DAWSON
CONSTRUCTION PLANT LTD

HPH 15000e
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

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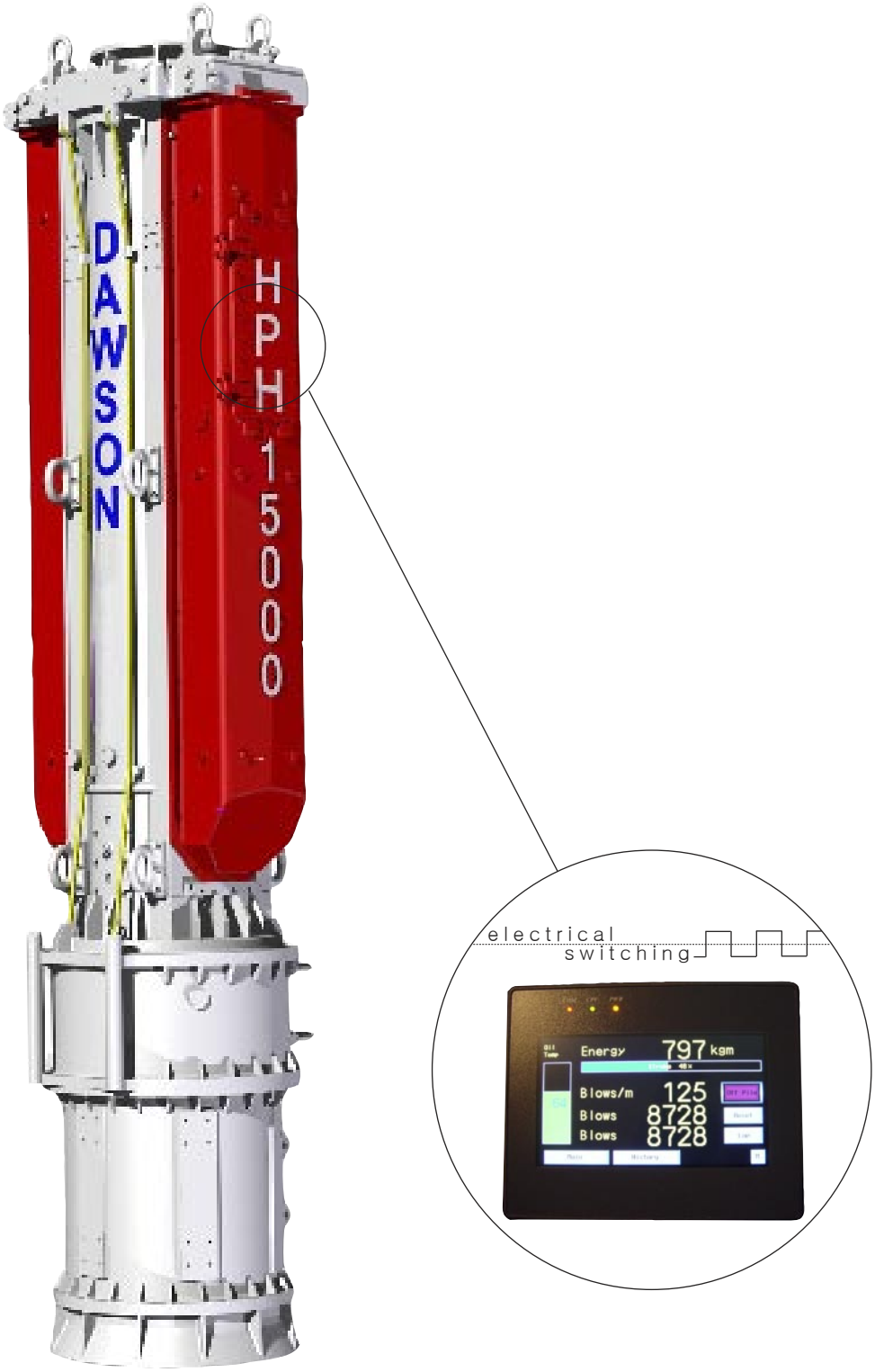
USER'S MANUAL & PARTS LIST



DAWSON
CONSTRUCTION PLANT LTD

HPH 15000e
HYDRAULIC HAMMER &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: .....

