MACHINE No. x

SOLENOID CONTROL WITH FULL GUARDS

PAYNE
PALLET INVERTERS

OPERATORS MANUAL

Si PALLET INVERTER

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PALLET INVERTERS

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SAFETY PRECAUTIONS

SAFETY: THE MACHINE IS TO BE USED ONLY IN ACCORDANCE WITH SAFETY GUIDELINES AND IS NOT TO BE USED FOR ANY OTHER PURPOSE THAN ORIGINALLY INTENDED.

The machine is fitted with a stop button, which **MUST** be activated in all possible emergency situations, disabling the machine.

The following guidelines **MUST** be obeyed and the machine operated in strict accordance with the operators manual:

- Only fully authorised personnel may operate this machine.
- The machine **MUST** only be operated when the area within the fixed guards is clear. Nobody may enter this area with the machine in operation.
- The machine **MUST** only be operated within the maximum load capacity for which it was designed (see specification page).
- All machine inspection covers must be in place before use.
- All loads **MUST** be located securely in the machine, with the leading comer placed against the fixed rear/side wall.
- At no point may any person/persons enter the area under the machine body.
- Only fully authorised, suitably qualified personnel may carry out maintenance operations on this machine.
- The electrical supply **MUST** be isolated and suitably locked off, when carrying out any maintenance task.
- When carrying out maintenance on or near the machine body, suitable chocks must be placed to prevent the body from moving.
- Do **NOT** tamper with or alter the machine in any way.
- Correct personal protective and safety equipment **MUST** be used at all times and in accordance with government health and safety and site specific guidelines.

PRODUCT DESCRIPTION

SOLENOID CONTROL & FULL GUARDS

This Pallet Inverter is a highly versatile machine, used for efficient exchanging of pallets from a load.

The machine is loaded with a forklift truck. A single table clamps the load, the machine then inverts the load through 180 degrees. This enables the operator to easily exchange or adjust the original pallet. The load is then returned to its original orientation and removed from the machine.

The machine is fitted with a unique identification plate. On this plate is stamped the model type, machine serial number, year of manufacture and maximum permissible machine load. This information should be quoted in every communication with us, enabling us to deal with your queries as effectively as possible.

The control panel is of solenoid push button construction and is located on the safety guard. This ensures the machine is operated easily and from a position of safety. The machine is also fitted with pedestrian access light barriers as standard.

NOTE: THE MACHINE SHOULD NOT BE USED FOR ANY OTHER PURPOSE THAN ORIGINALLY INTENDED.

HANDLING

The machine **MUST** only be unloaded and loaded with the use of a suitably rated fork lift truck and a competent, qualified driver.

There are two fork tine receiving slots on the machine 'A' frame. If required a designated lookout person should be assigned if the drivers visibility is reduced by the load. Ensure the forklift tines are completely through the receiving slots before lifting the machine.

SAFETY: CARE MUST BE TAKEN WHILST MANOEUVRING THE EQUIPMENT AROUND OBJECTS AND PEOPLE TO AVOID DAMAGE/INJURY.

FORK TINE SLOTS

MACHINE INSTALLATION

Tools Required:	Fasteners (supplied):
10mm spanner	Fixing kit for the machine
13mm spanner	M8 Through floor bolts
19mm spanner	M20 Through floor bolts
30mm spanner	Machine guards
Suitable mallet	Light barriers
8mm/20mm SDS drill bits	

Before installation, ensure the following items are available:

- Suitably rated forklift
- Level flooring

Also ensure the presence of:

- A qualified electrician
- A qualified forklift driver
- Suitable floor space for the machine
- Correct electrical supply

NOTE: ***AT THIS POINT THE FLOOR SHOULD BE CHECKED TO A DEPTH OF AT LEAST 200mm FOR UNDERGROUND OBSTRUCTIONS, WHICH COULD HINDER INSTALLATION.***

- Ensure the floor is free of obstructions or debris which could hinder the placement of the machine.
- Place the machine in its final intended position, ensuring there is enough space to access the electrical panel door at the rear of the machine and space at the front of the machine for placement of the guarded area.
- With the machine located, use a suitable drill and 20mm drill bit to drill the floor at each of the 4 floor attachment points of the frame to a depth of 100mm.
- Using a mallet, locate the supplied M20 floor anchor bolts securely in place. Using a 30mm spanner or ratchet, secure the machine to the floor bolts using the appropriate supplied fasteners.

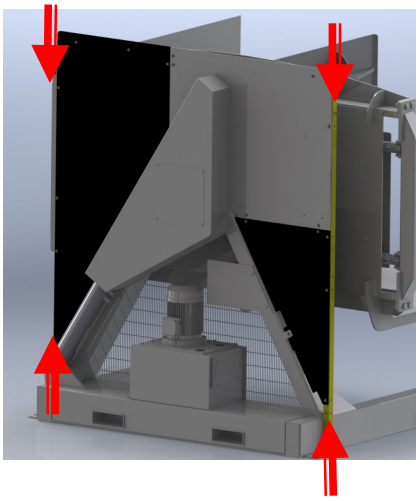
ATTACHMENT POINTS

GUARD INSTALLATION

- Once the Inverter is correctly bolted to the floor. Place the control box to the front of the machine where it cannot get damaged.
- Lay out the panels and posts as the layout drawing in the back of this manual with all the two holes on the feet on the outside of the guarded area. Ensure that any cable are not in a position to get damaged.

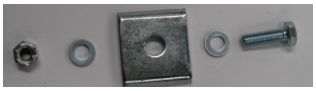
NOTE: ***ENSURE THE GUARDS ARE IN THE CORRECT ORIENTATION BEFORE COMMENCING ASSEMBLY.***

- Start the guard assembly either side at the rear of the machine the upright posts are already attached to the machine so the first small back panel are bolted to the posts. Loosely assessable the rest guard until they are self standing and are in roughly the correct position. Further instruction for assembly of the guards are on the page 11.

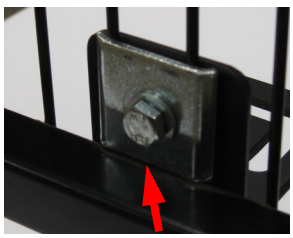


NOTE: ***DO NOT TIGHTEN THE GUARD PANELS DOWN AT THIS POINT.***

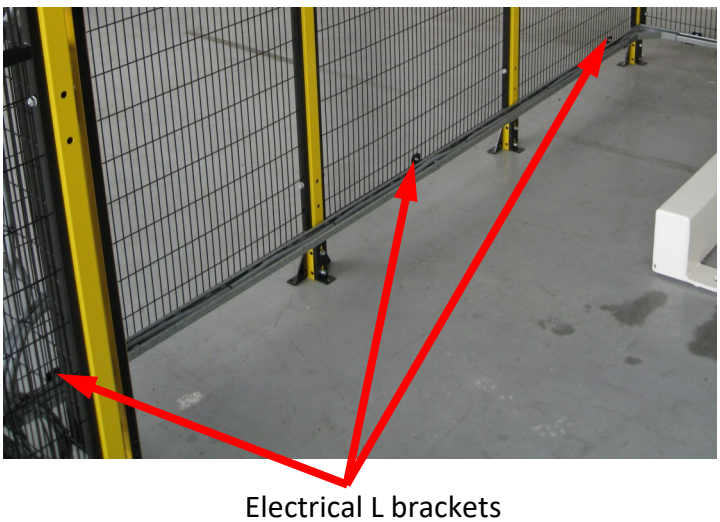
- Then fit the cable trays to the guards (this will help with alignment).
- Fix the L bracket to the bottom of the guards, (3 on each side, 2 on each side of the back guards). Fix the L bracket with M6 x 20 blots so the square washer touches the bottom of the guard.
- Place the cable tray on the L bracket and loosely fasten to the L bracket check the alignment and then tighten the tray to the bracket.



L bracket bolt assembly



Square washer touching bottom of guard



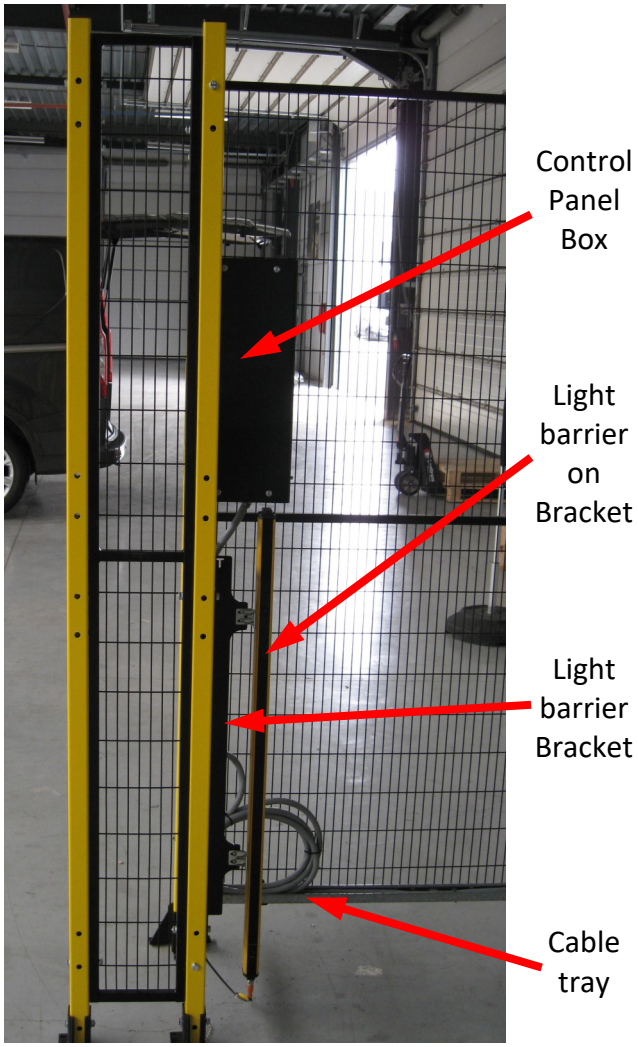
Electrical L brackets

GUARD INSTALLATION
CONTINUED

- Place the cable tray corners in the back to corners and fasten to the cable tray.

