PRO MECH GROUND SUPPORT SYSTEMS

MOTORISED PUMP

Motorised Shoring Pump

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Important Notes

All excavation work must be thoroughly planned before work commences on site to identify hazards and assess risk.

These instructions form guidance for the Motorised Shoring Pump. Non standard applications should be approved by a suitably qualified engineer.

Ensure all personnel engaged in excavation operations are properly briefed and adequately supervised by a competent person.

IF IN ANY DOUBT SEEK FURTHER ADVICE:
ON FREEPHONE 01329 828082

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Introduction

Motorised pumps are intended for use with larger double acting (expanding and retracting) equipment such as hydraulic struts where large fluid volumes are involved. They are also ideal for the installation of multiple braces where the quick release hose connections speed up the installation process. These pumps are powered by a small petrol engine which drives the hydraulic fluid pump. Fuel and Fluids specification

MOTORISED PUMP

Shoring Fluid

Shoring fluid concentrate is supplied in 5 litre containers marked ,COSHH datasheets are available on request. (see safety notes below)

Filling the Shoring Fluid Tank

Open the container, remove the shoring fluid reservoir filler cap and carefully pour shoring fluid concentrate into the tank. Motorised pumps have a 40 litres reservoir capacity and this should be filled using a mixture of shoring fluid concentrate and clean water. The concentrate to water ratio is dependent on the outside temperature range.
(see table below)

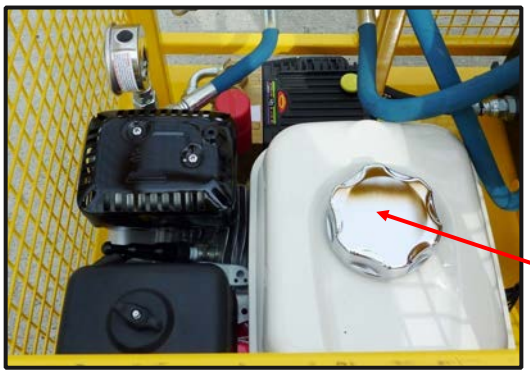
Temperature Range	Ratio (Shoring Fluid / Clean Water)
Greater than 0°C	1:3
Between 0°C and –10°C	1:1
Lower than –10°C	Neat Shoring Fluid

Unit Weights	
Empty	50kg approx
Full	90kg approx

Maximum Delivery Pressure	
Flow (ram out)	1500 Psi (103 bar)
Return (ram in)	3000 Psi (207 bar)

