

Hydraulic Wet Kit EN.....

Installation and Operating Instruction



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1 Explanation of symbols



WARNING!

Means that serious physical injury or significant material damage can occur if the relevant safety instructions are not followed.



ADVICE!

Contains additional important information



ATTENTION!

Means that slight physical injury or material damage can occur if the relevant safety instructions are not followed.

2 Introduction

2.1 Document Overview

Before using your hydraulic equipment for the first time you should familiarise yourself with how the hydraulic system works.

You should read this operating manual completely to ensure that you can install and use the hydraulic system safely and effectively. Incorrect operation or inadequate maintenance may result in failures and injuries. In the event that repair work is required to the tractor unit's hydraulic system, we recommend that this work is carried out by Edbro or an approved service partner.

Edbro cannot accept any claims for compensation caused by incorrect use, inadequate maintenance or repairs.

We carry out on-going development programmes to improve our products which mean it may happen that some product improvements are not reflected in this manual. The information contained in this manual is intended as a guide and as such adherence to normal workshop procedures, including compliance with relevant health & safety practice should be followed.



ADVICE!

The specification sheets are available on the Edbro Website and the technical centre

Contact Edbro

If you have any questions concerning the application, installation, operation or repair of any Edbro product, please contact your nearest Edbro Service Agent which you can identify on our website. Other documentation is available via the Technical Centre or via our Applications team.

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Web www.edbro.com

Service Agent www.edbro.com > Contact > Dealers & Parts Centres

Technical Centre www.edbro.com > Technical Centre

2 Introduction

2.2 Scope

A Hydraulic Wet Kit (HWK) is the partially completed system consisting of an oil tank, pump, valve, air actuation system, screw connectors, couplings and assembly materials. This hydraulic system only becomes functional when connected to a hydraulic slave (tipper, walking floor, ejector or tanker discharge equipment).

2.3 General information

Data sheets are available for almost every Edbro product. These data sheets contain all the main dimensions and properties, in addition each component includes specific installation instructions. If you have any reservations or questions relating to the application, assembly, use or repair of an Edbro product, please contact Edbro or your nearest Edbro service partner.



ATTENTION!

The installer / operator should read and follow the Instructions supplied by the trailer manufacturer in its operating and maintenance manual.

2.4 Safety information

The Edbro hydraulic wet kit is typically installed on a tractor unit. The hydraulic system is connected to a semi-trailer which completes the hydraulic system. The installer must always ensure that the operating pressure and oil volume of the hydraulic system match the operating pressure and oil volume of the hydraulic slave.

The safety instructions set out below are generally applicable to hydraulic systems with a tipper trailer, but also apply to other hydraulic systems.

Operating a tipper trailer is a dangerous process during which accidents may occur. To help you minimise the risks to you and your vehicle, please take a few minutes to read the guidelines contained in this document and also carefully read the separate detailed instructions supplied with the individual components.

2.4.1 Operating safety code for tippers



WARNING!

Just before loading, move the control lever to lower to ensure that no oil is trapped in the cylinder and the full load rests on the chassis.

Be particularly careful in frosty weather. Frost can cause wet loads to stick and discharge unevenly. If the vehicle starts to roll over:

- Remain in the vehicle, you are safer in the driver's cab
- Push yourself firmly into the driver's seat
- Hold onto the steering wheel securely. Never attempt to jump out of a vehicle rolling over.

Never initiate the PTO when a gear has been selected. Excessive use at high engine speeds during operation may result in reduced life or damage to the pump.

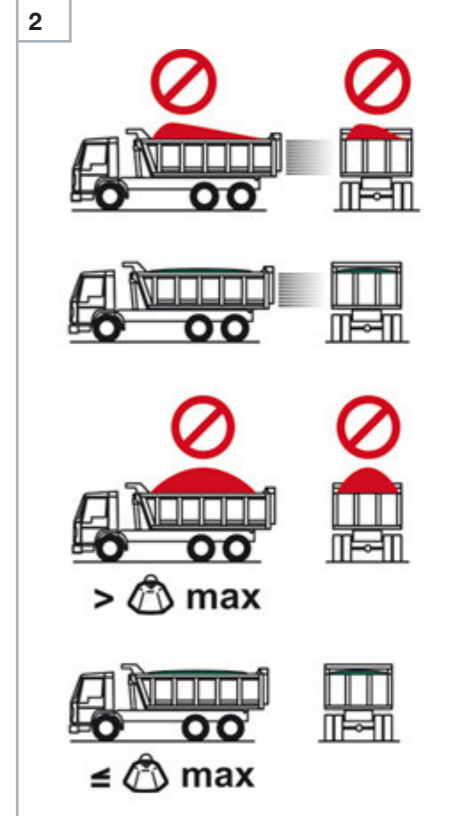
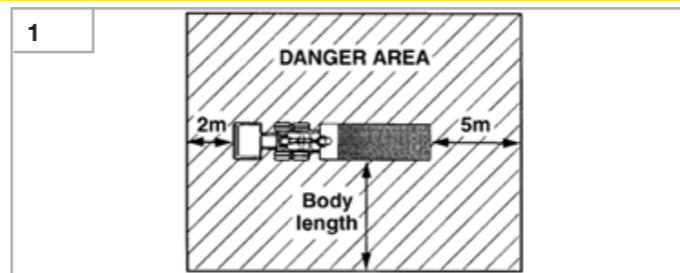
2 Introduction

ATTENTION!



2.4.2 SAFETY CODE - ALWAYS

- Keep tyres at the correct pressure.
- Spread the load evenly in the body.
- For articulated units, make sure the trailer is coupled and in line with the motive unit.
- Make sure the danger area is clear of people and obstructions.
- During tipping, stay in the cab at the controls; if danger signs develop, (for example, if the body starts to lean to one side or the load sticks) immediately lower the body.
- Prevent the discharging load from piling up and fouling on the tail door by driving forward very slowly by no more than a metre at a time.
- Ensure that no person, animal or other equipment is within the danger area when tipping, please see figure 1.

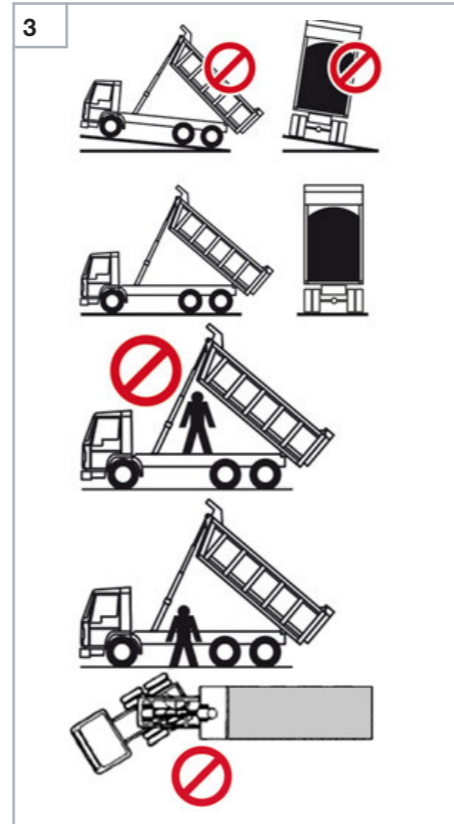


ATTENTION!