- Then fix the control panel in the control box recess by removing the bottom of the control box, fixing the Panel to the Box and replacing the bottom of the box. Lay the cable in the cable tray but do not cable tie until the guards are bolted to the floor.

- Fix the light barrier brackets to both front guards using M8 x 55 bolts, make sure the bracket are the correct way up and the with the 'T' at the top. The light barriers need be on the central position on they brackets. The light barrier cables are rolled up on both side of the machine at the bottom of the 'A' frame legs. From the front of the machine on the left hand side there is two cables (one extra for the control panel) and on the right hand side there is one cable. Lay them loosely in the cable tray and connect then to the bottom of light barriers.



- Once the machine is connected to the power supply, check the alignment of the light barriers, adjust guards if needed.

- Check the guard are in the correct positions **lock off the power to the machine**. Tighten all the guards, mark out the guard floor holes to be drilled. And remove the light barrier and but in a safe place.

- Once the guards and light barriers are in the correct position drill the floor for each attachment position of the guard feet (8mm x 100mm in depth). Locate the M8 floor bolts for the fixed guarding securely into the ground. Once the guards are aligned, tighten all guard panel fasteners (once the holes are marked the cable tray can be removed to help with access and replaced when guards are bolted to the floor).

CABLE INSTALLATION

LIGHT BARRIER/CONTROL PANEL

- Once the machine and guards are bolted to the floor replace the light barriers, lay the cables in the tray. Then cable tie them down until you reach the front. Plug in the cable to the light barrier (the cables can not be mixed up as the cable can only be plugged into the correct socket). Roll up the extra cable an cable tie the front guard (see picture below).

- From the left hand side lay the cables in the cable tray and cable tie it down until you reach the front. Plug in the cable to the light barrier. Roll up the extra cable an cable tie the side guard (see picture below).

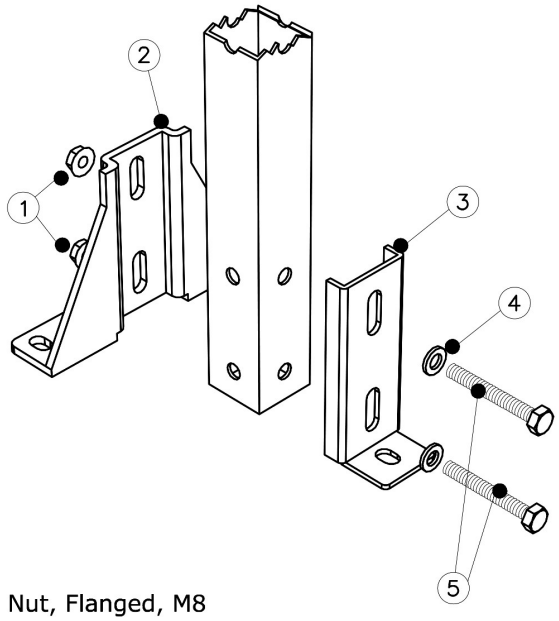
- Unlock the power supply, check the alignment of the light barriers, adjust them with the adjustment bolts if needed. (see page 22)

Light Hand side front

Right Hand side front

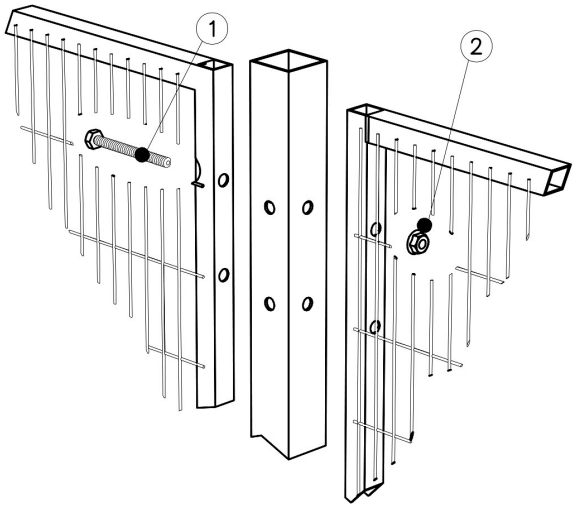
GUARD INSTALLATION
CONTINUED

Mounting the foot



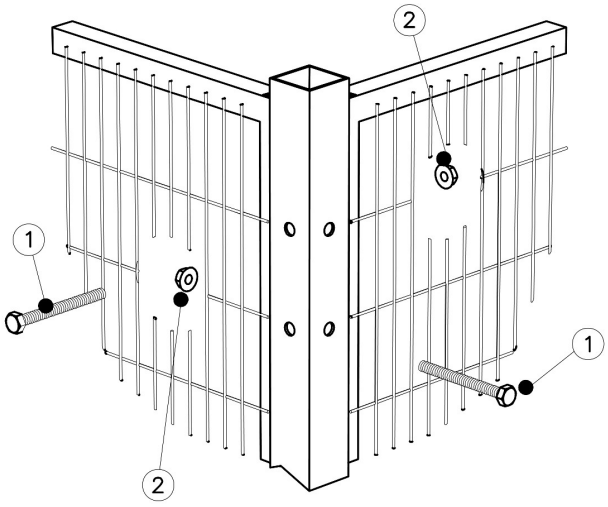
1) Nut, Flanged, M8
2) Foot bracket
3) Counter-Bracket
4) Washer, Ø32 Sp.3mm
5) Screw Hex Head M8x60

Mounting the panels (Linear wall)



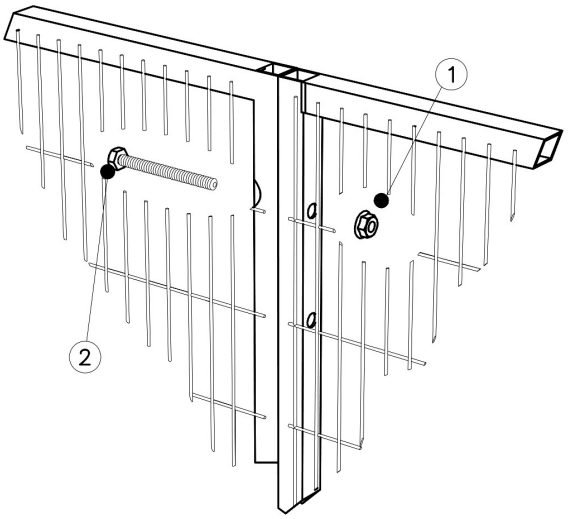
1) Screw, Hex Head M8x90
2) Nut, Flanged, M8

Mounting the panels (Angle wall)



1) Screw, Hex Head M8x70
2) Nut, Flanged, M8

Mounting the angle joint

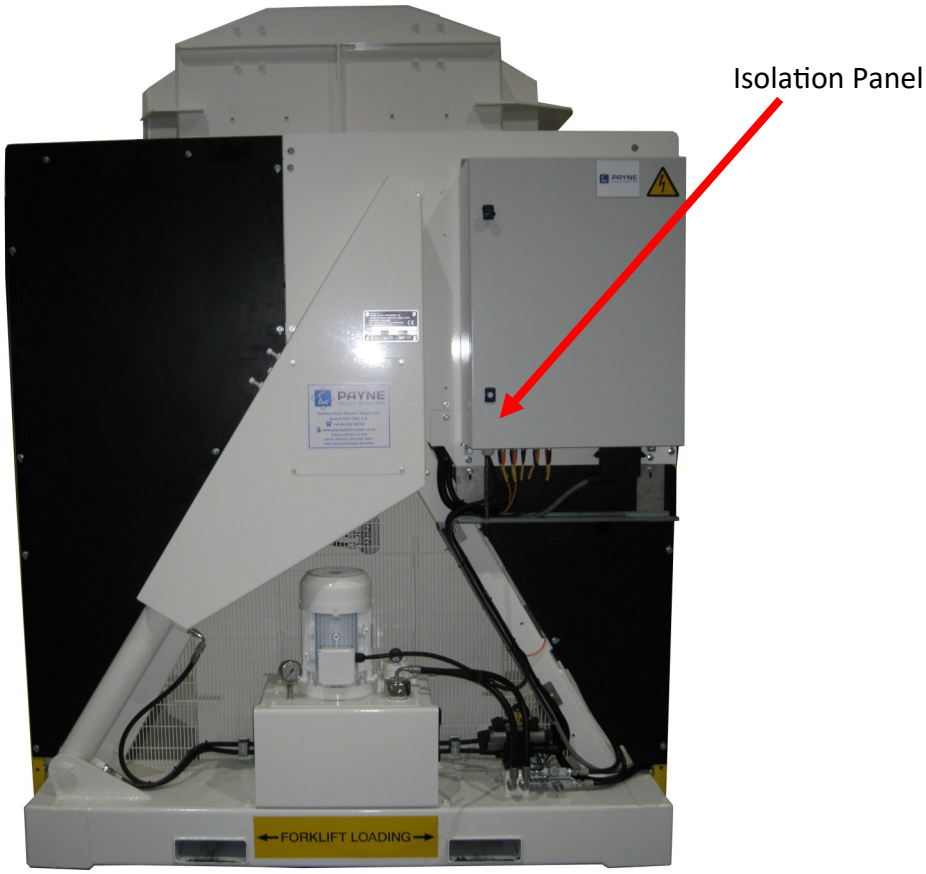


1) Screw, Hex Head M8x55
2) Nut, Flanged, M8

CONNECTION

SAFETY: THE FOLLOWING SHOULD ONLY BE CARRIED OUT BY A FULLY QUALIFIED ELECTRICIAN.

