

Reliability at work

BI014602

BUCYRUS



Operator's Manual



MH-40 Shield Hauler

Serial No: 5001686

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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 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.
 - 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, *tilt back*, *tilt forward*, *lift*, *lower* and *hold*. Pushing the lever to the *right* tilts the lift arms back for loading and tramming. Pulling the lever to the *left* tilts the lift arms down for unloading. Pushing the *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

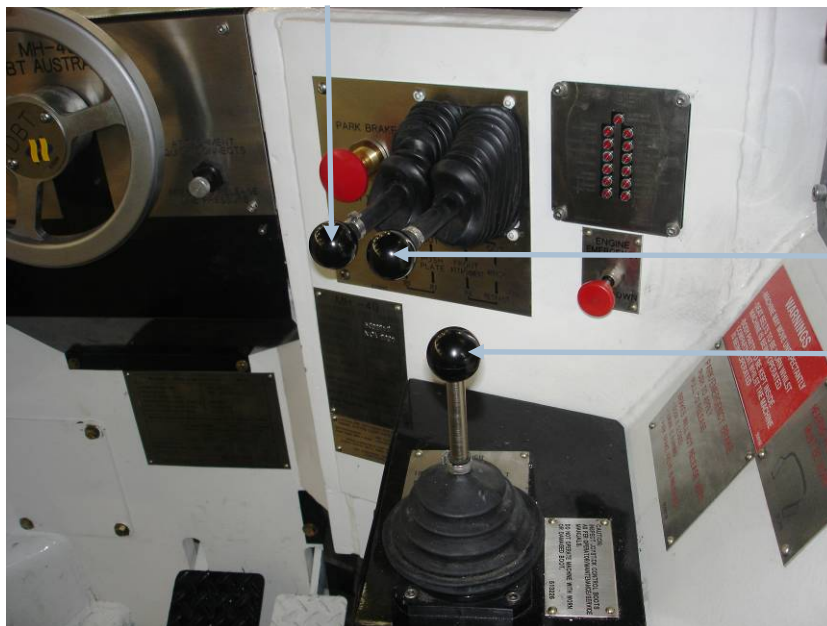
NO. 1 - TWO-WAY HYDRAULIC CONTROL LEVER

There are two hydraulic two-way control levers fitted to the machine. The first lever closest to the operator is used to auxiliary hydraulic power take off fitted to the rear of the machine. This lever has three positions, *up*, *down* and *hold*. The lever is spring centred to the *hold* position.

NO. 2 - TWO-WAY HYDRAULIC CONTROL LEVER

The second lever, furthest from the operator, is used to control the winch. This lever has three positions, *up*, *down* and *hold*. When operating the winch, the *down* position winches the rope in and pulling the lever up winds the winch rope out. The lever is spring centred to the *hold* position.

