central ram hammer CRH 5000

central ram hammer

owners manual
operators instructions
spare parts list
safety precautions
maintenance

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Original Instructions
CRH5000 ver. 2025-01

5K

CRH5000
HYDRAULIC HAMMER & POWER PACK

USER'S MANUAL

HAMMER SERIAL No: 5003

HAMMER COMMISSION DATE: 2022

POWER PACK SERIAL No: 270DCP002

POWER PACK COMMISSION DATE: 2023

ENGINE TYPE: 270l/min Tier 4 CAT Engine

ENGINE SERIAL No: .....

POWER PACK TYPE: PVE 270DCP STAGE V/TIER 4F CAT

Approved By	Date	Signature
Steve Desborough - Design Engineer		
Dave Brown - Managing Director		
Jon Heeley - Works Manager		
James Mead - Technician		
Dave Farmer - Project Manager		

preface

This manual is used to familiarise you with safety, assembly, operation, adjustment, troubleshooting, and maintenance. Read and follow the recommendations in this manual to ensure safe and efficient operation. Keep this manual with the attachment at all times for future reference.

We want you to be completely satisfied with your new product, feel free to contact your local authorized service dealer for help with service, replacement parts, or any other information you may require. If you need assistance in locating a dealer, visit our web site at www.dcpuk.com or call customer service at +44 (0) 1908 240300.

Whenever you contact your authorised service dealer, always have the model number and serial number of your product available. These numbers will help provide exact information about your specific product. You will find the model and serial numbers on an ID plate located on the product.

The descriptions and specifications in this manual are subject to change without notice. Dawson reserves the right to improve products. Some product improvements may have taken place after this manual was printed.

table of contents

Certificate

Declaration of Conformity

We declare that the machinery/equipment detailed below is in compliance with the applicable regulations and harmonised standards as listed. This declaration ceases to be valid if alterations are made the machinery/equipment without agreement with Dawson Construction Plant Ltd.

Category	Piling Equipment
Type	CRH5000 and Power Pack
Serial Number	500 / 270DCP00
Hammer Year of Manufacture	2025
Power Pack Year of Manufacture	2025

Relevant Regulations:

2006/42/EC	Machinery Directive
2000/14/EC	Noise emission in the environment -

Measured sound power level on machines representative of this type Applied conformity assessment procedure according to Annex VIII Technical documentation archive location: MK6 1NE	127dB (A)

Applied harmonised standards, in particular:

EN 12100:2010	Safety of machinery. Basic terminology and methodology
EN 16228-1:2014	Drilling & foundation equipment. Common requirements
EN 16228-4:2014	Drilling & foundation equipment. Foundation Equipment
EN 16228-7:2014	Drilling & foundation equipment. Interchangeable auxiliary equipment

Signed by on behalf of DCP

Name / Position DAVID BROWN - MANAGING DIRECTOR

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introduction

The DCP Hydraulic Hammer has been designed and manufactured to meet the demands of today's contractor. The hammer has many advantages over traditional piling hammers, including other hydraulic hammers:

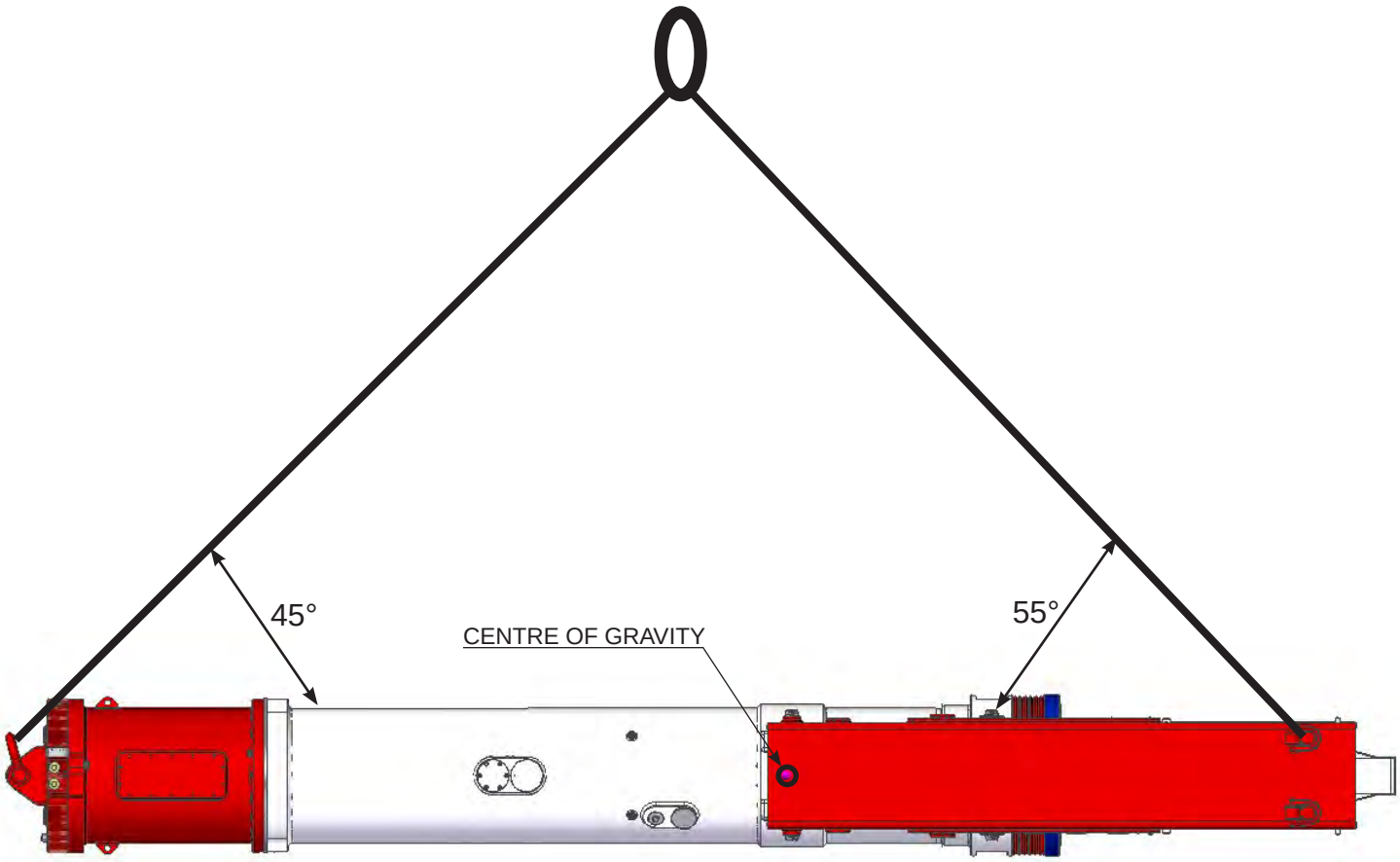
- The hammer fits all British and most foreign single sheet piles as well as numerous 'H' piles using one set of legs and inserts. It will also fit pairs of sheet piles and open bent corners with the same configuration. This significantly improves productivity and reduces costs.
- Hydraulic hammers are inherently efficient, typically 80-90% of the potential driving energy being transferred into the pile as opposed to 25-35% for diesel hammers.
- Rapid blow rate. The hammer is double acting, not only giving high energy output, but increasing the speed of operation. This inevitably increases production and keeps the pile on the move.
- Intelligent variable stroke controlled, between limits, at the touch of a button. This enables precise energy control which is very important when commencing piling or when coping with delicate operations. Full energy monitoring on screen.
- Highly reliable and robust electrical switching.
- Robust construction. The hammer has been designed with full knowledge of what is required of piling equipment. A quick look at the hammer sitting on a pile will confirm this.
- The hammer offers excellent power to weight ratio's lending itself to being used on long reach jobs where there are few economic alternatives.
- Pile with the hammer underwater thus eliminating the use of follower piles and the problems they create including huge loss of energy transfer.
- Noise levels are considerably lower than that of diesel or air hammers.

Transmitted ground vibrations have been measured lower than that of a vibrator.

basic safety points

- Ear protection should be worn when in close proximity of the hammer.
- Keep clear of the hammer and/or power pack when they are being lifted.
- Avoid standing directly below the hammer when it is piling.
- Adhere to maintenance requirements set out in this manual.
- Lift equipment using lifting points specified only (see figures over).

transportation and laying down hammer

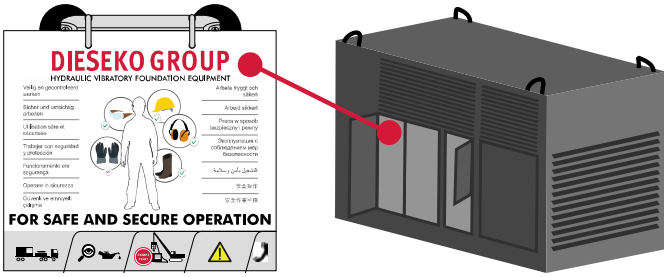


5k LIFT

- WHEN LAYING DOWN THE HAMMER, support top of hammer at higher level than bottom of hammer.
- TRANSPORTATION, support top of hammer at higher level than bottom of hammer.
- Fit transport bolt for travel.

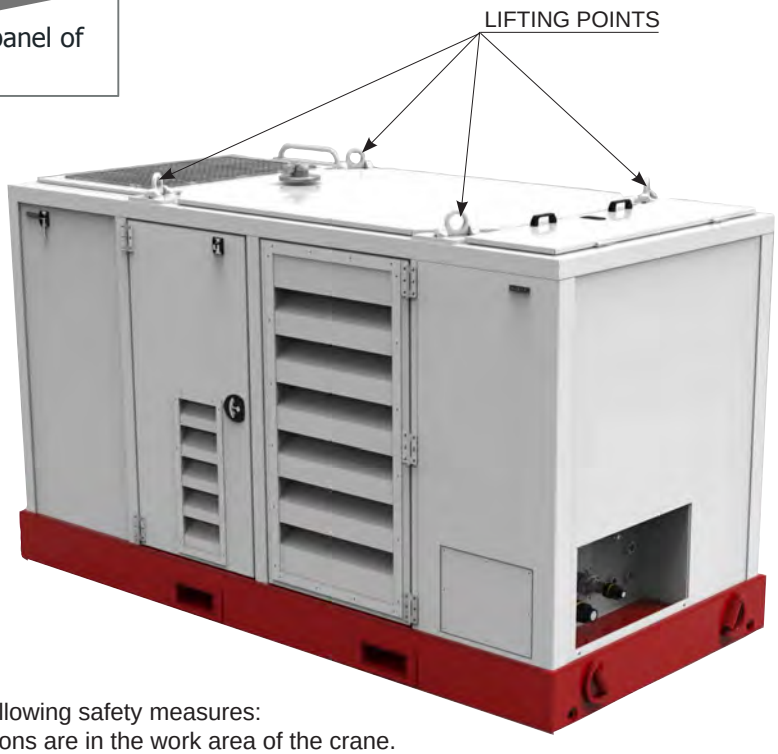
transportation and laying down power pack

General: consult the included Safety Guide before hoisting, transport and storage.



The "Safety Guide" can be found in the control panel of the power pack.

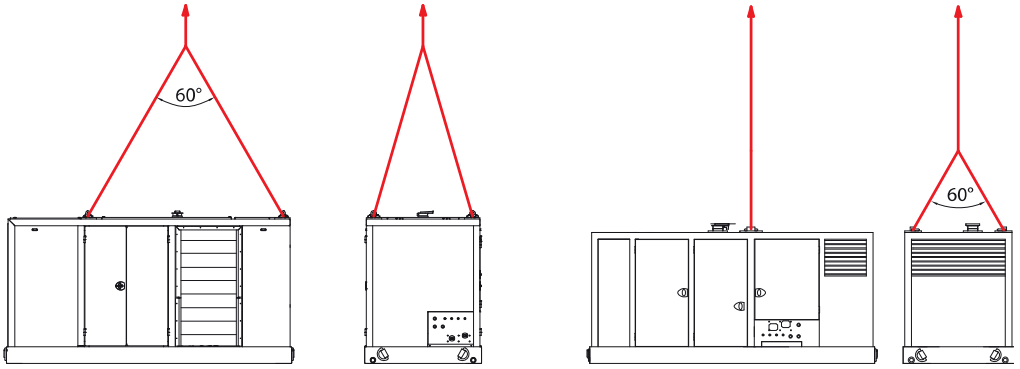
WEIGHT WITHOUT FUEL = 4,300 kg
WEIGHT FILLED UP = 4,700 kg



Hoisting
Before and during hoisting, take the following safety measures:
· Make sure that no unauthorised persons are in the work area of the crane.
· Do not stand directly under the boom, hook or lifted load. This is extremely dangerous.
· Always wear a hard hat, safety gloves and safety shoes.
· Power packs are covered by the same general safety regulations as crane loads.

With power packs, wire rope slings with a safety factor 5 must be used relative to the maximum lifting force.

Warning
The tensile strength of the hoisting cables must be sufficiently large. Cables that have not been supplied as a standard accessory with the power pack must have a safety factor 5 at least.
Fasten the sling to the hoisting points meant for that purpose. Use all of the hoisting points available.
Have one person operate the crane while another person gives directions and, if necessary, guides the power pack.



Use all hoisting points available.

how does the hammer work

The DCP Hydraulic Hammer consists of a ‘drop weight’ driven up and down by ‘hydraulic rams’ inside the ‘casing.’ The hydraulic ram is double acting which means the drop weight is accelerated both on the upstroke and on the downstroke. This gives the hammer its very efficient energy output and high blow rate.

The oil supplied to the hydraulic ram comes from the power pack via a ‘control valve’ mounted inside the top of the hammer. This control valve switches the oil supply on or off at the upstroke side of the hydraulic ram i.e. oil supply ‘on’ lifts the drop weight and oil supply ‘off’ drops it.

Dawson Construction Plant has developed an industry leading, robust and simple, electronic control system that constantly monitors the drop weight position. This constant monitoring allows the switching timing on the main hydraulic spool to be trended to continually optimise hammer performance throughout varying piling conditions.

With constant drop weight position monitoring, the velocity of the drop weight is also known, therefore energy output can be accurately measured and is displayed to the operator on the powerpack interface screen. This information can be recorded direct to a laptop via a Dawson software interface, and can be saved in standard spreadsheet formats, giving a blow by blow account of every pile driven and a day to day productivity record.

The main screen displays bar graphs showing hammer stroke & hydraulic oil temperature.

An Off Pile indicator confirms when the hammer is securely seated on the pile, and allows piling to commence.

There are numerical read outs showing blows per minute, energy per blow and total blows. The lower reading shows blows in LAP cycle. (Measuring blows per increment). The units can be changed from imperial to metric.

The history screen provides information on the total number of start ups / total hours / total blows and total energy through out the life of the hammer.

CONNECTING THE HYDRAULIC HOSES AND CONTROL PENDANT

(The power pack must be turned off at this time to enable correct installation of the hoses)

There are four hydraulic hoses running between the power pack and the hammer, viz:

1. Pressure line (1¼" BSP) carries the main high pressure oil supply to the hammer.
2. Return line (1½" BSP) returns low pressure oil from the hammer to the power pack.
3. Pilot Line (3/8" BSP)
4. Drain Line (3/8" BSP)

The pressure/return hoses have the same specification. However, the return hose ends have larger fittings than the pressure hose to avoid possible confusion. Similarly, pilot hoses have different end types. The hoses should be left connected to the hammer at all times – this reduces the likelihood of oil contamination and reduces leakage problems. The hoses should be connected/ disconnected at the outlets of the power pack. All these connectors are of the 'quick release' type. The hoses should be disconnected from the power pack when moving the power pack around to avoid straining the connectors.

Warning
Make sure that the connectors are thoroughly cleaned when making a connection

Having connected the hoses, next fit the hand control pendant connector block to the multipin outlet from the power pack. This is positioned below the instrumentation panel of the unit. Check that a clean connection is made and that no water is present in either half of the connection. The 'power' switch on the controller should be turned off.

Checking the power pack before starting

Having connected the hydraulic hoses and hand control pendant next check fluid levels on the power pack. Check:

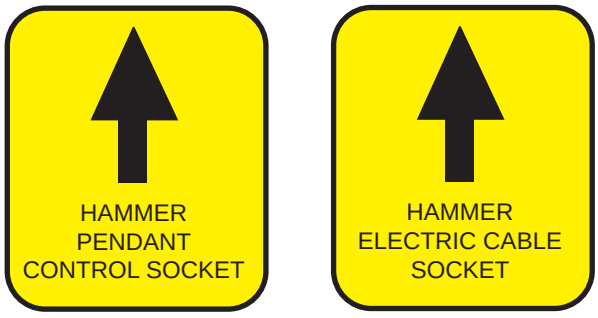
a. engine oil level
b. diesel fuel level
c. hydraulic oil level, and fill if required

Notes:

1. The diesel fuel and hydraulic oil tanks have sight gauges on the side of the tanks.

2. The power pack will not run if the hydraulic oil level is too low.

3. The hammer will not run if the hydraulic oil temperature is too low. The auto warm-up routine must be used to pre-warm the oil.



power pack instrumental panel

A	PRESSURE DISPLAY GAUGES
B	INTERFACE SCREEN
C	EMERGENCY STOP
D	POWER
E	HAND / AUTO
F	START
G	LOWER
H	RAISE
J	IDLE / RUN
K	LOCAL / REMOTE
L	HAMMER SOLENOID UP
M	HAMMER SOLENOID DOWN
N	OFF PILE

cont'd - power pack instrumental panel

MAIN PAGE

The left of the page contains an oil temperature bar display.
The 'M' button bottom left selects the Maintenance page.

The Reset button resets the adjacent blow counter.
The Lap button resets another blow counter and freezes the adjacent blow count, a second press of the Lap button unfreezes the adjacent display.

