DAWSON
CONSTRUCTION PLANT LTD

HPH 4500
HYDRAULIC HAMMER

INNOVATIVE PILING EQUIPMENT

HYDRAULIC PILING HAMMERS

EXCAVATOR MOUNTED VIBRATORS

EXCAVATOR MOUNTED DRILLS

QUIET, VIBRATIONLESS PUSH-PULL PILING

PILE EXTRACTION

SHEET PILE GUIDE FRAMES

SHEET PILE CAPPING SYSTEMS

CFA CLEANERS

PILE POINTS & SPLICERS

HANDLING / LIFTING

www.dcpuk.com

USER'S MANUAL & PARTS LIST

DAWSON
CONSTRUCTION PLANT LTD

HPH4500 HYDRAULIC

HAMMER AND POWER PACK

- USER'S MANUAL

HAMMER SERIAL NO:_____
HAMMER COMMISSION DATE:
POWER PACK SERIAL NO:_____
POWER PACK COMMISSION DATE:_____
ENGINE TYPE:_____
ENGINE SERIAL NO:_____
POWER PACK TYPE:

V3 27/02/2013

C O N T E N T S

EC Declaration of Conformity

EC Declaration of Conformity according to
EC Machinery Directive 2006/42/EC of the 17th May 2006, Annex IIA.

We hereby declare that the machinery/equipment described below is designed and manufactured to comply with the Essential Health and Safety Requirements of the applicable EC Directive(s) and that the required conformity assessment procedures have been carried out. This declaration ceases to be valid if alterations are made the machinery/equipment without agreement with Dawson Construction Plant Ltd.

Category:	Piling equipment
Description:	Hydraulic Piling Hammer and Powerpack
Type:	HPH4500
Engine power:	120kW
Serial number:	/

Relevant regulations:

2006/42/EC	Machinery directive
89/336/EEC	Electromagnetic compatibility directive
2000/14/EC	Noise emission in the environment
97/68/EC	Emissions from non-road mobile machinery
87/404/EEC	Simple pressure vessels directive

Applied harmonised standards, in particular:

EN 12100-1	Safety of machinery. Basic terminology and methodology
EN 12100-2	Safety of machinery. Technical principles
EN 996	Piling equipment

Measured sound power level on machines representative of this type: 124 dB(A)
Guaranteed sound power level: 127 dB(A)

Authorised representative for compiling the technical file:
D.A.Brown - contact details as per below

Signature for and on behalf of Dawson Construction Plant Limited:

Name:

Position:

Date:

Location: *Address below*

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DAWSON
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1.0 INTRODUCTION

The D.C.P. 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:

- Rapid blow rate. The hammer is double acting, not only giving high-energy output, but also increasing the speed of operation. This inevitably increases production and keeps the pile on the move. All Dawson hammers hit at 80 blows per minute at maximum energy rating and up to 120 blows per minute at minimum energy.

- Energy output is derived from a heavy ram impacting at a speed that will minimise pile head damage. This means that apparently lighter weight pile sections can be driven with the HPH4500 at lower energy settings without over stressing the pile. Other double acting hydraulic hammers produce their energy from high impact velocity – this is a prime cause of pile damage and definitely not the case with the HPH4500.

- Hydraulic hammers are inherently efficient, typically 80-90% of the potential driving energy being transferred into the pile.

- The hammer fits a huge range of bearing piles from H-pile, pipe and even concrete piles. Sheet piles can be accommodated with ease and the hammer can readily drive this vast range of pile types either leader mounted or free hanging. This adaptability is a feature common to all Dawson hydraulic hammers – hammers designed with the demands of a modern contractor in mind.

- The hammer does not have a single electrical component on it that controls its operation. This means no downtime due to electrics. All competent fitters can understand this hammer.

- Infinitely 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. Single blow control comes as standard – no more soft starting problems!

- 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.

1.1 Basic Safety Points

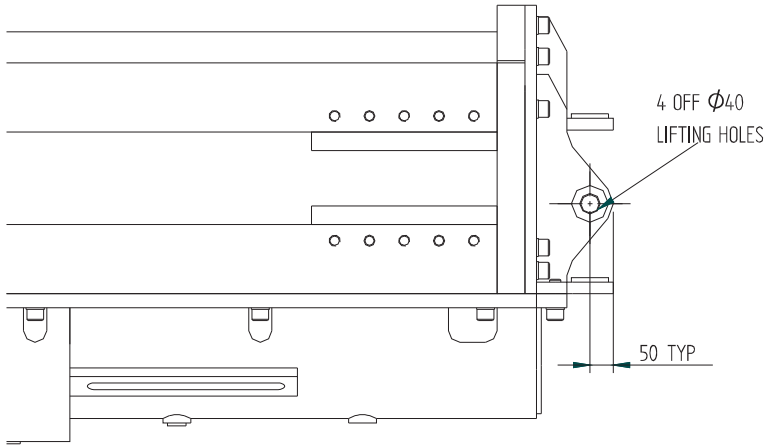
- Ear protection should be worn when in close proximity of the hammer.
- Keep clear of the hammer and/or power pack when they are being lifted.
- Avoid standing directly below the hammer when it is piling.
- Adhere to maintenance requirements set out in this manual.
- Lift equipment using lifting points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

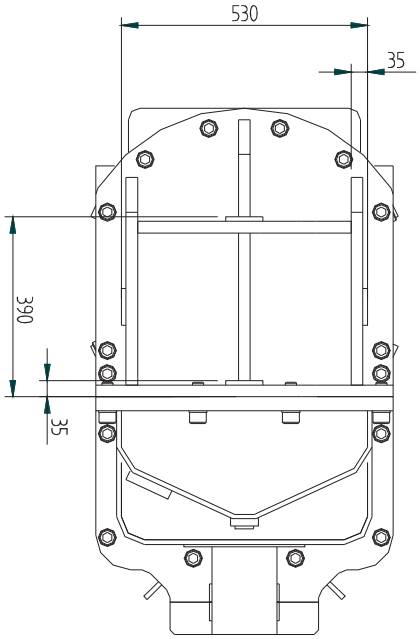
1.2 Transportation and laying down hammer

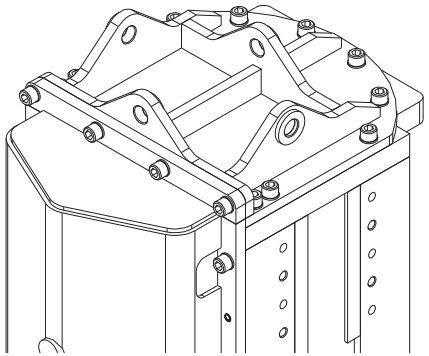
- BEFORE operating the hammer for the first time AND after each lay-down use inspection holes to ensure dolly is seated correctly in anvil before striking.
- WHEN LAYING DOWN HAMMER, support top of hammer at higher level than bottom of hammer.
- TRANSPORTATION, support top of hammer at higher level than bottom of hammer.
- TRANSPORTATION – install the Travel Bolt into the hammer casing prior to transportation. Failure to do so will create an unsafe transportation condition with the drop weight permitted to slide inside the hammer casing. This could allow the hammer to move during shipment.
- OFF-LOADING – prior to putting the hammer into service ensure the travel bolt is first removed.

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

3RD ANGLE







WEIGHT OF HAMMER UPTO 11000 Kg
(DEPENDING ON CONFIGURATION)
USE A DOUBLE LEG SLING AND
SHACKLES TO SUIT.

SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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
robertc	robertc	–	–	A3	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

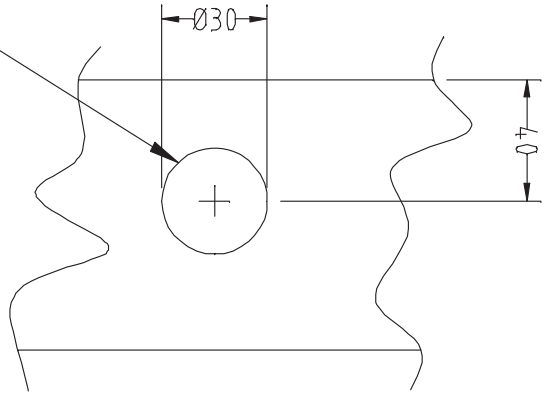
HPH4500 HAMMER
LIFTING POINTS

File	Date
–	10/08/2005

Drawing no. lifthammer

3RD ANGLE

Rf.no	Qnt.	Revision	Date	Intro.	Appr.by



WEIGHT OF POWER PACK = 3200Kg
(Hydraulic Oil Full, Diesel 50%)

Length = 3300mm
Depth = 1340mm
Height = 1800mm (2252 inc. exhaust)

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
PLW	PLW							

DAWSON CONSTRUCTION PLANT LTD.

HPH 4500 POWER PACK
DIMENSIONS AND LIFTING POINTS

File | Date 28/10/05

Drawing no. 4500 SPEC.6

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

2.0 HOW DOES THE HAMMER WORK? (See fig. 1)

The D.C.P. Hydraulic Hammer consists of a 'drop weight' driven up and down by 'hydraulic cylinders' inside a 'casing.' The hydraulic cylinders are double acting; meaning the drop weight is accelerated both on the upstroke and on the down stroke. This gives the hammer its very efficient energy output and high blow rate.

The oil supplied to the hydraulic cylinders 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.

The control valve itself has to be switched from one position to another at precisely the right times for optimum performance. The control valve is switched by hydraulic pilot signals from two mechanically actuated sensors mounted on the hammer casing. The 'bottom sensor,' when actuated by the drop weight, switches the control valve to the on (lift) position and the 'top sensor' switches the control valve to the off (drop) position. The stroke of the drop weight is adjusted by moving the position of the top sensor e.g. moving the sensor down reduces the stroke or vice versa.

The position of the top sensor is altered by a small 'height adjusting ram' mounted inside the top of the hammer. This is adjusted as required by the operator who can view an indicator on the side of the hammer.

The hammer is fully controlled using a hand-held control pendant. This unit enables the hammer to be started/stopped, run on single/automatic blows and have its stroke varied. The controller may be used from a remote position.

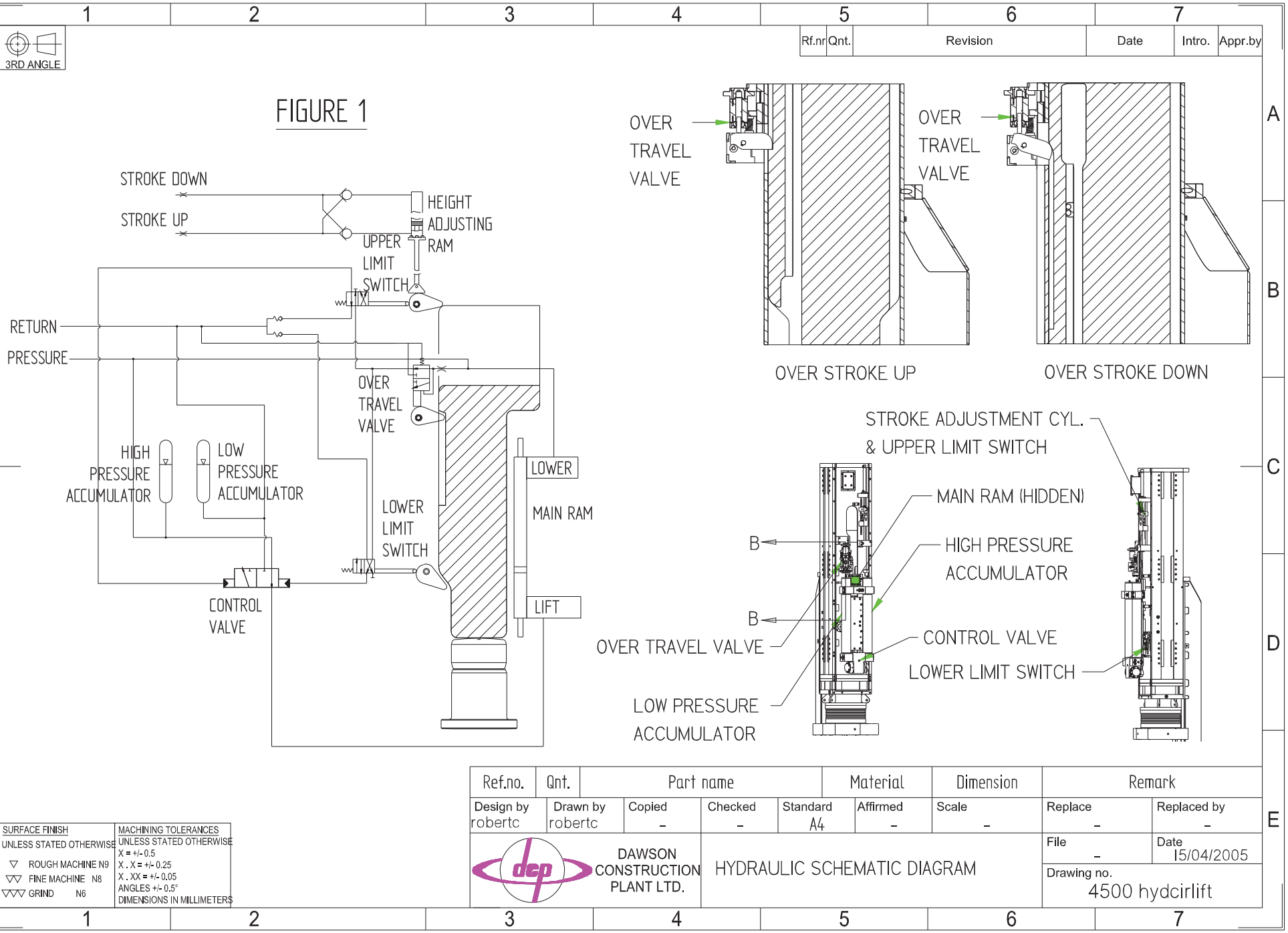

3RD ANGLE
Rf.nr
Qnt.
Revision
Date
Intro.
Appr.by
FIGURE 1
STROKE DOWN
STROKE UP
HEIGHT ADJUSTING RAM
UPPER LIMIT SWITCH
RETURN
PRESSURE
OVER TRAVEL VALVE
HIGH PRESSURE ACCUMULATOR
LOW PRESSURE ACCUMULATOR
LOWER LIMIT SWITCH
LOWER
MAIN RAM
LIFT
CONTROL VALVE
OVER TRAVEL VALVE
OVER TRAVEL VALVE
OVER STROKE UP
OVER STROKE DOWN
STROKE ADJUSTMENT CYL. & UPPER LIMIT SWITCH
MAIN RAM (HIDDEN)
HIGH PRESSURE ACCUMULATOR
B
B
OVER TRAVEL VALVE
CONTROL VALVE
LOWER LIMIT SWITCH
LOW PRESSURE ACCUMULATOR
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
Ref.no.
Qnt.
Part name
Material
Dimension
Remark
Design by robertc
Drawn by robertc
Copied -
Checked -
Standard A4
Affirmed -
Scale -
Replace -
Replaced by -
DAWSON CONSTRUCTION PLANT LTD.
HYDRAULIC SCHEMATIC DIAGRAM
File -
Date 15/04/2005
Drawing no. 4500 hydcirlift

FIGURE 1

3.0 CONFIGURING THE HAMMER FOR PILE DRIVING

The hammer can be readily adapted to perform many different types of pile driving tasks. It may, for example, be necessary to use the hammer in leads to drive 1:1 raking piles or be necessary to drive pipe piles free hanging. Switching configurations is quite straight forward but will require additional items from Dawson to cover all eventualities.

3.1 The Basic Hammer Configuration

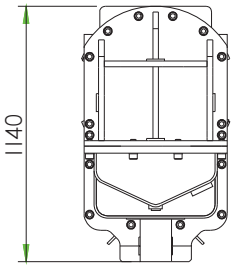
In its Basic Configuration the HPH4500 can not be used to drive any piles. The hammer is complete except for Primary Drive Anvil, Dolly, Suspension System and pile guidance system e.g. Sheet Pile Leg Guides and Inserts or Pipe Pile Guide etc.

The basic hammer configuration is shown on drawing number 45-000-00-01 in section 8.1 at the back of this manual.

To use the basic hammer the user must first decide what piles have to be driven and identify what the most appropriate method of pile driving will be. The following sections discuss the various configurations available.

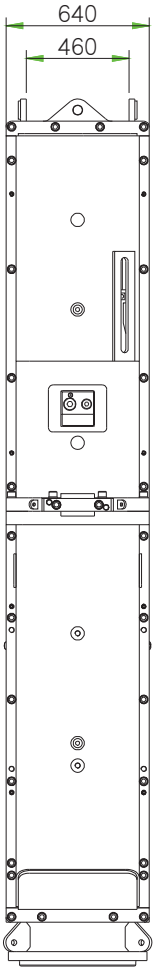
3RD ANGLE

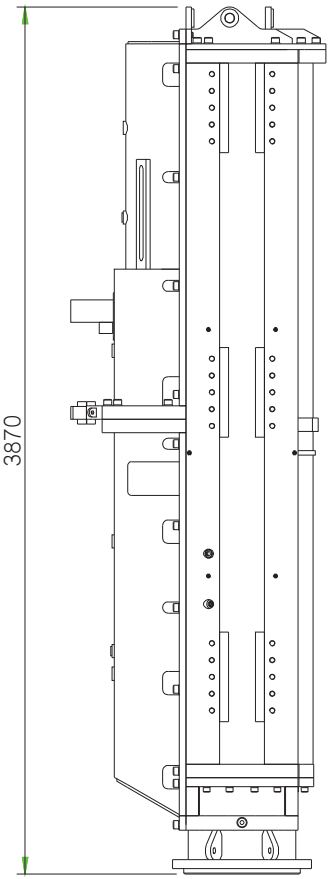
Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by



BASIC CONFIGURATION

IN 'BASIC' CONFIGURATION THE HAMMER CANNOT
BE USED TO DRIVE ANY PILE TYPES.
APPROPRIATE ANVILS, SUSPENSION SYSTEM &
PILE GUIDANCE SYSTEM MUST BE ADDED.
SEE PROCEEDING DRAWINGS





PERFORMANCE SUMMARY

MAX. ENERGY INTO PILE 4500 Kg.m
BLOW RATE AT MAX. STROKE 80 b.p.m.
BLOW RATE AT MIN. STROKE 120 b.p.m.
TOTAL WEIGHT 8000 kg
WEIGHT OF RAM 3500 Kg
OPERATING HYDRAULIC PRESSURE 255 bar
HYDRAULIC FLOW RATE REQUIREMENT 230 l/min
DIESEL ENGINE POWER 129 KW

SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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
peter watts	peter watts	–	–	A4	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

SPECIFICATION OF HPH4500 BASIC HAMMER CONFIGURATION

File: –
Date: 27/10/2005
Drawing no.: 4500 SPEC.1

3.2 Free Hanging Configuration – Universal Guide Sleeve

Dawson offers a Universal Guide system for use with the HPH4500 that is bolted to the bottom of the Basic Hammer Configuration. This system uses one large guide sleeve that can be altered for different diameter pipe piles up to a maximum ∅36" (914mm) - see drawing 45-300-00-01 under section 8.1 at the end of this manual. It can also be readily adapted to drive H-pile and other pile types.

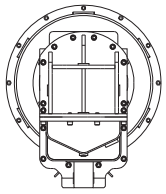
The system incorporates one secondary anvil that covers all pipe sizes up to ∅36"(914mm). Different diameters are accommodated by using either six support blocks (item 14) and a dedicated lower guide ring (item 7) or by installing an adaptor sleeve that fixes in place of the lower guide ring. The latter is held at its upper end by the ∅36"(914) guide block set.

Simply determine which pipe size is going to be driven and install either the relevant support block sets or the adaptor sleeve as shown on drawing 45-300-00-01.

Alternatively, larger sleeves can be made to order to suit specific applications.

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

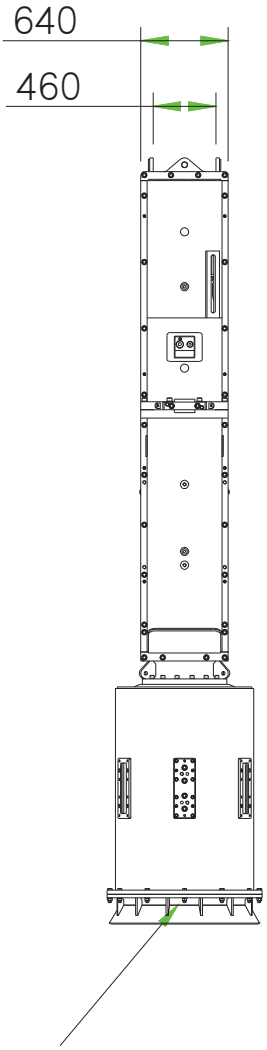
3RD ANGLE

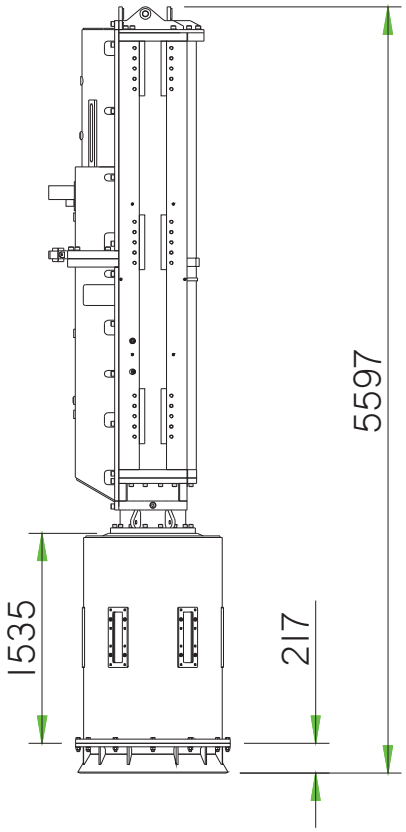


FREE-HANGING WITH UNIVERSAL GUIDE SLEEVE

THIS CONFIGURATION PERMITS THE HAMMER TO BE USED FREE-HANGING TO DRIVE NUMEROUS DIAMETERS OF PIPE PILE WITH APPROPRIATE ADAPTORS.

THE SAME ARRANGEMENT, BUT WITH SPECIAL ADAPTORS CAN BE USED TO DRIVE 'H' PILES.





UNIVERSAL GUIDE SLEEVE
SUITS UP TO Ø914mm. (36") PILES.

PERFORMANCE SUMMARY

MAX. ENERGY INTO PILE 4500 Kg.m
BLOW RATE AT MAX. STROKE 80 b.p.m.
BLOW RATE AT MIN. STROKE 120 b.p.m.
TOTAL WEIGHT COMPLETE WITH HOSES 10000 Kg
WEIGHT OF RAM 3500 Kg
OPERATING HYDRAULIC PRESSURE 255 bar
HYDRAULIC FLOW RATE REQUIREMENT 230 l/min
DIESEL ENGINE POWER 129 KW

SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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
peter watts	peter watts	–	–	A4	–	–	–	–

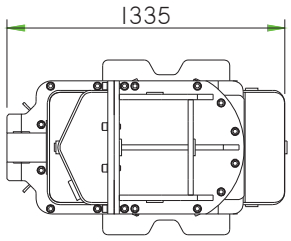
DAWSON CONSTRUCTION PLANT LTD.

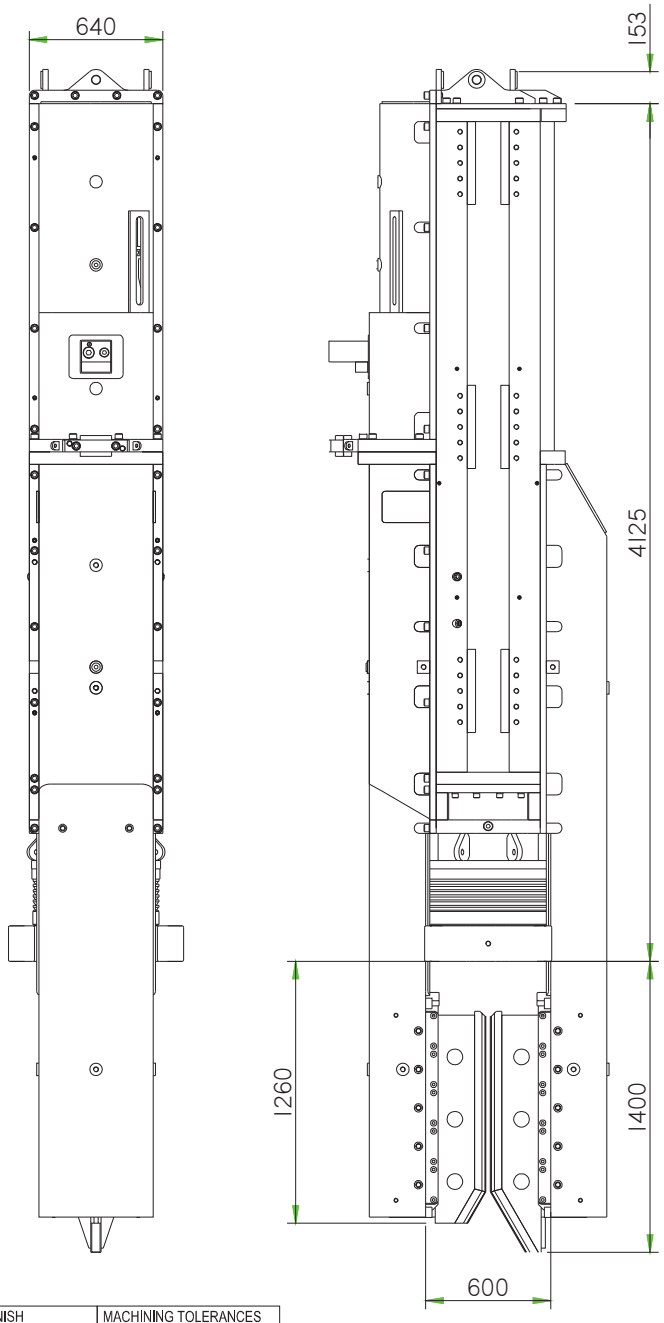
SPECIFICATION OF HPH4500
FREEHANGING CONFIGURATION WITH
UNIVERSAL GUIDE SLEEVE

File: –
Date: 27/10/2005
Drawing no.: 4500 SPEC.4

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

3RD ANGLE





FREE HANGING WITH LEG GUIDES

THE BASIC HAMMER CAN BE FITTED WITH LEG GUIDES THAT HAVE FLEXIBLE LEG INSERTS AS SHOWN. DIFFERENT LEG INSERTS CAN BE USED TO ADAPT TO DIFFERENT PILE TYPES.
THE HAMMER READILY FITS PAIRS OF MOST 'U' OR 'Z' SHEET PILES WITH DIFFERNET INSERTS.
INSERTS CAN ALSO BE SUPPLIED TO PERMIT THE HAMMER TO DRIVE 'H' PILES.

PERFORMANCE SUMMARY

MAX. ENERGY INTO PILE 4500 Kg.m
BLOW RATE AT MAX. STROKE 80 b.p.m.
BLOW RATE AT MIN. STROKE 120 b.p.m.
* TOTAL WEIGHT COMLETE WITH HOSES 10750 Kg

HYDRAULIC FLOW RATE REQUIREMENT 230 l/min
DIESEL ENGINE POWER 129 KW

* (WILL VARY DEPENDING ON SPREADER PLATE USED)

SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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
peter watts	peter watts	–	–	A4	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

SPECIFICATION OF HPH4500
FREE HANGING CONFIGURATION
WITH LEG GUIDES

File	Date
–	27/10/2005

Drawing no. 4500 SPEC.3

3.3 Free Hanging Configuration – with Leg Guides for Steel Sheet or H-Piling.

The HPH4500 will fit a whole range of U & Z steel sheet piles typically in pairs. Typically on lighter piles the hammer will not be run at maximum energy simply because it would be too powerful. This is however one of its strengths, running the hammer at lower energy levels derives even more benefit from the rapid blow rate – typically 100 to 120 blows per minute on sheet piling; real production!

The HPH4500 also offers excellent ram to pile weight ratios, ensuring the sheet pile receives much of the impact energy from ram mass and not from more damaging high impact velocity, as is the case with many other hydraulic impact hammers.

The Basic Hammer configuration requires its Lower Side Covers to be removed and in place much longer (and stronger) Sheet Pile Leg Guides must be fitted. Leg Inserts are then fitted inside the Leg Guides, mounted within elastomers or rubber sandwich mounts, so that the hammer takes a bite or grip on the steel sheet piles. This is all-important because it keeps the hammer in-line with the sheets, preventing pile damage, and it keeps the hammer and pile moving down together during driving. The Sheet Pile Configuration is shown on drawing 45-500-00-01 under section 8.1 at the back of this manual.

A Primary Drive Anvil has to be fitted, together with Dolly and Suspension System, and Spreader Plates are used to cover the pile tops as much as possible. The Spreader Plate required to cover a pair of Larssen 6's will of course be quite different from one used to cover a pair of Arbed AZ48's. There is a huge advantage in using the Spreader Plate concept, one proven by Dawson over many years.

Finally, which Leg Inserts used will depend on the pile types being driven. Essentially, there are different inserts for Z-piles and for U-piles. It is also possible to use other inserts to drive H-piles and certain sizes of pipe pile using the Sheet Pile Leg Guides if necessary.

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

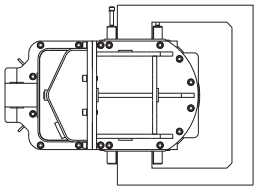
3RD ANGLE

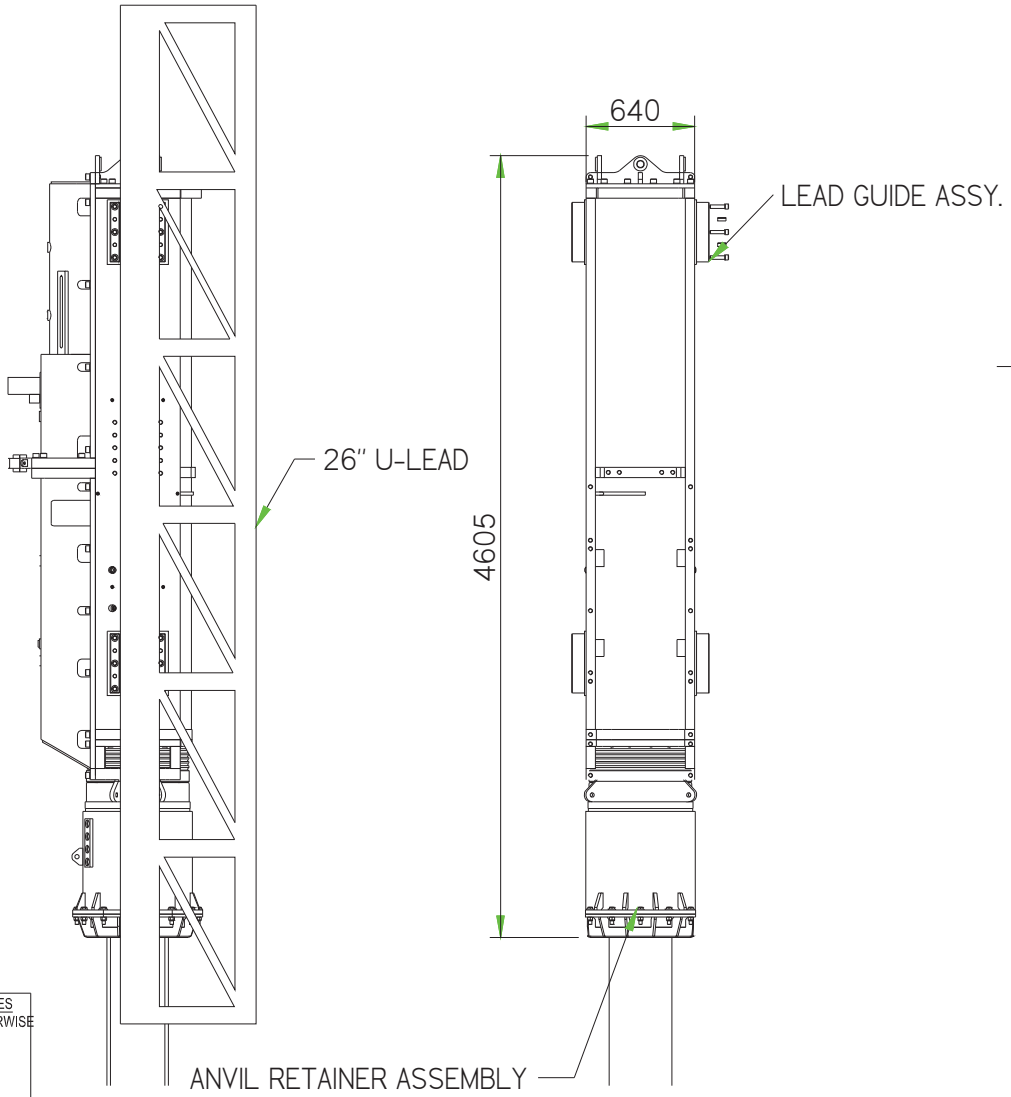
LEAD MOUNTED CONFIGURATION

WHILST THE HAMMER IS SHOWN IN 26" U-LEADS, IT CAN BE READILY FITTED TO MANY OTHER LEADER STYLES - DETAILS AVAILABLE ON REQUEST..

PERFORMANCE SUMMARY

MAX. ENERGY INTO PILE 4500 Kg.m
BLOW RATE AT MAX. STROKE 80 b.p.m.
BLOW RATE AT MIN. STROKE 120 b.p.m.
TOTAL WEIGHT COMPLETE WITH HOSES 10250 Kg
WEIGHT OF RAM 3500 Kg
OPERATING HYDRAULIC PRESSURE 255 bar
HYDRAULIC FLOW RATE REQUIREMENT 230 l/min
DIESEL ENGINE POWER 129 KW





SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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
peter watts	peter watts	–	–	A4	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

SPECIFICATION OF HPH4500
LEAD MOUNTED CONFIGURATION

File: –
Date: 27/10/2005
Drawing no.: 4500 SPEC.2

3.4 Lead Mounted Configurations

The HPH4500 lends itself to running on many styles of lead. Minimum American U-lead size is 26" as pictured here. Leads requiring the hammer to be mounted on the front of the lead can be easily accommodated also.

The benefit of this method is that the hammer can be used to drive raking piles, even to a rake of 1:1, with minimal loss of energy output due to its double acting nature; loss of gravitational effect is minimised. Diesel hammers, or free fall hammers generally suffer from tremendous energy loss when driving raking piles.