- Connect the machine to an adjacent suitably rated electrical supply.
- Ensure the stop button on the control panel is released.
- Switch the electrical isolator on, at the main electrical panel.
- Check the guards for correct alignment and functionality.
- Press the **START** Button on the control panel, this will start the pump.
- Check for the correct clockwise rotation of the motor. If necessary, change the motor connections to reverse the polarity.



PRE-USE INSPECTION

Pre-use Inspection:

- Visually inspect the machine for any obvious deformities or irregularities.
- Ensure there are no oil leaks and the hydraulic oil level is correct on the tank sight glass.
- Ensure the area under the rotating body is free from debris using a long handled broom, never enter the area under the rotating body at any time.
- Ensure any load placed in the machine is correctly located, with the load placed on the fixed table and the leading corner placed against the rotating body back/side wall.

SAFETY: NEVER START UP THE MACHINE IF ANY OF THE ABOVE CRITERIA ARE NOT MET

SAFETY: ALWAYS ENSURE THERE ARE NO PERSONS PRESENT WITHIN THE GUARDED AREA PRIOR TO STARTING!

Start up Procedure:

- Turn the electrical isolator on (located at the back of the machine). Turn the Key to the on position.
- **Press the Emergency stop button and then release it, press the reset button this will reset the machine. If this is not done the machine will not turn, clamp or unclamp.**
- Press the **START** button, until the light barriers reset and the pump motor runs.
- Confirm that the motor stops when the top most beam on the light barrier is physically interrupted.
- Confirm when all remaining beams are broken, that the motor again stops.
- Check the clamping operation of the machine, by pressing the clamp and unclamp buttons at the control panel.
- Check the machine inverts and returns when the corresponding buttons are pressed at the machine control panel.
- Check functionality of the stop button.
- Follow the operating instructions given on the following page.

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Correctly locate the desired load to be inverted, with the load placed on the fixed table and the leading corner placed against the rotating body back/side wall.

SAFETY: ALWAYS ENSURE THERE ARE NO PERSONS PRESENT WITHIN THE GUARDED AREA PRIOR TO STARTING!

Turn the key to the on position. **Press the Emergency stop button and then release it, press the reset button this will reset the machine. If this is not done the machine will not turn, clamp or unclamp.**

Press the **START** button, until the light barriers reset and the pump motor runs.

Turn and Hold the CLAMP switch until the load is fully clamped.

Turn and Hold the INVERT switch until the load is fully inverted.

Turn and Hold the UNCLAMP switch until the clamp tables are fully opened.

Replace the original pallet from the load. Ensure the guarded area is free from all personnel and foreign objects before proceeding to the next steps.

Turn and Hold the CLAMP button until the load is fully clamped.

Turn and Hold the RETURN button until the load is fully inverted.

Turn and Hold the UNCLAMP button until the clamp tables are fully open.

Remove the load from the machine. Shut down and isolate the machine when not in use.

If the machine is stopped by light barriers beams being broken or emergency stop button. Check the emergency is released and then press the reset button followed by the start button to continue.

MAINTENANCE SCHEDULE

SAFETY: BEFORE CARRYING OUT ANY MAINTENANCE OPERATION ENSURE THE MACHINE IS IN ITS DEFAULT (AT REST) POSITION AND THAT THE ELECTRICAL ISOLATOR ON THE MAIN CONTROL PANEL IS SWITCHED OFF AND LOCKED. CHOCK THE MACHINE IF WORKING IN THE AREA OF THE ROTATING BODY.

Weekly:

- Check all lubrication points & grease if required, including,

  i. Wear plate (Page 17)
  ii. Combination Bearings (Page 18)
  iii. Pivot boss (Page 19)

Monthly:

- Check the hydraulic oil level at the tank sight glass, replenish with correct grade oil if necessary (See specifications page)

Bi-Annually:

- Visually examine the machine for obvious deformities, paying particular attention to:

  i. Frame, body and tables (cracks and deformation)
  ii. Hoses, valves and manifolds (leaks or perishing)
  iii. Electrical panel, including latches and hinges
  iv. Electrical cables, insulation, conduit and clamps
  v. Rubber buffers (wear and perishing)
  vi. Light barriers (if present)

- Ensure all guard panels are secure and free from damage
- Clean the motor casing and fins
- Renew the hydraulic oil and suction filter (see pages 20 & 21)
- Adjust the wear plate (see page 17)

SAFETY: IN THE UNLIKELY EVENT OF ANY MACHINE MALFUNCTION, STOP AND REPORT IMMEDIATELY.

SAFETY: REPLACE ALL GUARD PANELS REMOVED DURING ANY MAINTENANCE OPERATIONS & ENSURE ALL SAFETY DEVICES ARE RE-INSTATED.

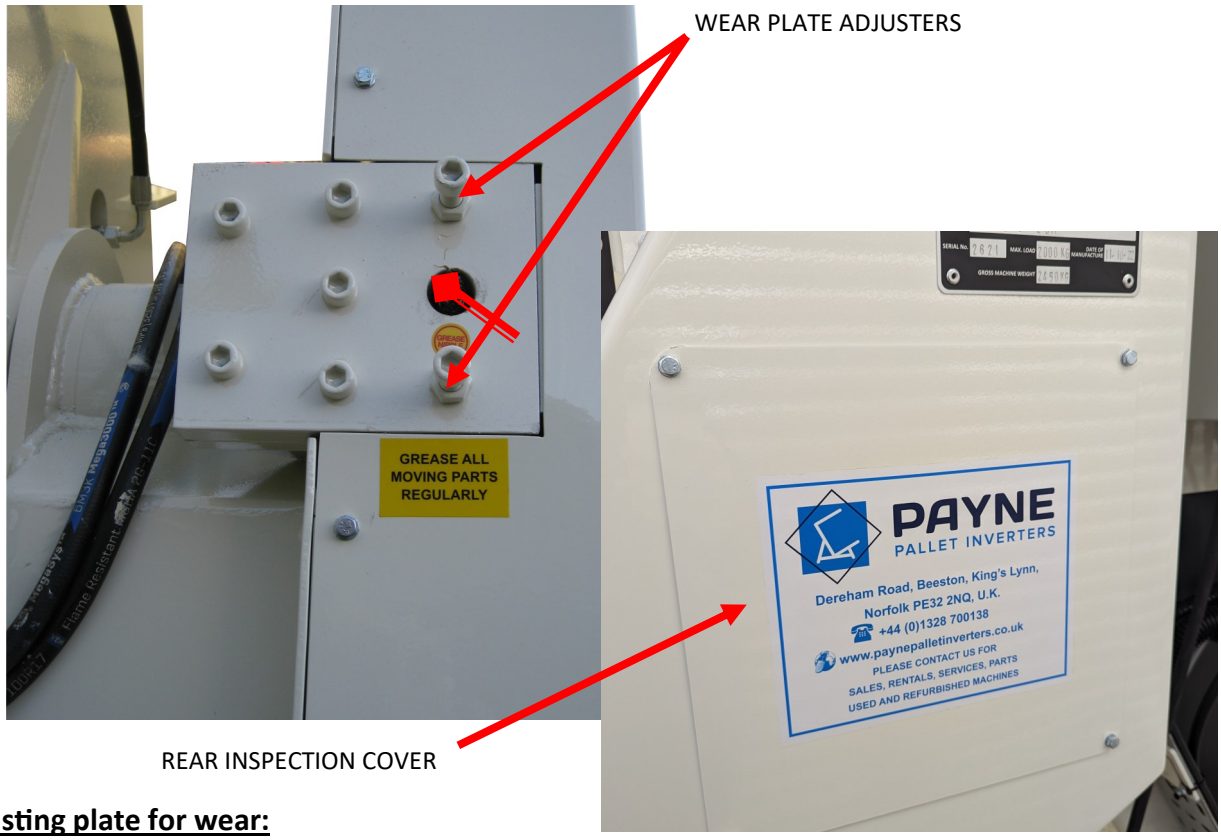
LUBRICATION

GREASING WEAR PLATE

i. The wear plate is a sacrificial element which is designed to guide the rack during normal operation, this plate requires regular lubrication to ensure smooth operation.
NOTE: ***It is important to use the correct grade of grease (see specification page).***

From time to time the plate may also need to be adjusted, this is detailed below and takes any play out of the rack/wear plate assembly which may have occurred due to frictional losses.

SAFETY: SUITABLE CHOCKS SHOULD BE PUT IN PLACE TO PREVENT THE BODY FROM MOVING WHILST LUBRICATION OF THE MACHINE IS CARRIED OUT.