HISTORY PAGE

MAINTENANCE PAGE

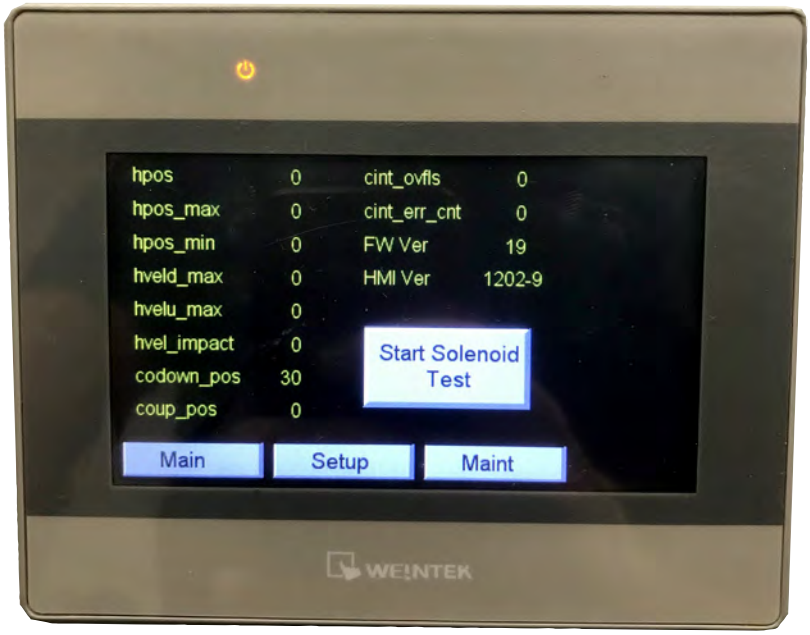
A password must be entered to allow access to the Config Page

cont'd - power pack instrumental panel

MIMIC PAGE

DIAG PAGE

All values on this page are in encoder pitch units (usually 6mm), velocities are pitch units per second.
Hpos = hammer current position
hpos_max = hammer maximum height during last blow
hpos_min = hammer minimum height during last blow
hveld_max = hammer downward velocity maximum during last blow
hvelu_max = hammer upwards velocity maximum during last blow
hvel_impact = hammer velocity on impact for last blow
codown_pos = hammer position when down valve was activated on last blow
coup_pos = hammer position when up valve was activated on last blow
cint_overflows = a count of errors where encoder edges occurred faster than the controller could process them, may indicate noisy or supurious encoder A and B signals.
enc_err_cnt = a count of events where encoder A and B edges occurred in an invalid sequence – more than 1 or 2 counts here indicates a problem with the encoder sensors. Not show above are are two numbers indicating HMI and controller firmware versions.



cont'd - power pack instrumental panel

CONFIG PAGE

The 'Load' button loads values from the VS1202. Touching a numeric value brings up a keypad allowing entry of a new value. The 'Save' button saves the current values to the VS1202 where (excepting Enc Pitch mm and Hmr Mass kg) they are used immediately. The 'Keep' button causes the values in the VS1202 to be saved to non-volatile memory.

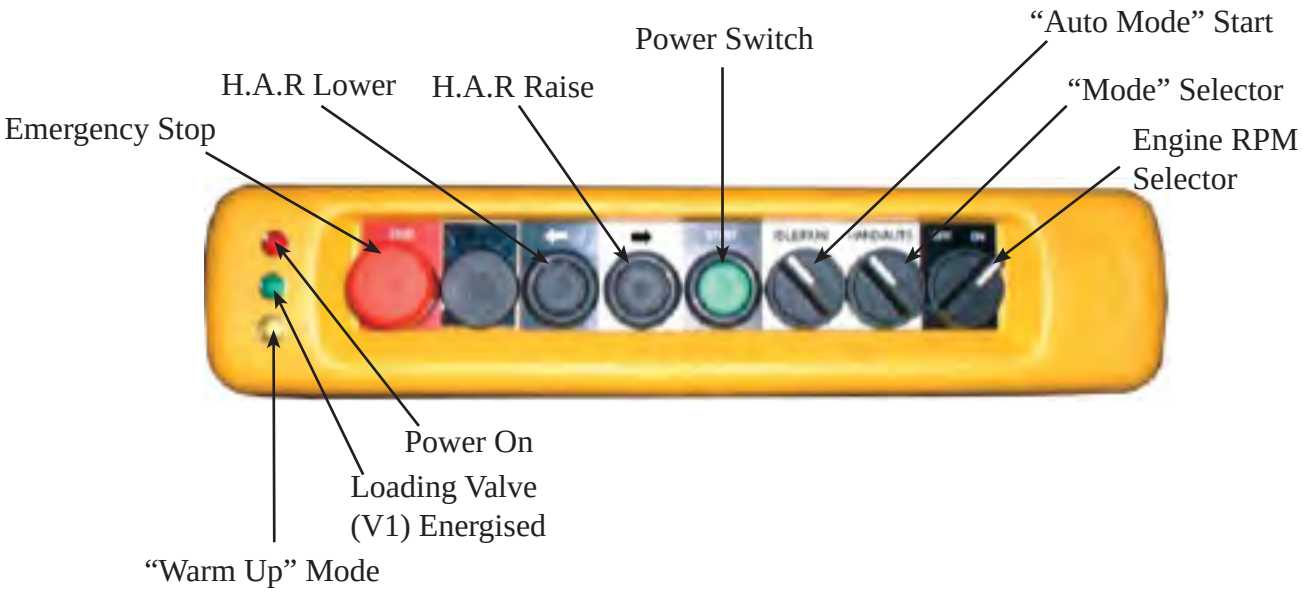
Enc Pitch mm = distance between each edge of the encoder, the pitch of the encoder holes is 4 times this value. Hammer positions are referenced to a zero datum which should be the lowest possible position of the drop weight.

Index Pos = position in encoder pitches where the index sensor transitions. This value effectively sets the zero datum position.

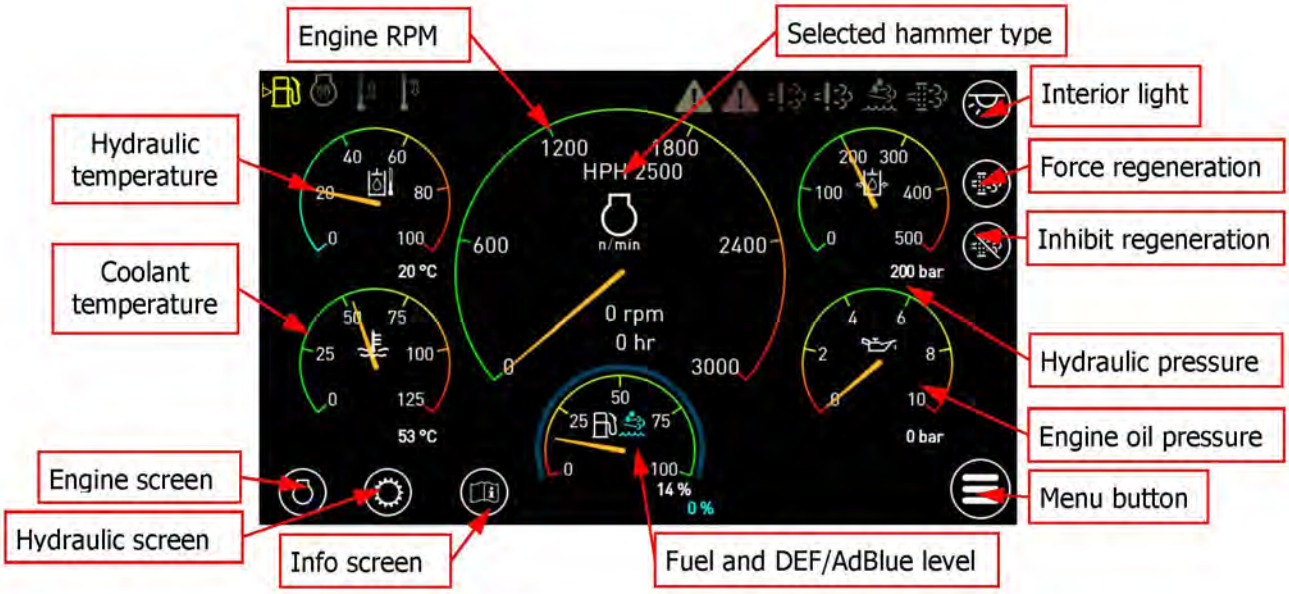
Impact Pos = position where drop weight impacts the pile, this is used predict when impact will occur and sets the bottom stroke limit for % stroke display.

Top Limit = maximum allowable height for the drop weight. The system automatically decreases stroke if the drop weight gets within 2 encoder pitches of this limit. Hmr Mass kg = drop weight mass used to calculate blow energy. UV Op Time ms = This value sets a notional time change over of the shuttle valve to the upwards direction. When the drop weight is falling the system will activate the up valve when it predicts impact will occur within this time value. This value is important, too high and the drop weight will be decelerating before impact, too low and speed will be reduced, much too low and the drop weight will drive into the pile causing the hammer to lift. DV Op Time ms = this value is currently unused.

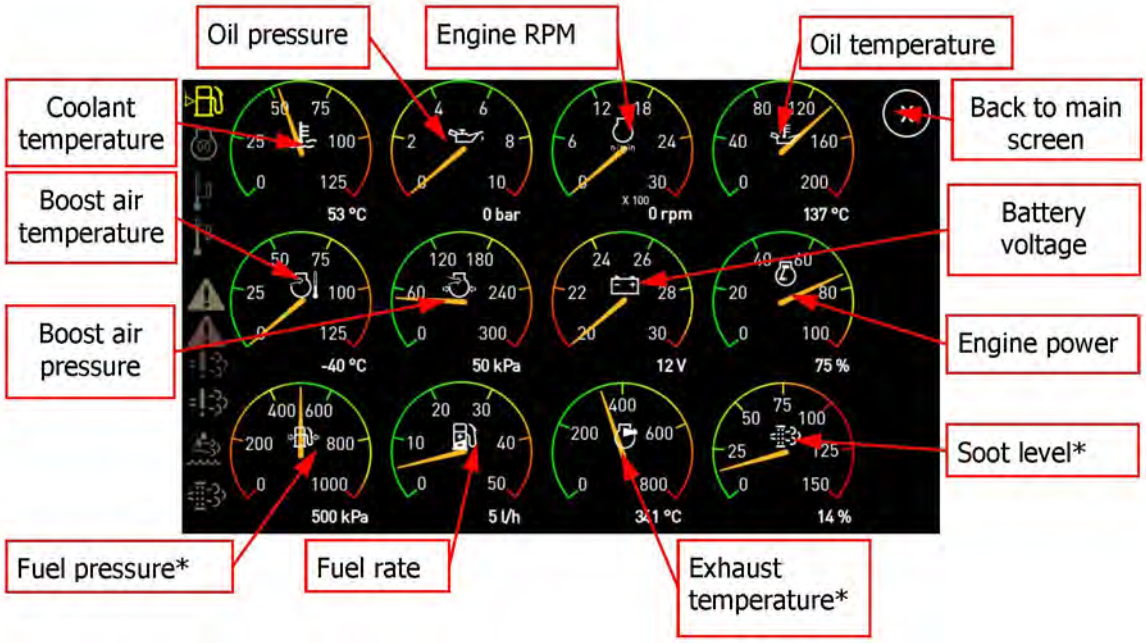
The 4 'Oil' values set the temperature sensor lower and upper limit temperatures and the high and low oil temperature thresholds (all in degrees C).



Main Screen

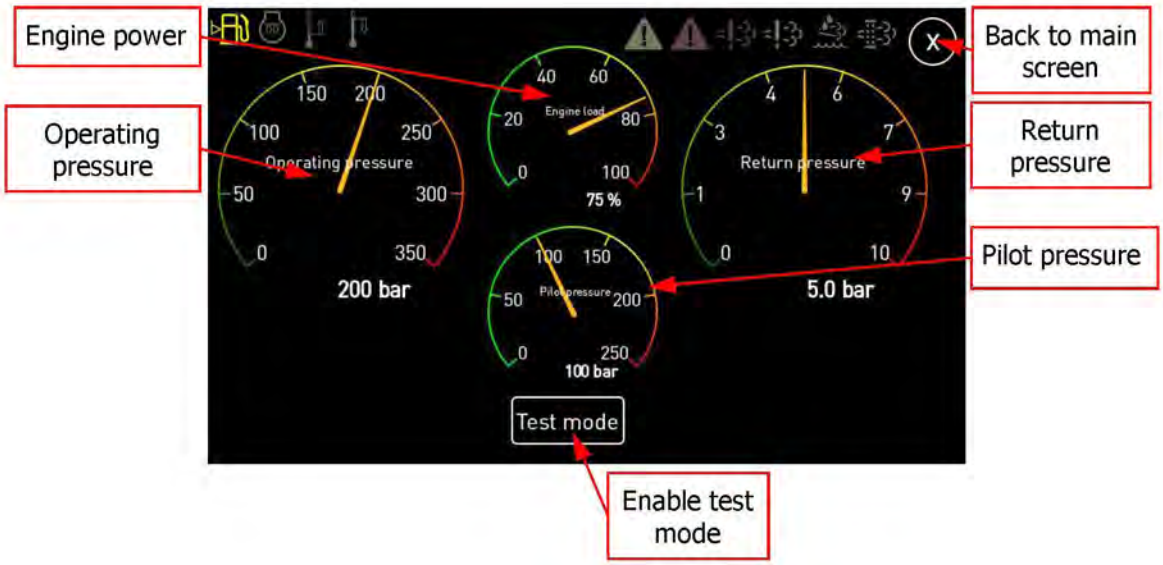


Engine Screen



Remark, gauges marked with * are only visible when data is present.

Hammer Screen



Info Screen

Remove travel bolt before installing hammer on the pile

Installing hammer on the pile

The hammer must be sat correctly on the pile to avoid hammer or pile damage. The pile tops should be as level and square cut as possible. The hammer anvil must be in good condition.

Lift the hammer onto the pile(s) to be driven. Lower the hammer down until the handling slings lose their tension. At this point, the anvil should be seated correctly i.e. the rubber ring around the anvil should be compressed between the casing and the anvil. If it is not and there is a gap here, re-site the hammer.

Note: Before using the hammer (and particularly after transportation) check that the dolly is fitted correctly in the anvil.

Bleeding air from the hammer hydraulic system - only required when running hammer after initial connection or following a repair.

When running the hammer for the first time after initial connection to the power pack, there will be air in the hydraulic system. The hammer will 'bleed' this air automatically but the following procedure must be applied:

a. Turn rpm to "Fast"

b. Turn on the control pendant 'power' button.

c. If f the hammer has been stopped for more than 1 min, then it will start at minimum stroke. If stopped for less than 1min then stroke will be the same as when stopped.

d. Set the 'Auto/Man' turn button to 'Man.'

e. Hold the 'start' push button down for 4-5 seconds.

f. Repeat (e) three or four times until the hammer consistently gives one or two small blows each time. Providing the hammer does not 'jump' on the pile, hold the 'start' push button down, so that the hammer gives several consistent blows, on the next operation. (Approximately 120 blows per minute.) If the hammer 'jumps' on the pile, because the drop weight is hitting the top of the hammer casing, the hammer will stop automatically.

g. Commence the piling operation using the hammer as required.

Pile driving with the hammer

Having the hammer sited on the pile and removed air from the hydraulic system (if necessary) as described above, the hammer is ready for pile driving:

a. Increase the power pack engine speed to 2200 rpm (having followed - "Starting the power pack" section)

b. Turn the hand control pendant 'power' button on.

c. If the hammer stops for more than one minute, then it will start from the minimum stroke but if it stops for less than one minute, then it will resume to the stroke setting when it stopped.

d. Set the ‘Auto/Man’ selector button to the required position:

‘Auto’ - hammer will continue running automatically when the ‘start’ push button is pressed once.
‘Man’ - hammer will only run whilst the ‘start’ push button is held down.

e. Depress the ‘start’ push button as required by ‘Auto/Man.’

f. During operation the hammer stroke may be altered using the ‘raise’ or ‘lower’ push buttons to adjust the stroke height indicator.

g. To stop the hammer whilst it is running on ‘Auto,’ turn the ‘Auto/Man’ selector to ‘Man’ or turn the ‘power’ selector off. It is good practice to start piling with the hammer set on minimum stroke, this limits unnecessary damage to both the hammer and the pile when the pile can be driven easily. The stroke may then be adjusted to suit the changing driving resistance.

On certain piling jobs, it may be possible to start driving on pairs of sheet piles, changing over onto a single sheet pile as the driving resistance increases (this will give maximum productivity.

Starting from cold
When the hammer is cold, only run the hammer on minimum stroke for the first 5 minutes to allow the cold oil in the hoses to be purged and the hammer to fully warm up.

Refusal

Piling must stop with this hammer when the rate of driving reaches 10 blows per 25 mm!

Continued use will result in hammer and/or pile damage

Using the hammer underwater
It is possible to drive piles with this hammer underwater. However, the hammer must be prepared correctly in order to do so - it can not be used underwater in standard format.

The work involved is briefly as follows:

a) Additional O-Rings must be fitted to prevent water ingress.

b) The insides of the hammer should be suitably greased to minimise the effects of corrosion.

c) A threaded compressed airline port must be added in the bottom end of the hammer casing or leg guide.

d) The hammer must be run in conjunction with a 35/70 c.f.m. (100 psi) air compressor.

e) The hammer grease nipples must be greased after every pile drive to ensure ample lubrication.

NOTE: FOR DETAILED ASSISTANCE WITH THIS TYPE OF WORK PLEASE CONTACT THE MANUFACTURER.

Wider or special pile sections

The CRH5000 hammer in standard format will drive a considerable range of steel piles. In some applications, however, where sheet piles are particularly wide or perhaps boxed together it is possible to use simple leg insert modifications and/or spreader plates to give improved pile coverage reducing pile head stress and improving productivity rates.

The standard leg inserts can have “wing extensions” bolted on to correctly centralise the hammer on a single sheet pile. Then either a special anvil can be used to give wider coverage, or, by dropping the inserts to a lower set of location holes, a ‘spreader plate’ can be added below the standard anvil to give improved pile coverage. This is a tried and tested technique (see figure 3).

With tubular piles, for example, the standard inserts can be removed and in place some simple bolt on plates added to centralise the hammer on the tube (see figure 4). A further refinement, if necessary, is to weld a ring onto the underside of the anvil to give correct location on the tube.

PLEASE CONTACT THE MANUFACTURER IF YOU HAVE A SPECIFIC PILE DRIVING PROBLEM - IT MAY HAVE BEEN DONE BEFORE!

