine or relevant system has a problem, the engine ECM detects and displays it on the **LCD** as fault codes (these codes are composed of SPN and FMI).

※ **Consult Hyundai or your Hyundai dealer for details.**

※ **Refer to page 3-11 for the LCD display.**

(8) Anti-restart system

The system protects the starter from inadvertent restarting when the engine is already operational.

2) HOW TO OPERATE THE MODE SELECTION SYSTEM

(1) When start key is turned on

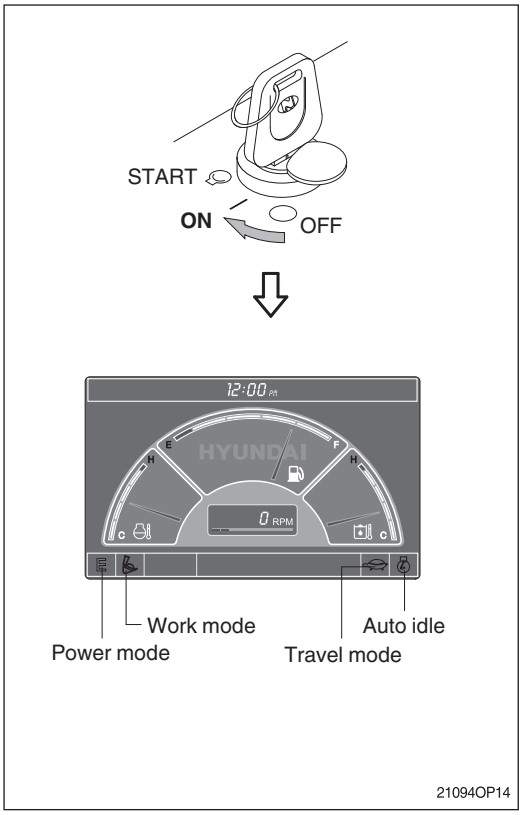
① When start key switch is turned on, the cluster turns on and buzzer sounds for 4 seconds. And then main information as gauges and engine speed are displayed on LCD.

② Initial default mode settings are displayed in the cluster.

Mode		Status
Power mode	E	ON
Work mode		ON
Travel mode	Low ( )	ON
Auto decel		ON

※ **These settings can be changed in U mode.**

③ The self-diagnostic function can be carried out from this point.

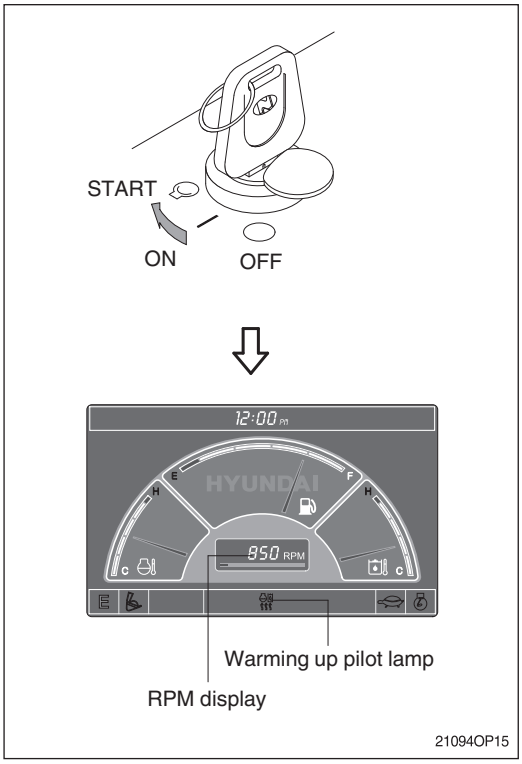


(2) After starting the engine

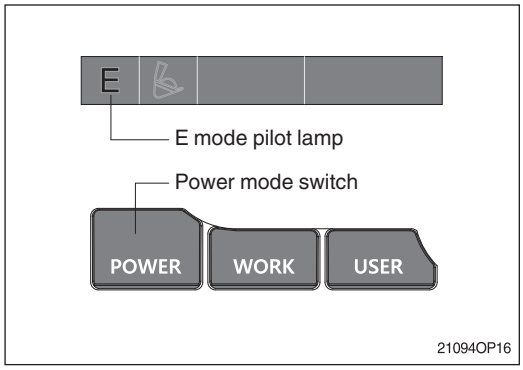
① When the engine is started, the rpm display indicates low idle, 950 ± 100 rpm.

② If the coolant temperature is below 30°C, the warming up pilot lamp lights on and after 4 seconds the engine speed increases to 1000 ± 100 rpm automatically to warm up the machine.

- After 2-3 minutes, you can select any mode depending on the job requirement.



3) POWER MODE SELECTION

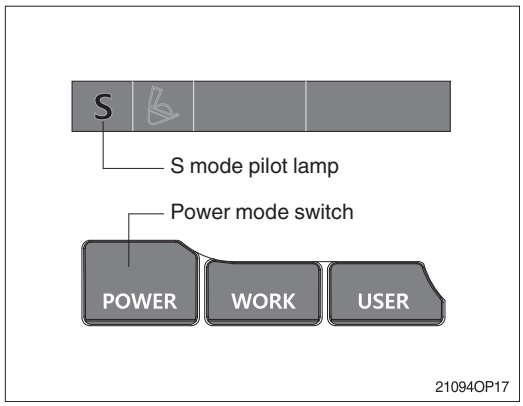


(1) E mode

The accel dial is set 10 and the auto idle mode is cancelled.

Engine rpm	Effect
1650 ± 50	Variable power control in proportion to lever stroke (improvement in fuel efficiency) ※ Same power as S mode in full lever operation.

※ **When the accel dial is located below 9 the engine speed decreases about 50-100 rpm per dial set.**

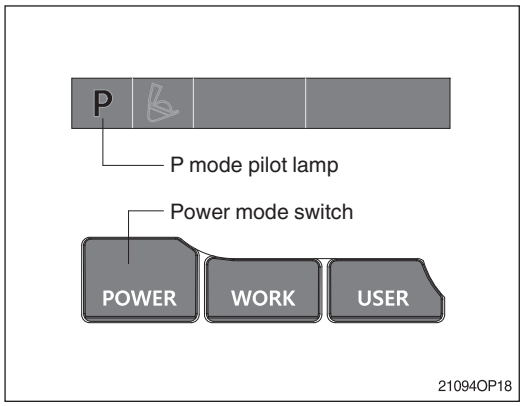


(2) S mode

The accel dial is set 10 and the auto idle mode is cancelled.

Engine rpm	Effect
1750 ± 50	Standard power

※ **When the accel dial is located below 9 the engine speed decreases about 50-100 rpm per dial set.**



(3) P mode

The accel dial is set 10 and the auto idle mode is cancelled.

Engine rpm	Effect
1750 ± 50	Approximately 120 % available of the S mode power and speed.

※ **When the accel dial is located below 9 the engine speed decreases about 50-100 rpm per dial set.**

5. OPERATION OF WORKING DEVICE

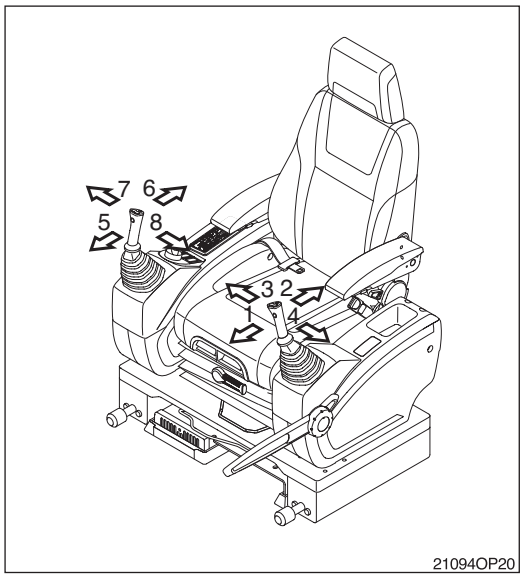
※ **Confirm the operation of control lever and working device.**

1) Left control lever controls arm and swing.

