



EM013041
Revision No 1
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Operation Manual

SH660 D Roof Support Carrier

Serial Number 5003742

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ALWAYS be aware of the impact of the payload on the visibility available to the operator. The recommended maximum speed when loaded is 10 km/h, however, the impact of the payload on the operator's field of vision must be considered when operating the machine with payload. Drive to the conditions.

NEVER operate the machine under unsecured roof.

- Keep your machine clean. A clean machine makes for a safer machine.
- No diesel engine should be operated underground if it is smoky, running unevenly, or if the exhaust system is not in good condition.
- In areas where auxiliary ventilation is used, the operator should make sure fans are operating before starting the machine.
- The engine shall not for any reason be left running unattended underground.
- The engine should not be shutdown from full load and must be allowed to idle for a few minutes before stopping.
- Never operate a machine that you feel is mechanically unsafe.

MACHINE TOP ACCESS

On the driver's side of the machine, two foot holds have been installed to aid in safe access to the top of the machine.



Prior to accessing the top of the machine ensure the top surfaces are free of any material that could pose a trip or slip hazard. Maintain a three-point contact to avoid injury.



TRANSMISSION GEAR CONTROL LEVER

The transmission gear control lever has four positions, *first*, *second*, *third* and *fourth*. Shifting from one range to another can be made at any time conditions permitting. Momentarily decrease engine revs when selecting a higher gear. Momentarily increase engine revs when selecting a lower gear.



NOTICE

The transmission in the machine is modulated. This prevents severe shocks being transmitted through the drive train when the transmission is shifted between gears.

TRANSMISSION DIRECTIONAL CONTROL LEVER

A directional control lever controls the transmission. This lever has three positions, *forward*, *neutral* and reverse. The engine should be at low idle when the transmission is shifted from the *neutral* position to either *forward* or *reverse* direction. Selecting the neutral position on the direction lever applies the machine brakes.



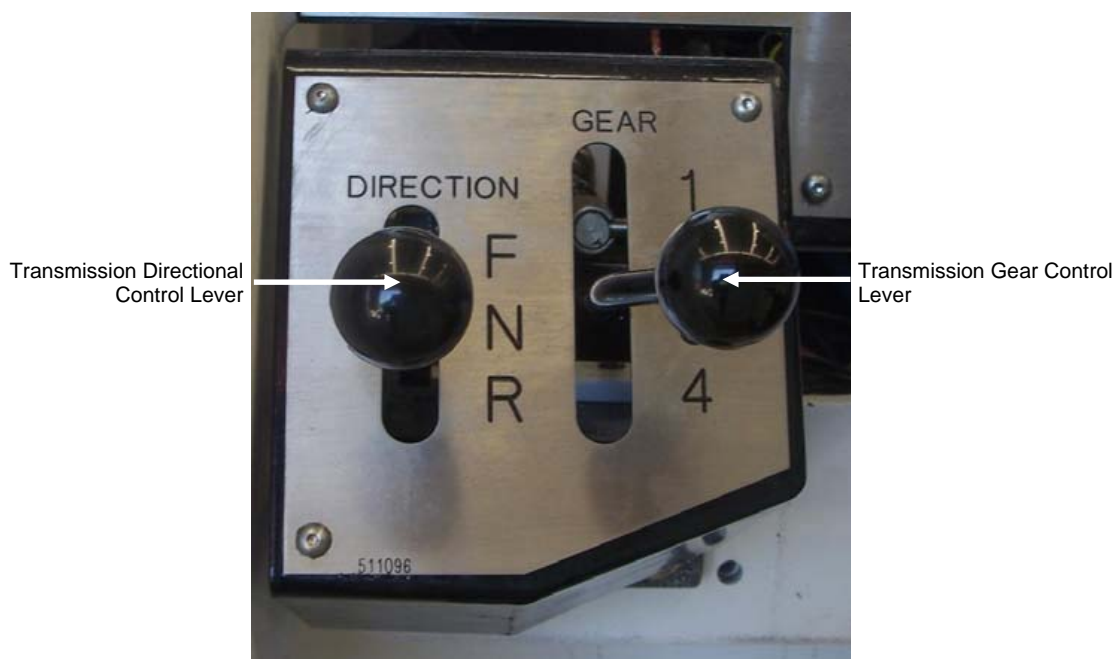
NOTICE

The transmission must be placed in the *neutral* position for the starter motor to engage when starting the engine.