PREVENTATIVE MAINTENANCE GUIDELINES FOR CRH5000 HYDRAULC HAMMERS, AND DIESEL ENGINED POWER PACKS

	DAILY OR REFUELLING	EVERY 125 HOURS	EVERY 250 HOURS	EVERY 500 HOURS	EVERY 1000 HOURS	EVERY 2000 HOURS
ENGINE	CHECK: . OIL LEVEL . COOLANT LEVEL . FAN - INSPECTION . DRIVE BELT - INSPECT . FUEL WATER TRAP - DRAIN		CHANGE: . LUBE OIL . LUBE FILTER CHECK: . AIR CLEANER . INTAKE SYSTEM . CHARGE AIR COOLER	CHANGE: . FUEL FILTER CHECK: . ANTI FREEZE	ADJUST: . VALVE LASH CLEARANCE CHECK: . FAN HUB . BELT TENSIONER BEARING . BELT TENSION	CHANGE: . ANTI FREEZE CHECK: . DAMPER
POWER PACK	CHECK: . HYDRAULIC OIL LEVEL . AIR INLET/OUTLETS FREE FROM OBSTRUCTION . CONDITION OF LIFTING POINTS & SLINGS/ SHACKLES . TEST DIAGNOSTIC LEDS . INSPECT GAUGES . CONDITION OF QUICK RELEASE COUPLINGS	CHECK: . FOR HYDRAULIC OIL LEAKS & RECTIFY . CONDITION OF HOSES . TIGHTNESS OF FASTENERS . CONDITION OF PAINTWORK . BATTERY WATER LEVEL . FUNCTION OF PENDANT & CONDITION OF CABLE	CHECK: . BATTERY CHARGING CHANGE: . HYDRAULIC OIL/FUEL FILLER FILTERS	CHECK: . PRESSURE OUTPUT OF PUMP . FLOW OUTPUT OF PUMP CHANGE: . PRESSURE/RETURN HYDRAULIC FILTERS	CHECK: . CONDITION OF WIRING . DRIVE COUPLING FOR WEAR . CONDITION OF EXHAUST CHANGE: . HYDRAULIC OIL AND CLEAN OUT SYSTEM	
		TEST RUN ON PILE 15 MINUTES BEFORE AND AFTER CHECKING	TEST RUN ON PILE 15 MINUTES BEFORE AND AFTER CHECKING	TEST RUN ON PILE 30 MINUTES BEFORE AND AFTER CHECKING	TEST RUN ON PILE 30 MINUTES BEFORE AND AFTER CHECKING	TEST RUN ON PILE 30 MINUTES BEFORE AND AFTER CHECKING

(FOR FULL DETAILS SEE SECTIONS IN THE DCP HAMMER MANUAL AND THE DIESEKO SERVICE MANUAL)

Daily maintenance checks (or every 10 hours):

a. Apply lithium-based general purpose grease to the hammer through each one of five grease points (part 1-057-00-01). Six operations of a grease gun on each grease point before every shift will be adequate.

b. Check all external fasteners for tightness and re-tighten where necessary.

c. Check the condition of lifting tackle and lifting points prior to being taken into service.

Service intervals:

In addition to the daily maintenance checks described above, the service intervals described in the table below must be adhered to:

Part No.	Description	Inspect / Replace	Frequency (blows)
	Full manufacturer's service Checks & replacements as required for the following parts: Piston & Rod Seals; Dolly; Anvil; Valve Block components; Buffers (Damper & Valve Block); Cables (continuity checks); Leg Inserts; Proximity Sensors; Suspension Rings; Proximity Location Key Slides; Accumulators	Inspect / Replace	750,000
50-009-05-01	Ram Damper Buffers	Replace	500,000
6-006-20-01	Dolly	Inspect	
6-005-20-01	Anvil	Inspect	
45-600-03-01	Leg Inserts	Inspect	
45-600-04-01			
45-600-05-01			
45-600-06-01			
25-031-02-01	Proximity Location Key Slides	Replace	250,000
6-024-30-01	Suspension Rings	Inspect	

Important: Parts must be replaced if showing signs of significant wear during inspection. If unsure, consult DCP.

Additional notes:

To inspect the Dolly, remove the lower pins that retain the leg guides & rotate to release the Spreader Plate. To replace the Dolly, insert a steel bar through one of the holes in the bottom of the Anvil (6-005-20-01) and drive the old Dolly out using a hammer. Insert a new Dolly (complete with O-Ring 6-089-00-01) ensuring that it is pushed fully home.

When checking the condition of Leg Inserts, the inner faces of each insert should touch the opposite insert. If not, the wear faces may require building up with hard facing.

To replace the Proximity Location Key Slides, the Wire Guide Tube must first be raised so it no longer engages the proximity housing. To raise the tube, remove its bolts via access through the hammer's access cover. The tube must be unseated by at least 125 mm (5"). The proximity housing can then be removed and the slides can be replaced.

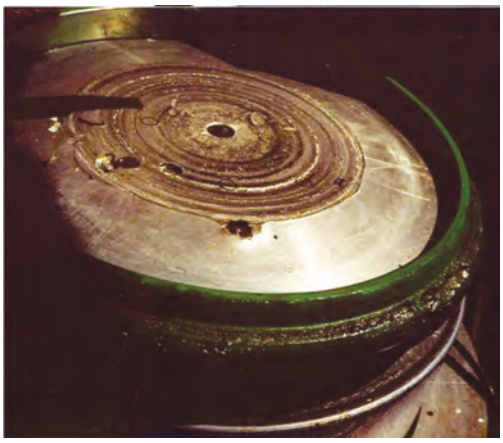
The Suspension Rings must be in good condition at all times. These parts act as the hammers 'suspension system', reducing the shock transmitted from the blows to the hammer and its components. They are very important for keeping the hammer functioning correctly.

Accumulator pressures:

The accumulator pressures will be checked & adjusted as necessary during any manufacturer's service. The factory precharge pressures on the accumulators are:

High pressure: 120 bar
Low pressure: 5 bar

FIG. 4.1

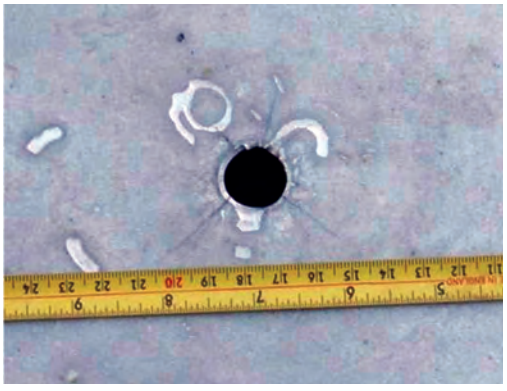


Debris embedded in dolly, remove debris and continue.

Severely cracked 6500 dolly should be replaced.

Overworked 6500 dolly stuck in anvil body, must be replaced or it can cause the anvil body to break.

If dolly is not replaced when it has been overworked, the anvil body can break due to expansion of dolly material.



4500 dolly starting to show signs of cracks after 150hrs of piling. OK but if cracks extend to the outer edge or the underside of the dolly, it must be changed.

View showing underside of 4500 dolly after 150 hrs of work.
No signs of cracking. OK.

BEFORE PERFORMING MAINTENANCE

- Stop the power pack and allow any oil pressure to depressurise.
- Remove the ignition keys from the ignition.

Wear protective clothing, gloves and safety goggles during maintenance activities on the power pack.
Be careful when using metal tools in the surrounding of the battery in connection with sparks and danger of explosion.

Danger
All maintenance activities must be performed by qualified and authorised staff only.
With the exception of visual inspections, all maintenance activities have to be performed when the diesel engine is not running.
Always make sure that the main switch is “off”.
Place a warning sign with “do not operate” by the main switch.

SAFETY

Warning
Most accidents with machines occur during maintenance and repair activities. For this reason, observe the following safety regulations carefully.

Warning
Hydraulic oil is toxic. Wear safety goggles and gloves.

Warning
Be careful when tracking down leaks if the system is still pressurised. Pressurised oil, water or air can penetrate under the skin and cause injury or infections.

Warning
First aid with battery acid in eyes: Rinse the eyes plentiful with clean water and consult a doctor.

Warning
Battery gas is explosive. Never use an open flame when checking the acid level.

DAILY AND PERIODIC MAINTENANCE

Preventive maintenance means performing maintenance activities in order to keep the power pack running without malfunctions. The maintenance activities can be divided into daily and periodic maintenance.

The daily maintenance should be performed before the working activities are started. The daily maintenance must be performed by the user/owner of the power pack.

The periodic maintenance must be performed after a specific number of operating hours. In order to establish the number of operating hours, the DCP power packs are equipped with an hour counter. If the power pack is not equipped with an hour counter, the hours must be logged by the user. It is also the users task to maintain an overview of the maintenance activities performed per periodic service. The periodic maintenance may be performed by DCP staff or by the user/owner.

Lubrication is essential to the system and, to a large degree, determines the lifetime of both the power pack and the machine driven by it. It is therefore important that the instructions regarding the types of oil and replacement intervals should be followed precisely.

Caution:
During repairs or maintenance, prevent dust, water and air from penetrating the lubricants and the system. Therefore, clean all quick couplings, fittings, caps, filter caps, oil level plugs and the adjoining surfaces prior to the maintenance.

SERVICE INTERVAL

If the power pack is equipped with IQAN and the warning sign for maintenance appears in the display, contact DCP or your nearest DCP representative for a service appointment or for more information.

If the power pack is not equipped with an IQAN, then the power pack is equipped with an hour counter. The periodic maintenance is performed according to the number of operating hours on this hour counter.
The type of maintenance, oil change, filters and the preventative replacement of worn parts is included in the service interval schedule in the parts catalogue.

For all service and maintenance information regarding the diesel engine, see the “Operation and Maintenance Manual” of the diesel engine supplier.

SERVICE INTERVAL SCHEDULE

This schedule is leading for the maintenance activities that must be performed on the power pack. This chapter also contains a logbook form to record the maintenance intervals. DCP advises to keep the following updated in the log:

- The number of operating hours
- Maintenance performed
- Any particularities

Warning
Special maintenance may only be performed by qualified staff of DCP or by a certified dealer recommended by DCP who will follow all safety instructions and maintenance periods to the letter.

Warning
Regular maintenance increases the lifetime and the reliability of the power pack and is essential for the safety of the user and possible bystanders.
Make sure the machine has cooled down, the work area is safe and clean and the hydraulic system depressurised before starting the maintenance activities. Place a warning sign with “do not operate” at the earth switch.
Turn off the earth switch prior to maintenance activities on the electrical system.

DAILY MAINTENANCE

DCP strongly advises performing a number of preventative checks before beginning activities:

1. Before starting, check:

Engine:

- Check the service indicator of the air filter.
- Check the motor oil level.
- Inspect the water separator of the fuel filter. Tap off water, if necessary.
- Check for leaks and loose connections.
- Check the oil level.

Other parts:

- Clean the bottom plate of the power pack.
- Inspect the hydraulic system for leaks.
- Perform a visual check of all couplings and hoses for signs of damage or cuts.
- Make sure all connections are fastened securely, especially the quick couplings.
- Check the oil level of the hydraulic tank on the level gauge (must be between the min. and max. indication).
- Whether the locks on the doors work correctly.
- Whether the doors open and close without sticking.
- Whether the rain cover on the exhaust opens and closes without any problems.

Coolant:

- Check the level of the coolant in the radiator (engine must be cool).
- The frost protection.
- Other regulations of the diesel engine manufacturer.

2. While running idle, check the diesel engine:
Follow the starting procedure on the inside of the control panel before starting the engine. Allow the motor to idle for approximately 5 minutes and check:

- Whether there are any oil or coolant leaks.
- Whether the hydraulic hoses are fastened properly.
- The contaminant detectors of the oil filters in the hydraulic system (contaminant detectors may not disengage above 40oC).
- The operation of the emergency stop (the engine should stop immediately).
- Restart the engine, following the starting procedures.

3. Checks of the power pack during working conditions:
While running, check the system of the power pack for:

- The working pressure: Consult the specification page in the user manual for the values of working pressures.
- The clamp pressure: Consult the specification page in the user manual for the values of clamp pressures.
- The Variable Moment (VM) or Resonance Free (RF) adjustable pressure, if applicable. For values, see the hydraulic schedule elsewhere in the user manual.
- Aberrant noises, vibrations, temperature differences and leaks.

4. Checking remote control
If the power pack is equipped with a remote control, check:

- If contact block of electrical plug of the remote control as well as the contact block of the control panel are in good condition.
- Whether the buttons/switches on the remote control are clean (dirt can influence its operation!).
- Whether the button/switch for “clamp open” turns back in neutral position.
- Whether the emergency stop button is not activated by turning it clockwise.

MAINTENANCE SCHEDULE

The maintenance schedule is a separate document in this user manual. It also contains a logbook form to record the maintenance intervals and the results of the oil analyses. DCP advises to keep the following updated in the log:

- Operating hours
- Maintenance performed
- Oil analyses performed and their results
- Maintenance must be performed according to the maintenance schedule.

SEVERE CONDITIONS

The service intervals are based on normal operating conditions. Operation under severe or unusual circumstances will require some modifications to the maintenance periods.

Warning
For conditions such as extreme cold or extreme heat, consult your supplier.

When operating in air with lots of salt or moisture, the maintenance periods do not have to change much. The unit must, however, be inspected weekly to determine whether additional maintenance is required. Have the hydraulic oil checked each quarter as well.

For longer periods of inactivity, the diesel engine must be started at least once a week and allowed to run idle until it is warmed up properly.

DRAINING AND FILLING THE HYDRAULIC TANK

- The hydraulic tank can be drained by removing a plug at the bottom of the tank.
- The hydraulic tank can be filled by means of a hand pump. All oil that is pumped to the hydraulic tank goes through the return valve to guarantee that no contaminants enter the hydraulic system. For the precise location of the hydraulic pump, see the parts catalogue.

FILLING VOLUMES

The filling volumes of the engine oil, diesel oil and hydraulic oil can be found in the parts catalogue, the data sheet or the diesel engine manual.

RECOMMENDED FLUIDS

Use under different environmental temperatures

The table below lists the fluids recommended by DCP. The power pack is filled with these fluids when delivered from the factory. During the warranty period, only these fluids must be used.

It is possible to use the power pack under different outdoor temperatures. However, the power pack must then comply with the correct conditions in order to avoid being damaged. When circumstances are not normal, this must be watched carefully. In these events, a different type of oil must be used. Other modifications may also have to be performed for a correct and safe operation of the machines.

Always contact DCP when working in areas with an environmental temperature below -25°C!

Specifications	Physical and Chemical Properties
Physical State	Oily liquid
Colour	Light yellow
Appearance	Bright & clear
Odour	Characteristic
pH	Neutral
Boiling Range, °C	Initial boiling point (oil base) > 200
Melting Point, °C	< -30
Flash Point, °C	246 (ASTM D92, COC)
Autoflammability/Ignition, °C	> 400 (oil base)
Upper Explosion Limit	Not known
Lower Explosion Limit	Not known
Vapour Pressure, 20° C,kPa	< 0.1 (oil base)
Viscosity, Kinematic , 40 °C, mm²/s	Ca. 46
Relative Density, 15 °	0.90-0.92
Water Solubility	Not soluble
Partition Coefficient, n-octano/water	Not known

cont’d - power pack maintenance

HYDRAULIC OIL

New power packs are filled with hydraulic oil Q8 Holbein Eco 46, unless otherwise specified. Always check the label in the power pack for the correct type of oil.

If the use of another type or brand of hydraulic oil is desired, contact DCP.

SEVERE CONDITIONS

- Engine: see the “Operation and Maintenance Manual” of the diesel engine manufacturer
- Hydraulic system: contact DCP.

Danger
Never weld on the diesel tank in connection with the danger of explosion. The diesel tank is integrated into the tubular frame of the power pack.

Danger
Never weld on the hydraulic tank in connection with the danger of explosion.

The hydraulic tank is coated on the inside. Welding on the tank and the thereby released heat will damage the tank coat paint. The paint is released into the hydraulic system, which could result in pump damage.

FILTERS, BELTS, OTHER WEARING PARTS

For the wearing parts, see the maintenance schedule.

TIGHTENING TORQUES FOR BOLTS

For each bolt on the power pack, there is a specific tightening torque. If one of these bolts is replaced, a tightening torque should be observed for it. Look at the tables for the correct values.

Tightening torques for UNC bolts with coarse thread

		Tightening torques [Nm]		
Diameter	Thread	Class	Class	Class
[inch]	[mm]	8.8	10.9	12.9
1/4"	1.270	10	14	17
5/16"	1.411	20	30	35
3/8"	1.588	35	55	65
7/16"	1.814	60	85	100
1/2"	1.954	90	130	155
5/8"	2.309	180	250	300
3/4"	2.450	310	435	520
7/8"	2.822	515	725	865
1"	3.175	775	1050	1300
1 1/4"	3.628	1500	2150	2600
1 1/2"	4.233	2650	3500	3500

Tightening torques for UNF bolts with fine thread

		Tightening torques [Nm]		
Diameter	Thread	class	class	class
[inch]	[mm]	8.8	10.9	12.9
1 1/8"x12	2.117	1250	1700	2050
1 1/4"x12	2.117	1700	2400	2850

Tightening torques for metric bolts with coarse thread

		Tightening torques [Nm]		
Diameter	Thread	Class	Class	Class
[mm]	[mm]	8.8	10.9	12.9
M6	1.00	10	14	16
M8	1.25	25	35	40
M10	1.50	45	65	80
M12	1.75	80	110	130
M14	2.00	125	180	210
M16	2.00	200	280	330
M18	2.50	275	390	465
M20	2.50	390	540	650
M22	2.50	520	735	880
M24	3.00	670	940	1125
M27	3.00	965	1350	1600
M30	3.50	1300	1850	2200
M33	3.50	1750	2600	3150
M36	4.00	2300	3350	3500
M39	4.00	2950	3400	3500

Tightening torques for metric bolts with fine thread

		Tightening torques [Nm]		
Diameter	Thread	Class	Class	Class
[mm]	[mm]	8.8	10.9	12.9
M16	1.50	220	310	370
M20	1.50	440	620	750
M24	2.00	750	1050	1250
M30	2.00	1503	2100	2500
M36	3.00	2536	3500	3500

Danger
All repair work must be performed by qualified and authorised staff only. All repair work is to be performed while the diesel engine is not running. Make sure that the main switch is turned “off”. Place a warning sign with do not operate at the main switch.