2) Right control lever controls boom and bucket.

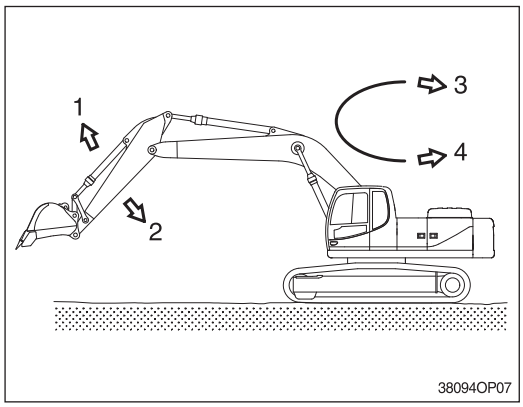
3) When you release the control lever, it returns to neutral position automatically.

※ **When operating swing, consider the swing distance by inertia.**



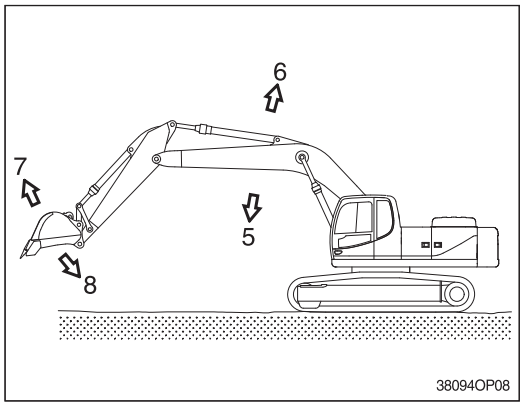
21094OP20

- **Left control lever**
  - 1 Arm roll-out
  - 2 Arm roll-in
  - 3 Swing right
  - 4 Swing left



38094OP07

- **Right control lever**
  - 5 Boom lower
  - 6 Boom raise
  - 7 Bucket roll-out
  - 8 Bucket roll-in
- **Right control lever** (for R520LC-9 DM)
  - 7 Crusher roll-out
  - 8 Crusher roll-in



38094OP08

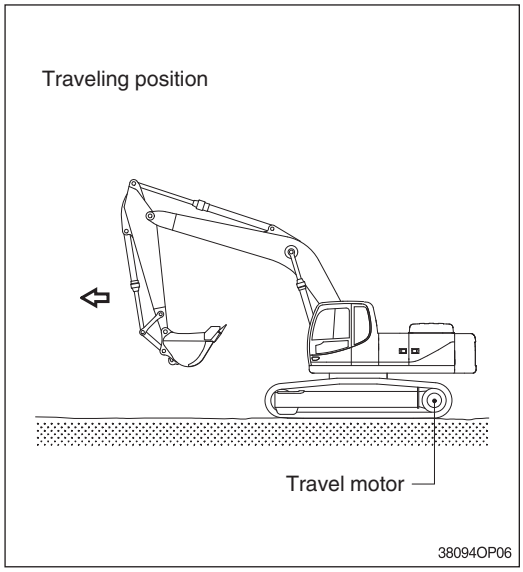
6. TRAVELING OF THE MACHINE

1) BASIC OPERATION

(1) **Traveling position**

It is the position which the traveling motor is in the rear and the working device is forward.

※ **Be careful as the traveling direction will be reversed when the whole machine is swinged 180°.**



(2) Traveling operation

It is possible to travel by either travel lever or pedal.

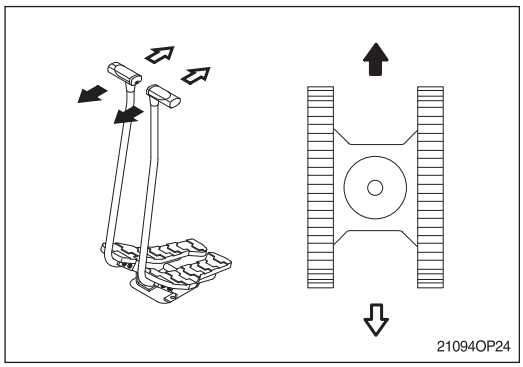
※ **Do not travel continuously for a long time.**

※ **Reduce the engine speed and travel at a low speed when traveling on uneven ground.**

(3) Forward and backward traveling

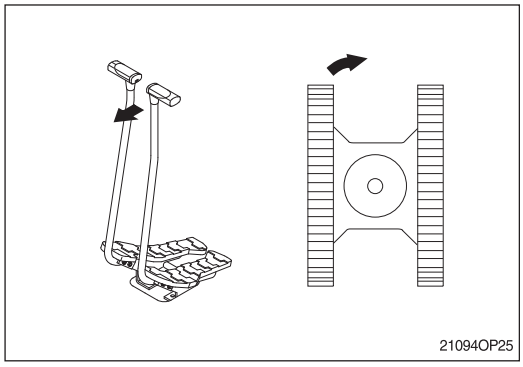
When the left and right travel lever or pedal are pushed at the same time, the machine will travel forward or backward.

※ **The speed can be controlled by the operation stroke of lever or pedal and change of direction will be controlled by difference of the left and right stroke.**



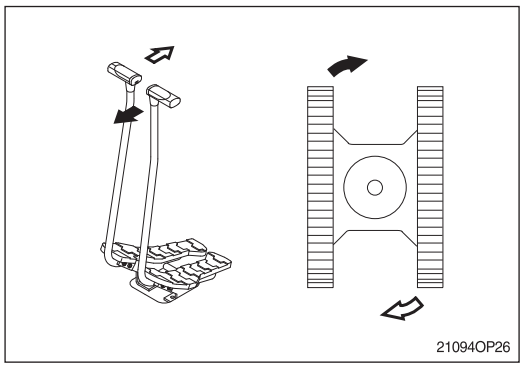
(4) Pivot turning

Operating only one side of lever or pedal make the change of direction possible by moving only one track.



(5) Counter rotation

It is to change the direction at the original place by moving the right and left track. Both side of lever or pedal are operated to the other way at the same time.



2) TRAVELING ON A SLOPE

(1) Make sure that the travel lever is properly maneuvered by confirming the travel motor is in the right location.

(2) Lower the bucket 20 to 30 cm (1 ft) to the ground so that it can be used as a brake in an emergency.

(3) If the machine starts to slide or loses stability, lower the bucket immediately and brake the machine.

(4) When parking on a slope, use the bucket as a brake and place blocks behind the tracks to prevent sliding.

