WEHN FAHRZEUG TECHNIK

Operating Instructions

Hydraulic Power Train HPT

MY 03/2024 and later

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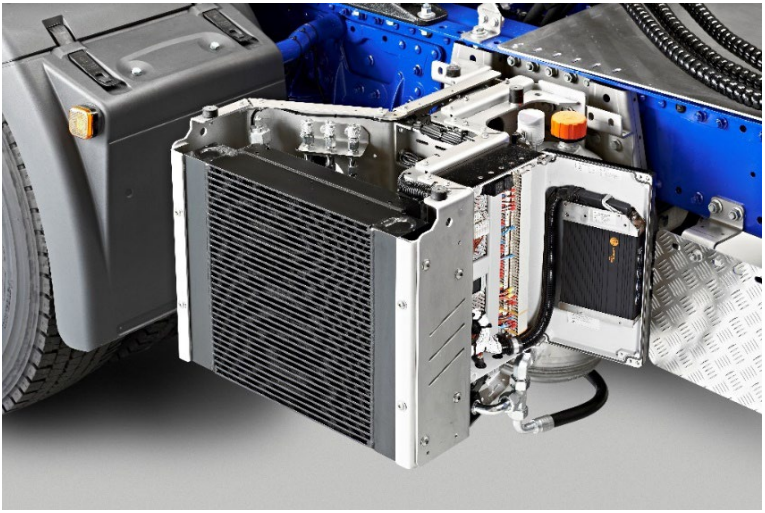

The Wehn Fahrzeugtechnik GmbH

Wehn Fahrzeugtechnik GmbH, a Europe-wide specialist in pumping systems for dangerous goods transport vehicles, offers planning, development, and production of cryogenic pumping systems with hydraulic or electric drives. Their maintenance and repair are an important part of their business.

The Wehn Fahrzeugtechnik GmbH delivers complete pump units with electric or hydraulic drive systems from various renowned pump manufacturers and equips them with drive systems tailored to the specific application. Additionally, they provide custom installation and mounting components, sensors, accessories, and spare parts as well as products in the control and drive sector.

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1. Introduction and general information

The following operating instructions contain information on the operation, maintenance, and care for the operating and maintenance personnel. Before putting your system into operation, read these operating instructions carefully and have qualified personnel instruct you accordingly.

The safety, reliability and lifespan of your system are primarily dependent on proper operation and maintenance.

Since we are constantly striving to improve our products or adapt them to new installation conditions, it is possible that your product has new features that are not yet included in these operating instructions.

We reserve the right to make changes at any time to the technical details contained in the information and figures in the operating instructions.

1.1. Symbols and warnings

The following symbols in these operating instructions are intended to point out particularly important information.

Symbol	Classification	Description
	Danger	This symbol indicates a hazardous situation that, if not avoided, will result in serious injury or death.
	Warning	This symbol indicates a hazardous situation that, if not avoided, can lead to serious injury.
	Caution	This symbol indicates a hazardous situation that, if not avoided, will result in minor or moderate injury.
	Info	This notice contains particularly important information.
	Environment	This notice contains information on environmental protection.

2. Safety and use

2.1. General safety instructions

Our products are state-of-the-art and comply with recognized safety regulations. Nevertheless, dangers and risks can arise.

Transfer systems are always hazardous:

- Rotating or moving parts
- Drives/aggregates that start automatically
- Hot surfaces or components
- Pressurized components and hoses
- Noise

Potential hazards and risks are described below in these operating instructions.

2.2. Proper use

Our drive and transfer systems are tailored to each other and designed and constructed for the transfer of cryogenic technical gases, liquid LCO2 and gases with similar characteristics.

They are generally not designed, tested, or approved for use in combination with third-party systems from other manufacturers. It cannot be guaranteed in this case that the relevant safety functions will work together correctly.

In particular, the associated control changes or operations can lead to unwanted and unexpected behavior of the system. This poses a substantial safety risk.

The use of third-party systems invalidates the CE conformity.

The relevant laws, standards, and directives can be found in the EU Declaration of Conformity.

2.3. Compliance with the safety regulations

During operation, the applicable legal safety regulations as well as the safety regulations specified by the operator must be followed.

This applies in particular to the German Ordinance on Industrial Safety and Health (BetrSichV) as well as the special requirements for loading and unloading stations.

Use your personal protective equipment when operating the transfer system.

Country-specific regulations must also be followed.

The operating instructions of the vehicle manufacturer must be followed.