Adjusting plate for wear:

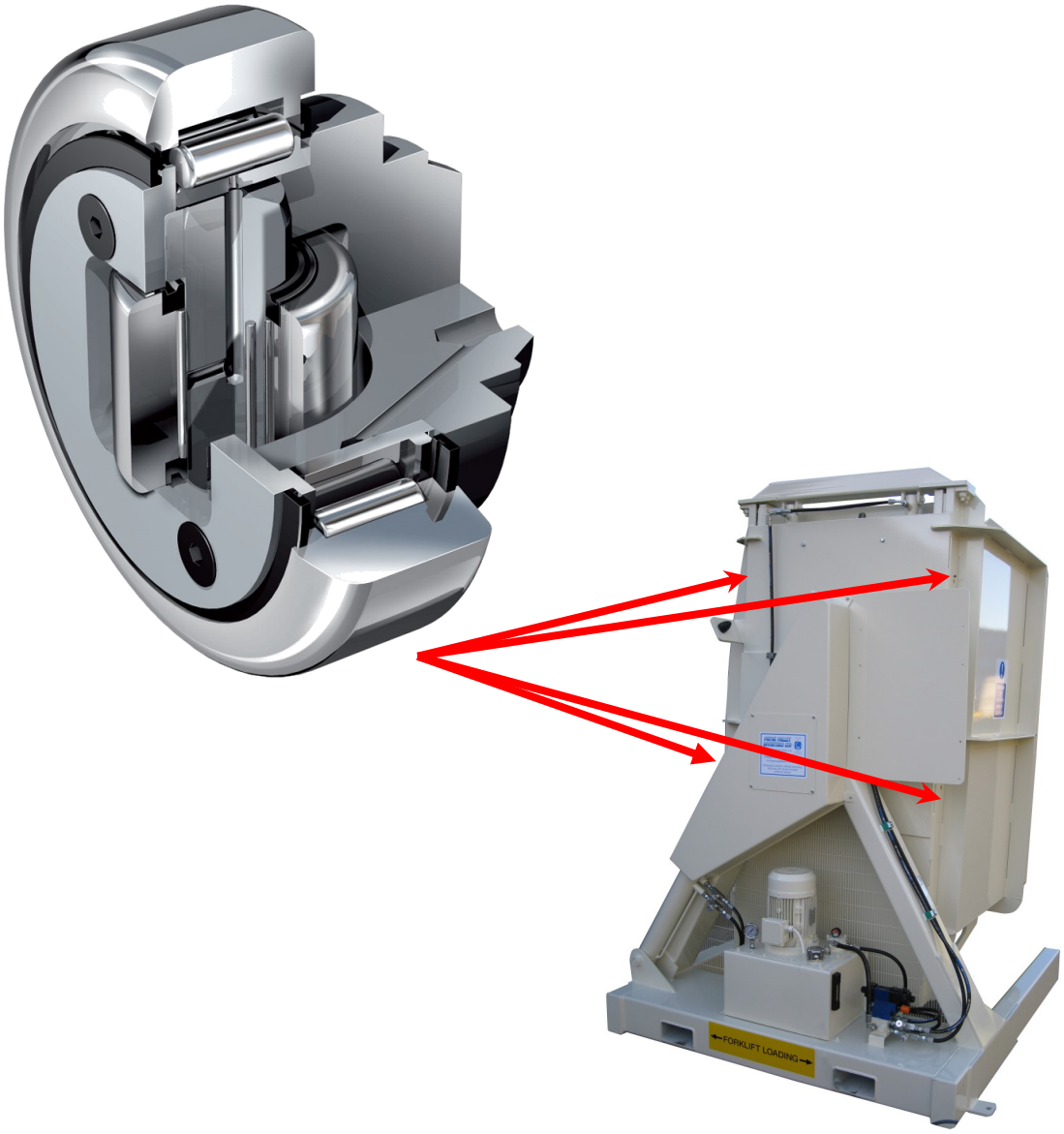
Remove inspection cover which once removed you can gain visual access to the rack/wear plate assembly. The wear plate can be adjusted by loosening the lock nuts and then tightening the adjuster screws until the plate rests against the rack. It is important not to over tighten the wear plate as this will induce excessive friction in the assembly. Once correctly adjusted, re-tighten the lock nuts and refit the rear inspection cover.

NOTE: ***This procedure only needs only be carried out when the plate has worn sufficiently enough for play to present itself in the assembly.***

LUBRICATION

COMBINATION BEARINGS

This machine is fitted with precision Combination bearings, these bearings come pre lubricated and do not require greasing. However it is worth checking the condition of the bearings in accordance with the maintenance schedule and **if required lightly** grease.



SAFETY: SUITABLE CHOCKS SHOULD BE PUT IN PLACE TO PREVENT THE BODY FROM MOVING, WHILST LUBRICATION OF THE MACHINE IS CARRIED OUT.

SAFETY: DISPOSE OF WASTE OIL AND SOILED RAGS CORRECTLY AND IN ACCORDANCE WITH LOCAL AUTHORITY GUIDELINES.

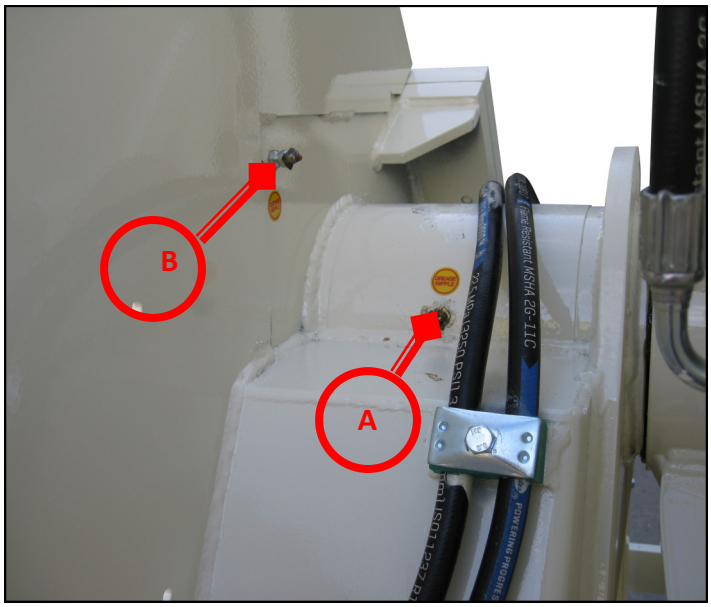
LUBRICATION

GREASING BOSS & PINION

iii. The pivot boss houses the main pivot pin and related bush, attached to the pivot pin is the pinion. This pinion is connected to the rack/turnover ram and is used to turn the rotating body. This assembly is housed behind the rear cover, however there is no need to remove this for the purpose of lubrication.

- Lubrication point A is for the pivot boss/bush
- Lubrication point B is for greasing the pinion

NOTE: ***It is important to use the correct grade of grease (see specification page).***



SAFETY: DISPOSE OF WASTE GREASE AND SOILED RAGS CORRECTLY AND IN ACCORDANCE WITH LOCAL AUTHORITY GUIDELINES.

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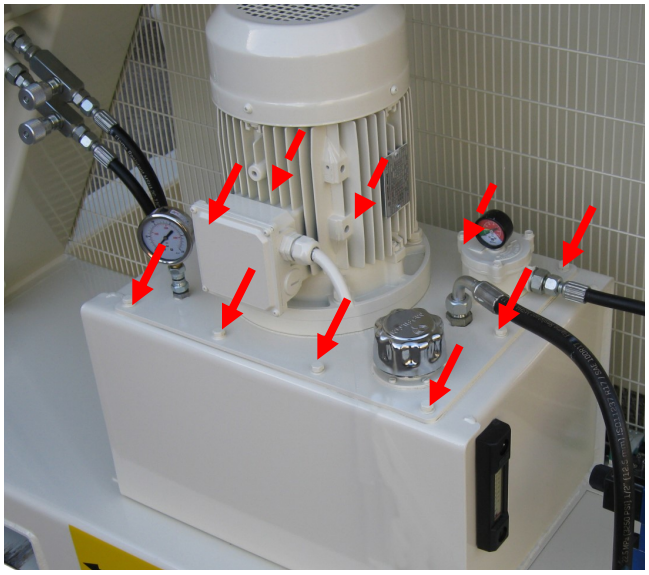
OIL CHANGE PROCEDURE

Tools Required:	Materials Required:	Part No.
13mm spanner	Oil suction filter	H-F-SE1320
24mm spanner	Return filter element	H-F-2012
Oil transfer pump	Qualube HM 32	A/R
60 litre container	Oil absorbent pads	A/R

NOTE: ***ALTHOUGH THE WHOLE HYDRAULIC SYSTEM CONTAINS 60 LITRES OF OIL ONLY 40 LITRES WILL BE IN THE TANK ITSELF.***

- Place a suitable empty container, sufficient to hold approx. 60 litres of oil.
- Using a 24mm spanner or ratchet, unscrew the top of the return filter and carefully remove the filter element.
- Remove the oil from the tank into the container through the return filter socket, using a suitable oil transfer pump. Into a suitable container approximately 60 litres capacity.
- Renew the filter element and refit the top of the return filter.
- Remove the M8 screws from the tank top lid and lift off carefully. The strainer filter will be found attached to the pump assembly.
- Remove the strainer filter by turning it anti-clockwise.



OIL CHANGE PROCEDURE

CONTINUED

- Replace the strainer filter with the new filter component.
- Examine the tank lid seal for deterioration, signs of perishing or damage and replace the seal if necessary. At this point drain any excess oil from the motor/pump assembly.
- Carefully refit the complete tank top lid assembly.
- Refill the hydraulic tank through the filler breather with Qualube HM 32 grade oil until it reaches the top mark on the sight glass. Fill the tank carefully, to prevent a build up of air in the system.