Further benefit can be gained from running the hammer from the hydraulic circuit of the base carrier if suitable, eliminating the need for an additional power pack.

In this configuration all that is added to the Basic Hammer is the Primary Drive Anvil, Dolly and some form of Mast Guides. In the case of the leads pictured here, four guide brackets were bolted to the hammer casing using the standard mast guide fixing holes in the hammer.

For general layout information see drawing 45-400-00-01 in section 8.1 at the back of this manual.

It should be noted that Dawson has considered the design of this configuration very carefully and felt it unnecessary to design a whole new range of special drive caps when many contractors have a range of existing drive caps available to them already; why spend more money? Typically, the drive cap will be SWR suspended off the bottom of the HPH4500 as shown here. Of course Dawson would be happy to manufacture drive caps for any specific requirements a contractor may have.

3.5 Using the hammer underwater

It is possible to drive piles with this hammer underwater whatever the hammer configuration. 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) The stroke adjuster 'slot' in the leg guide must be sealed with a cover.
b) The insides of the hammer should be suitably greased to minimise the effects of corrosion.
c) The gaps between hammer casing; side covers/leg guides and top cover must be sealed with a special rubber seal.
d) The inspection holes near the bottom of the hammer casing must be plugged.
e) A threaded compressed airline fitting must be fitted to the port near the bottom of the hammer.
f) The hammer must be run in conjunction with a 35/70 c.f.m. (100 psi) air compressor.
g) 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.

PLEASE CONTACT THE MANUFACTURER IF YOU HAVE A SPECIFIC PILE DRIVING PROBLEM – WE ARE MOST LIKELY TO HAVE DONE IT BEFORE!

4.0 POWER PACK AND HAMMER OPERATION

SEE ALSO SEPARATE POWER PACK MANUAL FOR MORE DETAILED INFORMATION.

4.1 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.} Height adjusting lines (3/8" BSP) used to deliver
4.} Oil to the height adjusting ram, as required.

The pressure/return hoses have the same specification. However, the return hose ends have larger fittings than the pressure hose to avoid possible confusion. 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.

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 multi-pin outlet from the power pack. This is positioned adjacent to 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.

4.2 Checking the power pack before starting

Having connected the hydraulic hoses and hand control pendant, as described in section 3.1, 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 is stored in the base of the pack frame and has an indicator gauge just inside the main door adjacent to the instrument panel. The hydraulic oil tank has a sight gauges on its side.

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. See section 4.3.1.

4.3 Starting the power pack (see fig. 2)

Prior to starting the power pack, check that the hand control pendant is turned 'off.' Set PENDANT / PANEL switch to PANEL. Set FAST / IDLE switch to IDLE. Set WARM UP / RUN switch to RUN. Select FLOW 4500.Turn 'on' the battery isolator. Push the ENGINE START button until the engine starts.

Allow the engine to run for 10minutes. If OIL COLD light is illuminated then set FAST / IDLE SWITCH TO FAST and WARM UP / RUN to WARM UP until OIL COLD light goes out. Check all gauges and diagnostic lights for correct function of unit (diagnostic lights should be off.)

Notes: -

1. If any of the following L.E.D's are 'on' when the isolator switch is turned 'on,' the power pack will not start. Rectify problem immediately.

2. If L.E.D.OIL HOT is on, the power pack will start but the pendant will be ‘dead’ until the hydraulic oil warm-up procedure is carried out.

4.3.1 Hydraulic Oil Warm-up Procedure

If the hydraulic oil temperature is less than +25ºC, OIL COLD L.E.D. will be on and the oil will require warming prior to using the hammer.

The hand control pendant will be ‘dead’ for as long as OIL COLD L.E.D. is on.

To warm the oil: -

a) Run the engine with selector switch FAST/IDLE set to FAST.

b) Turn the WARM UP / RUN selector switch to WARM UP. (The engine should go under load and the hammer pressure gauge should read approx. 250 bar).

c) Leave the pack in this condition until the OIL COLD L.E.D. goes off. (The engine should come off load at the same time the L.E.D. goes out and hammer pressure gauge return to zero bar).

d) Turn the WARM UP / RUN selector switch to RUN. The power pack is now ready for use.

4.4 Using the hammer

Before using the hammer for the first time ensure the Travel Bolts are removed from the casing.

4.4.1 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 rings 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. There are inspection holes at the bottom of the hammer casing to check this.

4.4.2. 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. Run the power pack FAST / IDLE switch set to FAST.

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

c. Adjust the stroke height indicator to minimum using the '↓' push button.

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

e. Hold the 'start' push button down for 2-3 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. To reset see section 4.4.4.

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

4.4.3 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 FAST (having followed - "Starting the power pack" section 4.3)

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

c. Adjust the 'stroke height indicator' on the side of the hammer to minimum stroke by pressing the '↓' push button.

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 '↑' or '↓' 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.

4.4.4 Cold running/over-travel

The hammer 'jumps' on the pile top when trying to achieve full stroke if the hydraulic system is 'cold.' If this happens, the hammer will **stop automatically.** (Thus preventing internal damage to the unit.) The power pack will continue to run and the 'pressure' gauge will read approximately 250 bar.

In order to reset the hammer, turn off the 'power' selector on the hand control pendant and stop the power pack. Allow the engine to stop for approximately 10 seconds then restart the unit. Reduce the stroke of the hammer to minimum. Run the hammer at this lower setting until the oil is warm enough to allow correct full stroke setting. If reducing the stroke does not cure the problem, warm the hydraulic oil as described in section 4.3.1.

If the hammer should over-travel again, refer to the Troubleshooting section 7.0.

THE HAMMER WILL NOT RUN IF IT IS NOT ALLOWED TO RESET CORRECTLY

4.4.5 Refusal

PILING MUST STOP WITH THIS HAMMER WHEN THE RATE OF DRIVING REACHES 10 BLOWS PER 25MM.

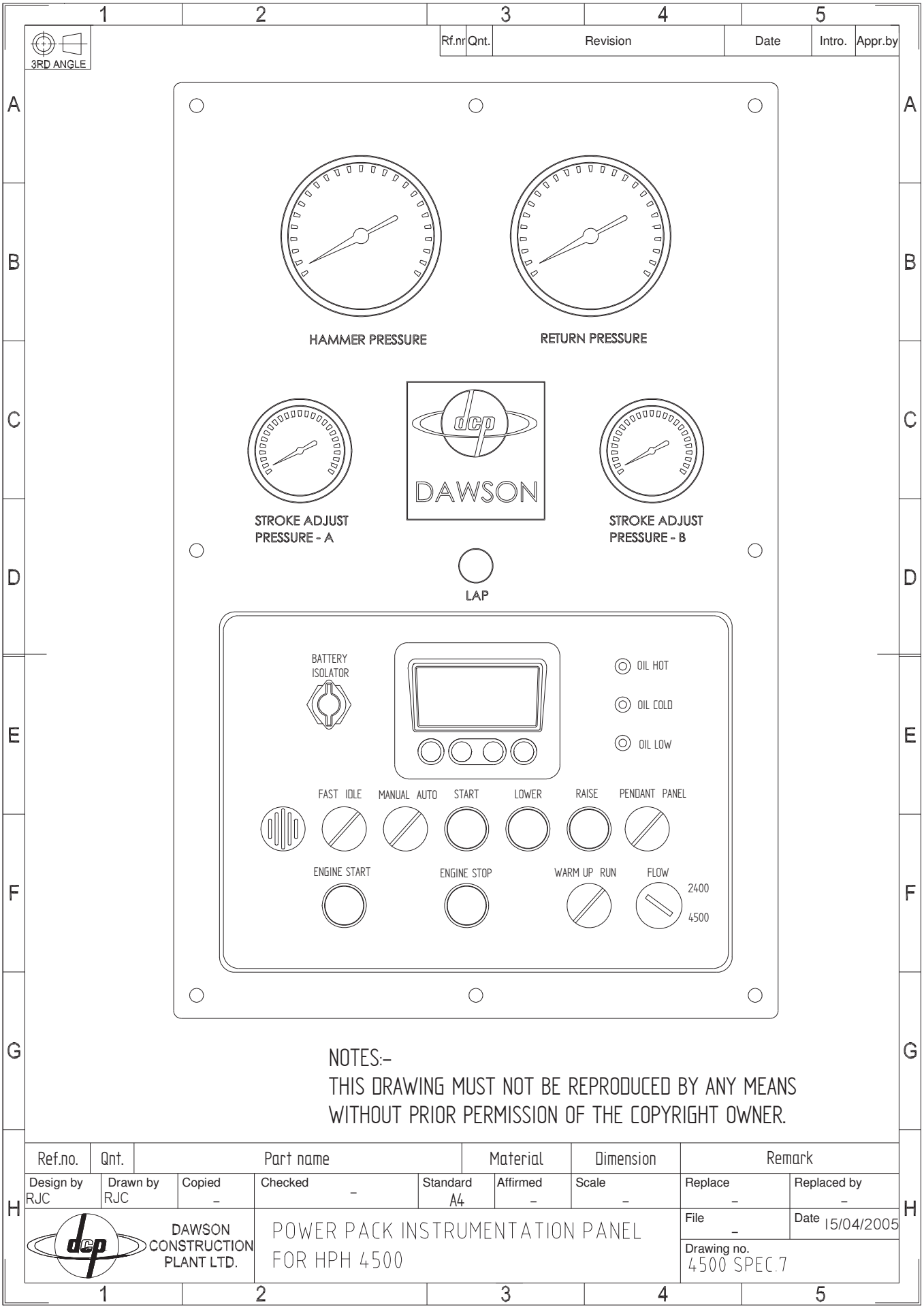
Continued use will result in hammer and/or pile damage.

4.4.6 Alternative to Pendant Control

It is possible to control the hammer directly from the Power Pack instrumentation panel instead of using the control pendant. To do this, simply switch the button on the instrumentation panel marked “Panel/Pendant” to Panel. All the pendant controls are replicated on the instrumentation panel and the hammer can be controlled in exactly the same way as described in the above sections.

This may be useful in cases where the pendent or cable has become damaged for some reason.

FIGURE 2 CONTROL PANEL POWER PACK



NOTES:-

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
RJC	RJC	–	–	A4	–	–	–	–

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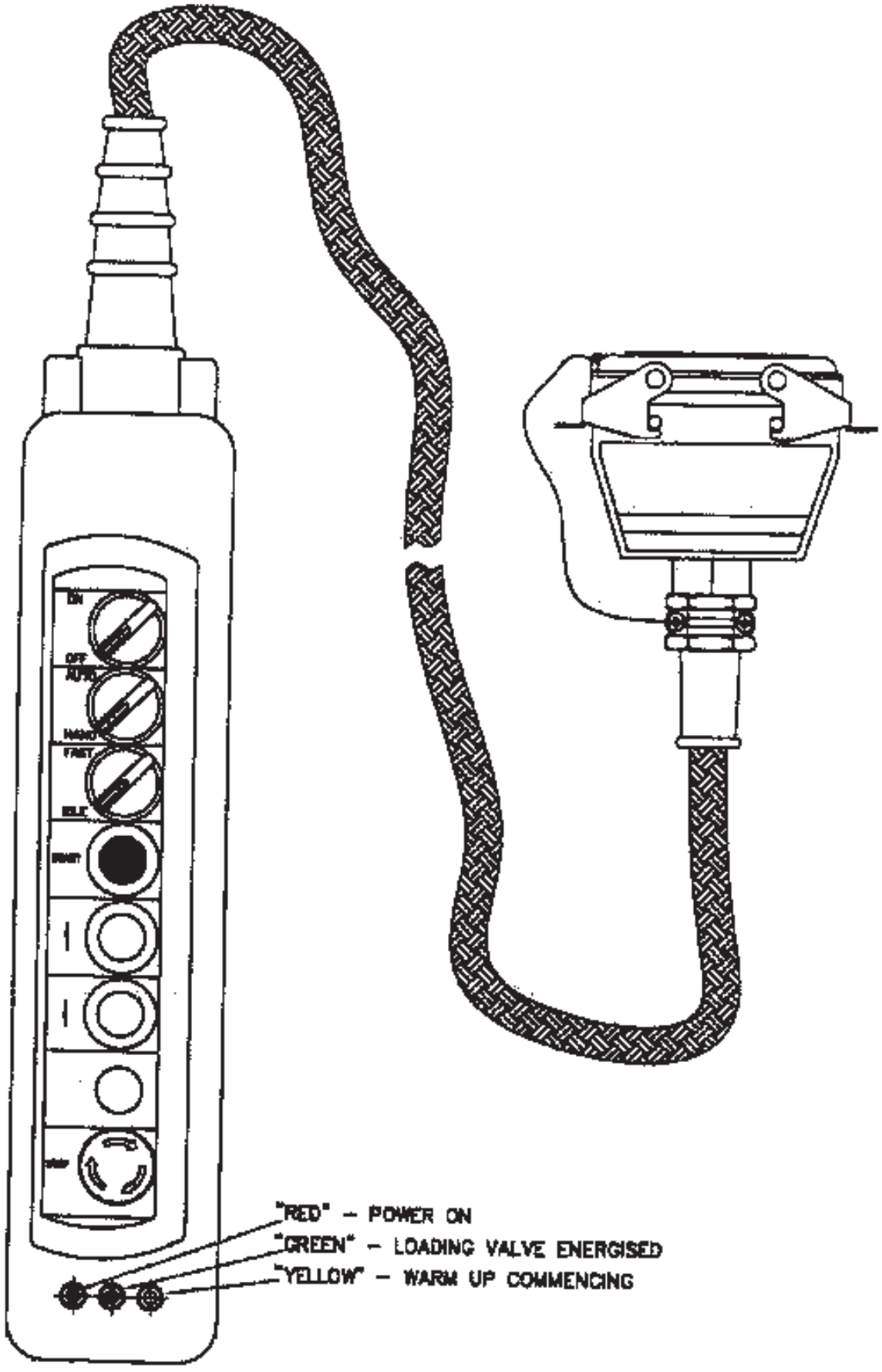
POWER PACK INSTRUMENTATION PANEL FOR HPH 4500

File: –

Date: 15/04/2005

Drawing no.: 4500 SPEC.7

FIGURE 2 PENDANT CONTROL



5.0 HAMMER MAINTENANCE (SEE APPENDIX 8.1)

5.1 Daily maintenance checks (or every 10 hours)

a. Apply Lithium based general-purpose grease to hammer through each one of fourteen points (part 1-057-00-01). Ten operations of a grease gun on each grease point every shift will be adequate.

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

c. Check that the dolly (part 45-006-00-01) has not been damaged or worn beyond its serviceable limit, i.e. the top face of the dolly not contaminated with foreign bodies or badly cracked. Also ensure dolly is still free moving in anvil case. Change dolly if in doubt. See Figure 4.

   To replace the dolly insert a steel bar through one of the holes in the bottom of the primary drive anvil and drive the old dolly out using a hammer. Insert a new dolly ensuring that it is pushed fully home.

d. Check the six rubber/steel suspension ring (ITEM 12) for wear/damage and replace if necessary. These must be in good condition at all times. These items act as the hammers 'suspension system' reducing the shock transmitted from the blow to the hammer and its components – **very important** for keeping the hammer functioning correctly.

e. Check the condition of lifting tackle and lifting points prior to being taken into service. Pay particular attention to the condition of the lifting lugs and holes for wear or cracking.

5.2 Planned 125 hour maintenance checks (run the hammer for 15 minutes before and after this maintenance work)

Every 125 hours the following work should be carried out in addition to that described in 5.1 above: -

a. Remove each hammer side cover in turn and check the condition and tightness of: all hydraulic hoses and fittings; bolts; locking rings, and visually check all components for condition.

b. Check the condition of each sensor assembly paying particular attention to cam wear, roller operated valve travel and tightness of fixing bolts. Each roller valve should have a travel of 4mm through full actuation of its associated cam. This measurement is critical and if it is not achieved the hammer will not run correctly (as with the ignition timing on a motor car). Travel can be lost through excessive cam wear or with wear on the roller or roller pin at the end of the valve.

c. Check the condition of the relevant pile guidance system e.g. sheet pile leg guides or pipe pile guide, in order to ensure correct fitting on pile sections and tightness of all fasteners.

FIGURE 4 Hammer Dolly photographs

5.3 Planned 250 hour maintenance checks (run the hammer for 15 minutes before and after this maintenance work)

Every 250 hours the following work should be carried out in addition to the work described in 5.1 and 5.2 above:

a. Check the accumulator (part 45-048-00-01) pre-charge pressures using the gas pressure checking kit and a bottle of nitrogen gas.

The pre-charge pressures are: -

High pressure -100 bar (three accumulators)
Low pressure – 3 bar (three accumulators)

To gain access to the accumulators it is necessary to remove the upper cover (part 45-060-00-01). The high-pressure accumulator is on the right hand. To check the pre-charge pressures see appendix 8.2 in this manual.

b. Check the function and condition of the bottom trip device.

c. Check the function of the hammer's over-travel valve by intentionally over-stroking the hammer when cold.

5.4 Planned 375 hour maintenance (run the hammer for 15 minutes before and after this maintenance work).

Every 375 hours the following work should be carried out in addition to the work described in 5.1 and 5.2 above:

The flexible couplings between the main hydraulic cylinders and the drop weight **must** be changed. The procedure is quite straightforward (see Figure 3). Failure to do this will result in an expensive repair.

Please look at Figure 3 and the hammer parts lists in section 8.1 whilst reading the instructions below.

a. Lay the hammer on its side on stable level ground with the hose inlet manifold uppermost, packed on timbers. Remove the Upper Cover; it is NOT necessary to remove the hose inlet manifold. This will expose one flexible coupling assembly through the hammer casing.

b. Remove items (2) & (3) from the top of the end cap, undoing the cap screws in a sequence so as to keep the cap square to the ram connector during removal.

c. Remove the top stack of Disc Springs (12) and ram washer (11).

d. Retract the piston rod of the Hydraulic Cylinder from the Drop Weight by hand and remove the other Disc Spring stack (12) and ram washer (11).

e. Dispose of the old Disc Springs (12) 32No. – they are now at the end of their useful service life and their re-use will be false economy.

f. Inspect items (10) and (11) for signs of excessive wear or cracking. Check the distance "X" across the two hardened bushes as shown in Figure 3 and ensure they are within acceptable wear limits. If this distance is below acceptable limit, even with new washers (11) fitted, it will be necessary to order and fit oversized washer from the manufacturer – contact Dawson or your nearest distributor for further details.

g. Re-assemble the connection as in Figure 3 ensuring the new Disc Springs (12) are installed in pairs using adequate EP Moly grease. Coat the Ram Connector (7) and underside of the End Cap (8) with EP Moly grease on all contact faces. Check that the threads in the end of the Ram Connector are free of grease before installing the End Cap (8), and that no grease gets into these threads before fitting the Cap Screws (2) with Loctite 270 Studlock; *Remember the Nordloc Washers (1).*

h. Tighten Cap Screws (2) until they are hand-tight, approximately 45 Nm (33ft.lbs) – just taking up the slack. Check the distance 'A' as shown on Figure 3 before, during and after tightening fully; *dimension 'A' should change by 6mm +/- 1mm during assembly!* Tighten the Cap Screws (2) to a torque of 320Nm.

Tip: Tighten all three screws fully with dry threads first. Then remove one at a time in order to apply the Loctite fluid. This produces less Loctite waste and ensures a more reliable installation process without Loctite getting between the Ram Connector end and the underside of the End Cap.

i. Once completed, re-assemble the Upper & Lower Side Covers on the hammer – the unit is now ready for turning over.

j. Turn the hammer over on to its opposite side, taking care not to rest the hammer on the Inlet Manifold. Remove the other set of Upper & Lower Side Covers. Repeat steps b) to i) as detailed above.

5.5 Planned 500 hour maintenance checks (run the hammer for 30 minutes before and after this maintenance work)

Besides the work mentioned in 5.1, 5.2 and 5.3 above the following work should be carried out: -

a. Condition and function of the Height Adjusting Ram.

c. Tightness of the Accumulator assemblies.

c. Condition of the main feed hoses between the hammer and power pack. Hoses with excessive amount of "braiding" exposed or damaged should be replaced.

d. Energy Monitoring System (EMS) service (if fitted). See EMS section in appendices for details.

5.6 Planned 1000 hour maintenance checks (run the hammer for 30 minutes before and after this maintenance work

Check the following: -

a. Condition of ram anchorage assembly. i.e. No cracks or splits in the urethane holding the cylinder in position. Also check for discolouration of the urethane, if it appears cloudy the material is degrading and should be renewed A.S.A.P. Contact Dawson's for replacement.

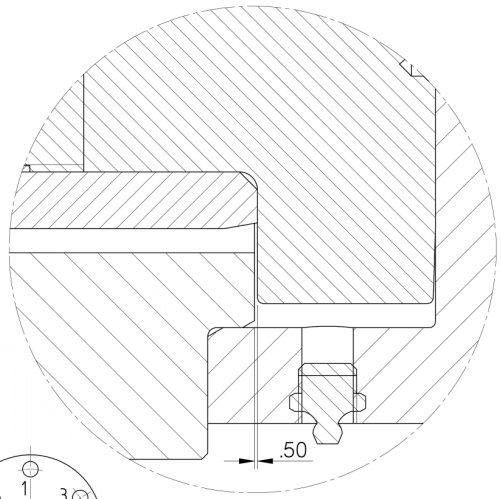
b. Condition of the Primary and Secondary Anvils.

c. Play between the Drop Weight and Casing bore.

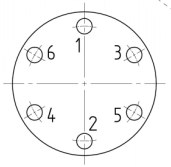
Note: It is strongly recommended that in order to achieve thorough and correct maintenance of this equipment that customer's service personnel should be fully trained by the manufacturer

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by
A		CHANGE FROM M12 TO M14	11.10.10	MDB	

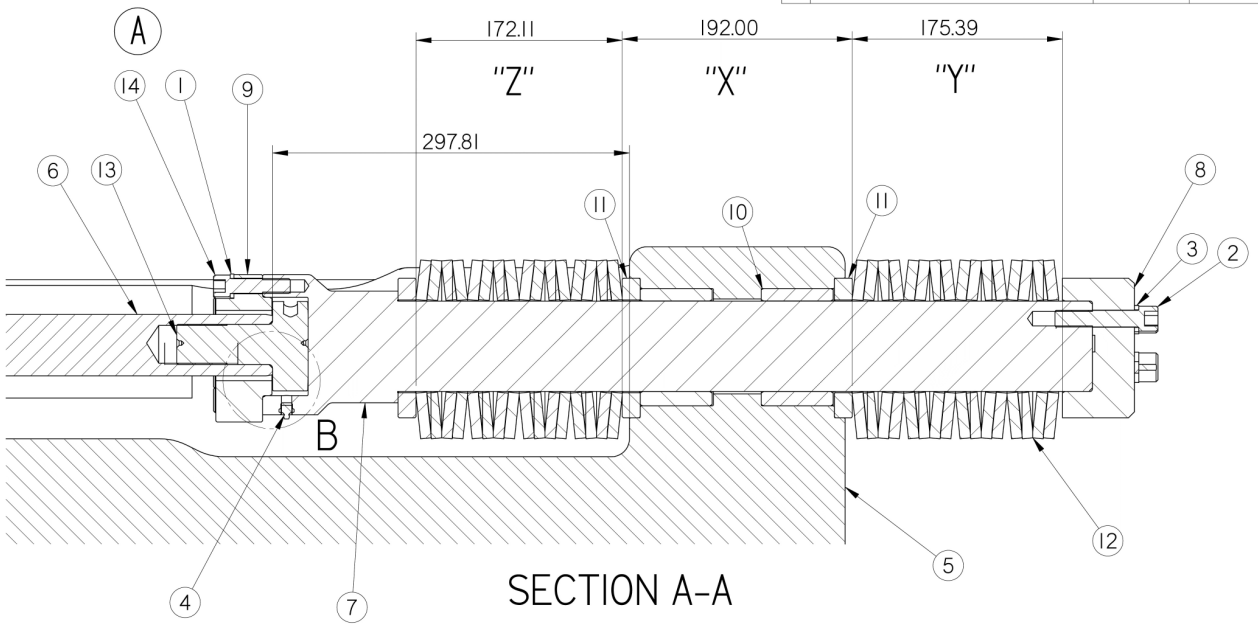
3RD ANGLE



DETAIL B



TIGHTENING SEQUENCE
FOR SCREWS ITEM 2



SECTION A-A

PISTON ROD / RAM CONNECTOR ASSEMBLY (RAM MUST BE OUT OF CASING TO REMOVE / REFIT RAM CONNECTOR TO PISTON ROD)

IMPORTANT – ENSURE ALL PARTS ARE THOROUGHLY CLEANED.
FIT RAM CONNECTOR COLLET INTO RAM CONNECTOR & ENSURE IT SEATS ON BOTTOM FACE OF HOLE.
FIT PISTON ROD CLAMPING RING TWO HALVES AROUND PISTON ROD & SLIDE END OF ROD INTO RAM CONNECTOR.
SLIDE CLAMPING RING UP TO PISTON ROD COLLAR.
FIT SCREWS & WASHERS. SEQUENTIALLY TIGHTEN (SEE SKETCH) TO 130 Nm.

RAM CONNECTOR / DROP WEIGHT ASSEMBLY

IMPORTANT – ENSURE ALL PARTS ARE THOROUGHLY CLEANED.
BEFORE ASSEMBLY CHECK DIMENSION 'X'. THIS DIMENSION WILL REDUCE WITH WEAR BUT WHEN NEW WILL MEASURE 192mm.
WHEN THIS DIMENSION REACHES 190mm THE STANDARD (15mm THICK) WASHERS MUST BE REPLACED WITH OVERSIZE (16mm THICK) WASHERS.
ASSEMBLE DISC SPRINGS AS SHOWN AND FIT END CAP.
FIT SCREWS & WASHERS & HAND TIGHTEN. MEASURE DIMENSION 'Y'.
TIGHTEN SCREWS TO 320 Nm. REMOVE SCREWS ONE BY ONE, APPLY LOCTITE 222 & RETIGHTEN. MEASURE DIMENSION 'Y' AGAIN.
THIS DIMENSION SHOULD BE LESS THAN THE PREVIOUSLY MEASURED DIMENSION BY 9.5mm +/– 1mm.
CHECK DIMENSION 'Z'. THIS SHOULD BE THE SAME AS DIMENSION 'Y'.

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
14	10	SOCKET HEAD CAP SCREW		OM14-50-02	
13	1	RAM CONNECTOR COLLET		45-009-09-01	
12	32	DISC SPRING - RAM CONNECTOR		45-009-08-01	
11	3	WASHER - RAM CONNECTOR		45-009-07-01	
10	2	BUSH - RAM CONNECTOR		45-009-06-01	
9	1	CLAMPING RING		45-009-03-03	
8	1	RAM CONNECTOR END CAP		45-009-02-01	
7	1	RAM CONNECTOR		45-009-01-03	
6	1	PISTON ROD ASSEMBLY		45-008-14-02	
5	1	DROP WEIGHT		45-001-00-01	
4	2	GREASE NIPPLE	1/8" BSP	1-057-00-01	
3	3	NORD-LOCK WASHER	M16	OM16.000.27	
2	3	SOCKET HEAD CAP SCREW	M16 x 70 LG	OM16-070-02	
1	10	NORDLOC WASHER	M14	OM14.000.27	

SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
M.D.B	M.D.B	–	–	A3	–	–	–	–

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RAM CONNECTOR ASSEMBLY

Sheet 1 of 1 | Date 05/10/2009

Drawing no. 45-009-00-02

FIGURE 3

FIGURE 3

5.7 PREVENTATIVE MAINTENANCE GUIDELINES FOR HPH4500 HYDRAULIC HAMMER AND DIESEL ENGINED POWER PACKS

	DAILY OR REFUELLING	EVERY 125 HOURS	EVERY 250 HOURS	EVERY 375 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	
HAMMER	CHECK ALL EXTERNAL FASTENERS FOR TIGHTNESS DOLLY CONDITION SUSPENSION RINGS LIFTING POINT CONDITION SERVICEABILITY OF SLINGS/SHACKLES **MUST:** GREASE HAMMER FREQUENTLY	CHECK: TIGHTNESS OF ALL HOSES, FITTINGS AND FASTENERS INSIDE HAMMER CONDITION OF BOTH SENSORS WEAR ON PILING GUIDANCE SYSTEM	CHECK: ACCUMULATOR NITROGEN PRECHARGE PRESSURES FUNCTION OF OVERTRAVEL VALVE FUNCTION/CONDITION OF PROBE ASSEMBLY AND BOTTOM TRIP DEVICE	CHECK: CONDITION OF RAM GUIDE BUFFER AND DAMPING PIN BUSH CHANGE: DISC SPRINGS BETWEEN DROP WEIGHT AND HYDRAULIC CYLINDERS	CHECK: CONDITION OF HEIGHT ADJUSTING RAM TIGHTNESS OF ACCUMULATORS CONDITION OF MAIN FEED HOSES TO HAMMER EMS SENSORS AND CABLES. CHANGE: EMS BATTERIES (IF FITTED)	CHECK: CONDITION OF MAIN RAM ANCHORAGE ASSEMBLY CONDITION OF ANVILS PLAY BETWEEN DROP WEIGHT AND CASING BORE	
	-	TEST RUN ON PILE 15 MINUTES BEFORE AND AFTER CHECKING	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 INUTES 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 5 AND 6 IN THE HAMMER MANUAL AND THE JOHN DEERE SERVICE MANUAL)

6.0 POWER PACK MAINTENANCE

6.1 Power pack specification

6.1.1 Basic specification

Engine power output	-	120 kW @ 2200 rpm
Engine maximum rpm	-	2200
Hydraulic flow output	-	230 l/min
Max hydraulic pressure output	-	250 Bar
Dimensions (l x w x h)	-	3300 x 1340 x 2252mm
Weight	-	3200 kg (Hydraulic oil & Diesel half full)

6.1.2 Lubrication specification

Hydraulic oil type	-	Fina Hydran LZ 32 or equivalent
Hydraulic oil capacity	-	576 litres
Diesel engine oil type	-	15 W 40
Diesel engine oil capacity	-	20.5 litres (incl. filter)
Diesel fuel type	-	DIN 51601-DK
Diesel fuel capacity	-	300 litres

6.2 Daily maintenance checks (for full details of diesel engine maintenance see John Deere service manual)

a. Check hydraulic oil level - must be visible in sight glass, but not over half way in sight.

b. Check diesel lubrication oil level.

c. Ensure pump isolator valve is fully open.

d. Ensure air inlet/outlet panels are free from obstruction.

e. Drain water from diesel water trap.

f. Inspect lifting tackle and lifting points before being put into service.

g. Check function of diagnostic L.E.D.'s by pressing test button.

h. Check function of gauges.

i. Check condition of quick release couplings.

j. Check engine coolant level.

k. Check condition of fan and drive belt.

6.3 Planned maintenance checks

For full details of diesel engine maintenance see John Deere service manual and for power pack maintenance procedures see section 6.4.

6.3.1 Every 125 hours

Check the following: -

a. Hoses, pipe work and fittings for any hydraulic oil leaks and rectify as required.

b. Tightness of all fasteners.

c. Condition of body panels and paint work. Touch-up where necessary.

d. Battery water level.

e. Condition and function of hand control pendant.

6.3.2 Every 250 hours

Check the following: -

a. Engine air cleaner.

b. Engine intake system

c. Engine charge air cooler.

d. Battery charging rate.

Change the following: -

e. Engine oil.

f. Engine oil filter.

g. Hydraulic oil filling filter.

h. Diesel fuel filling filter.

6.3.3 Every 500 hours

Check the following: -

a. Anti freeze in engine coolant.

b. Pump output flow rate and working pressure.

Change the following: -

c. Fuel filter.

d. Hydraulic oil pressure and return filters.

6.3.4 Every 1000 hours

Check the following: -

a. Engine fan hub.

b. Engine belt tensioner bearing.

c. Engine belt tension.

d. Adjust valve lash clearance on engine.

e. Condition of all wiring and tightness of electrical connectors.

f. Wear on hydraulic pump flexible coupling.

g. Condition of exhaust.

Change the following: -

i. System hydraulic fluid.

6.4 Maintenance procedures

NOTE: Before any of the following procedures are undertaken, the battery isolator switch must be switched off.

a. Changing fuel/hydraulic oil inlet filler elements.

(i) Replacement element
(ii) Remove filter bowl
(iii) Remove and discard filter element (do not clean)
(iv) Wash bowl thoroughly
(v) Fit replacement element into bowl
(vi) Re-assemble filter
(vii) Prime hand pump

b. Changing hydraulic pressure filter element.

(i) Replacement element
(ii) Remove filter bowl
(iii) Remove and discard filter element (do not clean)
(iv) Wash bowl thoroughly
(v) Fit replacement element onto spigot
(vi) Fill filter bowl with clean hydraulic oil
(vii) Replace bowl O' ring if necessary
(viii) Re-assemble filter

c. Change hydraulic return filter element.

(i) Replacement element
(ii) Remove filter bowl
(iii) Remove and discard filter element (do not clean)
(iv) Wash bowl thoroughly
(v) Fit replacement element onto spigot
(vi) Fill filter bowl with clean hydraulic oil
(vii) Replace bowl O' ring if necessary
(viii) Re-assemble filter

d. Pump removal/re-fitting.

(i) **IMPORTANT NOTE** - the hydraulic pump should be returned to the manufacturer for repair/overhaul. This item **must not** be stripped or tampered with.

(ii) Isolate pump from hydraulic oil reservoir using pump isolator valve
(iii) Remove hoses from pump body
(iv) Remove mounting screws from front flange of pump
(v) Withdraw pump from coupling towards oil reservoir
(vi) Remove bell-housing from engine mounting flange
(vii) Reverse procedure for re-assembly
(viii) Fill case drain of pump with clean hydraulic oil prior to start up following removal from the system (port located on the top of the pump with adaptor fitted)

e. Cooler removal/re-fitting.

(i) Close pump isolator valve to prevent system syphoning
(ii) Remove flexible hoses from cooler
(iii) Remove mounting bolts from cooler
(iv) To remove matrix, remove top and bottom retaining strips from front of cooler and withdraw matrix from front of cooler assembly

f. Control valve assembly.

(i) Close pump isolator valve to prevent system syphoning
(ii) To replace solenoid coils remove plastic retainer from end of coil and withdraw coil from retaining tube
(iii) To replace valve assemblies remove 4 off retaining screws from top of valve and replace component as necessary

g. Pipework.