Damage and malfunctions must be remedied immediately by a qualified specialized workshop. Oil leaks and damaged hydraulic hoses or couplings must be repaired or serviced immediately.

	**Caution** Follow all safety regulations; use personal protective equipment

2.4. Basic hazards

Make sure that no unauthorized persons are located near the vehicle while the pump is in operation.

The vehicle and the power take-off can be started from the body. This means that the vehicle engine may start suddenly, and the power take-off may be engaged. The rotating shaft of the power take-off poses a considerable risk. Keep away from the rotating components.

	**Warning** Self-starting machine

Parts of the system heat up during operation.

Hot surfaces can cause skin irritation or burns.

Exhaust fumes from the vehicle engine are harmful to your health. Do not stand near the exhaust system during the transfer process. Only operate the combustion engine in adequately ventilated areas.

	**Caution** Hot or heated surfaces; Exhaust fumes from the combustion engine

Operating personnel must be instructed in the operation, safe use, and potential hazards and must be instructed again at regular intervals.

Hydraulic systems pose particularly dangerous hazards. Media under pressure can cause serious injuries. The medium can escape from pinholes in hydraulic hoses or similar pressurized parts and penetrate the body (injection injuries). Never touch pressurized hoses under any circumstances. If an accident occurs and the medium enters the body, seek medical attention immediately.

Check hydraulic hoses regularly for damage and wear – follow all maintenance instructions.

	**Warning** Hydraulic components/hoses under pressure

2.5. Maintenance and operation

Maintenance work or technical modifications may only be carried out by qualified service workshops or approved workshops. In any case, always contact the manufacturer beforehand. Modifications to the design or control system always require written approval. Failure to obtain approval will automatically invalidate the warranty and CE conformity and may pose a significant safety risk.

Oil leaks can cause serious damage to the environment. In the event of an oil leak, the applicable regulations must be followed and, if necessary, rescue or emergency services must be notified.

Leaked oil must be cleaned up and disposed of properly.

	**Environment** Environmental damage due to leaking oil

In extreme cases, a damaged or poorly lubricated cardan shaft in the PTO can cause mechanical damage due to breakage of the shaft. Follow the maintenance instructions.

	**Warning** Breakage of the cardan shaft
	**Info** Follow the maintenance instructions

If components mounted externally on the truck are removed or modified, make sure that operator protection is provided in the area of the cardan shaft.

You absolutely must use original spare parts for repairs. If non-original spare parts be used in spite of this, then proper function cannot be guaranteed.

No additional parts may be mounted on the HPT unit. Please always mount additional parts directly on the frame or a similar location.

When operating the HPT system, always make sure that all hydraulic couplings are tightly connected. If there are any couplings that are not connected tightly enough, then proper operation cannot be guaranteed.

2.6. Safely connecting and disconnecting the trailer/body

Use personal protective equipment when connecting and disconnecting the hoses. Sharp edges, fittings, and other mounted components can cause injuries. Make sure that you are standing firmly when loosening and tightening hose couplings so you do not slip off the vehicle. Always follow the owner's standard safety instructions.

	**Info** Follow the owner's regulations
	**Caution** Follow all safety regulations; use personal protective equipment

3. Operating the system

Apply the parking brake – secure the vehicle to prevent it from rolling away.

Turn the ignition on. The lamp test is executed (1 red indicator lamp for the electronic immobilizer, 1 green indicator lamp for the oil level in the hydraulic tank).

Depending on the version, the vehicle engine and power take-off are either switched on using the control system of the trailer/body or need to be switched on manually according to the manufacturer's instructions.

In automatic transmissions, the power take-off is enabled after 6 seconds and the splitter unit is switched as shown on the label on the instrument panel or is switched into the programmed unit automatically.

You may not press the accelerator pedal or activate the cruise control switch after switching on the power take-off.

Perform the rest of the transfer process according to the operating instructions of the owner/tank manufacturer.

Gear lock: The vehicle must be equipped with a gear lock that prevents a driving gear and the power take-off from being engaged at the same time. If the vehicle does not have a gear lock, then the driver must make sure that the the power take-off is switched off after the transfer process has completed. If the power take-off is not switched off, then substantial damage to the power take-off, drive shaft, and hydraulic pump can be expected.

4. Electrical protection of the transfer system

Caution
Live components

The main fuse for the power supply of the HPT pump system is located in/on the battery box depending on the type of vehicle. The fuse is either designed as a screw fuse or a plug fuse in the battery box or is mounted as a connection box on the power distributor near the battery of the vehicle.

