



Technical Manual

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Section **2**

General Safety and Precautions

This section contains specific safety precautions that shall be followed whilst the machine is being used by suitably qualified operators. This list is *NOT* all inclusive and a measure of commonsense should always be applied together with established and ongoing site specific risk assessment and safety procedures.

ONLY TRAINED AND AUTHORISED OPERATORS SHALL OPERATE THIS MACHINE

- DO NOT** use the machine for any purpose other than its intended use.
- DO NOT** for any reason exceed the indicated capacity of the machine.
- DO NOT** operate the machine unless all operator checks and scheduled servicing have been performed. Report any damage or faulty operation immediately and do not operate the machine until the fault has been corrected.
- DO NOT** tie down or tow equipment such that the chains or slings are not rated for the capacity of the machine and equipment.
- DO NOT** operate the machine unless:
- There are no tags attached stating otherwise.
 - All covers and guards are correctly installed.
 - Personal protective equipment is worn.
- DO NOT** start the machine unless:
- There are no tags attached stating otherwise.
 - The area around the machine is clear.
 - The park brake is applied.
 - Transmission is in *neutral*.
 - All water and oil levels are checked.
 - All site specific checks are completed.
- DO NOT** leave the machine unless:
- The machine is parked in a safe place.
 - The transmission is in *neutral*.
 - The park brake is applied and brake head pressure is *zero*.
 - The lift arms are lowered or any attachment is flat on the ground or supported.
 - The engine is stopped.
- DO NOT** work on the machine in low ventilated areas while the engine is running.
- ALWAYS** sound the horn before starting the engine to alert anyone who may be around the machine.
- ALWAYS** ensure that the operator's compartment door is closed and made secure before operating the machine.



FOUR-WAY JOYSTICK CONTROL LEVER

This lever has five positions, *roll back*, *roll forward*, *lift*, *lower* and *hold*. Pushing the lever to the *right* rolls the RAS back plate back for loading or tramming. Pulling the lever to the *left* rolls the RAS back plate forward for digging or unloading. Pushing the lever *forward* lowers the lift arms. Pulling the lever *back* raises the lift arms. The lever is spring centred to the *hold* position.



Two functions may be engaged at the same time by pushing the four-way joystick control lever at 45° in the direction of the two required functions.

NOTICE

NO. 1 - TWO-WAY HYDRAULIC CONTROL LEVER

There are two hydraulic two-way control levers fitted to the machine. The first lever closest to the operator is used to control attachments and engage and disengage the RAS locking tongue. This lever has three positions, *up*, *down* and *hold*. The lever is spring centred to the *hold* position. When operating an attachment, the function of this lever alters depending on the attachment fitted.



To release attachments, the RAS Pilot Lock Cylinder Release Button must be pushed simultaneously whilst pulling down on the lever. This is to prevent an accidental uncoupling of the attachment.

NOTICE

NO. 2 - TWO-WAY HYDRAULIC CONTROL LEVER

The second lever, furthest from the operator, is used to control RAS attachments. This lever has three positions, *up*, *down* and *hold*. The lever is spring centred to the *hold* position. When operating an attachment the function of this lever alters depending on the attachment fitted.



On some machines an auxiliary hydraulic PTO (Power Take Off) may be fitted to the rear of the machine. This lever controls this function.

NOTICE

No. 1 - Two-Way Hydraulic Control Lever



Two-Way Control Levers

No. 2 - Two-Way Hydraulic Control Lever



Four-Way Joystick Control Lever



EMERGENCY INTAKE SHUT OFF VALVE

This valve is used in the event that the machine fails to shutdown under normal circumstances as stated in Section 9. *Closing this valve will stop the flow of air to the engine.* This provides a second means of shutting down the engine should the on/off toggle switch fail.



Emergency Intake Shut Off Valve Reset Lever

The valve is activated from the operator's compartment by a stop button which is pushed, once activated and the engine shuts down the valve will need to be reset before restarting. Ensure that the stop button has been pulled out and there is a reset lever down on the main body of the valve that will rotate and latch into the operating position. If the valve has not been reset the engine will not start. When the valve has been reset the engine can be started.

This engine system is fitted with a wet exhaust conditioner.



WARNING

Operation of the Emergency Intake Shut Off valve while the engine is running may result in exhaust conditioner water being drawn back into the engine. This may result in catastrophic damage to the engine.

ONLY OPERATE THE EMERGENCY INTAKE SHUT OFF VALVE IN THE EVENT THAT THE ENGINE SHUTDOWN SYSTEM FAILS TO STOP THE ENGINE.

Restarting of the engine should be done in compliance with the Manager's Rules.



WARNING

ONLY RESTART THE ENGINE AFTER VERIFYING THAT THERE HAS BEEN NO INGRESS OF WATER FROM EXHAUST CONDITIONER INTO THE ENGINE.

THIS IS TO BE VERIFIED BY SERVICE PERSONNEL PRIOR TO ATTEMPTING ENGINE START.

