

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.



NOTICE

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

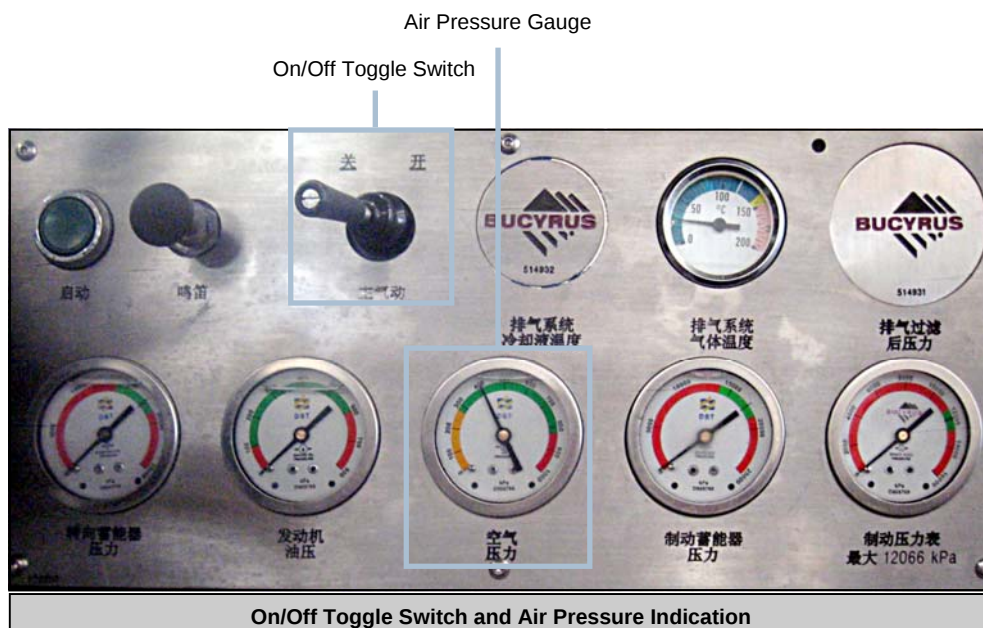
To isolate the engine perform the following procedure:

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).



WARNING

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



PNEUMATIC ISOLATION

To isolate the pneumatic system 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. Lower the lift arms to the ground, shutdown the engine, fit a danger tag to the on/off toggle switch, connect the articulation lock and chock the wheels.
3. Locate the main air isolation valve at the driver's side rear of the engine compartment and rotate to the *off* position.
4. Relieve air pressure in the system lines by successively switching the on/off toggle switch until the air pressure gauge reads *zero* when the on/off toggle switch is in the *on* position.