The subfuses are all located in the V310/320 distributor. The distributor is mounted on the HPT unit. The fuses are labeled.

5. Possible faults of the transfer system

Fault	Cause	Solution
The vehicle engine switched off during operation of the power take-off	Hydraulic system leaks; oil level in oil tank is too low	Take the vehicle to a workshop and clean up spilled oil; refill oil tank to correct oil level
The vehicle engine switched off during operation of the power take-off	Hydraulic oil temperature > 90°C; heat exchanger fan defective	Short-term use is possible, the system switches off at a hydraulic oil temperature > 90°C; take to a workshop and replace the fan
The vehicle engine switched off during operation of the power take-off	Temperature sensor defective/incorrect measurement by the sensor	Take to a workshop
The vehicle engine switched off during operation of the power take-off	Filter clogging indicator triggers; filter very clogged or pressure differential switch defective	Take to a workshop

Fault	Cause	Solution
Oil level LED in cab lights up	System oil level < 32	Check the transfer system for leaks, refill with oil to correct oil level if the transfer system is intact; only use the hydraulic oil marked on the system
The WFS (immobilizer) LED flashes and a warning buzzer sounds when the parking brake is released	Tailgate switch of trailer has triggered	Close the tailgate. If this does not help, check the tailgate sensor and take the trailer to a workshop

6. Maintenance

6.1. Maintenance instructions for the HPT system

Before carrying out maintenance or repair work on the system, and in particular on the PTO shaft, ensure that the vehicle and PTO is not switched on unintentionally (e.g. from the body).

Always switch off the ignition before carrying out maintenance or repair work. Remove the key from the vehicle ignition.

Danger
Self-starting machine

6.2. Emergency stop devices

Depending on the equipment installed, the system has one or more emergency stop devices. Check the function of the emergency stop devices regularly.

When the vehicle engine is running and the power take-off is engaged, the emergency stop device of the transfer system in the control compartment causes the power take-off to disengage and the vehicle engine to switch off.

The pump drive is also stopped at the same time.

6.3. Securing the vehicle

Before carrying out maintenance or repair work on the system, and in particular on the PTO shaft, ensure that the vehicle and PTO is not switched on unintentionally (e.g. from the body).

Always switch off the ignition before carrying out maintenance or repair work. Remove the key from the vehicle ignition.

Danger
Self-starting machine

6.4. Maintenance of the hydraulic system

Check the oil level in the hydraulic oil tank regularly (at least weekly). The vehicle should be parked on a level surface and the oil should be at ambient temperature before checking the oil level. The power take-off must not be engaged.

When the oil level is optimal, the display on the oil tank (with the ignition switched on) shows approximately 37 cm. If the value displayed is lower, you can fill the tank with oil up to this level.

Never put too much oil in the oil tank. At higher operating temperatures, the oil could leak out of the vent cap. Use only approved types of oil:

- Shell Tellus S3 V32
- Shell Naturelle HFE46 (provided that a biodegradable oil is required)

No other types of oil may be used, and the oils listed may not be mixed together.

6.5. Visual inspection of hydraulic hoses and threaded connections

The hydraulic hoses, and especially the towing hoses to the trailer/body, must be subject to a visual inspection at regular intervals. During the inspection, look in particular for abrasion, porous areas, corrosion, and leaks.

Hydraulic hoses age due to temperature differences, UV radiation, and other factors. Hydraulic hoses must be replaced when the recommended service life is reached (see corresponding DGUV regulation). Special steps must be taken for cleaning and filling procedures. This may only be carried out by a suitably qualified specialized workshop with appropriate flushing and filling equipment. Failure to do so may result in serious damage to the unit.

	**Info** Follow the maintenance instructions; note the recommended replacement intervals

6.6. Maintenance of the cardan shaft

Important notes for PTO cardan shaft maintenance:

Only perform maintenance when the ignition is switched off.

Make sure that nobody can start the vehicle while performing maintenance.

The cardan shaft is a high-temperature cardan shaft; it is lubricated with special "Castrol Braycote Inertox 500-2" grease in the cardan joints. This grease is not miscible with other grease. If the cardan joints are lubricated with a different grease, the warranty becomes void. The slider should be lubricated with lithium soap-based grease of consistency class 2 with penetration 265/295 and drop point around 180°C. The lubricants must not contain MoS2 additives.