CONTENTS

DAWSON
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The responsible person:-

DAWSON CONSTRUCTION PLANT LIMITED
CHESNEY WOLD, BLEAK HALL
MILTON KEYNES MK6 1NE
ENGLAND

EC DECLARATION OF CONFORMITY

Description: HYDRAULIC PILING HAMMER

Type: 15000 ELECTRIC

Serial Number: _____

The above mentioned equipment conforms to the Machinery Directive 89/392/EEC(a) as amended by Council Directive 91/368/EEC(b), Council Directive 93/44/EEC(c) and Article 6 of Council Directive 93/68/EEC(d).

Signed for and on behalf of
Dawson Construction Plant Limited: .....

Name: .....

Position: .....

Date: ...../...../.....

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:

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 HPH15000e 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 HPH15000e.

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

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

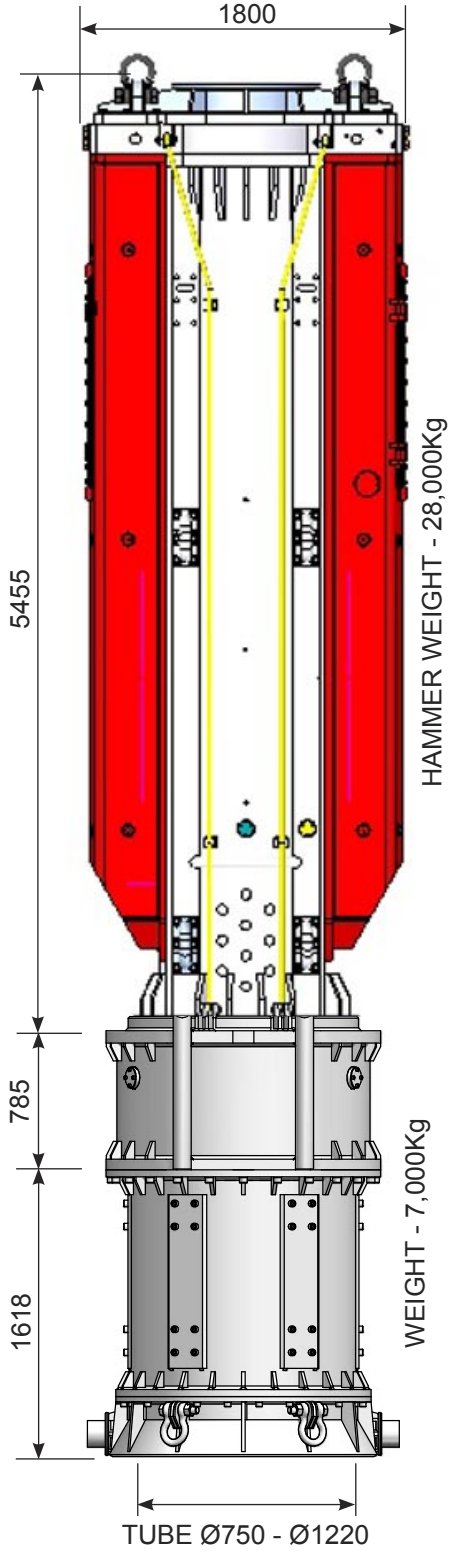
1.1 Basic Safety Points

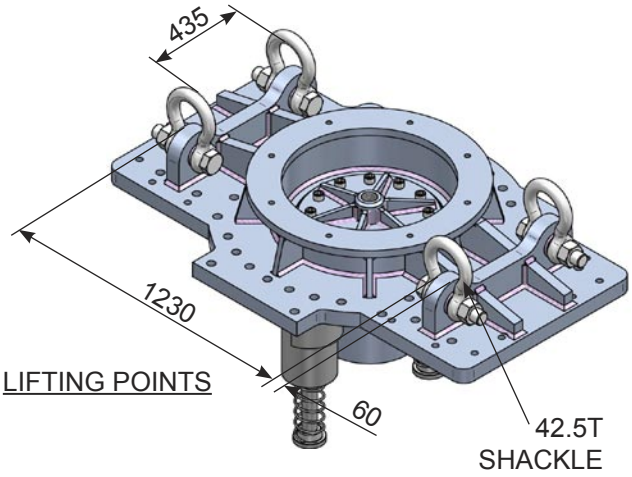
- Ear protection should be worn when in close proximity of the hammer.
- Keep clear of the hammer and/or power pack when they are being lifted.
- Avoid standing directly below the hammer when it is piling.
- Adhere to maintenance requirements set out in this manual.
- Lift equipment using lifting points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