2.4.3 SAFETY CODE - NEVER

- Overload.
- Alter the pressure setting of the relief (overload) valve.
- Put the tipper lever into 'tip' unless you are actually tipping.
- Tip an uncoupled trailer.
- Tip in high winds.
- Tip on a side slope.
- Tip with the body within 5 metres of overhead power lines.
- Shake the load free.
- Drive off with the body up or the PTO engaged. This could damage the equipment.
- Leave the body up overnight.
- Leave the tractor with the ignition key in.
- Go under a raised loaded body.
- Go under a raised empty body (unless it is propped).
- Uncouple the trailer unless the body is down and the PTO is 'out'.
- Steam clean the exposed cylinder tubes, this will cause corrosion.
- Climb on the equipment by any means other than that provided by the bodybuilder.



2.5 Identification

2.5.1 Tipping hoist

The Tipping Hoist is identified by a serial number plate on the side of the tank or inlet feed port. The date of manufacture is quoted as a week number/year.

The serial number and model code should be quoted in all correspondence.

4a



2.5.2 PTO and Pumps

Part and Serial numbers for Edbro PTO and pumps are stamped on the casing or on an attached plate.

4b



2.5.3 Tip control Valves

Tip Control Valves have their serial number and manufactured date on an attached plate.

The full part number is derived from the attached plate and the pressure relief cartridge fitted. In this example the full part number is CT202E075P175.

4c



2 Introduction

2.5.4 Oil Tanks

Oil Tanks have their part number and manufactured date stamped or on a nameplate in a prominent place.

2.5.5 Brackets

Brackets are stamped with their part number and specific application where relevant.

4D



4E



2 Introduction

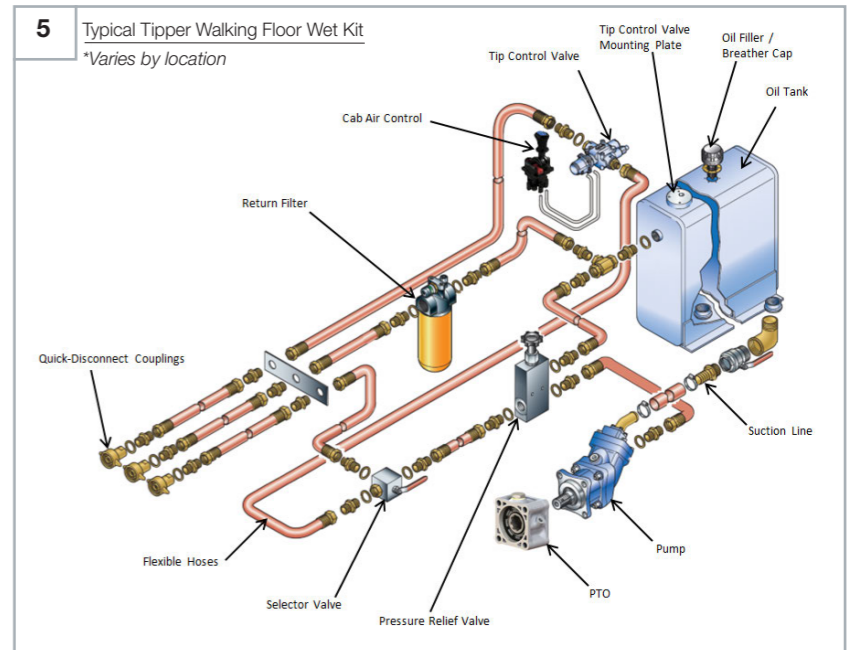
2.6 System Familiarisation

Before using the equipment, familiarise yourself with the key features opposite. The position of the hydraulic parts may vary depending on specification.

Before putting into service, confirm that the equipment is in good working order.

Check:

- Hoses and fittings for abrasion and leaks
- Security of hoist and hinge mountings
- Oil levels
- That quick-detach couplings are tight
- That the PTO engagement light is working



3 Installation

3.0 Installation

This document includes but is not limited to the installation of the four popular applications shown on the following page.

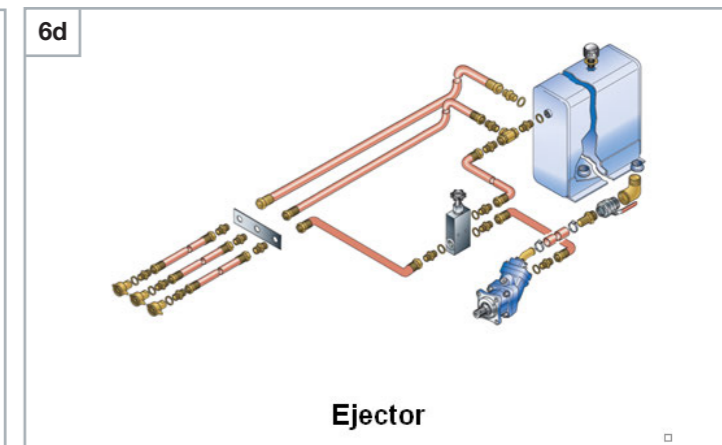
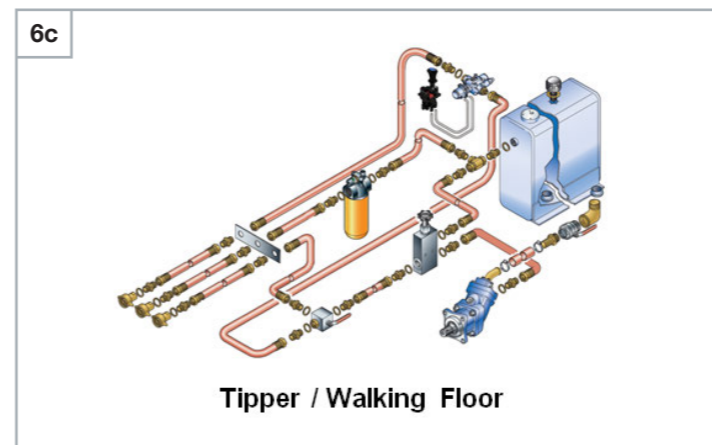
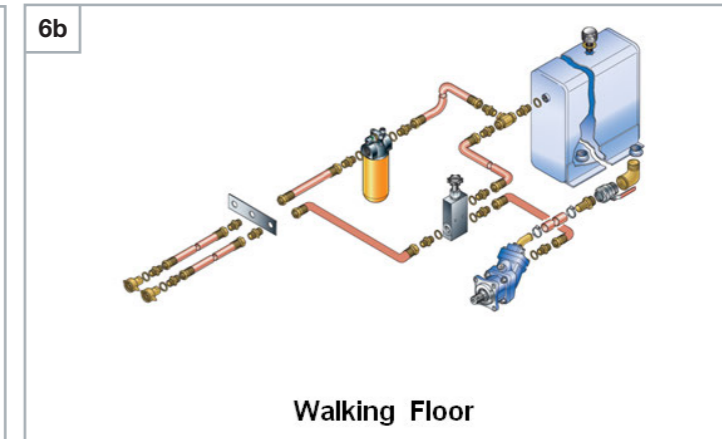
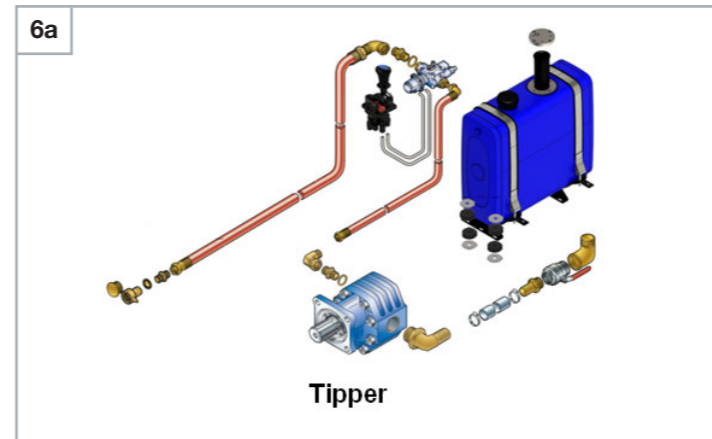
Prior to fitting any components, lay out the items of your hydraulic circuit to ensure there is nothing missing. Connect hose adaptors to components before fitment to the vehicle if possible, ensuring bonded seals are used where required. Detailed instructions are given below and with individual component packaging where appropriate.