(i) For details of hose assemblies see hydraulic schematic drawing Appendix 8.1.1
(ii) Welded pipe ends are currently utilised and should it become necessary to disturb these fittings a replacement O' ring should be used

h. Changing system hydraulic fluid

(i) Change hydraulic fluid
(ii) Remove clean-out cover and clean reservoir
(iii) Replace fuel inlet and hydraulic fluid inlet filter elements
(iv) Replace hydraulic pressure line filter element
(v) Replace hydraulic return line filter element
(vi) Blow through cooler matrix to clear
(vii) Replace solid pipe fitting O' rings as necessary
(viii) Replace tank cover gasket
(ix) Check all electrical connections for tightness
(ix) Check drive coupling for wear and replace or adjust if necessary

6.5 Setting procedures

a. Re-setting pressure

The pressure regulating adjuster is situated on the main control valve assembly.
To adjust:

(i) Loosen the lock nut and wind the centre spigot counter clockwise to reduce pressure
(ii) Press the test button on the control panel to load the system
(iii) Turn the centre spigot clockwise to raise the system pressure
(iv) When the required pressure has been achieved (max 250 bar) tighten the lock nut

NOTE: Should the required pressure be exceeded, wind the adjuster back and increase again. **Never** wind the pressure downwards to set

b. Engine gauges replacement.

(i) There is a resistor fitted to all gauge power lines. This must be replaced after maintenance to prevent damage to the gauges.

7.0 TROUBLESHOOTING

7.1 Power pack engine will not start

a. Check battery condition.

b. Check diagnostics panel for fault LED showing (see fig. 2.)

7.2 Engine cuts out during running

a. Check diagnostics panel for fault LED showing and rectify (see fig. 2.)

7.3 Power pack does not generate any pressure

a. Check L.E.D. (11) to see if hydraulic oil is up to temperature (see figure 2). If not perform warm-up operation described in section 4.3.1.

b. Check operation of main valve in power pack by turning selector switch (5) to 'warm-up' on the instrumentation panel (fig. 2.) This gives 200 bar reading on pressure gauge.

c. Check fuses or electrical connections to valve block if no reading from (b).

d. Check operation of relief valve if no reading from (b).

e. Check operation of hand control pendant and fuses in electrical box if reading is O.K. in (b).

7.4 Power pack generates pressure but hammer does not run

a. Anvil not pushed fully up into hammer casing (see section 4.4.1.) or the dolly is not sitting correctly in the anvil (especially after transportation or laying on its side)

b. Air in hammer hydraulic system - see section 4.4.2.

c. Hammer has been allowed to over-travel - see section 4.4.4. to reset.

d. Faulty bottom sensor assembly - lay the hammer on timber blocks on level stable ground with the hose inlet manifold upper most then remove the Upper & Lower Side Covers and check the bottom sensor as follows: -

(i) Cam/spring operation - does the cam rotate/return freely and is the spring in good order.
(ii) Check for correct lift on valve roller (4mm)
(iii) Check 'trip' arrangement for correct function

(iv) It is possible to work the hammer for diagnostic purposes whilst it is lying on the ground. However, extreme caution must be exercised when doing so, as incorrect operation will cause hammer damage. Always ensure the pendant is in MANUAL mode and NOT automatic mode. The anvil must be in the 'up' position so as to ensure the trip device is 'off'. The hammer can be pressurised by 'tapping' the 'start' push button on the pendant (power pack running) very gradually building up enough pressure to move the drop weight. If the button is held for too long the drop weight will possibly impact the inside top of the hammer - not a good idea!

However, by careful application of this method it is possible to check pressure is reaching the relevant sensor. If it is not, then the problem may be with the over-travel valve (part 1-084-00-05) not allowing oil flow to the control side of the hammer. This can be confirmed by removing the main pressure feed to either sensor - no oil flow when pressurising the system indicates over-travel valve problems and this item should be removed for inspection. The over-travel valve can be removed by removing the front cover- upper of the hammer. Turn the power pack off before removal.

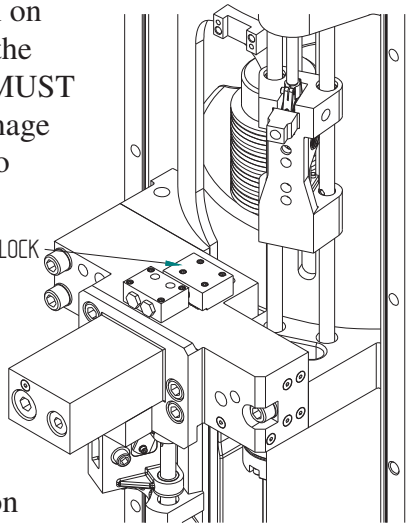
When checking the over-travel valve first check item (6) the small restrictor for any blockage. The valve is unlikely to be faulty inside and if this is suspected the unit should be returned to the manufacturer for checking.

If pressure is reaching the sensor check that the pilot signal from the sensor is reaching the main control valve block at the top of the hammer when the roller valve is operated. If not, remove and inspect the roller valve.

e. If this all appears to be in order check the top sensor mechanism in a similar manner to that described in e. (i) and (ii) above as it may be that the top sensor is jammed on.

Note: The spool inside the roller valve and the roller shaft are not connected so even though the roller returns when operated it does not follow that the spool has returned. Check the tension on the roller shaft, if there is none the spool may be stuck open.

f. If after checking the sensors and resetting as per 4.4.4 the hammer will not run for more than a few cycles then remove, rotate 180º and refit the transfer block. As shown on attached sketch and drawing 45-000-00-01PL, item 14. This will bypass the over travel valve and should allow the hammer to operate. The hammer MUST NOT be run for more than a few hours in this condition as permanent damage can occur. The over travel valve MUST be replaced as soon as possible to prevent permanent damage occurring.



g. If all appears well the problem may be with the main control valve spool. Contact the manufacturer for further details.

7.5 Hammer will lift but not drop

a. Has the hammer been allowed to over-travel? Check reset - see section 4.4.4.

b. Air in hammer hydraulic system - see section 4.4.2.

c. Damaged 'looped' hose from sensor assembly - check by removing the Upper & Lower Side Covers from the Rear Side of the hammer i.e. the side with the Hose Inlet Manifold.

d. Faulty top sensor assembly - see 7.4.d as diagnosis is similar to faulty bottom sensor assembly.

e. Faulty bottom sensor assembly i.e. valve is staying on (see section 7.4.d. for similar diagnosis)

f.

7.6 Hammer runs erratically

a. Air in hydraulic system - see section 4.4.2.

b. 'Cold' hydraulic oil - see section 4.4.4.

c. Accumulator pressures incorrect or bladders damaged.
See Appendix 8.2.High pressure accumulator - 100 bar (3 off)
Low pressure accumulator - 3 bar (3 off)

d. Not enough hydraulic flow/pressure from power pack - check flow rate.

e. One or both sensors damaged/contaminated - see sections 7.4 and 7.5

7.7 Excessive hose 'jumping'

Check accumulator pressures/condition - see Appendix 8.2.

7.8 Hammer 'jumping' excessively on pile top - reduce stroke immediately and/or stop piling

a. Too much hydraulic oil input - set to 260 l/min.

b. 'Cold' hydraulic oil - see section 4.4.4 and reduce stroke. To warm the oil see section 4.3.1.

c. Stroke adjuster set too high - reduce **immediately** to continue working.

d. Suspension Rings damaged. Inspect and replace immediately, if necessary.

e. Incorrect operation of top sensor assembly i.e. cam wear and/or incorrect roller travel.

7.9 Stroke height indicator will not move

a. With the power pack running and control pendant connected, check pressure gauges when '↑' and '↓' are pressed. If no readings, check relevant valve and wiring/fuses in power pack.

b. If readings are O.K., check hoses to hammer. If these are O.K., check restrictor orifices for blockages - these are the male/male adaptors located on the inlet manifold

c. If these are clear remove the Rear Upper Side Cover and check the height adjusting ram and top sensor assembly.

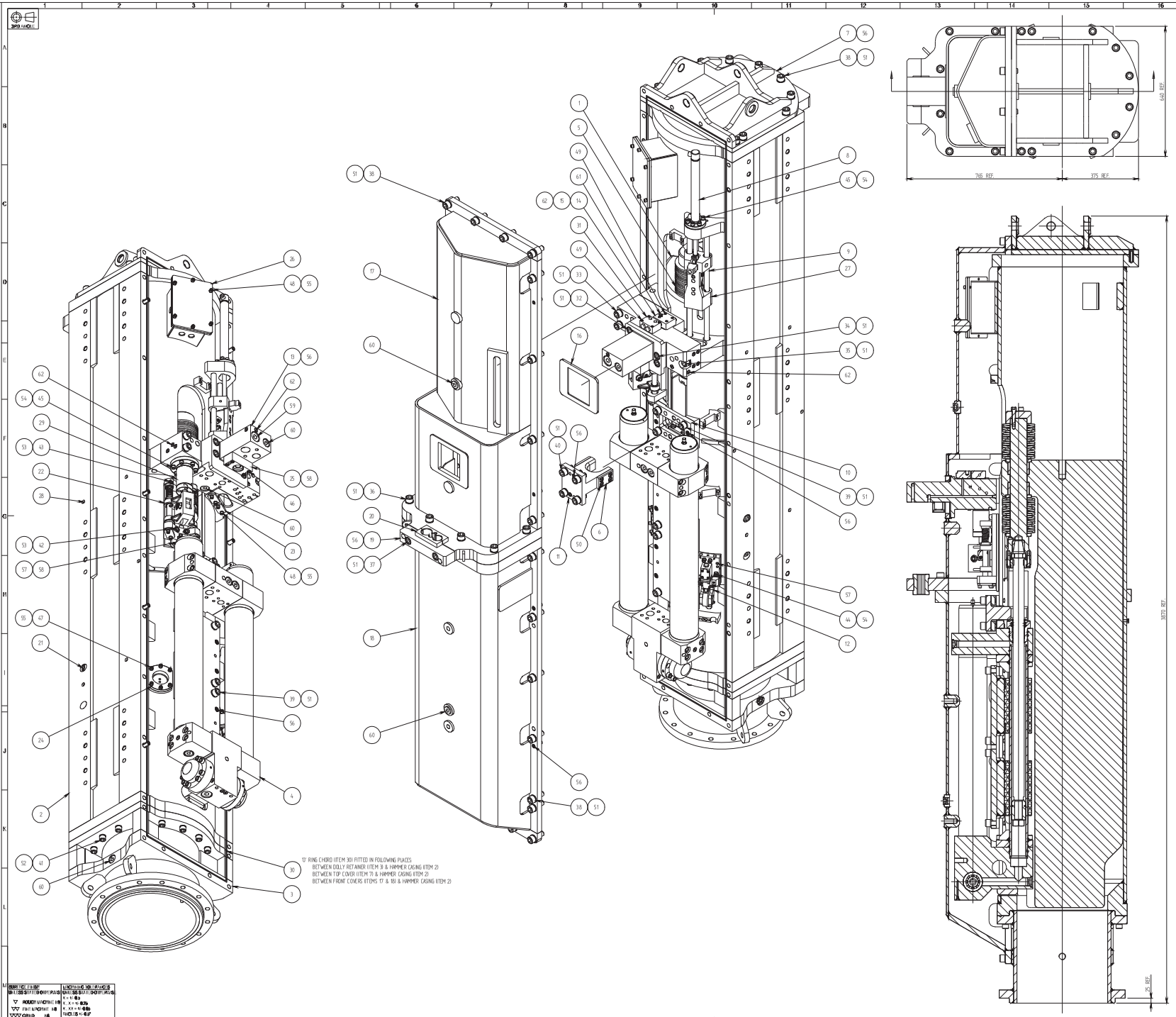
APPENDIX 8.1 -

HPH4500 HYDRAULIC HAMMER

PARTS LISTS FOR ALL CONFIGURATIONS

This includes the following drawings:

45-000-00-01 Basic Hammer Configuration.
45-300-00-01 Hammer Configured to Drive Tubes/Pipe with the. Universal Guide System – Free Hanging.
45-400-00-01 Hammer Configured to Operate in Leads.
45-500-00-01 Hammer Configured With Leg Guides.
45-600-00-01 Leg Guides Sub Assembly.
45-008-00-02 Hydraulic Ram, Control Valve & Accumulator Assy.
1-030-00-05 Top Sensor Assembly.
45-036-00-01 Bottom Sensor Assembly.
45-085-00-01 Over Travel Trip Assembly.
1-054-00-05 Over Travel Valve.



FOR PAINT & LOGO DETAILS SEE DRG. No. 45-200-00-01.

62	17	BLANKING PLUG		1¼" BSP	1-018-18-01
61	1	BLANKING PLUG		3/8" BSP	1-018-28-01
60	6	BLANKING PLUG		1" BSP	1-064-00-01
59	1	BLANKING PLUG		1 1/4" BSP	1-018-17-01
58	3	SPRING PIN		ø 12 x 30 LG	EM12-030-22
57	3	SPRING PIN		ø 12 x 40 LG	EM12-040-22
56	27	COILED PIN		ø 20 x 50 LG	EM20-050-36
55	16	NORD-LOCK WASHER		M10	EM10-010-27
54	16	NORD-LOCK WASHER		M12	EM12-000-27
53	4	NORD-LOCK WASHER		M16	EM16-000-27
52	16	NORD-LOCK WASHER		M20	EM20-000-27
51	69	NORD-LOCK WASHER		M24	EM24-000-27
50	8	CSK. SOCKET HEAD SCREW	GRADE 12.9	M10 x 25 LG	EM10-025-03
49	8	SOCKET HEAD CAP SCREW	GRADE 12.9	M16 x 40 LG	EM16-040-02
48	10	SOCKET HEAD CAP SCREW	GRADE 12.9	M10 x 25 LG	EM10-025-02
47	6	SOCKET HEAD CAP SCREW	GRADE 12.9	M10 x 30 LG	EM10-030-02
46	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M10 x 50 LG	EM10-050-02
45	12	SOCKET HEAD CAP SCREW	GRADE 12.9	M12 x 40 LG	EM12-040-02
44	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M12 x 50 LG	EM12-050-02
43	2	SOCKET HEAD CAP SCREW	GRADE 12.9	M16 x 55 LG	EM16-055-02
42	2	SOCKET HEAD CAP SCREW	GRADE 12.9	M16 x 80 LG	EM16-080-02
41	16	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 80 LG	EM20-080-02
40	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 50 LG	EM24-050-02
39	12	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 60 LG	EM24-060-02
38	38	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 65 LG	EM24-065-02
37	2	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 80 LG	EM24-080-02
36	6	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 100 LG	EM24-100-02
35	1	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 110 LG	EM24-110-02
34	2	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 150 LG	EM24-150-02
33	2	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 190 LG	EM24-190-02
32	2	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 230 LG	EM24-230-02
31	1	VALVE BLOCK - MAIN			6-026-01-01
30	1	'O' RING CHORD ø 6.99		12 m LG	6-022-11-01
29	1	OVERTRAVEL VALVE ASSEMBLY			1-084-00-05
28	11	GREASE NIPPLE		1/8" BSP	1-057-00-01
27	1	TOP SENSOR ASSEMBLY			1-030-00-15
26	1	COVER - E.M.S.			EA5-025-00-01
25	1	SOCKET HOUSING - E.M.S.			EA5-004-00-01
24	1	SENSOR PLATE - E.M.S.			EA5-002-00-01
23	2	GUIDE BAR RETAINER			45-035-05-01
22	1	OVERTRAVEL TRIP ASSEMBLY			45-035-00-01
21	2	TRAVEL BOLT			45-034-00-01
20	1	CLAMP INSERT - HOSE BUNDLE			45-064-00-01
19	1	CLAMP PLATE - HOSE BUNDLE			45-063-00-01
18	1	FRONT COVER - LOWER			45-062-00-01
17	1	FRONT COVER - UPPER			45-060-00-01
16	1	SEAL - FRONT COVER / MANIFOLD			45-058-00-01
15	4	'O' RING			45-057-00-01
14	1	TRANSFER BLOCK			45-056-00-01
13	1	MANIFOLD BLOCK			45-055-00-01
12	1	BOTTOM SENSOR ASSEMBLY			45-036-00-01
11	1	RAM GUIDE BLOCK			45-032-00-01
10	1	TIE PLATE			45-031-00-01
9	2	GUIDE BAR - TOP SENSOR			45-027-00-01
8	1	HEIGHT ADJUSTING RAM			45-026-00-01
7	1	TOP COVER			45-017-00-01
6	2	WEAR PAD			45-015-00-01
5	1	RAM CONNECTOR ASSEMBLY			45-009-00-01
4	1	NYD RAM, C.V. & ACC. ASSY.			45-008-00-01
3	1	DOLLY RETAINER BODY			45-007-00-01
2	1	HAMMER CASING			45-033-00-01
1	1	DROP WEIGHT			45-001-00-01

Ref no.	Qnt.	Part name	Material	Dimension	Remark

Designed by	Drawn by	Counted	Checked	Standard	Approved	Scale	Replaces	Replaced by
AMB	-	-	-	AS	-	1:6	-	-

GILBERT CONSTRUCTION PRODUCTS LTD

HPH4500 BASIC HAMMER ASSEMBLY

File: 25-06-04

Drawing no. 45-000-00-01

UNLESS STATED OTHERWISE
X = ± 0.5
X.X = ± 0.25
X.XX = ± 0.05
ANGLES = ± 0.5°
DIMENSIONS IN MILLIMETRES

UNLESS STATED OTHERWISE
X = ± 1
X.X = ± 0.5
X.XX = ± 0.05
ANGLES = ± 0.5°
DIMENSIONS IN MILLIMETRES

▽ ROUGH MACHINE 16
▽▽ FINE MACHINE 8
WWW GRIND 1.6

Ref.no.	Qnt.	Part name		Material	Dimension	Remark
29	1	OVERTRAVEL VALVE ASSEMBLY			1-084-00-05	
28	11	GREASE NIPPLE		1/8" BSP	1-057-00-01	
27	1	TOP SENSOR ASSEMBLY			1-030-00-05	
26	1	COVER - E.M.S.			E45-825-00-01	
25	1	SOCKET HOUSING - E.M.S.			E45-804-00-01	
24	1	SENSOR PLATE - E.M.S.			E45-802-00-01	
23	2	GUIDE BAR RETAINER			45-085-05-01	
22	1	OVERTRAVEL TRIP ASSEMBLY			45-085-00-01	
21	2	TRAVEL BOLT			45-084-00-01	
20	1	CLAMP INSERT - HOSE BUNDLE			45-064-00-01	
19	1	CLAMP PLATE - HOSE BUNDLE			45-063-00-01	
18	1	FRONT COVER - LOWER			45-062-00-01	
17	1	FRONT COVER - UPPER			45-060-00-01	
16	1	SEAL - FRONT COVER / MANIFOLD			45-058-00-01	
15	4	'O' RING			45-057-00-01	
14	1	TRANSFER BLOCK			45-056-00-01	
13	1	MANIFOLD BLOCK			45-055-00-01	
12	1	BOTTOM SENSOR ASSEMBLY			45-036-00-01	
11	1	RAM GUIDE BLOCK			45-032-00-01	
10	1	TIE PLATE			45-031-00-01	
9	2	GUIDE BAR - TOP SENSOR			45-027-00-01	
8	1	HEIGHT ADJUSTING RAM			45-026-00-01	
7	1	TOP COVER			45-017-00-01	
6	2	WEAR PAD			45-015-00-01	
5	1	RAM CONNECTOR ASSEMBLY			45-009-00-01	
4	1	HYD RAM, C.V. & ACC. ASSY.			45-008-00-01	
3	1	DOLLY RETAINER BODY			45-007-00-01	
2	1	HAMMER CASING			45-003-00-01	
1	1	DROP WEIGHT			45-001-00-01	

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
A.M.B.	-	-	-	A0	-	1:6	-	-

File	Date
-	25-06-04

DAWSON CONSTRUCTION PLANT LTD.

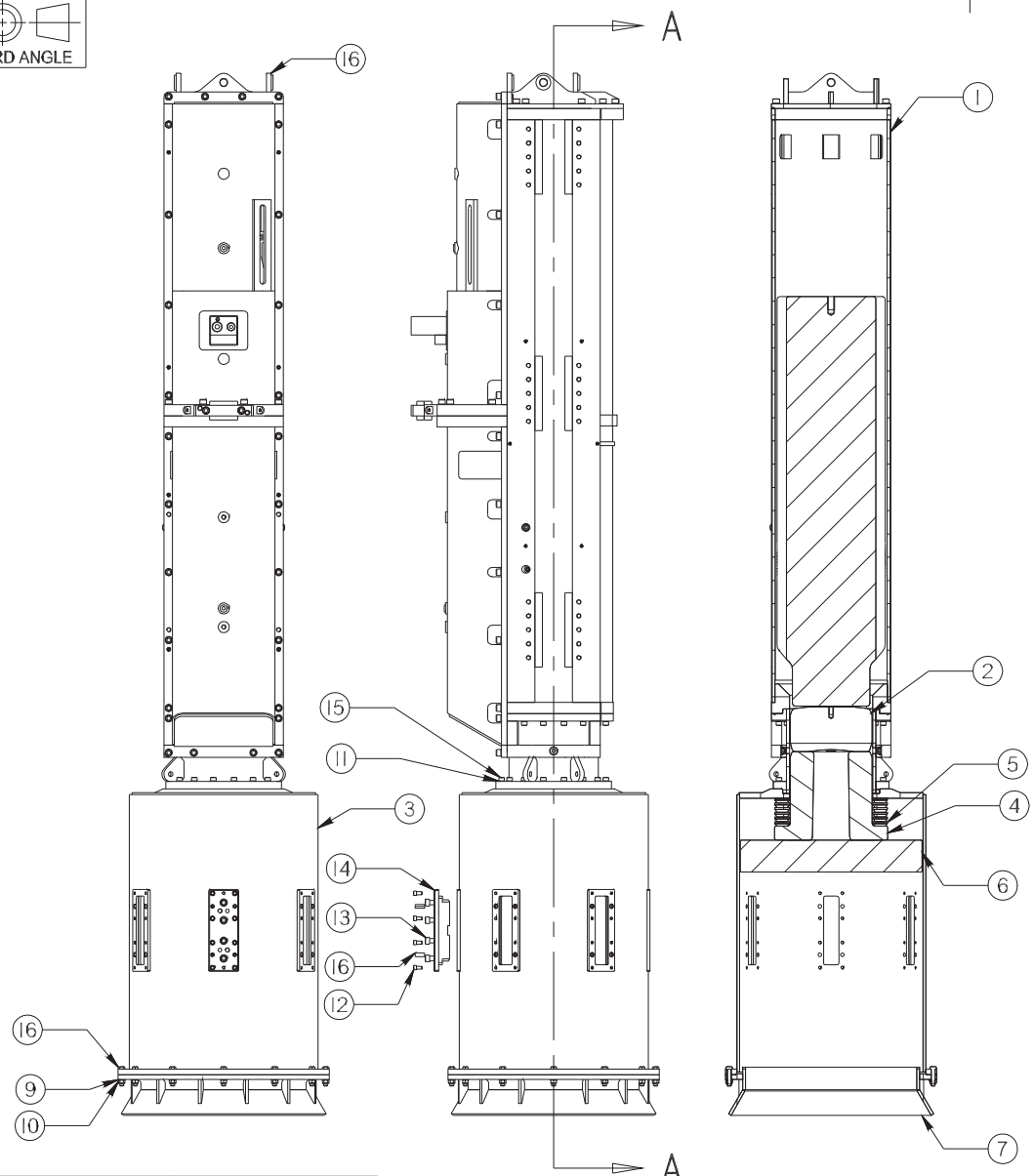
HPH4500 BASIC HAMMER ASSEMBLY

Drawing no. 45-000-00-01PL

Ref.no.	Qnt.	Part name		Material	Dimension	Remark
62	17	BLANKING PLUG			1/4" BSP	1-018-18-01
61	1	BLANKING PLUG			3/8" BSP	1-018-28-01
60	6	BLANKING PLUG			1" BSP	1-064-00-01
59	1	BLANKING PLUG			1 1/4" BSP	1-018-07-01
58	3	SPRING PIN			⌀ 12 x 30 LG	0M12-030-22
57	3	SPRING PIN			⌀ 12 x 40 LG	0M12-040-22
56	27	COILED PIN			⌀ 20 x 50 LG	0M20-050-36
55	16	NORD-LOCK WASHER			M10	0M10-000-27
54	16	NORD-LOCK WASHER			M12	0M12-000-27
53	4	NORD-LOCK WASHER			M16	0M16-000-27
52	16	NORD-LOCK WASHER			M20	0M20-000-27
51	69	NORD-LOCK WASHER			M24	0M24-000-27
50	8	CSK. SOCKET HEAD SCREW	GRADE 12.9		M10 x 25 LG	0M10-025-03
49	8	SOCKET HEAD CAP SCREW	GRADE 12.9		M6 x 40 LG	0M06-040-02
48	10	SOCKET HEAD CAP SCREW	GRADE 12.9		M10 x 25 LG	0M10-025-02
47	6	SOCKET HEAD CAP SCREW	GRADE 12.9		M10 x 30 LG	0M10-030-02
46	4	SOCKET HEAD CAP SCREW	GRADE 12.9		M10 x 50 LG	0M10-050-02
45	12	SOCKET HEAD CAP SCREW	GRADE 12.9		M12 x 40 LG	0M12-040-02
44	4	SOCKET HEAD CAP SCREW	GRADE 12.9		M12 x 50 LG	0M12-050-02
43	2	SOCKET HEAD CAP SCREW	GRADE 12.9		M16 x 55 LG	0M16-055-02
42	2	SOCKET HEAD CAP SCREW	GRADE 12.9		M16 x 80 LG	0M16-080-02
41	16	SOCKET HEAD CAP SCREW	GRADE 12.9		M20 x 80 LG	0M20-080-02
40	4	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 50 LG	0M24-050-02
39	12	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 60 LG	0M24-060-02
38	38	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 65 LG	0M24-065-02
37	2	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 80 LG	0M24-080-02
36	6	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 100 LG	0M24-100-02
35	1	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 110 LG	0M24-110-02
34	2	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 150 LG	0M24-150-02
33	2	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 190 LG	0M24-190-02
32	2	SOCKET HEAD CAP SCREW	GRADE 12.9		M24 x 230 LG	0M24-230-02
31	1	VALVE BLOCK - H.A.R.				6-026-01-01
30	1	'O' RING CHORD ⌀ 6.99			12 m LG	6-022-11-01

3RD ANGLE

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by



SECTION A-A

NOTES:-

LOWER GUIDE & SUPPORT BLOCKS SUPPLIED TO SUIT PILE DIAMETER FOR PIPE PILES.

LOWER GUIDE MAY BE SUBSTITUTED WITH ADAPTOR SLEEVE TO SUIT ALTERNATIVE PILE TYPES.

Ref. No.	Qnt.	Part Name	Material	Dimension	Remarks
16	4	COILED PIN		⌀ 20 x 50 LG	0M20-050-36
15	16	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 75 LG	0M20-075-02
14	6	SUPPORT BLOCK			6-300-20-01
13	27	SOCKET HEAD CAP SCREW	GRADE 12.9		0M24-040-02
12	55	SOCKET HEAD CAP SCREW	GRADE 12.9		0M16-030-02
11	16	NORD-LOCK WASHER		M20	0M20-000-27
10	12	NYLOC NUT		M20	0M20-000-11
9	12	WASHER	STEEL	M20	0M20-000-20
8	12	HEX HD BOLT	Grade 12.9	M20 x 90LG	0M20-090-01
7	1	LOWER GUIDE			6-300-30-01
6	1	SPREADER PLATE			6-005-30-02
5	6	SUSPENSION RING			45-024-30-01
4	1	PRIMARY ANVIL			45-005-00-01
3	1	GUIDE SLEEVE			45-300-11-01
2	1	DOLLY			45-006-00-01
1	1	HPH4500 BASIC HAMMER			45-000-00-01

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

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

DAWSON CONSTRUCTION PLANT LTD.	HPH4500 C/W UNIVERSAL GUIDE SLEEVE	File –	Date 15/04/2005
		Drawing no. 45-300-00-01	

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	Remarks
16	4	COILED PIN		⌀ 20 x 50 LG	0M20-050-36
15	16	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 75 LG	0M20-075-02
14	6	SUPPORT BLOCK			6-300-20-01
13	27	SOCKET HEAD CAP SCREW	GRADE 12.9		0M24-040-02
12	55	SOCKET HEAD CAP SCREW	GRADE 12.9		0M16-030-02
11	16	NORD-LOCK WASHER		M20	0M20-000-27
10	12	NYLOC NUT		M20	0M20-000-11
9	12	WASHER	STEEL	M20	0M20-000-20
8	12	HEX HD BOLT	Grade 12.9	M20 x 90LG	0M20-090-01
7	1	LOWER GUIDE			6-300-30-01
6	1	SPREADER PLATE			6-005-30-02
5	6	SUSPENSION RING			45-024-30-01
4	1	PRIMARY ANVIL			45-005-00-01
3	1	GUIDE SLEEVE			45-300-11-01
2	1	DOLLY			45-006-00-01
1	1	HPH4500 BASIC HAMMER			45-000-00-01

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

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

DAWSON CONSTRUCTION PLANT LTD.

HPH4500 C/W UNIVERSAL GUIDE SLEEVE

File: –

Date: 15/04/2005

Drawing no.: 45-300-00-01

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
15	1	LOWER GUIDE - 14" H PILE			45-415-05-01
14	1	ANVIL RETAINER BODY			45-415-01-01
13	4	LEAD GUIDE BRACKET			45-410-01-01
12	6	SUSPENSION RING			45-024-30-01
11	1	DOLLY			45-006-00-01
10	1	SPREADER PLATE			45-005-30-01
9	1	PRIMARY ANVIL			45-005-00-01
8	1	HPH4500 BASIC HAMMER			45-000-00-01
7	10	WASHER		M24	0M24-000-20
6	24	SOCKET HEAD CAP SCREW		M20 x 90 LG	0M20-090-02
5	24	HEX HD BOLT		M20 x 90LG	0M20-090-01
4	16	SOCKET HEAD CAP SCREW		M20 x 75 LG	0M20-075-02
3	16	COILED PIN		ø 20 x 50 LG	0M20-050-36
2	40	NORD-LOCK WASHER		M20	0M20-000-27
1	24	NYLOC NUT		M20	0M20-000-11

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
robertc	robertc	-	-	A3	-	-	-	-

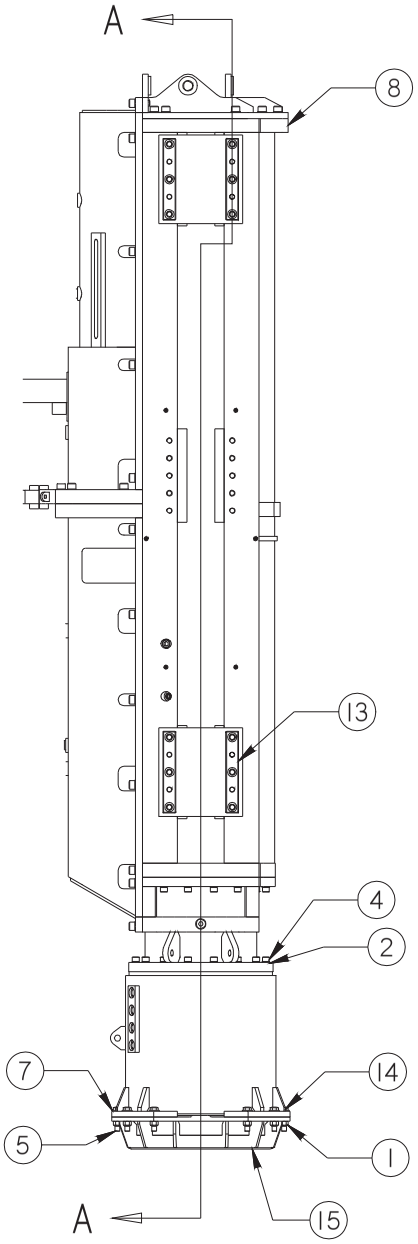
DAWSON CONSTRUCTION PLANT LTD.

