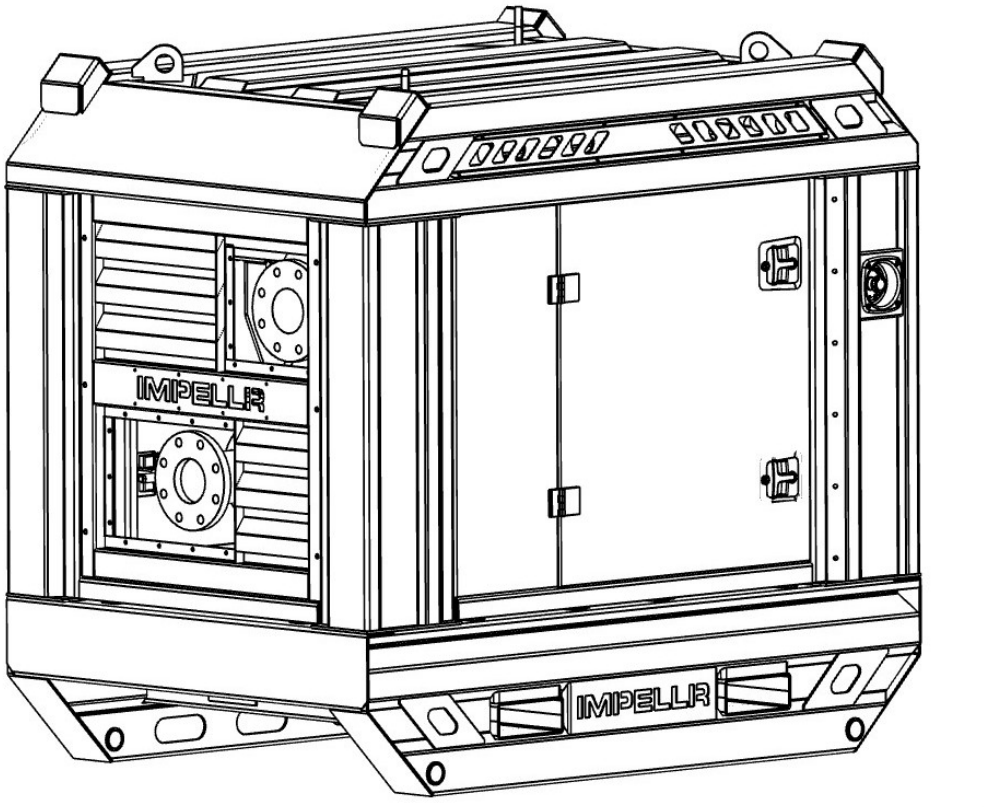
IMP4D-11-HCC

OPERATION & MAINTENANCE MANUAL



IMP4D-11-HCC

Diesel Powered Portable Dry Priming 4” Surface Pumps

IMPELLR
A TERRACORE COMPANY

IMPORTANT

Read, understand and obey these safety rules and operating instructions before operating or maintaining this machine

Only trained and authorized personnel shall be permitted to operate this machine.

This manual should be considered a permanent part of your machine and should remain with the machine at all times.

If you have any questions, please contact:

TERRACORE GROUP LTD

IMPELLR DIVISION

Quercus Court | Yate | Bristol | BS37 5NG

44 1454 513000 | www.dustquip.co.uk

CONTENTS

PRODUCT DATASHEET

SURFACE
4” DIESEL DEWATERING PUMP
IMP4D-11-HCC

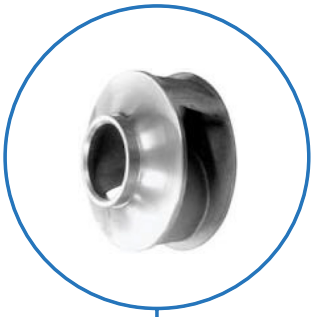
IMPELLR
A TERRACORE COMPANY

SCAN HERE

4” DIESEL

Dual Channel Enclosed Impeller

Durable ductile iron dual channel impeller for good solids handling and efficient operation.

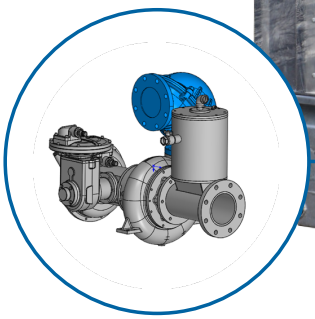


Single or 4 point lifting

Durable lifting eyes enable easy transportation and allow the pump to be placed into difficult areas.

HVO Compatible Stage V Engines

Stage 5 engines for compliance and smooth running. Inter-changeable bunded fuel tank. HVO com-patible.



100% Oil-spill free priming system

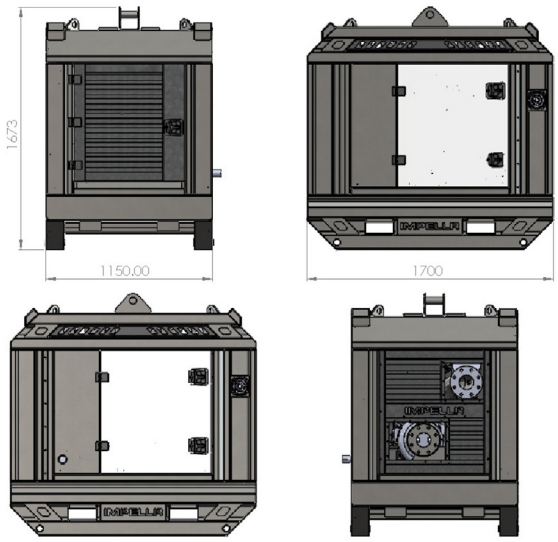
Mechanical priming system. Can quickly prime and re-prime, even from dry conditions.

Corrosion free hot dip galvanized canopy

With forklift pockets for easy moving.

Easy Access doors

Made for practical access and easy maintenance of oil glasses, float box, impeller, non-return value and more.



CONTROLLER FEATURES

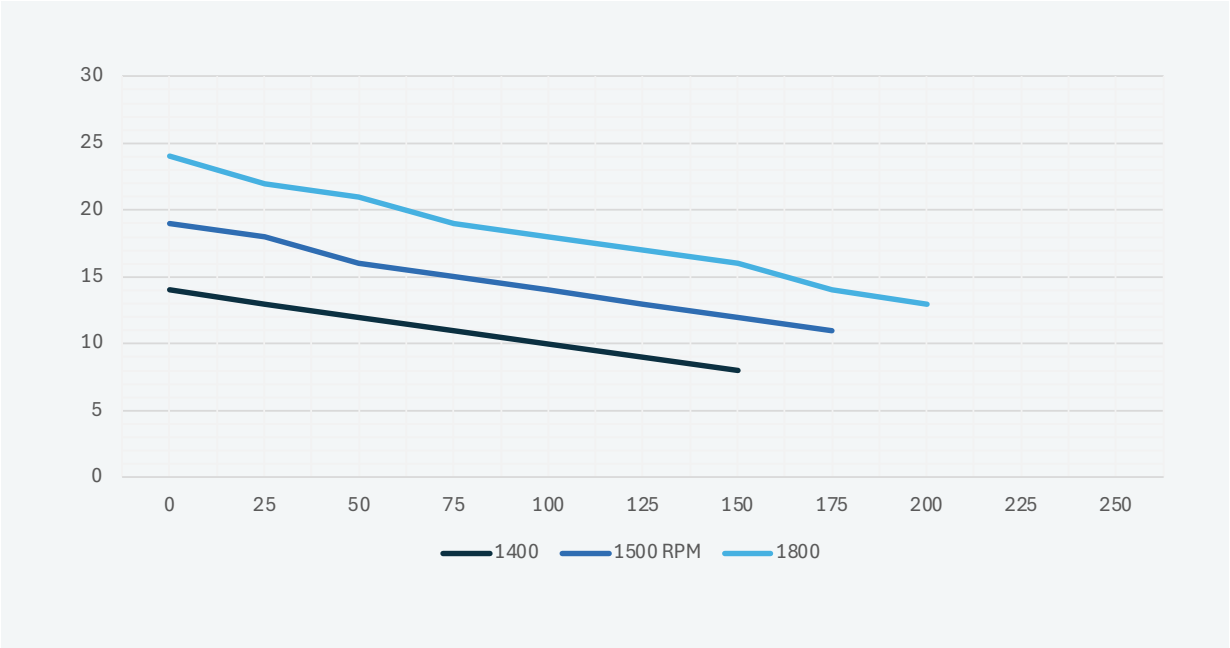
CONNEX On-device Controller:
- Auto Start / Stop Sytem
- Switch On / Off
- Tachnometer
- Hour Counter
- Warning Lights
- Two Float Switches
- Support for Automatic operation
- 2 Emergency Stop Buttons

CONNEX Cloud Telematics:
- GPRS - Web Supervisor and App
- Geolocation and Geo-fencing
- Fleet manager

+ Much more. Visit connex.impellr.com

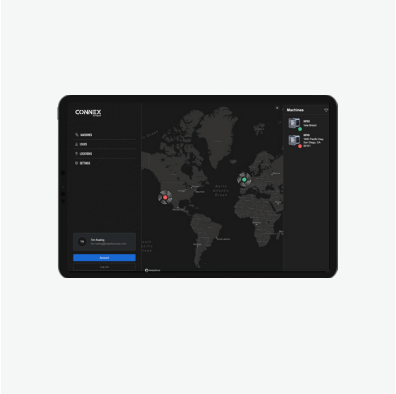
	IMP4D-11-HCC
Primary Use	Dewatering
Max Flow m3/hr (CFM)	200 (117)
Max Closed Head m (Ft)	20.8 (68)
Max Operating Head m (Ft)	17.5 (57)
Best Efficiency	77%
BEP Flow m	156 (41)
BEP Head	12.4 (40)
Suction Flange mm (inch)	100 (4")
Discharge Flange mm (inch)	100 (4")
Solids Handling mm (inch)	76 (3")
Impeller Type	Dual Channel Enclosed
Impeller Material	Ductile Iron
Volute Material	Ductile Iron
Pump Shaft	Stainless Steel 17-4PH
Speed RPM	1400-1750
Priming System	Mechanical Drive Diaphram Style
Discharge Check Valve	Swing Check Type
Vacuum prime m3/hr (CFM)	85 (50)
Vaccum Lift m (Ft)	8.5 (27)
Engine Type and Model	Hatz
Number of Cylinders	1
Engine Cooling System	Air Cooled
Emmisions Standard	Stage V
Exhust After Treatment	None
Fuel Type	Diesel (HVO)
Service Intervals Hrs	500
Fuel Tank Size - Ltr (USG)	200litres
Fuel Consumption Ltr/Hr (USG/Hr)	1.6lt/hr
Dimensions (LxWxH) - MM (inch)	1700x1150x1700 (67x45x67)
Dry Weight - Kg (Lbs)	NA
Wet Weight - Kg (Lbs)	NA
Warrentee Period	Std 12 Months Optional 3-year extended
Crane Lift Facility	YES
Fork Lift Facility	YES
Stackable	YES x3

PERFORMANCE CURVES



Trailer Mountable
A range of road and site-tow-spec trailers are available with optional hose and equipment carriers. These trailers are ideal for fast deployment of pumping equipment.

Stackable
Where storage is tight the Impellr pumps can be stacked 3 high.



Smart Software
Our CONNEX software platform allows you to manage and control your pumps remotely, with telematics and more.

INTRODUCTION & GENERAL INFORMATION

INTRODUCTION

Thank you for choosing an Impellr Pump manufactured by Terracore Ltd

This user manual contains information for the installation, use and user maintenance of the diesel driven Impellr Pump. The information in this manual must therefore be strictly followed.
Read and understand the manual completely before installing and commissioning the pump.
Contact Impellr if you have any questions or anything is unclear.
Terracore Group cannot be held responsible for accidents and/or damage that result from failure to follow the guidelines in this manual.

Certain information contained in this manual is governed by law and is subject to review and change without prior notice. Great care however, has been taken to ensure that the information in this manual is correct at time of publication. However, it is the owners/users sole responsibility to ensure that they fully comply with all legal requirements. Terracore Ltd / Impellr cannot and will not accept any liability for any inaccuracy or incorrectly stated legal requirements

Terracore Ltd maintains a policy of continuous product improvement. We reserve the right to alter pump, engine, motor & performance specifications without prior notice.

GENERAL INFORMATION

The information contained in the Handbook is correct at the time of publication, and can be altered by the manufacturers without prior notice.

The Operator must read this handbook and the motor/engine & pump operators handbook (appended to this document) and be familiar with all controls before operating the equipment.

The contents of this handbook are a guide to the machines control, operation, operating scope and maintenance. It is not a training manual.

These are the original Instructions in the English Language issued by Impellr.

The Operation Handbook must be stored near the machine in an environment protected against humidity and heat. The handbook must be attached to the machine in the event it is hired or sold. Damaging, modifying or removing part of the manual is prohibited.

Replacement handbooks can be obtained by contacting Impellr.

WARRANTY CONDITIONS

1. WARRANTY COVERAGE
- All machines manufactured by Terracore Ltd / Impellr are covered by a warranty for a period of one (1) year or 500 operational hours, whichever comes first, from the date of purchase.
- The warranty covers defects in materials and workmanship under normal use and service.
- The warranty does not cover misuse, abuse or neglect.

2. WARRANTY SERVICE
- Warranty service must be performed by authorized Terracore Technicians.
- Customers are responsible for shipping the machine to the factory for warranty service at their own expense
- Terracore / Impellr will cover the cost of repairs or replacements for components covered under warranty
- Warranty repairs can be carried out on site under certain circumstances, but any travel will be chargeable.

3. EXCLUSIONS
This warranty does not cover damage resulting from
- Misuse, abuse, or neglect
- Unauthorized modifications or repairs
- Failure to follow operating instructions
- Acts of nature, such as floods, fires or frost damage
- Normal wear and tear
- This list is not exhaustive

4. CLAIM PROCESS
To initiate a warranty claim, customers must:
- Contact Impellr and request a warranty application form
- On receipt of a completed form, an ISS Number will be issued.
- Ship the machine to the designated Impellr factory, along with the ISS number clearly marked on the machine
- Impellr will inspect the machine upon receipt to determine warranty coverage
- If the issue is covered under warranty, repairs will be carried out in a timely manner
- If the issue is deemed to be not covered by warranty a quotation for the repairs will be provided to the customer
- In the case of an Impellr Technician is required to attend site, an order number will be required from the customer to cover the site call out charge. If the issue is deemed to covered by warranty, the call out will not be charged.

5. LIMITATION OF LIABILITY
- Terracore Ltd / Impellr shall not be liable for any incidental or consequential damages arising from the use or inability to use the machine, including but not limited to loss of profits, loss of business or interruption of operations

6. TRANSFERABILITY
- This warranty is not transferable and applies only to the original purchaser of the machine

7. GOVERNING LAW
- This warranty policy shall be governed by and construed in accordance with the laws of your region, without regard to its conflict of law principles

8. MODIFICATION OF TERMS
- Terracore Ltd / Dustquip reserves the right to modify or amend this warranty policy at any time, without notice

9. CONTACT INFORMATION
- For warranty enquiries or assistance please contact Impellr in your local region. Contact details can be found on page 2 of this document.

10. EXCLUSIVE WARRANTY SERVICE
- Warranty repairs of service will exclusively be carried out at the Impellr factory in your location. No warranty repairs or service will be provided elsewhere.

By purchasing a machine from Terracore Ltd / Impellr, you acknowledge that you have read, understood, and agreed to the terms and conditions of this warranty.