	**Info** Follow the maintenance instructions

The proper lubrication interval will generally vary depending on the operating conditions, which can vary greatly. We recommend a lubrication interval of 4 weeks. Depending on the average condition (amount of grease required for relubrication), it may well be necessary to shorten the lubrication interval. A longer lubrication interval may also be perfectly adequate depending on the application profile. For this reason, the cardan shaft should be checked regularly for adequate lubrication and the interval adjusted accordingly, if necessary.

Lubrication: Each cardan shaft has 3 lubrication points (joint on the fixed flange and on the sliding flange as well as on the slider). Clean the grease nipple before lubricating!

The needle and roller bearings must be lubricated until the old grease emerges from the seals. Do not create any pressure surges during lubrication to avoid damaging the seals. The maximum pressing pressure is 20 bar.

Wear and tear on the cardan shafts is normal and can be kept to a minimum through regular maintenance. For this reason, the cardan shaft must be checked for play in the cardan joints and on the slider every time you lubricate the shaft. If you notice any play, the cardan shaft should be replaced (have it evaluated by a specialized workshop). The cardan shaft may only be installed using suitable hexagon head bolts of quality class 10.9 and grade 10 hexagon locknuts. The bolts and nuts must be replaced.

7. Optional Hydro-Boost

The additional Hydro-Boost option is available for the HPT. When this function is activated, the system is operated with a constant quantity of oil.

Operation:

Apply the parking brake – secure the vehicle to prevent it from rolling away.

Turn the ignition on. The lamp test is executed (1 red indicator lamp for the electronic immobilizer, 1 green indicator lamp for the oil level in the hydraulic tank).

Switch on the power take-off.

In automatic transmissions, the power take-off is enabled after 6 seconds and the splitter unit is switched as shown on the label on the instrument panel or is switched into the programmed unit automatically.

You may not press the accelerator pedal or activate the cruise control switch after switching on the power take-off.

Activate the Hydro-Boost function using the corresponding switch. The speed of the drive motor is automatically increased and the oil flow rate is increased up to the oil flow rate setting.

Important: You must switch the power take-off on first, and then you can activate the Hydro-Boost. For safety reasons, it is not possible to activate the Hydro-Boost function first.

	**Danger** Self-starting machine
	**Info** Follow the operating instructions of the trailer transfer system.

Perform the rest of the transfer process according to the operating instructions of the owner/tank manufacturer.

After completing the transfer process, deactivate the Hydro-Boost function and disengage the power take-off. The vehicle engine can then be switched off.

8. Applicable documents and additional information

8.1. Technical information

Additional technical information such as wiring diagrams, wear and spare parts as well as other documentation is available on request – please contact us if you need information.

8.2. Disclaimer

Compliance with the information in the system documentation is a prerequisite for safe operation and for achieving the intended performance and product characteristics.

The Wehn Fahrzeugtechnik GmbH accepts no liability for personal injury, property damage, or financial loss caused in particular by non-compliance with the documentation, incorrect maintenance, failure to perform maintenance, modifications, or improper use.

No claims can be derived from the content of these operating instructions.

8.3. Disposal

Please follow the national regulations. Dispose of individual parts depending on their properties and according to the existing country-specific regulations.

Hydraulic oils in particular must be disposed of in an environmentally friendly and professional manner. The components of the system contain many important recyclable raw materials.

9. EU Declaration of Conformity

EU-Konformitätserklärung
EU declaration of conformity

CE

Die EU-Konformitätserklärung gilt für folgende Geräte:
The EU declaration of conformity applies to the following units:

- HPT – V310
- HPT – V320

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Wir bestätigen die Übereinstimmung mit den grundlegenden Anforderungen der Richtlinie 2006/42/EG (Maschinenrichtlinie) sowie der folgenden weiteren europäischen Richtlinien:
We confirm the conformity with the essential requirements of directive 2004/42/EG (Machinery Directive) and the following other European directives:

- 1907/2006
- 2011/65/EU
- 2014/30/EU
- 2014/35/EU
- 2014/53/EU
- 2014/68/EU
- 2015/863/EU

Folgende Normen wurden angewandt:
The following standards were applied:

- EN 12100
- EN 13445-1:2014+A1:2014
- EN ISO 13849-1:2015
- EN ISO 13850:2015
- EN 301489
- EN 55035:2017
- EN 60204-1:2018
- EN 60947
- EN 61000
- DIN EN 61984
- EN 61508 Parts1-7:2010
- EN 62061:2005+AC:2010+A1:2013+A2:2015
- EN 62368-1:2014+A11:2017

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Signature:

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