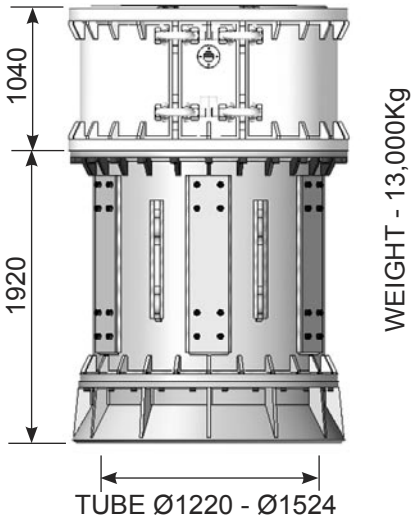
1.2 Transportation and laying down hammer

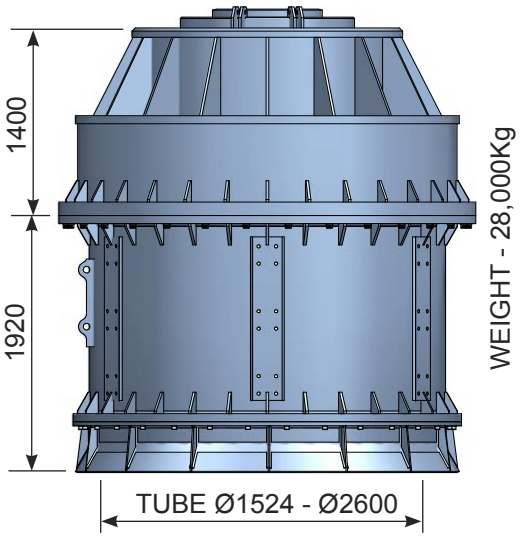
- BEFORE operating hammer first time AND after each lay-down use inspection holes to ensure dolly is seated correctly in anvil before striking.
- WHEN LAYING DOWN HAMMER, support top of hammer at higher level than bottom of hammer.
- TRANSPORTATION, support top of hammer at higher level than bottom of 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.**

(con't)
Transportation and laying down hammer









SPECIFICATION	UNITS	HPH15K
RAM WEIGHT	kg	12,000
IMPACT VELOCITY	m/s	5.0
MAXIMUM PILE ENERGY	KNm	150.0
MINIMUM PILE ENERGY	KNm	25
BLOW RATE	bpm	80-120
MAXIMUM - PILE MOMENTUM	kgm	60,000
WEIGHT- Ø914 CONFIGURATION	kg	35,000 (possible to split into 3 parts)

(con't)
Transportation and laying down hammer

CATERPILLAR C-18 ATAAC® - 6 CYLINDER DIESEL MOTOR WITH TURBOCHARGER AND INTER-COOLING. EPA & CARB TIER 111

SPECIFICATION	UNITS	DHP450
DIESEL ENGINE POWER	kW	470
	rpm	2100
HYDRAULIC SYSTEM PRESSURE	bar	280
	psi	4060
OIL FLOW RATE	l/min	850
SIZE - LENGTH x WIDTH x HEIGHT	m	5.25 x 2.2 x 2.4
	ins	206.7 x 86.6 x 94.5
WEIGHT	kg	12,000
	lbs	26,460
FUEL CAPACITY	litres	1000
	(US) gallons	264
FUEL CONSUMPTION @ 60%	l/hr	78.6
	(US) gal/hr	20.8