No. 1 - Two-Way Hydraulic Control Lever



No. 2 - Two-Way Hydraulic Control Lever

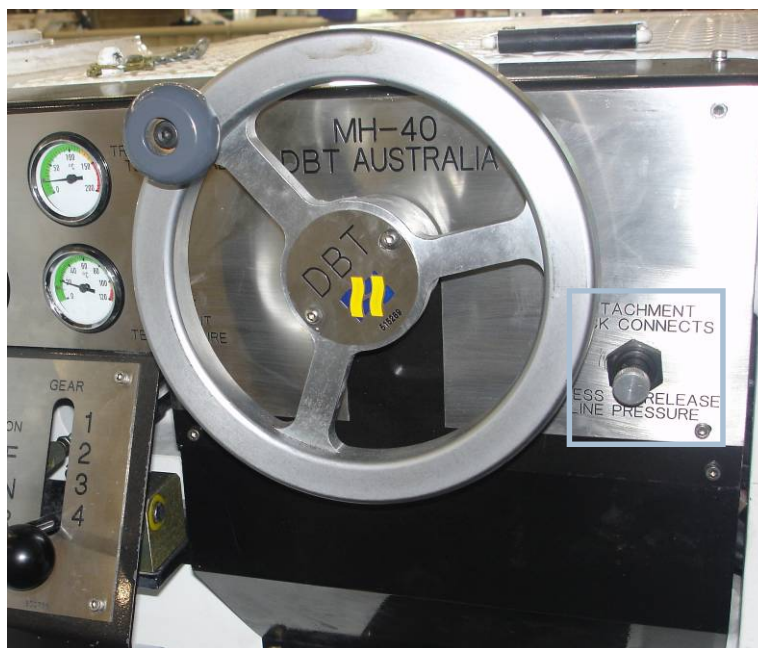
Four-Way Joystick Control Lever

RAS CONTROL LEVERS



ATTACHMENT QUICK CONNECTS BUTTON

This button releases all of the pressure in the PTO lines to allow the couplings to be easily released. To release the pressure, release both of the two-way control levers to the hold position and press in the pressure release button for two seconds.



ATTACHMENT QUICK CONNECTS BUTTON

Section 6

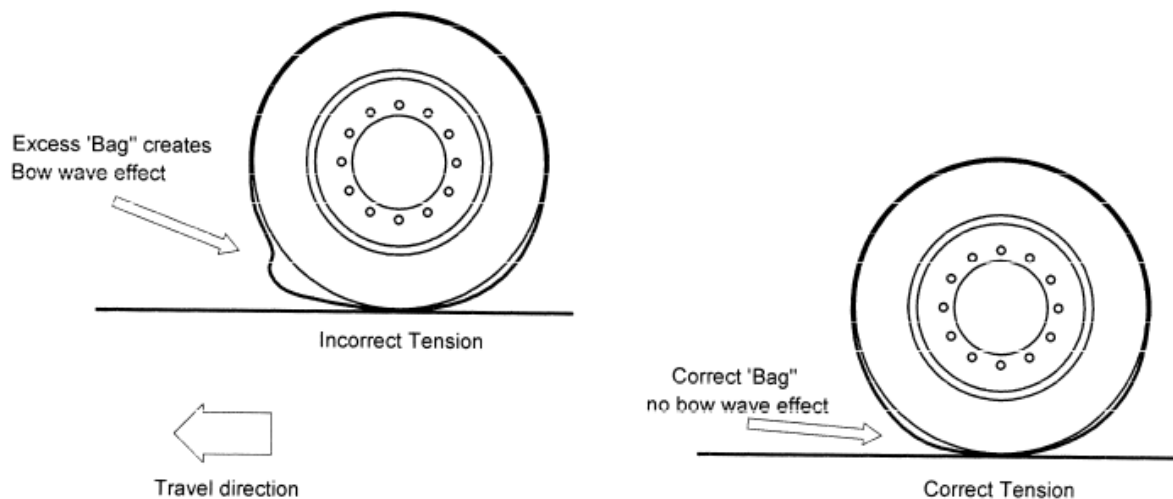
Pre-Start Procedure

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 condition of tyre protection chains if fitted for adjustment, irregular pattern, wear and breaks.
4. Check for loose wheel nuts.
5. Guards and covers are in place and secure.
6. Missing or loose bolts.
7. Oil leaks.
8. Hose damage.

Normal correct tension is when the machine rolls to a stop (not under brakes) and the TPC wear links at the bottom of the wheel are just falling away from the tyre.

5 mm to 20 mm would be considered as correct operating range.



Correct tensioning prolongs effective life of TPC



CAUTION

Always use the specified lubricant for the application and the regions seasonal temperatures. (See Section 21).



WARNING

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



WARNING

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

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.

If the Emergency Intake Shut Off valve has been operated, restarting of the engine should be done in compliance with the Manager's Rules.

**NOTICE**

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.

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 electronic shutdown system display LEDs will not activate if the air pressure is below 275 kPa

6. Wait for the run solenoid display LED to go off (approximately 30 seconds).
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 charge failure and engine oil pressure display LEDs have gone out.
10. Carry out post start checks and operate machine normally.

See Section 20 - Operating Electronic Shutdown 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 they 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 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 Bucyrus.

**CAUTION**

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

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