SAFE OPERATION

Careful operation is the best insurance against an accident. Read and understand this section fully before attempting to operate this machine. All operators regardless of how much experience they may have should read this manual prior to operating the machine. Terracore Ltd / Impellr operate a continuous development process, specifications may change without prior warning. It is the owners duty to provide all operators with this information and to instruct them on safe operation.

Please observe the following information.

1. OBSERVE SAFETY INSTRUCTIONS

- Read and understand carefully this “Operators Manual” and “Machine Decals” before attempting to operate the machine
- Learn how to operate and work safely. Know the machine and its limitations, always keep the machine in good working order
- Before allowing others to operate the machine, take the time to explain the operating methods and allow them to read this manual
- DO NOT modify the machine and its engine. Unauthorized modifications to the machine, engine or emissions control systems is illegal.
- Machine not to be run in an enclosed space, only well ventilated areas.
- Do not bypass any of the safety switches or functions.

2. WEAR THE CORRECT PERSONAL PROTECTIVE EQUIPMENT (PPE)

- DO NOT wear loose items of jewellery or clothing that could catch in the controls or be drawn into the machine air vents, causing personal injury
- Use additional items of PPE, as required & deemed appropriate
- NEVER use the machine while under the influence of alcohol, drugs (prescribed & recreational) or while fatigued

3. PRE START CHECK & MACHINE OPERATION

- Be sure to inspect the machine before operation. DO NOT operate the machine if there is anything wrong, take the machine out of service until it has been repaired and is fully operational.
- Ensure all cover plates & guards are in place before starting the engine. Replace any missing or damaged covers or guards
- Ensure the machine has at least 1 meter clearance on all sides, this is for sufficient cooling air flow & service access
- Do not allow anyone or livestock to approach the machine while in operation.
- Do not attempt to bypass any safety devices to start the engine

4. KEEP THE MACHINE AND SURROUNDINGS CLEAN

- Shut down the machine before cleaning
- Do not use high pressure jets for cleaning. Use a brush to clean the machine followed by low pressure water and detergent where required
- Ensure the air vents are clear from debris, ensure the radiator is checked and cleared of any dust and debris build up regularly. Ensure any waste & rubbish is kept clear of the machine to minimise any fire risk
- Store any flammable fluids in approved containers and well clear of the machine
- Check and repair leaks immediately

SAFE OPERATION

5. SAFE HANDLING OF LUBRICANTS AND FUELS

- Never refuel the machine with the engine running
- Shut down the engine before checking the oil levels in the engine or pump
- DO NOT smoke or allow flames or sparks near the machine - fuel is extremely flammable and explosive under certain circumstances
- Only refuel in well ventilated areas. Clean up any spilt fuel/oils immediately - do not operate the machine until spills have been cleaned up.
- Allow the machine to cool before refuelling
- Do not mix any other types of fuel with the Diesel. Ensure the Diesel fuel conforms to the standards set out in the Fuel Specifications table on the Specifications Page.
- Only store fuel and oils in approved containers

6. EXHAUST GASSES & FIRE PREVENTION

- Engine exhaust fumes can be very harmful if allowed to accumulate. Only run the machine in well ventilated areas.
- Exhaust gasses emitted from the muffler are very hot. To prevent a fire ensure the exhaust is not exposed to any flammable materials, such as waste materials
- To avoid a fire, be sure to check for leaks of flammable liquids from hoses & lines.
- To avoid a fire, do not short power cables & batteries. Ensure all wiring & leads are in good condition & connectors are clean and free from dirt. Bare or frayed cables could short and cause a fire.

7. ESCAPING FLUID

- Relieve all pressure in the oil, water & coolant systems before disconnecting any lines, fittings or related items
- Be aware of any possible and unintended pressure release when disconnecting any lines or fittings from a pressurized system. Do not use your hand to check for leaks, high pressure oil, water or fuel can cause personal injury.
- High pressure escaping fluid has sufficient force to penetrate skin causing serious personal injury
- Fluids escaping from pinholes may not be visible to the naked eye, use suitable leak detection methods to trace and identify the leak.
- If an injury from escaping fluid occurs, seek immediate medical attention.

8. CAUTIONS AGAINST BATTERY, BURNS & EXPLOSIONS

- To avoid burns be aware of any hot components such as the muffler, radiator hoses, turbo-charger and fluids etc. Some components will remain very hot even after the engine has been shut down.
- DO NOT remove the radiator cap while the engine is running or immediately after shutting down the engine. Scalding water and steam could be ejected from the cap causing serious burns. Only remove the cap once the engine has completely cooled down
- Be sure to close the coolant drain valve, secure the pressure cap and fasten the pipe band before operating. If these parts are taken off or loosened, it could cause a serious personal injury
- The batteries present a explosion hazard. When the batteries are being charged a explosive gas can be given off.
- Do not operate the machine if the battery fluid level is low. Operation with low battery fluid levels could shorten its life span or cause an explosion. If the fluid is low add battery water as required

SAFE OPERATION

- Keep sparks and open flames away from the battery while charging
- Only use appropriate battery testing equipment, do not short the terminals across.
- Do not charge a frozen battery. A frozen battery could explode if charged. Thaw out and warm it up to at least 16 degrees C before attempting to charge it
- For machines equipped with a DPF, THE DPF can run at temperatures in excess of 650 digraphs C so caution is required when working on the machine or near the exhaust.

9. KEEP HANDS AND BODY CLEAR OF ROTATING PARTS

- Ensure the engine is stopped and the battery disconnected before checking the tension of any drive belts, accessary drive belt & cooling fan
- Never run the machine with the covers removed, serious injury could be caused.
- Ensure all covers and guards are in place and secure before starting the machine

10. ANTI-FREEZE & CORRECT DISPOSAL OF FLUIDS

- Anti-freeze contains chemicals which can cause harm to the environment, animals & humans. Always wear the correct PPE while handling Anti-Freeze. In the event of contact with skin immediately wash it off with clean water
- Do not mix different brands of Anti-Freeze, a potential chemical reaction could damage the engine. Only use Anti-Freeze approved for the installed engine (check the engine owners manual - supplied with the machine)
- Dispose of any fluids (oils, Anti-Freeze & fuels) in accordance with your local environmental regulations. Do not dispose of them into any drains or watercourses. Ensure any filters (oil & fuel) are disposed of in the correct manner.
- When draining any fluids, ensure the collection receptacle is adequate for the task to prevent spills.

11. SAFETY CHECKS & MAINTENANCE

- When inspecting the machine or carrying out routine maintenance, ensure it is located on level and stable ground
- Always disconnect the battery to prevent accidental starting. Disconnect the ground cable first (Black cable connected to the (-) terminal on the battery)
- Always carry out the pre-start checks with the engine stopped
- Before starting any servicing or maintenance ensure the engine has cooled completely.
- Always use the correct tools for the job and only use genuine parts - this will ensure many years of satisfactory performance
- Do not use the accessary drive belt or fan blades to turn over the engine - damage can be caused to the engine.
- Replace all coolant hoses & fuel lines every 2 years, regardless of operating hours. Rubber degrades and could fail with little warning.
- Ensure a first aid kit and fire extinguisher are near by when carrying out servicing and maintenance

12. WARNING LABELS & DECALS

- Never remove or deliberately deface any warning labels, decals or serial plates.
- Replace any missing labels or decals - replacements can be obtained from Terracore Ltd / Impellr or agent in your region.
- Ensure all safety labels & decals are kept clean

SAFE OPERATION

WARNING & SAFETY SYMBOLS

DANGER
When the danger symbol with the text DANGER is shown, it is accompanied by information that is of great importance for the safety of everyone concerned. Ignoring the information can result in injury (possibly severe) or even death.

WARNING
When the warning symbol with the text WARNING is shown, it is accompanied by information that is of great importance for everyone concerned with the pump or pump unit. Ignoring the information can result in injury or damage (possibly severe) to the pump or pump unit

TOOLS
Indicates tools will be required to carry out this operation

BURN HAZARD
Keep your hands and other body parts away from hot engine surfaces such as the muffler, exhaust pipe and engine block during operation and shortly after you shut the engine down. These surfaces are extremely hot while the engine is operating and could seriously burn you.

FIRE AND EXPLOSION HAZARD:
- Diesel fuel is extremely flammable and explosive under certain circumstances.
- Only fill the fuel tank with diesel fuel. Filling the fuel tank with petrol or gasoline may result in a fire

HIGH-PRESSURE HAZARD:
- Avoid skin contact with high pressure diesel fuel spray caused by a fuel system leak such as a broken fuel injection line.
- High pressure fuel can penetrate your skin and result in serious injury. If you are exposed to high pressure fuel spray, obtain prompt medical treatment.

SAFE OPERATION

GENERAL
The pump or pump unit conforms to the European Machinery Directive. However, this does not exclude the possibility of accidents if used incorrectly.

Use of the pump for an application and/or deployment of the pump in an environment other than what is defined at the time of purchase is strictly prohibited and can result in a hazardous situation. This is particularly true for aggressive, poisonous or other hazardous liquids.

The pump or pump unit may only be installed, operated and maintained by persons who are familiar with it and are aware of the dangers of working with it.

The installer, operator and maintenance personnel must comply with the local safety regulations.

The company management is responsible for ensuring that all work is performed by qualified personnel in a safe manner.

It is not permitted to make changes to the pump or pump unit without written permission from Terracore Group / Impellr. If any changes are made to the pump without the written permission of Terracore Group / Impellr, Terracore / Impellr disclaims all liability.

Hearing protection must be worn if the sound emission level exceeds 85 dB(A).

DANGER
Exhaust gases contain carbon monoxide.
Carbon monoxide is a colourless, odourless and deadly gas which, when inhaled, prevents the body from absorbing oxygen, resulting in asphyxiation. Severe carbon monoxide poisoning can result in brain damage or death.

DIESEL ENGINE
- Never run the engine in an enclosed space.
- Provide a proper gas-tight discharge for exhaust gases.
- Provide sufficient ventilation.
- Never fill the fuel tank while the engine is running.
- Wear hearing protection while in the vicinity of a running engine.

SAFE OPERATION

WARNING
It is not permitted to pump volatile or hazardous substances with Impellr pumps

Pumps are suitable for water only

PUMP
Do not exceed the limit values of the pump curves. See the specification sheet for the relevant pump.

Make sure that hot/cold and rotating parts of the pump are shielded adequately to prevent unintentional contact.
It is not permitted to start the pump if such guards are missing or damaged.

The company management must ensure that everyone who works with/on the pump or pump installation is aware of the type of liquid that is being pumped. These persons must know what measures are to be taken in the event of leakage.

Dispose of any liquids that have leaked in a responsible manner. Observe local regulations.
If pumping liquids with a temperature of 70 °C (158°F) or higher, the hot surfaces of the pump and piping must be shielded. Apply 'hot surface' warning symbols.

Never allow a pump unit with a drive power in excess of 11 KW to run with a blocked pressure line. The heat build-up could lead to an explosion

ENVIRONMENTAL PROTECTION
Pollution poses a serious threat to the environment. The following rules must be observed to prevent environmental pollution:

- Check the pump and the connected piping for leaks on a regular basis.
- If an external fuel tank is used, the connections and routing of the piping must be checked carefully.
- If the piping is connected incorrectly or is susceptible to damage (leakage), this can harm the environment.
- A pump unit incorporates a catchment tank in the base. However for long term installations, operating the pump unit on a separate bund is recommended.
- Do not dispose of any environmentally harmful substances in drains, sewers or on the ground. This is illegal and punishable.
- Keep environmentally harmful substances separate and submit them to a designated disposal facility for processing or destruction.
- Maintain the pump or pump unit in accordance with the instructions.

SAFE OPERATION

DURING MAINTENANCE & REPAIR

Work may only be performed on the pump or pump unit when the pump or pump unit has been put out of operation.

Follow the procedure described in this manual to put the pump or pump installation out of operation.

Make sure all pressure within the pump or pump unit has been relieved before beginning the work.

When opening the pump follow all the instructions for handling the pumped liquid, such as protective clothing, safety goggles, no smoking, etc.

Consult the Material Safety Data Sheet (MSDS) for the pumped liquid.

If the pump or pump unit is being used to pump a hazardous liquid, it must first be cleaned and neutralised.
Protect the drive motor against unintended and unauthorised activation throughout the duration of the work activities.
Maintenance work on the electrical system may only commence after the power supply has been disconnected and may only be performed by personnel who have been trained and authorised to do so.

In the interest of safety, only use parts purchased from or approved by the supplier.

Modifications to the pump or pump installation or the application are only permitted after consultation with the suppliers. The reliability of the pump or pump unit can only be guaranteed when the pump is used for the application and in the manner for which it is intended, as specified at the time of delivery.

When the work is complete, all the safety provisions and protective measures must be reinstalled and made operative.

Review the operating instructions before restarting the pump or pump unit.

TRAINING & KNOWLEDGE LEVEL OF PERSONNEL

The company management must ensure that all the maintenance, inspection and installation work is performed by authorised and qualified personnel who possess the required level of knowledge concerning the Impellr pump.

The responsibilities of the concerned personnel and the personnel responsible for their supervision must be explicitly defined by the company management. If the personnel have insufficient knowledge, the company management must arrange for suitable training, provided by the supplier or manufacturer of the pump.

LIFTING TRANSPORT & STORAGE

LIFTING

1. When lifting the machine, ensure that there is adequate lifting capacity to lift the unit safely.
2. The units are fitted with twin access fork points to enable the machine to be lifted from ether end, or from either side.
3. There are also 4 lifting eyes provided should a suspend lift be required.

OBSERVE AND OBEY:

Common sense and planning must be applied to control the movement of the machine when moving it with a forklift

The transport vehicle must be parked on a level surface

SECURING TO TRUCK OR TRAILER FOR TRANSIT:

Always check the machine is on a level surface with the total skid in contact with the surface
Inspect the entire machine for loose or unsecured items

Ensure any pipe-work or diesel lines are removed.

TIE DOWN & STRAPPING:

Only use the lifting eyes for strapping.