NOTE: ***THE OIL LEVEL MAY DROP A SMALL AMOUNT AFTER THE MACHINE HAS BEEN RUN FOR THE FIRST TIME, THIS IS NORMAL AS THE OIL HAS TO FILL THE HYDRAULIC SYSTEM.***

- Re-fit the tank filler/breather cap and replace to Lower back guard.
- Replace any safety covers removed during the oil change.
- Run the machine for approximately 5 minutes to circulate the oil and remove any air that may have entered the system during the oil change procedure.
- Re-check the hydraulic oil level and examine the machine for any oil leaks.
- Top up the machine if the oil level has dropped.

SAFETY: DISPOSE OF WASTE OIL CORRECTLY, WITH AN AUTHORISED COMPANY IN ACCORDANCE WITH LOCAL AUTHORITY GUIDELINES.

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TECHNICAL INFORMATION

LIGHT BARRIERS

NOTE: ***NO ADJUSTMENT OF THE LIGHT BARRIERS MUST BE MADE, UNLESS DIRECTLY INSTRUCTED TO DO SO BY THE MANUFACTURER.***

The light barriers operate by projecting a beam from an emitter, which is then picked up by the adjacent receiver, if this beam is broken the machine will automatically shut down. The barriers are a vital safety feature and must not be tampered with.

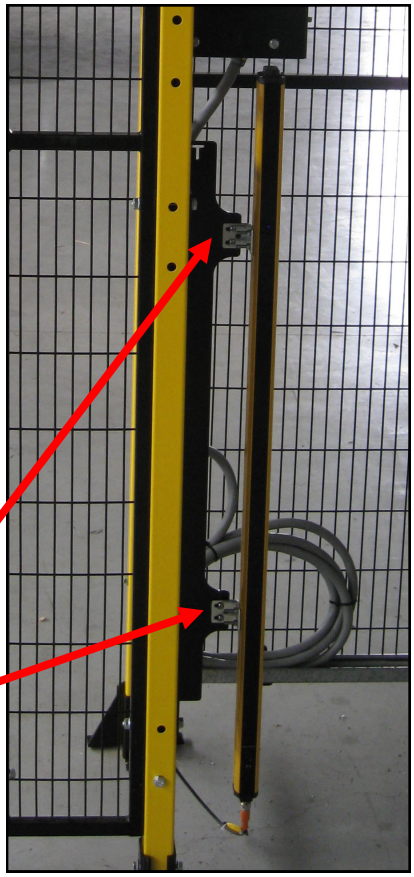
- The barriers are checked and aligned at factory and if erected accurately and in accordance with the floor plan, should be correctly aligned. No other adjustments need to be carried out.

- If however the floor is uneven, the barriers may not align correctly and adjustments may need to be made. In this case, the M6 mounting screws (top & bottom) may be loosened. This will allow the mounting brackets to be adjusted. Shims may also be required to gain accurate alignment.

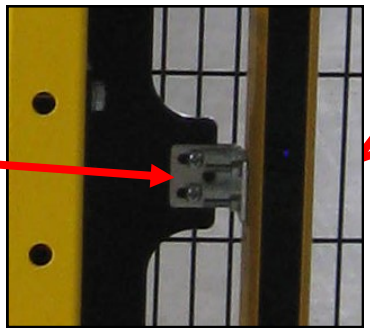
Alignment:

- The Emitter will show a constant green indicator.

- When moving the emitter up and down or side to side with respect to the receiver, a red indicator will be shown on the receiver, this indicates that the barrier is not aligned. As the emitter starts to align with the receiver a second amber indicator is shown at the receiver. When full alignment is gained the red and amber lights extinguish at the receiver and are replaced by a single green indicator. When full alignment is achieved both the emitter and receiver will indicate green.



Adjustment screws



SAFETY: BEFORE CARRYING OUT ANY ADJUSTMENTS, ENSURE THAT THE ELECTRICAL ISOLATOR ON THE MAIN CONTROL PANEL IS SWITCHED OFF AND LOCKED.

TECHNICAL

LIMIT SWITCHES (ROTATION)

NOTE: ***THE FOLLOWING SWITCHES MUST NOT BE ADJUSTED (UNLESS DIRECTLY INSTRUCTED BY THE MANUFACTURER).***

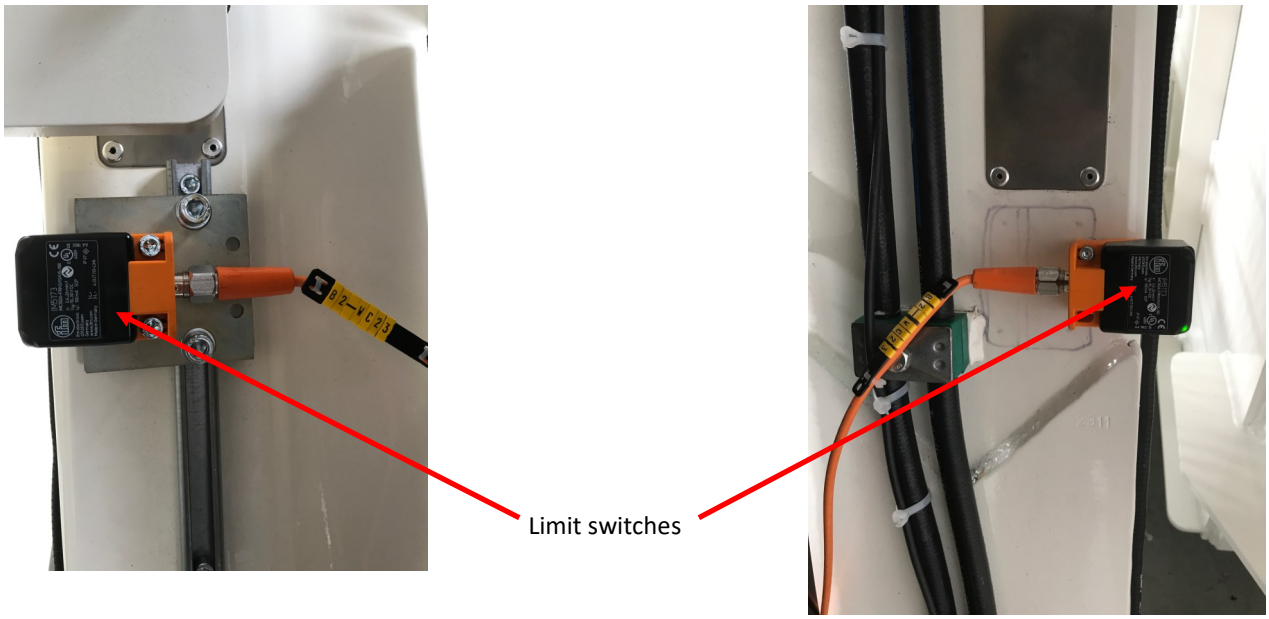
The limit switches control the limit of the rotating body's movement, It is important that these switches are not tampered with. The following instructions are laid out in the unlikely occurrence of machine malfunction and must only be carried out if instructed to do so by the manufacturer and only by a competent engineer.

Invert Limit Switch

- This switch is located on the 'A' frame below the main enclosure.

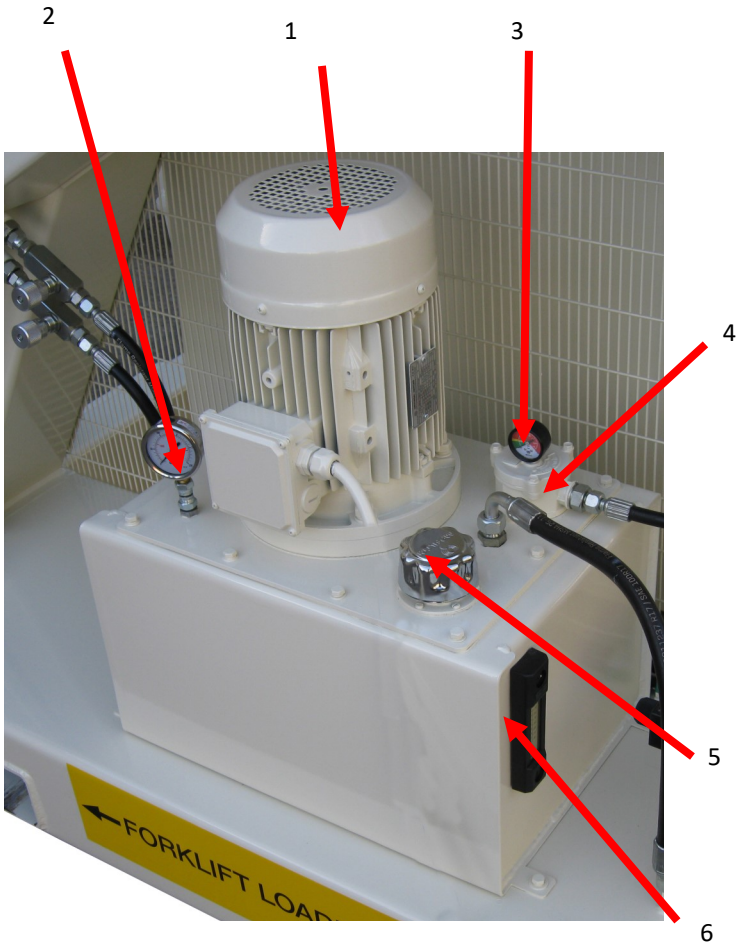
Return Limit Switch

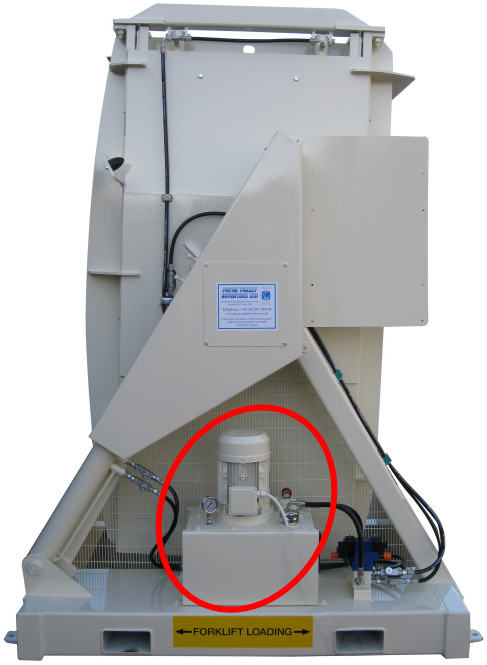
- The switch is located on the 'A' frame on the opposite side to the invert limit switch.