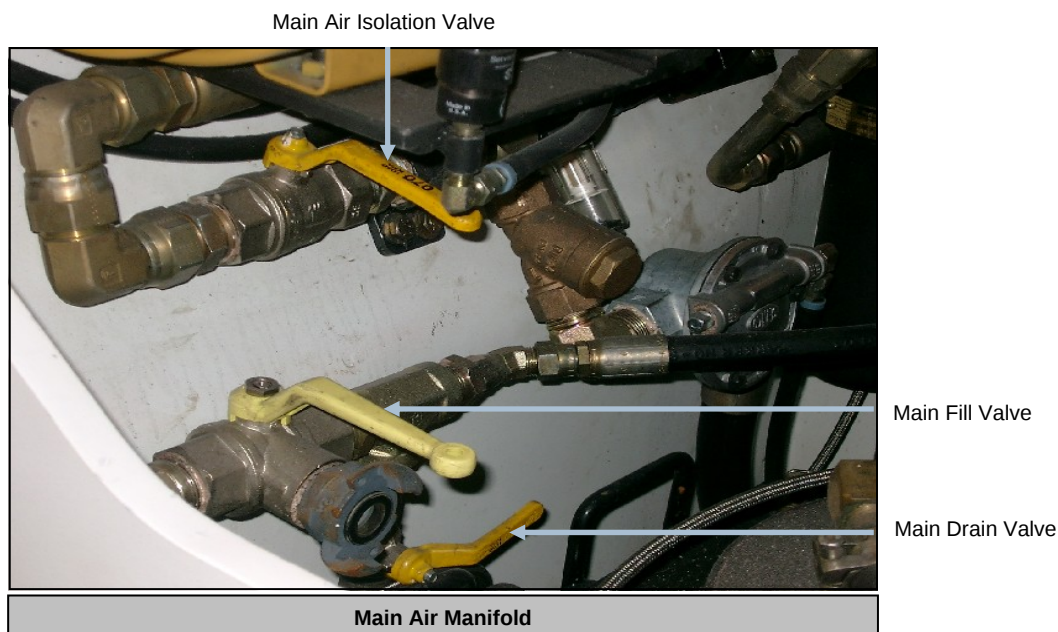
NOTICE

If work is required on the air receiver it will be necessary to remove air pressure from the air receiver by actuating the main air drain valve located next to the fill point. Stored air pressure will be safely released to the atmosphere. Ensure that the three-way ball valve is not connected to an external pressure source.



WARNING

Compressed air can be hazardous. Wear suitable protective equipment such as safety glasses and hearing protection.



HYDRAULIC ISOLATION

To isolate the hydraulic system 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. Lower the lift arms to the ground, shutdown the engine, fit a danger tag to the on/off toggle switch, connect the articulation lock and chock the wheels.
3. Depress the attachment quick connects button located in the operator's compartment. This will remove any residual pressure stored in the PTO lines.
4. Observe both steering and brake pressure gauges located in the operator's compartment. These must read zero before undertaking any hydraulic maintenance. The hydraulic system features a steering and brake accumulator automatic bleed circuit which will remove hydraulic pressure from both accumulators once the engine has stopped. This normally takes around 30 seconds. The steering and brake accumulators can also be bled via rotation of the steering wheel and actuation of the brake pedal, once the engine has been shutdown.
5. Remove hydraulic tank pre-charge pressure (50 kPa) by cracking hydraulic tank filler cap.



WARNING

Ensure all loads are mechanically supported before removal of any hydraulic lines. Hydraulic fluid may be hot. Wear personal protective equipment such as safety glasses, long sleeve shirt and gloves.



WARNING

Always assume there is hydraulic pressure in hydraulic lines or components unless it has been isolated by yourself.

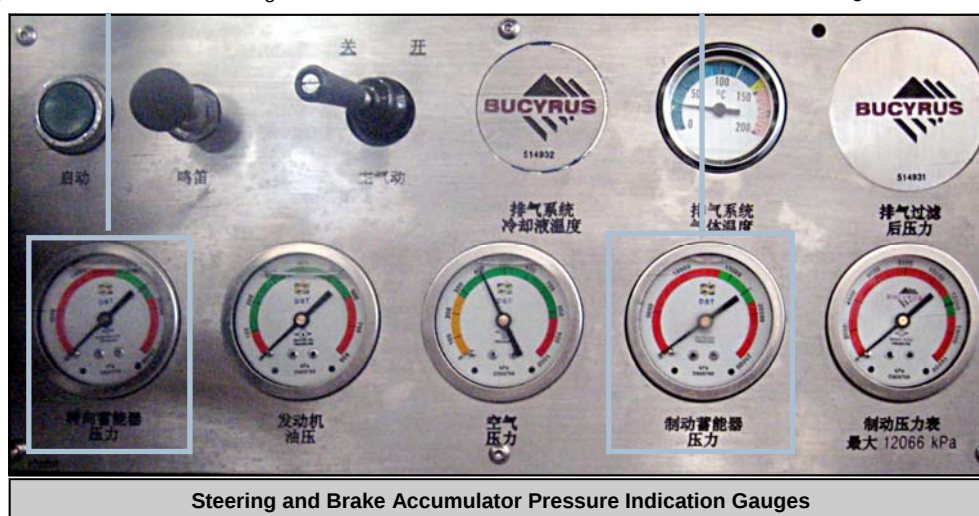


NOTICE

Crack hose end fitting (if pressure is present in line tighten fitting and remove pressure as above) but do not remove till any residual pressure is removed.