ADVICE!



Before commencing installation, check that the kit supplied meets your requirements and also check that the vehicle Make, Model & Gearbox is as expected. Ensure installation takes place in a safe environment and comply with all relevant local health & safety precautions.

3 Installation



3 Installation

3.1 Sealing and Bonding

Vehicle hydraulic systems operate at high pressures – up to the region of 400 bar for crane applications. Pump and PTO couplings form barriers between different oil-filled zones. It is therefore important to ensure all joints are appropriately sealed to prevent oil leaks, cross-contamination of oils / air / foreign matter, and injury from escaping fluids.

ATTENTION!



All mating surfaces must be properly matched, flat and /or parallel, not cross-threaded. Seals and gaskets must be clean, continuous and undamaged.

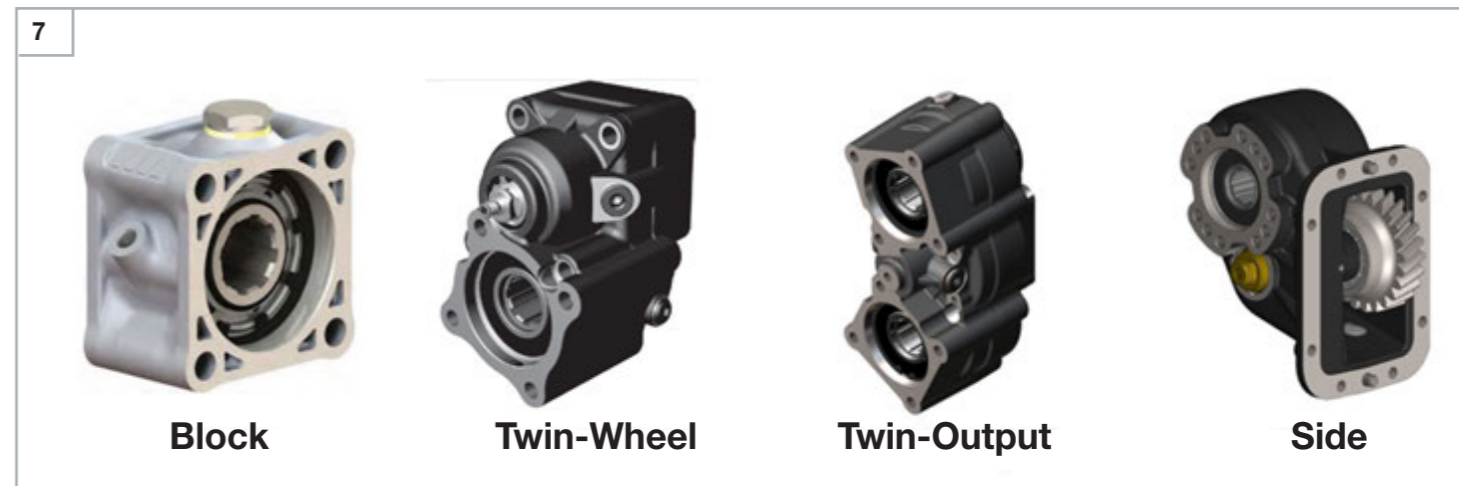
- Bonded seals Apply a smear of oil to rubber surfaces.
- Gaskets Gasket continuous without breaks, folds or stretched areas.
- Fasteners Tighten compression fasteners evenly and to recommended torque.
- O-rings Apply a smear of oil to rubber surfaces.
- Hose joints Free of debris. Check compatibility of connections, whether tapered or face-sealing.
- Hose-tail fittings Free of debris. Push hose fully onto hose-tail. Fit hose clip(s).
- Threaded tapered pipe joints Apply Teflon tape or mild thread-seal compound before screwing together.

Medium strength thread-seal compound may be applied to screw threads to prevent loosening and corrosion.

3 Installation

3.2 PTO

It is likely that a Power Take Off (PTO) will already be factory fitted to the truck, however if you are retro-fitting a PTO please refer to the instructions supplied with it and ensure the PTO / pump combination will fit onto the gearbox with sufficient clearance around the surrounding components, in particular the drive shaft flange. The Power Take Off (PTO) transmits mechanical power from the engine and is typically fitted to the side or rear of the gearbox. It drives the pump and therefore the hydraulic system. The common types below are pneumatically operated, though manual, electric and vacuum-operated versions are available.



3 Installation

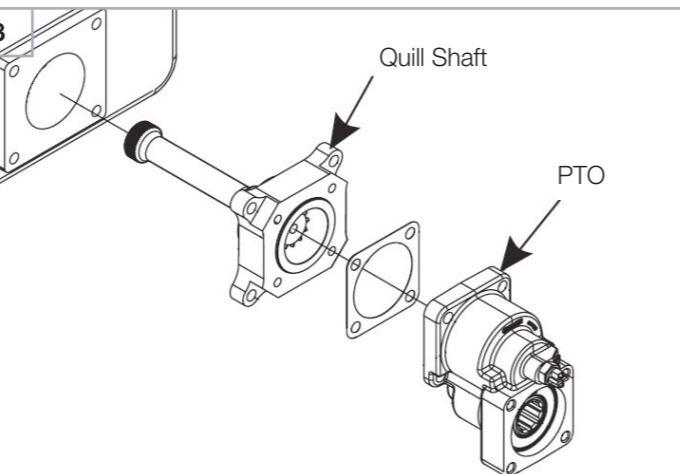
3.3 Quill Shaft

In some cases a Quill Shaft is required to connect the internals of the gearbox to the rear aperture, if needed it is normally supplied with the PTO

Depending on the type of gearbox the oil may need to be drained from it prior to fitting the PTO or quill shaft.

The combined moment imposed on the gearbox (by the weight of the PTO and pump) must be within the gearbox recommended maximum guidelines. If not, then a suitable bracket must be fabricated to support the weight of the pump.

The Merit Switch (if supplied with the PTO) signals to the cab control or engine ECU when the PTO is engaged. For instructions on how to connect the PTO to the truck wiring harness and any requirement for reprogramming of ECU, Refer to the vehicle manufacturer.

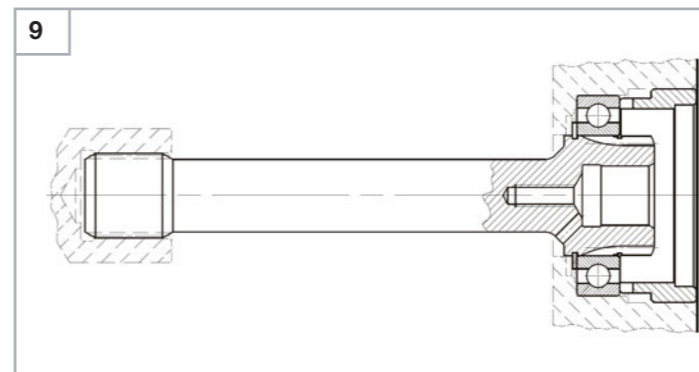


WARNING!
The area around the PTO aperture must be properly cleaned before removing the cover. Prepare a clean container or system to capture any gearbox oil that may leak when the cover is removed. Consult the gearbox manufacturer's instruction on oil levels and the specification of any replacement oil required.