DO NOT OVER TIGHTEN STRAPS:

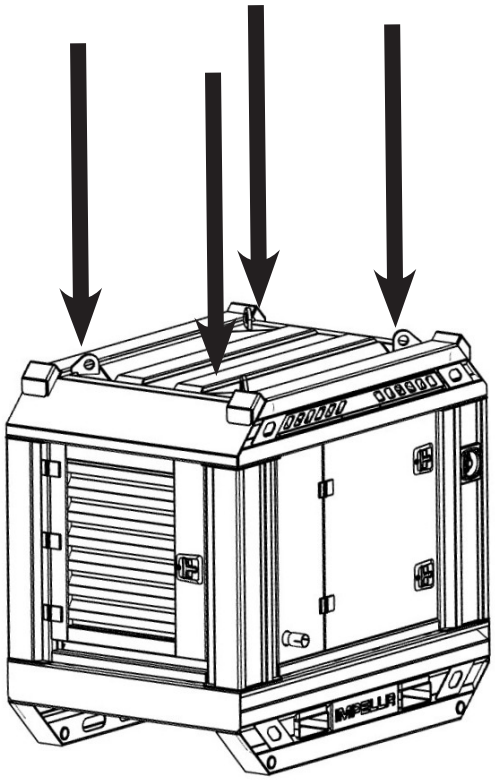
Excessive tension of the straps will cause damage to the machine

LIFTING TRANSPORT & STORAGE

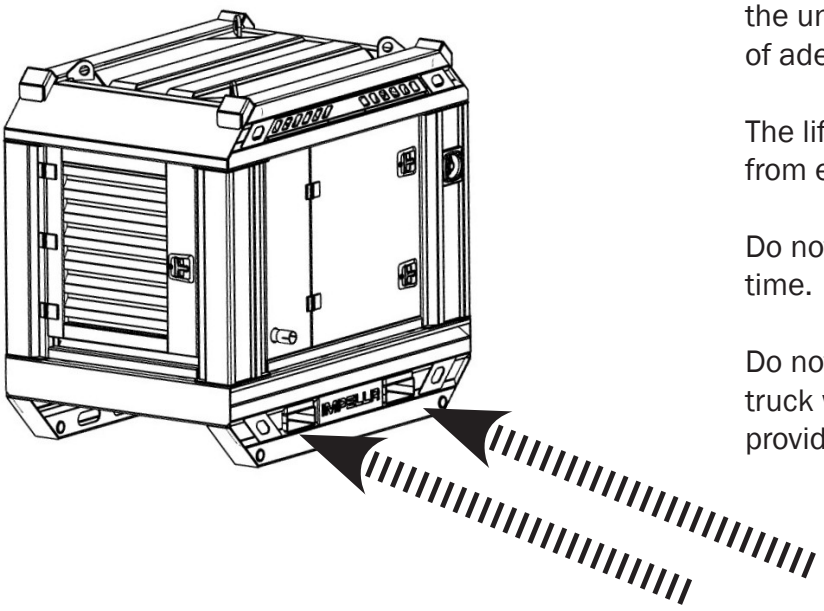
SUSPENDED LIFT (CRANE)

DANGER
Never walk under a raised load

Check that lifting equipment used has required capacity to lift the pump safely. Use all four of the lifting eyes as indicated to lift the machine when using a crane or a suspended lift.



FORK LIFT



Lift pockets are provided to enable the unit to be lifted with a forklift of adequate capacity

The lift pockets can be accessed from either side of the machine

Do not lift more than one unit at a time.

Do not attempt to lift with a forklift truck without using the pockets provided.

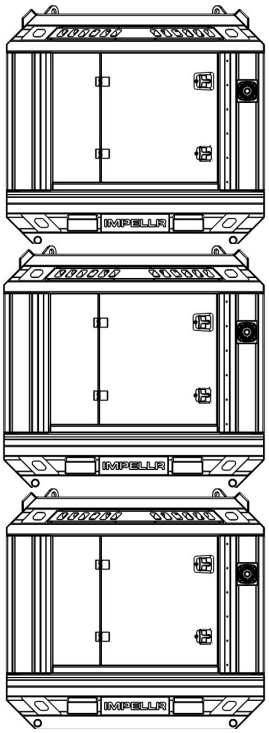
LIFTING TRANSPORT & STORAGE

The IMPELLR Pump has been designed to facilitate easy transport on either a flat bed or container transport.

Ensure that the frame is secured firmly from all 4 corners as show as shown

STORAGE
The IMPELLR pumps can be stacked up to 3 high.

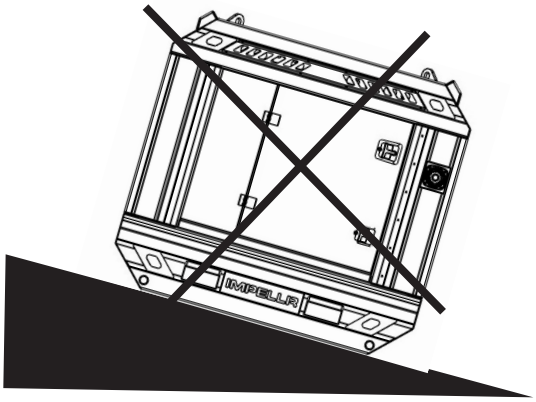
Ensure that the ground is firm and level so stacking can be carried out in a safe manner

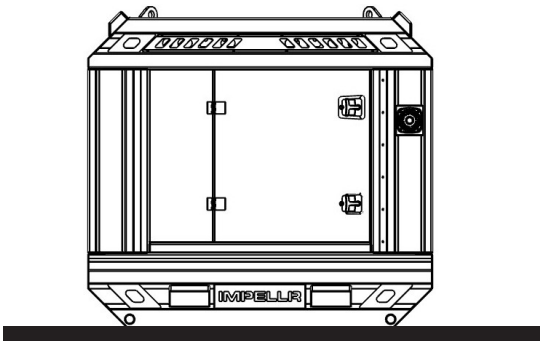


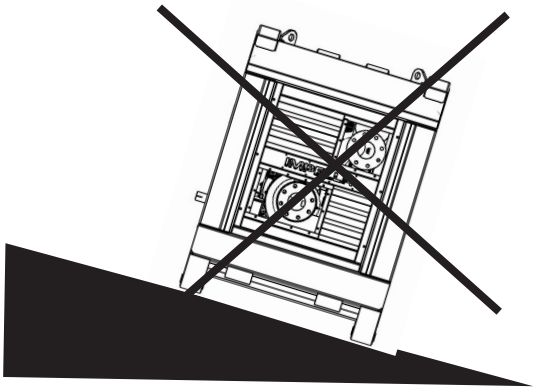
UNIT INSTALLATION

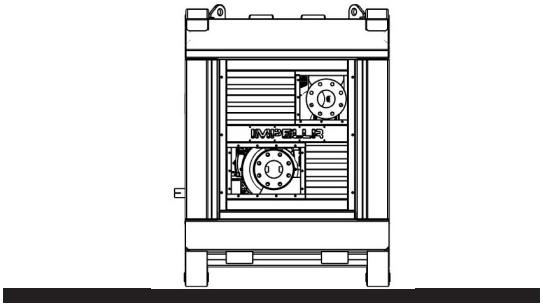
WARNING
Failure to follow the guidelines for the placement and installation of the pump unit can result in danger to the user and/or severe damage to the pump or pump unit.

IMPELLR are not responsible for accidents and damage that result from failure to follow the guidelines in this manual. Such use results in forfeiture of the right to assert any warranty or damage compensation claims.









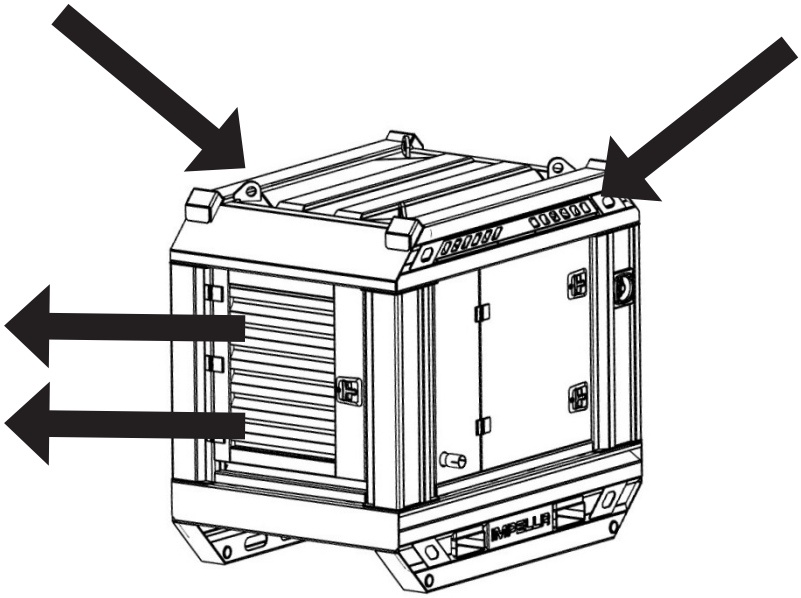
- Place the pump unit on a flat surface capable of supporting the full weight of the unit
- Make sure the pump unit is placed in such a manner that it is not subjected to any distorting forces.
- Ensure there is sufficient space around the pump unit for operation and maintenance work.

UNIT INSTALLATION

WARNING

- Make sure the top of the pump unit is not covered. This is important because the diesel engine driven pump unit draws in fresh air from the top.

- Make sure the front and sides of the pump unit are not covered. This is important



OUTDOOR USE

The pump unit may only be placed outdoors if the construction of the pump or pump unit allows this.
In addition to the general instructions, the following additional requirements must be met
.

- Make sure there is sufficient free space around the cooling air inlet so the engine is able to draw as much cooling air as it needs.
- Make sure there is sufficient free space around the hot air outlet. Maintain at least two metres of clearance (6,6 ft).
- Avoid dusty conditions and locations where corrosion or erosion can occur.

INDOOR USE

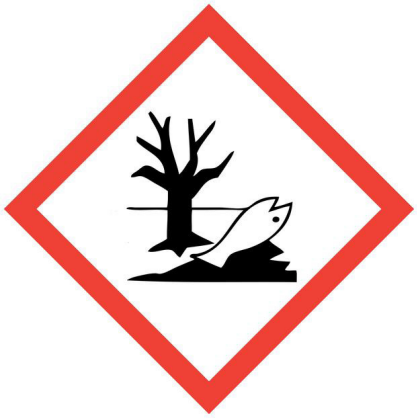
In addition to the general instructions, the following additional requirements must be met:

- Make sure the area has adequate ventilation.
- Make sure there is sufficient free space around the cooling air inlet so the engine is able to draw as much cooling air as it needs.
- Prevent high ambient temperature and humidity.
- Avoid dusty conditions and locations where corrosion or erosion can occur.

UNIT INSTALLATION

DANGER
Failure to follow the guidelines for use of the pump unit in a potentially flammable or explosive atmosphere can create an extremely dangerous situation.

PLACEMENT IN AN AREA WITH A POTENTIALLY FLAMMABLE OR EXPLOSIVE ATMOSPHERE
The standard pump unit is not suitable for placement in a potentially flammable or explosive atmosphere. In some cases, after consultation with IMPELLR and implementation of the prescribed measures, written approval may be provided by IMPELLR for use of the pump or pump unit in the specified situation.



ENVIRONMENTAL RESPONSIBILITY:

- Be environmentally responsible. Follow these procedures along with your environmental policy for hazardous waste disposal. Failure to follow these procedures may seriously harm the environment.
- Follow the guidelines of the relevant environmental department in your country (EPA in USA and EA in UK etc) for the proper disposal of hazardous materials such as engine oil, diesel fuel and engine coolant. This includes used filters. Consult the local authorities or reclamation facility.
- Never dispose of hazardous materials irresponsibly by dumping them into a sewer, on the ground or into ground water or waterways

PIPING GUIDELINES - general

WARNING
The designer of the installation that includes the pump unit is responsible for installing the pump unit correctly.
Failure to follow the guidelines can result in an excessive load on the pump unit and/or piping, which can cause severe damage to the pump unit and/or piping.

WARNING
The designer of the installation that includes the pump unit is responsible for taking the necessary measures to prevent an internal explosion and, in the event an internal explosion nevertheless occurs, to stop it and limit the consequences.

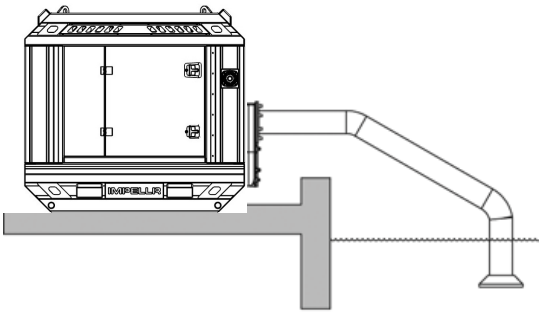
THE PIPING MUST COMPLY WITH THE FOLLOWING GUIDELINES:

- Select the diameter and length of the suction and pressure pipes as well as those of any additional components such that the inlet pressure remains above the minimum allowable value
- The operating pressure must not exceed the maximum allowable value.
- The power rating of the installed drive system must be sufficient. NPSH graphs are available on request.– The diameters of the pipes must be equal to or greater than the connection sizes on the pump.
- See the specification sheet for the particular pump or pump installation to obtain the prescribed pipe diameters.
- If possible, the transition between various pipe diameters must be made with a transition angle of approx. 8 degrees.
- The pipe must be properly aligned with the pump connection.
- It must be possible to connect the flanges of the pipes and pump together without applying any force.
- In the case of vibration and/or hot liquids, install expansion elements in the pipes.
- Support the pipes directly in front of the pump. The weight of the pipes and fittings may not be supported by the pump.
- Install shut-off valves in the suction and pressure pipes as close as possible to the connection flanges in order to allow isolation of the pump for maintenance and repair work. The shut-off valves must be of a type that allows straight-line flow, such as gate or globe valves. The internal diameter of the shut-off valve must be the same as that of the pipe.
- If there is a possibility that a back-flow of liquid could cause the pump to turn in the opposite direction when stopped, a NRV must be placed in the piping to prevent this.
- Install measurement instruments in the piping for monitoring during operation.
- If applicable, connect the pump unit to a suitable safety system. This is left to the judgement of the designer of the installation.
- Insulate or shield hot pipes.
- Observe specific regulations that pertain to the suction and pressure pipes.
- Thoroughly clean all parts that come into contact with the transported liquid before putting the pump unit in operation

PIPING GUIDELINES - Suction pipe

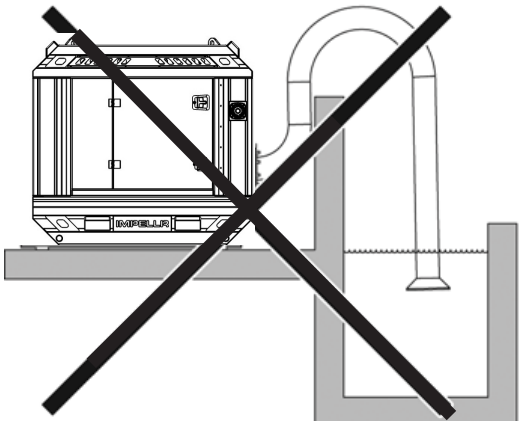
The suction pipe must meet the following requirements:

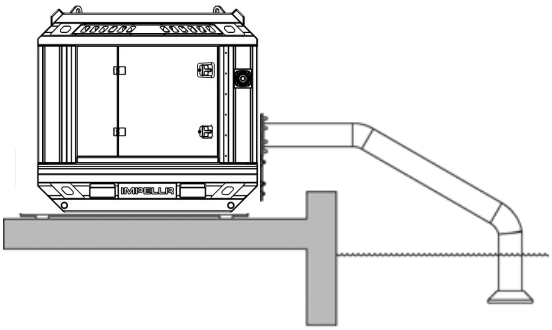
- Place the pump or pump unit as close as possible to the pumped liquid.
- The pipe must be as short as possible.
- Run the pipe so it slopes upwards toward the pump to prevent the formation of air pockets.



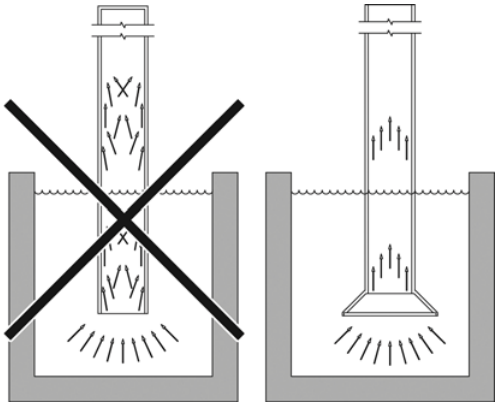
Lay the pipe so as to prevent the formation of air pockets.