HOW DOES THE HAMMER WORK

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

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

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

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

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

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

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

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

INTERFACE SCREEN MOUNTED ON POWER PACK

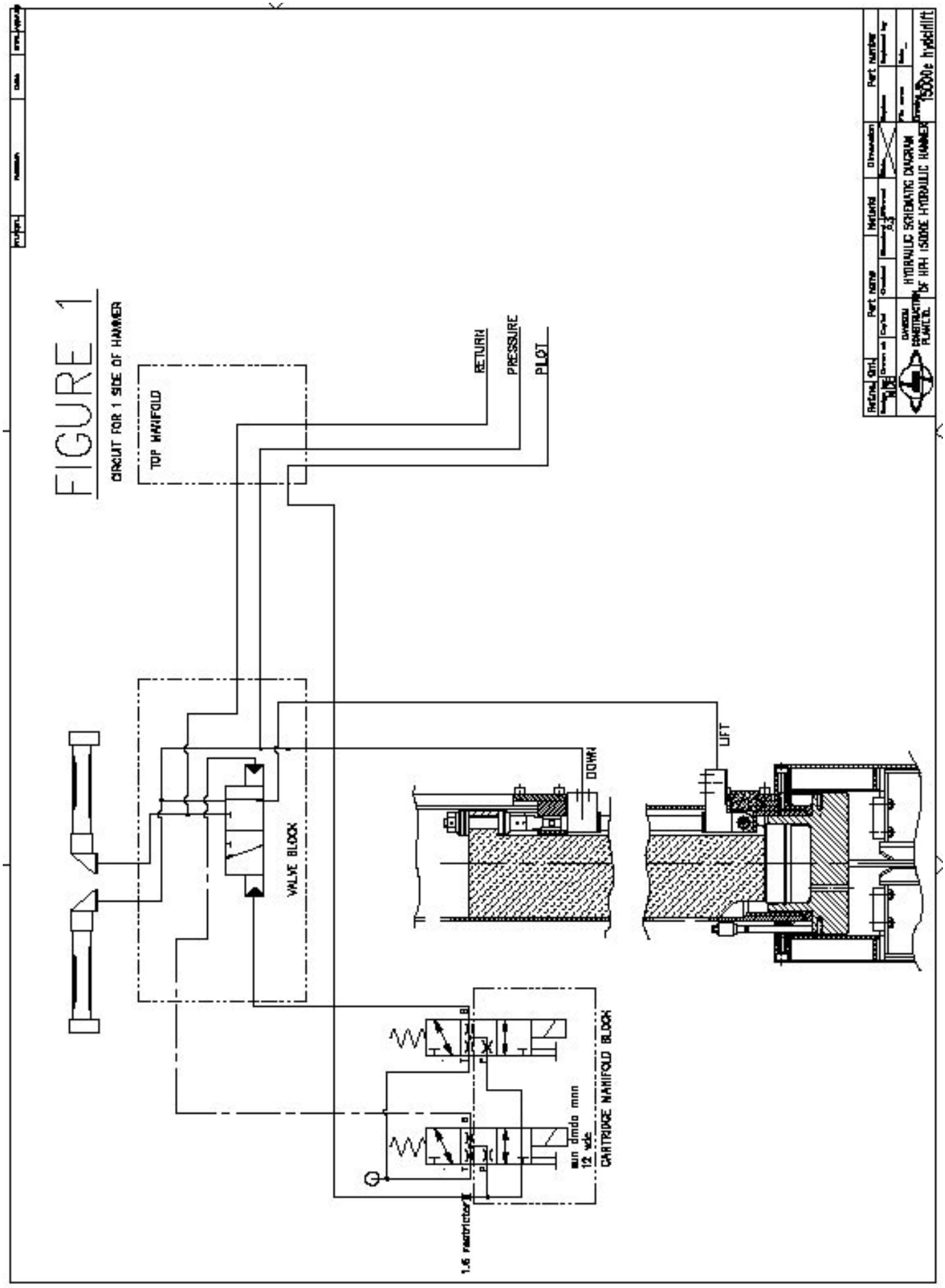


FIGURE 1
CIRCUIT FOR 1 SIDE OF HAMMER
TOP MANIFOLD
RETURN
PRESSURE
PILOT
VALVE BLOCK
DOWN
LIFT
CARTRIDGE MANIFOLD BLOCK
12 vdc
1.6 restrictor
HYDRAULIC SCHEMATIC DIAGRAM
HPH 15000E HYDRAULIC HAMMER
15000e hydrolift

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 HPH15000 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. Pipe Pile Guide etc.

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.

3.2 Free Hanging Configuration – Universal Guide Sleeve

Dawson offers a Universal Guide system for use with the HPH15000 that is bolted to the bottom of the Basic Hammer Configuration. This system uses a large guide sleeve that can be altered for different diameter pipe piles up to a maximum Ø102” (2600mm) - see drawing SA150-719-00-01 under section 8.4 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. Different diameters are accommodated by using either six guide blocks and a dedicated bottom guide ring or by installing an adaptor insert that fixes in place of the bottom guide sleeve. The latter is held at its upper end by the Ø60” (1530mm) guide block set.
Simply determine which pipe size is going to be driven and install either the relevant guide block sets or the adaptor sleeve as shown on drawing SA150-715,7,9-00-01.
Alternatively, larger sleeves can be made to order to suit specific applications.