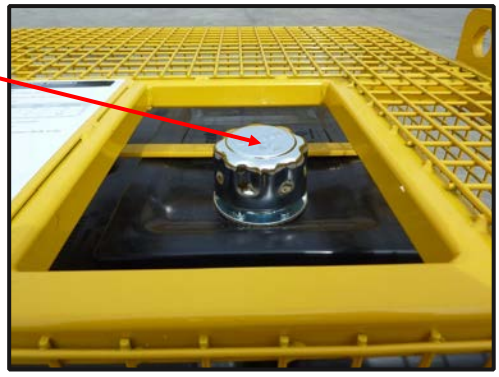
MOTORISED PUMP

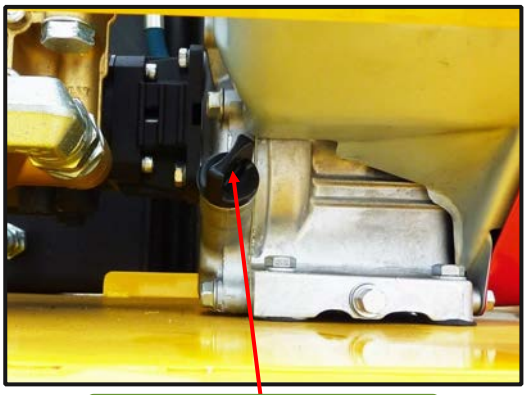
Filler Points



Shoring fluid reservoir filler cap

Petrol tank filler cap



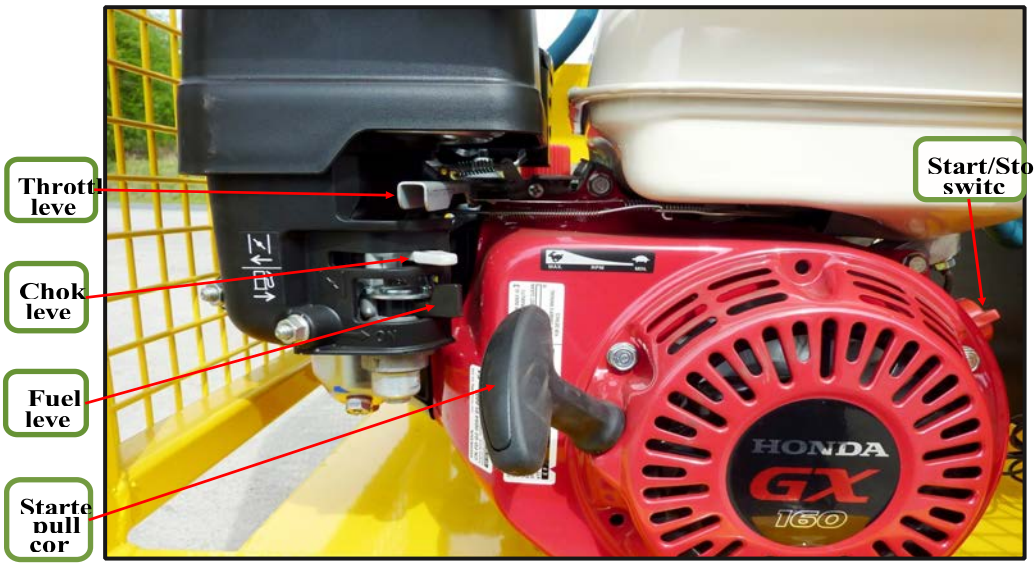


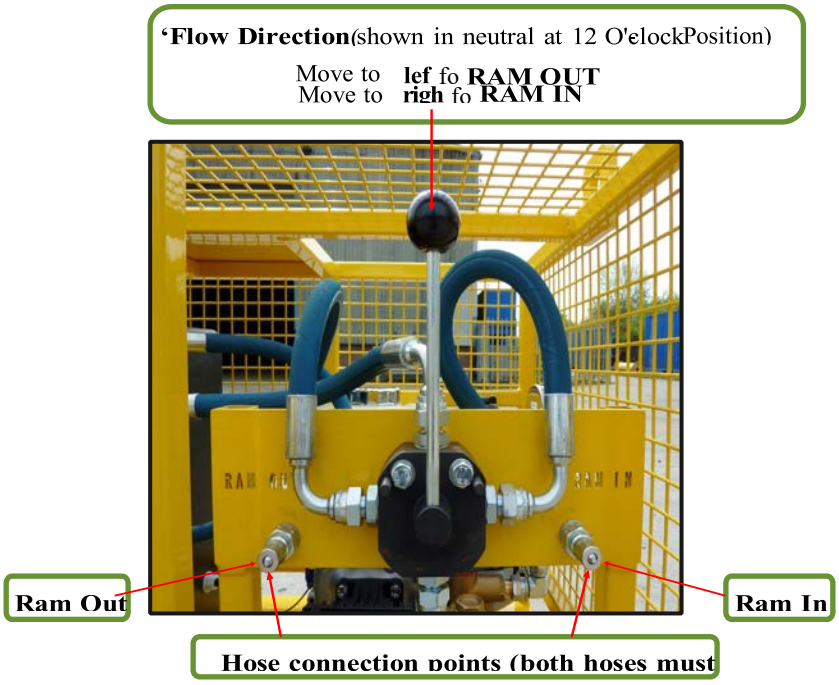
Oil filler cap and dipstick

Note: Running the engine with insufficient oil can cause serious damage. Perform the following actions before use:

- Ensure that the engine is stopped and the unit is on level ground.
- Remove the oil filler cap (located through the lower side cut -out access opening) and wipe the dipstick clean.
- Insert the dipstick into the filler neck (do not screw in).
- If the level is low, fill to the top of the neck with a good quality SAE 10W 30 oil.

MOTORISED PUMP





MOTORISED PUMP

Safety Notes

- Do not operate the engine in a confined space always ensure adequate ventilation.
- Be aware that engine components will become hot during use.
- Exercise extreme care when handling petrol.
- Do not smoke when refilling the petrol tank.
- Do not overfill the petrol tank.
- Do not manually lift the motorised pump unit.
- Only use shoring fluid supplied by Promech.

Perform the following actions daily and before use:

1. Check the engine oil level
2. Check the fuel level (use clean unleaded petrol only)
3. Check the shoring fluid level – (the pump will not start if the reservoir falls below 1/4 full)
4. Inspect for any physical damage to the engine and pump unit
5. Slowly extend the starting cord and examine it for fraying. (do not attempt to start the engine if it is badly worn)

5. Check for any physical damage to the cage, including lifting eyes and anchorage points:

a) Check the attachment of the cover frame to the base. (all four locking bolts and retaining clips must be in place and fully tightened)
b) The lifting eyes on top of the cage must be in good condition with no cracking, significant wear or deformation
c) **Do not** lift the unit if any of the items in point 5 are in doubt

MOTORISED PUMP

Engine start-up (refer to images on page 3)

1. Ensure the 'Flow Direction Valve' is in neutral with the lever at the 12 O' clock position
2. Turn the Start/Stop switch to the **ON** position
3. Turn the fuel supply switch to the **ON** position by sliding the lever to the right
4. Turn the choke **on** by sliding the lever to the left
5. Set throttle lever to approximately **50%**
6. Pull the cord to start the engine
7. Turn the choke **off** by sliding the lever to the right once the engine is running
8. Allow the engine to warm up before operating the pump