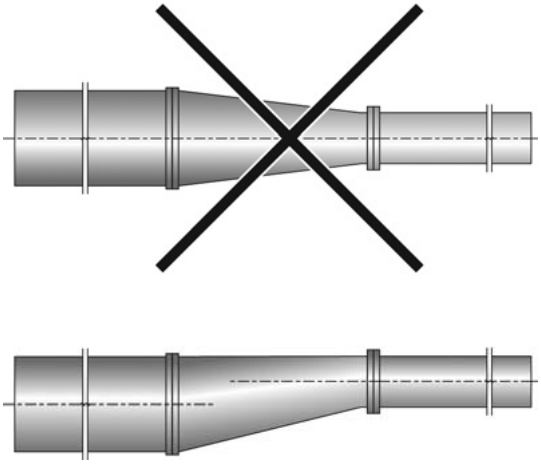
- Bends must have the largest possible radius.
- The pipe system must be completely airtight.
- In the case of polluted liquids, always install a suction strainer or solids separation screen with a sufficiently large net opening area. The filtration particle size of the suction strainer must be equal to or less than the solids handling specification of the pump.





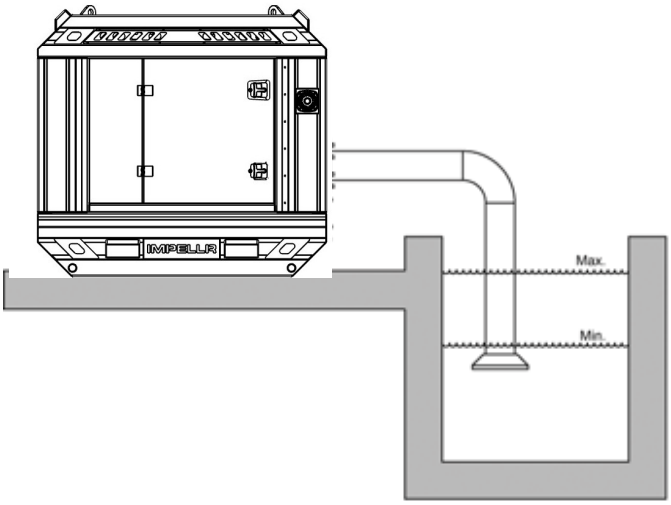
PIPING GUIDELINES - Suction pipe





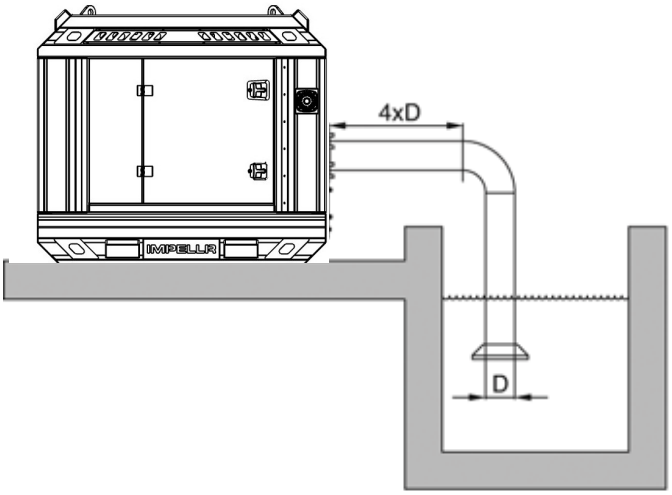
When there is a change of diameter in the piping, use an eccentric reducer to prevent the accumulation of air.

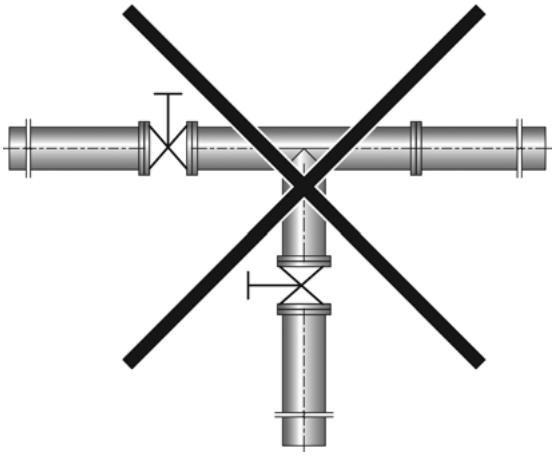
Make sure that the liquid intake will remain sufficiently submerged beneath the liquid surface so no air will be drawn in even when the liquid is at its lowest level.



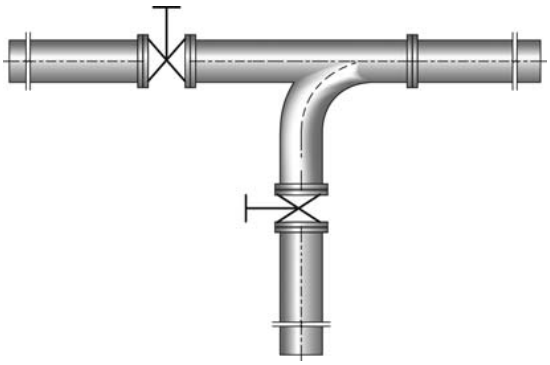
PIPING GUIDELINES - Suction pipe

Make sure the length of the pipe between a bend and the pump is at least four times the diameter of the pipe, especially when there is little difference between the available and required NPSH. A bend prevents the smooth inflow of liquid to the pump impeller and can have a negative impact on the suction conditions.





When a ‘T’ junction is installed, use an inflow bend.



PIPING GUIDELINES - Suction pipe

WARNING

Piping with an inadequate diameter, an excessively long suction pipe or a clogged suction strainer can cause the pipe losses to increase to the point that the available NPSH (NPSHa) falls below the required NPSH (NPSHr). This results in cavitation of the pump. This is damaging to the pump and has a negative impact on the operation of the pump unit.

WARNING

In all cases in which pre-pressure is desired you must contact IMPELLR for advice. Pre-pressure may not be employed without written permission from IMPELLR.

RESISTANCE TABLES

Internal pipe diameter	Resistance in:					
	Bends		Tee	Shut-offs		Non-return valve
	90°	45°		Gate	Globe	
mm	m	m	m	m	m	m
20	0.6	0.3	1.5	0.15	7.5	2.0
25	0.7	0.4	1.8	0.2	8.7	2.2
30	0.8	0.45	2.1	0.25	10.0	2.7
40	1.0	0.6	2.7	0.3	13.5	3.4
50	1.2	0.75	3.4	0.35	17.0	4.3
70	2.0	1.0	4.7	0.5	24.0	6.0
100	2.5	1.5	6.7	0.7	34.0	8.5
120	3.0	1.8	8.0	0.85	41.0	10.0
150	3.7	2.25	10.0	1.1	51.0	12.7
200	5.0	3.0	13.5	1.4	68.0	17.0
250	6.2	3.75	16.5	1.75	85.0	21.2
300	7.5	4.5	20.0	2.1	99.5	25.5

Internal pipe diameter	Resistance in:					
	Bends		Tee	Shut-offs		Non-return valve
	90°	45°		Gate	Globe	
inch	ft	ft	ft	ft	ft	ft
0.787	1.97	0.98	4.92	0.49	24.6	6.6
0.984	2.30	1.31	5.91	0.66	28.5	7.2
1.18	2.62	1.48	6.89	0.82	32.8	8.9
1.57	3.28	1.97	8.86	0.98	44.3	11.2
1.97	3.94	2.46	11.2	1.15	55.8	14.1
2.75	6.56	3.28	15.4	1.64	78.7	19.7
3.94	8.20	4.92	22.0	2.30	112	27.9
4.72	9.84	5.91	26.2	2.79	135	32.8
5.90	12.1	7.38	32.8	3.61	167	41.7
7.87	16.4	9.84	44.3	4.59	223	55.8
9.84	20.3	12.3	54.1	5.74	279	69.6
11.8	24.6	14.8	65.6	6.89	326	83.7

PIPING GUIDELINES - Pressure pipe

WARNING
Prevent sudden closure of the pressure pipe that would cause water hammer.

If there is a danger of water hammer, install a bypass, accumulator or pressure safety valve in the pressure pipe.

The designer of the installation is responsible for including the required safeguards, such as protection against overpressure:

- To prevent pipe losses, use the fewest number of bends possible.
- When the pressure pipe is long or when a NRV valve is used in the pressure pipe directly after the pump, install a bypass line, fitted with a shut-off valve. Connect the bypass line to the suction line or suction point.
- To bleed air from the pump more quickly, the bypass line must be connected to the supply tank or suction point.

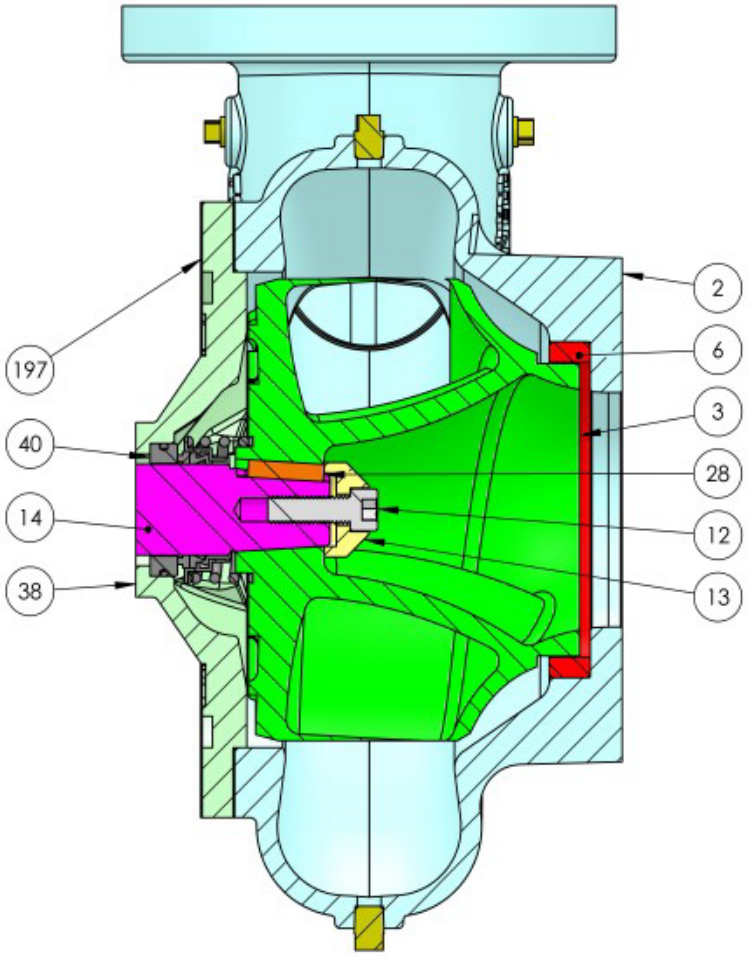
PIPING GUIDELINES - Suction strainer

When pumping polluted liquid or liquid that may contain solid particles, install a suction strainer in the suction opening.

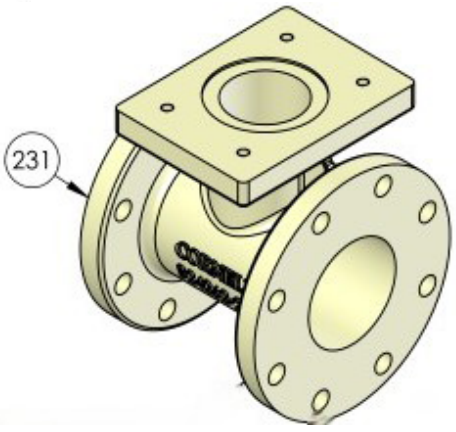
- When selecting the suction strainer, carefully consider the mesh width so pipe losses are kept to a minimum. The net opening area of the suction strainer must be at least three times the cross sectional area of the suction pipe.
- In the case of polluted liquids, always install a suction strainer with a sufficiently large net opening area. The filtration particle size of the suction strainer must be equal to or less than the solids handling specification of the pump.
- Install the suction strainer such that maintenance and cleaning are possible.
- Make sure the liquid being drawn in has the expected viscosity and can easily flow through the suction strainer. Heat the suction strainer if necessary.
- Consult the technical specifications for the pump series for the maximum allowable particle size.

PUMP

THE IMPELLR IMP-4-D is fitted with a Cornell 4408T Dry Prime Centrifugal Pump. The pump is assembled into the IMPELLR unit in accordance with factory stipulated conditions, any modifications to the installation and and drive arrangement requires written permission from IMPELLR prior to any modifications being carried out.
This manual contains the basic information required by an operator of the unit, for more detailed information required for pump dismantling and impellor replacement, please request the Cornell hand book from IMPELLR



PARTS LIST	
2	Volute
3	Impeller
6	Wear Ring
12	Impeller Lock-screw
13	Impeller Washer
14	Shaft
28	Impeller Key
38	Back-plate
40	Mechanical Seal
197	Gasket



PUMP OPERATION

CAUTION: Damage will result if oil levels are not maintained.

Pre-Start Check List

1. Check oil levels in vacuum pump crank case and seal oil reservoir and add oil as necessary
2. Drain all fluid from stop cock at bottom of diaphragm on vacuum pump. Be sure to close stop cock after all fluid is drained.
3. Trailer and skid mounted units must be set on firm, level ground and wheels chocked.
4. Ensure that hoses are correctly coupled and that the suction strainer is fully submerged.
5. Ensure that all drain valves or plugs are closed.
6. For indoor installations, make certain the air pump exhaust line to outside is in place and leak free
7. In freezing conditions, ensure that separator float movement is not impeded by any ice in the separator float box.

CAUTION: Do not operate at higher than recommended speed to shorten priming time as this will shorten the service life of the vacuum pump.