3.3 Lead Mounted Configurations

The HPH15000 lends itself to running on many styles of lead. Minimum American U-lead size is 32" as pictured here. Leads requiring the hammer to be mounted on the front of the lead and 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.

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.

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 HPH15000 as shown here. Of course Dawson would be happy to manufacture drive caps for any specific requirements a contractor may have.

3.4 Using the hammer underwater

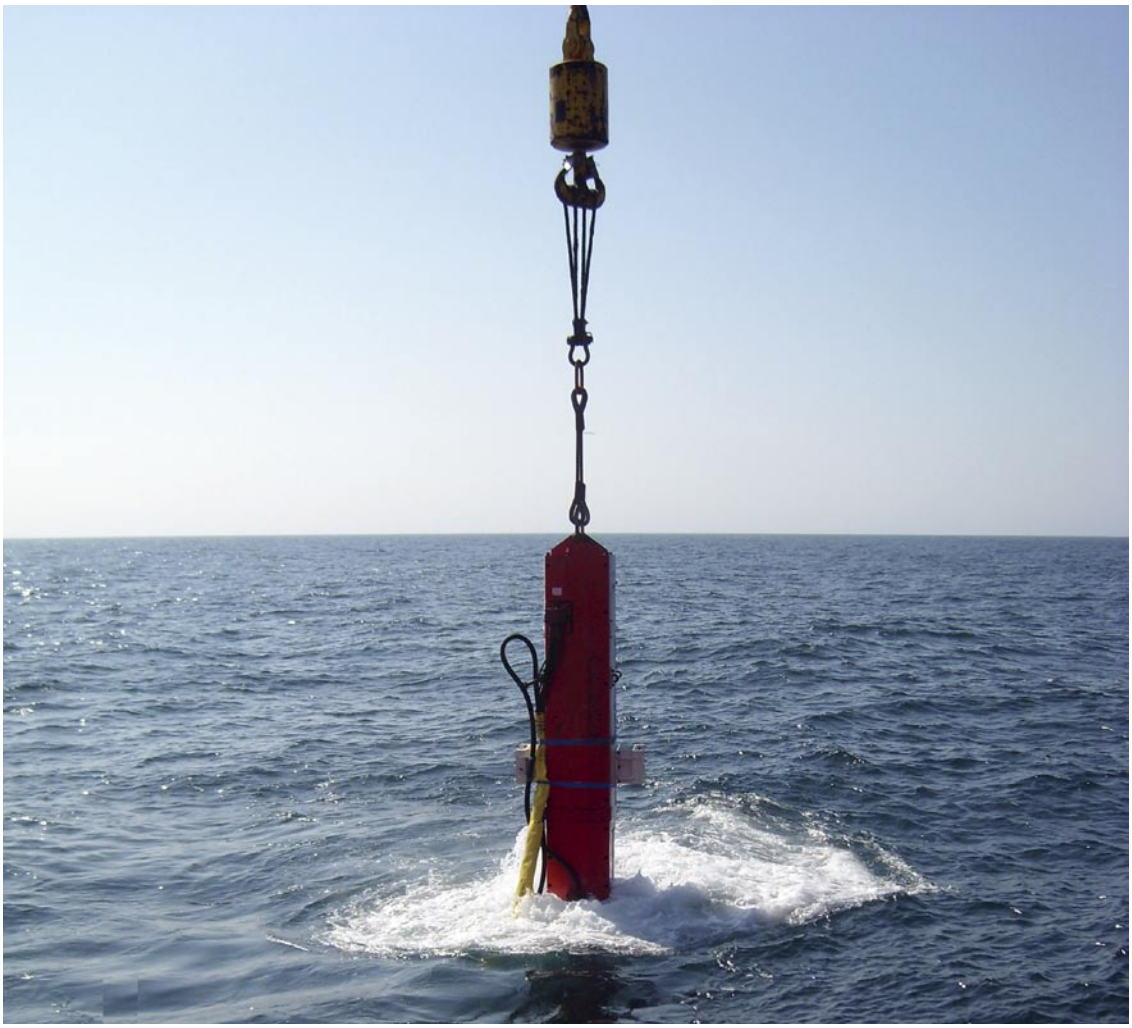
It is possible to drive piles with this hammer underwater whatever the hammer configuration. However, the hammer must be prepared correctly in order to do so - it can not be used underwater in standard format.