SAFETY

Before beginning with maintenance:

- Stop the machine and allow any oil pressure to depressurise.
- Remove the ignition keys from the ignition.
- Remove the negative pole of the battery before starting work on the electrical system.
- Be careful when using metal tools in the surrounding of the battery (sparks).
- Wear gloves and safety goggles when checking the batteries.
- For repairs to the diesel engine, consult the appended maintenance instructions of the diesel engine manufacturer.

Warning
Most accidents with machines occur during maintenance and during repair activities. For this reason, observe the following safety regulations carefully.

Warning
Hydraulic oil is toxic. Wear safety goggles and gloves.

Warning
Be careful when tracking down leaks if the system is still pressurised. Pressurised oil, water or air can penetrate under the skin and cause injury or infections.

Warning
First aid with battery acid in eyes: Rinse the eyes plentyful with clean water and consult a doctor.

Warning
Battery gas is explosive. Never use a flame when checking the acid level.

Warning
Beware of entrapment when repairing moving parts.

Caution
Always handle heavy parts with a sufficient number of people.

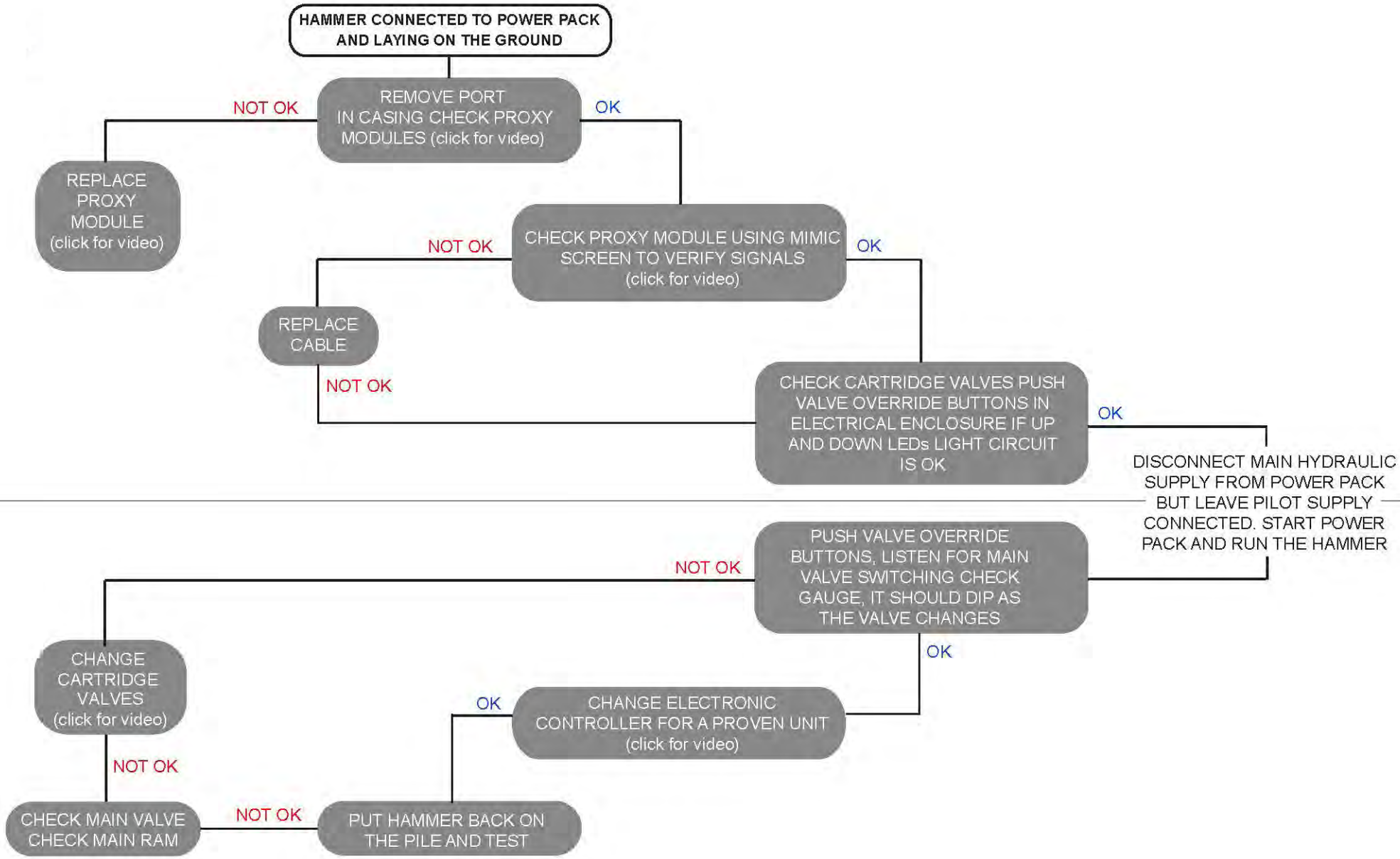
GENERAL

To perform a repair on your system, knowledge of the matters below must be available.

- Mechanical systems
- Hydraulic systems
- Electrical systems

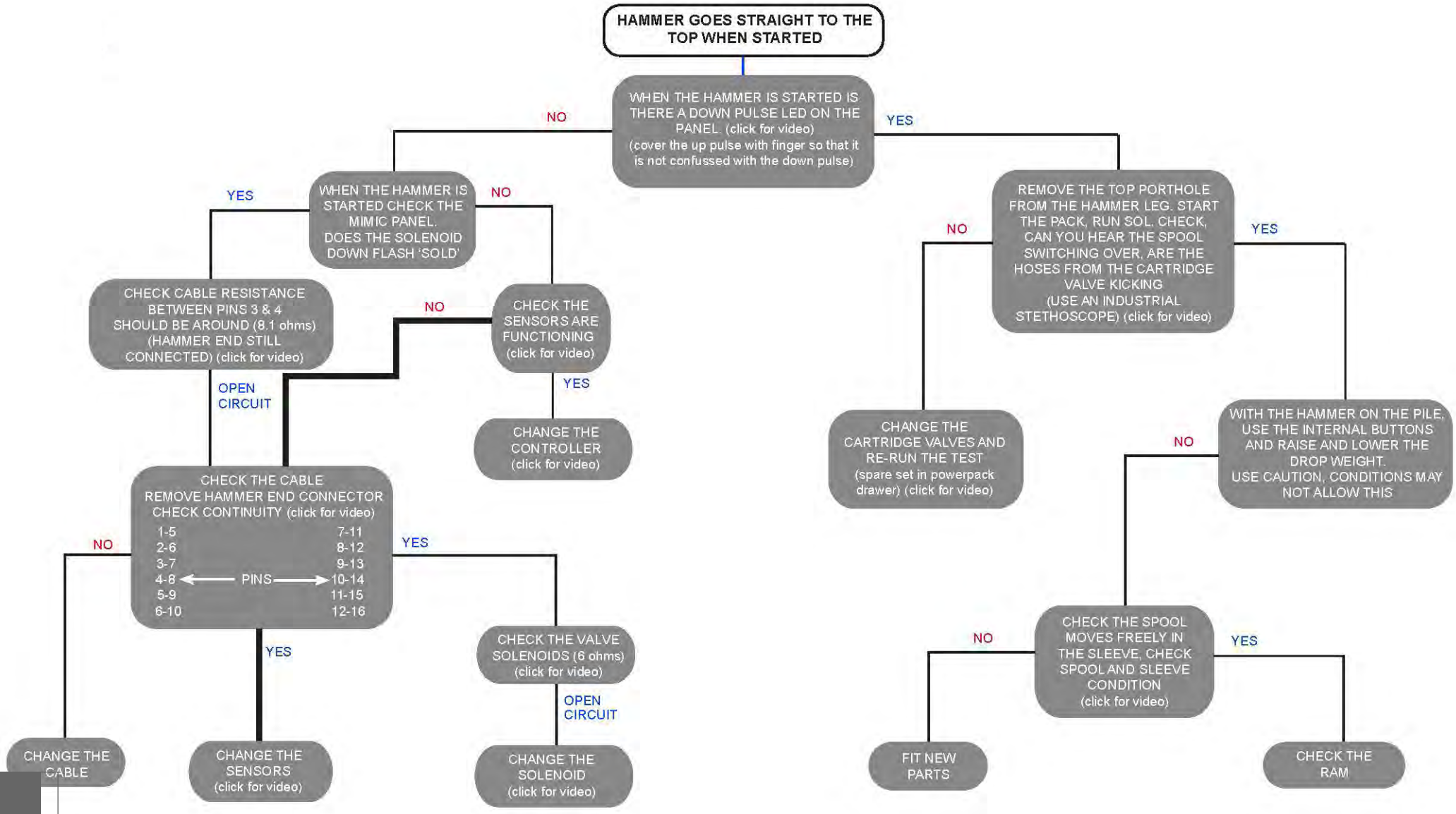
FAULT FINDING CHART FOR ELECTRIC HAMMER

FAULT = HAMMER DOES NOT RUN ASSUMING THAT THE POWER PACK IS DELIVERING OIL (CHECK GAUGES)

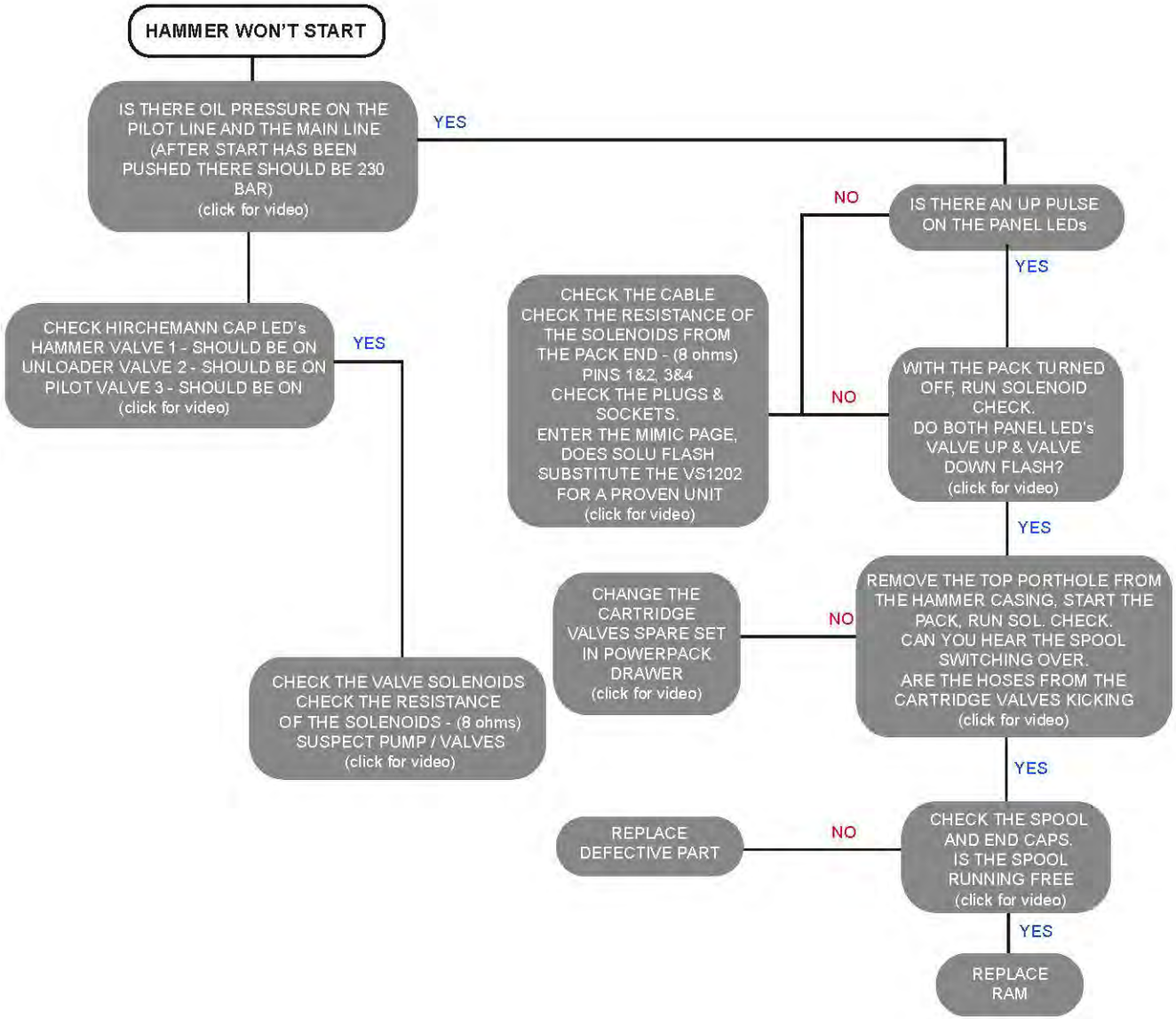


FAULT FINDING CHART FOR ELECTRIC HAMMER

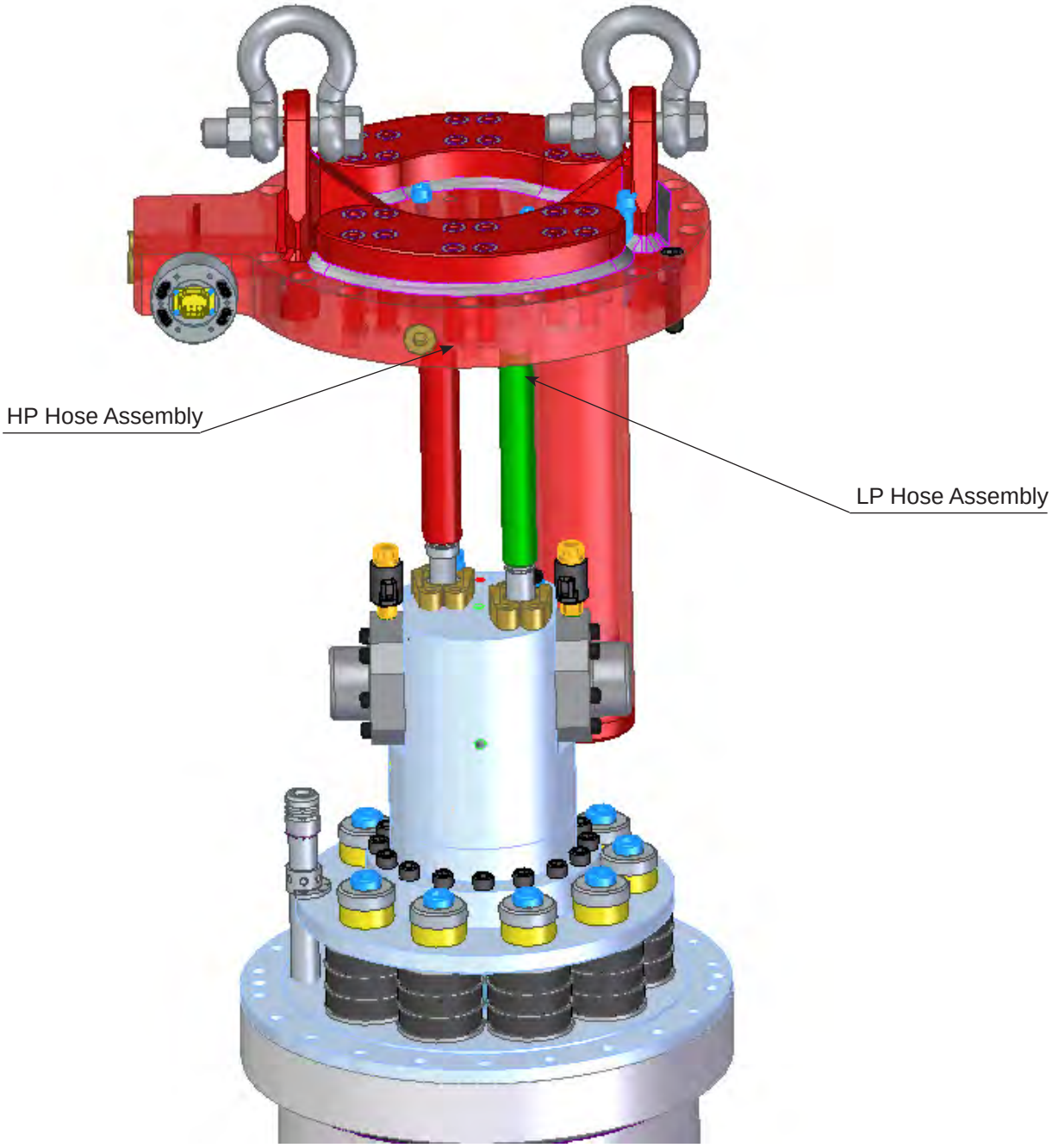
FAULT = HAMMER DOES NOT RUN ASSUMING THAT THE POWER PACK IS DELIVERING OIL (CHECK GAUGES)