COMPONENTS

PUMP ASSEMBLY

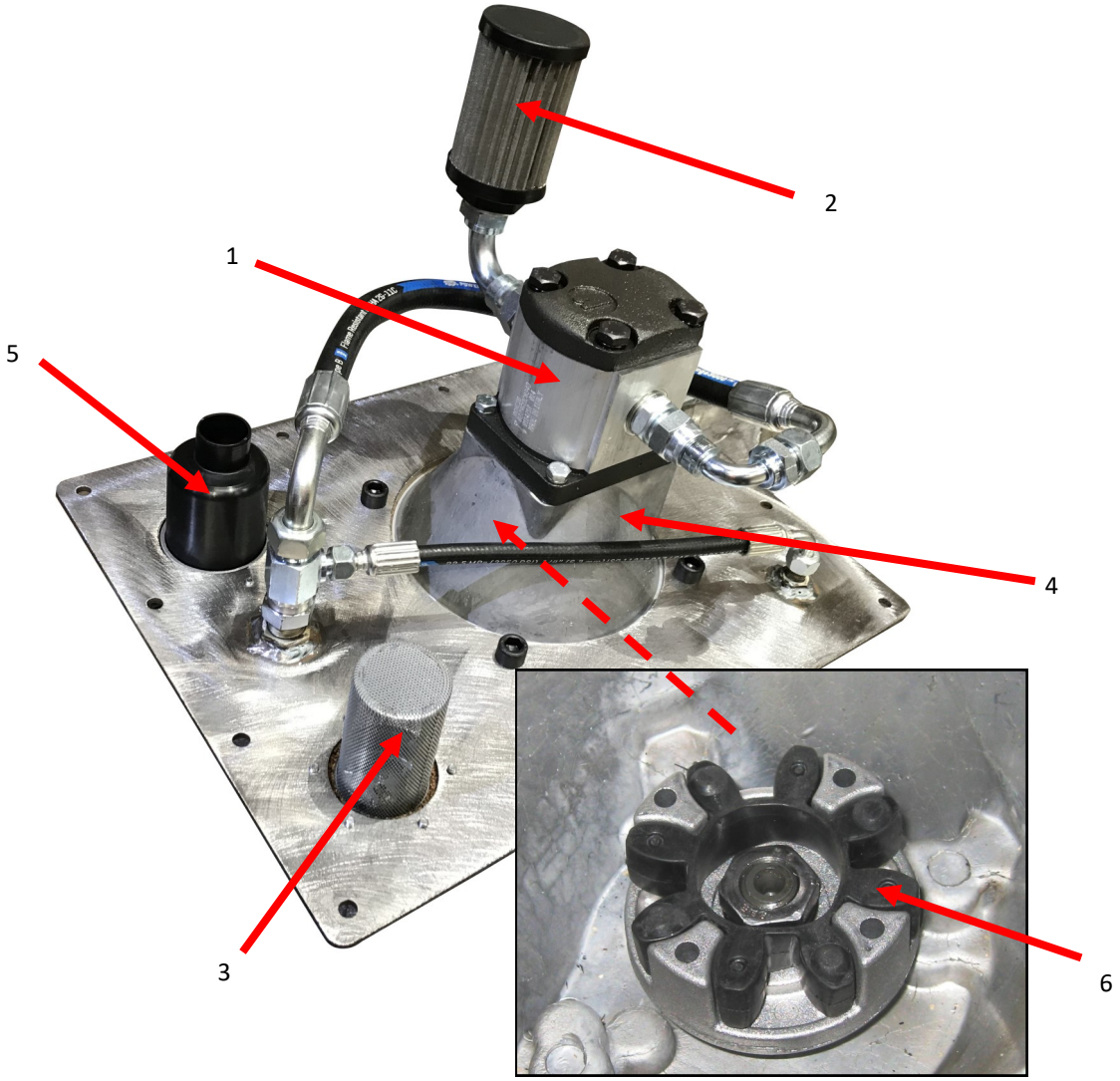




Item	Component	Part No.
1	Motor/pump assembly	E-EMA-4KW
2	Bottom mounted pressure gauge	H-PG-4000 BTM
3	Return filter pressure indicator	H-F-RFI
4	Return filter assembly	H-FH-2012
5	Filler/filter	H-F-1163.40
6	Tank sight glass	H-SG-FLT-221

COMPONENTS

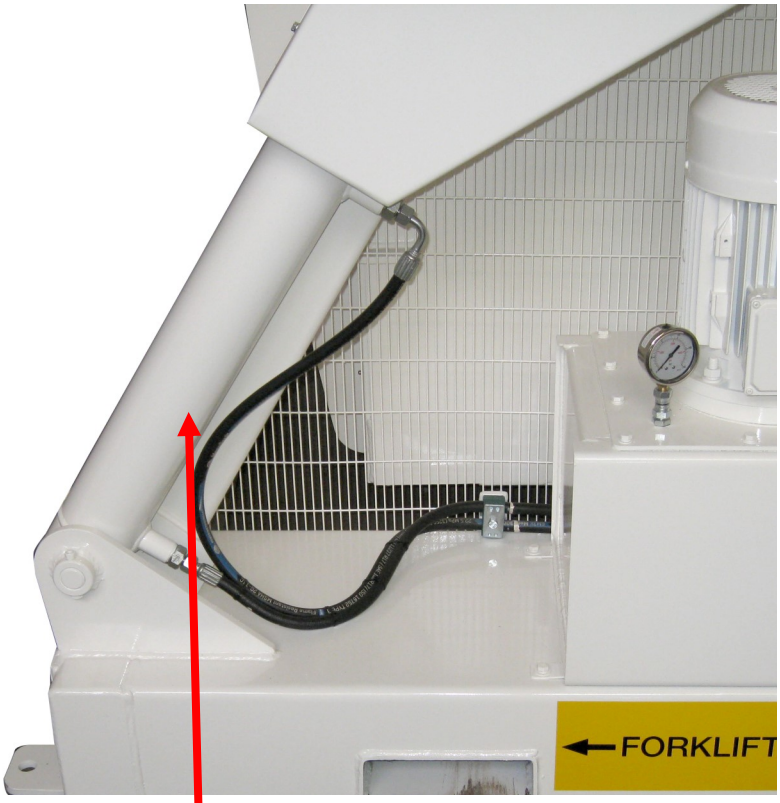
PUMP ASSEMBLY (INTERNAL)



Item	Component	Part Number
1	11cc hydraulic pump	H-P-11CC
2	Strainer filter	H-F-SE1320
3	Filler filter	H-F-1163.40
4	LS252 motor bell housing	H-EM-B/HOUS
5	Return filter replacement element	H-F-2012
6	Flexible coupling (inside bell housing)	H-EM-P/COUP

COMPONENTS

TURNOVER RAM

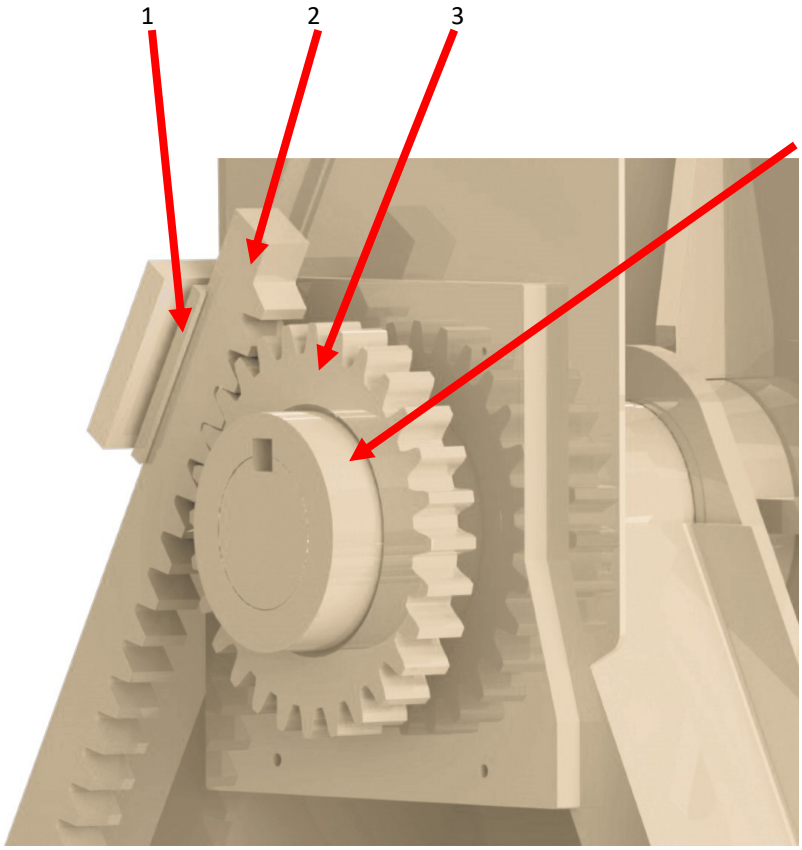


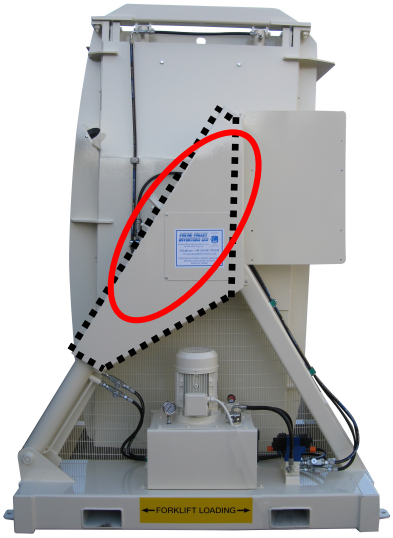
1&2

Item	Component	Part No.
1	Turnover ram	H-RAM-SI0002-2015
2	Ram seal kit	H-RS-GM-90/50