Operation

1. Priming time is a function of the volume of air in the suction line and the RPM of the vacuum pump. High lifts and larger suction line diameter will require longer priming times
2. If pump will not prime or maintain prime, or if vacuum pump runs hot or passes water, refer to the “Troubleshooting Guide” section in this manual.
3. When pumping in extremely cold conditions, ice may form on the prime valve seat or linkage, preventing closure and allowing water into the vacuum pump. Close observation must be maintained and the pump shut down at the first signs of excessive water coming from the vacuum pump.
4. Should the discharge check valve become plugged, the pump must be shut down and the valve cleaned out per the “Discharge Check Valve Operation and Servicing” section in this manual
5. Clogging of the suction strainer or hose may result in loss of prime without recovery. A vacuum gauge can be connected to the tap on the side of the separator float box to aid in diagnosing such clogs

PUMP TROUBLE SHOOTING

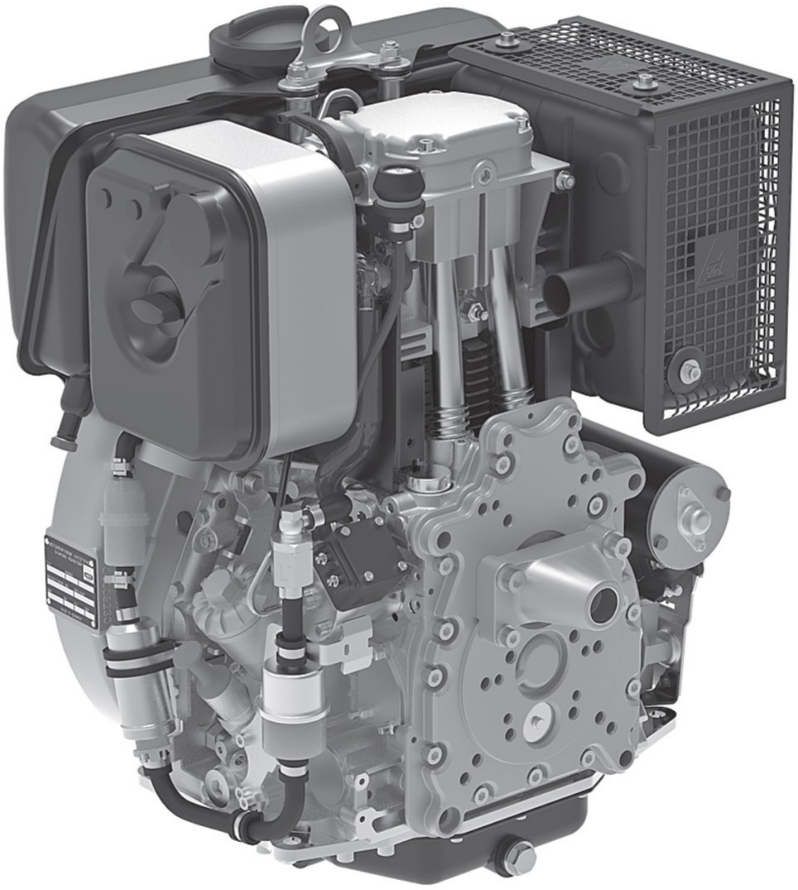
Problem	Likely Cause	Solutions
Failure to pump	Pump not primed	Inspect priming system
	Speed too low or head too high	Consult factory
	Head insufficient to open check valve	Consult factory
	Air leak	Locate and correct
	Plugged suction	Correct
	Suction lift too high	Consult factory
Failure to prime	Drain taps on volute or vacuum pump open	Close all drain taps
	Discharge check valve not seating	Open valve inspection cover, remove debris, check condition of disk and seat
	Air leak on suction hose	Check all connections
	Air entering at inlet to suction	Ensure full submergence
	Faulty vacuum pump or compressor	Disconnect hose and connect vacuum gauge to intake nozzle. Gauge should read 25" HG, minimum; if not, dismantle vacuum pump and check seals
Vacuum pump or compressor belt broken	Overtightened or misaligned	Replace, and properly tension and/or properly align
Pump loses prime when running	Air entering suction inlet	Ensure full submergence and no vortices
	Impeller or wear rings worn	Check condition and clearances
	Suction level has dropped too low	Check lift against pump's published capabilities
	Air hose (B01) leak	Check clamps and hose condition
Reduced output	Air entering suction	Check for leaks and proper submergence
	Blockage	Check: suction strainer, discharge check valve separator, kinked or blocked hoses
	Reduced pump speed	Check with tach and adjust
	Worn impeller or wear rings	Inspect and replace or repair
	System head greater than anticipated	Connect pressure gauges to suction and discharge at pump, calculate head and compare to performance curve. Consult factory
	Improper rotation	Correct rotation is clockwise as viewed from driver location
	Insufficient NPSHA	Calculate NPSH available and compare with pump curve

PUMP TROUBLE SHOOTING

Problem	Likely Cause	Solutions
Rapid fluid gain from R-D Reservoir	Mechanical seal leaking	Replace (see pump manual)
Rapid fluid loss from R-D Reservoir	Mechanical seal leaking	Replace (see pump manual)
	R-D Lip seal leaking	Replace (see pump manual)
	R-D line fitting loose	Check and tighten
Main vacuum pump bearing hot	Over greased, wrong grade or contaminated grease	Remove bearing covers and remove excess or incorrect grease
Vacuum pump or compressor housing excessively hot (above 140°F)	Air leak	Check hose clamps and hoses for looseness or cracks. Replace as necessary.
	Coolant leak	Check coolant lines back to engine for leaks
	Speed too high	Consult factory
Excessive vibration	Loose fasteners	Check all fasteners on pump, engine
	Engine out of tune	Consult engine supplier
	Pump cavitation	Check NPSH available against NPSH required and reduce lift if possible
	Damaged bearings	Check for blockage in suction Check noise from bearing housings Check temperatures
Discharge check valve	Leakage	Tighten bolts, replace gasket
	Valve leaks when closed	Inspect disc for damage - replace Inspect seating surface, clean if necessary
	Valve does not open	Check for obstruction in valve, see disassembly procedure
Water discharge from venturi or vacuum pump	Prime valve seat damaged	Replace (see "Separator Service and Operation" section in manual)
	Float restricted	Clear blockage (see "Separator Service and Operation" section in manual)
	Float puncture	Float punctured

DIESEL ENGINE

MANUFACTURER	HATZ
MODEL	1D90E



Introduction

This section includes extracts from the relevant HATZ Diesel engine manual.
The extracts have been selected to assist with the day to day running and maintenance of the IMPELLR pump.
For a comprehensive overview of the diesel engine, including settings and parameters please refer to the full 88 page HATZ manual.

DIESEL ENGINE

ENGINE SAFETY

DANGER TO LIFE FROM INHALING GASES

Toxic engine exhaust gases can lead to loss of consciousness, and even death, in closed off or poorly vented areas.

- Never operate the machine in closed-off or poorly ventilated areas.
- Do not breath in the exhaust gases

DANGER OF FIRE FROM HOT EXHAUST GAS SYSTEMS

If inflammable materials come into contact with the exhaust gas flow or the hot exhaust gas system, these materials will ignite.

- Keep inflammable materials away from the exhaust gas system
- Do not operate the engine (exhaust flow or hot exhaust gas system) in the direct vicinity of combustible materials.

DANGER - FIRE HAZARD FROM FUEL

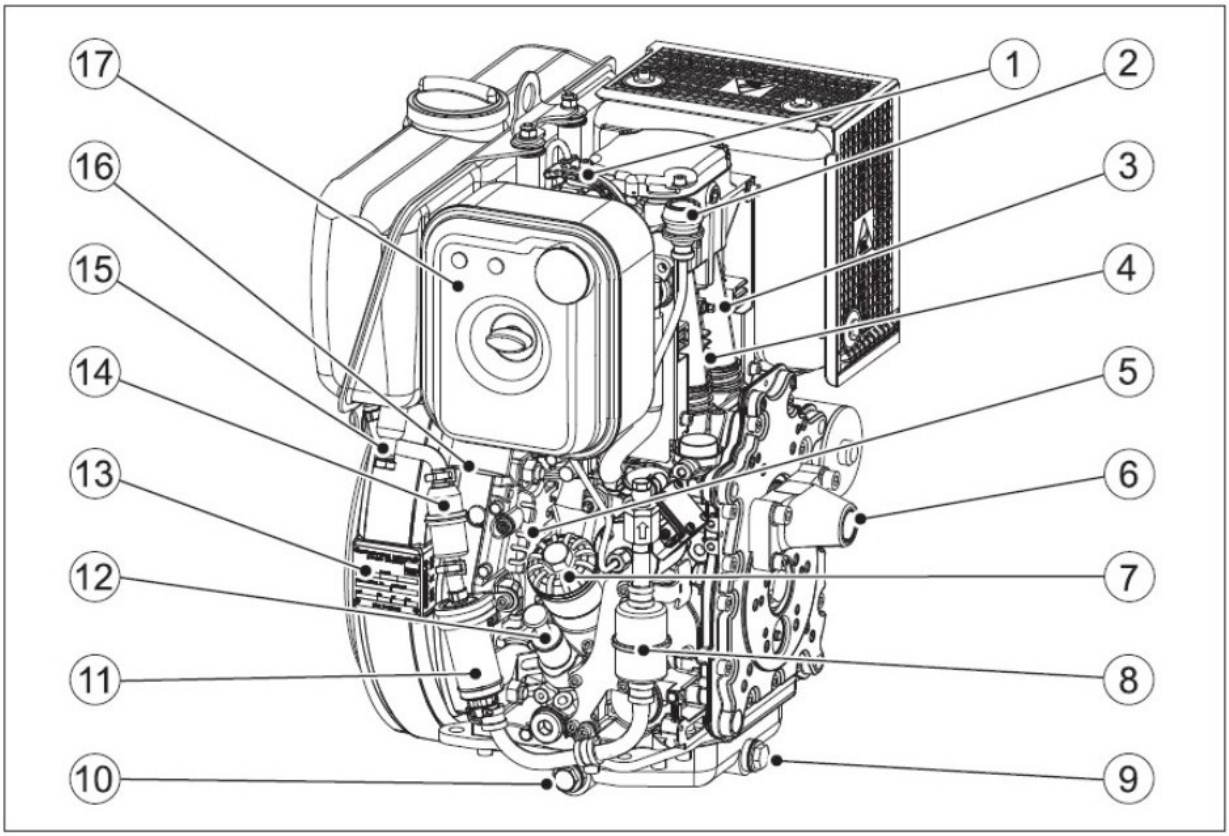
Leaked or spilled fuel can ignite on hot engine parts and cause serious burn injuries

- Only refuel when the engine is switch off and has cooled down.
- Never refuel in the vicinity of open flames or sparks that can cause ignition.
- Do not smoke
- Do not spill fuel

DANGER TO LIFE, INJURY OR PROPERTY DAMAGE DUE TO INCORRECT USE OF BATTERIES

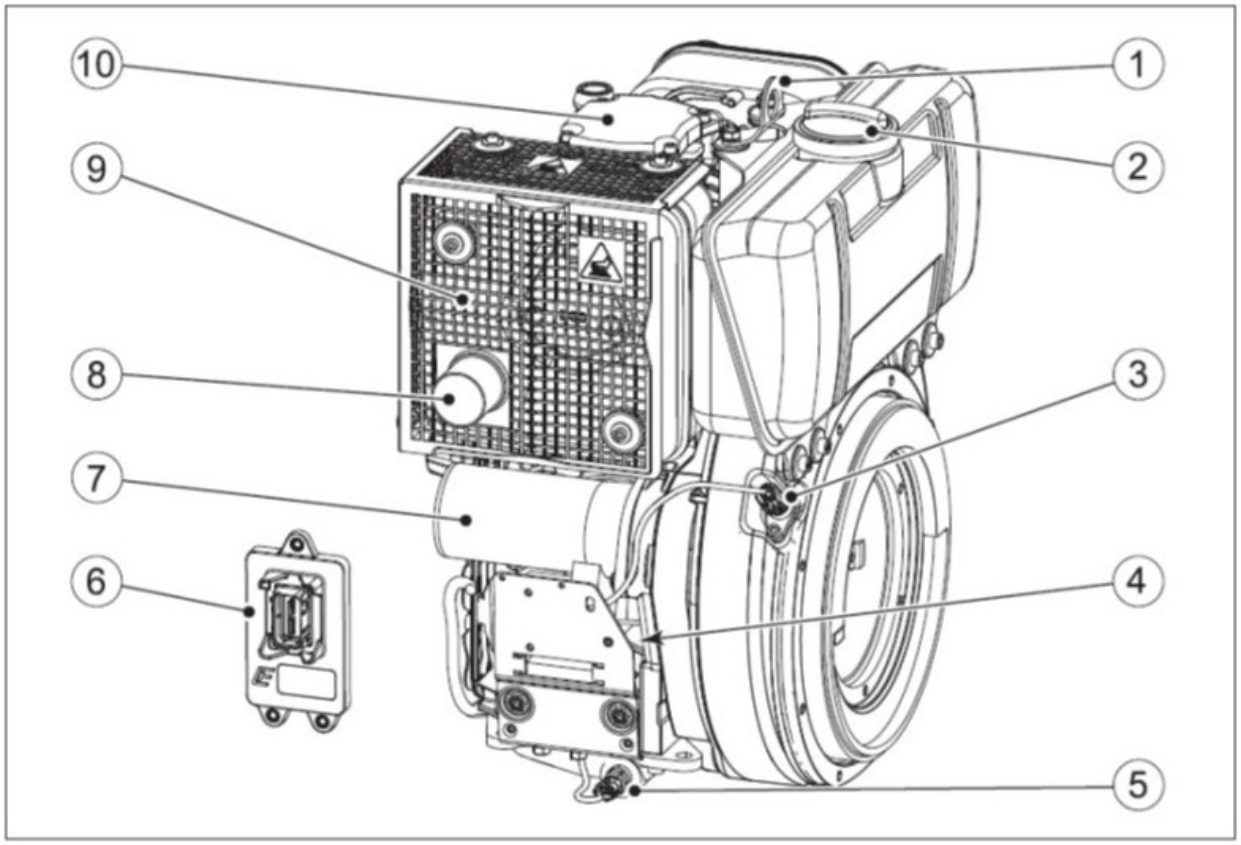
- Do not place tools or other metal objects on the battery.
- Before performing work on the electrical equipment, always disconnect the negative battery terminal
- Never swap the plus (+) and negative (-) battery terminals.
- When installing the battery, first connect the **plus cable**, and then the **negative cable**.
- When removing the battery, first disconnect the **negative cable** and then the **plus cable**.
- It is imperative to prevent short circuits and mass contact of current currying cables
- If faults occur, check the cable connections for good contact.

DIESEL ENGINE



Designation of components - Intake side	
1	Decompression lever
2	Air filter Maintenance indicator (option)
3	Temperature switch
4	Coolant air outlet
5	Intake opening for cooling air
6	Guide sleeve for starting handle
7	Oil filter (option)
8	Main Fuel filter
9	Oil drain screw (front)
10	Oil drain screw (side)
11	Electric fuel pump
12	Oil filling opening and dipstick
13	Engine type plate
14	Fuel prefilter
15	Water separator
16	Intake opening for combustion air
17	Dry air filter

DIESEL ENGINE



Designation of components - Exhaust side	
1	Lifting eye
2	Fuel cap
3	Crankshaft speed sensor
4	Voltage controller
5	Oil temperature sensor
6	Engine control unit
7	Starter
8	Exhaust outlet
9	Silencer
10	Cylinder head cover

DIESEL ENGINE

Engine information and filling quantities

Type		**1D90E**
Model		S,Z
Type		Air-cooled, four stroke diesel engine
Combustion System		Direct Injection
Number of cylinders		1
Bore/Stroke	mm	104 / 85
Displacement	cm3	722
Engine oil consumption (after running-in period)	Approx	1 % of fuel consumption, pertaining to full load
Engine oil pressure at oil temperature of 80–120 °C	Min	0.6 bar at 850 rpm
Sense of rotation		When viewing flywheel: left
Permissible inclination	Max	25°
Tappet clearance at 10–30 °C inlet/outlet		0.30
Weight Model S Model Z	Approx Kg	 107 109
Battery capacity	Max	12 V – 88 Ah / 640 A (EN) / 700 A (SAE)

The values apply to continuous operation in any direction.
Exceeding these limit values causes engine damage.

DIESEL ENGINE

Performing Tests

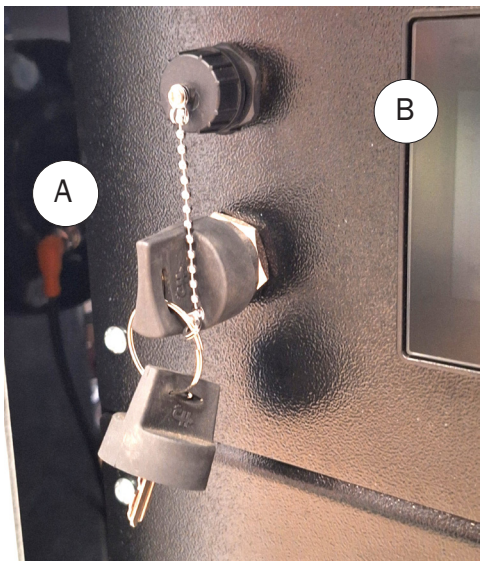
Before Starting
Before starting the engine, several tests need to be performed to ensure the machine is working

	Procedure
1	Check the machine is standing securely and on a level surface
2	The location is adequately ventilated
3	There is a sufficient amount fuel in the tank (See Refuelling Page 47)
4	There is a sufficient amount of engine oil in the engine house (See fill with engine oil Page 39)
5	No persons are located in the danger zone of the engine or the pump apparatus
6	All safety equipment is in place.