3 Installation

3.4 Installing the Quill Shaft

With the aperture cover remove, follow the specific fitting instructions supplied with the Quill Shaft to insert it in place. The end spigot locates in a socket within the gearbox, in some cases it has subtle flats machined to allow the shaft to pass other gearbox internals. If it does not fit easily and fully, contact Edbro to ensure correct matching. Some variants of quill shaft are floating (see below), others have an outside bolted flange. Tighten the bolts correctly using a torque wrench. Take care with aluminium housings as the torque values must adhere to the gearbox manufacturer's recommendations. If in doubt contact the vehicle manufacturer.



3 Installation

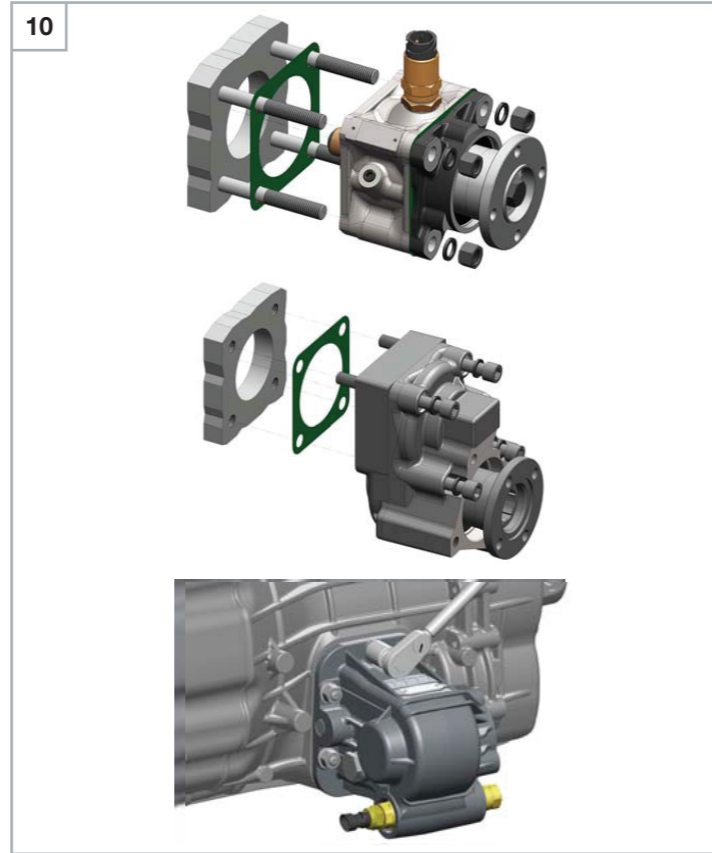
3.5 Installing the PTO

Specific fitting instructions and precautions are given with every PTO, and a further General Installation Guide for PTOs is available. Special attention must be given to:

- Vehicle preparation – Cleanliness, capturing and replacing gear-box oil, ECU interface(s). Quill shaft if required.
- Location and orientation of the PTO for adequate lubrication and pump clearance
- PTO particulars – circlips, gaskets, merit switch, mountings, adapters
- Fastenings – Pay attention to tightening torques given by gearbox manufacturers taking special care of aluminium gearboxes. Apply a medium strength thread-lock compound to screws.

Ensure the pneumatic pipe from the PTO to the hoist hand-control valve in the cab is connected to the correct port and routed appropriately. Avoid hot surfaces and moving parts. Protect the pipe with sleeves where it needs to articulate or pass through risk areas.

Note that the output rotation direction differs between the PTO types. The block PTO is a direct coupling so the direction is the same as the gearbox, whereas output direction is reversed with the Twin-Wheel and Twin-Output types. This consideration is important for some styles of pump, see page 19 Refer to Edbro or the vehicle manufacturer specifications for rotation details.

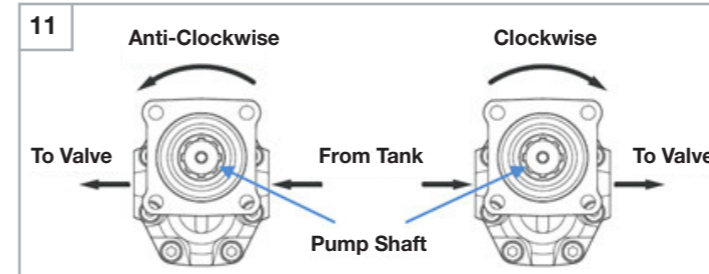


3 Installation

3.6 Pump Styles

Four types are available, the most common are the Gear pump and Bent-Axis Piston pump. Dual Flow and Variable Flow pumps are also available, see figure 12.

The rotation of piston pumps can be changed by following the instructions enclosed with the pump.



ATTENTION!



Special attention must be given to pump rotation to ensure the correct match with the PTO, all piston pumps and some gear pumps have a specified direction.

PTO and pump direction is described looking end-on to the connection, see Figure 11. The correct selection for an anti-clockwise rotating PTO output is a clockwise pump and vice versa.

3 Installation

3.7 Pump Installation Notes

The standard Edbro Gear Pump is bi-rotational so either direction PTO can be used. Note the port connection of suction and flow hoses.

- Ensure adequate clearance between the pump/PTO and truck hardware including the driveshaft at full articulation. Hoses should have 25mm minimum clearance from vehicle structure or be clamped to the chassis.

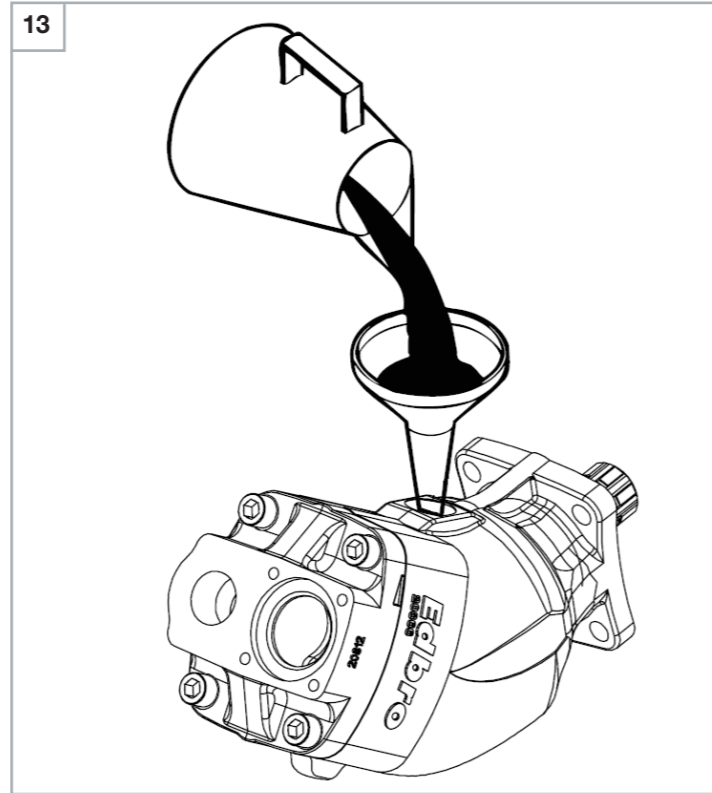
- Prime piston pumps as directed in their specific instructions, This is easiest done with the pump on a bench, see figure 13. Use a funnel to direct oil to the priming point and gently turn the shaft to allow all pump cavities to fill. Have caps handy to retain the oil in the pump.