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. Visible 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 lowered position, the engine is turned off and the machine is isolated as per Section 5 - Pneumatic Isolation.
3. Check the level at normal operating temperature.
4. When the oil level has dropped below the mark shown below, 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 23).



HYDRAULIC LEVEL
SIGHT GAUGE



HYDRAULIC TANK FILL POINT

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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 or safety notice 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 275 kPa (39 psi) the engine may not start. If the air pressure is below 275 kPa (39 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

6. Wait for the display to indicate waiting for start.
7. Hold the accelerator pedal approximately $\frac{1}{3}$ to $\frac{1}{2}$ open.
8. Press the engine start button and release it when the engine has fired.
9. Check the display indicates "Engine Running".
10. Carry out post start checks and operate machine normally.

See Section 22 - 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 **12** Driving on a Ramp

1. Stop and shift into first gear, and check the brakes before travelling up or down a ramp.
2. Always use a low gear when travelling down a ramp.
3. Avoid changing gears while travelling on a steep ramp
4. If you have a mechanical or brake failure:
 - a. Immediately apply the brakes.
 - b. If the brakes do not function, apply park brake.
 - c. If the machine does not stop, turn the machine into the rib.



WARNING

The machine should not be operated on more than the recommended grades (Section 1).



NOTICE

Operators must be competent in Emergency Stop Procedure.

Section **17**

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 15 Tonne 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 20000 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 of loads greater than 15000 kg the mass must be braked. Prior to towing loads in excess of 15000 kg consult Bucyrus.



CAUTION

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



Section **22**
Electronic Shutdown System

SAFETY SHUTDOWN

The electronic shutdown system monitors the atmosphere for methane and controls the engine shutdown and will light the appropriate LEDs on the display panel.

The following sensors are fitted to the machine:

- | | |
|---------------------------------------|-------------------|
| 1. High Methane Shutdown (1.25%) | Shuts engine down |
| 2. Low Methane Warning (1%) | Warning light |
| 3. Charge Failure | Warning light |
| 4. Engine Oil Pressure | Shuts engine down |
| 5. Scrubber Level 1 | Shuts engine down |
| 6. Engine Coolant/Hydraulic Oil Level | Shuts engine down |
| 7. Scrubber Level 2 | Shuts engine down |
| 8. Engine Coolant Temperature | Shuts engine down |
| 9. Exhaust Outlet Temperature | Shuts engine down |
| 10. Run Solenoid | Warning light |
| 11. Start Fault | Warning light |

STRAIGHT LIP EJECTOR BUCKET

Various size ejector buckets are available, all with common operation and servicing requirements. Two double acting hydraulic cylinders actuated from the PTO lines on both sides of the lift arm assembly operate a hinged ejector plate for material discharge.

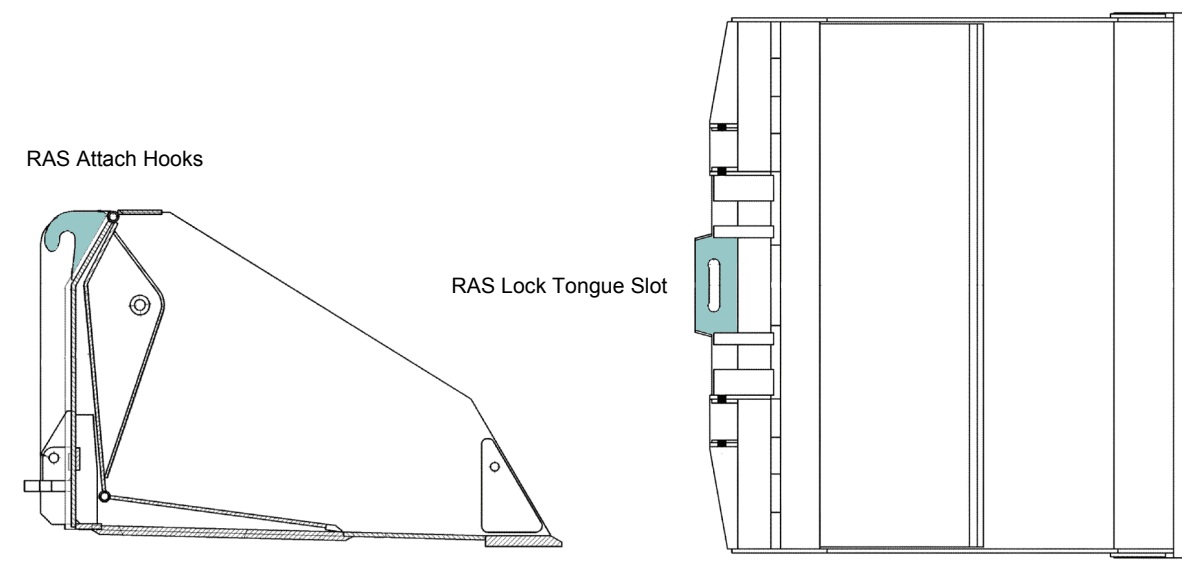
Specifications:

Unladen Mass:	3637 kg
Capacity:	4.5 m ³
Width:	2700 mm
Height:	1533 mm
Length:	2250 mm

Servicing

Every time the ejector bucket is to be attached to the machine a visual inspection should be carried out to ensure that the locking and retention components are in good condition.