Note: If the engine will not start, consult the troubleshooting guide on the next page

Engine shut-down

1. Ensure the 'Flow Direction Valve' is in neutral with the lever at the 12 O'clock position
2. Ensure the throttle is set to minimum by sliding the lever fully to the right
3. Turn the Start/Stop switch to the **OFF** position to shut-down the engine

Troubleshooting Guide

Problem	Possible Cause	Possible Solution
The engine will not start	The Start/Stop switch is in the **OFF** position	Turn the Start/Stop switch to the **ON** position
	The 'Flow Direction Valve' is not in the vertical position	Ensure the 'Flow Direction Valve' is in the vertical position.
	The Fuel Valve is in the **OFF** position	Ensure the Fuel Valve is in the **ON** position
	Not enough fuel in the tank	Top up as necessary with clean petrol
	Not enough oil in the engine (low oil level cut-out has switched)	Top up as necessary
	The engine is flooded (strong petrol smell)	Close the choke and try again

MOTORISED PUMP

Pump Operation - (Ram Extension)

Note: Regularly check the shoring fluid reservoir for adequate supply – the engine will cut-out if the fluid level in the reservoir falls below 1/4 full.

1. Connect one end of each of the hoses provided to **both** outlet ports on the pump.
2. Take the hose which is connected to the 'Ram Out' coupling on the pump and connect the opposite end to the 'Expand' coupling on the hydraulic ram.

Note: Consult the relevant Struts or Braces User Guide for hydraulic hose connection and Lock-Off Valve details.

3. Take the hose which is connected to the 'Ram In' coupling on the pump and connect the opposite end to the 'Retract' coupling on the hydraulic ram.

Note: Both hoses must be properly connected for the ram to move

4. Open the Lock-Off valve on the hydraulic ram using the tool provided. Approximately 2 turns anticlockwise from the closed position.
5. Fully open the engine throttle and move the 'Flow Direction Valve' to the left to expand the ram unit.

MOTORISED PUMP

Note: If the ram fails to move, or moves in the wrong direction, swap the hose connections on the pump and repeat 5 above.

6. Continue pressurising the ram, observing the pressure gauge (the relief valve will limit the pressure to approximately 1500 Psi).
7. Close the Lock -Off valve on the ram by turning clockwise **- Do not tighten with excessive force.**
8. Move the 'Flow Direction Valve' into the neutral 12 O'clock position and throttle the engine back to idle.
9. Disconnect both hoses from the ram unit couplings.
10. Repeat for any other ram units.
11. Turn the Start/Stop switch to the **OFF** position.

Pressure gauge

Pump Operation - (Ram Retraction)

Note: Regularly check the shoring fluid level in the reservoir to prevent overspill - a drain tap is located on the side of the reservoir.

1. Connect one end of each of the hoses provided to **both** outlet ports on the pump.
2. Take the hose which is connected to the 'Ram Out' coupling on the pump and connect the opposite end to the 'Expand' coupling on the hydraulic ram.
3. Take the hose which is connected to the 'Ram In' coupling on the pump and connect the opposite end to the 'Retract' coupling on the hydraulic ram.
4. Open the Lock-Off valve on the hydraulic ram using the tool provided. Approximately $1^{1}/_{4}$ turns anticlockwise from the closed position.
5. Fully open the engine throttle and move the 'Flow Direction Valve' to the right to expand the ram unit.

Note: If the ram fails to move, or moves in the wrong direction, swap the hose connections on the pump and repeat 5 above.

MOTORISED PUMP

6. Continue retracting the ram sufficiently to enable the equipment to be removed. Up to 3000Psi is available for retraction. **Note**: the pump/pressure gauge will drop to zero if this pressure is reached.
7. Move the 'Flow Direction Valve' into the neutral 12 O'clock position and throttle the engine back to idle.
8. Disconnect both hoses from the ram unit couplings.
9. Repeat for any other ram units.

11. Turn the Start/Stop switch to the **OFF** position.

Do	Do Not
✔ Ensure daily checks are conducted.	× Lift the unit without ensuring that all four cage anchorage bolts are in place.
✔ Site on level, firm ground.	× Use excessive force on any of the controls.
✔ Ensure adequate ventilation for exhaust fumes.	× Operate the engine in confined spaces.
✔ Keep the unit upright at all times.	× Operate the engine without oil.
✔ Connect both hoses to both units.	× Exceed the equipment installation pressure.
✔ Operate the engine at full throttle whilst pumping.	× Over-rev the engine.
✔ Regularly check fluid levels.	× Allow the unit to run out of fuel or shoring fluid.
✔ Throttle back or turn off the engine between pumping operations.	× Force the couplings off under pressure.
✔ Switch off the petrol tap at the end of each shift.	× Smoke whilst filling the petrol tank.
✔ Only use shoring fluid supplied by Promech.	
✔ Wear appropriate PPE when operating the pump. ✔ Ensure only clean unleaded petrol is used.	
× Manually lift the unit.	