Starting the Engine

Sequence for starting

1. Turn ignition key (A) to the right one notch.
2. Control screen (B) will light up with the word 'Connex'
3. Turn the key (A) another notch to the right, and release.
4. Engine will start automatically and run at the pre-set speed
5. The screen will now show a range of engine information
6. To switch engine off return key to original position.



MAINTENANCE

Engine Oil & Capacities

Checking the oil level

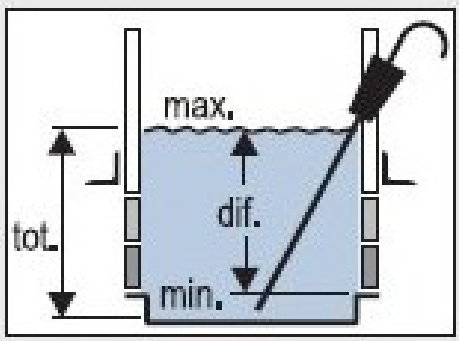
WARNING
Danger of burns.
There is a danger of burns when working on a hot engine.
- Wear safety gloves.

Danger of injury
Prolonged contact with engine oil can lead to irritation of the skin.
- Wear safety gloves
- If there is contact with the skin, thoroughly wash the affected areas of the skin with soap and water

Sump Capacity
tot. ltr.: engine oil capacity (in litres) for the first filling or oil change. For engines without an oil filter, the filling quantities are reduced by approx.
0.1 liter.

dif. ltr.: Oil refill quantity (in litres) between the “min” and “max” marking on the dipstick.

These values are approximations only. The max. mark on the dipstick is decisive
in any case



tot. ltr.[2)]	dif. ltr.[3)]
4.5	3.5

Oil quality

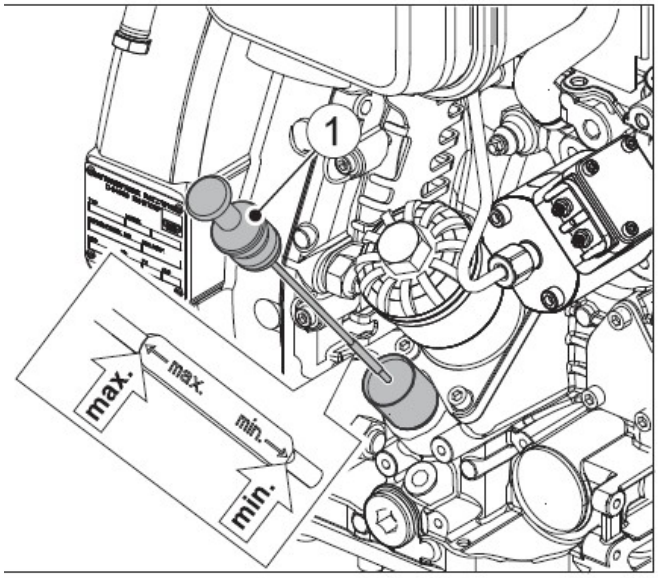
All oil brands that meet at least one of the following specifications are suitable:
- ACEA E6 or E8 (recommended)
- ACEA E9 or E11
- ACEA C3 / C4 (HTHS ≥ 3.5 mPas)
- API CK-4 or CJ-4

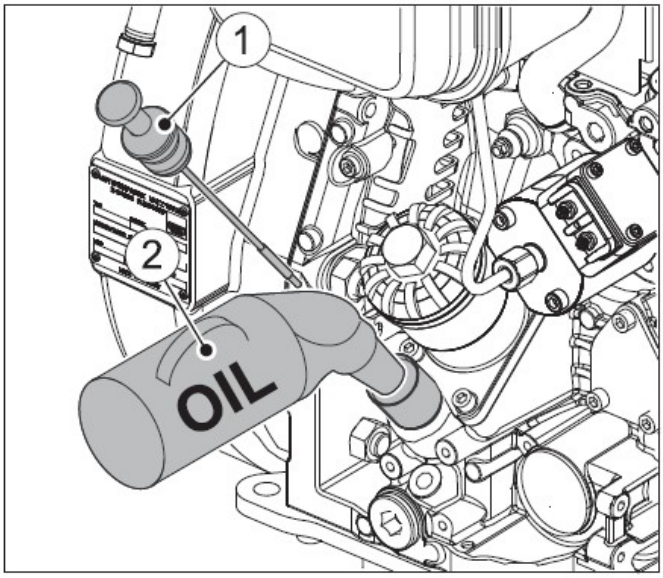
MAINTENANCE

CAUTION

Danger of later engine damage.

- Operating the engine with an oil level below the **min.** mark or above the **max.** mark can lead to engine damage.
- When checking the oil level, the engine must be horizontal and have been switched off for a few minutes.





Procedure - Checking Oil Level / Adding Oil	
1	Switch off the engine and wait several minutes for the engine oil to collect in the crank-case. Engine must be level.
2	Remove contamination on the engine in the area of the dipstick (1).
3	Pull out the dipstick and clean it.
4	Reinsert the dipstick.
5	Pull out the dipstick and check the oil level.
6	If the oil level is close to the min. mark, add engine oil to the max. mark.
7	Reinsert the dipstick.

Maintenance Plan

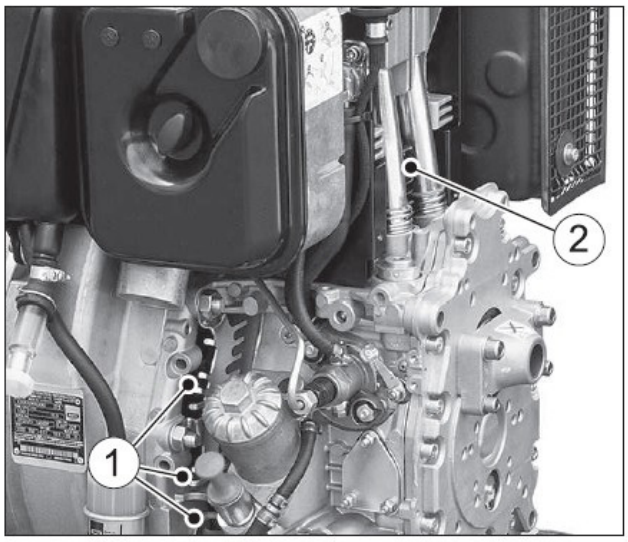
DAILY CHECKS		
Interval	**Activity / Check**	**O&M Location**
Every 8-15 operating hours or every day before starting	Check the oil level	Page 38
	Check the air filter maintenance indicator	Page 41
	Check the intake area of the combustion air	Page 20
	Checking the cooling air area	Page 20
iNITIAL MAINTENANCE - NEW / REBUILT ENGINES		
Interval	**Activity / Check**	**O&M Location**
After the first 25 operating hours	Change the engine oil/filter	Page 42/43
	Check and set the tappet clearance.	See HATZ Manual
	Check the screw connections	See HATZ Manual
	ROUTINE MAINTENANCE	
Interval	**Activity / Check**	**O&M Location**
Weekly	Checking the water separator	
Every 250 operating	Diagnosis of engine management (Require trained technicians)	
	Change the engine oil/filter	Page 42/43
	Check & adjust the tappet clearance	See HATZ Manual
	Clean the cooling air area	Page 41
	Check the screw connections	See HATZ Manual
	Change the fuel prefilter and main fuel filter	See HATZ Manual
	Maintain the dry air filter	Page 41

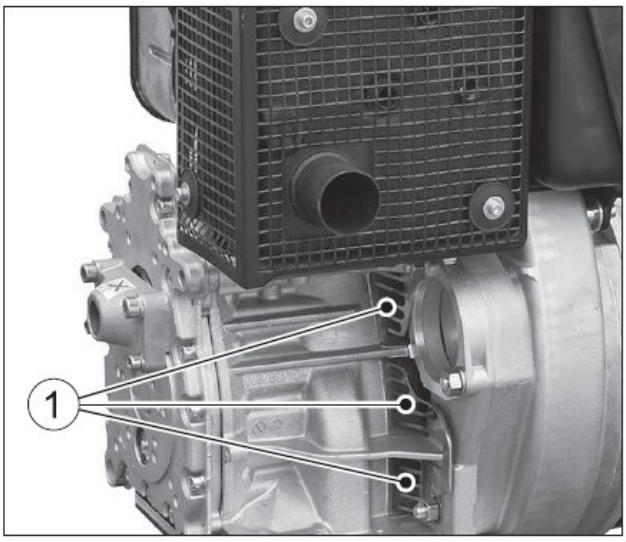
Checking the Cooling Air Area

CAUTION
Danger of Burns
There is danger of burns when working on a hot engine.
- Let the engine cool before maintenance

CAUTION
Danger of engine damage from overheating

The engine temperature display lights up as soon as the engine becomes impermissibly hot.
- Switch off the engine immediately and eliminate the cause.





1	Intake opening for cooling air	2	Coolant air outlet

Check the intake opening (1) and cooling air outlet (2) for coarse contamination such as leaves, heavy dust deposits, etc., and clean if necessary.

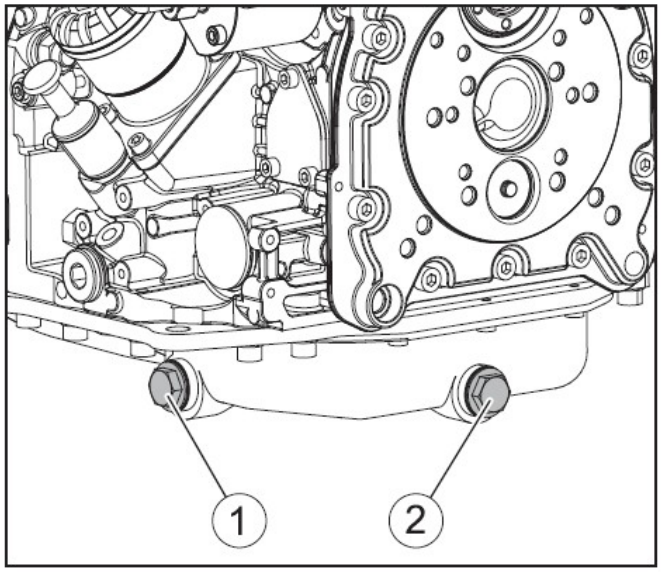
Keep the inside of the pump canopy clear of loose debris, as free circulating air is vital to good performance of the machine

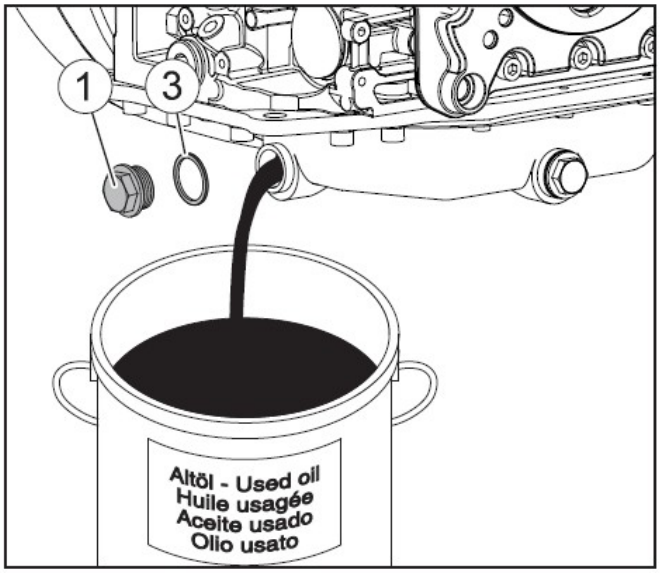
Draining the Engine Oil

CAUTION

Danger of engine damage

- Operating the engine with an oil level below the **min.** mark or above the **max.** mark can lead to engine damage.
- When checking the oil level, the engine must be horizontal and have been switched off for a few minutes.

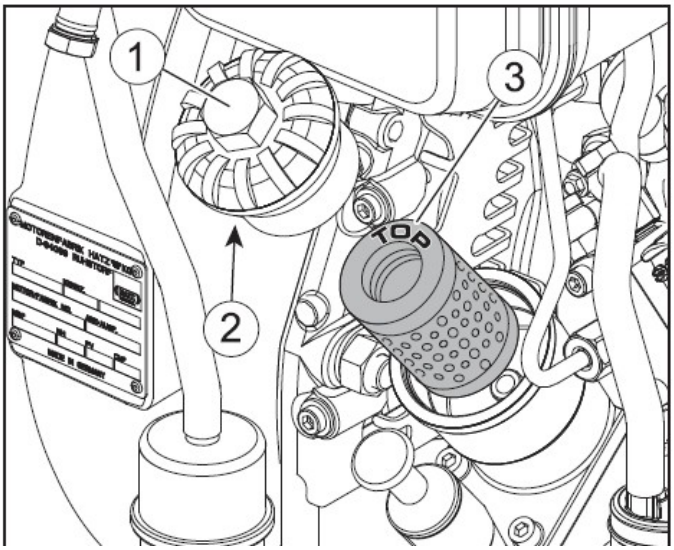


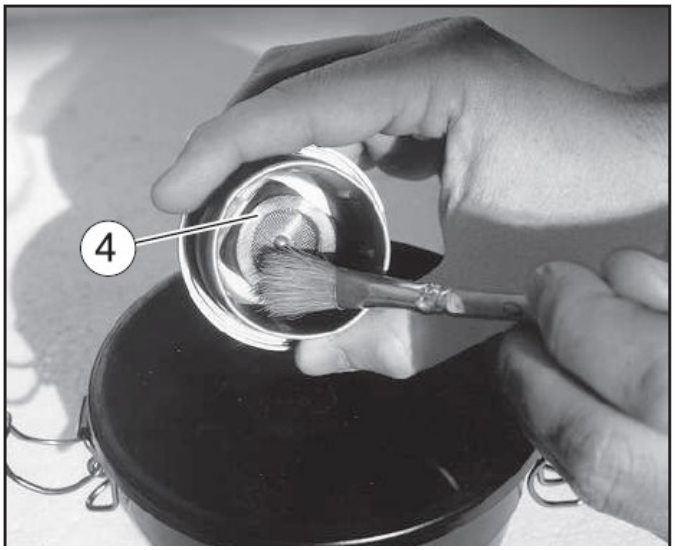


1	Oil drain screw (side)
2	Oil drain screw (front)
3	Seal ring

Procedure	
Step	**Activity**
1	Keep a container ready for collecting the used oil. The container must be large enough to hold the entire amount of engine oil. For engine oil capacity, check page 37.
2	Depending on accessibility, the engine oil can be drained at oil drain screw (1) or (2). Unscrew the oil drain screw and drain the used oil entirely
3	Screw in the cleaned oil drain screw with the new sealing ring and tighten to 50Nm