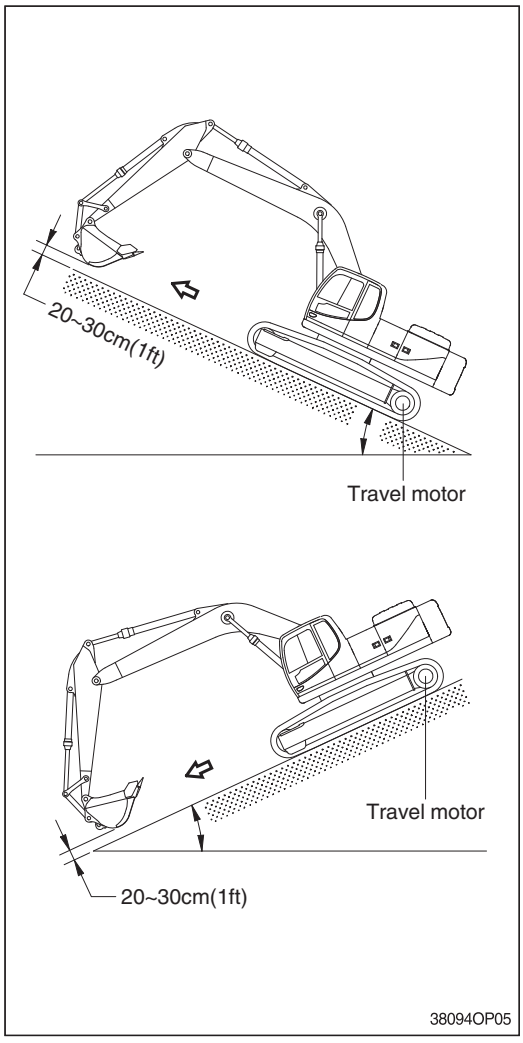
(5) For R520LC-9 DM only:

① It is not allowed to travel with this machine on a slope.

② It is not allowed to travel with the machine when the boom and arm are in the fully upward position.

③ Travelling over small distances is only allowed if the middle arm and end arm are in the folded position.

④ Travelling over larger distances (to and from the jobsite or loading or unloading for transport) is only allowed when the total front attachement is folded and in an almost horizontal position.



※ **Machine cannot travel effectively on a slope when the oil temperature is low. Do the warming-up operation when it is going to travel on a slope.**

⚠ **Be careful when working on slopes. It may cause the machine to lose its balance and turn over.**

⚠ **Be sure to keep the travel speed switch on LOW (turtle mark) while traveling on a slope.**

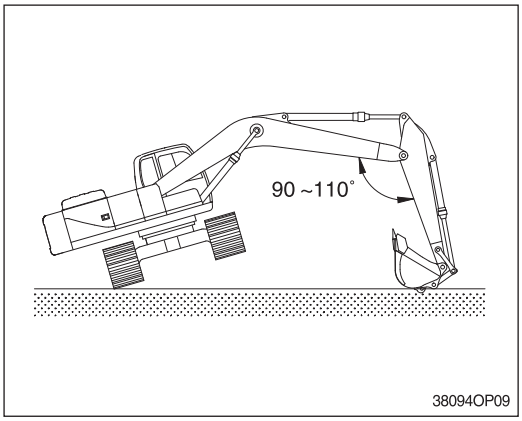
3) TRAVELING ON SOFT GROUND

※ **If possible, avoid to operate on soft ground.**

(1) Move forward as far as machine can move.

(2) Take care not to go beyond the depth where towing is impossible on soft ground.

(3) When driving becomes impossible, lower bucket and use boom and arm to pull the machine. Operate boom, arm, and travel lever at the same time to avoid the machine sinking. (Not applicable for R520LC-9 DM)



4) TOWING THE MACHINE

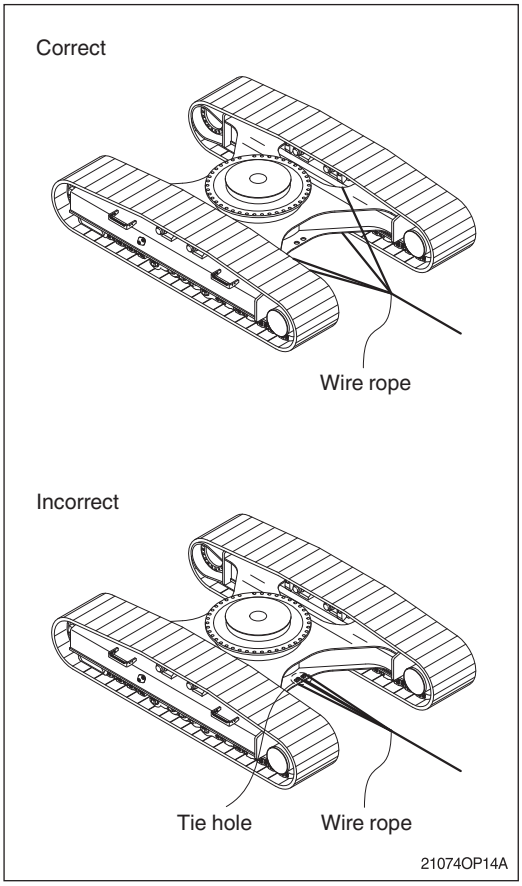
Tow the machine as follows when it can not move on its own.

(1) Tow the machine by other machine after hook the wire rope to the frame as shown in picture at right.

(2) Hook the wire rope to the frame and put a support under each part of wire rope to prevent damage.

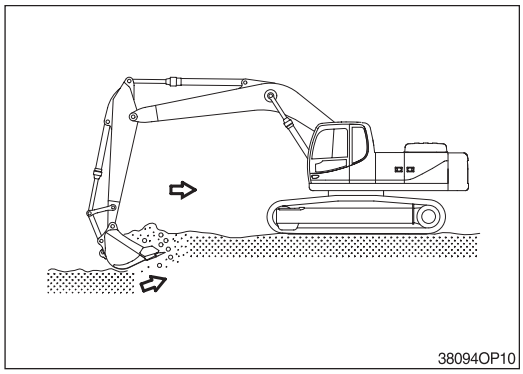
※ **Never tow the machine using only the tie hole, because this may break.**

⚠ **Make sure no personnel are standing close to the tow rope.**

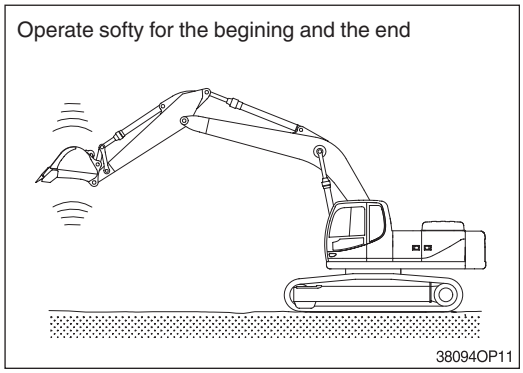


7. EFFICIENT WORKING METHOD (R480LC-9, R480-9 and R520LC-9 only)

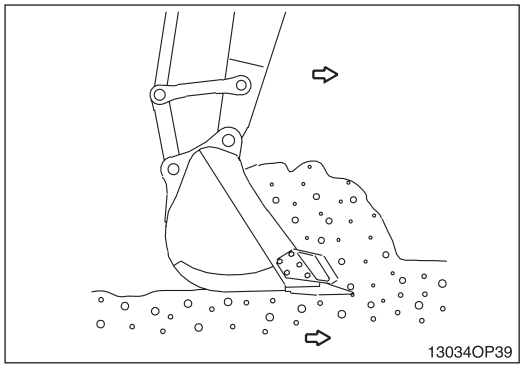
1) Do the digging work by arm.
Use the pulling force of arm for digging and use together with the digging force of the bucket if necessary.



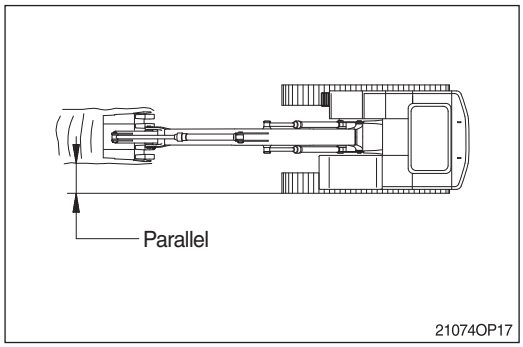
2) When lowering and raising the boom operate softly in the beginning and at the end.
In particularly, sudden stops while lowering the boom may cause damage to the machine.