Steering Accumulator Pressure Gauge

Brake Accumulator Pressure Gauge



ENGINE COOLANT ISOLATION

To isolate the engine cooling system 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. Lower the lift arms to the ground, shutdown the engine, fit a danger tag to the on/off toggle switch, connect the articulation lock and chock the wheels.
3. Isolate the pneumatic circuit as described on page 4.
4. Locate the header tank relief cap located at the rear of the machine on the driver's side.
5. Remove coolant circuit pressure (105 kPa) by slowly lifting up the *red* relief lever on the relief cap and hold up till pressure is released.
6. Slowly remove relief cap with relief lever held in the *up* position.



WARNING

The coolant fluid will be under pressure and hot (up to 100°C). Always relieve pressure by lifting the relief lever on relief cap before removal. Wear personal protective equipment such as safety glasses, long sleeve shirt and gloves to avoid scalds and burns from hot coolant.

Engine Coolant Relief Cap



ELECTRICAL ISOLATION

1. Ensure the area is clear of any obstructions and area is fit for carrying out safe operation and maintenance.
2. Lower the lift arms to the ground, shutdown the engine, connect the articulation lock and chock the wheels.
3. All electrical energy is isolated once the engine has stopped.



WARNING

The electrical system installed on this machine is approved/certified as explosion protected for use in Australian underground coal mines and may cause an atmospheric explosion if not maintained and used in its approved state. Such equipment is to be inspected and maintained in accordance with the relevant regulatory authorities rules and regulations and the conditions for which the apparatus has been approved.



NOTICE

If any fault or damage is detected to the electrical system it should be reported to the service department.



NOTICE

Isolating the main air isolation valve or completely draining the pneumatic system of air will render the machine unable to be started until it is re-energised.

ARTICULATION ISOLATION

To fit the articulation lock:

1. Ensure the area is clear of any obstructions and area is fit for carrying out safe operation and maintenance.
2. Bring the machine to a stop and manually apply the park brake by pressing the *red* park brake button located in the operator's compartment and isolate the engine.
3. Locate the articulation lock at the articulation area on the off driver's side of the machine and remove the locking clamp on the bottom location.
4. Line the articulation lock up with the pin location on the front and rear half of the machine.
5. Install the lynch pin through the retaining hole in the locating pins.

To remove the articulation lock:

1. With the park brake applied, remove the lynch pins from the locating pins.
2. Install articulation lock on the storage location pins and secure it with the lynch pins.



WARNING

The articulation area of this machine can cause fatal crush injuries if extreme caution is not observed. Always ensure that the park brake is applied and the operator's compartment is vacant when accessing the articulation area to fit or remove the articulation lock. **NEVER** work in the vicinity of the articulation joint unless the articulation lock has been correctly installed



Articulation Lock in Locked Position



Articulation Lock in Stored Position

LIFT ARM ISOLATION

To install the lift arm lock:

1. Ensure the area is clear of any obstructions and area is fit for carrying out safe operation and maintenance.
2. Remove any load from the fork tines.
3. Park the machine on flat level ground. Ensure the ground is stable.
4. Fit the articulation lock.
5. Raise the lift arms until the locking pin holes on the rear of the lift arm line up with the locking pin hole mounted on the front frame.
6. Remove the lock pin from storage location and install through the aligned holes on the lift arms and front frame.
7. Note that the pin is to be fully inserted into the holes.
8. It is now safe to work under the lift arms.

To remove the lift arm lock:

1. Remove the lock pin from the locating holes and secure in their respective storage locations.
2. Lower the lift arm to the ground.



WARNING

The lift arms on this machine can cause fatal crush injuries if extreme caution is not observed. Never access or perform work under the lift arms unless the engine has been shutdown, the articulation lock fitted, the park brake applied, and the lift arms have been supported in the raised position.



Lift Arm Lock Installed



Storage Position on Front Guard

EXHAUST CONDITIONER ISOLATION

To isolate the exhaust conditioner perform the following procedure:

1. Isolate the machine.
2. Isolation of the *wet bath* exhaust conditioner is carried out via a valve located between the water inlet hose and the to the conditioner and the shutdown float chamber. The main isolation valve has two positions *closed* and *open*, this regulates the water flow from the make up tanks.



NOTICE

If the exhaust conditioner remains isolated after testing or maintenance to the system and the machine is returned to service it will be purged of water causing the machine to shutdown via the safety system.



Main Isolation Valve

Wet Bath Exhaust Conditioner