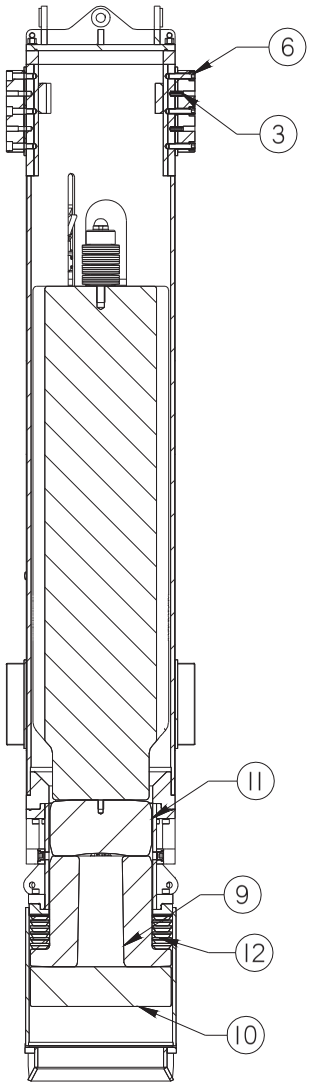
HPH4500 HAMMER LEAD MOUNTED
SHOWN CONFIGURED FOR 26" U-LEAD

File: -
Date: 15/04/2005
Drawing no.: 45-400-00-01

3RD ANGLE

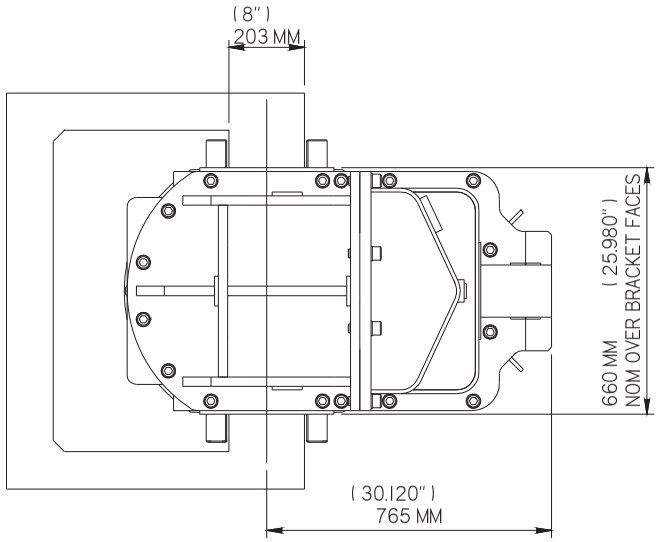
Rl.nr	Qnt.	Revision	Date	Intro.	Appr.by





SECTION A-A

TYPICAL HAMMER INSTALLATION IN 26" x 8"



Ref.no.	Qnt.	Part name	Material	Dimension	Remark
15	1	LOWER GUIDE - 14" H PILE			45-415-05-01
14	1	ANVIL RETAINER BODY			45-415-01-01
13	4	LEAD GUIDE BRACKET			45-410-01-01
12	6	SUSPENSION RING			45-024-30-01
11	1	DOLLY			45-006-00-01
10	1	SPREADER PLATE			45-005-30-01
9	1	PRIMARY ANVIL			45-005-00-01
8	1	HPH4500 BASIC HAMMER			45-000-00-01
7	10	WASHER		M24	0M24-000-20
6	24	SOCKET HEAD CAP SCREW		M20 x 90 LG	0M20-090-02
5	24	HEX HD BOLT		M20 x 90LG	0M20-090-01
4	16	SOCKET HEAD CAP SCREW		M20 x 75 LG	0M20-075-02
3	16	COILED PIN		ø 20 x 50 LG	0M20-050-36
2	40	NORD-LOCK WASHER		M20	0M20-000-27
1	24	NYLOC NUT		M20	0M20-000-11

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
robertc	robertc	-	-	A3	-	-	-	-

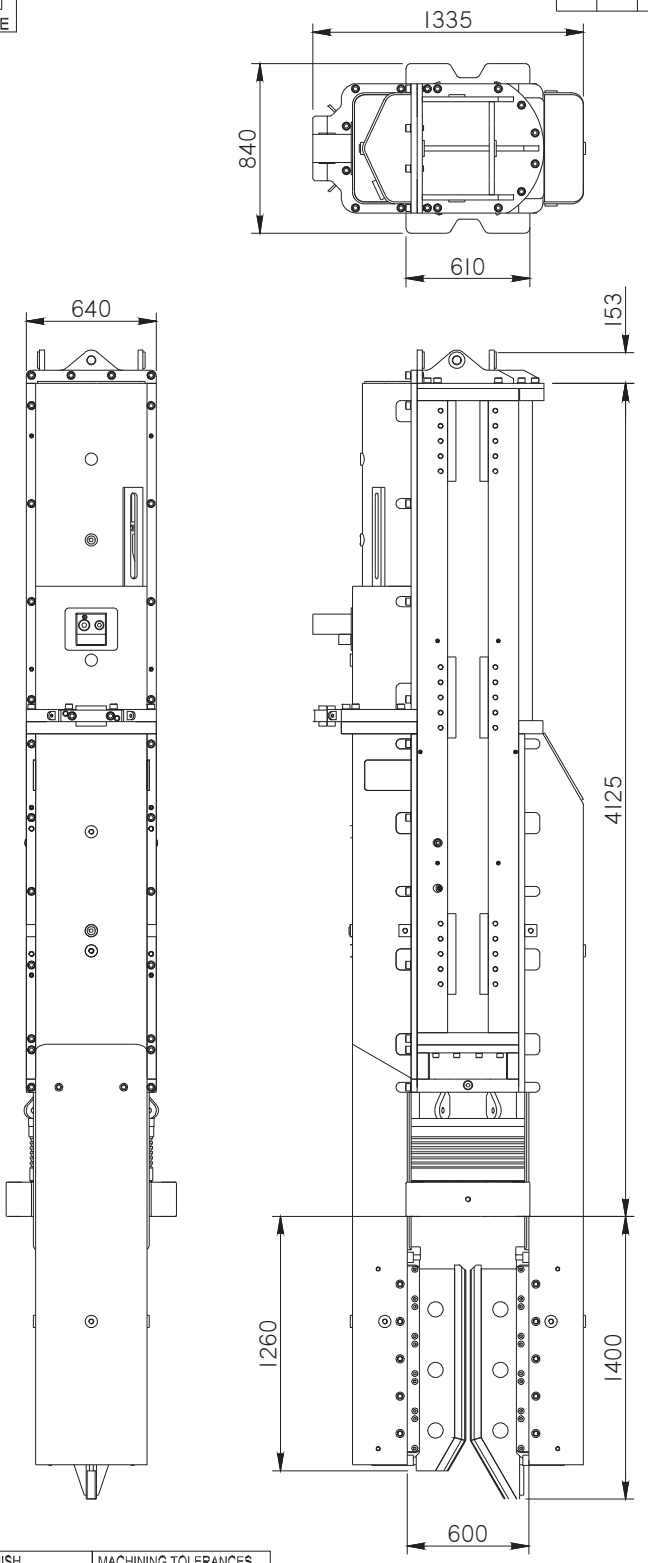
DAWSON CONSTRUCTION PLANT LTD.

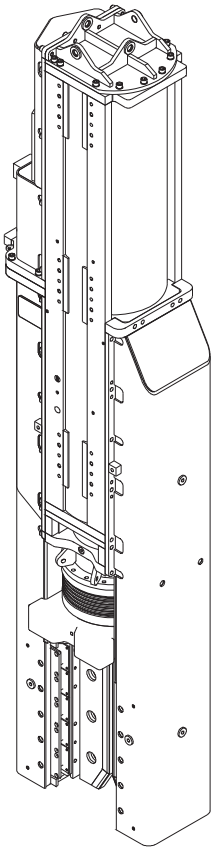
HPH4500 HAMMER LEAD MOUNTED SHOWN CONFIGURED FOR 26" U-LEAD

File: -
Date: 15/04/2005
Drawing no.: 45-400-00-01

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

3RD ANGLE





FREE HANGING WITH LEG GUIDES

THE BASIC HAMMER CAN BE FITTED WITH LEG GUIDES THAT HAVE FLEXIBLE LEG INSERTS AS SHOWN. DIFFERENT LEG INSERTS CAN BE USED TO ADAPT TO DIFFERENT PILE TYPES.
THE HAMMER READILY FITS PAIRS OF MOST 'U' OR 'Z' SHEET PILES WITH DIFFERNET INSERTS.
INSERTS CAN ALSO BE SUPPLIED TO PERMIT THE HAMMER TO DRIVE 'H' PILES.

PERFORMANCE SUMMARY

MAX. ENERGY INTO PILE 4500 Kg.m
BLOW RATE AT MAX. STROKE 80 b.p.m.
BLOW RATE AT MIN. STROKE 120 b.p.m.
TOTAL WEIGHT 11000kg
WEIGHT OF RAM 3500 Kg
OPERATING HYDRAULIC PRESSURE 240bar
HYDRAULIC FLOW RATE REQUIREMENT 220L/min
DIESEL ENGINE POWER 80 kw

SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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
peter watts	peter watts	–	–	A4	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

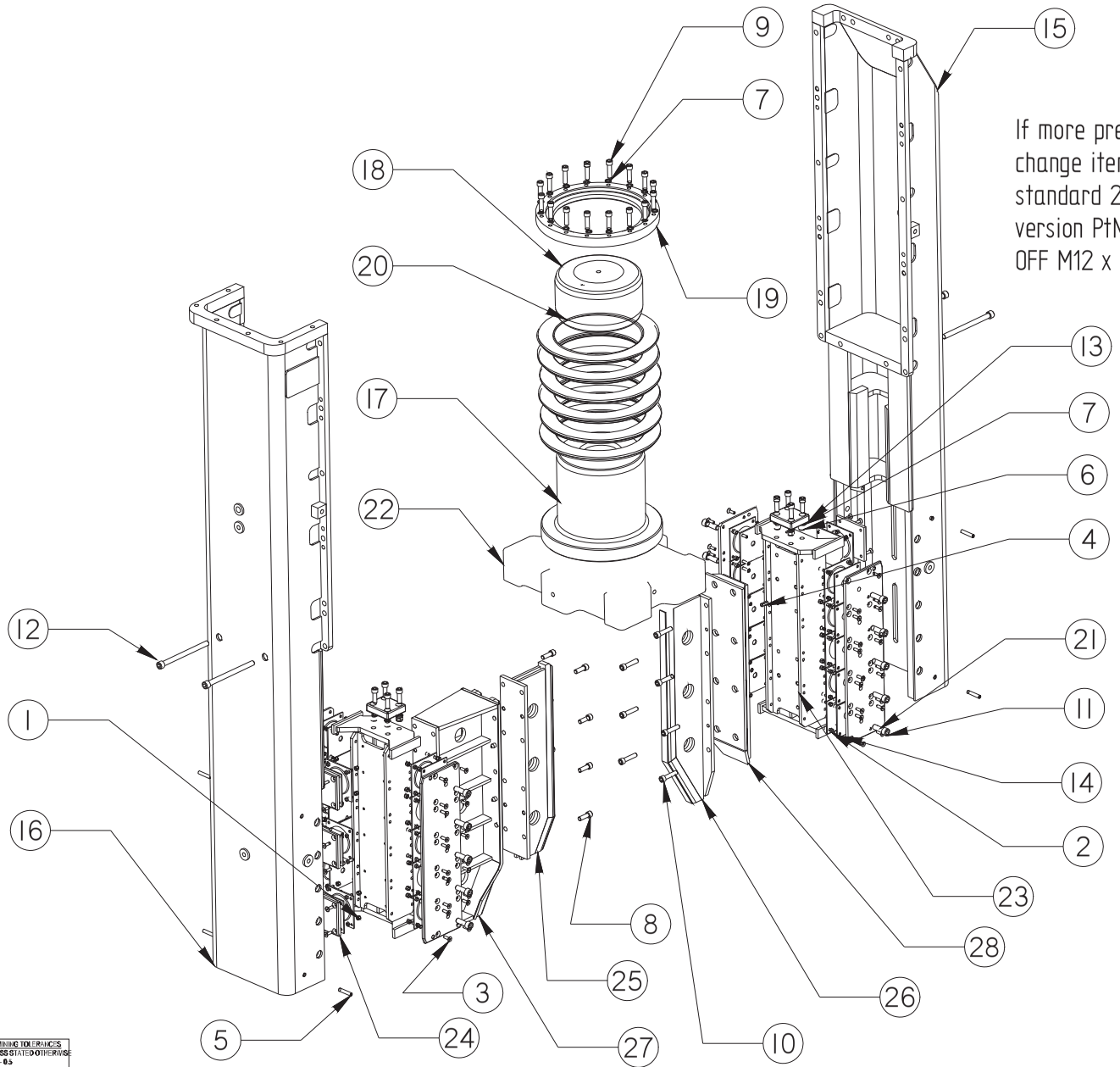
Basic Specifications Of HPH4500 With Leg Guides Fitted

File	Date
–	20/05/2005

Drawing no. 4500-500-00-01

3RD ANGLE

Rev	Qnt.	Revision	Date	Intro.	Appr.by
A		2 ITEMS ADDED	27/04/05	PLW	
B		NOTE MOIFIED TO INCLUDE LONGER BOLTS	30/11/05	PLW	



If more pre-clamp on pile is required then change item 24 Mount packer plate from the standard 20mm thick to the 30mm thick version PtNo. 45-600-07-01. Also change 24 OFF M12 x 40 LG C/Sinks to 50 Long.

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
28	1	Rear Leg Insert "Z" Profile	EN10		45-600-06-01
27	1	Front Leg Insert "Z" Profile	EN10		45-600-05-01
26	1	Rear Leg Insert "U" Profile	EN10		45-600-04-01
25	1	Front Leg Insert "U" Profile	EN10		45-600-03-01
24	6	Mount Packer Plate	EN10		45-600-02-01
23	2	Insert Mounting Bracket	EN10		45-600-01-01
22	1	Spreader Plate Sheet Piles	EN10		45-160-00-01
21	4	Location Plate			45-042-00-01
20	6	SUSPENSION RING			45-024-30-01
19	1	PLATE	S355JR ISO81		45-022-00-01
18	1	DOLLY			45-006-00-01
17	1	PRIMARY ANVIL			45-005-00-01
16	1	Front Leg Guide	EN10		45-004-00-01
15	1	Rear Leg Guide	EN10		45-002-00-01
14	26	Sandwich Mount	See Dwg		2-033-00-02
13	2	Buffer Pad	EN10		1-040-00-01
12	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 320 LG	OM24-320-02
11	20	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 70 LG	OM24-070-02
10	8	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 90 LG	OM20-090-02
9	16	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 75 LG	OM20-075-02
8	16	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 60 LG	OM20-060-02
7	24	NORD-LOCK WASHER		M20	OM20-000-27
6	8	NYLOC NUT		M20	OM20-000-11
5	8	COILED SPRING PIN		Φ16 x 80L	OM16-080-22
4	8	SPRING PIN		Φ16 x 40LG	OM16-040-22
3	104	CSK.SOCKET HEAD SCREW	Grade 12.9	M12 x 40 LG	OM12-040-03
2	104	HEX HEAD BOLT	Grade12.9	M12 x 35 LG	OM12-035-01
1	184	NYLOCK NUT TYPE T	Grade12	M12	OM12-000-12

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

DAWSON CONSTRUCTION PLANT LTD

Sub-Assembly Parts For Leg Guide HPH4500 Hammer

File: – Date: 07/10/04

Drawing no. 45-600-00-01

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

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
28	1	Rear Leg Insert "Z" Profile	EN10		45-600-06-01
27	1	Front Leg Insert "Z" Profile	EN10		45-600-05-01
26	1	Rear Leg Insert "U" Profile	EN10		45-600-04-01
25	1	Front Leg Insert "U" Profile	EN10		45-600-03-01
24	6	Mount Packer Plate	EN10		45-600-02-01
23	2	Insert Mounting Bracket	EN10		45-600-01-01
22	1	Spreader Plate Sheet Piles	EN10		45-160-00-01
21	4	Location Plate			45-042-00-01
20	6	SUSPENSION RING			45-024-30-01
19	1	PLATE	S355JR (50B)		45-022-00-01
18	1	DOLLY			45-006-00-01
17	1	PRIMARY ANVIL			45-005-00-01
16	1	Front Leg Guide	EN10		45-004-00-01
15	1	Rear Leg Guide	EN10		45-002-00-01
14	26	Sandwich Mount	See Dwg		2-033-00-02
13	2	Buffer Pad	EN10		1-040-00-01
12	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 320 LG	0M24-320-02
11	20	SOCKET HEAD CAP SCREW	GRADE 12.9	M24 x 70 LG	0M24-070-02
10	8	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 90 LG	0M20-090-02
9	16	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 75 LG	0M20-075-02
8	16	SOCKET HEAD CAP SCREW	GRADE 12.9	M20 x 60 LG	0M20-060-02
7	24	NORD-LOCK WASHER		M20	0M20-000-27
6	8	NYLOC NUT		M20	0M20-000-11
5	8	COILED SPRING PIN		Φ16 x 80L	0M16-080-22
4	8	SPRING PIN		Φ16 x 40LG	0M16-040-22
3	104	CSK.SOCKET HEAD SCREW	Grade 12.9	M12 x 40 LG	0M12-040-03
2	104	HEX HEAD BOLT	Grade12.9	M12 x 35 LG	0M12-035-01
1	184	NYLOCK NUT TYPE T	Grade12	M12	0M12-000-12

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

DAWSON CONSTRUCTION PLANT LTD.

Sub-Assembly Parts For Leg Guide HPH4500 Hammer

File	Date
–	07/10/04

Drawing no.

45-600-00-01

RAM SPECIFICATION
CYLINDER BORE - 70mm
ROD DIAMETER - 55mm

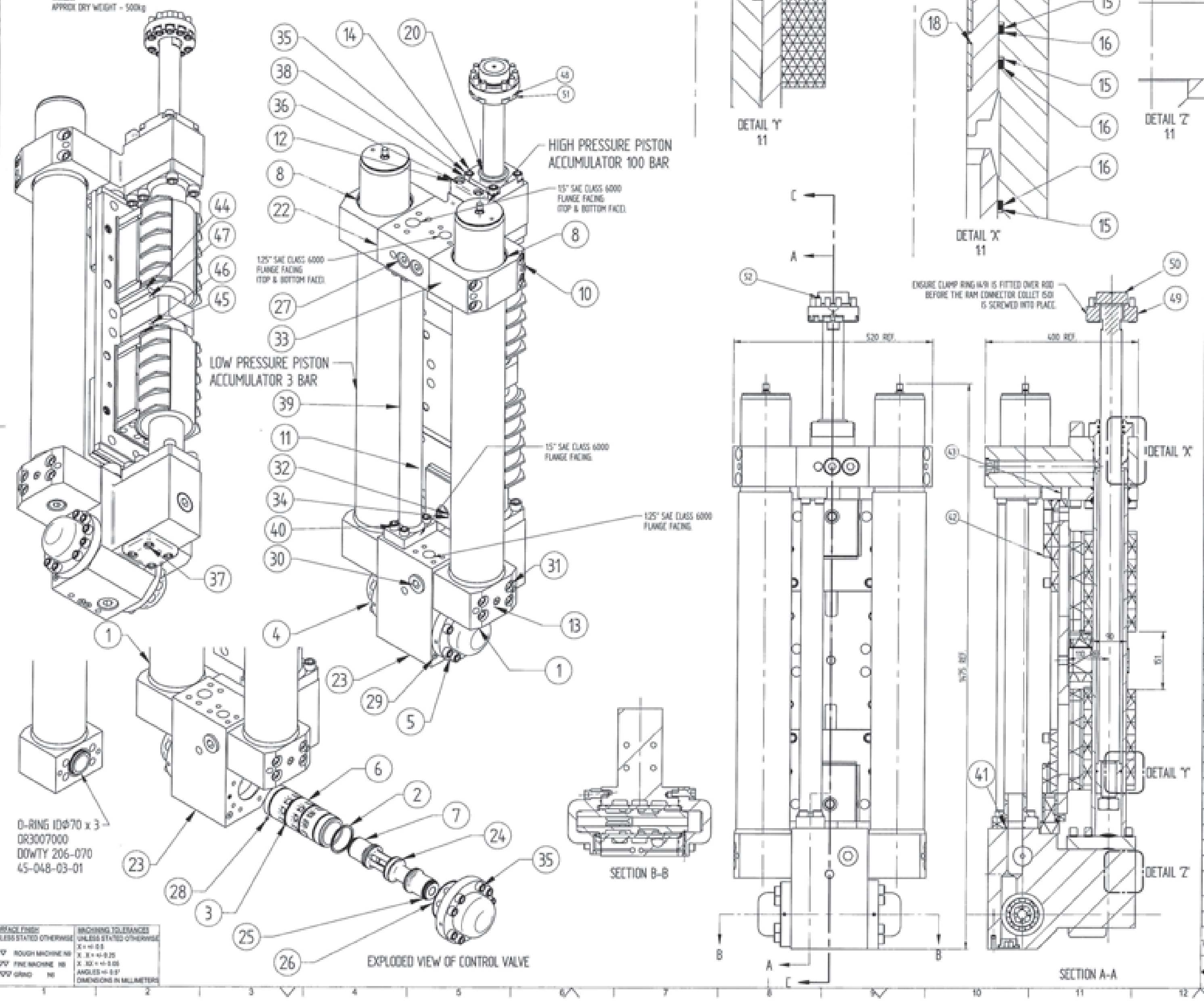
LOCTITING PROCEDURE (ITEMS 32 - 35 & ITEM 37)
CLEAN PARTS TO BE LOCTITED USING LOCTITE 7063 & ALLOW TO DRY (2-3 MINUTES).
APPLY LOCTITE ACTIVATOR 7471 TO BOTH SURFACES & ALLOW TO DRY (2-3 MINUTES).
APPLY LOCTITE 270 TO COMPONENTS & ASSEMBLE.
ADHERE TO ANY LOCTITE SAFETY RECOMMENDATIONS.

WEIGHT
APPROX DRY WEIGHT - 500kg

PRESSURE TESTING
BOTH ENDS OF RAM TO BE INDEPENDANTLY TESTED TO 350 BAR.
CHECK INTEGRITY OF SEALS.

PAINTING
RAM TO BE PRIMED WITH ZINC PHOSPHATE. MASK OFF FLANGE FACINGS & PISTON ROD BEFORE PAINTING.

IDENTIFICATION
RAM TO BE CLEARLY IDENTIFIED WITH D.C.P. PART NUMBER & RAM SERIAL NUMBER.



INSTALLATION OF SEALS ETC.

ENSURE ORIENTATION OF ALL SEALS, 'O' RINGS & BACK UP RINGS IS AS SHOWN.

PISTON SEAL (ITEM 7)
SLIDE 'O' RING INTO GROOVE ENSURING IT DOES NOT TWIST. LUBRICATE SEAL & SLIDE ONTO PISTON KEEPING IT SQUARE TO AXIS & NOT ALLOWING IT TO TWIST. WHEN ASSEMBLING PISTON TO CYLINDER KEEP ROD IN CENTRE OF BORE TO ENSURE SEAL IS SIZED CORRECTLY. OIL COPIOUSLY.

ROD & WIPER SEALS (ITEMS 4 & 5)
INSERT 'O' RING INTO GROOVE ENSURING IT IS NOT TWISTED. SQUEEZE SEAL INTO A KIDNEY SHAPE & PLACE INTO GROOVE OVER 'O' RING. ALLOW SEAL TO SNAP BACK INTO SHAPE & PRESS INTO GROOVE. OIL COPIOUSLY.

WEAR STRIPS (ITEM 6)
FORM STRIP INTO DIAMETER SMALLER THAN BORE. SLIDE INTO PLACE KEEPING IT SQUARE & ALLOW IT TO RECOVER TO GROOVE DIAMETER. PRESS BACK INTO GROOVE. OIL COPIOUSLY.

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
52	1	GREASE NIPPLE		1/8" BSP	1-077-00-01
51	10	SOCKET HEAD CAP SCREW			0M16-50-02
50	1	RAM CONNECTOR COLLET			45-009-05-01
49	1	CLAMPING RING			45-009-03-01
48	10	NORDLOC WASHER	M16		0M16.00027
47	2	POLYURETHANE BUFFER			45-008-41-01
46	2	POLYURETHANE BUFFER			45-008-40-01
45	2	BUFFER BACKPLATE			45-008-39-01
44	2	BUFFER BACKPLATE			45-008-37-01
43	4	STOP BUFFER			45-008-46-01
42	2	STOP PLATE			45-008-33-01
41	2	O-RING 46 x 3			45-008-43-01
40	8	SOCKET HEAD CAP SCREW		M16 x 55 LG	0M16-055-02
39	1	SUPPORT STRUT			47-008-37-02
38	8	NORD-LOCK WASHER		M16	0M16.00027
37	4	SOCKET HEAD CAP SCREW		M16 x 35 LG	0M16-035-02
36	2	SOCKET HEAD CAP SCREW	12.9	M16 x 40 LG	0M16.04002
35	26	SOCKET HEAD CAP SCREW	1	M16 x 45	0M16-45-02
34	28	NORD-LOCK WASHER		M20	0M20.00027
33	8	COILED PIN		⌀ 20 x 50 LG	0M20-050-36
32	12	SOCKET HEAD CAP SCREW		M20 x 65 LG	0M20-065-02
31	16	SOCKET HEAD CAP SCREW		M20 x 145	0M20.145.02
30	2	BLANKING PLUG	VS-R 1 1/4 WD	1 1/4" BSP	5-018-07-01
29	4	BLANKING PLUG		1/4" BSP	1-018-18-01
28	2	'O' RING	206-008-4470	ID 8 x 2	5-018-20-01
27	3	DRAIN PLUG	VS-R 1 WD	1" BSP	1-064-00-01
26	2	O-RING	206-114-4470	ID 54 x 6	2-018-10-01
25	2	PISTON RING			2-018-15-01
24	3	PISTON RING			2-018-14-01
23	1	BOTTOM BLOCK			45-008-10-02
22	1	TOP BLOCK			45-008-11-01
21	1	PISTON ROD ASSEMBLY			45-008-14-02
20	1	ROD SCRAPER			45-008-15-01
19	2	ROD SEAL			45-008-16-01
18	2	ROD WEAR RING			45-008-17-01
17	1	PISTON SEAL			45-008-18-01
16	4	'O' RING			45-008-19-01
15	4	BACK-UP RING			45-008-20-01
14	1	TOP BUSH			45-008-22-02
13	1	BOTTOM BUFFER PAD			45-008-23-01
12	1	TOP BUFFER PAD			45-008-24-01
11	1	CYLINDER BARREL & ANCHOR BRKT.			45-008-25-01
10	2	ACCUMULATOR SUPPORT			45-008-29-01
9	6	'O' RING			45-008-30-01
8	4	ROD WEAR RING			45-008-31-01
7	1	CONTROL VALVE PISTON			45-018-02-01
6	1	PISTON SLEEVE			45-018-03-01
5	1	CONTROL VALVE END CAP 1			45-018-05-01
4	1	CONTROL VALVE END CAP 2			45-018-06-01
3	4	O-RING DR3007950 90 SHORE	DOWTY 200-711	ID Φ79.5 x 3	45-018-07-01
2	1	TOLERANCE WASHER			45-018-08-01
1	2	PISTON ACCUMULATOR			45-048-00-01

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replaces	Replaced by
AMB	-	-	-	A1	-	1:5	-	-

DAWSON CONSTRUCTION PLANT LTD.

HYDRAULIC RAM, CONTROL VALVE & ACCUMULATOR ASSEMBLY

File: - Date: 15-08-08
Drawing no. 45-008-00-04

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
52	1	GREASE NIPPLE		1/8" BSP	1-007-00-01
51	10	SOCKET HEAD CAP SCREW			0M14-50-02
50	1	RAM CONNECTOR COLLET			45-009-09-01
49	1	CLAMPING RING			45-009-03-03
48	10	NORDLOC WASHER	M14		0M14.000.27
47	2	POLYURETHANE BUFFER			45-008-41-01
46	2	POLYURETHANE BUFFER			45-008-40-01
45	2	BUFFER BACKPLATE			45-008-39-01
44	2	BUFFER BACKPLATE			45-008-39-01
43	4	STOP BUFFER			45-008-46-01
42	2	STOP PLATE			45-008-33-01
41	2	O-RING 46 x 3			45-008-43-01
40	8	SOCKET HEAD CAP SCREW		M16 x 55 LG	0M16-055-02
39	1	SUPPORT STRUT			45.008.35.02
38	8	NORD-LOCK WASHER		M16	0M16.000.27
37	4	SOCKET HEAD CAP SCREW		M16 x 35 LG	0M16-035-02
36	2	SOCKET HEAD CAP SCREW	12.9	M16 x 40 LG	0M16.040.02
35	26	SOCKET HEAD CAP SCREW	1	M16 x 45	0M16-45-02
34*	28	NORD-LOCK WASHER		M20	0M20.000.27
33*	8	COILED PIN		ø 20 x 50 LG	0M20-050-36
32*	12	SOCKET HEAD CAP SCREW		M20 x 65 LG	0M20-065-02
31	16	SOCKET HEAD CAP SCREW		M20 x 145	0M20.145.02
30	2	BLANKING PLUG	VS-R 1 1/4 WD	1 1/4" BSP	1-018-07-01
29	4	BLANKING PLUG		1/4" BSP	1-018-18-01
28	2	'O' RING	204-008-4470	ID 8 x 2	1-018-20-01
27	3	DRAIN PLUG	VS-R 1 WD	1" BSP	1-064-00-01
26	2	O-RING	206-654-4470	ID 54 x 6	2-018-10-01
25	2	PISTON RING			2-018-13-01
24	3	PISTON RING			2-018-14-01
23	1	BOTTOM BLOCK			45-008-10-02
22	1	TOP BLOCK			45-008-11-01
21*	1	PISTON ROD ASSEMBLY			45-008-14-02
20	1	ROD SCRAPER			45-008-15-01
19	2	ROD SEAL			45-008-16-01
18	2	ROD WEAR RING			45-008-17-01
17	1	PISTON SEAL			45-008-18-01
16	4	'O' RING			45-008-19-01
15	4	BACK-UP RING			45-008-20-01
14	1	TOP BUSH			45-008-22-02
13*	1	BOTTOM BUFFER PAD			45-008-23-01
12	1	TOP BUFFER PAD			45-008-24-01
11*	1	CYLINDER BARREL & ANCHOR BRKT.			45-008-25-01
10	2	ACCUMULATOR SUPPORT			45-008-29-01
9*	6	'O' RING			45-008-30-01
8	4	ROD WEAR RING			45-008-31-01
7	1	CONTROL VALVE PISTON			45-018-02-01
6	1	PISTON SLEEVE			45-018-03-01
5*	1	CONTROL VALVE END CAP 1			45-018-05-01
4*	1	CONTROL VALVE END CAP 2			45-018-04-01
3	4	O-RING OR3007950 90 SHORE	DOWTY 202-741	ID Ø79.5 x 3	45-018-07-01
2	1	TOLERANCE WASHER			45-018-08-01
1	2	PISTON ACCUMULATOR			45-048-00-01

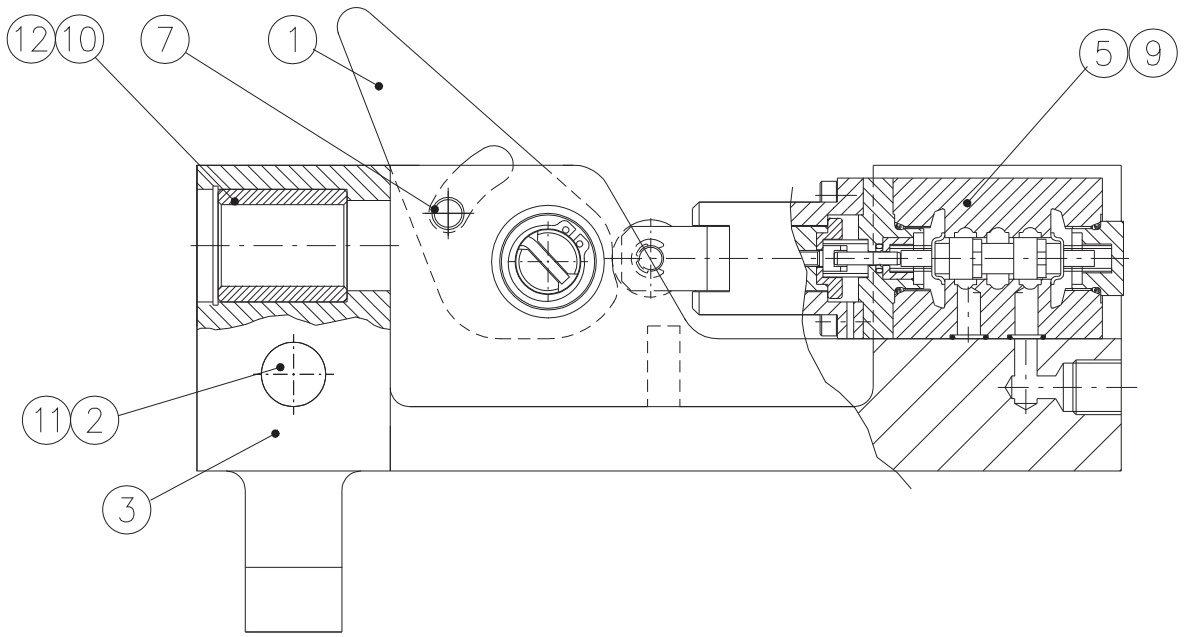
Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
A.M.B.	-	-	-	A1	-	15	-	-

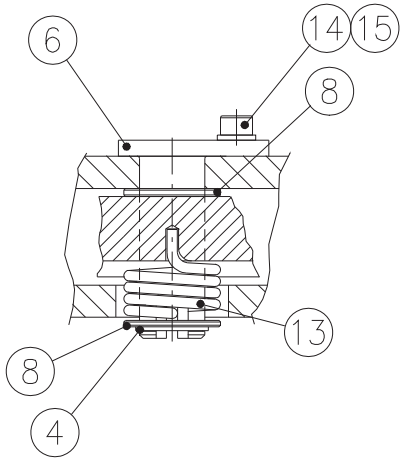
DAWSON CONSTRUCTION PLANT LTD.

HYDRAULIC RAM, CONTROL VALVE & ACCUMULATOR ASSEMBLY

File: -
Date: 18-08-08
Drawing no: 45-008-00-04

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by
A		9 WAS 1-050-00-02 5 WAS 1-050-01-02 M5x50	27-09-96	API	M.LEE





MECHANISM COMPONENTS

Ref.no.	Qnt.	Part name	Material	Dimension	Part number
16	2	BLANKING PLUG			1-018-18-01
15	1	PLAIN WASHER		M6	622
14	1	SOCKET HEAD CAP SCREW	12.9	M6 x 16	623
13	1	TORSION SPRING			1-030-18-01
12	4	CIRCLIP		D1300-0350	1-065-00-01
11	1	CIRCLIP		D1300-0200	1-030-11-01
10	4	GUIDE BUSH			1-030-10-01
9	1	ROLLER OPERATED VALVE	HFA 2B2		1-050-00-03
8	2	SPACER WASHER		2 THICK	1-030-21-01
7	1	SPRING PIN		ϕ10 x 50	1-030-07-01
6	1	CAM CENTRE SHAFT			1-030-06-04
5	4	SOCKET HEAD CAP SCREW	12.9	M5 x 45	1-050-01-03
4	1	CIRCLIP		D1400-0200	1-036-04-01
3	1	VALVE MOUNTING BLOCK			1-030-03-03
2	1	LINK PIN			1-030-02-01
1	1	CAM 2			1-030-01-03

NOTES :

BEFORE ASS'Y OF MECHANISM COMPONENTS CLEAN
THE M6 HOLE IN ITEM 3 & ITEM 14 WITH LOCTITE 7063
APPLY ACTIVATOR 7471 TO THE AFOREMENTIONED ONLY IF
THE ASS'Y IS TO BE USED WITHIN 24 HRS OF ASS'Y

USE A SOFT FACED HAMMER TO FIT ITEM 6
APPLY A COPPER BASED ANTI-SEIZE COMPOUND SUCH AS ROCOL J 166
TO SPACER WASHERS ITEM 8 AND TORSION SPRING ITEM 13

APPLY LOCTITE STUDLOCK 270 TO SOCKET HEAD CAP SCREW ITEM 14 AND
TIGHTEN TO A TORQUE OF 16 Nm
CIRCLIP ITEM 4 TO BE INSTALLED AS SHOWN SO THAT THE GAP IS NOT
COINCIDENT WITH THE SLOT IN THE CAM CENTRE SHAFT ITEM 6

Design by	Drawn at	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
API				A3		1 : 1.5		

DAWSON CONSTRUCTION PLANT LTD.