FAULT FINDING CHART FOR ELECTRIC HAMMER



hydraulic hose details for CRH5000



APPENDIX 7.4 **DHP1688 Power Pack - Parts List**

Please refer to Power pack manual for full details

Hydraulic Circuit

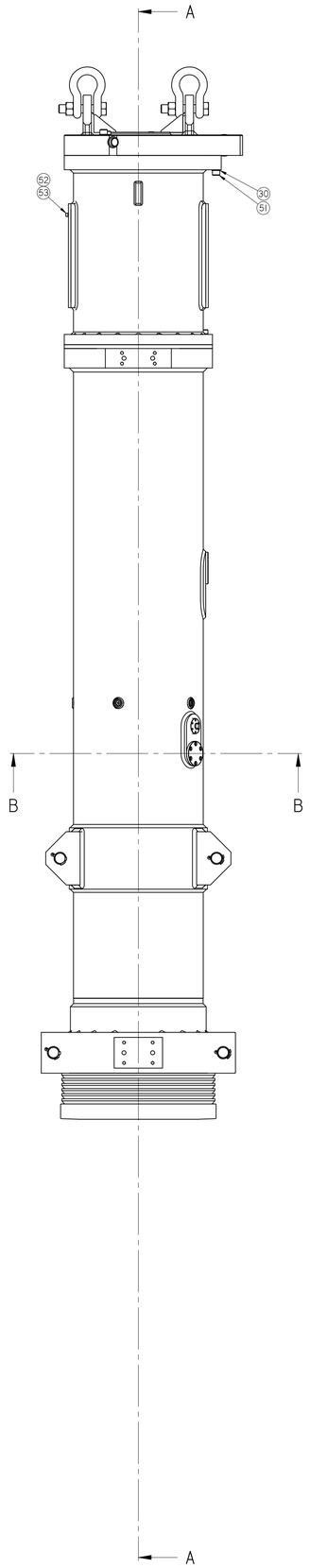
Electrical Circuit

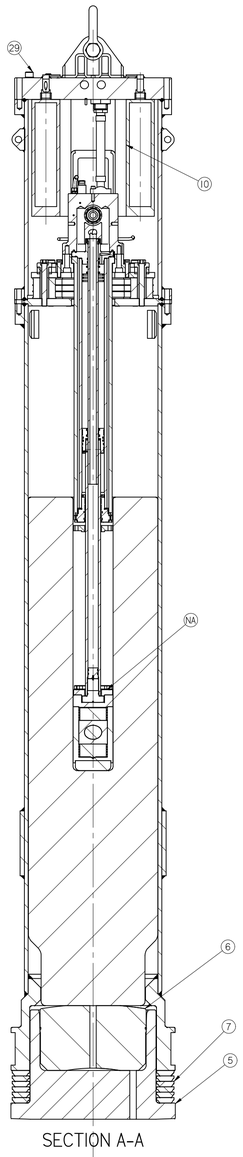
Engine Type

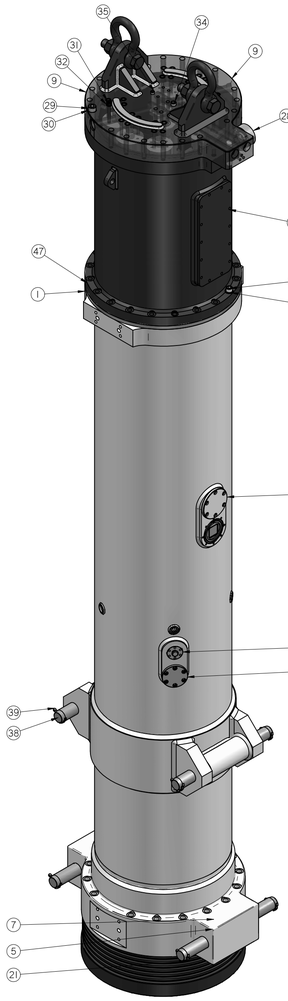
drawings & schematics

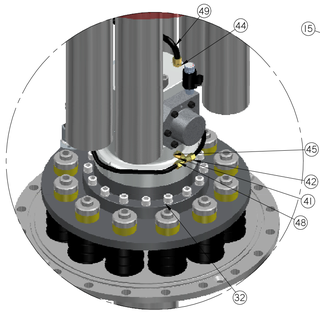
3RD ANGLE

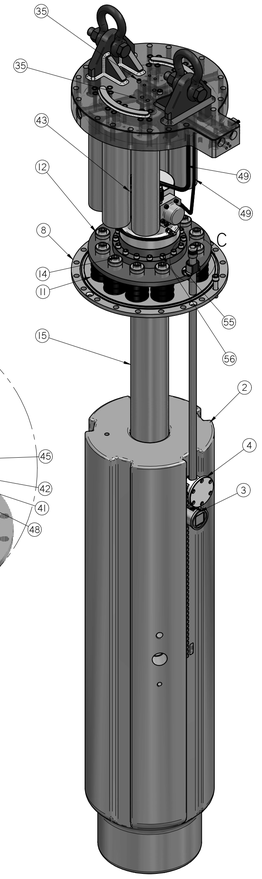
Rt.nr	Qnt.	Revision	Date	Intro.	Appr.by
C		NEW RAM SEAL DESIGN	13/09/23	MDB	

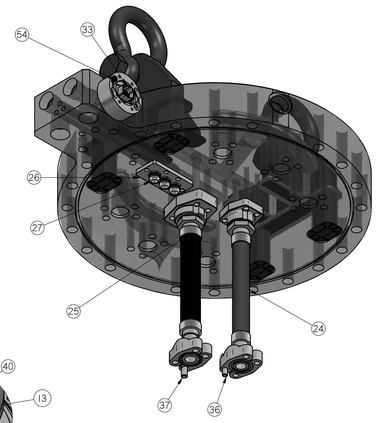


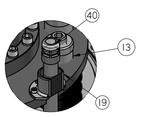


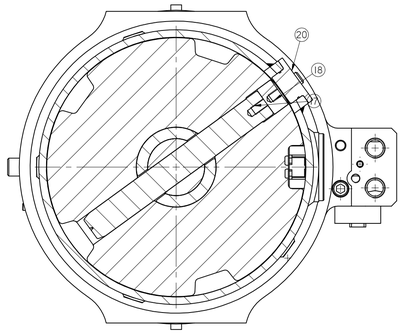












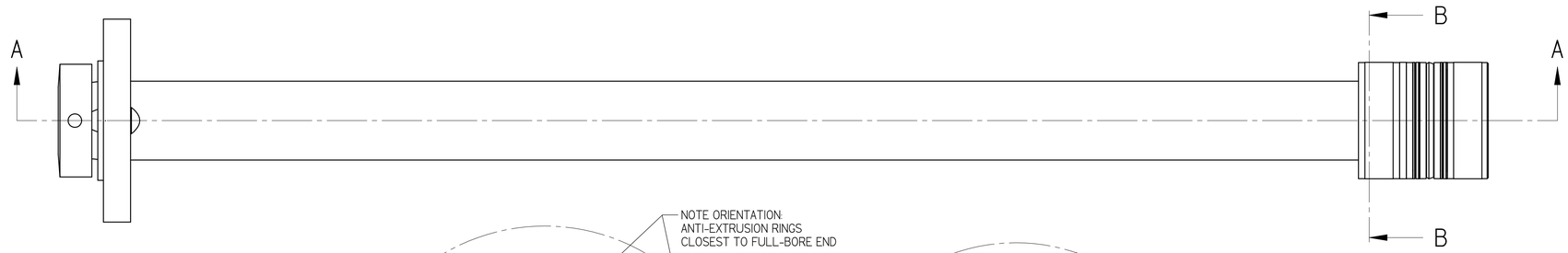
Ref.no.	Qnt.	Part name	Material	Dimension	Remark
1	1	CASING			50-003-00-01
2	1	DROP WEIGHT			50-001-00-01
3	1	PROXIMITY MODULE			E0-1131-00-01
4	1	LOCATION KEY			25-031-00-01
5	1	DOLLY RETAINER			6-005-20-01
6	1	DOLLY			6-006-20-01
7	6	SUSPENSION RING			6-024-30-01
8	1	RAM MOUNT ASSEMBLY PLATE			50-018-30-01
9	1	TOP MANIFOLD			50-018-23-02
10	6	ACCUMULATOR			25-48-00-01
11	11	BUFFER	SK 095-01		25-018-31-02
12	11	SPRING RETAINER			25-018-36-01
13	11	BUFFER			50-018-37-01
14	11	SOCKET HEAD CAP SCREW		M24 x 190 LG	0M24-190-02
15	1	MAIN RAM			50-008-00-03
16*	1	RAM DAMPER			50-009-00-02
17	1	RAM CONNECTOR PIN			50-01-01-01
18	1	PIN RETAINER			50-004-07-01
19	1	WIRE GUIDE TUBE			ZC-031-03-01
20	1	PIN ACCESS COVER			50-003-02-01
21	1	TRANSIT PIN			25-003-01-01
22*	1				
23	2	ACCESS COVER			25-017-05-01
24	1	LOW PRESSURE HOSE ASSEMBLY			25-115-00-01
25	1	HIGH PRESSURE HOSE ASSEMBLY			25-116-00-01
26	1	GLAND PLATE COVER			1-018-35-01
27	3	CABLE GLAND M20			E0-1082-00-01
28	1	MANIFOLD SOCKET HOUSING			25-090-24-01
29	21	SOCKET HEAD CAP SCREW	12.9	M24 x 145 LG	0M24-145-02
30	22	NORD-LOCK WASHER		M24	0M24-000-27
31	24	SOCKET HEAD CAP SCREW			0M16.130.02
32	40	NORD-LOCK WASHER		M16	0M16.000.27
33	1	24 WAY PLUG			E0-871-00-01
34	4	SOCKET HEAD CAP SCREW		0M16-120-02	
35	4	SOCKET HEAD CAP SCREW			0M10-80-02
36	4	SOCKET HEAD CAP SCREW		M12 x 45	0M12.045.02
37	4	SOCKET HEAD CAP SCREW			0M14-50-02
38	4	PIN			50-004-06-01
39	8	10mm SPLIT PIN			
40	1	CABLE GLAND	RS COMPONENTS	211-6802	PG29
41	1	TEE PIECE			H00538
42	1	LEAK LINE SHORT			25-118-00-01
43	1	MAIN VALVE ASSEMBLY			50-018-00-01
44	2	3/8" BSP NIPPLE			
45	2	CHECK VALVE			ABVUN1405F
46	20	SOCKET HEAD CAP SCREW	12.9	M20 x 100	0M20.100.02
47	1	SKIRT			50-017-00-01
48	1	LEAK LINE LONG			25-117-00-01
49	1	PILOT LINE			25-119-00-01
50	20	NORD-LOCK WASHER		M20	0M20.000.27
51	1	SOCKET HEAD CAP SCREW		M24 x 100 LG	0M24-100-02
52	28	NORD-LOCK WASHER		M10	0M10.000.27
53	28	SOCKET HEAD CAP SCREW		0M10.030.02	M10 x 30 LG
54	8	SOCKET HEAD CAP SCREW			0M8-40-02
55	3	SOCKET HEAD CAP SCREW			0M08-016-02
56	16	SOCKET HEAD CAP SCREW			0M16.65.02

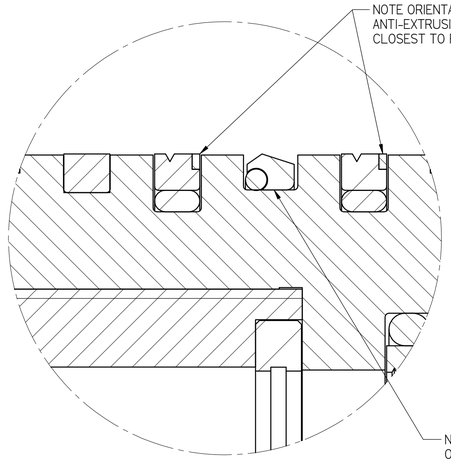
SURFACE FINISH UNLESS STATED OTHERWISE	MACHINING TOLERANCES UNLESS STATED OTHERWISE
▽ ROUGH MACHINE N9	X = +/- 0.5
▽▽ FINE MACHINE N8	X . X = +/- 0.25
▽▽▽ GRIND N6	X . XX = +/- 0.05
	ANGLES +/- 0.5°
	DIMENSIONS IN MILLIMETERS

Design by SDO	Drawn by SDO	Copied –	Checked –	Standard A0	Affirmed –	Scale –	Replace –	Replaced by –
dcp	DAWSON CONSTRUCTION PLANT LTD.	HPH 5000					File –	Date 13/04/2022
							Drawing no.	50-000-00-01

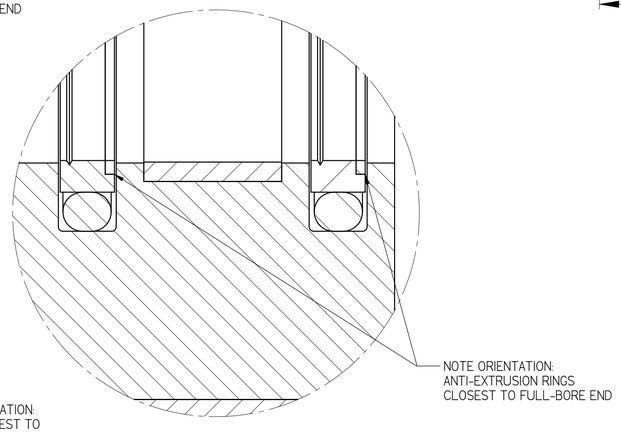
3RD ANGLE

Used On: 50-008-00-03





DETAIL E



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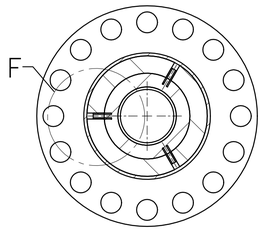
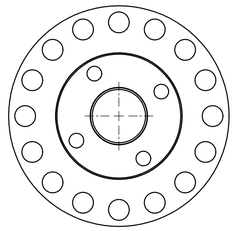
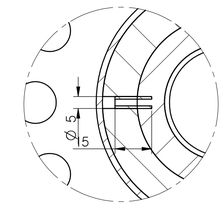


SECTION B-B





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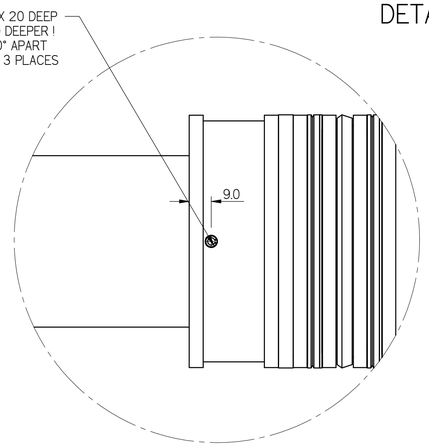

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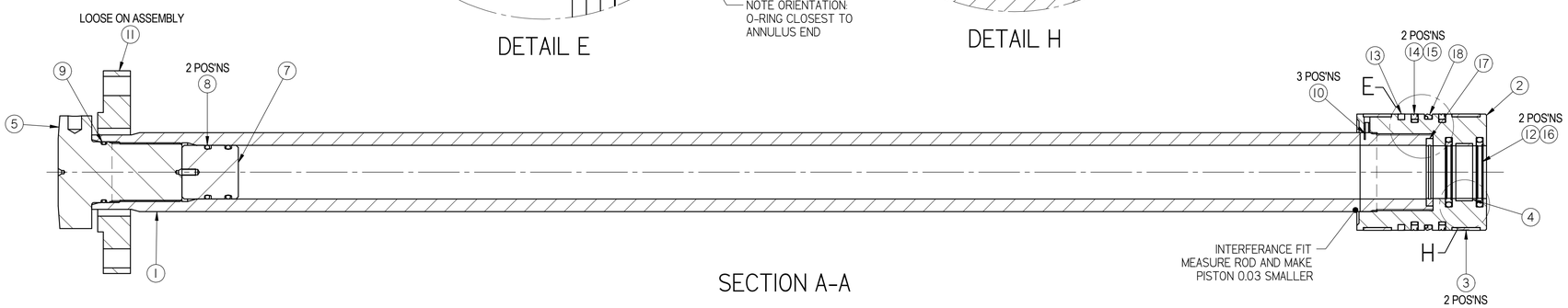


SECTION A-A

NOTES

PISTON HEAD TIGHTENING PROCEEDURE:

ASSEMBLE THE PISTON HEAD AND CHECK FOR CONCENTRICITY TO ROD, MUST BE WITHIN 0.05 mm

CHECK THE PISTON RINGS ARE FREE WHEN THE PISTON HEAD IS TIGHTENED TO 3000 N.m

DRILL ROD AND FIT LOCKING PINS

RETAIN PINS BY STAKING HOLES

Item	Part Number	Description	Qty
18	50-008-57-01	PISTON SEAL, TURCON VECTOR SEAL M12	1
17	50-008-68-01	BUFFER SEAL, ROD	1
16	50-008-67-01	O-Ring, Ø53.34 x 5.33, NBR, 70 Shore A, Black	2
15	50-008-66-01	O-Ring, Ø85.9 x 5.33, NBR, 70 Shore A, Black	2
14	50-008-64-01	PISTON SEAL, EXTERNAL, TURCON STEPSEAL M12	2
13	50-008-63-01	DUAL PISTON RING, BUFFER, TURCON	1
12	50-008-65-01	ROD SEAL, INTERNAL, TURCON STEPSEAL M12	2
11	50-009-03-01	RAM RETAINER CAP	1
10	10-008-08-01	5mm x 15 ROLL PIN	3
9	50-008-52-01	O-RING, SQUARE SECTION, 48 x 56 x 4, PU	1
8	50-008-47-01	O-RING, SQUARE SECTION, 40 x 48 x 4, PU	2
7	50-008-29-01	RAM BORE SEAL	1
5	50-009-09-01	MUSHROOM HEAD	1
4	50-008-58-01	WEAR RING	1
3	50-008-106-01	WEAR RING	2
2	50-008-26-04	PISTON HEAD	1
1	50-008-03-02	MAIN RAM	1

Appr.	UNLESS OTHERWISE STATED					
SDD 12/09/23	ALL DIMENSIONS IN MILLIMETERS. ALL MASSES IN KILOGRAMS.					
Drawn	GENERAL TOLERANCES: X ± 0.5, XX ± 0.25, XXX ± 0.05, ANGLES ± 0.5°	SURFACE FINISH: N9 (6.3 µm) MINIMUM	AIB	AIB	3	07/01/24	B
SDD 12/09/23		ALL EDGES TO HAVE A RADIUS/CHAMFER OF 0.3 MINIMUM	SDD	SDD	1	12/09/23	A
		IF IN DOUBT, ASK!	Drawn	Appr.	ECN No.	Date	Rev.