The work involved is briefly as follows: -

a) The insides of the hammer should be suitably greased to minimise the effects of corrosion.
b) The gaps between hammer casing; side covers/leg guides and top cover must be sealed with a special rubber seal.
c) The inspection holes near the bottom of the hammer casing must be plugged.
d) A threaded compressed airline fitting must be fitted to the port near the bottom of the hammer.
e) The hammer must be run in conjunction with a 35/70 c.f.m. (100 psi) air compressor.
f) 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 DAWSON CONSTRUCTION PLANT.

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



POWER PACK AND HAMMER OPERATION

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 3 hydraulic hoses running between the power pack and the hammer:

1. Pressure line (40mm) carries the main high pressure oil supply to the hammer.

2. Return line (2" BSP) returns low pressure oil from the hammer to the power pack.

3. Pilot line (3/8" BSP) used to deliver oil to the cartridge valves.

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

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 below the instrumentation panel of the unit. Check that a clean connection is made and that no water is present in either half of the connection. The 'power' switch on the controller should be turned off.

4.2 Checking the power pack before starting

Having connected the hydraulic hoses and hand control pendant, as described in section 4.1, 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 and hydraulic oil tanks have sight gauges on the side of the tanks.

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

3. The hammer will not run if the hydraulic oil temperature is too low. The auto warm-up routine must be used to pre-warm the oil. See section 4.3.1.

4.3 Starting the powerpack (see fig. 2)

Prior to starting the power pack, check that the hand control pendant is turned 'off.' Turn 'on' the battery isolator (1). Set the idle-fast selector switch (2) to idle. Push the engine start push button (4) until the engine starts.

Allow the engine to reach working temperature by running it at idle for 5 minutes. 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 - hydraulic oil to cold (7), hydraulic oil overheated (8), hydraulic oil level low (11) are 'on' when the isolator switch (1) is turned 'on,' the power pack will not start.
   Rectify problem immediately.

4.3.1 Hydraulic Oil Warm-up Procedure

If the hydraulic oil temperature is less than +25ºC, L.E.D. (7) 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 L.E.D. (7) is on.

To warm the oil:-

a) Turn the 'warm-up/run' selector switch (6) to 'warm-up'. (The engine should go under load and the high pressure gauge (20) should read approx. 200 bar).

b) Leave the pack in this condition until the L.E.D. (7) goes off. (The engine should come off load at the same time the L.E.D. goes out and gauge (20) return to zero bar).

c) Turn the 'warm-up/run' selector switch (6) to 'run'. The power pack is now ready for use.

4.4 Using the hammer

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 ring around the anvil should be compressed between the casing and the anvil. If it is not and there is a gap here, re-site the hammer.

Note: Before using the hammer (and particularly after transportation) check that the dolly is fitted correctly in the anvil. 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 at 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 3.3)
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/ overtravel

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 270 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

(con't)
4.4.4 Cold running/ overtravel

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 3.3.1.

If the hammer overtravels again, refer to the Troubleshooting section 6.0.

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 reache 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" (switch 14 on figure 2) 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
See Figure 2 Buttons 12,13,15 & 16.

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

FIG. 2 Power Pack Instrumentation Panel

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 150-006-00-01) has not been damaged or worn beyond its serviceable limit, i.e. the top face of the dolly should not fall below the top of the anvil rim by more than 30mm.

To replace the dolly remove the guide sleeve. Ref (SA 150-000-00-01) Remove dolly retainer bolts (11) and dolly retainer (22). Slide out old dolly. Insert a new dolly (complete with O' ring) ensuring that it is pushed fully home.

d. Check the ten rubber/steel suspension rings 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. Check tightness of bolts in side lift points.

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 the relevant pile guidance system e.g. pipe pile guide, in order to ensure correct fitting on pile sections and tightness of all fasteners.

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 150-048-00-01) pre-charge pressures using the gas pressure checking kit and a bottle of nitrogen gas.

The pre-charge pressures are: -

High pressure -100 bar (2 accumulators)
Low pressure - 3 bar (2 accumulators)

To gain access to the accumulators it is necessary to remove both side covers (part 150-060-04-01). One high and low pressure accumulator on each side of the hammer. 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.