Changing the Oil Filter

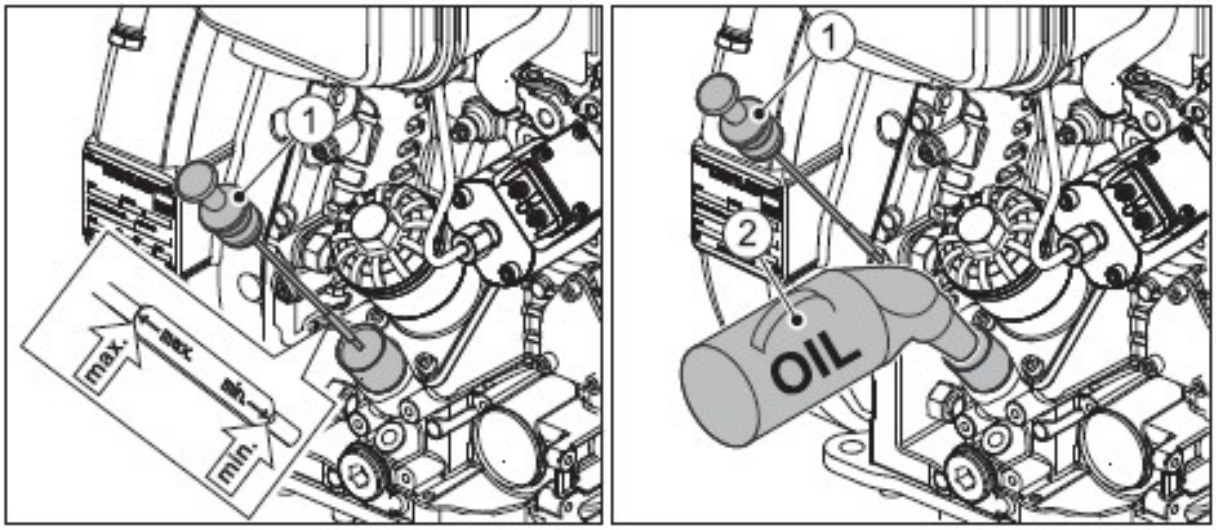




1	Screw cap for oil filter
2	Seal ring
3	TOP Marking on the oil filter
4	Screen insert

Procedure	
Step	**Activity**
1	Unscrew the screw cap (1)
2	Clean the screen insert (4) carefully to ensure that the wire mesh is not damaged. Wipe out the screw cap or blow it out with compressed air.
3	Dispose of the old oil filter in accordance with local environmental regulations
4	When inserting the new oil filter, pay attention to the ‘TOP’ marking (3)
5	Renew the gasket ring (2)
6	Coat the screw cap thread and gasket with lubricant
7	Screw in and tighten the screw cap

Filling the Engine Oil



1	Dipstick
2	Oil Filling Container

Procedure	
Step	**Activity**
1	Pull out the dip stick (1) and wipe it clean
2	Fill engine oil. For the specification and viscosity, see chapter 4.3 Engine oil, page 24. For the filling quantity, see chapter 4.1 Engine information and filling quantities, page 21.
3	Reinsert the dipstick
4	Pull out the dipstick and check the oil level.
5	If required, add engine oil to the max. mark.
6	Reinsert the dipstick.
7	Check the oil level again after a short test run and top up engine oil as required.

Fuel & Fueling

Fuel type

All types of diesel fuel that meet the minimum requirements of the following specifications are suitable:

- Europe: EN 590
- UK: BS 2869 A1 / A2
- USA: ASTM D 975-09a 1-D S15 or 2-D S15

Danger of engine damage from low quality fuel.

The use of fuel that does not meet the specifications can lead to engine damage.

The use of fuels that do not meet specifications require approval by Motorenfabrik HATZ (main plant).

Danger of malfunctions due to old fuel.
When diesel fuel is stored in a fuel tank or canister for lengthy periods, deposits may form on account of fuel aging. These deposits result in malfunctions due to clogged fuel filters and damage to the injection system.

- Perform the prescribed storage steps in machines that will be out of use for more than three months.
- Only refuel with fresh diesel fuel such as can be obtained from filling stations.

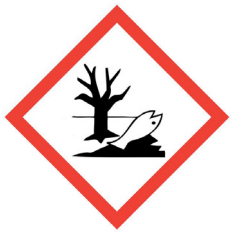
Winter fuel
Diesel fuel loses its fluidity at low temperatures, which can lead to operating problems. Use cold-resistant winter diesel fuel for outside temperatures below 0 °C.

Fuel & Fueling - Safety Notes

DANGER

Fire hazard from fuel.

- Leaked or spilled fuel can ignite on hot engine parts and cause serious burn injuries.
- Only refuel when the engine is switched off and has cooled down.
- Never refuel in the vicinity of open flames or sparks that can cause ignition.
- Do not smoke.
- Do not spill fuel.



CAUTION

Danger of environmental damage from spilled fuel

Do not overfill the fuel tank and do not spill fuel.

Collect any leaking fuel and dispose of it according to local environmental regulations.

CAUTION

Danger of injury.

Repeated contact with diesel fuel can cause chapped and cracked skin.

- Wear safety gloves.
- If there is contact with the skin, thoroughly wash the affected areas of the skin with soap and water

NOTICE

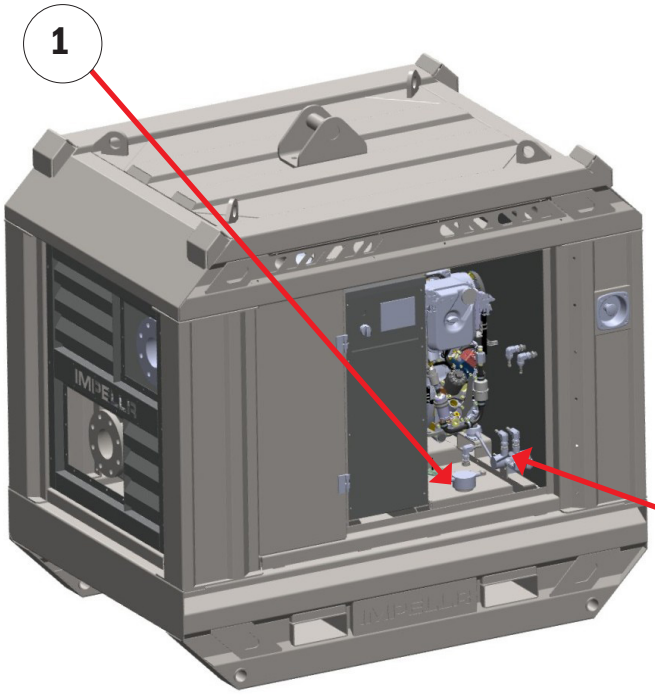
Never run the tank empty if possible, as otherwise air can enter the fuel system. This can lead to damage to the injection system.

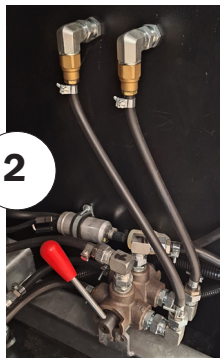
If the tank is still run empty, proceed as follows:

- Fill the fuel tank with diesel fuel.
- Bleed the fuel system (see chapter 6.5 Venting the fuel system, page 35).

MAINTENANCE

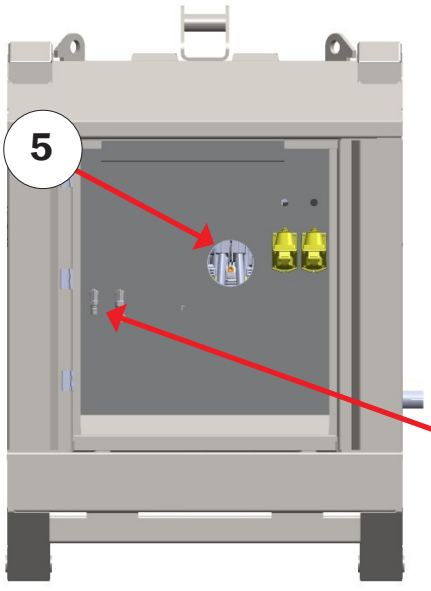
Fuel & Fueling





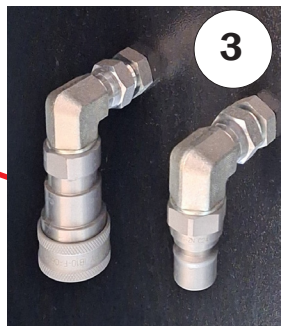
Integral Fuel Tank
The Impellr IMP4D is fitted with an integral fuel tank of 200 litres. This will provide a running time depending on engine load of approx 140 hours.

To fill the tank remove the cap (1), fill and replace the cap. Ensure this cap stays in place to avoid any foreign material or water entering the tank.



Integral Tank

Remote Tank



Remote Tank Connection
To facilitate longer term installations, the Impellr pump is equipped with a remote connection configuration.

Connection requires the connection of the flow and return hose into the bulkhead mounted couplings (3).

When connected the move the selecter lever (2) into the Remote Tank position.

CAUTION
KEEP CLEAR OF HEAT OUTLET (5)

- Do not cover
- Do not put hands or fingers into this outlet.
- When pump is in use, ensure that the vent door is in the closed position.

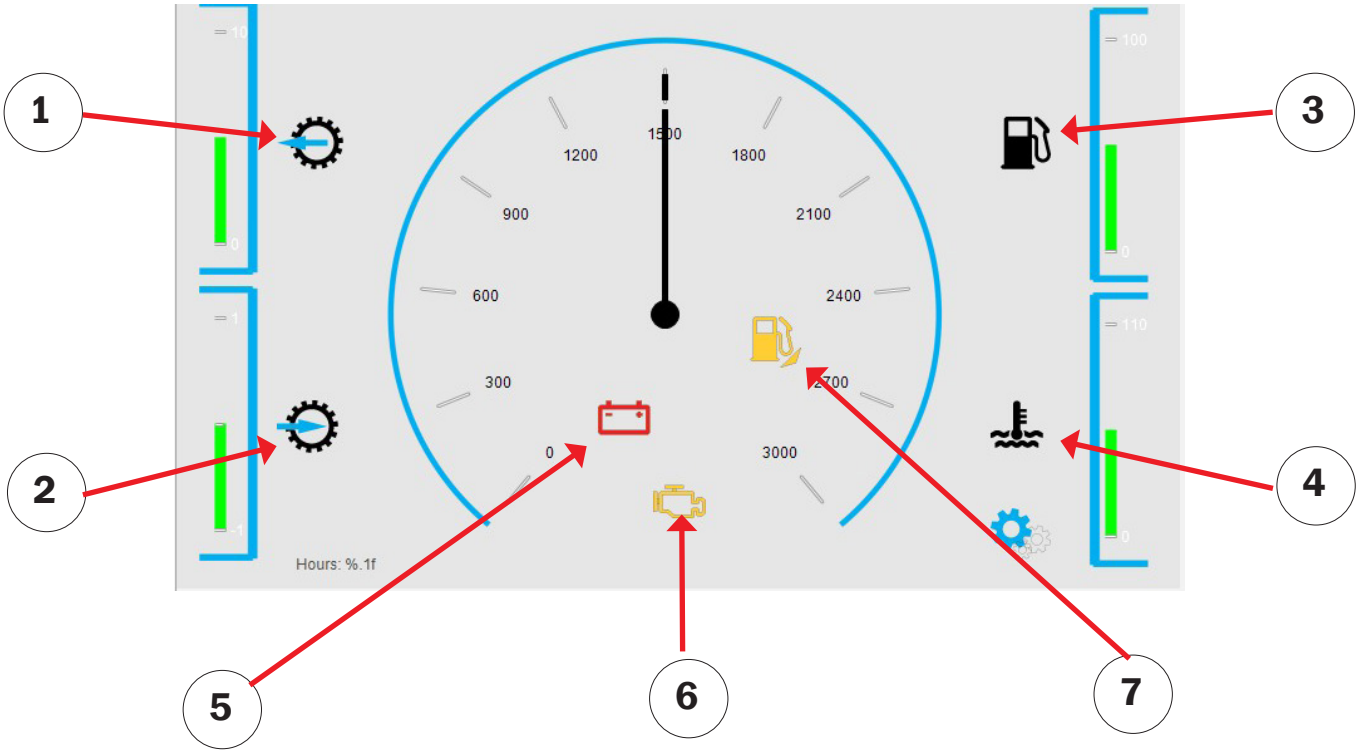
CONTROLS

Control System

The Impellr Pump units feature the 'CONNEX' control system. This is factory set to automate the controls and enhance to performance of the pumping unit.

The detailed control panel is show below, please note that Terracore will update this module as required and add new features as they are available, so the illustration may not exactly the reflect to panel on your machine.

Remote access and monitoring are available, please contact your Impellr dealer if required.



Item	Description
1	• Discharge Pressure (bar)
2	• Suction Pressure (bar)
3	• Fuel Level
4	• Coolant Temperature
5	• Battery / Alternator Warning
6	• Diagnostic Indicator

CONTROLS

Float Switch Control

The Impellr Pump is fitted with float switch connections that are intended to be used for connection of the float switches for determining the level.

The floats that are used are identical.

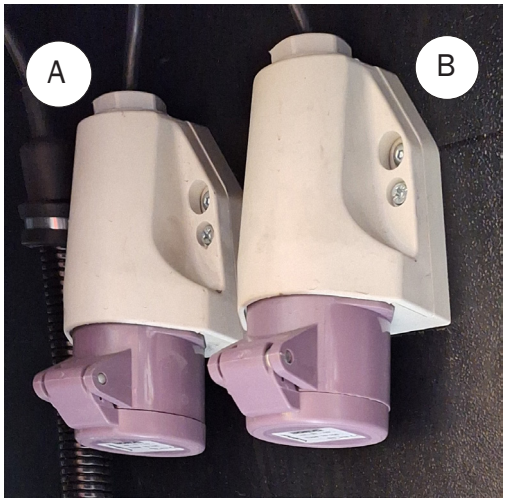
Connection (A) switches on the pump unit when the maximum level (2) is reached.
Connection (B) switches off the pump unit when the minimum level (1) is reached.

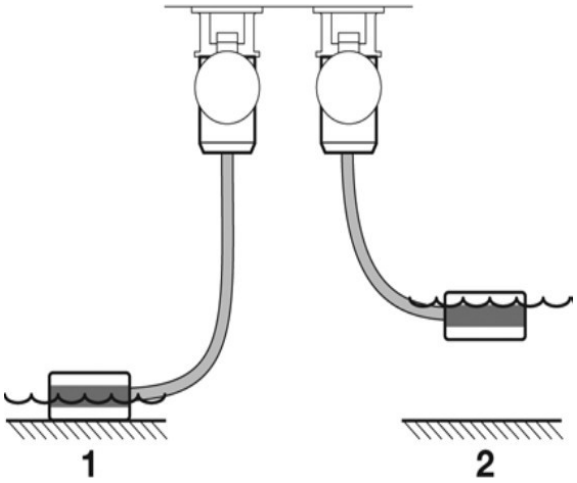
When float switches are used it is important that the pump unit cycle on and off no more than four times per hour.

Keep this in mind when positioning the float switches.

Note
The float switches are made for use in water. For use in other liquids, contact Impellr.

Note
Position the floats so the pump unit shuts down no more than 4 times per hour.





WARNING

When float switches are used the pump unit may start automatically. Therefore always switch off the power when working on the pump unit.

PRE - OPERATION INSPECTION

DO NOT OPERATE UNLESS:

You learn and practice the principles of safe machine operation contained in this operators manual.

1. Avoid hazardous situations
2. Always perform a pre-operation inspection. Know and understand the pre-operation inspection before going on to the next section
3. Always perform function tests prior to use
4. Inspect the workplace
5. Only use the machine as it was intended

FUNDAMENTALS

It is the responsibility of the operator to perform a pre-operation inspection and routine maintenance.