- Grease the shaft splines to prevent wear, ensure gaskets are clean and flat.

- Fit circlips / gearwheel / adaptors as directed by their specific instruction.

- Fit and torque bolts, fit hoses, line adapters and bonded seals. Re-check clearances.

- For suction hoses longer than 2m the internal diameter must be increased by 10mm for every metre extension.



3 Installation

3.8 Oil Tank

Prior to fitting to the vehicle and taking care to protect the tank surface, install the hydraulic tip valve and suction line onto the tank. Adhere to the specific instructions included with the Tip Valve and in the following sections. For standard practices on making joints refer to the Sealing and Bonding section 3.1. Install the filler-breather cap and return filter if applicable. Take time to check that all previously installed fittings are tight.

Check for adequate space to mount the tank, particularly when using a chassis side-mounted version. Most Edbro side-mount tanks will have the facility to mount the Tip Valve directly to the side of the tank. If lack of space requires the valve to be remote mounted, a hose extension kit (RMV kit) is available.



ADVICE!

Due to their size and weight ensure sufficient clearance between the tank assembly and any chassis components – Aim for minimum of 25mm to accommodate flexing and vibration. Fatigue cracking of the tank, straps and brackets can occur if mountings or straps are too tight. Consider the flexing of the chassis and allow for the movement.

Connect the pressure, return and suction hoses according to your hydraulic circuit. Refer to the Hoses section for guidelines on correct hose length, routing and fitment.



3 Installation

For back of cab tanks:

Ensure the tank is connected to the chassis by using appropriate brackets and bolts, using rubber anti-vibration mounts. Take care to ensure that all straps, mounting rubbers and brackets are fitted and torqued in accordance with instructions included with tank.

For side mounted tanks:

Fit the brackets to the chassis using the appropriate fittings, spacers and tightening torques, ensuring the brackets are perpendicular to the chassis, parallel to each other and provide equal support for the tank. Use bolts of a size to suit the holes given in the tank brackets and of a grade to match chassis manufacturers' items. Torque accordingly.

Assemble the tank onto the brackets, and ensure the rubber straps secure the tank all round, then tighten the straps with the supplied nuts to the required torque – Important that you do not exceed torque figure and cause damage to the hydraulic tank.

3 Installation

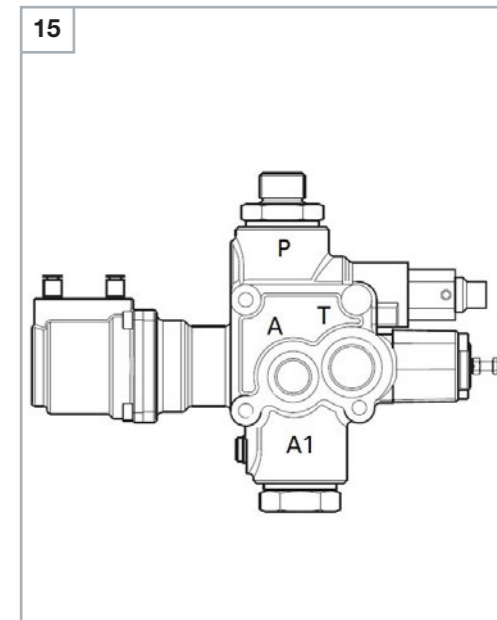
3.9 Proportional Hydraulic Tip Control Valve

The tip valve controls and regulates the flow of oil for a hydraulic tipping cylinder. Oil flows from the pump, through the tip valve to the tipping cylinder, causing it to lift. Oil returns through the tipping valve to the oil tank when lowering.

Popular tip valves including the one illustrated here are pneumatically controlled, though electric versions are available. To minimise risk of leakage and reduce the number of hoses the tipping valve is fitted directly to the side or top face of the oil tanks. Where lack of space or operational requirements dictate, the valve can be remote mounted. Check that supplied hose lengths are sufficient prior to mounting the valve.

Mount the tip valve either to a tank or remotely, following the instructions accompanying the valve. Take care to use the correct seals which include a retainer ring on some models. Use a torque wrench to tighten the mounting bolts. Connect hoses using the fittings and bonded seals supplied.

There are two pneumatic connections on the tip valve which connect to the hoist hand control located in the vehicle cab. The connections can be supplied to suit either 6mm or 1/4" outside diameter tube. European kits will be 6mm to suit tubing supplied with hoist hand control



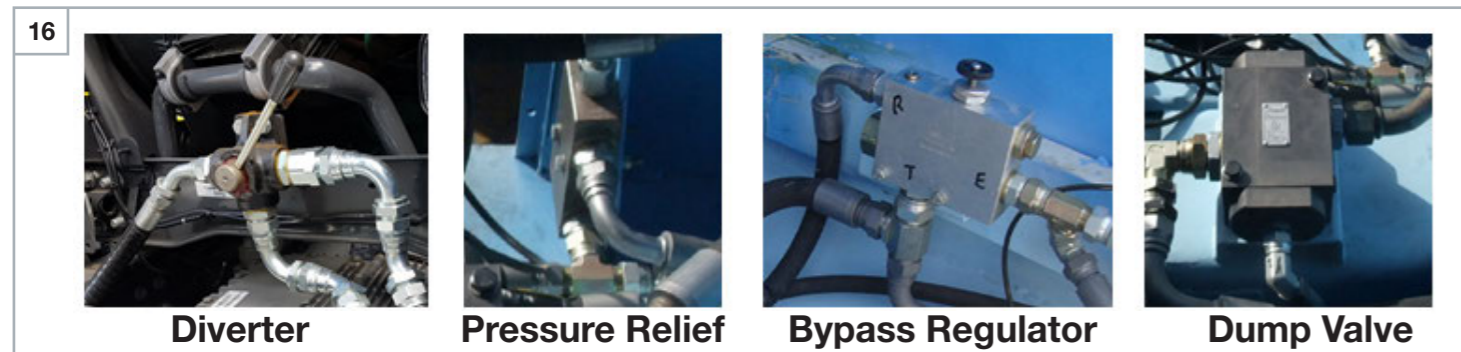
15

3 Installation

3.10 Other Valves

Dependent upon specification there may be other valves included in the kit supplied. E.g. Divertor valve or pressure relief valves. When fitting these components choose a location that accommodates hose lengths supplied, and allows mounting of valve without impeding functionality of existing equipment. Use bonded seals as necessary.

If in doubt regarding hose connections seek advice from Edbro on service-edbro@jost-world.com



3 Installation

3.11 Air Controls

3.11.1 Hoist Hand Control (Cab Control)

Air controls are available for hoist (cylinder) tipping/lowering and PTO engagement. The two operations are integrated into one unit in several ways, and are available as separate items. The types of control(s) are dependent on:

- Market preference. Some prefer separate hoist control and switch whilst others prefer the integrated option
- If the vehicle has been prepared for, or has a PTO fitted by the manufacturer it is likely that the PTO engagement switch will be integrated into vehicle dashboard and the hoist hand control will be supplied without a PTO switch.