WARNING

If the engine starts when the transmission is not in neutral, the machine should be tagged out of service until the problem is rectified.



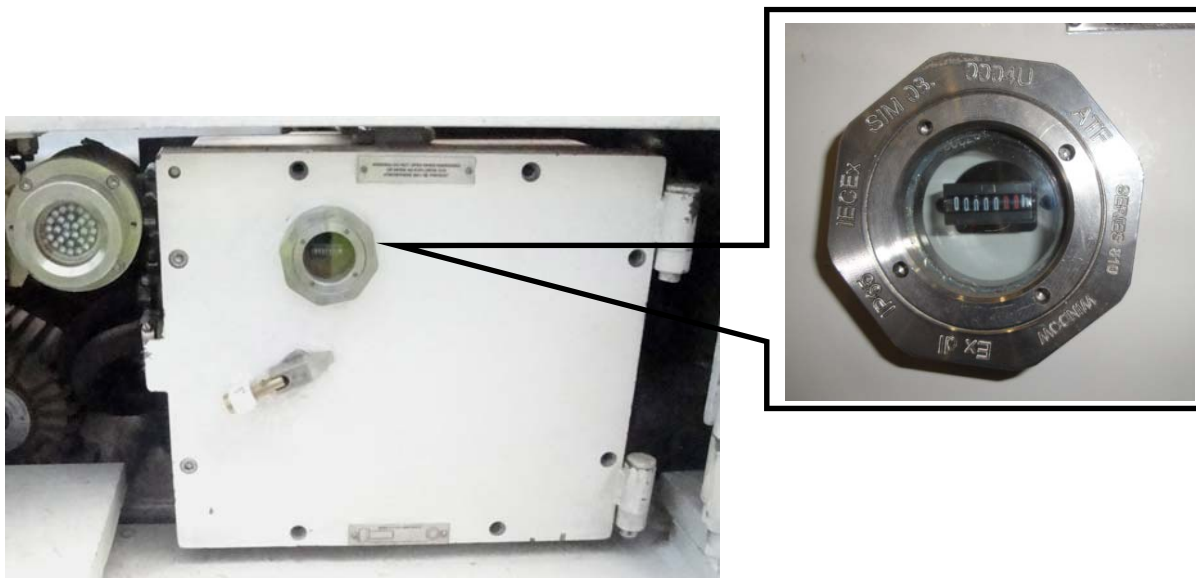
TRANSMISSION CONTROLS



ENGINE SERVICE HOUR METER

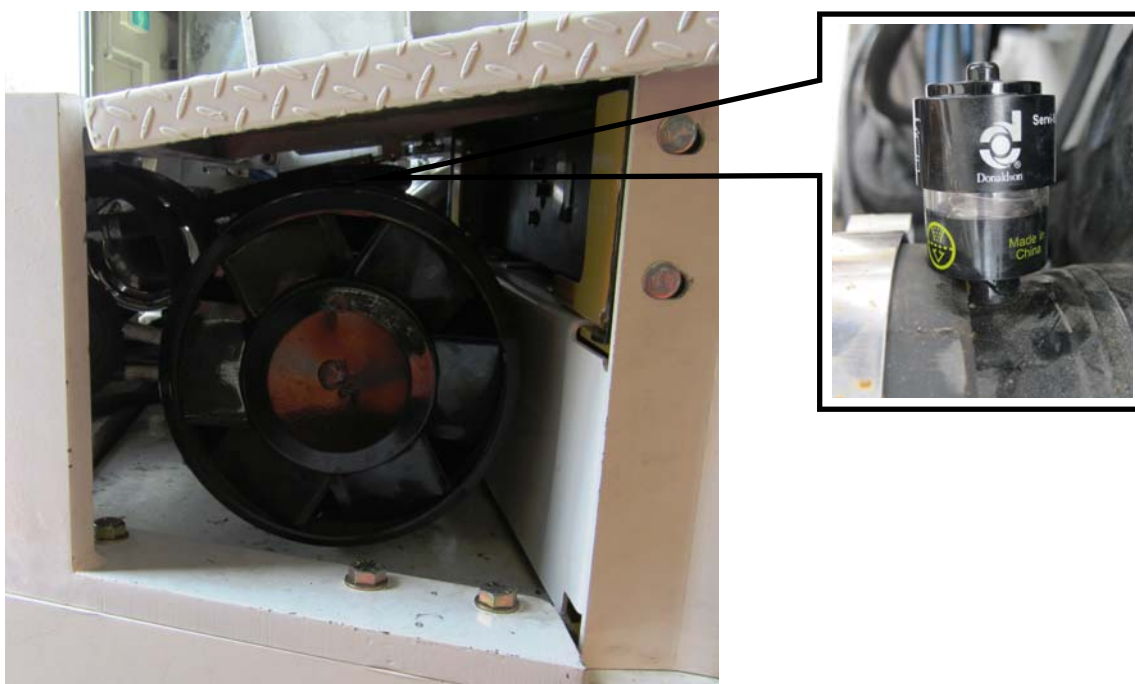
This electric meter is mounted on the door of the main electrical enclosure at the rear of the machine.

Use the hour meter to determine servicing intervals.



AIR CLEANER SERVICE INDICATOR

The air cleaner service indicator is located at the back of the air cleaner and indicates the condition of the air cleaner element. When the service indicator is in the *red* zone, the air cleaner elements should be removed and serviced.