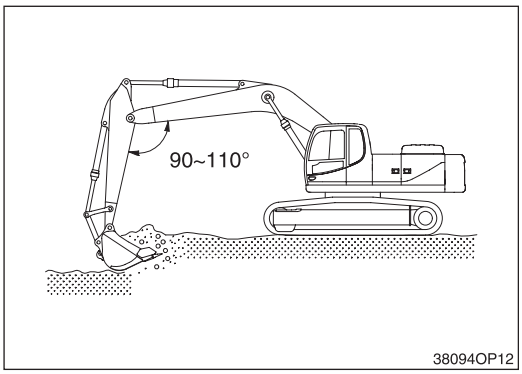
3) The digging resistance and wearing of tooth can be reduced by putting the end of bucket tooth to the digging direction.



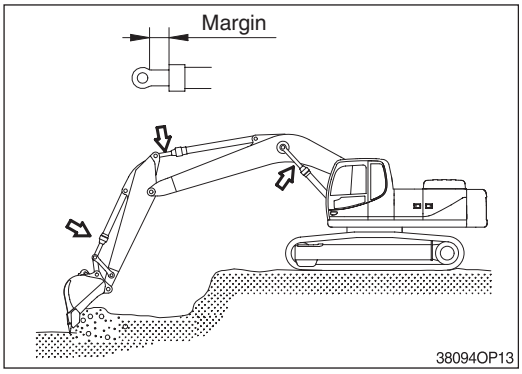
4) Set the tracks parallel to the line of the ditch to be excavated when digging ditch. Do not swing while digging.



5) Dig slowly with keeping the angle of boom and arm, 90–110 degree when maximum digging force is required.

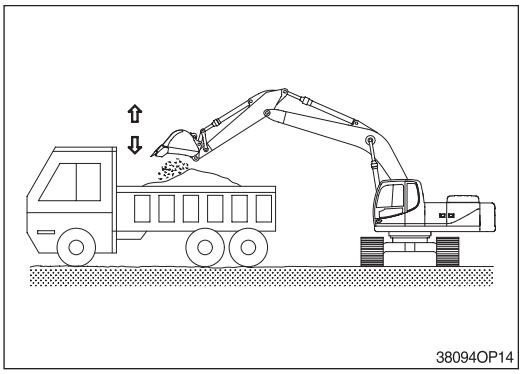


6) Operate leaving a small safety margin of cylinder stroke to prevent damage of cylinder when working with the machine.

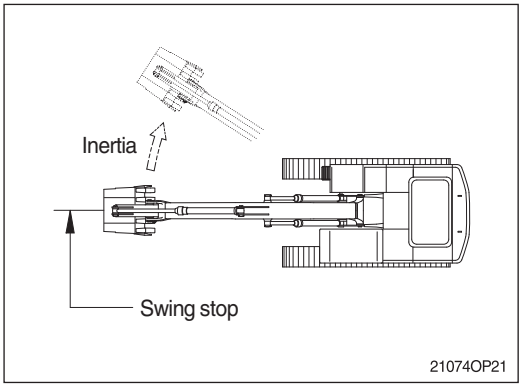


7) Keep the bucket to the dumping position and the arm horizontal when dumping the soil from the bucket.
Operate bucket lever 2 or 3 times when hard to dump.

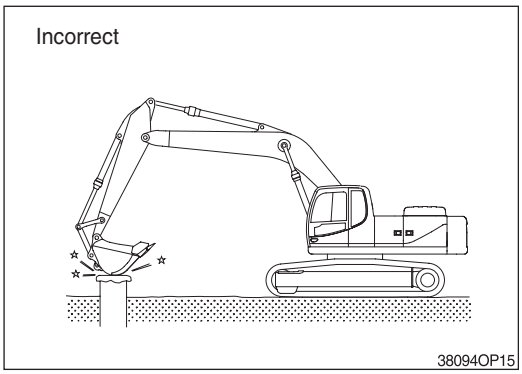
※ **Do not use the impact of bucket tooth when dumping.**



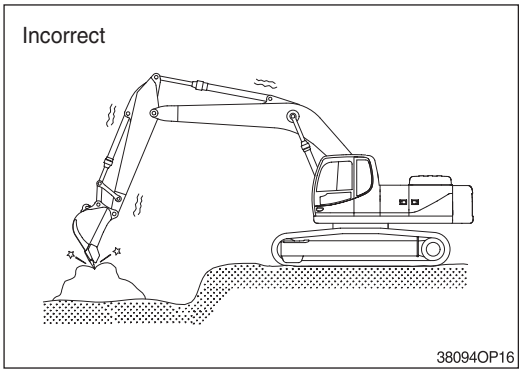
8) Operate stop of swing considering the swing slip distance is created by inertia after neutralizing the swing lever.



9) Do not use the dropping force of the work equipment for digging.
The machine can be damaged by the impact.

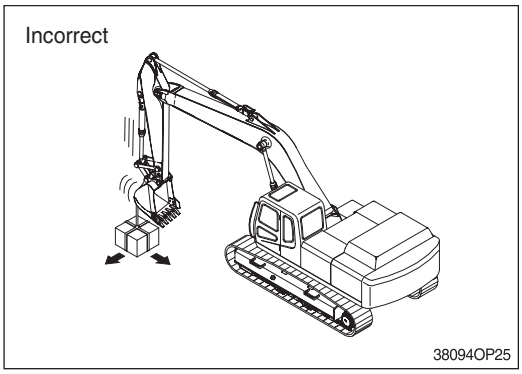


10) Do not use the bucket to crack hard objects like concrete or rocks.
This may break a tooth or pin, or bend boom.



11) NEVER CARRY OUT EXCESSIVE OPERATIONS

Operation exceeding machine performance may result in accident or failure.
Carry out lifting operation within specified load limit.
Never carry out operations which may damage the machine such as overload or over-impact-load.
Never travel while carrying a load.
In case you need installing an overload warning device for object handling procedure, please contact your Hyundai distributor.



12) BUCKET WITH HOOK

When carrying out lifting work, the special lifting hook is necessary.

The following operations are prohibited.

- Lifting loads with a wire rope fitted around the bucket teeth.
- Lifting loads with the wire rope wrapped directly around the boom or arm.

When performing lifting operation, securely hook the wire rope onto the special lifting hook.

When performing lifting operation, never raise or lower a person.

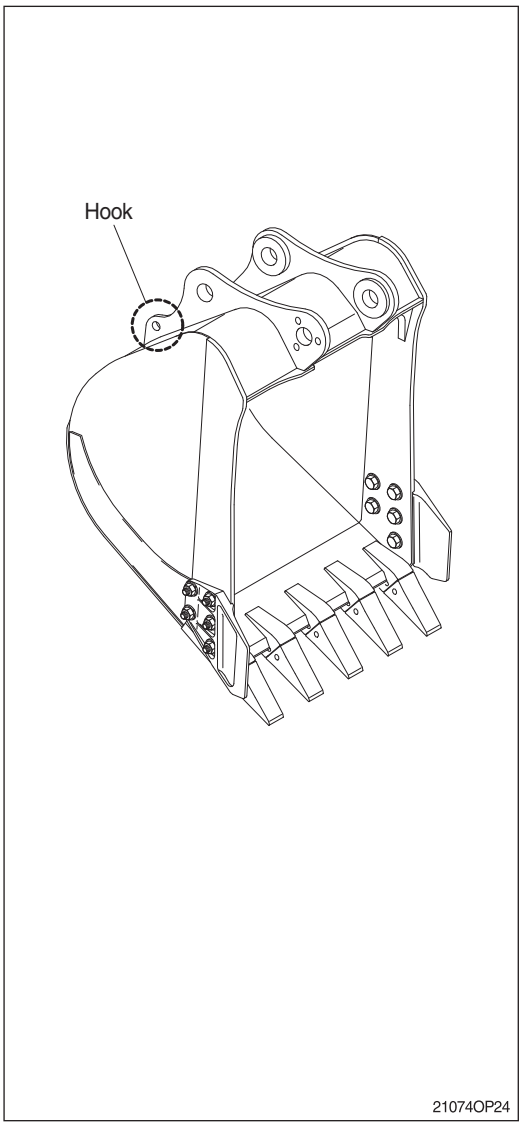
Due to the possible danger of the load falling or of collision with the load, no persons shall be allowed in the working area.