3 Installation

3.11.2 Mountings

The Hoist Control and PTO switch will normally be fitted in an appropriate position inside the cab, typically adjacent to the driver's seat. The PTO switch will either be integrated into the hoist control, be a separate unit adjacent to hoist control or be fitted in the vehicle dashboard. Several mounting options are possible, brackets available for the SA28xx controls are below.

3.11.3 Installation Notes

Ensure the routing of pneumatic tubing is kept away from hot components that may cause damage, securely fastened and allows the cab to be fully articulated for servicing. Refer to installation instructions for the piping diagram and make sure the air supply is taken from a protected source within vehicle pneumatic system. Ensure any wiring (warning light of PTO switch) connection complies with vehicle manufacturers' requirements.



3 Installation

3.12 Filters

For the external filters a suitable bracket will be required for mounting. Ensure adequate access for changing the spin-on filter cartridge, and that it does not interfere with other components on the vehicle.



ADVICE!

Filters are supplied for some systems and are available as external in-line or semi-immersed within the oil tank.

The semi-immersed cartridge return filter fits through an aperture in the top of the tank.

A semi-immersed cartridge return filter is standard on tractor back-of-cab mounted tanks. The Tip Valve can be mounted directly to it. Ensure that the bolts fixing the plate to the tank are tight, torque = 15Nm



3 Installation

3.13 Hoses

High pressure flow and low-pressure suction hoses form part of every hydraulic kit. A suction hose connects the tank outlet to the pump inlet. It pushes directly onto barbed hose-tails and is retained with hose clips.

High-pressure hoses connect the pump outlet, valves and couplings. The end connectors are mechanically swaged onto the hose, if adjustments are required to hose lengths either specialist equipment is required or new hoses ordered.

When fitting hoses ensure that:

- All hoses are rated to at least the relief pressure of the protection valve.
- There is some slack or bend which allows for changes in length when pressure is applied. Do not install hoses under tension as it will cause strain on the hose, coupling and components.
- Excess hose length is carefully routed and secured to ensure correct operation and to prevent it snagging during any truck-trailer articulation. Provide space and free movement for hoses connected to moving parts.
- Avoid tight bend radii that may cause the hose to collapse. Relieve sharp bends with elbows and other adaptors. Provide for as large a bend radius as possible.
- Hoses are secured to vehicle structure preventing contact with moving / rotating components.
- Linear stripes are observed and hoses are not twisted. High pressure applied to twisted pipes may cause failure or loosen nut(s).



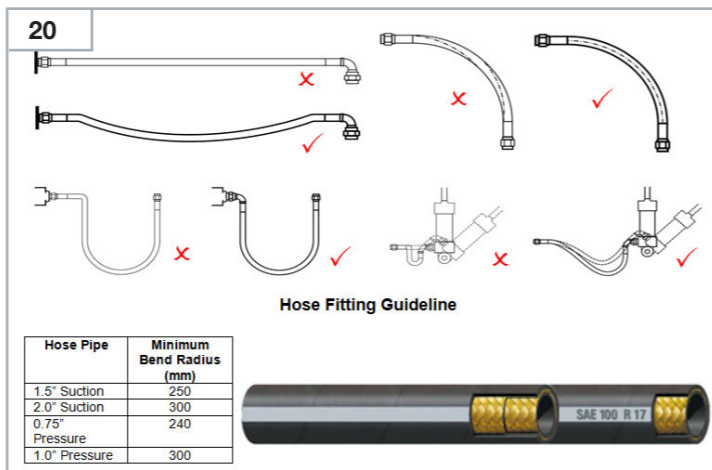
ADVICE!

When fitting suction hoses also consider the movement of the engine and gearbox. Allow for the extra movement to prevent cracking around the tank feed port or pump adaptor caused by excessive strain.



WARNING!

Do not exchange hose pipes with others that have lower pressure ratings. They have been selected to match the hydraulic system.



3 Installation

3.14 Couplings and Connectors

3.14.1 Quick Disconnect Couplings

Quick-Disconnect Couplings (QDC) are available in various styles, a selection of which are shown below. Ensure good coupling between the male / female pairs and use appropriate caps and retainers.

- Connect QDCs to hoses using adapters and bonded seals
- Attach retainers where hose fitting guidelines will be respected.
- Caps and retainers should be used to protect the hydraulic system from damage and contamination while not in use

Screw type

- Popular on tipping cylinders
- Attach, remove with partial internal pressure



ISO-A

- Walking floors, tankers
- Fast coupling and decoupling



ISO Flat Face

- Walking floors, tankers
- Fast coupling and decoupling
- Easy clean



3 Installation

3.14.2 Swivel couplings - Optional

These are joints which allow hoses to rotate in conjunction with truck and trailer articulation, thereby minimising stress and wear applied to hoses and components. They can be mounted to a bracket or directly to a tip valve.

- Mount in the hydraulic lines which connect a tractor unit to a trailer.
- Use adaptors and bonded seals

SGKxxx

- Simple
- Swivel and adaptors



SGxxx - J

- Swivel with extension tube
- Elevates and protects hose
- Tube length variants



4 Commissioning

4.1 Procedure

Omit references to items that are not fitted

- Where a PTO is fitted, check for leaks around the joint with the gearbox. Check that the gearbox is filled as per manufacturers' recommendations.
- Ensure the PTO and switch (if fitted) have been fitted to the vehicle electrical system and any reprogramming of the vehicle ECU has been completed.
- Clean the area around the Filler/Breather and fill the tank with oil to the mid-point of the sight glass (or marks on the dip stick of the filler breather). Oils are specified to suit environmental temperature conditions.
- Operate the suction isolator valve. Check the tank, valve and suction line for leaks.
- For piston pumps only, prime as per the Installation Instructions included with the unit
- Take the cab control through the full range of movement – Hoist and PTO if fitted. Check for air escaping from fittings and that piping is correctly fitted at each end. Listen to the valve (and PTO) for their actuation.



ADVICE!

The system should be primed with oil as much as possible before connecting it to equipment. This prevents excessive air from being circulated to zones potentially difficult to bleed out. Allow at least 10 minutes for oil to settle before starting the pump.

4 Oil Specification Guide

Environmental conditions	Extreme Cold	Cold	Winter to Summer	Hot	Very Hot
	To -40°C	-5 to 25°C	-5 to 30°C	30 to 50°C	Over 50°C
ISO Grade	N/A	15	32	46	68

Note: Use of oils outside of the temperature ranges stated above is acceptable, however hydraulic efficiency will be reduced.

Manufacturer	Mineral Oil					Grease
Mobil	Aero HFA	DTE11M	DTE24	DTE25	DTE26	XHP222
Shell	AeroShell 4	Tellus T15	Tellus 32	Tellus 46	Tellus 68	Retinax EP
BP	Not available	Bartran HV15	Bartran HV32	Bartran HV46	Bartran HV68	Energrease LS EP2
Gulf	Not available	Hydasil 10	Hydasil 32	Hydasil 46	Hydasil 68	Gulfcrown EP no2

Specified according to ISO 6743/4 HLP-HM or DIN 51524 (part 2)

Manufacturer	Environmentally Friendly Oil					Grease
Mobil	Not available	Not available	EAL 32	EAL 46	Not available	EAL 102
Shell	Not available	HF – E 15	HF – E 32	HF – E 46	HF – E 68	Naturelle EP2
BP	Not available	Not available	Biohyd SE-S32	Biohyd SE-S-46	Biohyd SE-S 68	Biotac EP 2
Gulf	Not available	Not available	Biosynth VG32	Biosynth VG 46	Not available	Biocal 2

Specified according to ISO 15380 type HEES equivalent to the mineral oils above.