TOP SENSOR ASS'Y
TORSION SPRING VERSION

File name | Date 07-11-95

Drawing no. 1-030-00-05

Ref.no.	Qnt.	Part name	Material	Dimension	Part number
16	2	BLANKING PLUG			1-018-18-01
15	1	PLAIN WASHER		M6	622
14	1	SOCKET HEAD CAP SCREW	12.9	M6 x 16	623
13	1	TORSION SPRING			1-030-18-01
12	4	CIRCLIP		D1300-0350	1-065-00-01
11	1	CIRCLIP		D1300-0200	1-030-11-01
10	4	GUIDE BUSH			1-030-10-01
9	1	ROLLER OPERATED VALVE	HFA 2B2		1-050-00-03
8	2	SPACER WASHER		2 THICK	1-030-21-01
7	1	SPRING PIN		⌀10 x 50	1-030-07-01
6	1	CAM CENTRE SHAFT			1-030-06-04
5	4	SOCKET HEAD CAP SCREW	12.9	M5 x 45	1-050-01-03
4	1	CIRCLIP		D1400-0200	1-036-04-01
3	1	VALVE MOUNTING BLOCK			1-030-03-03
2	1	LINK PIN			1-030-02-01
1	1	CAM 2			1-030-01-03

Design by	Drawn at	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
API				A3		1 : 1.5		

DAWSON CONSTRUCTION PLANT LTD.

TOP SENSOR ASS'Y
TORSION SPRING VERSION

File name

Date 07-11-95

Drawing no. 1-030-00-05

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
12	5	KOENIG PLUG			4116-26
11	1	SPRING PIN		⌀ 10 x 50 LG	0M10-050-22
10	1	WASHER	STEEL	M6	0M06-000-20
9	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M5 x 45 LG	0M05-045-02
8	1	SOCKET HEAD CAP SCREW	GRADE 12.9	M6 x 15 LG	0M06-015-02
7	1	ROLLER OPERATED VALVE			1-050-00-03
6	1	CIRCLIP			1-036-04-01
5	1	CAM CENTRE SHAFT			1-036-03-03
4	1	CAM 3			1-036-01-03
3	2	SPACER WASHER			1-030-21-01
2	1	TORSION SPRING			1-030-18-01
1	1	MOUNTING BRACKET			45-036-20-01

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
A.M.B.	–	–	–	A2	–	1:2	–	–

DAWSON CONSTRUCTION PLANT LTD.

BOTTOM SENSOR ASSEMBLY

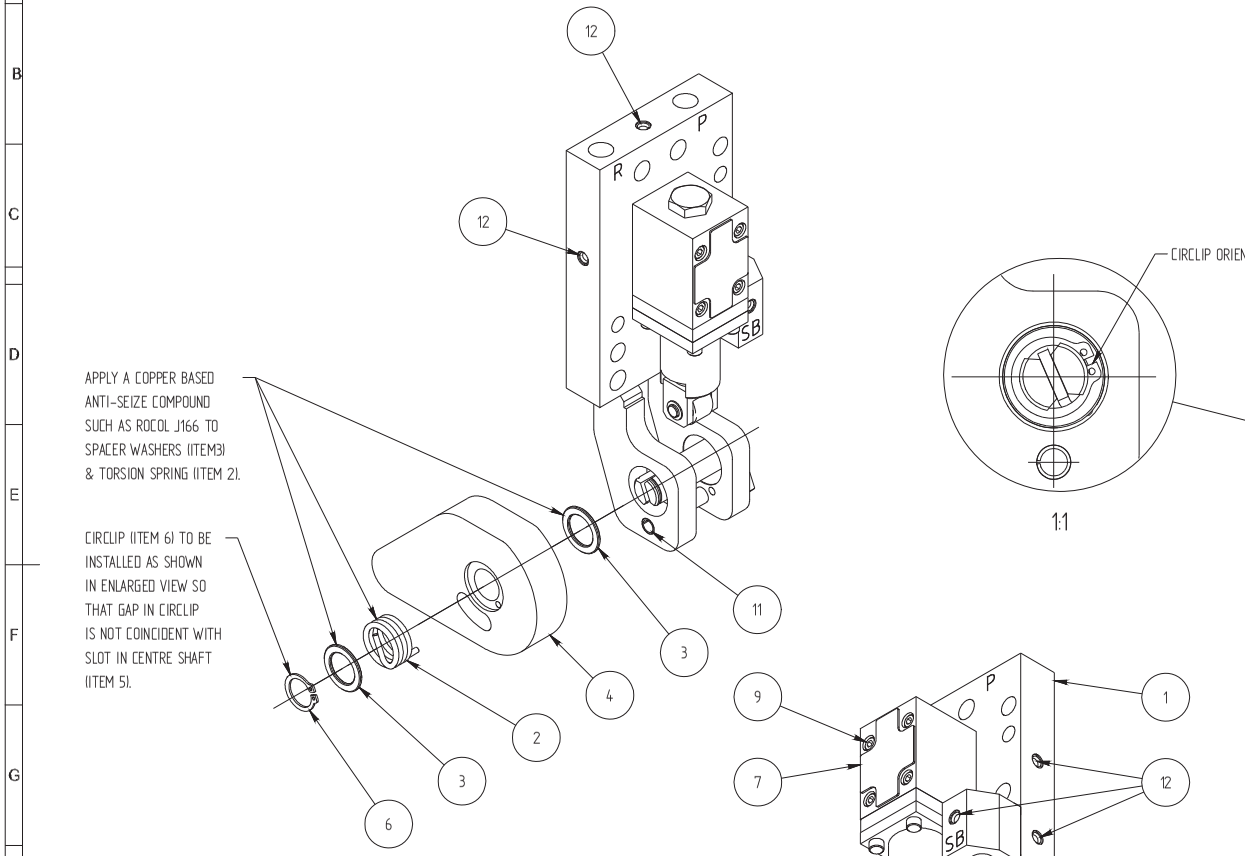
File	Date
–	21-06-04

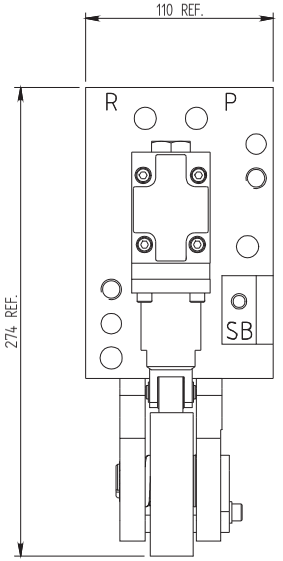
Drawing no.

45-036-00-01PL

3RD ANGLE

Ref.no.	Qnt.	Revision	Date	Intro.	Appr.by





Ref.no.	Qnt.	Part name	Material	Dimension	Remark
12	5	KOENIG PLUG			4116-26
11	1	SPRING PIN		⌀ 10 x 50 LG	0M10-050-22
10	1	WASHER	STEEL	M6	0M06-000-20
9	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M5 x 45 LG	0M05-045-02
8	1	SOCKET HEAD CAP SCREW	GRADE 12.9	M6 x 15 LG	0M06-015-02
7	1	ROLLER OPERATED VALVE			1-050-00-03
6	1	CIRCLIP			1-036-04-01
5	1	CAM CENTRE SHAFT			1-036-03-03
4	1	CAM 3			1-036-01-03
3	2	SPACER WASHER			1-030-21-01
2	1	TORSION SPRING			1-030-18-01
1	1	MOUNTING BRACKET			45-036-20-01

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
A.M.B.	–	–	–	A2	–	1:2	–	–

File	Date
–	21-06-04

DAWSON CONSTRUCTION PLANT LTD.

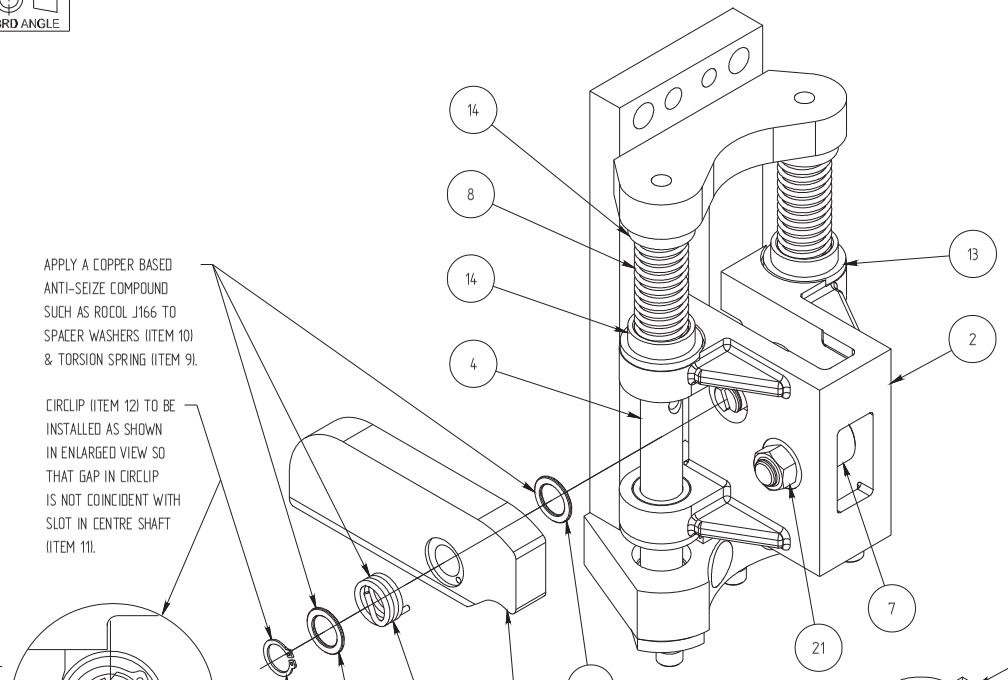
BOTTOM SENSOR ASSEMBLY

Drawing no. 45-036-00-01

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

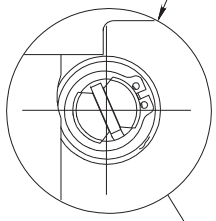
3RD ANGLE

Rl.nr	Qnt.	Revision	Date	Intro.	Appr.by



APPLY A COPPER BASED ANTI-SEIZE COMPOUND SUCH AS ROCOL J166 TO SPACER WASHERS (ITEM 10) & TORSION SPRING (ITEM 9).

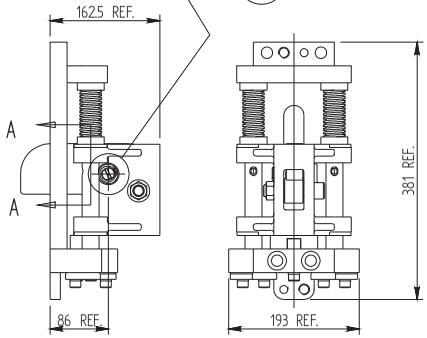
CIRCLIP (ITEM 12) TO BE INSTALLED AS SHOWN IN ENLARGED VIEW SO THAT GAP IN CIRCLIP IS NOT COINCIDENT WITH SLOT IN CENTRE SHAFT (ITEM 11).



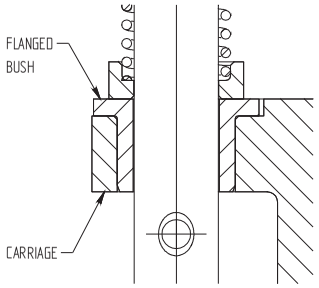
1:1

USE A SOFT FACED HAMMER TO FIT CENTRE SHAFT (ITEM 11) INTO CARRIAGE (ITEM 2).

CLEAN M6 THREAD IN CARRIAGE (ITEM 2) & THREAD ON SCREW (ITEM 18) WITH LOCTITE 7063. IF ASSEMBLY IS TO BE USED WITHIN 24 HOURS APPLY LOCTITE ACTIVATOR 7471. APPLY LOCTITE STUDLOCK 270 TO SCREW & TIGHTEN TO 16 Nm.



1:5 1:5



PART SECTION A-A
1:1

ASSEMBLY OF FLANGED BUSHES (ITEM 13) INTO CARRIAGE (ITEM 2)

APPLY LOCTITE CLEANER 7070 TO SURFACES TO BE BONDED. WIPE OF CLEANER WITH A CLEAN RAG & ALLOW TO DRY FOR 2-3 MINUTES.

DO NOT USE CLEANER 7063 AS THIS IS SOLVENT BASED & WILL ATTACK THE NYLON FLANGED BUSHES.

APPLY LOCTITE ACTIVATOR 7471 TO SURFACES TO BE BONDED. ALLOW ACTIVATOR TO EVAPORATE FOR 2-3 MINUTES UNTIL SURFACES ARE DRY.

APPLY LOCTITE 601 TO BOTH SURFACES TO BE BONDED. INSTALL FLANGED BUSHES INTO CARRIAGE UNTIL SURFACES ARE FLUSH.

REMOVE ANY EXCESS LOCTITE FROM THE JOINT WHILST IT IS STILL WET.

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
21	1	NYLOC NUT - TYPE T		M16	0M16-000-12
20	1	WASHER	STEEL	M6	0M06-000-20
19	6	NORD-LOCK WASHER		M10	0M10-000-27
18	1	SOCKET HEAD CAP SCREW	GRADE 12.9	M6 x 15 LG	0M06-015-02
17	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M10 x 25 LG	0M10-025-02
16	2	SOCKET HEAD CAP SCREW	GRADE 12.9	M10 x 50 LG	0M10-050-02
15	1	SOCKET HEAD CAP SCREW	GRADE 12.9	M16 x 75 LG	0M16-075-02
14	4	COMPRESSION SPRING SEAT			1-081-01-01
13	4	FLANGED BUSH			1-036-13-01
12	1	CIRCLIP			1-036-04-01
11	1	CAM CENTRE SHAFT			1-036-03-03
10	2	SPACER WASHER			1-030-21-01
9	1	TORSION SPRING			1-030-18-01
8	2	COMPRESSION SPRING - O/T TRIP			45-085-08-01
7	1	CAM STOP - OVERTRAVEL TRIP			45-085-07-01
6	1	CARRIAGE STOP - O/T TRIP			45-085-06-01
5	2	GUIDE BAR RETAINER			45-085-05-01
4	2	GUIDE BAR - OVERTRAVEL TRIP			45-085-04-01
3	1	CAM - OVERTRAVEL TRIP			45-085-03-01
2	1	CARRIAGE - OVERTRAVEL TRIP			45-085-02-01
1	1	MOUNTING BRACKET - O/T TRIP			45-085-01-01

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
A.M.B.	-	-	-	A2	-	12	-	-

File	Date
-	21-06-04

DAWSON CONSTRUCTION PLANT LTD.

OVERTRAVEL TRIP ASSEMBLY

Drawing no. 45-085-00-01

SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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
21	1	NYLOC NUT – TYPE T		M16	0M16-000-12
20	1	WASHER	STEEL	M6	0M06-000-20
19	6	NORD-LOCK WASHER		M10	0M10-000-27
18	1	SOCKET HEAD CAP SCREW	GRADE 12.9	M6 x 15 LG	0M06-015-02
17	4	SOCKET HEAD CAP SCREW	GRADE 12.9	M10 x 25 LG	0M10-025-02
16	2	SOCKET HEAD CAP SCREW	GRADE 12.9	M10 x 50 LG	0M10-050-02
15	1	SOCKET HEAD CAP SCREW	GRADE 12.9	M16 x 75 LG	0M16-075-02
14	4	COMPRESSION SPRING SEAT			1-081-01-01
13	4	FLANGED BUSH			1-036-13-01
12	1	CIRCLIP			1-036-04-01
11	1	CAM CENTRE SHAFT			1-036-03-03
10	2	SPACER WASHER			1-030-21-01
9	1	TORSION SPRING			1-030-18-01
8	2	COMPRESSION SPRING – O/T TRIP			45-085-08-01
7	1	CAM STOP – OVERTRAVEL TRIP			45-085-07-01
6	1	CARRIAGE STOP – O/T TRIP			45-085-06-01
5	2	GUIDE BAR RETAINER			45-085-05-01
4	2	GUIDE BAR – OVERTRAVEL TRIP			45-085-04-01
3	1	CAM – OVERTRAVEL TRIP			45-085-03-01
2	1	CARRIAGE – OVERTRAVEL TRIP			45-085-02-01
1	1	MOUNTING BRACKET – O/T TRIP			45-085-01-01

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
A.M.B.	–	–	–	A2	–	1:2	–	–

DAWSON CONSTRUCTION PLANT LTD.

OVERTRAVEL TRIP ASSEMBLY

File	Date
–	21-06-04

Drawing no. 45-085-00-01PL

Ref.no.	Qnt.	Part name	Material	Dimension	Part number
20	4	KOENIG SEALING PLUG	MB700050		1-084-20-01
19	1	SPRING PIN		ϕ3 x 18	0M03-018-22
18	4	SCREW SKT CAP HEAD		M8 x 55	0M08-055-02
17	4	SCREW SKT CAP HEAD		M8 x 30	0M08-030-02
16	1	CAP (H86/053)	ALLIANCE		1-084-16-01
15	1	ROD WIPER (CSWM 20)	OL SEALS		1-084-15-01
13	1	STEPSEAL CPI 110078-1	OL SEALS		1-084-23-01
12	1	SNAP RING (RWM 0200)	BELLEVILLE		1-084-12-01
11	1	COMP'N SPRING (LC-080J-11)	LEE SPRINGS		1-084-11-01
10	1	COMP'N SPRING SPECIAL	LION SPRINGS		1-084-10-02
9	1	'O' RING (206-134-4470)	DOWTY	ϕ34.00X2.5	1-084-09-02
8	1	'O' RING (200-026-4470)	DOWTY	ϕ31.47x1.78	1-084-08-01
7	6	`O` RING (200-109-4470)	DOWTY	ϕ7.6x2.62	1-084-07-01
6	1	SCREW SPECIAL CAP HEAD		M6	1-084-06-01
5	1	PISTON			1-084-05-01
4	1	PLUNGER-OVERTRAVEL VALVE			1-084-04-01
3	1	END CAP-OVERTRAVEL VALVE			1-084-03-01
2	1	BODY-OVERTRAVEL VALVE			1-084-02-02
1	1	FLANGE			1-084-01-01

Design by	Drawn at	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
AMB				A2		1 : 1		

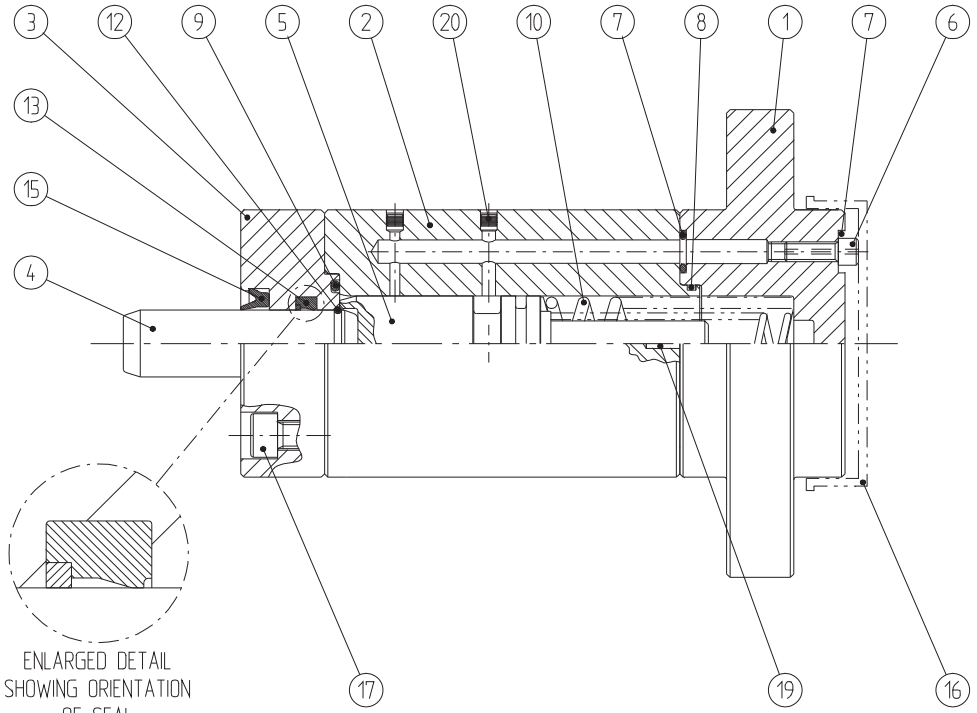
DAWSON CONSTRUCTION PLANT LTD.

OVERTRAVEL VALVE ASSEMBLY

File name	Date
	28-02-03

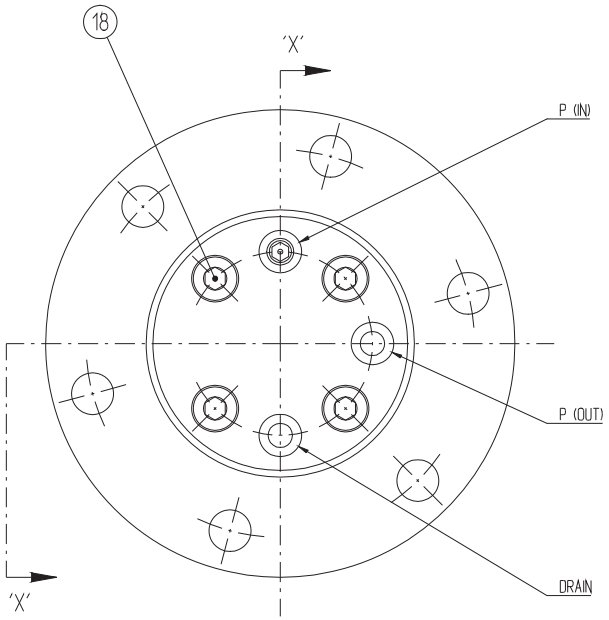
Drawing no. 1-084-00-05PL

Rf.nr	Qnt.	Revision	Date	Initio	Appr.by



ENLARGED DETAIL SHOWING ORIENTATION OF SEAL

SECTION 'X-X'



SEAL INSTALLATION INSTRUCTIONS.

ROD SEAL - ITEM 13

SQUEEZE THE SEAL RING TOGETHER TO FORM A KIDNEY SHAPE. PLACE THE SEAL RING IN THE GROOVE.

ROD WIPER - ITEM 15

SNAP THE SEAL INTO POSITION

ASSEMBLY NOTES

1. PLUNGER (ITEM 4) AND SEAL (ITEM 13) TO BE OILED BEFORE ASS'Y. PLUNGER TO BE KEPT AS PERPENDICULAR TO THE END CAP AS POSSIBLE DURING ASS'Y AS THE PLUNGER RESIZES THE SEAL.
2. ASSEMBLE ITS 7 & 19 TO ITEM 1, & IT 8 TO IT 2 USING CLEAN OIL BOLT TOGETHER USING ITS 18 & LOCTITE 242 TORQUE TIGHTEN TO 50 N/mm FIT IT 6, TORQUE TIGHTEN TO 20 N/mm.
3. LOAD ITS 10 & 11 ONTO PISTON IT 5, THEN USING CLEAN OIL ENTER ASSEMBLY INTO BORE IT 2. SECURE ENDCAP ASSY IT 3 TO PREVIOUS ASSY WITH IT 9, USING IT 17 & LOCTITE 242 TORQUE TIGHTEN TO 50 N/mm.
4. PHYSICAL TEST- SEE TEST PROCEDURE.
5. STATIC PRESSURE TEST- SEE TEST PROCEDURE
6. MASK OFF ITS. 4, 6 & 15, & DEGREASE, THEN PAINT WITH GREY HAMMERITE SMOOTH.
7. ENSURE HOLE IN ITEM 6 IS CLEAR OF LOCTITE BEFORE FITTING CAP IT 16

Ref.no.	Qnt.	Part name	Material	Dimension	Part number
20	4	KOENIG SEALING PLUG	MB700050		1-084-20-01
19	1	SPRING PIN		ϕ3 x 18	0M03-018-22
18	4	SCREW SKT CAP HEAD		M8 x 55	0M08-055-02
17	4	SCREW SKT CAP HEAD		M8 x 30	0M08-030-02
16	1	CAP (H86/053)	ALLIANCE		1-084-16-01
15	1	ROD WIPER (CSWM 20)	OL SEALS		1-084-15-01
13	1	STEPSEAL CPI 110078-1	OL SEALS		1-084-23-01
12	1	SNAP RING (RWM 0200)	BELLEVILLE		1-084-12-01
11	1	COMP'N SPRING (LC-080J-11)	LEE SPRINGS		1-084-11-01
10	1	COMP'N SPRING SPECIAL	LION SPRINGS		1-084-10-02
9	1	'O' RING (206-134-4470)	DOWTY	ϕ34.00X2.5	1-084-09-02
8	1	'O' RING (200-026-4470)	DOWTY	ϕ31.47x1.78	1-084-08-01
7	6	'O' RING (200-109-4470)	DOWTY	ϕ7.6x2.62	1-084-07-01
6	1	SCREW SPECIAL CAP HEAD		M6	1-084-06-01
5	1	PISTON			1-084-05-01
4	1	PLUNGER-OVERTRAVEL VALVE			1-084-04-01
3	1	END CAP-OVERTRAVEL VALVE			1-084-03-01
2	1	BODY-OVERTRAVEL VALVE			1-084-02-02
1	1	FLANGE			1-084-01-01

Design by	Drawn at	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
AMB				A2		1 : 1		

DAWSON CONSTRUCTION PLANT LTD.

OVERTRAVEL VALVE ASSEMBLY

File name | Date 28-02-03

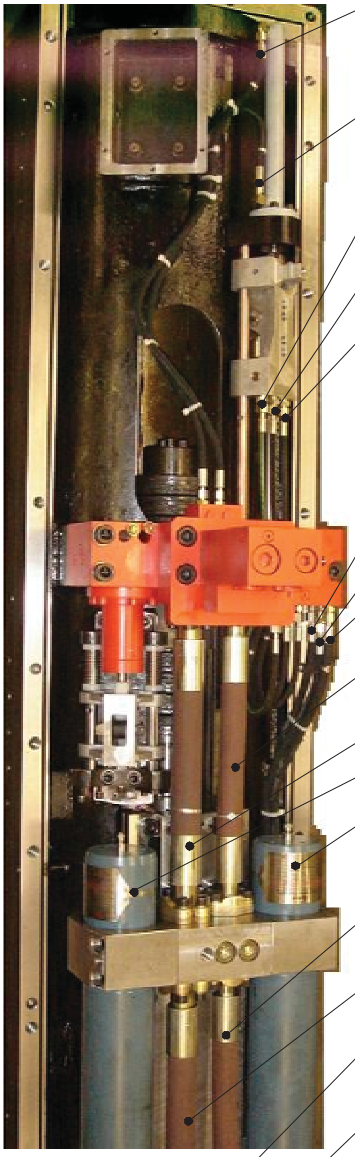
Drawing no. 1-084-00-05

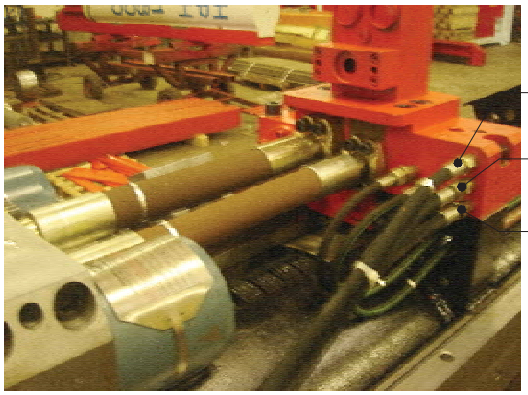
LAYER INFO FROZEN

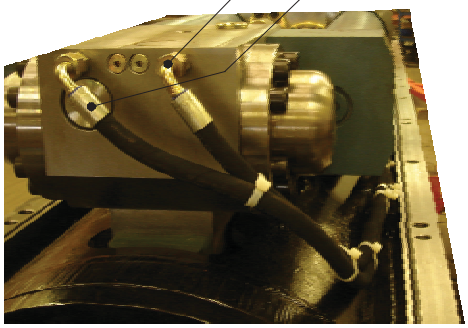
APPENDIX 8.1.1 -
HYDRAULIC HOSE DETAILS FOR HPH4500 HAMMER

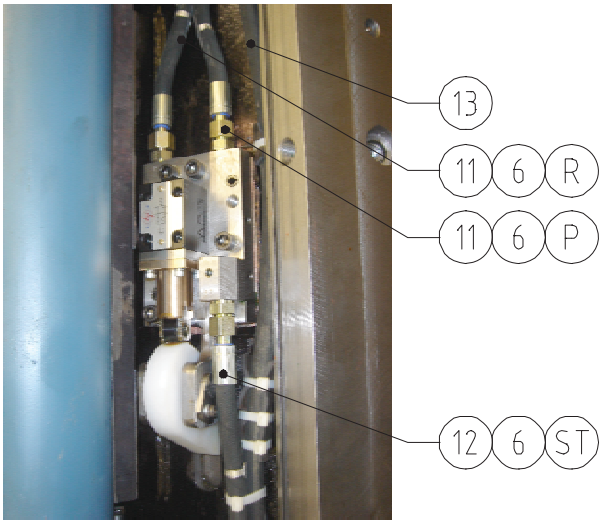
Rf.no	Qnt.	Revision	Date	Intro.	Appr.by

3RD ANGLE









P = PRESSURE LINE R = RETURN LINE ST = SIGNAL LINE

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

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
PLW	PLW							

DAWSON CONSTRUCTION PLANT LTD.

HPH 4500 HAMMER HYDRAULIC HOSES & FITTING KIT SHEET 1

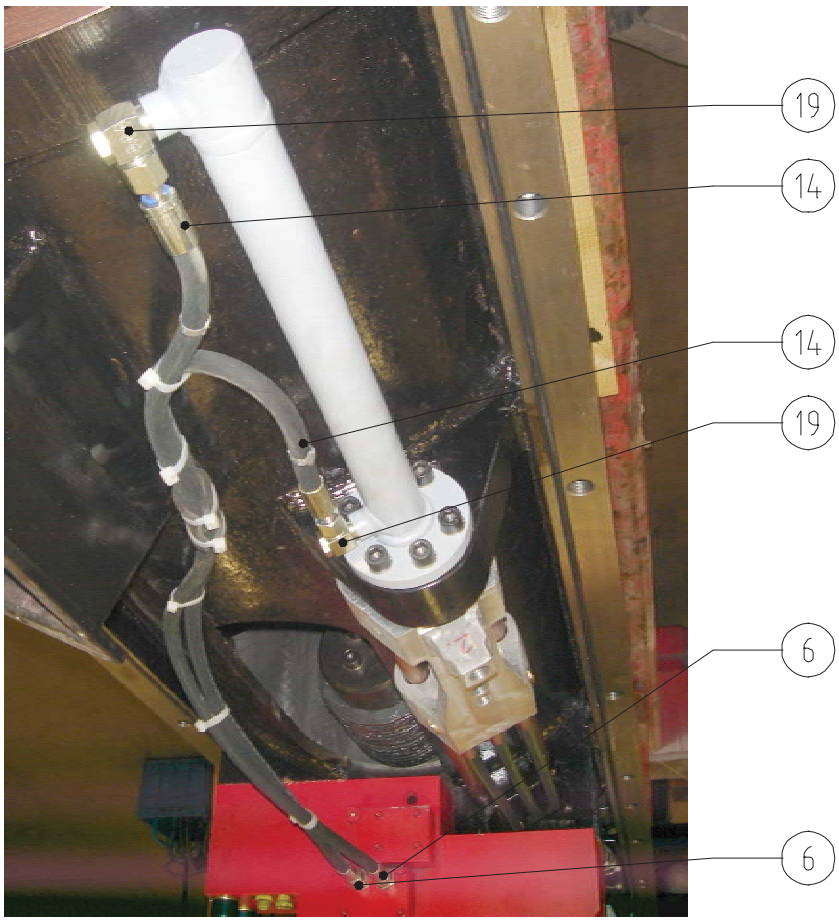
File

Date 01/11/05

Drawing no. 45-113-00-01

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

3RD ANGLE



ITEM	PART NUMBER	QTY	DESCRIPTION	HOSE LENGTH
1	1.018.07.01	3	Blanking Plug VSTIR 1-1/4 Wd 1-1/4 BSP	
2	1.018.18.01	19	Blanking Plug VSTIR 1/4 Wd 1/4 BSP	
3	1.064.00.01	4	Drain Plug (1" Blank Plug VSTR)	
4	1.088.00.01	8	1-1/2" SAE 6000 Split Flange Coupling (Pair)	
5	1.100.03.02	2	Valve Non Return Waltshd PRV 12 SR 3/8 WD FLOW>BSP	
6	1.110.02.02	5	Stud Coupling Male Body Only GEV8SR 3/8 Wide	
7	1.111.12.01	2	Stud Coupling Male Body Only	
8	1.111.14.02	10	Stud Coupling 3/8" BSP male x 12S male	
9	1.111.21.01	8	Split Flange Clamp Halves (Pair)	
10	2.018.29.01	1	1 1/2" VStir Blanking Plug	
11	2.110.06.01	2	Hose Assy 3/8" R2T 12S Female E/E	1160mm
12	45.110.05.01	1	Hose Assy 3/8" R2AT 12S Female to Female 90°	780mm long cone to cone.
13	45.110.06.01	1	Hose Assy 3/8" R2AT 12S Female to Female 90°	2280mm long cone to cone.
14	45.110.08.02	2	Hose Assy 1/4" R2AT 8S Female to 8S Female. 2SN-04 f/w U16MSOF08-04 each end.	1100mm long cone to cone.
15	45.111.01.01	1	Hose Assy EH920-24 fitted with HP-24-SFH-6-24 each end	610mm face to face
16	45.111.02.01	1	Hose Assy EH920-24 fitted with HP-24-SFH-6-24 each end	895mm face to face
17	45.111.03.01	1	Hose Assy EH920-20 fitted with HP-24-SFH-6-20 each end	614 face to face
18	45.111.04.01	1	Hose Assy EH920-20 fitted with HP-24-SFH-6-20 each end	891 face to face
19	6.026.32.01	2	1/4" Banjo Coupling RSW8SRWD	
20	6.110.04.02	3	Hose Assy Europulse-04 Fw U12MSF04 with M12S + P-R12L/S nuts & olives each end.	HCL = 830mm

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

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
PLW	PLW							

DAWSON CONSTRUCTION PLANT LTD.