Before performing lifting operation, designate an operation supervisor.

Always execute operation according to his instructions.

- Execute operating methods and procedures under his direction.
- Select a person responsible for signaling. Operate only on signals given by such person.

Never leave the operator's seat while lifting a load.



8. EFFICIENT WORKING METHOD (R520LC-9 DM only)

1) Raise the base/extension boom up to reach the safety working range (20° down from perpendicular position; 5° warning range [sound and rotating beacon in cabin])

2) When the base/extension boom is within the safety range, the middle arm can be moved up fully.

3) Finally the end arm can be moved up; the full working range of the attachment is within the full stretch of the end arm cylinder.

   ⚠ **It is forbidden to pull any material by using the front attachment (crusher/shear).**

4) To lower the front attachment work:

   (1) Fold the end arm fully in

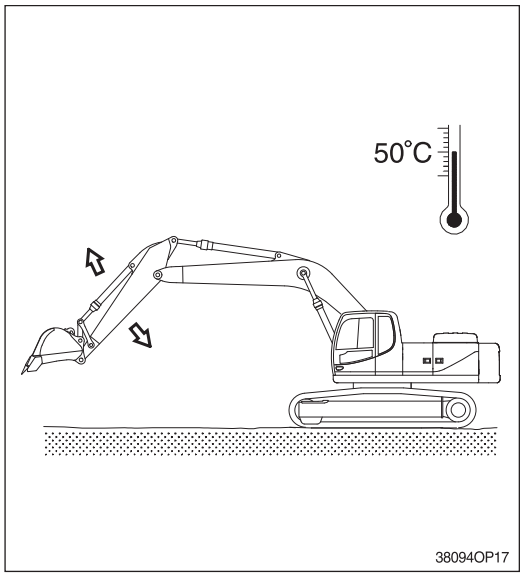
   (2) Fold the middle arm fully in

   (3) Lay the base/extension boom down on the ground cautiously. Be carefull not to damage the full front attachment.

   ⚠ **Always raise and lower the front attachment when the upperstructure is in line with the undercarriage.**

9. OPERATION IN SPECIAL WORK SITES

1) OPERATING THE MACHINE IN COLD WEATHER



(1) Use proper engine oil and fuel for the weather.

(2) Fill the required amount of antifreeze in the coolant.

(3) Start the engine and extend the warming up operation.

(4) Be sure to open the heater cock when using the heater.

(5) Always keep the battery completely charged.

※ **Discharged batteries will freeze more easily than fully charged.**

(6) Clean the machine and park on the wood plates.

2) OPERATION IN SANDY OR DUSTY WORK SITES

(1) Inspect air cleaner element frequently. Clean or replace element more frequently, if warning lamp comes ON and buzzer sounds simultaneously, regardless of inspection period.

※ **Replace the inner and outer element after 6 times of cleaning.**

(2) Inspect radiator frequently, and keep cooling fins clean.

(3) Prevent sand or dust from getting into fuel tank and hydraulic tank during refilling.

(4) Prevent sand or dust from penetrating into hydraulic circuit by tightly closing breather cap of hydraulic oil tank. Replace hydraulic oil filter frequently.

(5) Keep all lubricated part, such as pins and bushings, clean at all times.

(6) If the air conditioner and heater filters clogged, the heating or cooling capacity will drop. Clean or replace the filter element more frequently.

3) SEA SHORE OPERATION

(1) Prevent ingress of salt by securely tightening plugs, cocks and bolts of each part.

(2) Wash machine after operation to remove salt residue.
Pay special attention to electrical parts and hydraulic cylinders to prevent corrosion.

(3) Inspection and lubrication must be carried out more frequently.
Supply sufficient grease to replace all old grease in bearings which have been submerged in water for a long time.

4) OPERATION IN MUD, WATER OR RAIN WORK SITES

(1) Perform a walkaround inspection to check for any loose fittings, obvious damage to the machine or any fluid leakage.

(2) After completing operations, clean mud, rocks or debris from the machine. Inspect for damage, cracked welds or loosened parts.

(3) Perform all daily lubrication and service.

(4) If the operations were in salt water or other corrosive materials, make sure to flush the affected equipment with fresh water.

10. NORMAL OPERATION OF EXCAVATOR

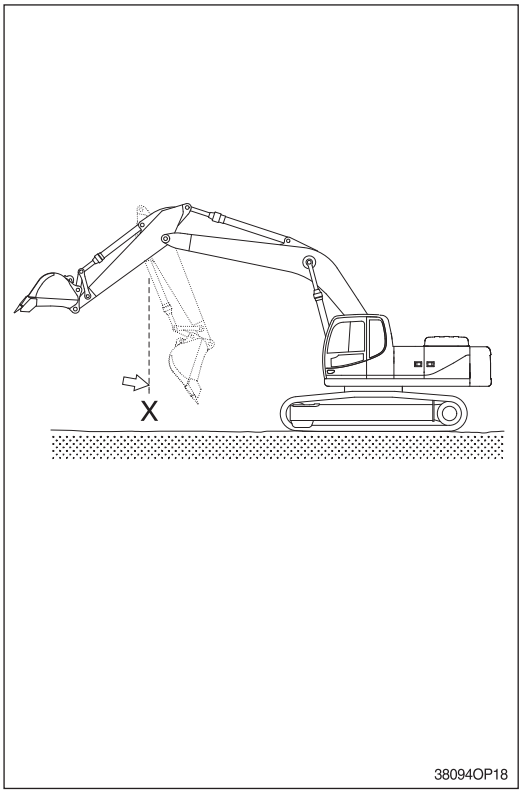
The following events may occur during the operation due to the nature of a hydraulic excavator.

1) When rolling in the arm, the roll-in movement stops momentarily at point **X** in the picture shown, then recovers speed again after passing point **X**.
   The reason for this phenomenon is that movement by the arm weight is faster than the speed of oil flow into the cylinder.

2) When lowering the boom, one may hear continuous sound.
   This is caused by oil flow in the valve.

3) Overloaded movement will produce sound caused by the relief valves, which are for the protection of the hydraulic systems.

4) When the machine is started swing or stopped, a noise near the swing motor may be heard. The noise is generated when the brake valve relieves.



11. NORMAL OPERATION OF EXCAVATOR (R520LC-9 DM only)

1) Raise the base/extension boom up to reach the safety working range (20° down from perpendicular position; 5° warning range [sound and rotating beacon in cabin])

2) When the base/extension boom is within the safety range, the middle arm can be moved up fully.

3) Finally the end arm can be moved up; the full working range of the attachment is within the full stretch of the end arm cylinder.

   ⚠ **It is forbidden to pull any material by using the front attachment (crusher/shear).**

4) To lower the front attachment work:

   (1) Fold the end arm fully in

   (2) Fold the middle arm fully in

   (3) Lay the base/extension boom down on the ground cautiously. Be carefull not to damage the full front attachment.