4 Commissioning

Where the system is designed for a Tipping trailer:

Couple the tractor unit to a tipping trailer and connect air, electrical and hydraulic lines, apply brakes and ensure area above and around vehicle is clear of obstructions and dangers. If a trailer is unavailable, ensure that couplings are self-sealing or blanked to prevent oil spillage.

Where the system is designed for providing oil feed and return (walking floor, tanker, ejector cylinder):

Connect the feed and return hoses to a short loop to allow easy priming, See Figure 23. Otherwise couple the tractor unit to a trailer requiring oil feed/return and connect air, electrical and hydraulic lines, apply brakes and ensure area above and around vehicle is clear of obstructions and dangers. If a trailer or return loop is unavailable, ensure that couplings are self-sealing or blanked to prevent oil spillage.

- With hand brake applied, start vehicle and allow air pressure to build. Check gear box / PTO and pump for leaks or unexpected sounds. Also check pressure line from pump to tip valve for leaks. Ensure the suction isolator valve is open.

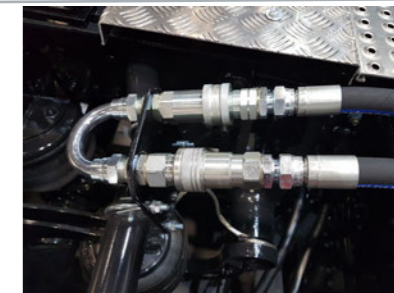
- Using the instructions contained with the PTO or vehicle operators handbook if a factory fitted PTO has been supplied, engage & disengage the PTO to verify correct operation and pump response. Oil should circulate from and back to the tank.



WARNING!

In all cases ensure that free-ended hoses are either connected to the service or retained before applying hydraulic pressure. Risk of damage or injury from straining hoses.

23



- In the case of a factory fitted PTO refer to manufacturer's handbook for recommended engine speed setting. For PTOs supplied with the hydraulic kit please contact service-edbro@jost-world.com or your local Edbro agent to confirm engine speed.

- Re-check for leaks and any unexpected noise from gearbox and PTO. Having confirmed the correct working of the PTO and pump,

4 Commissioning

- Engage PTO again using appropriate switch on vehicle dashboard or Hoist control valve
- Hoist control - move to Tip position, confirm the body starts to rise smoothly, then move the lever back to hold and observe the body holding in a raised position.
Move the lever to Lower and observe the body lowering smoothly back to chassis. Check for oil leaks in the circuit at each of the three stages.
- Replicate the above process a few times gradually increasing the height the body is raised until full tip is reached, this will help air to be removed from the system.
- If lowering speed is too slow, increase the return flow by adjusting the flow control screw on the Hydraulic Tip Valve if fitted (see valve instructions).
- Always start with a slow speed and increase gradually. Ensure that returning oil does not froth excessively in the tank.
- Repeat the process for walking floor or hydraulic discharge motors ensuring corresponding diverter valves and relief valves are working correctly.
- Finally with the engine switched off and handbrake on re-check the torque of all mounting bolts.



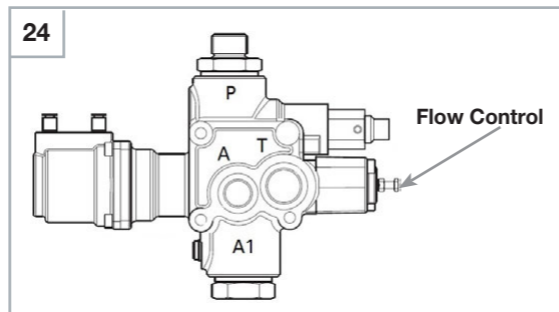
ADVICE!

Oil returning to tank can froth if it is returned too quickly or if it is aerated. Excessive frothing can cause oil to leak from the filler-breather cap and saturate the air filter inside it. The filter will need to be replaced in this case to prevent collapse or bloating of the tank due to air flow restriction. Over or under-filling the tank will increase the likelihood of this happening. Low oil levels may cause air entrainment into the suction line causing frothing and operational problems.



WARNING!

- Ensure gearbox is in neutral before attempting to engage PTO
- If pump speed information is unavailable, limit the engine speed to 1000 RPM until the correct maximum engine speed has been verified. Excess speed can cause damage to the pump.



5 Fault Finding

Symptom	Cause	Solution
Noisy Pump	Air in system – Pump Cavitation	Inspect for loose connections on suction line. Ensure that the Ball valve is fully open. Ensure suction line is clear from obstructions and oil flow is not restricted by distorted pipes. Prime pump with oil before initial start-up.
	Low oil level	Add oil and confirm minimum 100mm level above tank outlet at full tip.
Oil leaking from pump face	Shaft seal damaged	Remove pump and replace shaft seal
	Incorrect rotation	Inspect pump to confirm rotation is correct prior to installation to the PTO. If incorrect, follow specific instructions given with the pump to change its rotation direction.
	Over-speeding	Do not exceed the 1500rpm maximum pump speed
Hydraulic oil in gearbox	Shaft seal damaged	Remove pump and replace shaft seal
	Incorrect rotation	Inspect pump to confirm rotation is correct prior to installation to the PTO. If incorrect, follow specific instructions given with the pump to change its rotation direction.

5 Fault Finding

Symptom	Cause	Solution
Low pump pressure	Damaged seals	Follow steps as described previously.
Oil leaking from Filler-Breather Cap Or Oil is frothing	Over-filled tank	Check that oil level is no higher than indicated on the sight glass or dipstick. Remove oil as necessary. Replace the filler-breather filter.
	Oil return or cylinder descent is too fast, causing frothing	Ensure oil tank volume is large enough for the application being powered. Decrease the cylinder descent rate by adjusting the flow control screw on the Tip Valve. Replace the filler-breather filter
	Filler/Breather filter is saturated with oil	Replace the filler-breather filter.
Collapsing or bloating of tank	Filler/Breather filter is saturated or contaminated	Replace the filler-breather filter.
	Tank mounting straps are too tight	Re-torque the bolts tensioning the straps to the specified torque.
Tank bracket cracking or bending	Base mountings too rigid, are twisted or misaligned. Failed mountings / rubbers	Replace rubber mountings Reassess tank positioning to avoid vibration Contact Edbro Service for bracket replacements service-edbro@jost-world.com

5 Fault Finding

Symptom	Cause	Solution
Cannot tip	Air supply or cab Air Control failure	Check air supply – source, tubes and fittings for leaks. Test for air signals at the tip valve. Replace Air Control and/or air tubes / fittings.
	Spool sticking in Tip Valve. To confirm, remove the bonnet cap (beside pressure cartridge) and observe spool.	1. Tip Valve casting distortion: Re-torque mounting bolts 26 to 28Nm. 2. Contamination: Dismantle and clean the valve. In some cases the spool can be freed with gentle pressure directly onto the spool. Check system filter(s)
	No hydraulic pressure	1. Pressure relief valve has operated: Check for physical restrictions to body movement, check that hoses are properly connected. Remove contamination from pressure relief valve. 2. PTO not engaged: Check air supply to PTO, engagement signal light. Listen for mechanical connection and pump operation or tank oil surging 3. Pump failure. Contact service-edbro@jost-world.com

5 Fault Finding

Symptom	Cause	Solution
Leaks from Tip Valve mounting face	Seal failure	Remove Tip Valve and replace o-ring seals
	Loose / skewed mountings	Re-torque mounting bolts 26 to 28Nm.
Hoses leaking	Loose hose connections Failed hose/swaged end(s)	Check fittings tightness. Incorrect hoses – Check that hoses have pressure ratings higher than the relief valve in their zone(s). Check for normal wear and tear, replace as required.
	Incorrect fitting	Check that hoses are not twisted, collapsed, worn, restricted or stretched for any reason. Remove any new alien objects. Contact service-edbro@jost-world.com for further advice.