AIR CLEANER AND INDICATOR (LOCATED AT BACK)

Section 5 Machine Isolation

Before commencing work on the machine, it is imperative to ensure the system to be worked on is correctly isolated. This may also require the isolation of other systems that affect the safe completion of the job.



Any site/mine specific isolation procedures override those listed on the following pages. The procedures presented here are the minimum required to perform any work on the machine. Before commencing check with the relevant people regarding any site/mine specific isolation procedures.

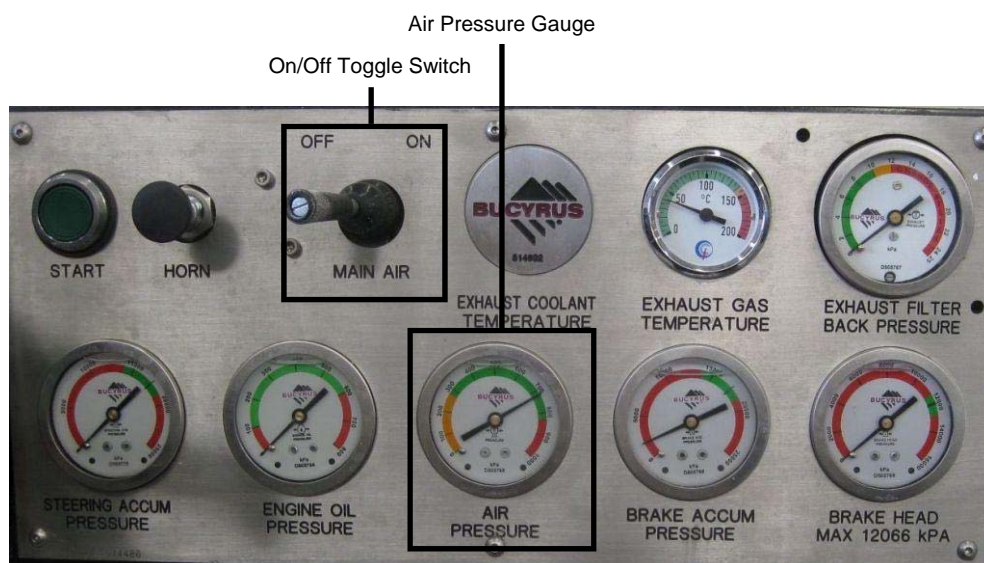
ENGINE ISOLATION

To isolate the engine perform the following procedure:

1. Ensure the area is clear of any obstructions and area is fit for carrying out safe operation and maintenance.
2. Ensure the machine is in a straight line (not articulated).
3. Lower the lift arms to the ground.
4. Select *neutral* on transmission directional control lever.
5. Apply the park brake.
6. Shutdown the engine.
7. Fit a danger tag to the on/off toggle switch.
8. Connect the articulation lock and chock the wheels.
9. Close the main air isolation valve and fit a danger tag (see Pneumatic Isolation).



Be careful of hot surfaces, when working on or around the machine, allow time for them to cool down.



RIGHT HAND SIDE OPERATOR'S DISPLAY PANEL

Section 6

Pre-Start Procedure

Walk around the machine:

1. Check condition of all tyres. Inspect for sidewall cuts, tread cuts and separation.
2. Look for damaged or missing wheel nuts and studs.
3. Check for loose wheel nuts.
4. Guards and covers are in place and secure.
5. Missing or loose bolts.
6. Oil leaks.
7. Hose damage.



WARNING

Never start or operate the machine if the diesel control system has been bypassed, report to service personnel.



WARNING

Always ensure the machine is correctly isolated before undertaking any tasks.

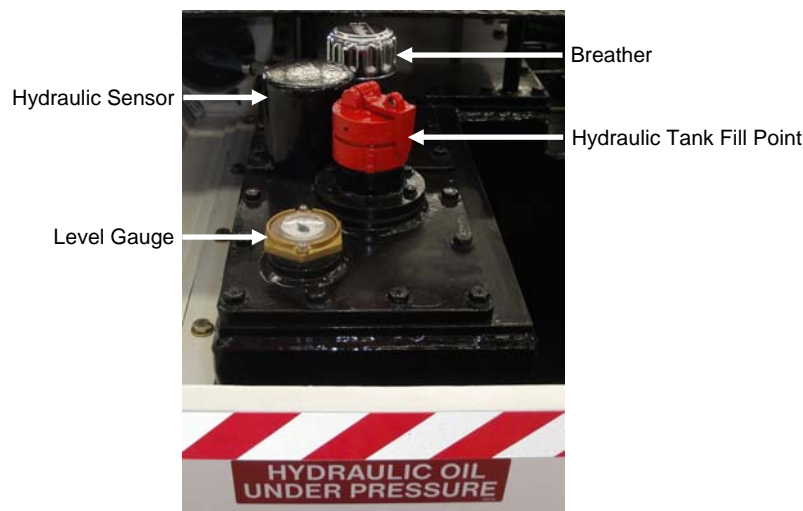
Check the hydraulic tank oil level:

1. Be sure the machine is on a level surface when checking oil level.
2. Ensure the lift arms are in the lower position, the engine is turned off and the machine is isolated as per Section 5.
3. Check the level at normal operating temperature.
4. When the oil level has dropped below the $\frac{3}{4}$ mark, add hydraulic oil to restore the correct operating level.
5. The tank fill cap is located on the off driver's side of the machine on the top of the hydraulic tank.



CAUTION

Always use the specified lubricant for the application and the region's seasonal temperatures. (See Section 20).



Section **7****Engine Starting Procedure****WARNING**

Always sound the horn and make sure the area around the machine, especially between the front and rear frames, is clear before starting the engine. Never attempt to start an engine without first knowing how to shut it off.