COMPONENTS

RACK & PINION



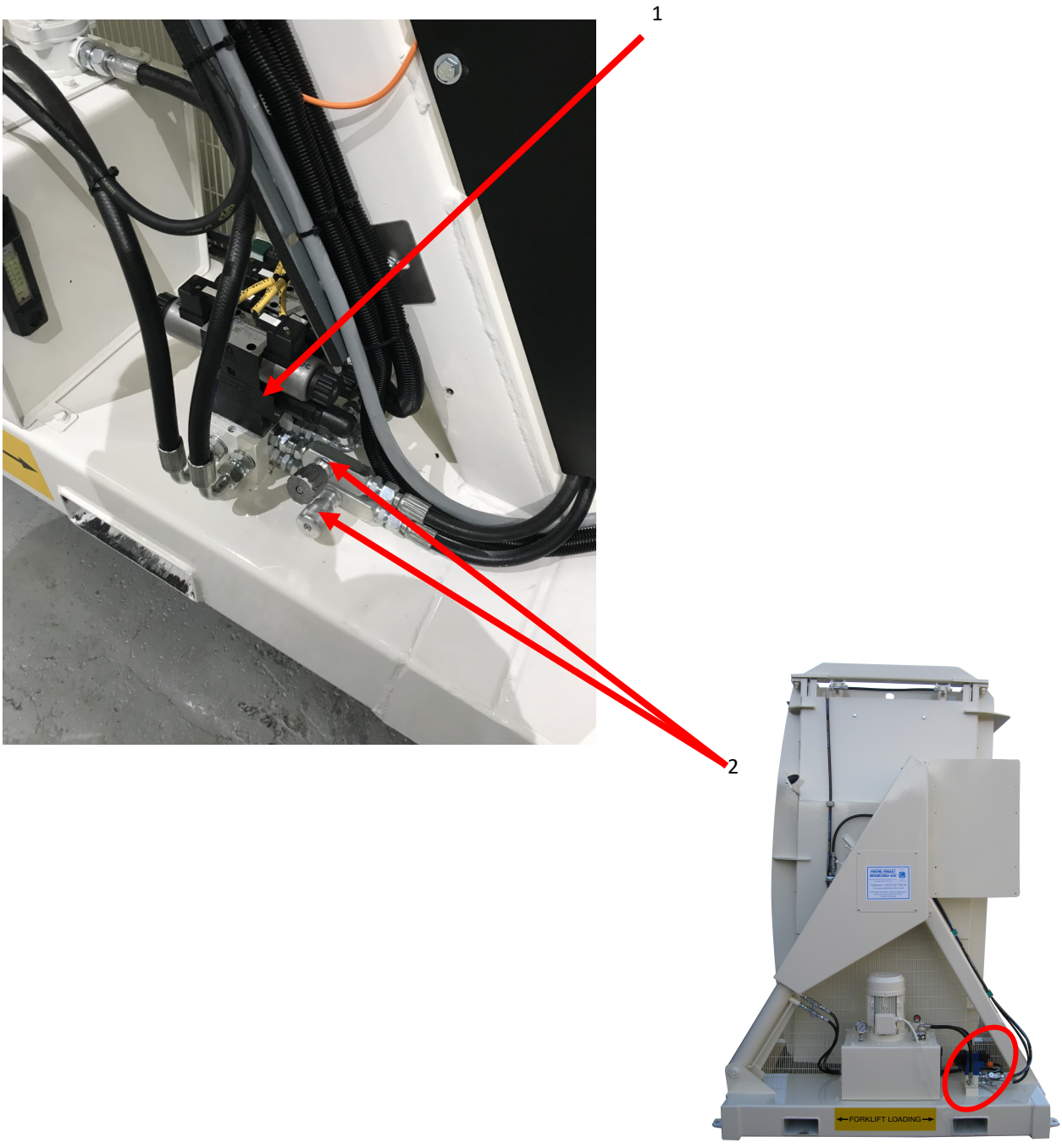


(located under fixed rear cover)

Item	Component	Part No.
1	Brass wear plate	STD-RACK WEAR PLATE
2	Rack	R-40 RACK
3	Pinion	R-40 PINION
4	Boss	R-40 BOSS
5	Rack boss	STD-RAM BOSS

COMPONENTS

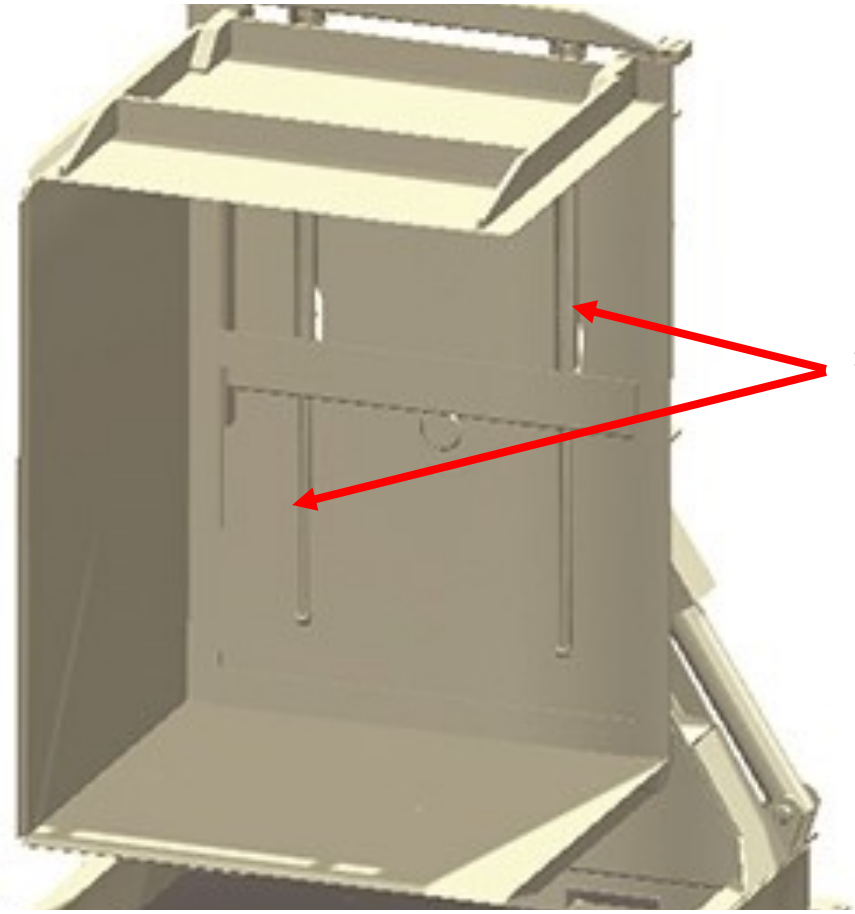
SPOOL VALVE ASSEMBLY



Item	Component	Part No.
1	Valve Manifold Assembly	H-V-PH-STD-24
2	Speed control valve	H-V-SCV-06S

COMPONENTS

CLAMP RAMS

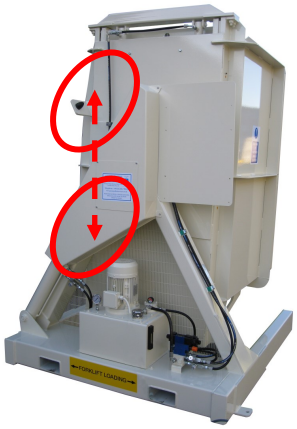


(located behind back cover plate)

Item	Component	Part No.
1	Clamp Ram	H-RAM-NSSI-C
2	Replacement seal kit	H-RS-GM-50/30