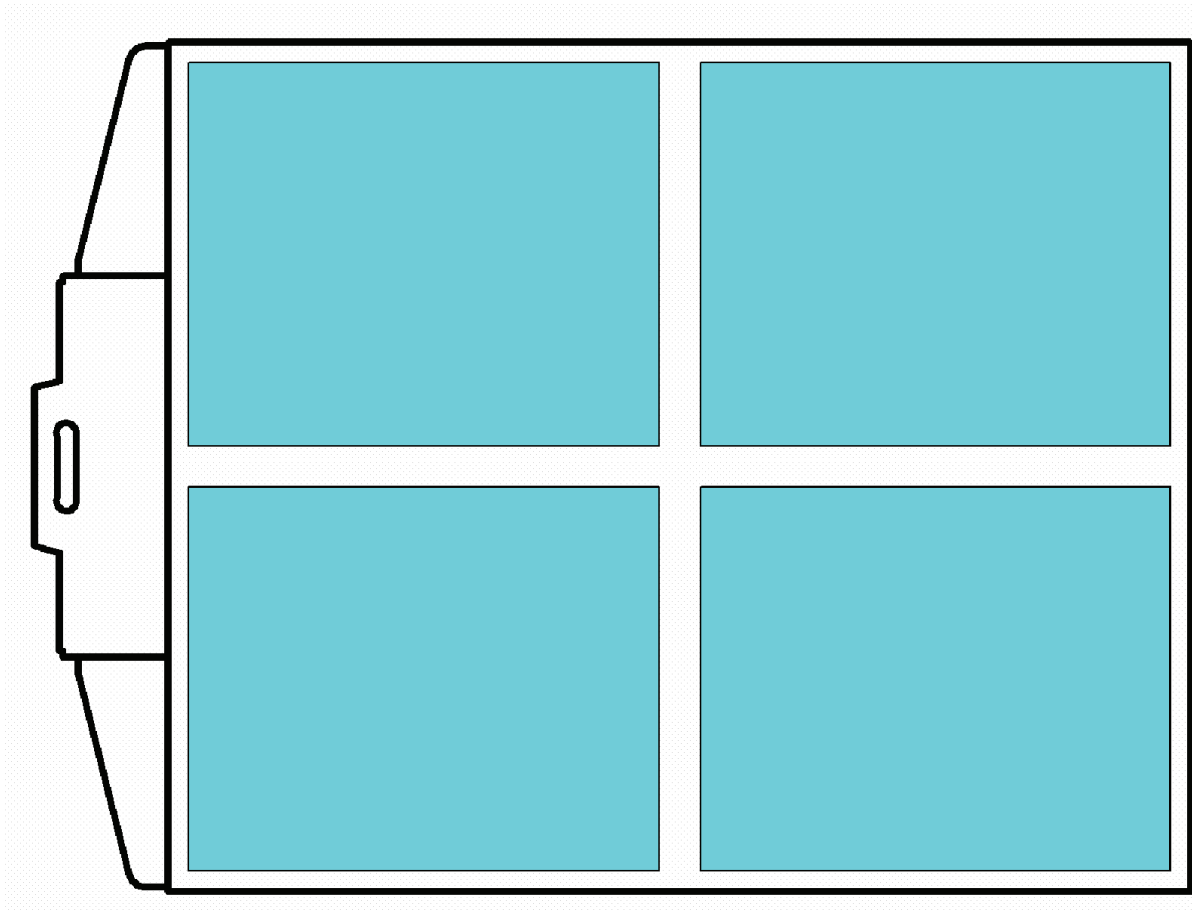
1. Check the bucket RAS attach hooks for damage.
2. Check the RAS lock tongue slot for damage or excessive wear.
3. Check the bucket back plate welds for signs of cracking.
4. After the bucket has been attached to the machine check that the RAS lock tongue is fully engaged in the bucket lock tongue slot.
5. Disconnect the driver's side PTO lines from the RAS lock tongue and connect to the push plate.
6. Extend and retract the push plate and check for free plate operation, cylinder pivot wear and hydraulic system leaks.
7. Grease the eject cylinder bottom pivot points.



Straight Lip Type Ejector Bucket Attachment

This lifting device shall:

- Only be used by trained and authorised operators.
- Not lift more than the rated laden safe working load.
- Not be operated on grades more than 1:8 (side to side) .
- Not to exceed the maximum laden tramming speed of 9 kph.
- Carry the loads as close as possible to the ground at all times.



WARNING

Maximum load to be carried in the materials pod is 6700kg, the load is to be evenly distributed over four pallets as shown in diagram above.



WARNING

Cut outs are to be used for tie down points only, not to be used for lifting or towing.

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