Starting the Engine

General

⚠ **Notice:** Do not use ether or other starting fluids to assist cold starting. Using these fluids may result in an explosion causing possible injury and/or damage to the engine.

The engine noise and or tone may be louder than usual when cold. The engine will become quieter when the engine reaches normal operating temperature.

New engines do not require a running-in period. The engine/machine should be used in a normal work cycle immediately, glazing of the piston cylinder bores resulting in excessive oil consumption, could occur if the engine is gently run-in. Under no circumstances should the engine be allowed to idle for extended periods.

If any warning lights fail to go off or come on while the engine is running, stop the engine as soon as it is safe to do so.

Safety Features

The machine is fitted with an operator seat occupancy switch and lever position switch designed to prevent inadvertent activations of the controls. If either of the features malfunction stop using the machine immediately and contact your JCB dealer. This safety feature must be checked every time before operating the machine.

Operator Seat Occupancy Switch

This feature prevents the machine from starting if it detects that the operator is not seated and drive lever is not in the park brake position. This feature will also stop the engine from running and bring the machine to a safe standstill after 2s when it detects that the operator seat is vacant and drive lever is not in park brake position.

With the ignition on the seat switch LED (Light Emitting Diode) on the instrument panel must illuminate when the seat is vacant and extinguish when it is occupied. Refer to: Instruments (Page 45).

Drive Lever Position Switch

This feature prevents the machine from starting if it detects that the drive lever is not in the park brake position (furthest position away from the operator). Refer to: Transmission Drive Lever (Page 43).

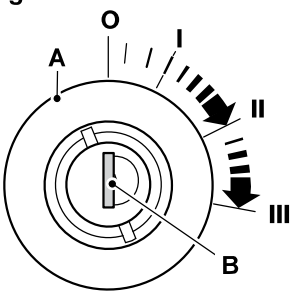
With the ignition on the park brake light on the display illuminates when the lever is in park brake position and extinguishes when it is moved to the neutral position. Refer to: Instruments (Page 45).

Start the Engine

1. Make sure that the machine is ready to start.
   Refer to: Before Starting the Engine (Page 31).
2. Make sure that the articulation lock is in the drive position.
   Refer to: Articulation Lock (Page 41).
3. Make sure there are no blocks under the machine.
4. Make sure that the drive lever is in the park position.
5. Make sure that the throttle control is in the idle position.
6. Make sure that the vibration switch is in the off position.
7. Insert the key into the ignition switch and turn it on.
8. Make sure that the following indicator lights on the instrument panel operate correctly: charging current indicator light, engine oil pressure warning light, park brake light and neutral position lights, rectify them if they do not illuminate.
9. Turn the ignition switch to the preheat position and allow the glow lamp to illuminate, then extinguish.

10. Turn the key to start position and the engine should start. Release the key immediately when the engine starts.
11. When the engine has started, check the all warning lights (excluding the neutral and park brake warning lights) have gone off.
12. Warm the engine at medium speed without load.
13. If the engine does not catch or start at 10 seconds after the starter switch is set at start position, wait for another 30 seconds and then begin the engine starting sequence again.

Figure 18. Standard Switch



A Ignition switch **B** Ignition key

13.1. Do not allow the starter motor to run continuously for more than 20 seconds.

Table 5. Switch Positions

Position	Function
0	Off/Stop the Engine: Turn the ignition key to this position to stop the engine. Make sure the controls are in neutral before you stop the engine.
I	On: Turn the ignition key to this position to connect the battery to all of the electrical circuits. The ignition key will return to this position when it is released from position II or position III.
II	Not used.
III	Preheat position. Turn the ignition key to this position to operate the glow plug or grid heater for the appropriate time.
IV	Start position: Turn the ignition key to this position to operate the starter motor and turn the engine. The ignition switch has an inhibitor to stop the ignition switch being turned on when the engine is running.

Cold Weather Start

1. The table shows the standard preheat position times for various temperatures. This operation is not required, when the engine is warmed up. Refer to Table 6.

   1.1. Make sure to warm up the engine, not only in winter, but also in warmer seasons. An insufficiently warmed-up engine can decrease its service life.

   1.2. When the temperature drops below the figure specified detach the battery from the machine and keep it inside in a safe area.

   Temperature: -15°C (5.0°F)

2. Warm up the machine for up to 5 minutes with moderate speed and low loads until the oil in the hydraulic system has warmed up to the temperature specified.

   Temperature: 20°C (68.0°F)
   Refer to: Operating in Low Temperatures (Page 66).

Table 6.

Ambient temperature	**Preheat Position Time**	
	With Glow Lamp Timer	**Extended Time**
Above 10°C (50.0°F)	When the ignition switch key is turned to the preheat position glow lamp goes off after about 6 seconds. If necessary keep the ignition key at the preheat position for the extended time.	Not required
10°C (50.0°F) to -5°C (23.0°F)		Approximately 5 seconds
Below -5°C (23.0°F)		Approximately 10 seconds