6 Operating Instructions

6.1 PTO Operation

The Power Take-off (PTO) connects the gearbox with the pump.

Feed and Return Systems: Unless controlled by a separate valve in the circuit, hydraulic oil will be delivered at the feed hose while the PTO is engaged. Ensure that a load or return loop is fitted before engaging the PTO

Tipper Systems: With the PTO engaged, oil will circulate around a closed loop until the hoist cab control is operated, see instructions in the following section.

6.2 To Engage the PTO:

To Engage the PTO: (in the absence of instructions from the vehicle manufacturer)

- Bring the vehicle to a standstill and apply the handbrake. Set the gearbox to neutral with engine idling.
- Ensure the PTO switch is off and the tipper cab control (if fitted) is set to the neutral position.
- Press the clutch for eight seconds.
- Engage the PTO by using the appropriate switch located in the vehicle cab.
- Check that the indicator lamp (if fitted) is lit, and slowly release the clutch.
- The PTO is now active

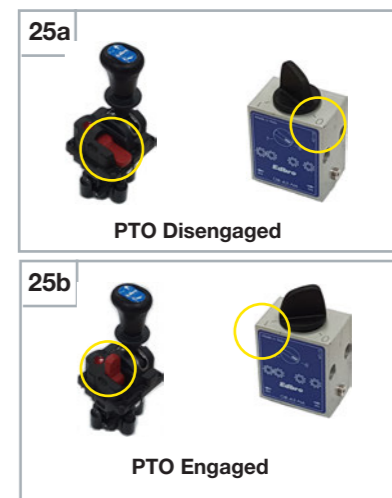
6.3 To disengage the PTO

- Set the hoist control to the neutral position and press the clutch.
- Disengage the PTO Check that the indicator lamp has gone out and carefully release the clutch.
- The PTO is now switched off.



ATTENTION!

- The installer / operator should read and follow the Instructions supplied by the trailer/system manufacturer in its operating and maintenance manual. Further guidelines for safe tipping are given in Edbro Operator's Manuals for the range of hoists.
- Familiarise yourself with all system components and features before attempting to operate.
- Tipping bodies must be fully lowered before moving the vehicle. Failure to do so can result in damage not covered under warranty



6 Operating Instructions

6.3 Tipping operation

- Ensure Hoist air control valve is in neutral (hold)
- Engage the PTO using the PTO switch.
- Actuate to tip by setting the lever on the Air Control to **TIP** 26.a. Hydraulic oil now flows into the tipping cylinder to raise the tipper body. The process can be stopped at any time by switching the actuation valve to “HOLD” (Neutral)

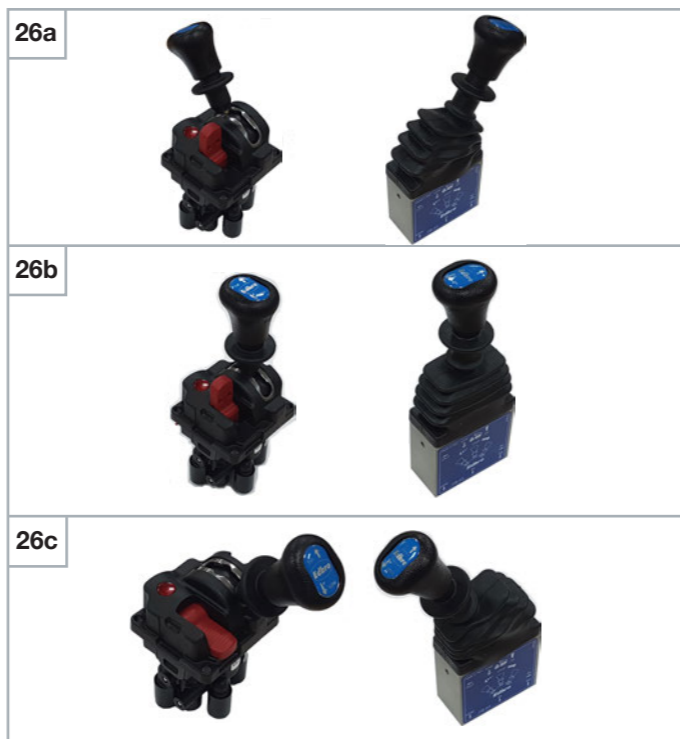
6.4 HOLD (Neutral) Fig. 26b

- The hoist is maintained in the current position. In the HOLD (or Neutral) position, oil in the hoist line is held static. Oil continuing to flow from the pump is recirculated through the tipping valve and back to tank.

LOWER Fig. 26c

- Disengage the PTO
 - Actuate to lower by setting the lever on the Air Control to LOWER.
- The tipping cylinder will lower completely under the weight of the body. Oil in the cylinder is controlled back to tank.
- Note: A selection of combined air controls will automatically disengage the PTO
- **Allow body to completely lower before returning the lever to HOLD.**

i **ADVICE!**
For more detailed instruction on operation of the equipment connect to the tractor hydraulics, refer to the manufacturer's documentation



7 Maintenance Instructions

Category	Instructions	Weekly	Monthly	Quarterly	Annually
Oil	Check and re-fill hydraulic oil	✓			
	Replace tank filler breather filter		✓		✓
	Drain and refill oil tank with new hydraulic oil				✓
	Replace oil filter if fitted		✓		✓
Hydraulic Couplings / Pipes	Check hose pipe condition, and replace when necessary	✓			
	Check pipes are secured and not hanging loose	✓			
	Check for oil leaks	✓			
	Re-Tighten pipe connections		✓		
Connecting bolts	Tighten fixing bolts for tipper valve, PTO and tank mounting brackets			✓	
	Check condition and re-tighten tank straps			✓	

7 Maintenance Instructions

Category	Instructions	Weekly	Monthly	Quarterly	Annually
Pneumatic Components	Check for leaks and correct operation	✓			
Pump	Check for leaks, damage and correct operation	✓			
	Check for noisy operation	✓			
PTO	Check for oil leaks, damage and correct operation	✓			
Brackets	Grease articulating joints	✓			

✓ In very dusty environments replace the return line filter element and filler-breather elements monthly.

Dirty oil is the enemy of a hydraulic system. The cleaner the oil, the more efficiently the equipment will operate and the longer the life will be. Always use clean hydraulic oil for topping up or changing the oil in the tank.

Please dispose of oil according to local regulations and in an environmentally friendly manner.

Check and tell your Edbro service provider if:

- Oil is leaking from the hydraulic equipment
- Air is leaking from the air pipes
- Air is leaking continuously from the controls



ADVICE!

It is recommended that the oil is replaced after the first six months of operation, annually thereafter.

7 Maintenance Instructions

7.2 Service Parts

Genuine replacement parts are available through Edbro network. When ordering spare parts, please identify the part number / description to ensure the correct parts are supplied for the system.

7.3 Warranty

Please refer to our standard terms and conditions – See website. Alternatively contact your Edbro service partner.

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