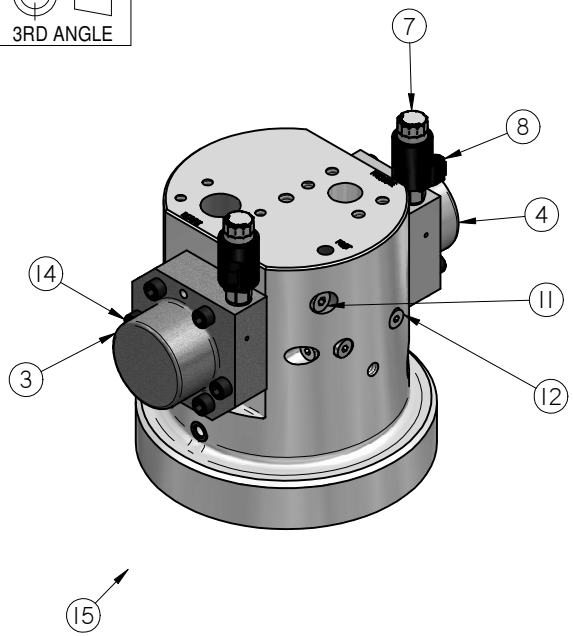
DAWSON CONSTRUCTION PLANT LTD.
DAWSON CONSTRUCTION PLANT LTD.
CHESNEY WOLD, BLEAK HALL,
MILTON KEYNES, MK6 1NE

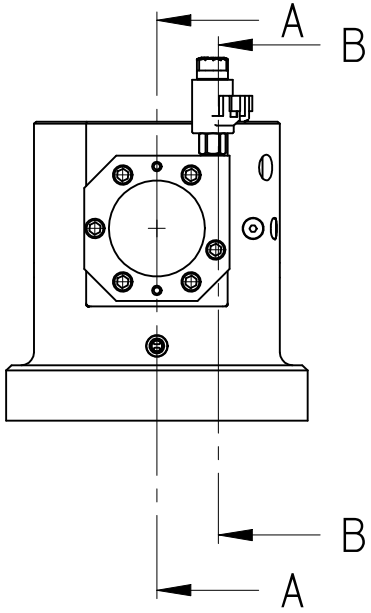
DRAWING DIMENSIONS, ANNOTATIONS & SYMBOLS IN ACCORDANCE WITH BS 8888. TOLERANCES UNLESS STATED IN ACCORDANCE WITH BS EN ISO 2553

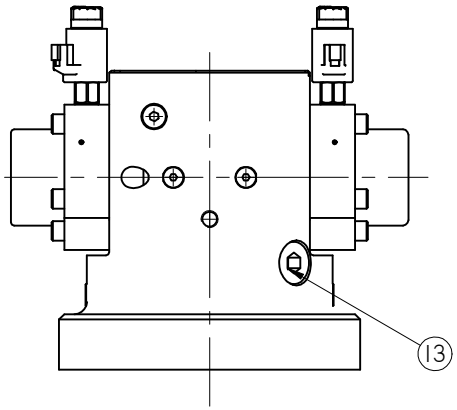
Material	Est. Mass	Scale	Sht Size
SEE PARTS LIST	N/A	2 : 5	A1
Description	**Sheet**	**Date**	
PISTON ROD ASSEMBLY	1 of 1	12/09/23	
v1.0	**Drawing No.** 50-008-007-03		

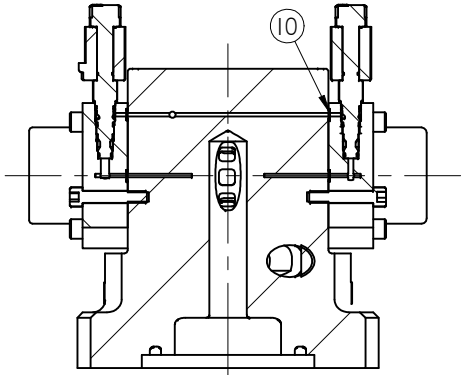
3RD ANGLE

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by
A		ISSUED FOR PRODUCTION	26/01/23	AIB	

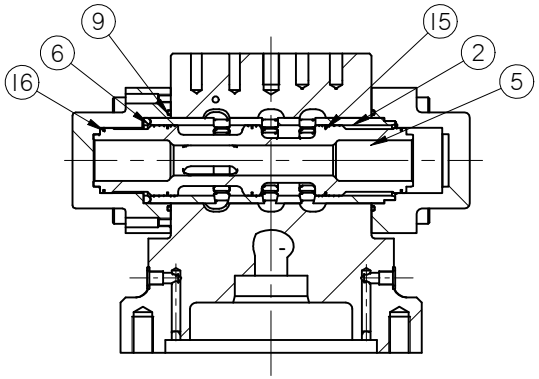








SECTION B-B



SECTION A-A

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
1*	1	VALVE BLOCK			50-018-01-02
2	1	SLEEVE			25-018-03-01E
3	1	END CAP			25-018-04-01E
4	1	END CAP			25-024-05-01
5*	1	SPOOL			25-018-02-01E
6	1	TOLERANCE WASHER			2-018-27-01E
7	2	CARTRIDGE VALVE			2-018-06-01E
8	2	SOLENOID			E0-1093-00-01
9	2	86 x 4 O-RING			25-018-20-01
10*	4	O-RING 8 x1.9			1-018-20-01
11	1	BLANKING PLUG	VS-R 3/8 WD	3/8" BSP	1-018-28-01
12	3	BLANKING PLUG	VS-R 1/4WD	1/4" BSP	1-018-18-01
13	1	DRAIN PLUG	VS-R 1 WD	1" BSP	1-064-00-01
14	12	SOCKET HEAD CAP SCREW			OM12-060-02
15	3	PISTON RING		WISECO 2598CD	2-018-13-01
16	2	PISTON RING		WISECO 2402CD	2-018-15-01
17*	2	1/4 " BSP DOWTY WASHER			H00127

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
SDD	SDD	–	–	A3	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

MAIN VALVE ASSEMBLY

File: – Date: 11/05/18

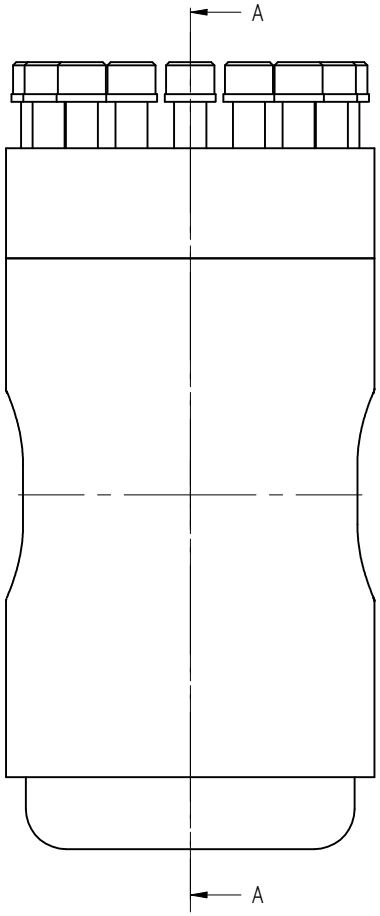
Drawing no. 50-018-00-01

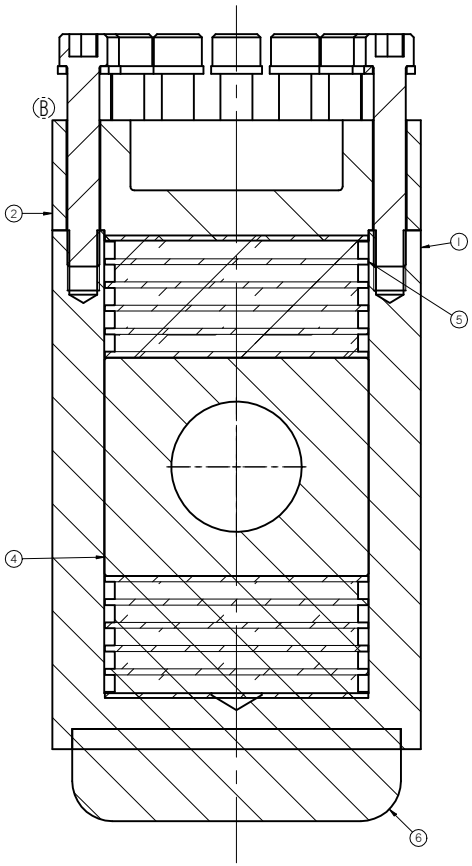
SURFACE FINISH
UNLESS STATED OTHERWISE
▽ ROUGH MACHINE N9
▽▽ FINE MACHINE N8
▽▽▽ GRIND N6

MACHINING TOLERANCES
UNLESS STATED OTHERWISE
X = +/- 0.5
X . X = +/- 0.25
X . XX = +/- 0.05
ANGLES +/- 0.5°
DIMENSIONS IN MILLIMETERS

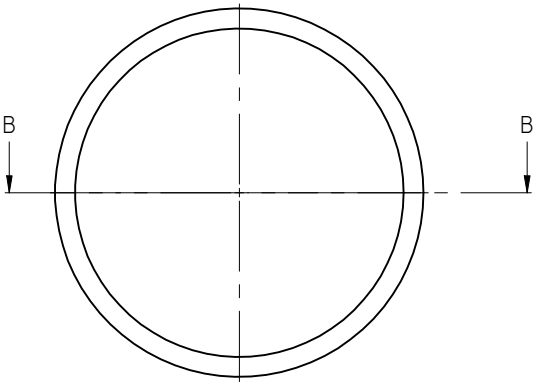
3RD ANGLE

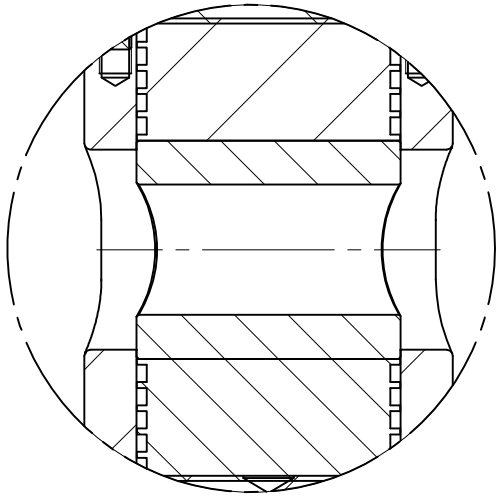
Rf.no	Qnt.	Revision	Date	Intro.	Appr.by
A		ISSUED FOR PRODUCTION	06/07/23	MDB	
B		REMOVED BUSH FROM KINETIC BOM	15/09/23	AIB	





SECTION A-A





PART SECTION THRO B-B

1	1	CASING			50-009-04-03
2	1	DAMPER CAP			50-009-02-01
3	16	SOCKET HEAD CAP SCREW	12.9	M16 x 100	0M16-100-02
4	1	FOLLOWER			50-009-01-02
5	2	BUFFER			50-009-05-01
6	1	POLYURETHANE BUFFER			50-009-06-01
7	16	NORD-LOCK WASHER		M16	0M16.000.27

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
SDD	SDD	–	–	A1	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

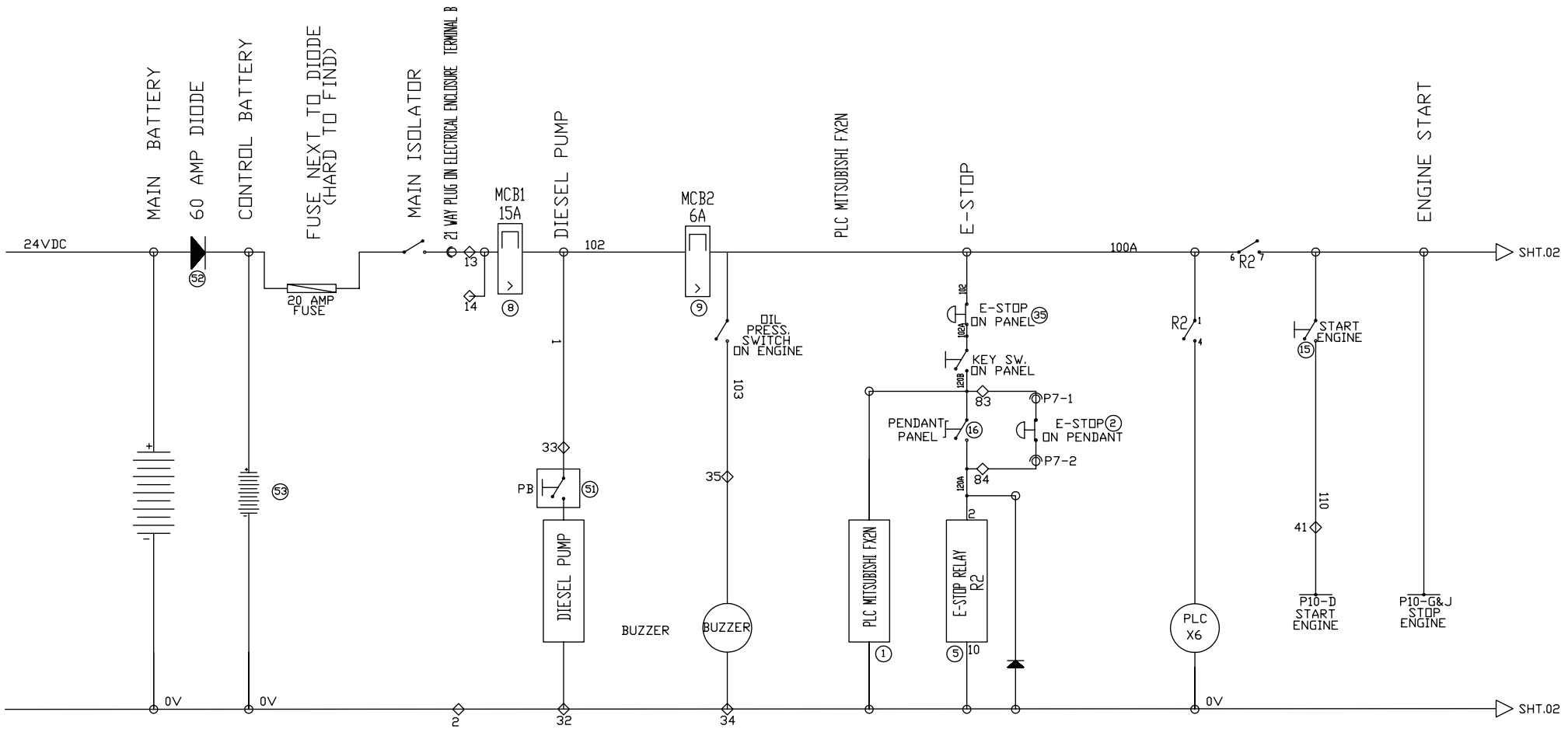
ROD DAMPER

File –

Date: 07/06/23

Drawing no. 50-009-00-02

SURFACE FINISH UNLESS STATED OTHERWISE	MACHINING TOLERANCES UNLESS STATED OTHERWISE
▽ ROUGH MACHINE N9	X = +/- 0.5
▽▽ FINE MACHINE N8	X . X = +/- 0.25
▽▽▽ GRIND N6	X . XX = +/- 0.05
	ANGLES +/- 0.5°
	DIMENSIONS IN MILLIMETERS



PLC

PLC INPUTS

No.	FUNCTION	GOES TO
X0	ENERGY RAISE	DIN 42-44
X1	ENERGY LOWER	DIN 46-48
X2	START	DIN 50-52
X3	WARMUP RUN	PANEL SW.
X4	AUTO	PANEL SW.
X5	OIL UP TO TEMP	VS1202 P3-1
X6	E-STOP	R2-PIN-4
X7	OIL LEVEL OK	DIN 23
X10	OIL OVER TEMP	VS1202 P3-2
X11	ENGINE FAST	PANEL SW.
X12	NOT USED	
X13	OFF PILE	VS1202 P3-3
X14	NOT USED	
X15	HAMMER DOWN SIGNAL	VS1202 P3-6

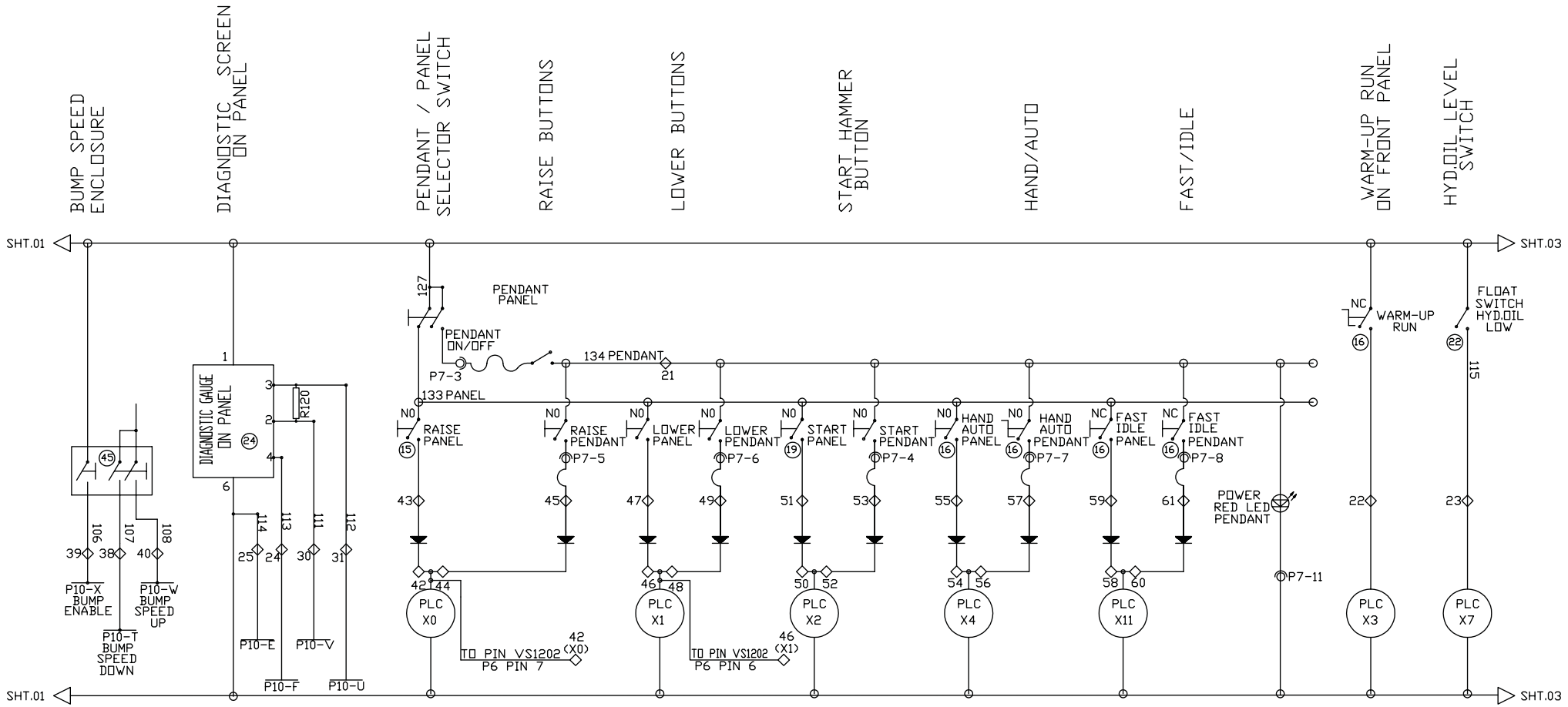
PLC OUTPUTS

No.	FUNCTION	GOES TO
Y0	UP VALVE	DIN 63
Y1	DOWN VALVE	DIN 65
Y2	VALVE 1 UNLOAD	DIN 73
Y3	ON PILE PANEL LED	DIN 67
Y4	VALVE 2 HAMMER	DIN 69
Y5	OIL COLD LED	L.E.D ON PANEL
Y6	WARM UP VALVE	DIN 71
Y7	SPEED SELECT	VS1202 P6-5
Y10	OIL OVER TEMP	L.E.D ON PANEL
Y11	OIL LEVEL LED	L.E.D ON PANEL
Y12		