   ⚠ **Always raise and lower the front attachment when the upperstructure is in line with the undercarriage.**

12. ATTACHMENT LOWERING (When engine is stopped)

1) On machines equipped with an accumulator (within 2 minutes) after the engine is stopped, the attachment can be lowered under its own weight when the attachment control lever is shifted to LOWER. This only happens when the starting switch is ON and the safety lever is in the UNLOCK position. After the engine is stopped, set the safety lever to the LOCK position.

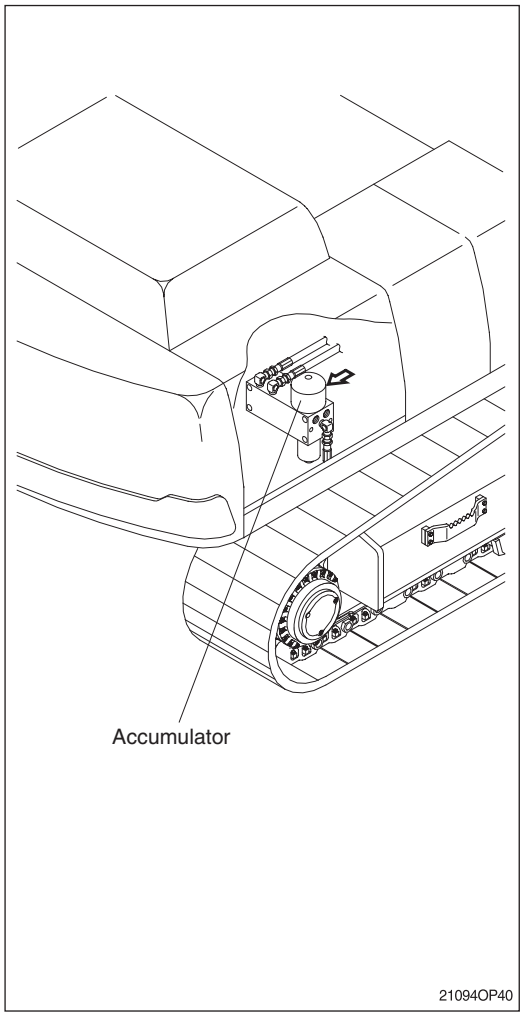
   ⚠ **Be sure no one is under or near the attachment before lowering the boom.**

2) The accumulator is filled with high-pressure nitrogen gas, and it is extremely dangerous if it is handled in the wrong way. Always observe the following precautions.

   ⚠ **Never make any hole in the accumulator expose it to flame or fire.**

   ⚠ **Do not weld anything to the accumulator.**

   ※ **When carrying out disassembly or maintenance of the accumulator, or when disposing of the accumulator, it is necessary to release the gas from the accumulator. A special air bleed valve is necessary for this operation, so please contact your Hyundai distributor.**



13. STORAGE

Maintain the machine taking care of following to prevent the deterioration of machine when storing the machine for a long time, over 1 month.

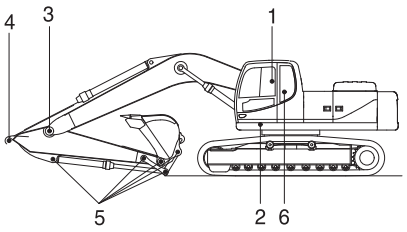
1) CLEANING THE MACHINE

Clean the machine. Check and adjust tracks. Grease each lubrication part.

2) LUBRICATION POSITION OF EACH PART

Change all oils.

※ **Be particularly careful when you reuse the machine as oil can be diluted during storage.**
Apply an anticorrosive lubricant on the exposed part of piston rod of cylinder and in places where the machine rusts easily.



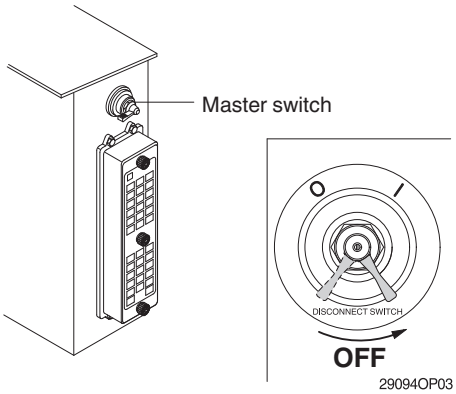
1 Lubricating manifold (5EA)
2 Boom cylinder pin (2EA)
3 Boom and arm connection pin (1EA)
4 Arm cylinder pin (rod side, 1EA)
5 Arm and bucket (6EA)
6 Boom rear bearing center (1EA)

38094OP19

3) MASTER SWITCH

Turn OFF the master switch mounted in the battery box and store the machine.

4) Be sure to mix anticorrosive antifreezing solution in the radiator.



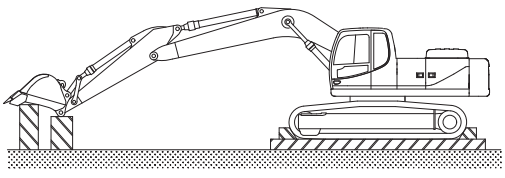
29094OP03

5) PREVENTION OF DUST AND MOISTURE

Keep machine dry. Store the machine setting wood on the ground.

※ **Cover exposed part of piston rod of cylinder.**

※ **Lower the bucket to the ground and set a support under track.**

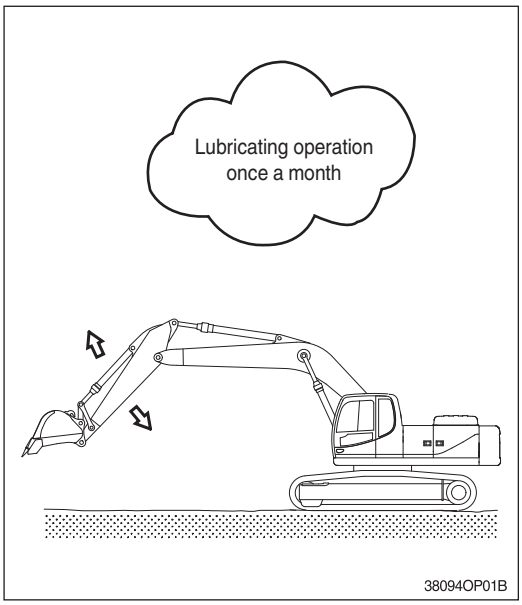


38094OP20

6) DURING STORAGE

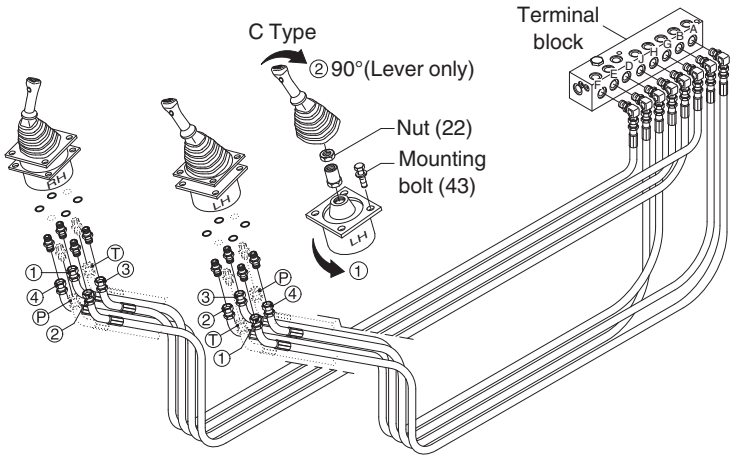
Start engine and move the machine and work equipment once a month and apply lubrication to each part.