HPH 4500 HAMMER HYDRAULIC HOSES & FITTING KIT SHEET 2

File

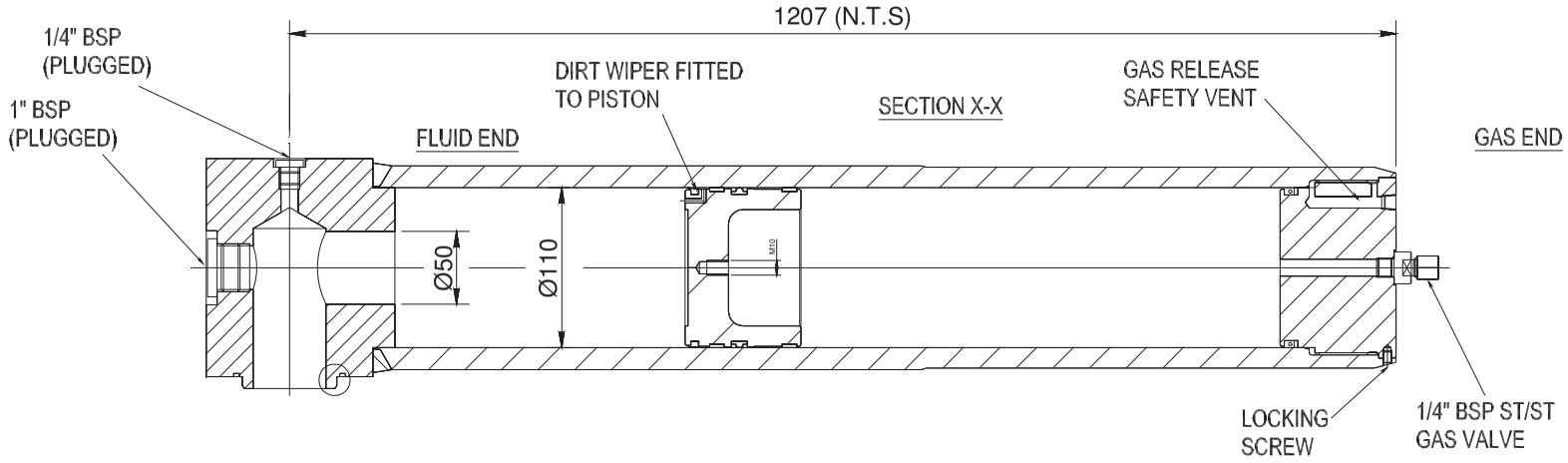
Date 01/11/05

Drawing no. 45-113-00-01

APPENDIX 8.2
ACCUMULATOR PARTS LIST AND INSTRUCTIONS

3RD ANGLE

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by



GENERAL NOTES:-
DMS = MM
MODEL NO.....PA-9.5-280-80930
SEAL KIT.....SK-PA-14081

SPECIFICATION

CAPACITY:	9.5	LITRES
DESIGN PRESSURE:	280	BARG
TEST PRESSURE:	420	BARG
WEIGHT:	80	KG
SEALS:	NITRILE/PTFE	
OPERATING FLUID/S:	MINERAL OIL	
SAFETY DEVICE:	NONE	

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
robertc	robertc	-	-	A4	-	-	-	-

DAWSON CONSTRUCTION PLANT LTD.

PISTON ACCUMULATOR
PA-9.5-280-80930

File: -
Date: 12/08/2005
Drawing no.: 45-048-00-01

Maintenance Instructions

Piston Accumulators ‘HS’ Type

General Introduction

All piston accumulators supplied by Fawcett Christie Hydraulics (FCH) are manufactured individually for each and every contract. Due to the vast range of sizes, pressures and operating parameters and conditions it is impossible to record and document product reliability.

Under normal operating conditions we would expect the life of the mechanical parts of a piston accumulator to exceed 20 years, and as long as the vessel is protected from the environment and is not subject to external damage.

The seals and bearings would normally be expected to have a life of 4 years without replacement. However this would depend on the operating parameters, the condition of the operating fluid and to some extent the operating temperature. If for instance the operating fluid is very clean then this would extend life considerably, however if the operating fluid was badly contaminated then the seals could wear out in a matter of months.

FCH make the following recommendation

Annually

a. Inspect the external surfaces of the vessel for corrosion and/or damage.

b. Test the full operation of the piston accumulator

4 yearly

a. Remove the gas end cap, fluid end cap & piston.

b. Inspect cylinder bore & internals for wear/corrosion.

c. Re-assemble with new seal kit (piston seals, wear rings and end cap seals) & pressure test.

Warning

Before attempting any maintenance on a piston accumulator, all fluid and gas pressure must be completely released. Fluid pressure should be released to tank or drained, gas pressure should be vented/released to atmosphere. If a gas valve is fitted, then a FCH nitrogen charging/discharging set (or similar) should be used.

Dismantling Procedure

Whenever possible, the accumulator should be removed from the installation and taken to a clean area workshop. The smaller vessels can be dismantled in the horizontal plane, but due to the weight of the end caps and piston on the larger vessels, it is recommended to dismantle and reassemble in the vertical plane.

1. Socket head set screw (item A on Fig 1 .0) where lifted, should be removed from each end cap being stripped.

2. End cap removal tool should be lifted to M16 tapped holes in gas end cap. If blanking screws are lifted to end cap, then these will have to be removed as end cap removal tool uses these holes. The fluid end cap to be removed in the same manner.

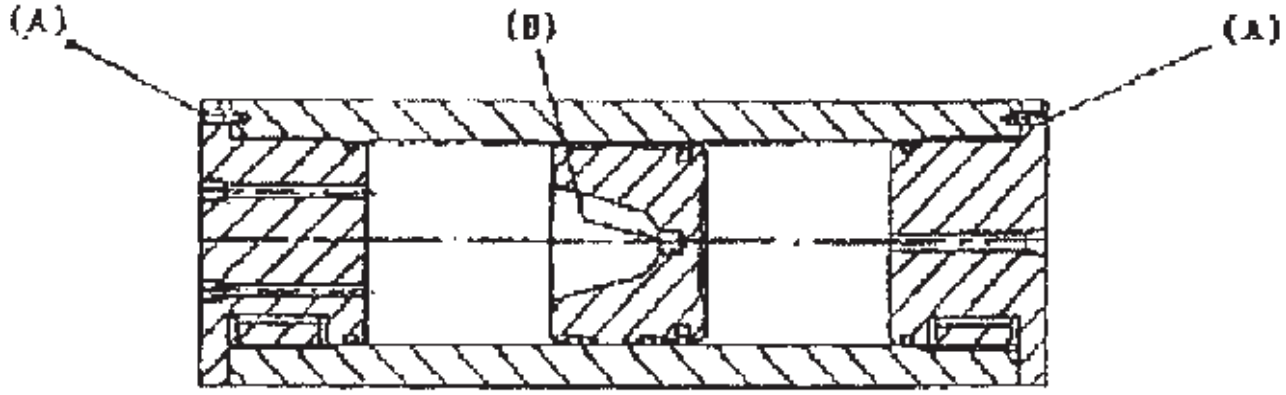


Fig 1.0

3. End cap should be carefully unscrewed. A feature of the design is that there is a safety gas release vent in each end cap, which will vent any residual gas well before end cap thread becomes disengaged. If escaping gas can be heard, do not unscrew end cap any further until all the gas has been released. When approaching the end of the thread, care should be taken not to damage the last thread. End cap can be removed from the vessel.

4. M16 tapped rod should be screwed into tapped hole in recess of piston (item B on Fig 1 .0) where fitted. Piston can then be pulled out of accumulator bore. Alternatively the piston can be driven carefully out of the bore form the opposite end by using a wooden drift. Care should be taken when the piston leaves the locating bore so as not to damage the piston seals, piston or the cylinder threads.

Inspection

All seals and bearing should be removed and inspected. It is recommended to fit a new seal kit on each strip down of the vessel. Honed section of the bore should be visually inspected for scoring. If any damage to the bore is apparent, then the vessel should be returned to FCH for further attention. All other components should be inspected for damage, particularly the threads of the cylinder and both end caps.

Re-Assembly Procedure

Note. Generally there are two types of piston seal used on FCH piston accumulator; these are the ‘AQ’ seal and the ‘GT’ seal. The ‘AQ’ seal comprises a square section PTFE glyd ring, s quad ring and an energized ‘o’ ring. The ‘GT’ seal comprises a ‘T’ section seal with split anti extrusion rings.

(‘AQ’ Seal)

1 . The ‘o’ ring can be fitted to the piston.
2. Glyd ring requires to be stretched by heating before fitting. This can normally be done by immersion in boiling water, and then using gloves, fitting to the piston groove. Once the glyd ring is fitted to the piston groove, the piston should be inserted into the piston locating tool/sleeve to ensure that the glyd ring retains its normal size.
3. Piston should be removed from the locating tool when glyd ring has cooled. Quad ring can now be filled to the glyd ring, and care should be taken to ensure that it is not twisted. Bearing strips can now be filled to the piston.
4. Piston should now be inserted into the piston locating tool on the bench. Tool should be lubricated liberally with hydraulic fluid or suitable assembly compound/solution prior to filling piston.
5. Locating sleeve and piston can be inserted into end of accumulator cylinder, again firstly ensure that cylinder bore is well lubricated. Piston can now be tapped gently into the accumulator bore. Once fully located in the bore, locating sleeve can be removed. At this point it is recommended to check for good piston movement.

(‘GT’ Seal)

1 . Main ‘T’ seal and anti extrusion rings can be filled to the piston groove.
2. Bearing strips can be filled.
3. Piston should now be inserted into the piston locating tool on the bench. Tool should be lubricated liberally with hydraulic fluid or suitable assembly compound/solution prior to filling piston.
4. Locating sleeve and piston can be inserted into end of accumulator cylinder, again firstly ensure that cylinder bore is well lubricated. Piston can now be tapped gently into the accumulator bore. Once fully located in the bore, locating sleeve can be removed. At this point it is recommended to check for good piston movement.

(End Caps)

1 . It is recommended to fit new ‘o’ rings and anti extrusion rings on each strip down
2. End cap thread and cylinder thread should be smeared with anti-seize compound. The ‘o’ ring locating diameter should be smeared with hydraulic fluid, assembly compound or anti-seize compound.
3. End cap tool can be filled to end cap. End cap should be carefully offered to the cylinder until thread is located. Care should be in screwing the end cap over its full length, to ensure that thread seizure does not occur. End cap can be screwed fully home.
4. Anti-rotation screw (item A on Fig 1 .0) can be re-filled where applicable.

Installation

Piston accumulator can be filled back into position. Nitrogen charging of the vessel should be done in accordance with normal hydraulic accumulator pre-charging practice.

Gas Bottles

Maintenance of these vessels is restricted to the replacement of the end cap seals on only. The procedure for the removal and refilling of the end caps is as for piston accumulators.

Long Term Preservation

After installation of piston accumulators and/or gas bottles, an inspection of all painted surfaces should take place and where necessary local repair work should be undertaken to avoid corrosion and resulting adverse effects. This should be done whenever servicing has been carried out.

Internal Protection for Long Term Storage

If units are to be stored for long periods of time, we advise that they should be stood vertically, and a rust preventative be applied through the end cap ports. It is recommended that the piston be cycled several times every 6 months. This can be done using low pressure nitrogen typically 10 bar.

Recommended rust preventative:

0 to 12 months protection - Use vapour space inhibitor QP 40 (Nickerson Lubricants) or similar. Use amount as specified by manufacturer.

When the system fluid is water based and the vessel material is carbon steel, additional precautions need to be taken to prevent internal corrosion during extended storage periods.

If the accumulator is to be stored ‘on the shelf then the piston should be centralised, ie mid-stroke, and both sides filled with fluid to exclude air and sealed. System fluid HW 443 should be used as it contains a vapour phase inhibitor (VFI). Better still is the use of Oceanic EFF which is specially formulated for preservation during long term storage.

The above are general recommendations only. Where severe conditions are prevalent special precautions might need to be considered.

Important Safety Notes for Accumulators

1. Use nitrogen gas only
2. All accumulators are supplied precharged to 100bar (1450 psi) unless sent via air-freight – in which case they will be shipped unprecharged
3. Always use the gas filling apparatus supplied by Dawson. This equipment includes a regulator valve specifically designed for use with hammer accumulators where the precharge pressure is less than the supply cylinder pressure.
4. Read the instructions below fully before attempting to adjust the precharge in any accumulator
5. Routine maintenance on the accumulator in-situ or removal of the accumulator must only be carried out when the hydraulic system pressure has been completely removed.

Accumulator Pre-charge Pressure

High pressure accumulator – 100 bar

Low Pressure Accumulator – 3 bar

Pre-charge Procedure

1. Attach the Regulator Valve to the nitrogen cylinder – see figure 2.
2. Attach the charging set (5) to the accumulator gas valve assembly (6) and connect charging hose (7) between the regulator and the charging set connection.
3. Back off handle (8) anticlockwise until loose. Check gas bleed valve (9) on charging set is closed and screw hand wheel (10) clockwise to open gas valve.
4. Open nitrogen cylinder valve by turning key (11), cylinder pressure will register on right hand gauge (12). This pressure should be checked against the required precharge pressure.
5. Turn handle (8) clockwise until outlet pressure on left hand gauge (13) registers 10% higher than required precharge pressure (110 bar or 3.5 bar). When pressure on the charging set and outlet gauges are equal, close nitrogen cylinder valve.
6. Turn hand wheel (10) anticlockwise to seal gas valve.
7. Crack bleed valve (9) to exhaust gas from charging hose and remove hose from charging set and replace hose connection sealing cap.
8. Close bleed valve, turn hand wheel (10) clockwise to open gas valve and crack bleed valve (9) to vent down to required precharge pressure. Close bleed valve.
9. Turn hand wheel (10) anticlockwise to reseal gas valve, crack bleed valve and remove charging set from the accumulator.
10. Test accumulator gas valve for leaks using soapy water or similar.

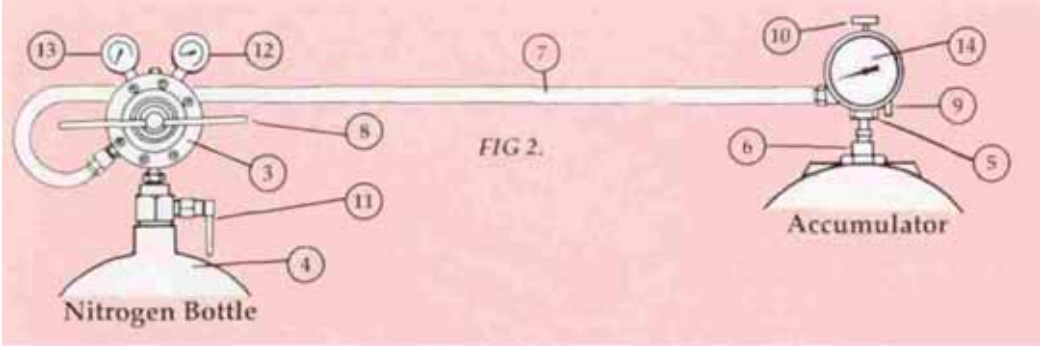


FIG 2.

Inspection and repair of Accumulators

Due to the nature of the design and specific assembly procedures it is recommended that the accumulators should only be inspected and repaired by a competent person. Dawson Construction Plant Limited or their approved dealers will be happy to undertake this work as required. Please note the Important Safety Notes at the beginning of this section.

Removal of Accumulator Pre-charge

- Connect Charging Set to the Gas Valve Assembly
- Release all the gas pressure by opening the Bleed Valve (Item 9 on the gas Charging Set)
- Disconnect the Charging Set from the Accumulator

Removal of Accumulator Top

- See maintenance instructions piston accumulator page 2 of 4.

Cleaning and Inspection

- Clean all metallic components with an organic solvent – do not use on rubber components
- Inspect seals and bearing strips for damage and replace as appropriate.
- Inspect the inside of accumulator housing for signs of corrosion / mechanical damage.
- Replace any parts found or considered to be defective.
- If the unit was removed from the system the connecting O-Rings should be replaced irrespective of condition.

After re-assembling the accumulator is ready to be Pre-charged – see details at the top of this section.

PRIOR TO APPLYING HYDRAULIC PRESSURE TO THE SYSTEM THE ACCUMULATOR MUST BE PRECHARGED WITH NITROGEN IN ACCORDANCE WITH THE ABOVE INSTRUCTIONS. FAILURE TO DO SO WILL RESULT IN FAILURE OF THE SYSTEM.

Appendix 8.3 - Energy Monitoring System (EMS) instructions and parts list (*optional fit)*

An overview of the system

The system works by measuring the velocity of the drop weight just before impact. This value is used, along with the known ram weight, to calculate the kinetic energy of the ram weight before each impact.

To measure the velocity of the drop weight, two magnetic sensors are used to sense a corrugated profile that has been machined into the drop weight. As the corrugations pass the sensors a chain of pulses is generated. The on hammer electronics then condition the pulses, perform some calculations, and format the information. The information is then sent to the display unit in the power pack either via a radio link or a wire link.

Power for the system is provided by 6 batteries (Duracell D type) these are mounted inside the hammer electronics enclosure, battery life is 1000 hours +. A pressure switch mounted on the main hydraulic valve block turns on the system. The system turns off automatically 3-4 minutes after hydraulic pressure is removed.

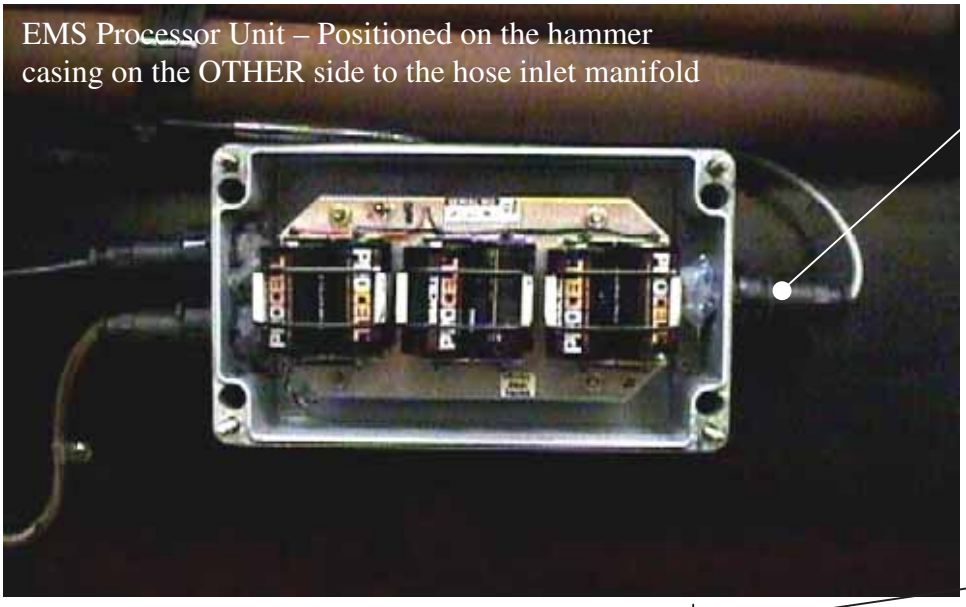
System Operation

The system can communicate between the hammer and display via either radio or wire link. Decide which is most appropriate for the particular job.

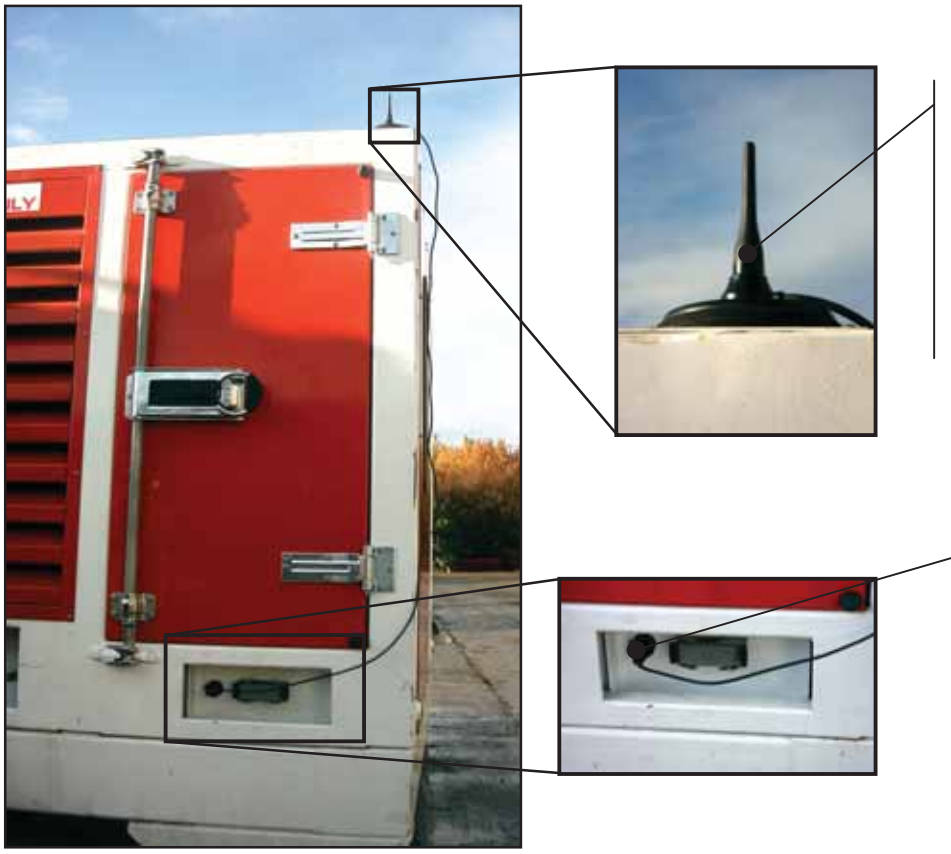
Radio + No physical connection between power pack and hammer
- Needs clear line of sight between hammer antenna and power pack antenna
- Will not work underwater

Wire + Will work underwater
+ Will not be affected by obstructions between hammer and pack
- Requires physical connection

Setting the hammer for radio or wire link:



Setting the power pack end for radio or wire link:



If using radio link, position the antenna on pack top. (magnetic mounted)

Plug in antenna for radio link OR wire from hose inlet manifold for wire link.

Using the system

The display has three modes - Running, Lap, and Reset.

- Running: **Top display** - last blow energy.
  Middle display - blows per minute (averaged over the last 5 blows).
  Bottom display - live blow counter.

- Lap: **Top display** - average blow energy over the last lap.
  Middle display - frozen blows per minute.
  Bottom display - frozen lap count preceded by a letter "L" as an indication of lap state.

- Reset: **Top display** - radio signal strength 0-100%
  Middle display - monitor battery strength

  (0-9.0V)
  Bottom display - total blows since last reset.

Switching modes

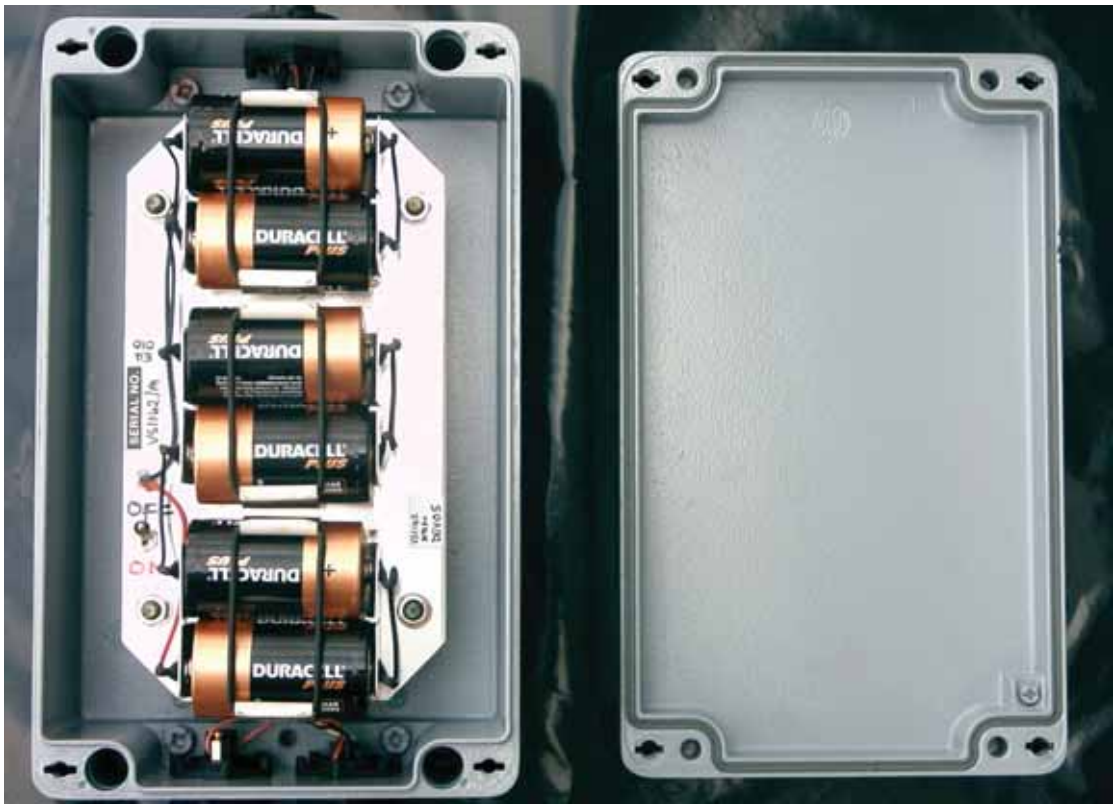
- Press the lap button for less than 1 second to toggle the display between running and lap mode. (the lap counters are reset on entry into the lap mode).

- Holding the lap button for more than 1 second will cause the unit to enter the reset mode (remains in the reset state until the button is released)

System maintenance Every 500 hours

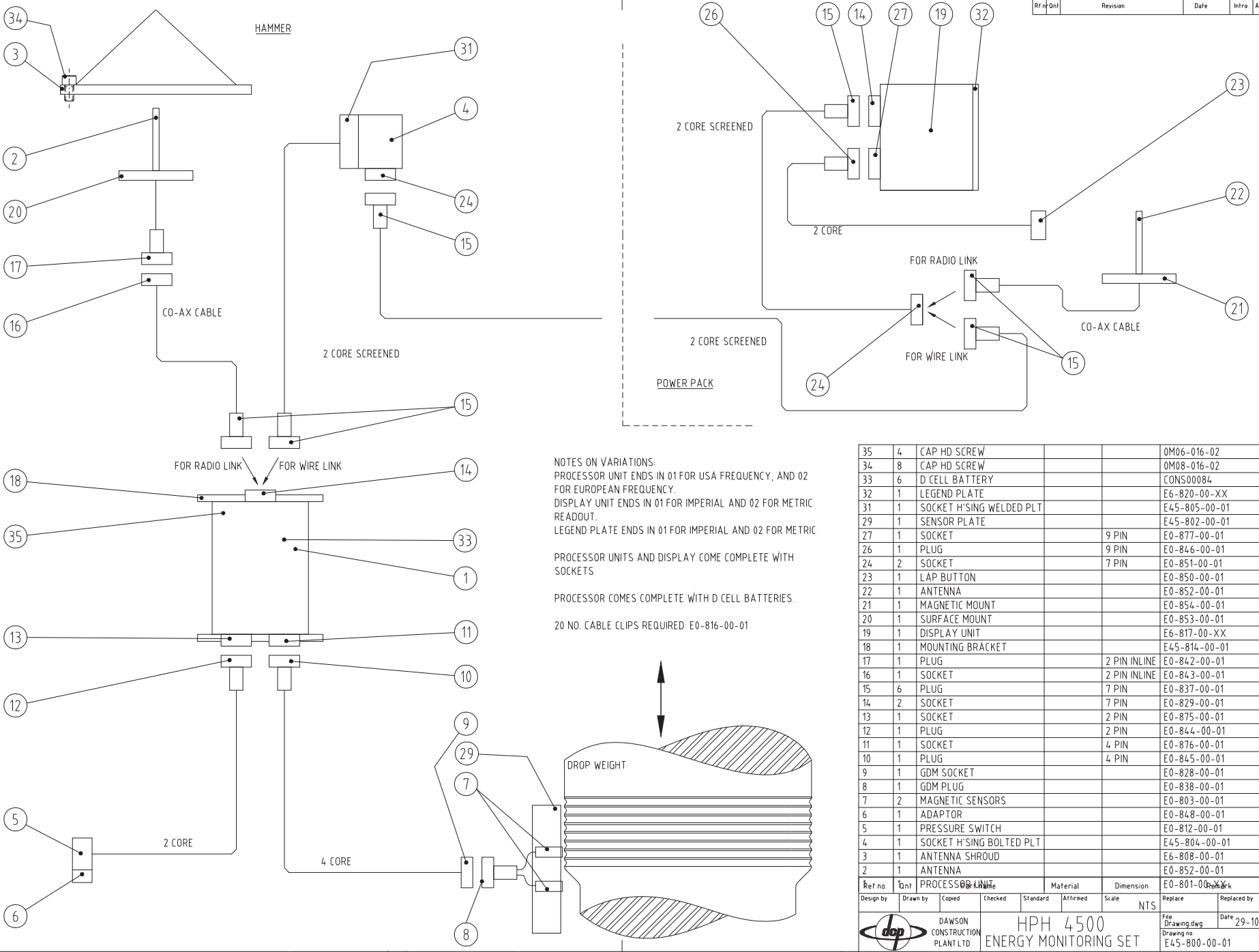
a. Replace the 6 duracell type D batteries.

Remove the lid of the processor unit (4 M6 nyloc nuts), this is mounted on the hammer casing on the OTHER side to the hydraulic hose inlets. Note the orientation before removing the old batteries. Ensure the protective tape to prevent the batteries from chafing on the steel supports is in place.



c. Check all plugs and sockets are screwed up tightly and cabling is in good condition.

d. Check the two magnetic sensors for physical damage, also measure their resistance. This should be between 300-350 ohms. (across pins 1-2 and 3-4 on the 4 pin plug)
Replace the complete sensor assembly if there are any signs of damage.



NOTES ON VARIATIONS:
PROCESSOR UNIT ENDS IN 01 FOR USA FREQUENCY, AND 02 FOR EUROPEAN FREQUENCY.
DISPLAY UNIT ENDS IN 01 FOR IMPERIAL AND 02 FOR METRIC READOUT.
LEGEND PLATE ENDS IN 01 FOR IMPERIAL AND 02 FOR METRIC

PROCESSOR UNITS AND DISPLAY COME COMPLETE WITH SOCKETS.

PROCESSOR COMES COMPLETE WITH D CELL BATTERIES.