PENDANT COMPONENTS

1	8 BUTTON PENDANT ENCLOSURE	1	BPX	XACA08
2	E-STOP BUTTON	1	BPX	ZABS844
3	16 WAY INSERT	1	RS COMPONENTS	448-890
4	16 WAY TOP ENTRY HOOD	1	RS COMPONENTS	243-6164
5	GREEN PANEL L.E.D	1	RS COMPONENTS	210-967
6	RED PANEL L.E.D	1	RS COMPONENTS	210-951
7	YELLOW PANEL L.E.D	1	RS COMPONENTS	210-989
8	BLANK LEGEND PLATES	1	BPX - TELEMEQ	ZB2BY2101
9	ENGRAVED LEGEND PLATES	1	TRACEWAY	
10	BLANKING PLUG	1	BPX - TELEMEQ	ZB2SZ3
11	GREEN PUSH BUTTON	1	BPX - TELEMEQ	XACA9413
12	BLACK PUSH BUTTON	2	BPX - TELEMEQ	XACA9412
13	SELECTOR SWITCH	3	BPX - TELEMEQ	ZA2BD2
14	GREEN PUSH BUTTON	1	BPX - TELEMEQ	XACA9413
15	N.OPEN CONTACT	6	BPX - TELEMEQ	ZB2BE101
16	N.CLOSED CONTACT	1	BPX - TELEMEQ	ZB2BE102
17	12 CORE CABLE 15 Mts	1	ICD	SY 1mm
18	CABLE ENTRY GLAND	1	RS COMPONENTS	157-2101

ELECTRICAL HAMMER CIRCUIT DIAGRAM SHT.01



PENDANT CABLE
P7 16 WAY HARTING (PENDANT)

PIN No.	FUNCTION	WIRE No.	GOES TO
1	E-STOP	1	DIN 83
2	E-STOP	2	DIN 84
3	+24V	3	DIN 21
4	START HAMMER (TO X2)	4	DIN 53
5	RAISE (TO X0)	5	DIN 53
6	LOWER (TO X1)	6	DIN 45
7	HAND/AUTO (TO X4)	7	DIN 57
8	FAST/IDLE (TO X11)	8	DIN 61
9	GREEN LED	9	DIN 62
10	AMBER LED	10	DIN 67
11	0 VOLTS	11	DIN 68

HAMMER CABLE P8 & P9

P8 24 WAY HARTING DD POWER PACK END

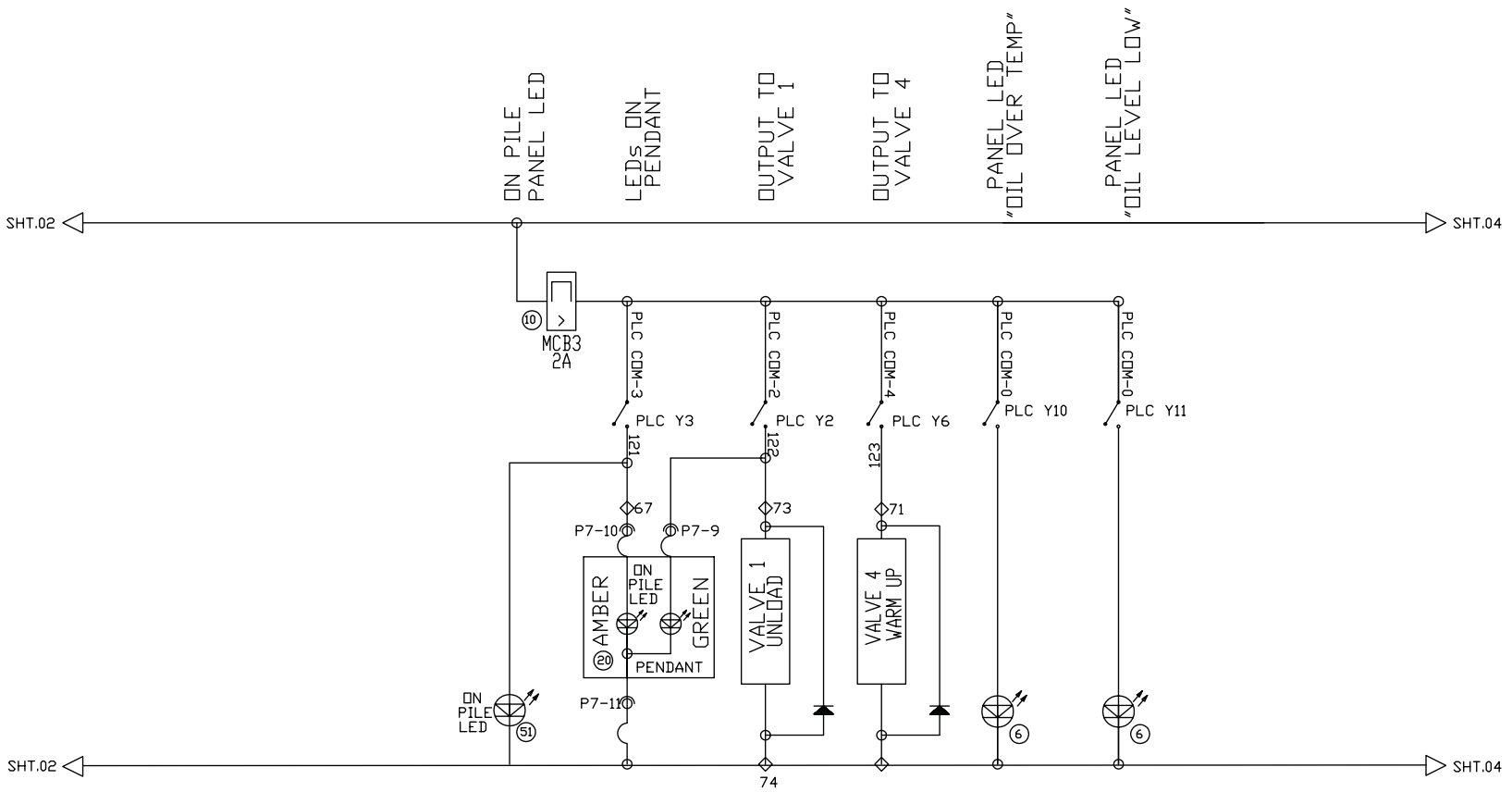
PIN No.	FUNCTION	GOES TO
1	UP VALVE +	DIN 11
2	UP VALVE -	DIN 12
3	DOWN VALVE +	DIN 9
4	DOWN VALVE -	DIN 10
5	PROXIMITY SUPPLY	DIN 1
6	UPPER PROX 3 OUT I	DIN 5
7	UPPER PROX- 4 OUT L	DIN 6
8	PROXIMIY 0 VOLTS	DIN 2
9	PROXIMITY SUPPLY	DIN 1
10	PROXIMIY - 1 OUT (CHANNEL "A")	DIN 3
11	PROXIMITY - 2 OUT (CHANNEL "B")	DIN 4
12	PROXIMITY 0 VOLTS	DIN 11

IGUS CF10-05-12

P9 24 WAY HARTING DD HAMMER END

PIN No.	FUNCTION
1	
2	
3	
4	
5	UP VALVE +
6	UP VALVE -
7	DOWN VALVE +
8	DOWN VALVE -
9	PROXIMITY SUPPLY
10	PROXIMITY - 3 OUT (INDEX)
11	PROXIMITY- 4 OUT (OFF PILE)
12	PROXIMITY 0 VOLTS
13	PROXIMITY SUPPLY
14	PROXIMIY - 1 OUT (CHANNEL "A")
15	PROXIMITY - 2 OUT (CHANNEL "B")
16	PROXIMITY 0 VOLTS

ELECTRICAL HAMMER CIRCUIT DIAGRAM SHT.02



◇ DIN RAIL CONNECTIONS ◇

HAMMER MODULE CONNECTIONS BLUE

1	24v (100)
2	0 VOLTS
3	P6-1 (ENCODER "A")
4	P6-2 (ENCODER "B")
5	P6-3 (INDEX)
6	P6-4 (OFF PILE) (X13)
7	P5-1 (OIL TEMP. SENSOR +)
8	P5-2 (OIL TEMP. SENSOR -)
9	DOWN VALVE SUPPLY ,VIA DROPPER RES.
10	DOWN VALVE -
11	UP VALVE SUPPLY ,VIA DROPPER RES.
12	UP VALVE -
13	102 [24V (15A)]
14	102 [24V (15A)]
15	100 [24V (5A)]
16	100 [24V (5A)]
17	100 [24V (5A)]
18	100 [24V (5A)]
19	100 [24V (5A)]
20	100 [24V (5A)]
21	PENDANT SUPPLY 24V

24V FROM ISOLATOR VIA P10 PIN B
20 AMP FUSE IN ENGINE HARNESS

22	X3 WARM UP- RUN
23	X7 OIL LEVEL LOW
24	113 (TO PIN 4 DIA.GAUGE)
25	114 (TO PIN 6 DIA.GAUGE)
26	100 [24V (5A)]
27	100 [24V (5A)]
28	100 [24V (5A)]
29	100 [24V (5A)]
30	111 (TO PIN 2 DIA.GAUGE)
31	112 (TO PIN 3 DIA.GAUGE)
32	0 V
33	DIESEL PUMP 16 AMP SUPPLY
34	0 V
35	
36	104 TO P4-1
37	105 TO P4-2
38	107 BUMP SPEED DOWN (P6-T)
39	106 BUMP SPEED ENABLE (P6-X)
40	108 BUMP SPEED UP (P6-W)
41	110 START ENGINE (P6-D)

42	X0 PLC INPUT (TO PLC)
43	X0 PLC INPUT FROM PANEL
44	X0 PLC INPUT (TO PLC)
45	X0 PLC INPUT FROM PENDANT
46	X1 PLC INPUT (TO PLC)
47	X1 PLC INPUT FROM PANEL
48	X1 PLC INPUT (TO PLC)
49	X1 PLC INPUT FROM PENDANT
50	X2 PLC INPUT (TO PLC)
51	X2 PLC INPUT FROM PANEL
52	X2 PLC INPUT (TO PLC)
53	X2 PLC INPUT FROM PENDANT
54	X4 PLC INPUT (TO PLC)
55	X4 PLC INPUT FROM PANEL
56	X4 PLC INPUT (TO PLC)
57	X4PLC INPUT FROM PENDANT
58	X11 PLC INPUT (TO PLC)
59	X11 PLC INPUT FROM PANEL
60	X11 PLC INPUT (TO PLC)
61	X11 PLC INPUT FROM PENDANT

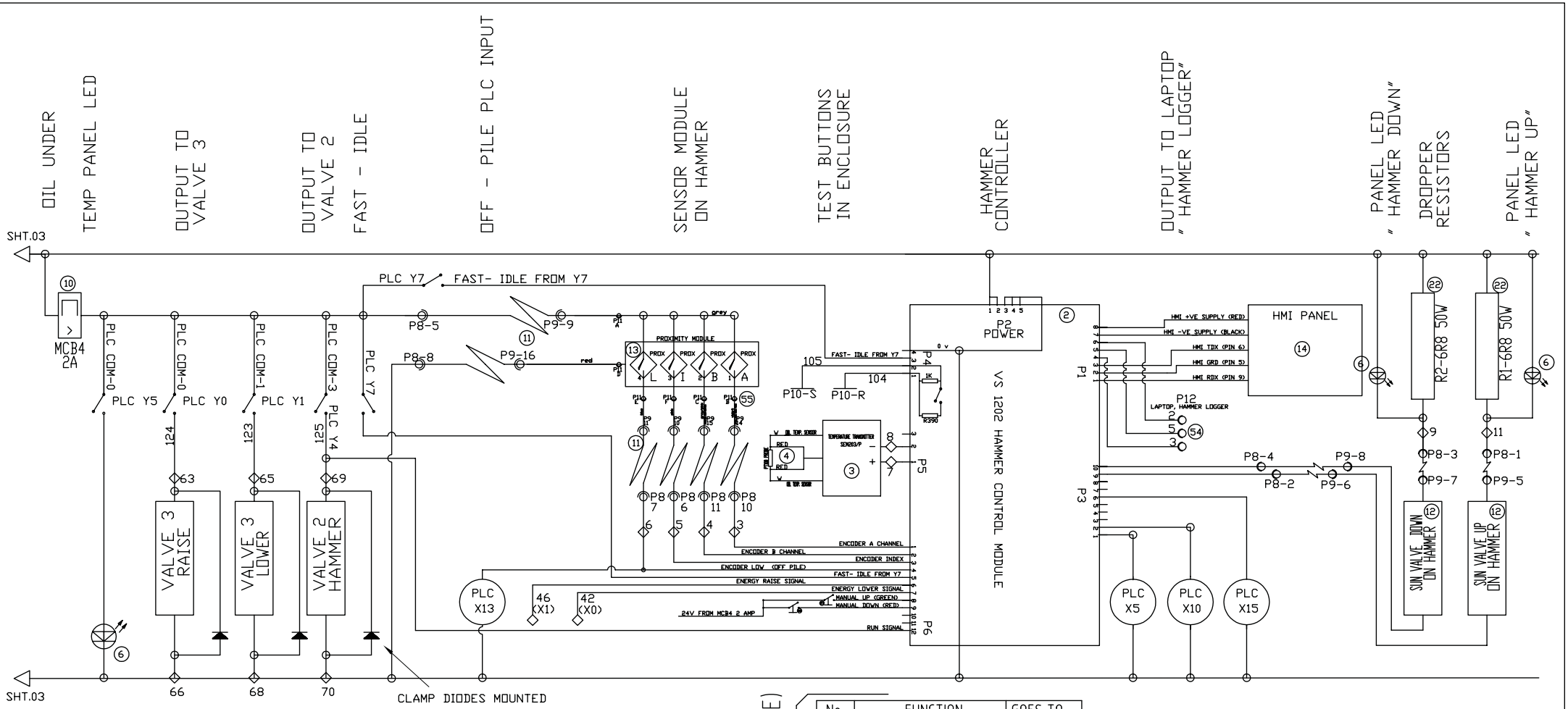
62	PENDANT GREEN LED
63	Y0 PLC OUTPUT, UP VALVE
64	122
65	Y1 PLC OUTPUT, DOWN VALVE
66	0 V
67	Y3 PLC OUTPUT, OFF PILE LED
68	0 V
69	Y4 PLC OUTPUT, HAMMER VALVE
70	0 V
71	Y6 PLC OUTPUT, WARM- UP VALVE
72	0 V
73	Y2 PLC OUTPUT , UNLOAD VALVE
74	0 V
75	
76	0 V
77	
78	0 V
79	
80	0 V
81	
82	120A (FROM PENDANT-PANEL SELECT)
83	TO E-STOP PB ON PANEL
84	TO E-STOP RELAY (R2) PIN 3

CLAMP DIODES MOUNTED IN THE DIN RAIL

P11 PROXIMITY MODULE PLUG

PIN No.	FUNCTION	GOES TO
A	24v	P9-9
B	CHANNEL A	P9-14
C	CHANNEL B	P9-15
D	0v	P9-16
E	LIMIT	P9-11
F	INDEX	P9-10
G		
H		
J		
K		

ELECTRICAL HAMMER CIRCUIT DIAGRAM SHT.03



P12 OUTPUT TO LAPTOP (ON FRONT PANEL)

PIN No.	FUNCTION
1	
2	TXD2
3	RXD2
4	
5	SRC2
6	

COMPUTER COM PORT

PIN No.	FUNCTION
1	
2	RXD2
3	TXD2
4	
5	SRC2
6	
7	
8	
9	

P10 ENGINE MANAGEMENT 21 PIN ENGINE INTERFACE CONNECTOR (ON THE SIDE OF ELECTRICAL ENCLOSURE)