**WARNING**

Do not start the engine if machine is tagged out of service or Personal Danger Tag/Lock is affixed.

**NOTICE**

If the machine is to be put into operation, make certain that the articulation lock is disconnected.

1. Turn the main air isolation valve, located in the engine compartment to the *on* position.
2. Enter the operator's compartment and close and latch the door.
3. Place the transmission directional control lever in the *neutral* position.
4. Make sure the park brake is applied. Check the air pressure gauge. If the start pressure is below 700 kPa (100 psi) the engine may not start. If the air pressure is below 700 kPa (100 psi), recharge the air receiver up to maximum 827 kPa (120 psi).
5. Turn the on/off toggle switch to the *on* position.

**NOTICE**

The diesel control system display will not activate if the air pressure is below 275 kPa (39 psi).

6. Wait for the display to indicate waiting for start.
7. Do not press start button until the siren sounds.
8. Do not apply throttle when starting the engine.
9. Press the engine start button and release it when the engine has fired.
10. Check the display indicates "Engine Running".
11. If the alternator becomes faulty do not continue to use the machine as this will discharge the battery.
12. Carry out post start checks and operate machine normally.

See Section 20 - Operating Diesel Control System

As soon as the engine starts, check all gauges and indicators to ensure that all systems are functioning correctly. Always let the engine warm up slowly. Never load up a cold engine.

**CAUTION**

Do not engage the starter motor when the flywheel is moving.

Section **11** Stopping and Braking

1. Use the transmission to help slow down the machine, by shifting down gears and utilising engine braking.
2. Apply the brakes and bring the machine to a halt at the side of the roadway, turn the machine toward the rib and lower the lift arms to the ground.
3. Apply the park brake.
4. The engine should not be shutdown from full load. To stabilise temperatures allow it to idle for a few minutes before stopping.
5. Shut off the engine by turning the on/off toggle switch to the *off* position.
6. After stepping off the machine, switch *off* the main air isolation valve.



WARNING

The brakes fitted to the machine are extremely effective to cope with towing large loads. Operators should be prepared for rapid deceleration when the brakes are applied.



NOTICE

In an emergency immediately apply the brake. If this fails to activate the brakes, immediately apply the park brake.



NOTICE

The seat belt should be worn whilst operating the machine at all times.

If the brakes fail on the machine you should:

- Use the gears to help slow the machine.
- Lower the lift arms.
- Gradually turn machine to the rib.
- Apply the park brake.
- Shutdown the engine.

Section **16**

Towing with the Machine

**WARNING**

The transmission will not hold the machine when the spring applied park brakes are bypassed by the Porta-Power pressure.

**NOTICE**

Maximum towing speed is 3 kph.

1. Ensure the machine is parked and isolated prior to connecting the trailer or load, park brake *on*.
2. Attach the load to the rear tow hitch, ensure tow pin is secure.
3. The trailer or load should be secured by 2 x 16000 kg safety chains in a straight line pull in addition to a rated draw bar for the task.
4. Both chains must be used and adjusted to ensure an even pull.
5. Both chains have a combined loading of 32000 kg in a straight line.
6. Both chains must be used for maximum tractive effort pull.
7. Ensure all connections on the towed piece are in good condition and rated for the maximum pull.
8. Ensure all holding devices and hitches are in good condition and rated for the maximum pull before connecting the machine.
9. Always ensure that the trailer and load are secure before towing, and prior to releasing the park brake.
10. Travel at a speed that is suitable to conditions and load.
11. Ensure trailer or load has wheels chocked prior to removal from the machine.

**CAUTION**

Always connect the trailer or load before releasing the park brakes. Make sure the park brake is reapplied before the towing machine is disconnected

**WARNING**

For towing braked trailer masses consult the Dealer.

**CAUTION**

Failure to comply to these procedures may result in serious personal injury or damage to the equipment.

**CAUTION**

For machines fitted with a Proximity Detection System (PDS), review the tow item against the field size before towing.

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