20 NO. CABLE CLIPS REQUIRED: E0-816-00-01

Ref no.	Qnt	Part Name	Material	Dimension	Remark
35	4	CAP HD SCREW			0M06-016-02
34	8	CAP HD SCREW			0M08-016-02
33	6	D CELL BATTERY			CONS00084
32	1	LEGEND PLATE			E6-820-00-XX
31	1	SOCKET H'SING WELDED PLT			E45-805-00-01
29	1	SENSOR PLATE			E45-802-00-01
27	1	SOCKET		9 PIN	E0-877-00-01
26	1	PLUG		9 PIN	E0-846-00-01
24	2	SOCKET		7 PIN	E0-851-00-01
23	1	LAP BUTTON			E0-850-00-01
22	1	ANTENNA			E0-852-00-01
21	1	MAGNETIC MOUNT			E0-854-00-01
20	1	SURFACE MOUNT			E0-853-00-01
19	1	DISPLAY UNIT			E6-817-00-XX
18	1	MOUNTING BRACKET			E45-814-00-01
17	1	PLUG		2 PIN INLINE	E0-842-00-01
16	1	SOCKET		2 PIN INLINE	E0-843-00-01
15	6	PLUG		7 PIN	E0-837-00-01
14	2	SOCKET		7 PIN	E0-829-00-01
13	1	SOCKET		2 PIN	E0-875-00-01
12	1	PLUG		2 PIN	E0-844-00-01
11	1	SOCKET		4 PIN	E0-876-00-01
10	1	PLUG		4 PIN	E0-845-00-01
9	1	GDM SOCKET			E0-828-00-01
8	1	GDM PLUG			E0-838-00-01
7	2	MAGNETIC SENSORS			E0-803-00-01
6	1	ADAPTOR			E0-848-00-01
5	1	PRESSURE SWITCH			E0-812-00-01
4	1	SOCKET H'SING BOLTED PLT			E45-804-00-01
3	1	ANTENNA SHROUD			E6-808-00-01
2	1	ANTENNA			E0-852-00-01
1	1	PROCESSOR UNIT			E0-801-00-XX

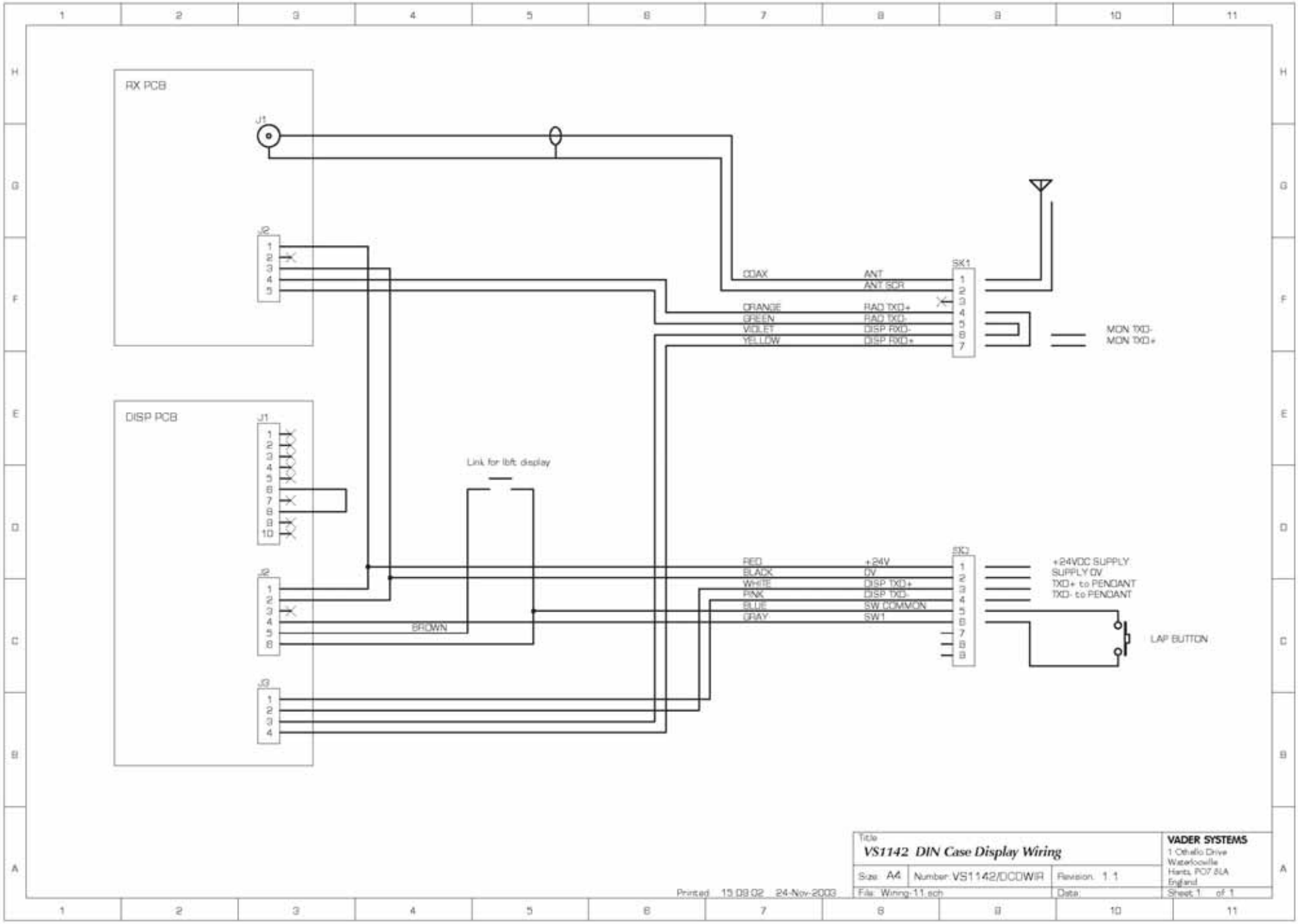
Rf nr	Qnt	Revision	Date	Intro	Appr by

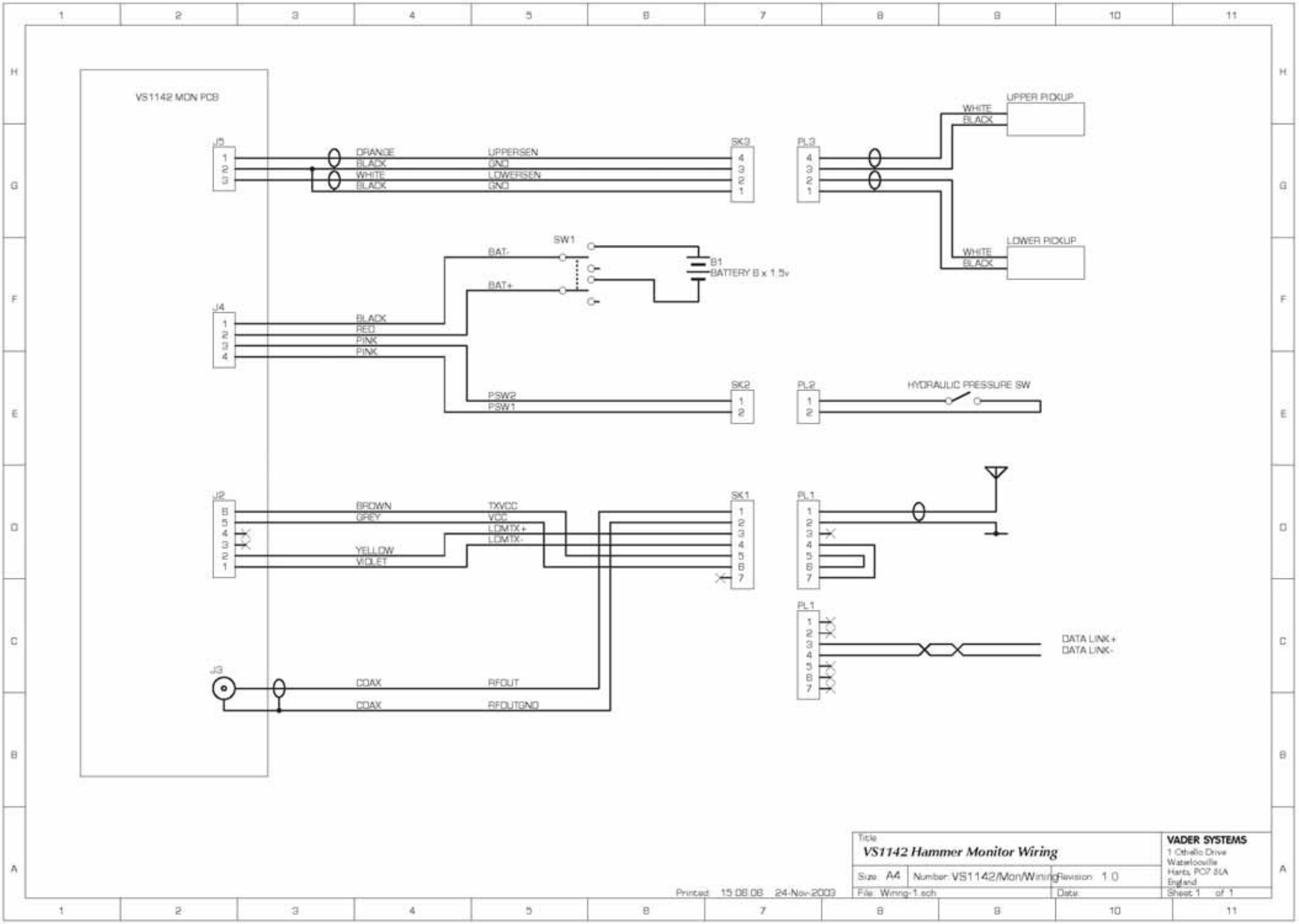
Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
						NTS		

DAWSON CONSTRUCTION PLANT LTD

HPH 4500
ENERGY MONITORING SET

File Drawing.dwg
Date 29-10-03
Drawing no. E45-800-00-01


RX PCB
J1
J2
1
2
3
4
5
COAX
ANT
ANT SCR
ORANGE
GREEN
VIOLET
YELLOW
RAD TXD+
RAD TXD-
DISP RXD-
DISP RXD+
SK1
1
2
3
4
5
6
7
MON TXD-
MON TXD+
DISP PCB
J1
1
2
3
4
5
6
7
8
9
10
Link for left display
J2
1
2
3
4
5
6
BROWN
J3
1
2
3
4
RED
BLACK
WHITE
PINK
BLUE
GRAY
+24V
0V
DISP TXD+
DISP TXD-
SW COMMON
SW1
SK2
1
2
3
4
5
6
7
8
9
+24VDC SUPPLY
SUPPLY 0V
TXD+ to PENDANT
TXD- to PENDANT
LAP BUTTON
Printed: 15:09:02 24-Nov-2003
Title
VS1142 DIN Case Display Wiring
Size: A4
Number: VS1142/DCDWIR
Revision: 1.1
File: Wiring-11.sch
Date:
VADER SYSTEMS
1 Othello Drive
Waterlooville
Hants. PO7 8UA
England
Sheet 1 of 1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2
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BLACK
UPPERSEN
GND
LOWERSEN
GND
SK3
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2
1
PL3
4
3
2
1
WHITE
BLACK
UPPER PICKUP
WHITE
BLACK
LOWER PICKUP
SW1
BAT-
BAT+
B1
BATTERY 8 x 1.5v
J4
1
2
3
4
BLACK
RED
PINK
PINK
PSW2
PSW1
SK2
1
2
PL2
1
2
HYDRAULIC PRESSURE SW
J2
6
5
4
3
2
1
BROWN
GREY
YELLOW
VIOLET
TXVCC
VCC
LDMTX+
LDMTX-
SK1
1
2
3
4
5
6
7
PL1
1
2
3
4
5
6
7
PL1
1
2
3
4
5
6
7
DATA LINK+
DATA LINK-
J3
COAX
COAX
RFOUT
RFOUTGND
Printed: 15:08:08 24-Nov-2003
Title
VS1142 Hammer Monitor Wiring
Size: A4
Number: VS1142/Mon/Wiring
Revision: 1.0
File: Wiring-1.sch
Date:
Sheet 1 of 1
VADER SYSTEMS
1 Othello Drive
Wateloooville
Hants, PO7 8IA
England

APPENDIX 8.4
FOR MORE ENGINE INFORMATION SEE JOHN DEERE OPERATORS MANUAL

JOHN DEERE

4045H Specifications

PERFORMANCE DATA

Rated Power

Intermittent	160 hp (119 kW) @ 2200 rpm
Continuous	143 hp (107 kW) @ 2200 rpm

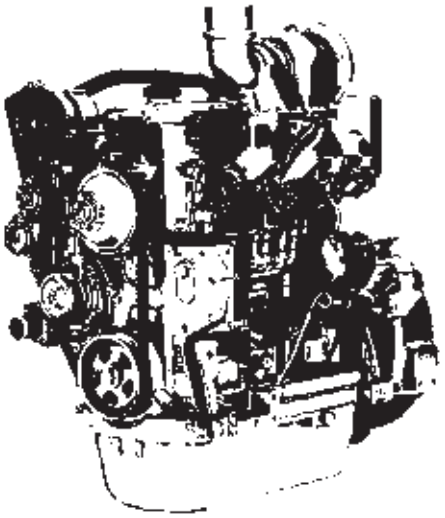
Peak Torque

Intermittent	476 lb-ft (645 N.m) @ 1400 rpm

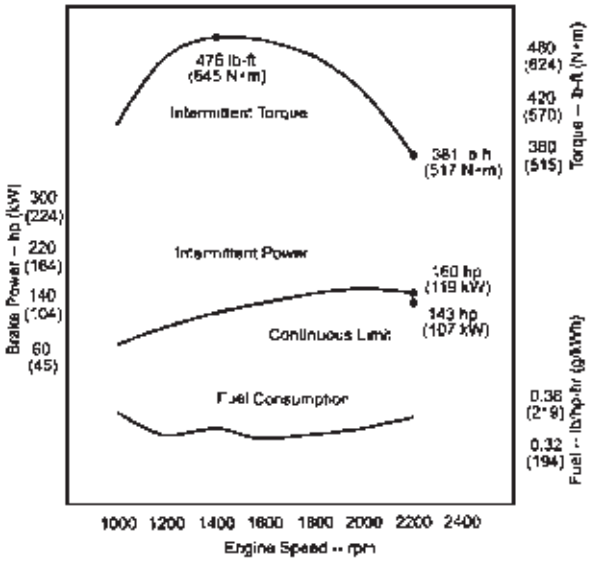
Fuel Economy

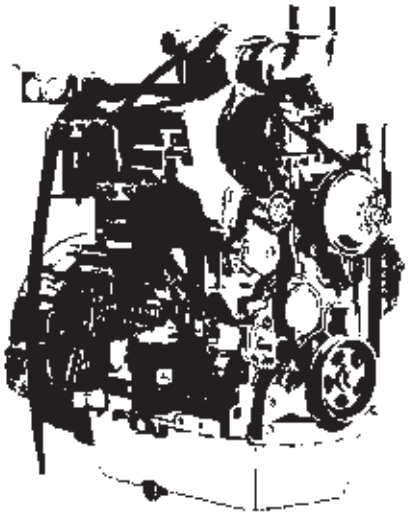
BSFC	0.350 lb/hp-hr (213 g/kWh) @ 2200 rpm

RATED BHP is the power rating for variable speed and load applications where full power is required intermittently.
CONTINUOUS BHP is the power rating for applications operating under a constant load and speed for long periods of time.
POWER OUTPUT is within + or - 5% at standard SAE J 1995 and ISO 3046.
TIER 2 EMISSION CERTIFICATIONS: CARB, EPA, and EU.



PERFORMANCE CURVE





Photographs may show non-standard equipment

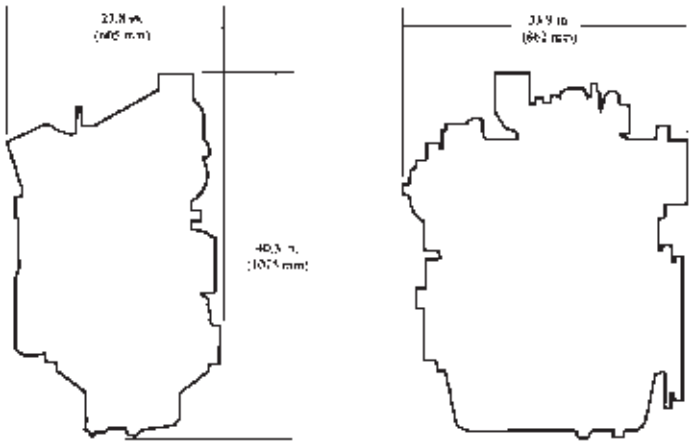
ISO 9000

4045H
Specifications

GENERAL DATA

Model	4045HF475	Aspiration	Turbocharged
Number of Cylinders	4	Length - in. (mm)	33.9 (862)
Displacement - L (cu.in)	4.5 (276)	Width - in. (mm)	23.8 (605)
Bore and Stroke - in. (mm)	4.19 x 5.0 (106 x 127)	Height - in. (mm)	40.3 (1025)
Compression Ratio	17.0:1	Weight - lb. (kg)	994.3 (451)
Engine Type	In-line, 4-Cycle		

DIMENSIONS



FEATURES AND BENEFITS

High Power Density
- High power density allows an OEM to use engines of a smaller displacement, reducing total install cost

Improved Fuel Economy
- Up to 5% better than like two-valve engines or larger displacement engines

Glow Plugs
- Glow plugs provide superior cold weather starting

Noise Reduction
- Up to 2dB(A) reduction

Exhaust Port Liners
- Exhaust port liners provide best-in-class heat rejection allowing for a smaller cooling package and a lower total installed cost

4-Valve Cylinder Head
- New cylinder head with 4-valve design provides increased air flow resulting in higher low speed torque and better transient response time

Centered, Vertical Injectors
- Engines burn cleaner, resulting in lower emission and improved fuel economy with the aid of vertical injectors

High-Pressure Common Rail Fuel System
- Higher (33%) injection pressures, up to 1600 bar (23,000 psi)
- Variable injection pressure and timing control

John Deere Electronic Controls
- John Deere electronically controlled fuel systems monitor critical engine functions and either derates or shuts down (override capability provided) an engine to prevent costly engine repairs
- Built in controls eliminate the need for costly add-on engine warning/shutdown systems and associated components
- Service diagnostics and error codes automatically stored for later retrieval, increasing machine uptime
- Performance connector part of engine wiring harness which allows for programming of multiple power curves and droop or isochronous governor regulation

500-Hour Oil Change
- Customers save significant costs on oil, filters and labor with a 500-hour oil change interval

Specifications and design subject to change without notice

JOHN DEERE

John Deere Power Systems
3801 W. Ridgeway Ave.
PO Box 5100
Waterloo, IA 50704-5100
Phone (800) 533-6446
Fax (319) 292-5075

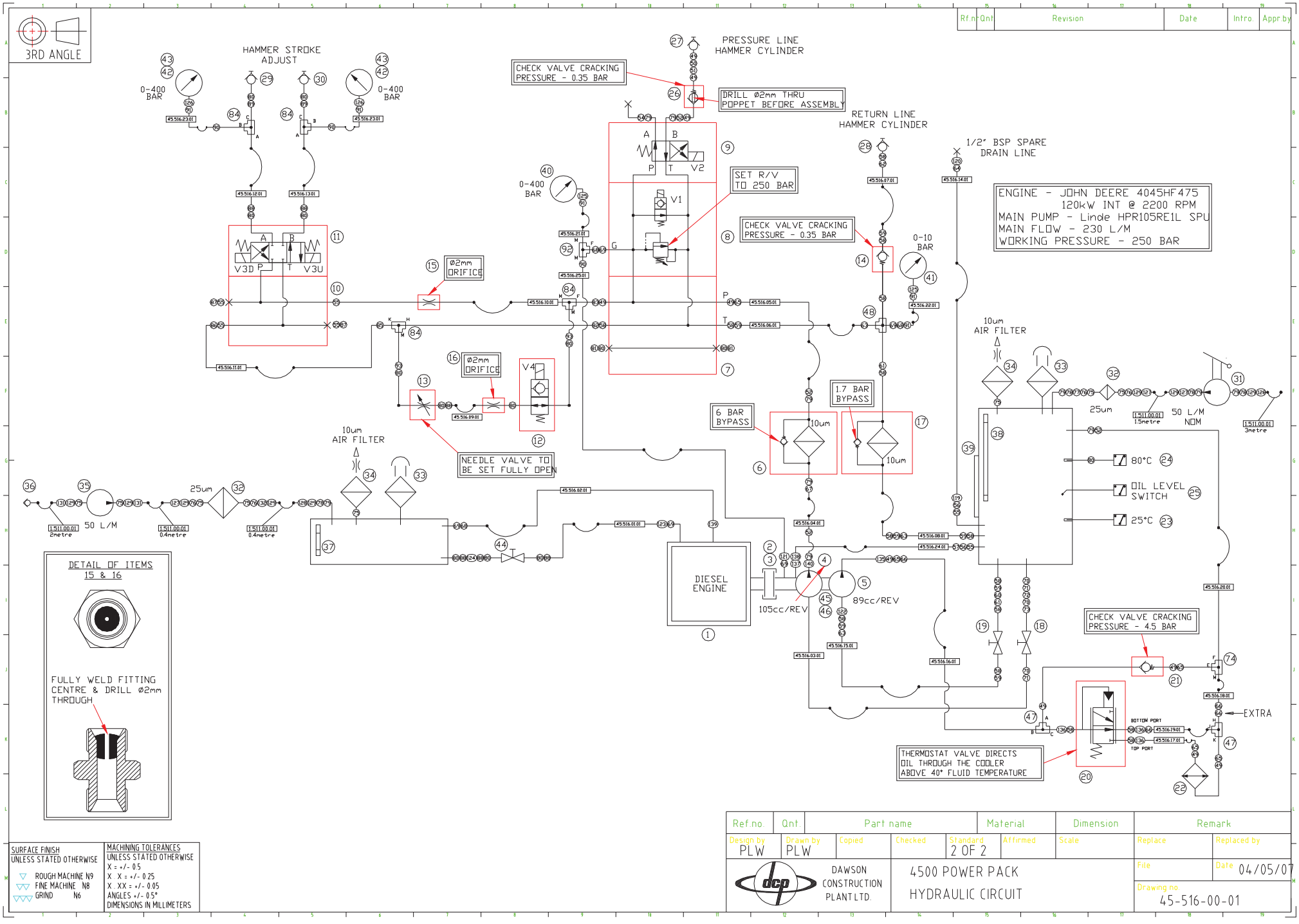
John Deere Power Systems
Usine de Saran
B.P. 11013
F-45401 Fleury les Aubrais Cedex
France
Phone (33) 2 38 82 61 19
Fax (33) 2 38 82 60 00

DSWDI47 Litho in U.S.A. (03 Aug 04)

APPENDIX 8.5 – POWER PACK INFORMATION

SEE ALSO SEPARATE POWER PACK MANUAL FOR MORE DETAILED INFORMATION.

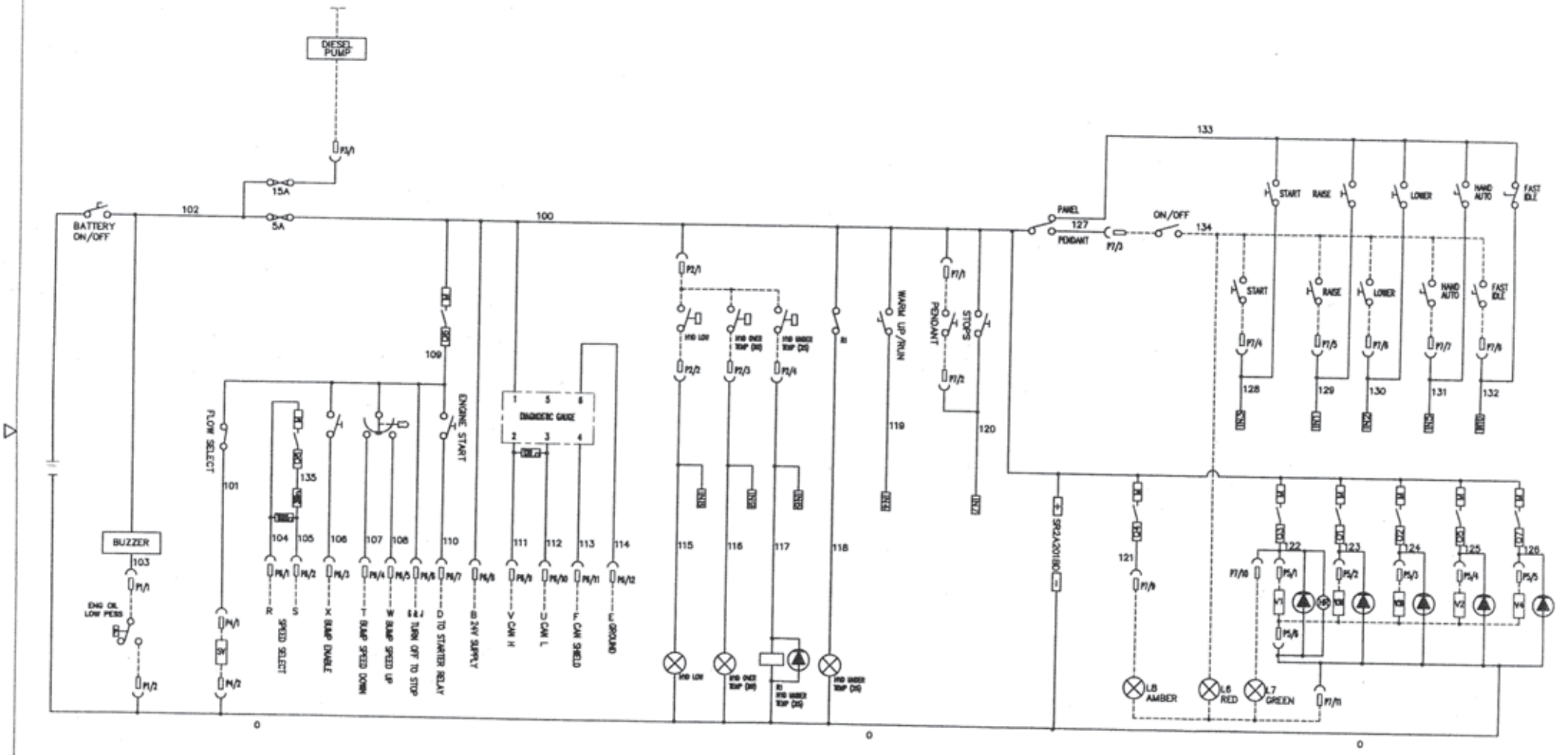
8.5.1 Hydraulic circuit schematic
8.5.2 Electrical circuit schematic
8.5.3 General assembly drawings


3RD ANGLE
HAMMER STROKE ADJUST
0-400 BAR
PRESSURE LINE HAMMER CYLINDER
CHECK VALVE CRACKING PRESSURE - 0.35 BAR
DRILL Ø2mm THRU POPPET BEFORE ASSEMBLY
RETURN LINE HAMMER CYLINDER
1/2" BSP SPARE DRAIN LINE
SET R/V TO 250 BAR
CHECK VALVE CRACKING PRESSURE - 0.35 BAR
0-10 BAR
ENGINE - JOHN DEERE 4045HF475
120kW INT @ 2200 RPM
MAIN PUMP - Linde HPR105RE1L SPU
MAIN FLOW - 230 L/M
WORKING PRESSURE - 250 BAR
Ø2mm ORIFICE
Ø2mm ORIFICE
NEEDLE VALVE TO BE SET FULLY OPEN
10um AIR FILTER
25um
50 L/M
6 BAR BYPASS
1.7 BAR BYPASS
10um
80°C
OIL LEVEL SWITCH
25°C
DIESEL ENGINE
105cc/REV
89cc/REV
CHECK VALVE CRACKING PRESSURE - 4.5 BAR
EXTRA
THERMOSTAT VALVE DIRECTS OIL THROUGH THE COOLER ABOVE 40° FLUID TEMPERATURE
DETAIL OF ITEMS 15 & 16
FULLY WELD FITTING CENTRE & DRILL Ø2mm THROUGH
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
Rf.no Qnt Revision Date Intro. Appr.by
Ref.no. Qnt Part name Material Dimension Remark
Design by PLW
Drawn by PLW
Copied
Checked
Standard 2 OF 2
Affirmed
Scale
Replace
Replaced by
File
Date 04/05/07
DAWSON CONSTRUCTION PLANT LTD.
4500 POWER PACK
HYDRAULIC CIRCUIT
Drawing no. 45-516-00-01

No.	PART.	DESCRIPTION	QTY
1	DIESEL ENGINE	JOHN DEERE 4045HF475 45.511.06.01	1
2	COUPLING	CPLY ASSY 3C3002 H00201	1
3	BELL HOUSING		1
4	LINDE PUMP	HPR 105-02 RE1L+SPU H00164	1
5	FIXED DISPLACEMENT COOLING PUMP	P5000-2.25" GEAR DCP 4505	1
6	PRESSURE FILTER	24P.2.10C.M.1 H00188	1
7	MANIFOLD BLOCK	MR7.1.G.1" H00210	1
8	RELIEF UNLOADER	YRF1-LCN-B-T H00212	1
9	CONTROL VALVE	DPH1.2631.2.N.24V DC H00208	1
10	MANIFOLD BLOCK	MR3.1.G H00211	1
11	CONTROL VALVE	DH1.0711.2.N.24V DC H00170	1
12	WARM UP CARTRIDGE	□D-15-06-56 H00176	1
12	WARM UP VALVE BODY	□C-10-09-004 H00177	1
12	WARM UP VALVE COIL	□D-02-03-01-30-□C H00178	1
13	FLOW CONTROL	NV□6B H00163	1
14	RETURN LINE CHECK VALVE	CV12A-05 H00209	1
15	ADAPTOR RESTRICTOR	1/2"-3/8" BSP M/M (M□D) H00111 (M□D)	1
16	ADAPTOR RESTRICTOR	3/8" BSP M/M (M□D) H00152 (M□D)	1
17	RETURN FILTER	40.CN1.10C.M2-25.E2E2.1 H00179	1
18	MAIN SUCTION CHECK VALVE	BV 32 B H00202	1
19	COOLER SUCTION CHECK VALVE	BV 24 B H00172	1
20	COOLER LINE THERMOSTAT	E7096-45 H00203	1
21	COOLER LINE CHECK VALVE	FT 257/6-114-4 H00204	1
22	ENG MOUNT HYD COOLER	SUPPLIED WITH JOHN DEERE ENGINE	1
23	25°C TEMP SWITCH	TS.IRN□.025.3/8 BSP 1.547.11.01	1
24	ADJUSTABLE THERMOSTAT	RS-561-460 SMM1 H00183	1
25	FLOAT SWITCH	MFS 21E2 H00185	1
26	"P" LINE CHECK VALVE	CV 10A-05 H00200	1
27	QR COUPLING	1 1/4" A SERIES MALE 1.516.00.01	1
28	QR COUPLING	1 1/2" FIRG MALE 1.518.00.01	1
29	QR COUPLING	3/8" FIRG FEMALE 1.512.00.01	1
30	QR COUPLING	3/8" FIRG MALE 1.513.00.01	1
31	ROTARY OIL HAND PUMP	VL 0102 H00193	1
32	IN LINE FILTER	SP16B BDN□ H00173	2
33	TANK FILLER W/STRAINER	TRBF-3 45.518.38.01	2
34	TANK BREATHER	SA075-G2-L10-A H00192	2
35	DIESEL PUMP	VR 050-2120 H00180	1
36	FOOTER VALVE	23759-0000B H00181	1
37	FUEL LEVEL GAUGE	G/LL15-2485GW 45.518.40.01	1
38	SIGHT LEVEL GAUGE	LVA 30 H00191	1
39	ACCESS COVER	ø200mm COVER PLATE 45.518.11.01	2
39	ACCESS COVER O-RING	BS 433 45.518.07.01	2
40	PRESSURE LINE GAUGE	1001 - 400 H00182	1
41	RETURN LINE GAUGE	100P/150/G + U CLAMP H00194	1
42	STROKE ADJ LINE GAUGE	63B/6T/G H00195	2
43	Clamp to suit 63mm Gauge	U CLAMP H00196	2
44	DIESEL LINE BALL VALVE	BV 06 B H00205	1
45	PUMP INTERFACE	LINDE - 262.231.14.11 DCP 4507A	1
46	DRIVE COUPLING ADAPTOR	LINDE - 254.305.12.02 DCP 4507B	1
47	1.25" BSP F/M/M TEE	TBA H00124	2
48	MODIFIED M/M/M TEE 1.5" BSP	H00138 45.513.42.01	1
49	Dowty Seal 1.25" BSP	TBA 1.102.03.01	10
50	Male Bulkhead 1.25" BSP	BH09508 H00117	1
51	Male / Female Straight 1.25" BSP	A□M120F120 H00122	1
52	Male/Male Adaptor 1.25" - 1"	A□M116M120 H00120	4
53			
54	1" Blanking Plug	AM0116 H00101	1
55	□OWETY SEAL 1/2"	TBA H00020	7
56	Male/Male Adaptor 1/2" BSP	A□M108M108 H00110	2
57	Male Swept 90 1/2" BSP	AWM108F108 H00114	1
58	Dowty Seal 1.5" BSP	TBA H00134	15
59	Male/Male Adaptor 1.5" BSP	MB24 H00135	7
60	Male/Female Block 90 1.5" BSP	TBA H00143	1
61	M/F Swivel Adaptor 1.5" BSP	TBA H00213	2
62	Male Bulkhead Fitting 1.5" BSP	TBA H00136	1
63	Male/Female Swept 90 1.5" BSP	E/S/MB24/FB24 H00139	3
64	Bulkhead c/w Locknut 1/2" BSP	ABHM108M108L H00112	1
65	Male / Male Adaptor 1.25" BSP	A□M120M120 H00118	5
66	Male/Female Block 90 1.25" BSP	TBA H00126	3
67	Male/Female Swept 90 1.25" BSP	TBA H00123	1
68	Male/Male Adaptor 1/4" BSP	TBA H00128	3
69	Dowty SEAL 1/4" BSP	TBA H00127	5
70	Dowty SEAL 2" BSP	TBA H00031	4
71	Male / Male Adaptor 2" BSP	TBA H00145	2
72	Male/Female Block 90 2" BSP	TBA H00146	1
73	M/F Swivel Adaptor 2" BSP	TBA H00147	1
74	Male/Male/Female Tee 1.25" BSP	TBA H00125	1
75	Dowty SEAL 3/4" BSP	TBA H00148	7
76	Male / Male Adaptor 1" - 3/4" BSP	A□M112M116 H00105	4
77	Female/Female Block 90 1" BSP	TBA H00214	1
78	Male/Male Adaptor 1" BSP	AM0116M116 H00102	3
79	Dowty SEAL 1" BSP	TBA H00100	10
80	Dowty SEAL 3/8" BSP	TBA H00150	13
81	Blanking Plug 3/8" BSP	TBA H00151	1
82	Male Adaptor 1.5" - 3/8" BSP	TBA H00137	1
83	Male Adaptor 1.25" - 3/8" BSP	TBA H00119	1
84	3/8" BSP F/M/M TEE	TBA H00155	4
85	Male/Female Block 90 3/8" BSP	TBA H00157	1
86	Male Adaptor 1/2" - 3/8" BSP	TBA H00111	1
87	Blanking Plug 1/2" BSP	TBA H00109	3
88	Male/Male Adaptor 3/8" BSP	320-0606 H00152	7
89	Male Bulkhead 3/8" BSP	TBA H00153	2
90	Female/Male Block 90 3/8" - 1/4" BSP	TBA H00158	3
91	Male/Female Block 90 1/4" BSP	TBA H00157	5
92	Male/Male/Female Tee 1/4" BSP	TBA H00037	1
93	Male/Female Straight 3/8" BSP	TBA H00156	2
94	FUEL IN - TANK TO PRE-FILTER 3/8" NOM BORE RIAT - 655mm 3/8" FEMALE STRAIGHT 3/8" FEMALE SWEPT 90	45.516.01.01	1
95	FUEL OUT - ENGINE TO TANK RL-6 2000mm long E/C fitted with U04BF06	45.516.02.01	1
96	MAIN SUCTION - TANK TO MAIN PUMP 2" NOM BORE RIAT - 1430mm 2" FEMALE STRAIGHT 2" 3000 PSI SAE SWEPT 90	45.516.03.01	1
97	MAIN PRESSURE LINE - MAIN PUMP TO PRESSURE FILTER 1 1/4" NOM BORE 4SH - 2300mm 1 1/4" FEMALE STRAIGHT 1 1/4" FEMALE SWEPT 90	45.516.04.01	1
98	MAIN PRESSURE LINE - PRESSURE FILTER TO MICRO 1 1/4" NOM BORE 4SH - 1300mm 1 1/4" FEMALE STRAIGHT 1 1/4" FEMALE SWEPT 90	45.516.05.01	1
99	MAIN TANK LINE- MICRO TO TEE 1 1/2" NOM BORE RIAT - 700mm 1 1/2" FEMALE STRAIGHT 1 1/2" FEMALE SWEPT 90	45.516.06.01	1
100	MAIN TANK LINE- TEE PIECE CHECK TO BULKHEAD 1 1/2" NOM BORE R2AT - 1200mm 1 1/2" FEMALE STRAIGHT 1 1/2" FEMALE SWEPT 90	45.516.07.01	1
101	MAIN TANK LINE- TEE PIECE TO TANK 1 1/2" NOM BORE R2AT - 495mm 1 1/2" FEMALE STRAIGHT 1 1/2" FEMALE SWEPT 90	45.516.08.01	1
102	CETOP 3 LINE- NEEDLE VALVE TO WARM UP VALVE 3/8" NOM BORE R2AT - 325mm 3/8" FEMALE SWEPT 90 3/8" FEMALE SWEPT 90	45.516.09.01	1
103	CETOP 3 LINE- CETOP 7 "P" TO CETOP 3 "P" 3/8" NOM BORE R2AT - 390mm 3/8" FEMALE SWEPT 90 3/8" FEMALE SWEPT 90	45.516.10.01	1
104	CETOP 3 LINE- CETOP 7 "T" TO CETOP 3 "T" 3/8" NOM BORE R2AT - 415mm 3/8" FEMALE SWEPT 90 3/8" FEMALE STRAIGHT	45.516.11.01	1
105	CETOP 3 LINE- CETOP 3 "A" TO BULKHEAD 3/8" NOM BORE R2AT - 470mm 3/8" FEMALE SWEPT 90 3/8" FEMALE STRAIGHT	45.516.12.01	1
106	CETOP 3 LINE- CETOP 3 "B" TO BULKHEAD 3/8" NOM BORE R2AT - 415mm 3/8" FEMALE SWEPT 90 3/8" FEMALE STRAIGHT	45.516.13.01	1
107	SPARE DRAIN LINE - BULKHEAD TO TANK 1/2" NOM BORE R1AT - 1050mm 1/2" FEMALE SWEPT 90 1/2" FEMALE STRAIGHT	45.516.14.01	1
108	COOLER LINE - TANK TO SUCTION PUMP 1 1/2" NOM BORE R1AT - 1050mm 1 1/2" FEMALE STRAIGHT 1 1/2" FEMALE STRAIGHT	45.516.15.01	1
109	COOLER LINE - PUMP TO THERMOSTAT VALVE 1 1/4" NOM BORE R1AT - 2150mm 1 1/4" FEMALE SWEPT 90 1 1/4" FEMALE SWEPT 90	45.516.16.01	1
110	COOLER LINE - THERMOSTAT VALVE "R" PORT TO RAD TOP 1 1/4" NOM BORE R1AT - 1445mm 1 1/4" FEMALE SWEPT 90 1 1/4" FEMALE SWEPT 90	45.516.17.01	1
111	COOLER LINE - CHECK VALVE BASE TEE TO RAD BASE TEE 1 1/4" NOM BORE R1AT - 700mm 1 1/4" FEMALE SWEPT 90 1 1/4" FEMALE SWEPT 90	45.516.18.01	1
112	COOLER LINE - RAD BASE TEE TO THERMOSTAT "B" PORT 1 1/4" NOM BORE R1AT - 1110mm 1 1/4" FEMALE SWEPT 90 1 1/4" FEMALE SWEPT 90	45.516.19.01	1
113	COOLER LINE - CHECK VALVE TO TANK 1 1/4" NOM BORE R1AT - 1230mm 1 1/4" FEMALE BLOCK 90 1 1/4" FEMALE SWEPT 90	45.516.20.01	1
114	MINI MESSS HOSE - MAIN PRESSURE MINI MESS TEST HOSE - 2150mm 1/4" FEMALE STRAIGHT 1/4" FEMALE STRAIGHT	45.516.21.01	1
115	MINI MESSS HOSE - RETURN LINE PRESSURE MINI MESS TEST HOSE - 1120mm 1/4" FEMALE STRAIGHT 1/4" FEMALE STRAIGHT	45.516.22.01	1
116	MINI MESSS HOSE - CETOP 3A & B PRESSURE MINI MESS TEST HOSE - 1765mm 1/4" FEMALE STRAIGHT 1/4" FEMALE STRAIGHT	45.516.23.01	2
117	CASE DRAIN TO TANK 1/2" NOM BORE R1AT - 2220mm 1/2" FEMALE SWEPT 90 1/2" FEMALE STRAIGHT	45.516.24.01	1
118	PUMP LOAD SENSE 1/4" NOM BORE R2AT - 575mm 1/4" FEMALE SWEPT 90 1/4 FEMALE STRAIGHT	45.516.25.01	1
119	Male/Female Swept 90 1/2" BSP	TBA H00259	1
120	1" BSP Female Flange 1" SAE 6000 PSI	TBA H00113	1
121	FEMALE BLANKING PLUG 1/2" BSP	TBA H00131	1
122	Str Flange 1 1/2" BSP - SAE	DCP4513 H00207	2
123	Male/Male Adaptor 3/8" BSP - 12mm	TBA H00160	1
124	Female/Female Swept 90 3/8" BSP	TBA H00159	1
125	Gauge Connector+Ring 1/4" BSP Male - 1/2"	TBA H00129	2
126	Gauge Connector+Ring 1/4" BSP Male - 1/4"	MB24 H00132	2
127	Female 90Deg Swept 1" BSP - 1" Hose	HSCP1616FG90B H00104	3
128	1" Hose Insert 3/4" BSP Male	TBA H00103	4
129	Jubilee Clip 25-35mm	TBA H00190	8
130	Fuel/Oil Transfer Hose 1" America Oil	TBA 1.511.00.01	5
131	3/4" BSP Male 1" Hose Insert	TBA H00149	2
132	1" BSP F/F Block Compact 90	ACF116F116 H00106	1
133	Pipe Clamp 35mm	CPC 035 45.518.08.01	1
134	Pipe Clamp 44mm	CPC 0044 45.518.09.01	1
135	Str Flange 1 1/4" BSP - SAE	DCP4512 H00206	1
136	Male/Male Adaptor 1.5" - 1.25" BSP	CFG15022 H00142	1
137	Dowty Washer 22mm	CFG2203 H00161	1
138	Male/Male Adaptor M22 x 1.5 - 1/2" BSP	CFG2205 H00162	1
139	1/4" BSP Male - 6mm Standpipe	TBA H00133	1
140	1" BSP Female Flange 1" SAE 6000 PSI	TBA H00108	1