- ※ **Check the level of engine oil and coolant and fill if required when starting engine.**
- ※ **Clean the anticorrosive on the piston rod of cylinder.**
- ※ **Operate the machine such as traveling, swing and work equipment operation to make sure enough lubrication of all functional components.**



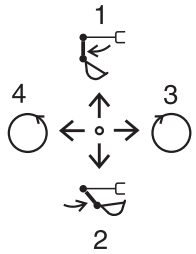
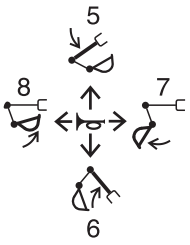
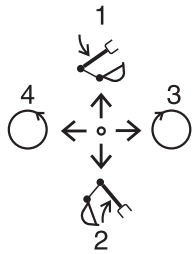
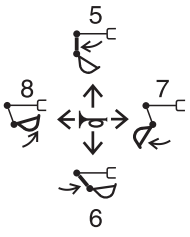
14. RCV LEVER OPERATING PATTERN

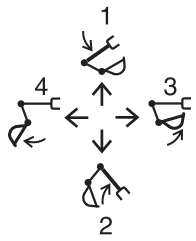
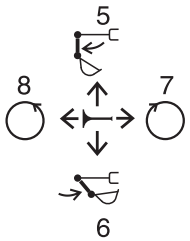
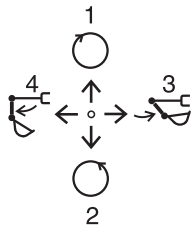
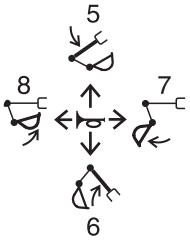
1) PATTERN CHANGE VALVE NOT INSTALLED (standard)



※ Whenever a change is made to the machine control pattern also exchange the pattern label in the cab to match the new pattern.

48094OP02

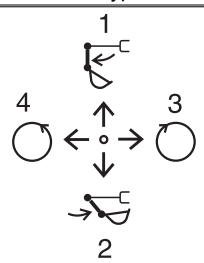
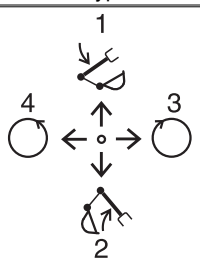
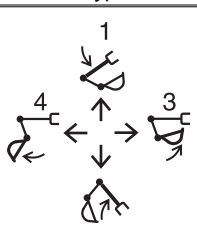
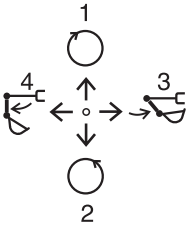
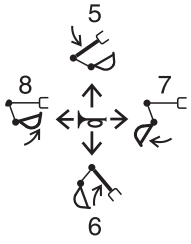
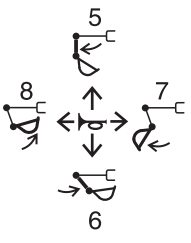
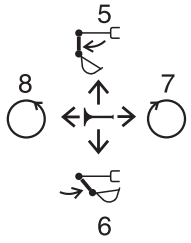
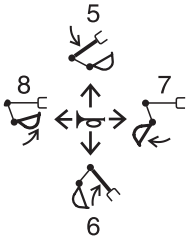
Pattern	Operation		Control function		Hose connection (Port)		
	Left RCV lever	Right RCV lever			RCV lever	Change of terminal block	
						From	To
ISO type			Left	1 Arm out	②	D	-
				2 Arm in	④	E	-
				3 Swing right	③	B	-
				4 Swing left	①	A	-
			Right	5 Boom lower	④	J	-
				6 Boom raise	②	H	-
				7 Bucket out	①	F	-
Hyundai				8 Bucket in	③	G	-
A type			Left	1 Boom lower	②	D	J
				2 Boom raise	④	E	H
				3 Swing right	③	B	-
				4 Swing left	①	A	-
			Right	5 Arm out	④	J	D
				6 Arm in	②	H	E
				7 Bucket out	①	G	-
				8 Bucket in	③	F	-

Pattern	Operation		Control function		Hose connection (Port)		
	Left RCV lever	Right RCV lever			RCV lever	Change of terminal block	
						From	To
B type			Left	1 Boom lower	②	D	J
				2 Boom raise	④	E	H
				3 Bucket in	③	B	F
				4 Bucket out	①	A	G
			Right	5 Arm out	④	J	D
				6 Arm in	②	H	E
				7 Swing right	①	G	B
				8 Swing left	③	F	A
C type			Left	① Loosen the RCV lever mounting bolt (43) and rotate lever assy 90° counterclockwise; then install. ② To put lever in correct position, disassemble nut (22) and rotate only lever 90° clockwise.			
			Right	Same as **ISO** type			

2) PATTERN CHANGE VALVE INSTALLED (Option)

※ **If the machine is equipped with the pattern change valve, the machine operation pattern can be easily changed.**

※ **Whenever a change is made to the machine control pattern also exchange the pattern label in the cab to match the new pattern.**

Operation	ISO type	A type	B type	C type
Left RCV lever				
Right RCV lever				

1) The machine control pattern can easily be changed from the "ISO" type to the "A" type, "B" type or "C" type by changing the position of the lever.

⚠ **Before starting the machine, check the lever position of the pattern change valve and actual operating of attachment.**

2) Change of operating pattern

- A type

(1) Loosen the wing bolt.

(2) Move lever from the "ISO" type to "A", "B" or "C" type position.

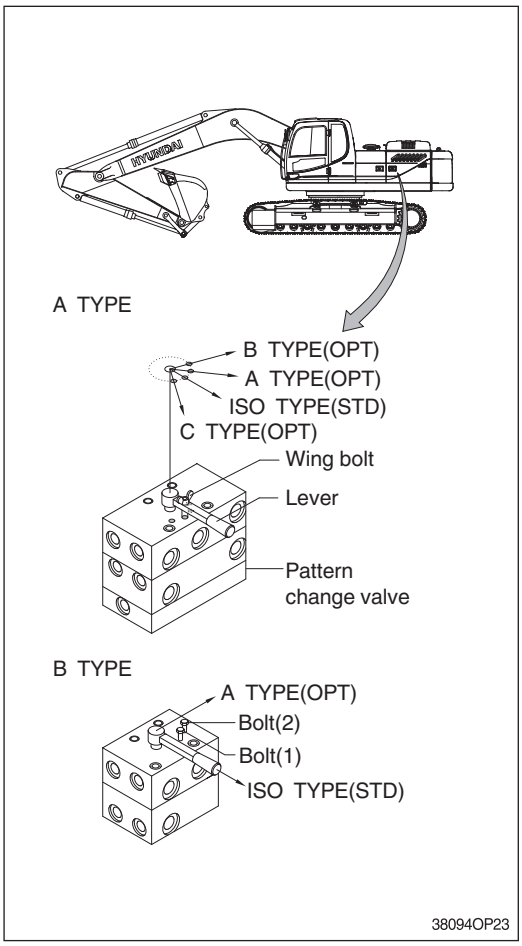
(3) After the lever is set, tighten the bolt in order to secure the lever.

- B type

(1) Loosen bolt (1) or bolt (2).

(2) Move lever to the "ISO" or "A" position.