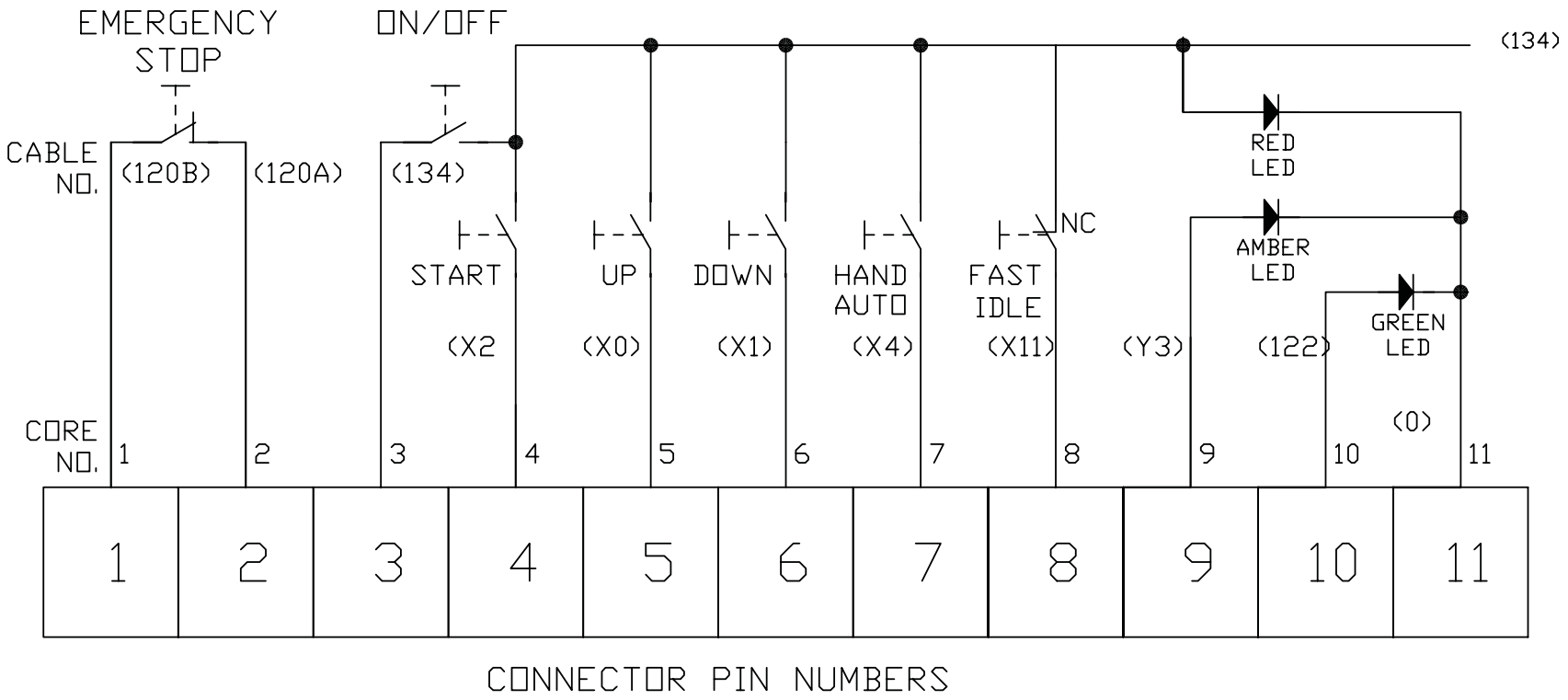
No.	FUNCTION	GOES TO
A	GLOW PLUG WAIT LAMP	NOT USED
B	24V FROM ENGINE HARNESS (FUSED AT 20 AMP)	DIN 13-14
C	SENSOR RETURN	NOT USED
D	110 START ENGINE	DIN 41- P6-D
E	114 PANEL GAUGE PIN 6	DIN 25 P6-E
F	113 PANEL GAUGE PIN 4	DIN 24 P6-F
G	100 STOP ENGINE	P6-J
H	WARNING LAMP DRIVER	NOT USED
J	100 STOP ENGINE	P6-G
K	TACHO OUTPUT	NOT USED
L	PRIMARY ANALOG THROTTLE	NOT USED
M	5v SENSOR POWER	NOT USED
N	SHUTDOWN OVERRIDE	NOT USED
P	SHUTDOWN OVERRIDE RETURN	NOT USED
R	104 SPEED RELAY	DIN 36- VS1202 -P4-1
S	105 SPEED RELAY	DIN 37- VS1202 -P4-2
T	107 BUMP SPEED DOWN	DIN 38 - P6-T
U	112 PANEL GAUGE PIN 3	DIN 31 - P6-U
V	111 PANEL GAUGE PIN 2	DIN 30 - P6-V
W	108 BUMP SPEED UP	DIN 40 - P6-V
	X 106 BUMP ENABLE	DIN 39 - P6-X

NOTE
SPEED SELECT RELAY IS LOCATED IN THE VS1202 HAMMER CONTROL MODULE P4 PINS 1&2

ELECTRICAL HAMMER CIRCUIT DIAGRAM SHT.04

3RD ANGLE

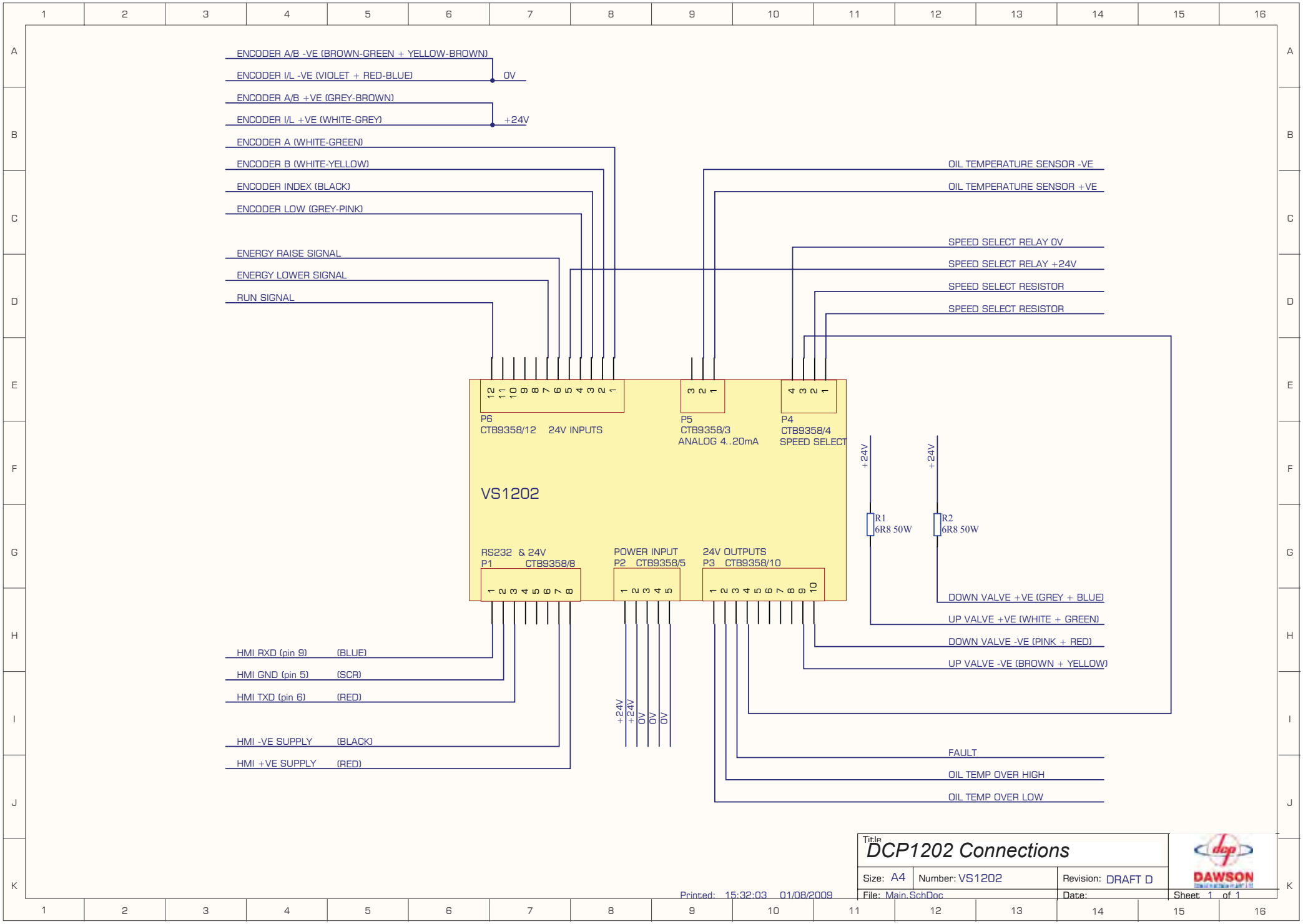
Rf.no	Qnt	Revision	Date	Intro.	Appr.by



CONNECTOR PIN NUMBERS

SURFACE FINISH UNLESS STATED OTHERWISE	MACHINING TOLERANCES UNLESS STATED OTHERWISE
▽ ROUGH MACHINE N9	X = +/- 0.5
▽▽ FINE MACHINE N8	X . X = +/- 0.25
▽▽▽ GRIND N6	X . XX = +/- 0.05
	ANGLES +/- 0.5°
	DIMENSIONS IN MILLIMETERS

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
Design by	Drawn by	Copied / Checked / Standard / Affirmed	Scale	Replace	Replaced by
DAWSON CONSTRUCTION PLANT LTD.		PENDANT CIRCUIT		File	Date 6/11/11
				Drawing no.	


ENCODER A/B -VE (BROWN-GREEN + YELLOW-BROWN)
ENCODER I/L -VE (VIOLET + RED-BLUE)
0V
ENCODER A/B +VE (GREY-BROWN)
ENCODER I/L +VE (WHITE-GREY)
+24V
ENCODER A (WHITE-GREEN)
ENCODER B (WHITE-YELLOW)
ENCODER INDEX (BLACK)
ENCODER LOW (GREY-PINK)
ENERGY RAISE SIGNAL
ENERGY LOWER SIGNAL
RUN SIGNAL
OIL TEMPERATURE SENSOR -VE
OIL TEMPERATURE SENSOR +VE
SPEED SELECT RELAY 0V
SPEED SELECT RELAY +24V
SPEED SELECT RESISTOR
SPEED SELECT RESISTOR
P6
CTB9358/12 24V INPUTS
P5
CTB9358/3
ANALOG 4..20mA
P4
CTB9358/4
SPEED SELECT
VS1202
+24V
+24V
R1
6R8 50W
R2
6R8 50W
RS232 & 24V
P1 CTB9358/8
POWER INPUT
P2 CTB9358/5
24V OUTPUTS
P3 CTB9358/10
DOWN VALVE +VE (GREY + BLUE)
UP VALVE +VE (WHITE + GREEN)
DOWN VALVE -VE (PINK + RED)
UP VALVE -VE (BROWN + YELLOW)
HMI RXD (pin 9) (BLUE)
HMI GND (pin 5) (SCR)
HMI TXD (pin 6) (RED)
+24V
+24V
0V
0V
0V
HMI -VE SUPPLY (BLACK)
HMI +VE SUPPLY (RED)
FAULT
OIL TEMP OVER HIGH
OIL TEMP OVER LOW
Printed: 15:32:03 01/08/2009
Title
DCP1202 Connections
Size: A4
Number: VS1202
Revision: DRAFT D
File: Main.SchDoc
Date:
Sheet 1 of 1
DAWSON

appendix A - CRH5000 tool kit

Part Description	Qty	Part No.
3mm Allen Key	1	065
4mm Allen Key	1	066
5mm Allen Key	1	067
6mm Allen Key	1	068
8mm Allen Key	1	2-150-01-01
12mm Allen Key	1	2-150-02-01
14mm Allen Key	1	2-150-03-01
17mm Allen Key	1	070
19mm Allen Key - long series	1	1-150-02-01
19mm Combination Spanner	1	1-150-12-01
22mm Combination Spanner	1	1-150-27-01
18” Adjustable Spanner	1	1-150-09-01
Soft Hammer	1	1-150-24-01
Grease Gun	1	1-150-25-01
Gas Filling Apparatus	1	1-070-00-03

HPH1200

Blow Rate b.p.m.	Impact Energy			Bearing Capacity at Final Set (blows/25mm) - tonnes									
	kgm	kNm	ft lb	2	4	6	8	10	12	14	16	18	20
120	640	6.2	4629	17	29	38	45	50	55	59	62	65	67
115	710	6.9	5135	19	32	42	50	56	61	65	69	72	75
110	780	7.6	5641	20	35	46	55	61	67	72	76	79	82
105	850	8.3	6148	22	38	50	59	67	73	78	82	86	89
100	930	9.1	6726	24	42	55	65	73	80	85	90	94	98
95	1000	9.8	7233	26	45	59	70	79	86	92	97	101	105
90	1070	10.4	7739	28	48	63	75	84	92	98	104	108	112
85	1140	11.1	8245	30	51	67	80	90	98	105	110	115	120
80	1210	11.8	8751	32	54	71	85	95	104	111	117	122	127

HPH1800

Blow Rate b.p.m.	Impact Energy			Bearing Capacity at Final Set (blows/25mm) - tonnes									
	kgm	kNm	ft lb	2	4	6	8	10	12	14	16	18	20
120	1005	9.8	7269	26	45	59	70	79	86	92	97	102	106
115	1119	10.9	8093	29	50	66	78	88	96	103	108	113	117
110	1233	12.0	8918	32	55	73	86	97	106	113	119	125	129
105	1347	13.2	9742	35	61	80	94	106	116	124	131	136	141
100	1458	14.2	10545	38	66	86	102	115	125	134	141	148	153
95	1567	15.3	11334	41	71	93	110	123	135	144	152	159	165
90	1680	16.4	12151	44	76	99	118	132	144	154	163	170	176
85	1797	17.6	12997	47	81	106	126	141	154	165	174	182	189
80	1910	18.7	13815	51	87	114	135	152	165	177	186	194	202

HPH2400

Blow Rate b.p.m.	Impact Energy			Bearing Capacity at Final Set (blows/25mm) - tonnes									
	kgm	kNm	ft lb	2	4	6	8	10	12	14	16	18	20
120	998	9.7	7218	26	45	59	70	79	86	92	97	101	105
115	1166	11.4	8433	31	52	69	82	92	100	107	113	118	122
110	1333	13.0	9641	35	60	79	93	105	115	122	129	135	140
105	1496	14.6	10820	39	67	88	105	118	129	137	145	151	157
100	1668	16.3	12064	44	75	99	117	131	143	153	162	169	175
95	1832	17.9	13250	48	82	108	128	144	157	168	178	185	192
90	1996	19.5	14437	52	90	118	140	157	171	183	193	202	210
85	2167	21.2	15673	57	98	128	152	171	186	199	210	219	228
80	2335	22.8	16889	61	105	138	163	184	201	215	226	236	245
78	2402	23.5	17373	63	108	142	168	189	206	221	233	243	252

CRH2500

Blow Rate b.p.m.	Impact Energy			Bearing Capacity at Final Set (blows/25mm) - tonnes									
	kgm	kNm	ft lb	2	4	6	8	10	12	14	16	18	20
120	1045	10	7558	27	47	62	73	82	90	96	101	106	110
115	1238	12	8954	32	56	73	87	97	106	114	120	125	130
110	1431	14	10350	38	64	85	100	113	123	131	139	145	150
105	1622	16	11732	43	73	96	114	128	139	149	157	164	170
100	1817	18	13142	48	82	107	127	143	156	167	176	184	191
95	2013	20	14560	53	91	119	141	159	173	185	195	204	211
90	2200	22	15913	58	99	130	154	173	189	202	213	223	231
85	2396	24	17330	63	108	141	168	189	206	220	232	243	252
80	2579	25	18654	68	116	152	181	203	222	237	250	261	271

CRH5000

Blow Rate b.p.m.	Impact Energy			Bearing Capacity at Final Set (blows/25mm) - tonnes									
	kgm	kNm	ft lb	2	4	6	8	10	12	14	16	18	20
120	2049	20	14820	54	92	121	143	161	176	188	199	207	215
115	2427	24	17555	64	109	143	170	191	208	223	235	246	255
110	2806	28	20296	74	126	166	196	221	241	258	272	284	295
105	3181	31	23008	83	143	188	223	250	273	292	308	322	334
100	3562	35	25764	93	160	210	249	280	306	327	345	361	374
95	3947	39	28549	104	178	233	276	311	339	363	383	400	414
90	4314	42	21203	113	194	255	302	340	371	396	418	437	453
85	4697	46	33973	123	211	277	329	370	403	431	455	476	493
80	5076	50	36715	133	228	300	355	400	436	466	492	514	533

HPH6500

Blow Rate b.p.m.	Impact Energy			Bearing Capacity at Final Set (blows/25mm) - tonnes									
	kgm	kNm	ft lb	2	4	6	8	10	12	14	16	18	20
120	2500	24.5	18082	65	113	148	175	197	215	230	243	254	264
116	2900	28.4	20975	76	131	172	204	229	250	267	282	295	305
112	3300	32.3	23868	87	149	195	232	261	285	305	321	335	347
108	3700	36.2	26762	97	167	219	260	293	319	341	360	375	390
104	4100	40.2	29655	108	185	243	288	324	354	378	399	416	432
100	4500	44.1	32548	118	204	266	316	355	388	415	437	457	475
96	4900	48	35441	129	221	291	345	387	423	452	476	498	516
92	5300	51.9	38334	139	239	314	372	418	455	487	515	537	557
88	5700	55.8	41228	150	257	337	399	449	490	525	553	578	599
84	6100	59.8	44121	160	275	361	427	481	525	561	592	618	642
80	6500	63.7	47014	171	293	385	455	513	559	598	631	659	684

CRH10000

Blow Rate b.p.m.	Impact Energy			Bearing Capacity at Final Set (blows/25mm) - tonnes												
	kgm	kNm	ft lb	2	4	6	8	10	12	14	16	18	20	22	24	25
120	4078	40	29502	108	186	243	289	325	354	379	400	417	433	446	458	464
115	4894	48	35402	128	220	288	342	384	419	448	473	494	512	528	543	549
110	5608	55	40565	148	254	333	395	444	485	518	547	571	592	611	627	635
105	6424	63	46466	168	288	378	448	503	549	587	620	647	671	692	711	719
100	7138	70	51629	188	322	423	501	564	615	658	694	725	751	775	796	805
95	7953	78	57529	208	357	468	555	624	681	728	769	803	833	859	882	892
90	5667	85	62692	228	392	514	609	685	748	799	843	881	914	942	967	979
85	9483	93	68593	249	426	559	663	746	814	870	918	959	995	1026	1053	1066
80	10197	100	73756	269	460	604	716	806	879	940	992	1036	1074	1108	1138	1151

HPH15000

Blow Rate b.p.m.	Impact Energy			Bearing Capacity at Final Set (blows/25mm) - tonnes									
	kgm	kNm	ft lb	2	4	6	8	10	12	14	16	18	20
120	6220	61	44991	162	278	365	433	487	531	568	599	626	649
115	7341	72	53104	192	329	432	512	577	629	673	710	741	769
110	8463	83	61217	222	381	500	592	666	727	778	820	857	889
105	9585	94	69330	252	432	566	671	755	824	881	929	971	1007
100	10707	105	77443	282	483	634	752	846	922	986	1041	1087	1127
95	11930	117	86294	312	535	702	833	937	1022	1093	1153	1204	1249
90	13052	128	94407	343	587	771	914	1028	1121	1199	1265	1322	1371
85	14174	139	102520	373	639	839	995	1119	1221	1305	1377	1438	1492
80	15397	151	111371	403	691	907	1075	1209	1319	1410	1488	1554	1612

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