DRG. NO.	SHEET NO. OF	SERIAL No
HPH 2400		1603

IF IN DOUBT ASK. APP 9015



DRAWN				
DG				
CHECKED				
	1	CAD RE ISSUE	22/08/2000	–
	ISSUE	MOD. No.	DATE	CHK'D

TOLERANCES EXCEPT WHERE OTHERWISE STATED	
LINEAR	
UP TO 50	±0.25
OVER 50 TO 100	±0.50
OVER 100	±1.00
ANGULAR	+0.50°

REMOVE ALL BURRS, SHARP EDGES & CORNERS

0 ORIGINAL SCALE 50

DO NOT USE TO SCALE DRAWING.

MATERIAL N/A

FINISH N/A

SCALE:-1:1

TOLERANCES UNLESS OTHERWISE STATED

DIMENSIONS IN mm

EST. MASS

Tomlin HYDRAULICS Ltd
STATION ROAD, UPPINGHAM, RUTLAND, LE15 9TX
TEL: (01572) 821052. FAX: (01572) 821361.

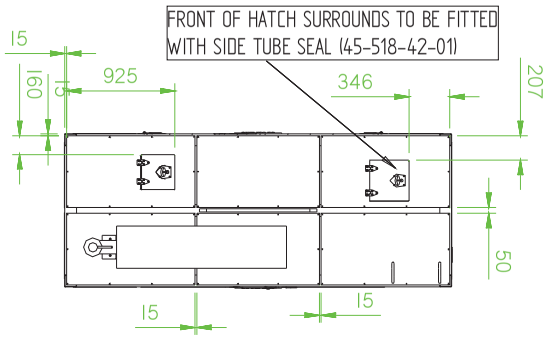
TITLE
ELECTRIC SCHEMATIC
N.S.N.

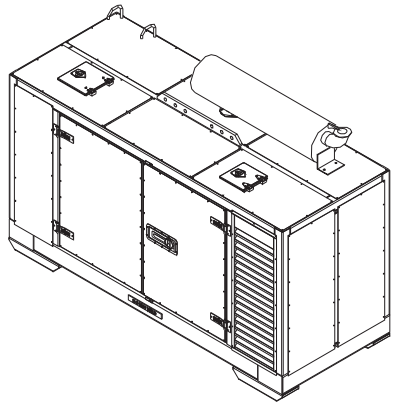
DRG. NO. HPH 2400

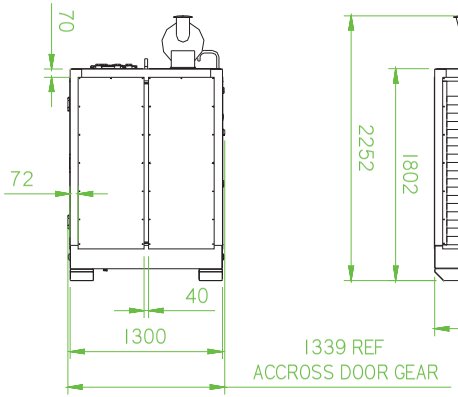
SHEET NO. OF

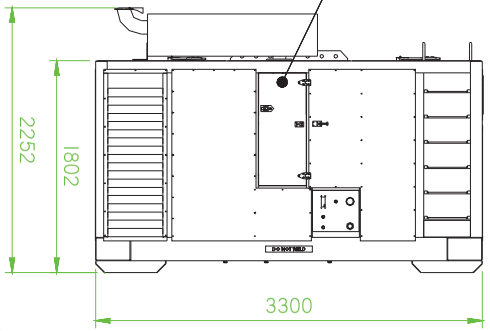
3RD ANGLE

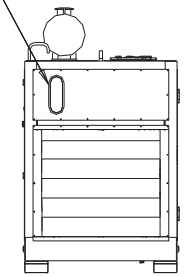
Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

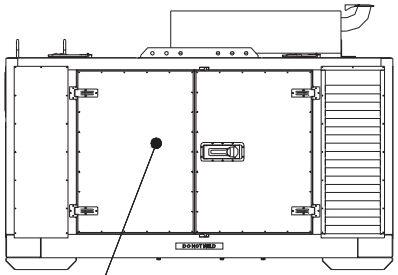


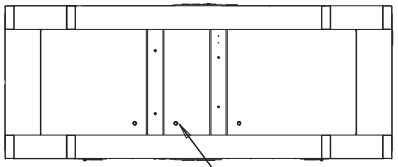












GENERAL NOTES:-
SEE HYDRAULIC BUILD AND HOSE LIST FOR DETAILED INSTRUCTIONS.
SEE NUTS AND BOLT LIST FOR DETAILED INSTRUCTIONS.
REF ONLY TOMLINS OLD NO 4500-0001

SURFACE FINISH	MACHINING TOLERANCES
UNLESS STATED OTHERWISE	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
peter watts	peter watts	–	–	A3	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

4500 POWER PACK

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Drawing no. 45-500-00-02

3RD ANGLE

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

COLOUR SCHEME

FINISH PAINTED IN TWO PACK GLOSS WHITE PAINT ~

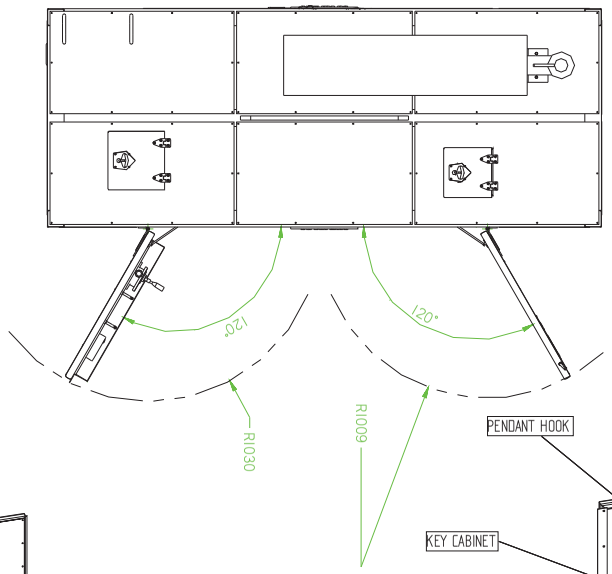
~ BASE FRAME, ROOF PANELS, INTERNAL AIR BOX PANELS, HATCH LIDS, MAIN PUMP & BELL HOUSING.

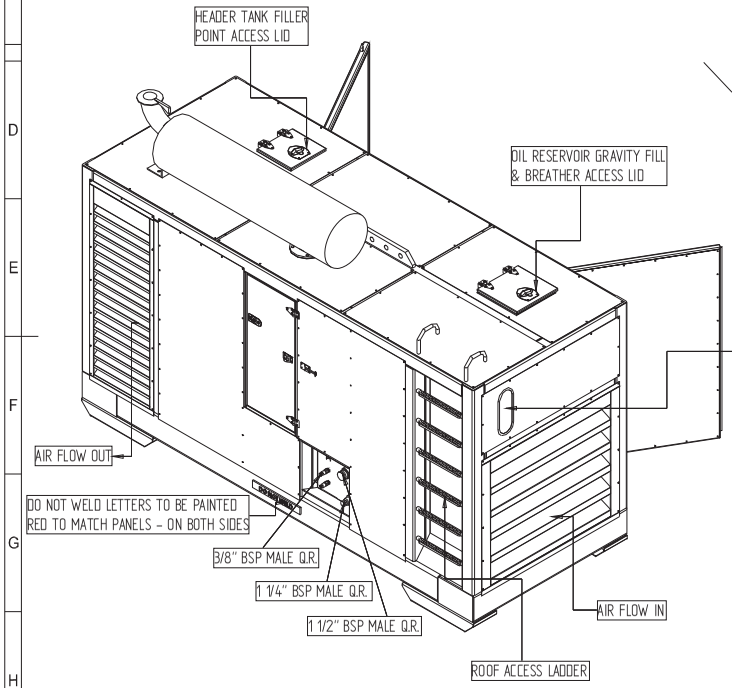
FINISH PAINTED IN TWO PACK 537 SIGNAL RED ~

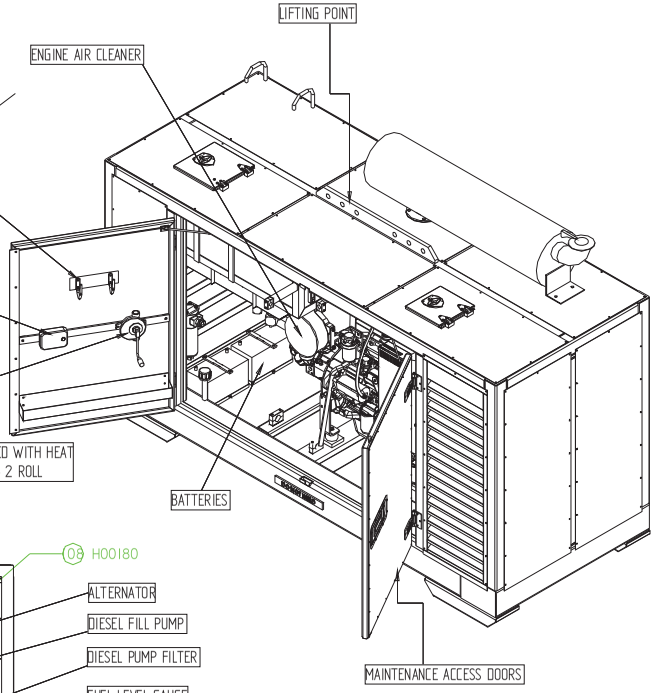
~OIL RESERVOIR, DOORS, LOOVERS, BLANK PANELS & HIGHLIGHTED WARNING SIGNS.

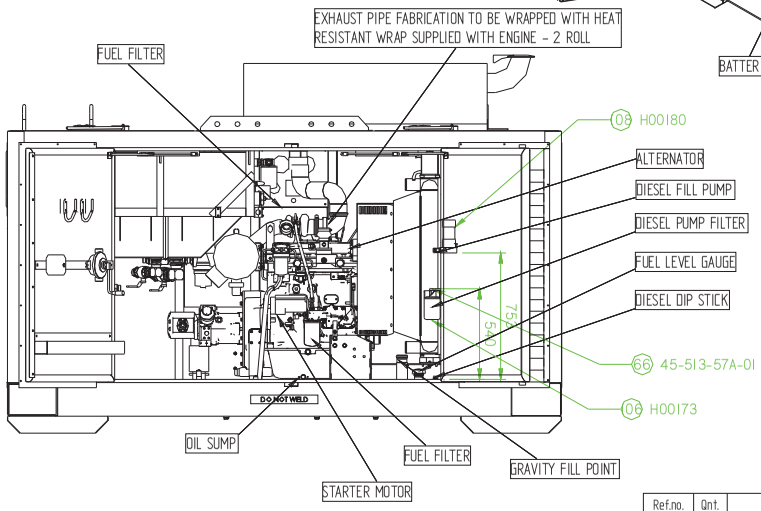
SILICON DETAIL

SILICON SEAL AROUND ~
- ~ROOF PANELS
- ~HATCH LIDS
- ~HATCH LID FRAMES
- ~HYDRAULIC BULK HEAD INTERNAL JOINTS
- ~EXHAUST FRONT SUPPORT FOOT









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

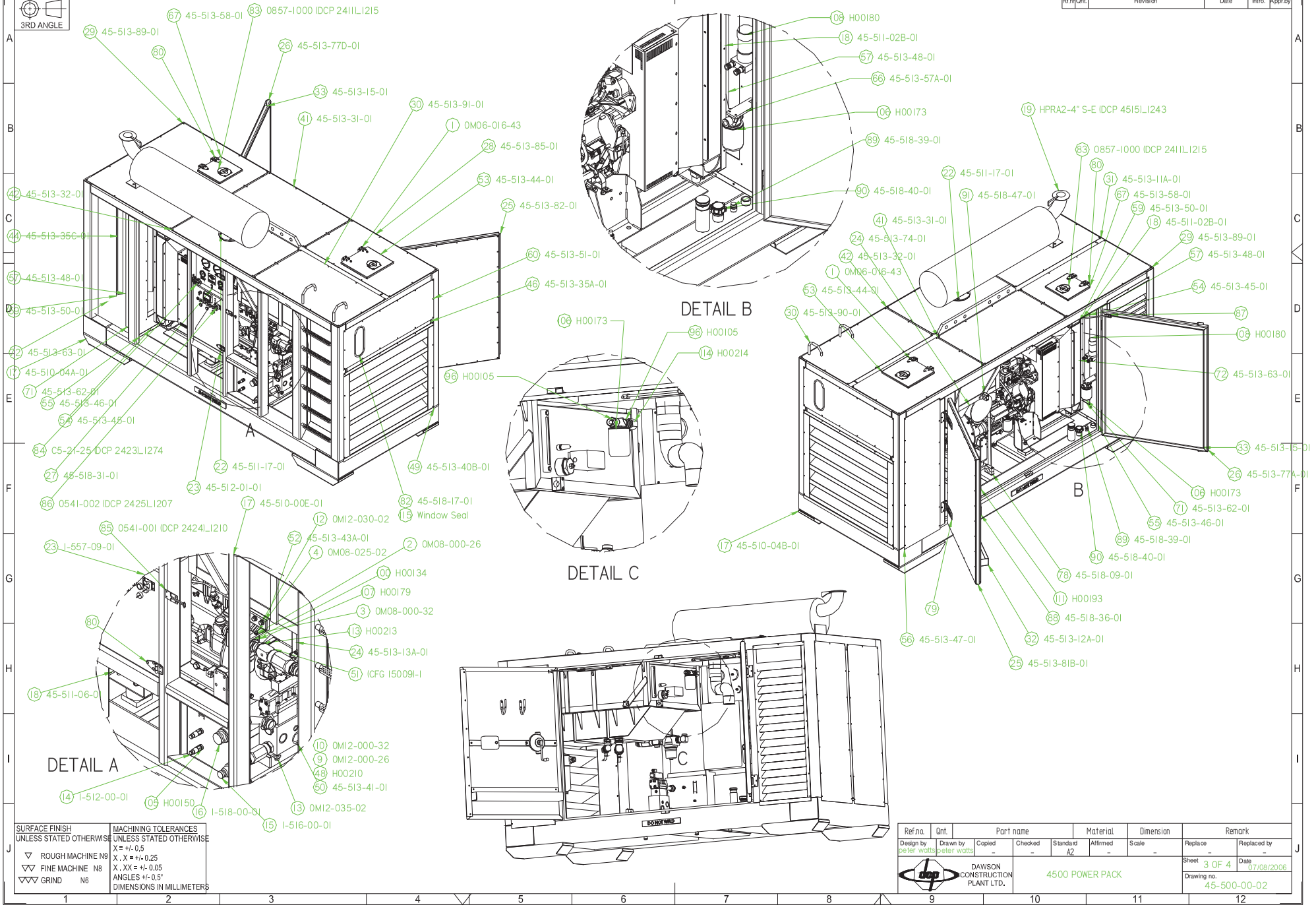
Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
peter watts	peter watts	–	–	A2	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

4500 POWER PACK

Sheet 2 OF 4 | Date 07/08/2006

Drawing no. 45-500-00-02


3RD ANGLE
Rf.nr | Qnt. | Revision | Date | Intro. | Appr.by
67 45-513-58-01
83 0857-1000 IDCP 2411L1215
29 45-513-89-01
80
26 45-513-77D-01
33 45-513-15-01
30 45-513-91-01
41 45-513-31-01
1 0M06-016-43
28 45-513-85-01
53 45-513-44-01
25 45-513-82-01
42 45-513-32-01
44 45-513-35C-01
60 45-513-51-01
46 45-513-35A-01
57 45-513-48-01
59 45-513-50-01
62 45-513-63-01
17 45-510-04A-01
71 45-513-62-01
55 45-513-46-01
54 45-513-45-01
84 C5-21-25 IDCP 2423L1274
27 45-518-31-01
86 0541-002 IDCP 2425L1207
22 45-511-17-01
23 45-512-01-01
49 45-513-40B-01
82 45-518-17-01
115 Window Seal
A
08 H00180
18 45-511-02B-01
57 45-513-48-01
66 45-513-57A-01
06 H00173
89 45-518-39-01
90 45-518-40-01
DETAIL B
06 H00173
96 H00105
14 H00214
96 H00105
DETAIL C
19 HPRA2-4" S-E IDCP 4515L1243
83 0857-1000 IDCP 2411L1215
80
22 45-511-17-01
31 45-513-11A-01
91 45-518-47-01
67 45-513-58-01
59 45-513-50-01
41 45-513-31-01
18 45-511-02B-01
24 45-513-74-01
29 45-513-89-01
42 45-513-32-01
57 45-513-48-01
1 0M06-016-43
53 45-513-44-01
54 45-513-45-01
30 45-513-90-01
87
08 H00180
72 45-513-63-01
33 45-513-15-01
26 45-513-77A-01
06 H00173
71 45-513-62-01
55 45-513-46-01
89 45-518-39-01
90 45-518-40-01
78 45-518-09-01
111 H00193
88 45-518-36-01
32 45-513-12A-01
25 45-513-81B-01
17 45-510-04B-01
79
56 45-513-47-01
B
85 0541-001 IDCP 2424L1210
23 1-557-09-01
17 45-510-00E-01
12 0MI2-030-02
52 45-513-43A-01
4 0M08-025-02
2 0M08-000-26
00 H00134
07 H00179
3 0M08-000-32
13 H00213
24 45-513-13A-01
51 ICFG 15009I-I
80
18 45-511-06-01
DETAIL A
10 0MI2-000-32
9 0MI2-000-26
48 H00210
50 45-513-41-01
14 1-512-00-01
09 H00150
16 1-518-00-01
13 0MI2-035-02
15 1-516-00-01
C
DO NOT WELD
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
Ref.no. | Qnt. | Part name | Material | Dimension | Remark
Design by peter watts | Drawn by peter watts | Copied – | Checked – | Standard A2 | Affirmed – | Scale – | Replace – | Replaced by –
DAWSON CONSTRUCTION PLANT LTD.
4500 POWER PACK
Sheet 3 OF 4
Date 07/08/2006
Drawing no. 45-500-00-02

3RD ANGLE

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

45*	2	OUTLET LOUVER FAB			45-513-36-01
44	1	VERTICAL REMOVABLE END POST			45-513-35-01
43*	1	RETURN FILTER BLANK PANEL	Mild Steel Sheet	2mm	45-513-33-02
42	1	EXHAUST ROOF PANEL	Mild Steel Sheet	3mm	45-513-32-01
41	1	BLANK ROOF PANEL 2	Mild Steel Sheet	2mm	45-513-31-01
40*	1	HAND PUMP SUPPORT BRACKET	080A15 Bright	50x10x922.5mm	45-513-23-01
39*	1	ROOF PANEL 5			45-513-21-01
38*	1	ROOF PANEL 4			45-513-20-01
37*	1	ROOF PANEL 3			45-513-19-01
36*	1	ROOF PANEL 2			45-513-18-01
35*	2	ROOF PANEL 1			45-513-17-01
34*	1	LH DOOR BLANK			45-513-16-01
33	1	RH DOOR BLANK			45-513-15-01
32	1	DOOR TRAY FAB			45-513-12-01
31	1	EXHAUST END SUPPORT ROOF PANEL			45-513-11-01
30	1	LADDER GRAB HANDLE			45-513-10-01
29	1	HEADER TANK ACCESS PANEL			45-513-09-01
28	1	OIL TANK ACCESS PANEL			45-513-08-01
27	1	CONTROL PANEL ASSY			45-513-03-02
26	1	RH DOOR BUILD			45-513-02-01
25	1	LEFT HAND DOOR BUILD			45-513-01-01
24	1	OIL RESEVOIR BUILD			45-513-00-01
23	1	Electrical Control System		(DCP 4514)	45-512-00-02
22	2	4" Nom Bore Gasket		(DCP 2419)	45-511-17-01
21*	2	4" Stemco Clamp		(DCP 2416)	45-511-14-01
20*	1	4" Nom Bore Galv Polylock		(DCP 2415)	45-511-13-01
19	1	SILENCER HPRA2-4" S-E		(DCP 4515)	45-511-12-01
18	1	DIESEL ENGINE SUB ASSY			45-511-00-01
17	1	FRAME FABRICATION		SEE LIST	45-510-00-02
16	1	1.5" FIRG Male Probe		(DCP 2008)	1-518-00-01
15	1	1.25" FIRG Male Probe		(DCP 0025)	1-516-00-01
14	2	0.375" FIRG Male Probe		(DCP 0023)	1-512-00-01
13	6	Hex Cap Screw	ST.STEEL	M12 x 35	0M12-035-02
12	3	Hex Cap Screw	ST.STEEL	M12 x 30	0M12-030-02
11*	2	prevailing torque nut style 1 insert	ST.STEEL	M12	0M12-000-45
10	9	Spring Lock Washer		M12	0M12-000-32
9	9	NARROW WASHER	ST.STEEL	M12	0M12-000-26
8*	4	Cap Screw	ST.STEEL	M10 x 25	0M10-025-02
7*	8	Hex nut, Style 1	ST.STEEL	M10 x 1.5	0M10-000-45
6*	4	SPRING WASHER	ST.STEEL	M10	0M10-000-32
5*	4	FLAT WASHER	ST.STEEL	M10	0M10-000-26
4	4	Cap Screw	ST.STEEL	M8 x 25	0M08-025-02
3	4	SPRING WASHER	ST.STEEL	M8	0M08-000-32
2	4	Flat Washer Narrow	ST.STEEL	M8	0M08-000-26
1	10	Socket Countersunk Head Screw	ST.STEEL	M6 x 16	0M06-016-43

89	1	DIP STICK	ILAF-2	(DCP 6008)	45-518-39-01
88	1	KEY CABINET	495240	(DCP 2441)	45-518-36-01
87	2	11" SPRING LOADED D/P	1231-1000	(DCP 2435)	45-518-33-01
86	1	ST STEEL SPRING LOADED RETAINER	0541-002	(DCP 2425)	45-518-30-01
85	1	ST STEEL 100MM DD BACK	0541-001	(DCP 2424)	45-518-29-01
84	1	LATCH	C5-21-25	(DCP 2423)	45-518-28-01
83	2	VECTOR LOCKING TEE HANDLE		(DCP 2411)	45-518-18-01
82	1	PLASTIC WINDOW		DCP 2409	45-518-17-01
81*	9	RUBBER BUFFER	050-218	(DCP 2406)	45-518-16-01
80	6	CATCH	2218-002	(DCP 2018)	45-518-13-01
79	4	9810-6140		(DCP 2017)	45-518-12-01
78	2	44mm Single Clamp		(CPC 0044)	45-518-09-01
77*	1	RETURN FUEL FILTER BLANK PANEL			45-513-68-01
76*	1	CONTROL DOOR SIDE BLANK PANEL 1			45-513-67-02
75*	1	CONTROL DOOR SIDE BLANK PANEL 2			45-513-66-02
74*	2	MAIN DOOR SIDE END BLANK			45-513-65-01
73*	1	SIGHT GAUGE PANEL			45-513-64-01
72	2	AIR BOX TOP & BOTTOM			45-513-63-01
71	1	AIR BOX MAIN PANEL			45-513-62-01
70*	2	EXTENDED HOOK FAB			45-513-61-01
69*	1	EXHAUST FLANGE STEM FAB			45-513-60-01
68*	1	TANK SUPPORT BEAM FAB			45-513-59-01
67	1	HEADER TANK HATCH LID	Mild Steel Sheet	3mm	45-513-58-01
66	1	FUEL FILTER BRACKET FAB			45-513-57-01
65*	1	CONTROL DOOR PANEL	Mild Steel Sheet	2MM	45-513-56-02
64*	1	EXTERNAL "L" PANEL	Mild Steel Sheet	2mm	45-513-55-02
63*	2	BATTERY STRAP	080A15 Bright	25x10x230mm	45-513-54-01
62*	1	EXHAUST PIPE FAB			45-513-53-01
61*	1	CETOP 3 ASSY			45-513-52-01
60	1	SIGHT GAUGE WINDOW PANEL	Mild Steel Sheet	2MM	45-513-51-01
59	2	AIR BOX END BLANK			45-513-50-01
58*	2	AIR BOX BLANK PANEL	Mild Steel Sheet	2mm	45-513-49-01
57	1	AIR BOX SPLITTER			45-513-48-01
56	1	SIDE BLANK PANEL	Mild Steel Sheet	2MM	45-513-47-01
55	1	AIR BOX BASE PLATE	Mild Steel Sheet	2mm	45-513-46-01
54	1	AIR BOX MAIN PLATE	Mild Steel Sheet	2mm	45-513-45-01
53	1	OIL TANK HATCH LID	Mild Steel Sheet	3mm	45-513-44-01
52	1	RETURN FILTER FAB			45-513-43-01
51	1	RETURN LINE TEE MODS	1.5" BSP Equal Male Tee	CFG 15009	45-513-42-01
50	2	VALVE SLIDE TIE BAR	080A15 Bright	25x10x115mm	45-513-41-01
49	1	INLET LOUVRE FAB			45-513-40-01
48	1	CETOP 7 ASSY			45-513-39-01
47*	1	TANK SUPPORT FRAME TIE BAR			45-513-38-01
46	1	HORIZONTAL REMOVABLE END POST			45-513-37-01

115	1				Window Seal
114	1	1" BSP F-F Block 90		(CFG 10025)	H00214
113	1	1.5" BSP M-F Swivel Adaptor		(CFG 15003)	H00213
112	1	CHECK VALVE	CV12A-05	(DCPEUR 2006)	H00209
111	1	OIL TRANSFER PUMP	VL0102	(DCP 2413)	H00193
110*	1	BREATHER - 10um	SA075-G2-L10-A	(DCP 2408)	H00192
109*	1	PRESSURE FILTER	24P-2-10C-M-1	(DCP 2011)	H00188
108	1	DIESEL PUMP	VR050-2120	(DCP 0204)	H00180
107	1	RETURN LINE FILTER	4.0-EN1-108-M25 -E2E2-1	(DCP 0115)	H00179
106	2	INLINE FILTER	MPS050-U-G1-P2 5-A	(DCP 0014)	H00173
105	2	0.375" BSP Dowty Washer		(CFG 38011)	H00150
104*	2	0.75" BSP Dowty Washer		(CFG 34011)	H01148
103*	1	1.5" BSP M-F Block 90	C90-28-24	CFG 15019	H00143
102*	1	1.5" BSP M-F Swivel Swept 90 Fitting		(CFG 15013)	H00139
101	3	1.5" BSP M-M Adaptor		(CFG 15002)	H00135
100	9	1.5" BSP Dowty Washer		(CFG15001)	H00134
99*	2	1.25" BSP to 1" BSP M-M Adaptor		(CFG 12514)	H00120
98*	1	Dowty Washer	1.25" BSP	(CFG12501)	H00116
97*	3	0.5" BSP Blanking Plug		(CFG 1202)	H00109
96	2	1" BSP to 0.75" M-M Adaptor		(CFG 10014)	H00105
95*	1	1" BSP M-M Adaptor		(CFG 10003)	H00102
94*	3	Dowty Washer	1" BSP	(CFG10001)	H00100
93*	3	0.5" BSP Dowty Washer		(CFG 1201)	H00020
92*	2	Battery	663-12V	(DCP 1024)	E0.1010.00.01
91	2	30mm Single Clamp		(CPC 0030)	45-518-47-01
90	1	LEVEL GAUGE	612-00A09758	(DCP 6018)	45-518-40-01

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

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

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
peter watts	peter watts	_	_	A2	_	_	_	_

DAWSON CONSTRUCTION PLANT LTD.

4500 POWER PACK

Sheet 4 OF 4
Date 07/08/2006
Drawing no. 45-500-00-02

APPENDIX 8.6 -

HYDRAULIC HAMMER TOOL KIT

(PART NO. 45.150.00.01)

PART NO.	QTY.	DESCRIPTION
T066	1 off	4mm Allen Key
T067	1 off	5mm Allen Key
T068	1 off	6mm Allen Key
1.150.02.01	1 off	19mm Allen Key - long series
1.150.09.01	1 off	18” Adjustable Spanner
1.150.12.01	1 off	19mm Combination Spanner
1.150.18.01	4 off	M24 Lifting Eye
1.150.20.01	1 off	5/16" Parallel Pin Punch
1.150.21.01	1 off	External/Internal Circlip Pliers
1.150.24.01	1 off	Soft Hammer
1.150.25.01	1 off	Grease Gun
1.150.27.01	1 off	22mm Combination Spanner
1.150.28.01	1 off	24mm Combination Spanner
1.150.29.01	1 off	27mm Combination Spanner
1.150.30.01	1 off	30mm Combination Spanner
1.150.31.01	1 off	6mm Allen Key Long Series
1.150.33.01	1 off	12mm Allen Key Long Series
1.150.35.01	1 off	Tool Box 22” 5 Tray Cantilever
1.150.36.01	1 off	14mm Allen Key Long Series
1.070.00.02	1 off	Gas Filling Apparatus
2.150.04.01	1 off	10mm Combination Spanner

DAWSON
CONSTRUCTION PLANT LTD

HPH 4500
HYDRAULIC HAMMER

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CE