The pre-operation inspection is a visual inspection performed by the operator prior to each work shift.

The inspection is designed to discover if anything is apparently wrong with a machine before the operator performs the function tests.

The pre-operation inspection also serves to determine if routine maintenance procedures are required. Only routine maintenance items specified in this manual may be performed by the operator.

PRE - OPERATION INSPECTION

Refer to the list below and check each of the items and locations for modifications, damage or loose/missing parts.

A damaged or modified machine must never be used. If damage or variation from factory delivered condition is discovered, the machine must be tagged and removed from service

Repairs to the machine may only be made by a qualified service technician according to the Manufacturers specifications. After repairs are completed, the operator must perform a pre-operation inspection again before going on to the function tests.

Scheduled maintenance inspections shall be performed by qualified service technicians, according to the manufacturer's specifications.

Be sure that all decals are legible and in place. See "Decals" section.

Be sure the fuel tank is full of fuel, oil levels are correct and the mast locking pin secures the mast in place

Ensure all guards are in place

Be sure the correct accessories & manual is present. See parts list.

Check the following components or areas for damage, modifications and improperly installed or missing parts:

1. Electrical components
2. Wiring
3. Battery, terminals tight & not damaged
4. Engine oil level
5. Gear box oil level
6. Fluid leaks
7. Fuel level
8. Fuel leaks
9. Safety interlocks

Check entire machine for:

1. Cracks in welds or structural components
2. Dents or damage to the machine
3. Be sure that all structural and other critical components are present, and all associated fasteners are in place and properly tightened.

WORKPLACE INSPECTION

DO NOT USE UNLESS;

1. You learn and practice the principles of safe machine operation contained in this operator's manual.
2. Avoid hazardous situations
3. Always perform function tests prior to operation
4. Inspect the workplace. Know and understand the function tests before going on to the next stage
5. Only use the machine as it was intended

FUNDAMENTALS:

The workplace inspection helps the operator determine if the workplace is suitable for safe machine operation. It should be performed by the operator prior to moving the machine to the workplace

It is the operator's responsibility to read and remember the workplace hazards, then watch for and avoid them while moving, setting up and operating the machine.

Be aware of and avoid the following hazardous situations

1. Slopes
2. Unstable or slippery surfaces
3. Overhead obstructions
4. Hazardous locations
5. Inadequate surface support to withstand all load forces imposed by the machine
6. Wind and weather conditions
7. The presence of unauthorised personnel
8. Low temperature & freezing conditions
9. Other possible unsafe conditions
10. Ensure any equipment or objects that could be damaged by water are removed from the area

OPERATION

Pre Start Checks

Whilst basic details of the Hatz engine are included in this manual, it is important that the operator is conversant with the engine manual.
Further copies are available on request

In addition to the instructions provided in the Hatz engine manual, the following instructions apply to all engines:

– Observe all applicable local safety instructions.
– Shield the engine exhaust pipe to prevent accidental contact.
– The starting system must automatically disengage when the engine is started.
– The minimum and maximum engine speed set by Impellr may not be changed.
– Before starting, check the following:

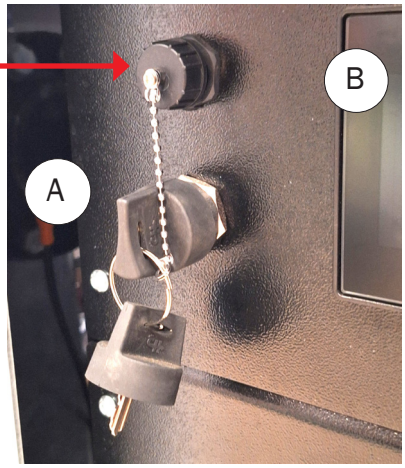
- Engine coolant level, if applicable
- Coolant leakage, if applicable
- Engine oil level
- Fuel level
- Fuel lines, for leakage
- Emergency stop buttons are disengaged
- Isolator switched on

Starting the Engine

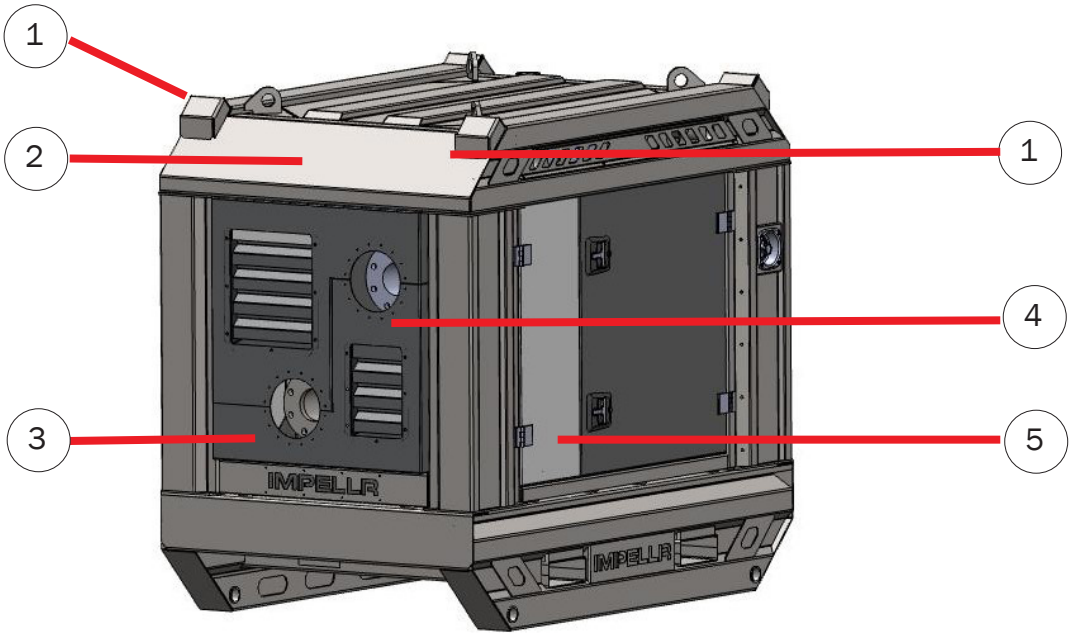
Sequence for starting

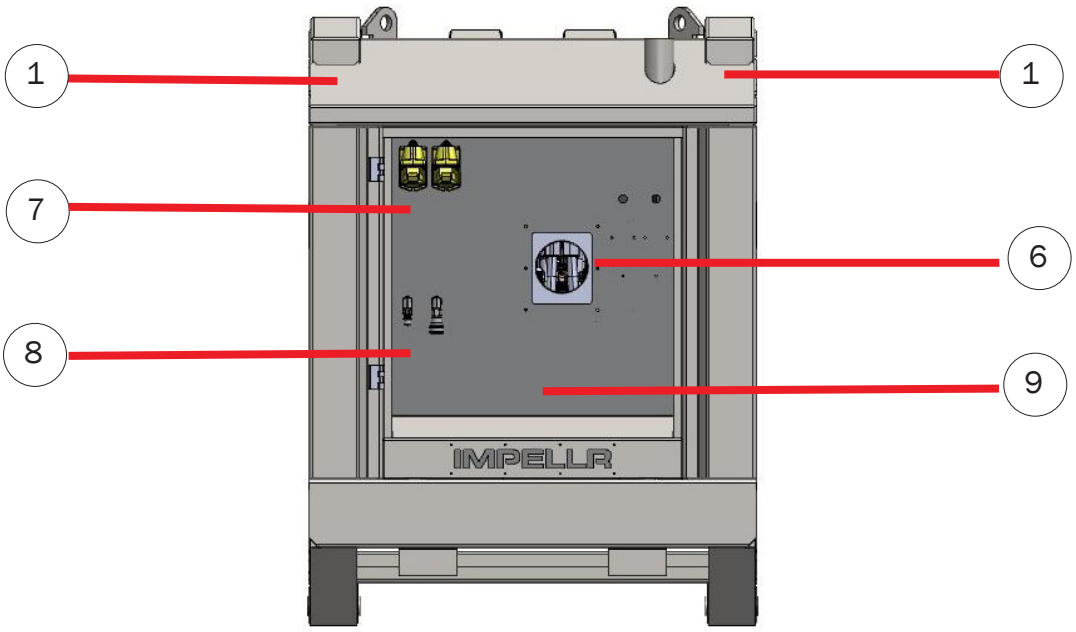
1. Turn ignition key (A) to the right one notch.
2. Control screen (B) will light up with the word ‘Connex’
3. Turn the key (A) another notch to the right, and release.
4. Engine will start automatically and run at the pre-set speed
5. The screen will now show a range of engine information
6. To switch engine off return key to original position.

USB Socket Protection Cover - do not remove



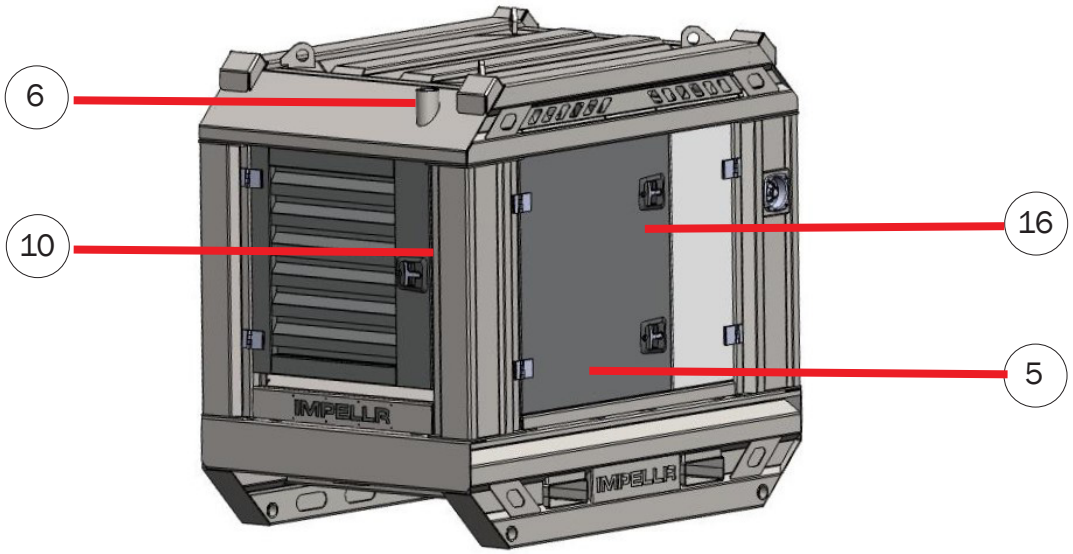
DECALS

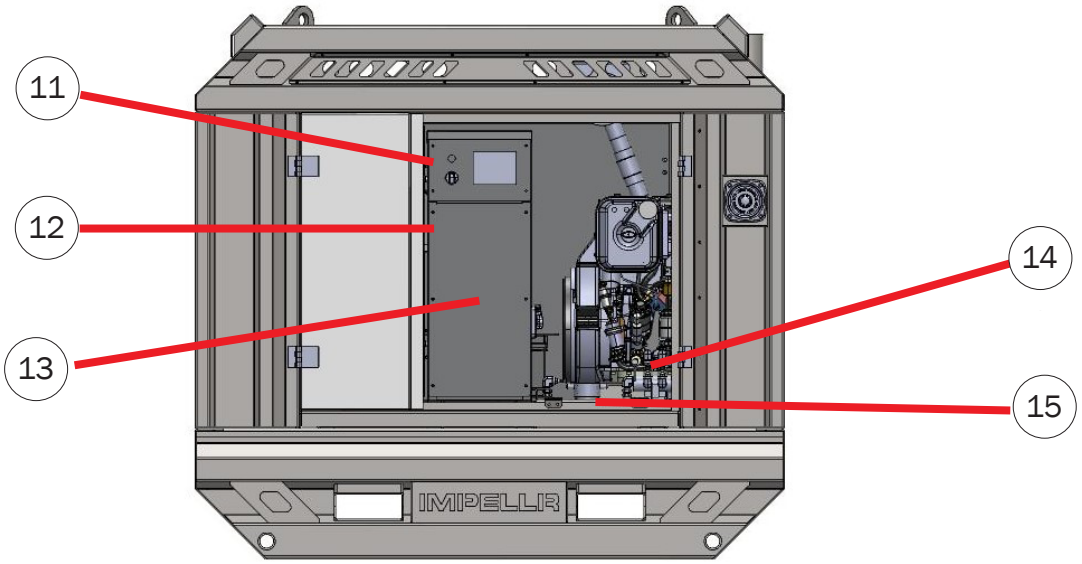




Item	Detail	Part Number
1	Lifting Eye - Hook Emblem	SP047
2	Four Point Lift Only	SP046
3	INLET	SP055
4	DISCHARGE	SP054
5	Noise, Auto-start, Isolation & tracking warning	SP042
6	Danger Hot Surfaces	SP043
7	Low Float Switch	SP052

DECALS





Item	Detail	Part Number
8	Fuel Feed / Return	SP051
9	External Fuel Tank Valve Reminder	SP053
10	Do Not Obstruct	SP045
11	Ignition Instructions	SP048
12	Start up & Shut down Instructions	SP057
13	Isolator	SP049
14	Fuel Selector Valve	SP050
15	White Diesel Only	SP056
16	Keep doors shut & locked when not attended	SP044

CE & UKCA

MANUFACTURERS IDENTIFICATION DATA	
Manufacturer	Terracore Group Ltd
Brand	IMPELLR
Head Office	Quercus Court, Armstrong Way, BS37 5NG
Telephone	44 (0) 1454 513 000
Email	info@impellrpumps.com
Website	www.impellrpumps.com

All machines are identified with a Model & Serial ID plate which includes the CE & UKCA marking

CE DECLARATION

UKCA DECLARATION OF CONFORMITY

Terracore Group Ltd
Declaration of Conformity

In accordance with UK Government Guidance

1. Product Model
   - a. Product: IMPELLR Dry Prime Surface Pump b. Model:IMP4D-11-HCC
   - c. Serial: 1000/8888
   - d. Specification: Skid mounted diesel powered 6” Surface Water Pump.

2. Manufacturer
   - a. Name: Terracore Group Ltd
   - b. Address: Quercus Court, Armstrong Way, Yate, BS37 5NG (UK)

3. This declaration is issued under the responsibility of the above mentioned manufacturer.

4. The object of the declaration described above is in conformity with the relevant UK Statutory Instruments and their amendments:

   Supply of Machinery (Safety) Regulations 2008

   Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001

   Electromagnetic Compatibility Regulations 2016

   Radio Equipment Regulations 2017 (where remote control fitted)

   The Restrictions of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

5. Additional information:
   The technical documentation for the machinery is available from:

Name:	Terracore Group Ltd TA Impellr
Address:	Quercus Court, Armstrong Way, Yate, BS37 5NG
Signed for & behalf of:	IMPELLR
Place of issue:	Yate, United Kingdom
Name:	
Position:	Director
Signature:	*Neal Davies*

SERVICE RECORD

SERVICE DATE	CARRIED OUT BY	COMPANY	NAME

NOTE:
This service record will need to be provided in the event of a warranty claim.
A missing or incomplete service record may result in a warranty claim being declined or voided.

NOTES

TERRACORE GROUP LTD
IMPELLR DIVISION

Quercus Court | Yate | Bristol | BS37 5NG
44 1454 513000 | www.dustquip.co.uk

Service & Parts service@impellrpumps.com