(3) After setting to secure lever.
- Bolt (1) for "ISO" pattern
- Bolt (2) for "A" pattern

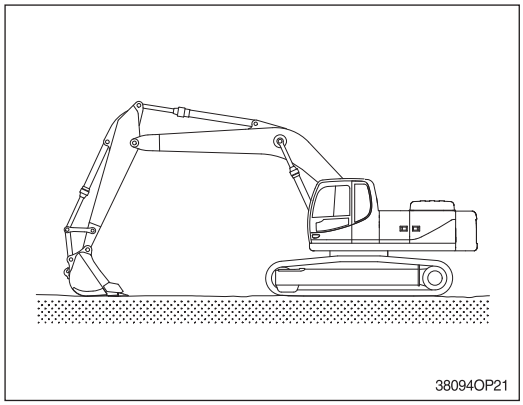


15. SWITCHING HYDRAULIC ATTACHMENT CIRCUIT

1) The combined hydraulic attachment circuit is capable of providing single action or double action.

2) The position of the 3-way valve selects the single action hydraulic attachment circuit or the double action hydraulic attachment circuit.

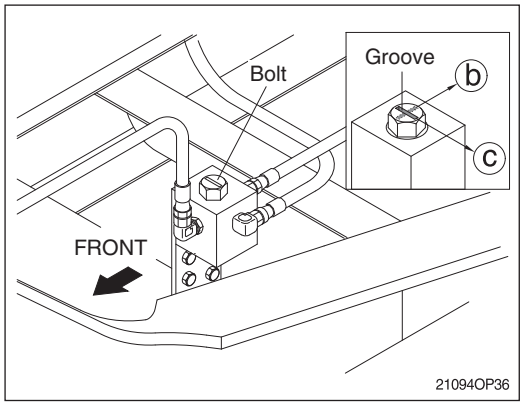
3) Before you change the flow mode of hydraulic attachment circuit, place the machine in the servicing position as shown. Stop the engine.



4) Use the spanner to turn the bolt of 3 way valve. Make sure that you turn the bolt between Ⓑ and Ⓒ.

   (1) One way flow (Hydraulic breaker)
   Position the manual lever parallel to the piping (Ⓑ)

   (2) Two way flow (Clamshell or shear)
   Position the manual lever perpendicular to the piping (Ⓒ).



16. INSTALLATION AND REMOVAL OF THE DEMOLITION FRONT (for R520LC-9 DM only)

※ **The R520LC-9 DM is designed so to be used as a standard excavator with the backhoe attachment installed or as a high-reach demolition excavator with the high-reach demolition attachment installed.**

⚠ **Installing or removing the demolition front may only be done with the cabin in a horizontal position.**

1) INSTALLATION OF THE HIGH-REACH DEMOLITION BOOM

※

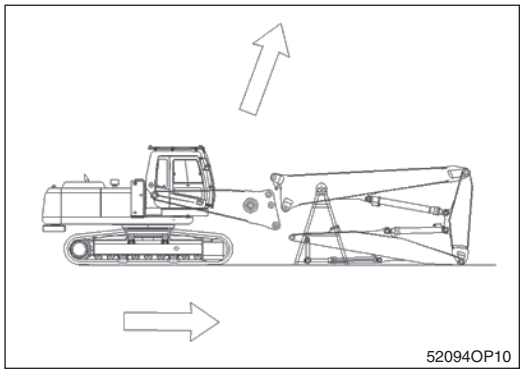
- **Perform this procedure on a flat and level surface.**
- **Make sure to have suitable containers available to collect hydraulic oil when opening, maintaining, inspecting, testing, adjusting or repairing components containing hydraulic oil.**
- **Dispose drained fluids according to local regulations and mandates.**

(1) Have the engine running and move the machine inline with the attachment in the supporting cradle.

(2) Move the base boom side pins in the extension boom hooks slowly. Raise the attached boom until both pin holes are aligned.

(3) Install the support pins and tighten the security screws.

(4) Connect the hydraulic hoses one by one and tighten them as necessary. Start first with the lower row, then proceed with the upper row.



(5) After connecting the hydraulic lines vent the hydraulic system by running the engine on high RPM and by slowly operating the functions by using full stroke of the joystick and pedals.

⚠ **If some functions don't operate, stop the engine and check for line connections or leakages. If necessary remove the trapped air from the hydraulic lines.**

(6) Install the suitable demolition attachment (see proper installation manual).

⚠ **The heavy extension boom can fall when not correctly installed. Before moving the attached extension boom, make sure that all relevant persons take the necessary safety distance.**

2) REMOVAL OF THE HIGH-REACH DEMOLITION BOOM

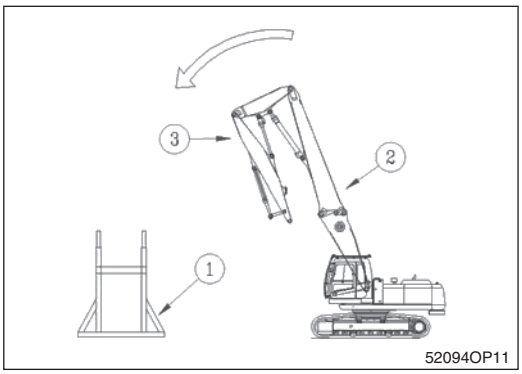
※

- **Perform this procedure on a flat and level surface.**
- **Make sure to have suitable containers available to collect hydraulic oil when opening, maintaining, inspecting, testing, adjusting or repairing components containing hydraulic oil.**
- **Dispose drained fluids according to local regulations and mandates.**

1. Place the supporting craddle (1) on a flat and level surface.

2. Fully retract the middle arm cylinder and the end arm cylinder. Fully extend the bucket cylinder.

   ※ **Make sure that the demolition attachment is removed from the end arm properly.**



52094OP11

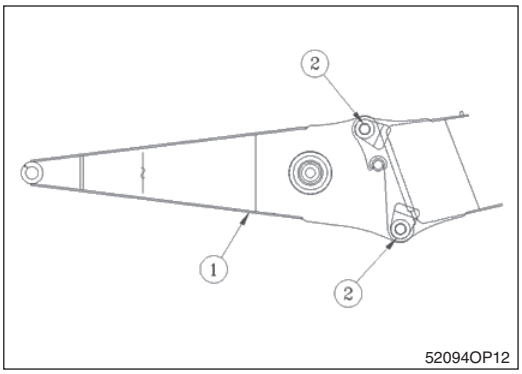
3. Align and park the machine in front of the supporting craddle.

4. Position the boom (2) while maintaining proper clearance to the craddle.

5. Lower the boom until the extension boom pins are properly supported by the craddle.

6. Move the end arm outwards until the supporting bracket reaches the ground and the extension boom is properly supported in a 3-point stable position.

7. Loosen the safety bolts and remove the support pins.
   If supporting pins are stuck, move the base boom up or down slowly while hammering the pins.



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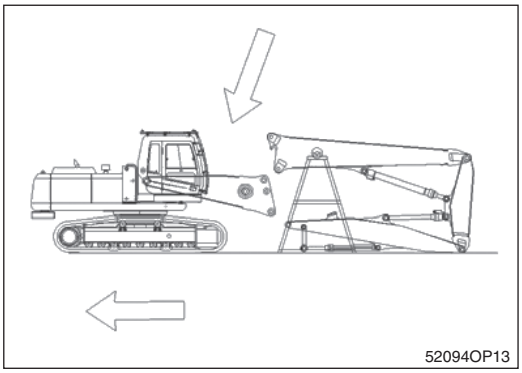
8. Stop the engine, operate both joysticks and the middle arm operating pedal to relieve the pressure from the hydraulic lines, then disconnect the hydraulic lines. First take the upper lines, then loosen the lower lines.

   ⚠ **Please take care of the above note!**

9. Restart the engine and slowly lower the base boom in order to final detach the extension arm.

10. Move the machine back to free up the attachment.

11. Fasten the extension boom safely to the craddle.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17. INSTALLATION/REMOVAL OF STANDARD BACKHOE FRONT

Use the same workflow as described for the demolition front.