COMPONENTS

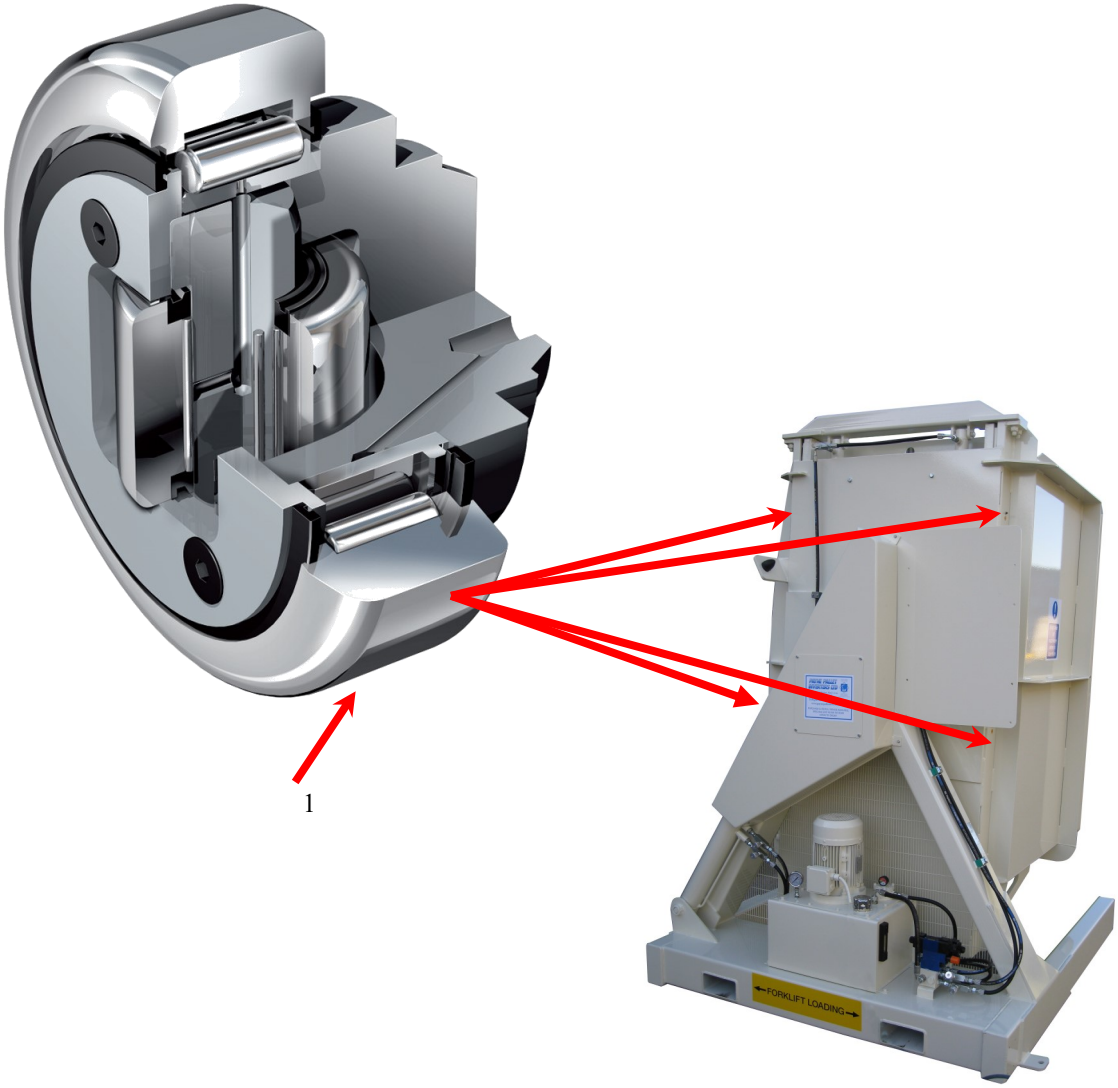
BUFFERS



Item	Component	Part No.
1	Rubber conical buffer	R-BUFFER-C1

COMPONENTS

COMBINATION BEARINGS



Item	Component	Part No.
1	Combination Bearings	B-COM-BEARING_4.055

SPECIFICATION

Type	
Si Standard Pallet Inverter 180 degree	
Solenoid control c/w full guards	

Manufactured	
2022	
Beeston Kings Lynn, Norfolk, UK	

General data	
Minimum operating temperature (č)	0
Maximum noise level (Db)	<74.8
Finish	Blue/Black guards

Mechanical data	
Oil capacity (litre)	60
Oil pump capacity (cc)	11
Hydraulic system pressure (psi)	2000
Load capacity (kg)	2000

Electrics	
Power supply (V)	415
Frequency (Hz)	50
Motor (kw)	4

Lubrication type	
Oil	Qualube HM32
Grease	Proteus 2ep

PAYNE
PALLET INVERTERS

OIL SHEET DATA

QUALUBE HYDRAULIC HM FLUIDS

Qualube Hydraulic HM Fluids incorporate characteristics that give:

1. protection against oxidation, anti-wear properties to reduce the wear occurring in all moving parts.

2. rust inhibitor treatment to help reduce the detrimental effects of water contamination.

3. low foaming to prevent inadequate lubrication and potential damage to pumps.

4. good demulsibility characteristics allowing quick separation from water helping to prevent rust.

5. excellent hydrolytic stability to protect equipment from corrosion in the presence of water.

Qualube Hydraulic HM Fluids offer superior wet filterability as measured by the AFNOR 48-691 performance test providing protection against fine filtration blockage due to the presence of water. This allows the product to meet the stringent requirements of increasingly fine filters being built into many modern hydraulic systems.

The advanced chemistry that enhances the formulation's filterability affords it extreme thermal stability. As a result of this combination of characteristics, Qualube Hydraulic HM Fluids helps reduce the formation of sludge and varnish which can lead to unexpected downtime.

For end users of hydraulic equipment this high standard of performance means protection of their equipment against the damaging effects of water, contamination, and longer service between filter and fluid replacement, excellent anti-wear, anti-rust performance and a more reliable system in operation.

Health and Safety:

These grades are mineral oil based lubricants and should be handled according to good standards of industrial hygiene. Further detailed information is available on request.

Storage:

Drums should be stored in a clean dry place and protected from extremes of temperature, store >5°c.

The information given is correct to the best of our knowledge. It is offered in good faith but without guarantee as the conditions and methods of use of our products are beyond our control.

OIL DATA SHEET
CONTINUED

QUALUBE HYDRAULIC HM FLUIDS

Performance Specifications:

Qualube Hydraulic HM Fluids meet or exceed the requirements for industrial and mobile hydraulic systems which call for

Parker Denison HF-0 (formerly Denison HF-1, HF-2, HF-0)
Vickers Product, Eaton Brochure 694 (formerly Vickers I-286-S and M-2950-S)

MAG IAS, LLC (formerly Cincinnati Milacron	P-68, P-69 and P-70)	US Steel 127, 136
DIN 51524, Part 2	Rexroth	General Motors LH-04-1, LH-06-1, LH-15-1
Sauer Danfoss	Bosch, variable vane pumps	ISO 11158 (replaced ANFOR specs)
Commercial Hydraulics*		

*except for PM-500 series silver containing pumps which require R&O additive systems

PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Oil
Odour:	None
Specific Gravity @ 20°C:	>0.98
pH:	N/A
Solubility:	Insoluble in water
Flash Point (closed cup)°C:	>200
Flammability Limit (in air % by volume) LEL:	N/E
UEL:	N/E
Vapour Pressure @ 20°C:	<0.1mm Hg.
Vapour Density (air = 1):	N/E
Boiling Point (°C):	310 min.
Pour/Melting Point (°C):	140 min.
Kinematic Viscosity @ 40°C (mm^2S^{-1}):	N/A

THESE PROPERTIES DO NOT CONSTITUTE A SPECIFICATION

PAYNE
PALLET INVERTERS

GREASE DATA SHEET

Proteus 000EP, 00EP, 0EP, 1EP, 2, 2EP, 2M, 3

Lithium Soap Greases:

A range of premium quality multi purpose greases, manufactured from Lithium-12-Hydroxyl Separate Soap dispersed in solvent refined mineral base stocks, fortified with selected compounds to inhibit corrosion and oxidation. The grades highlighted with EP signifies the inclusion of specially selected soluble extreme pressure additives, and in the case of Proteus 2M the addition of micronized Molybdenum Disulphide has been added to enhance its operational characteristics.

This highly versatile range of greases are recommended for a variety of applications including automotive, industrial and off-highway plant for bearings, steering and chassis fittings, grease cups, water pump bearings and grease lubricated universal joints.

These grades may also be used to advantage over a wide range of other industrial applications from small high speed bearings operating under high unit pressure and load, as well as centralised lubricating systems. As well as the ability to provide continuous pump ability over wide temperature ranges, they exhibit excellent load carrying properties, high resistance to shock loading, coupled with exceptional, resistance to water washing.

Performance Benefits:

Long service life in a wide range of operational applications

RP/LB/20 November/1:

Excellent resistance to water washing and protection against rust and corrosion
Reduced wear on heavily loaded bearing applications
Controlled pump ability makes them ideally suitable for use in centralised lubrication systems
Prolonged life due to high resistance to oxidation at high operating temperatures
Extended bearing life in environments where water ingress could be a problem.

Health and Safety:

These grades are mineral oil based and should be handled according to good standards of industrial hygiene. Further detailed information is available on request.

Storage:

Containers should be stored in a clean, dry place and protected from extremes of temperature.

The information given is correct to the best of our knowledge. It is offered in good faith but without guarantee as the conditions and methods of use of our products are beyond our control.

GREASE DATA SHEET

Proteus 2EP

Lithium Soap Grease:

Typical Physical Characteristics:

	2EP
Appearance	Medium fibred grease
Colour	Bottle Green
Worked Penetration (IP50)	265/295
NLGI Classification	2
Dropping Point (IP132)	180EC min.
Operating Temperature Range	-20/+130EC
Oil Separation (IP121)	5% max
Oxidation Stability (IP142) 160 hours at 99EC - Pressure Drop psi	4
Water wash out ASTM D1264 at 38EC at 79EC	 3% 4%
Timken OK Load (IP326) Kg	20
4 Ball Weld Load (IP239) Kg	315