5.31 Change the disc springs / buffer stack

Ref. SA 150-011-00-01 - Disc spring buffer assembly
SA 150-009-00-01 - Buffer Stack assembly

Please use Dawson hydraulic nut tool no. hnt-150-01 to acheive correct top nut tightness.

5.3.2 Other items

a. Check the accumulator (part 150-048-00-01) pre-charge pressures using the gas pressure checking kit and a bottle of nitrogen gas.

The pre-charge pressures are: -

High pressure -100 bar (2 accumulators)

Low pressure - 3 bar (2 accumulators)

To gain access to the accumulators it is necessary to remove the side covers (part 150-060-04-01). The two high-pressure accumulators are on the left hand side viewed from the inlet manifold. To check the pre-charge pressures see appendix 8.2 in this manual.

5.4 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. Tightness of the Accumulator assemblies.

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

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

Check the following: -

a. Check sandwich mounts on Ram / Valve assembly.

b. Condition of the Primary and Secondary Anvils.

c. Play between the Drop Weight and Casing bore.

d. Check for scouring on Main Ram.

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.

5.6 PREVENTATIVE MAINTENANCE GUIDELINES FOR HPH 15000e HYDRAULC HAMMERS, AND DIESEL ENGINED POWER PACKS

	DAILY OR REFUELLING	EVERY 125 HOURS	EVERY 250 HOURS	EVERY 500 HOURS	EVERY 1000 HOURS	EVERY 2000 HOURS
ENGINE	CHECK: . OIL LEVEL . COOLANT LEVEL . FAN - INSPECTION . DRIVE BELT - INSPECT . FUEL WATER TRAP - DRAIN		CHANGE: . LUBE OIL . LUBE FILTER CHECK: . AIR CLEANER . INTAKE SYSTEM . CHARGE AIR COOLER	CHANGE: . FUEL FILTER CHECK: . ANTI FREEZE	ADJUST: . VALVE LASH CLEARANCE CHECK: . FAN HUB . BELT TENSIONER BEARING . BELT TENSION	CHANGE: . ANTI FREEZE CHECK: . DAMPER
POWER PACK	CHECK: . HYDRAULIC OIL LEVEL . AIR INLET/OUTLETS FREE FROM OBSTRUCTION . CONDITION OF LIFTING POINTS & SLINGS/ SHACKLES . TEST DIAGNOSTIC LEDS . INSPECT GAUGES . CONDITION OF QUICK RELEASE COUPLINGS	CHECK: . FOR HYDRAULIC OIL LEAKS & RECTIFY . CONDITION OF HOSES . TIGHTNESS OF FASTENERS . CONDITION OF PAINTWORK . BATTERY WATER LEVEL . FUNCTION OF PENDANT & CONDITION OF CABLE	CHECK: . BATTERY CHARGING CHANGE: . HYDRAULIC OIL/FUEL FILLER FILTERS	CHECK: . PRESSURE OUTPUT OF PUMP . FLOW OUTPUT OF PUMP CHANGE: . PRESSURE/RETURN HYDRAULIC FILTERS	CHECK: . CONDITION OF WIRING . DRIVE COUPLING FOR WEAR . CONDITION OF EXHAUST CHANGE: . HYDRAULIC OIL AND CLEAN OUT SYSTEM	
HAMMER	CHECK: . ALL EXTERNAL FASTENERS FOR TIGHTNESS . DOLLY CONDITION . SUSPENSION BLOCK & SUSPENSION RING CONDITION . 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 LEVEL ON LEG INSERTS	CHECK: . . ACCUMULATOR NITROGEN PRECHARGE PRESSURES . HAMMER FILTER	CHECK: . TIGHTNESS OF ACCUMULATORS . CONDITION OF MAIN FEED HOSES TO HAMMER CHANGE: . RESILIENT WASHERS BETWEEN DROP WEIGHT AND HYDRAULIC RAM	CHECK: . PLAY IN MAIN RAM ANCHORAGE ASSEMBLY . CONDITION OF ANVIL . 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 30 MINUTES BEFORE AND AFTER CHECKING	TEST RUN ON PILE 30 MINUTES BEFORE AND AFTER CHECKING	TEST RUN ON PILE 30 MINUTES BEFORE AND AFTER CHECKING

(FOR FULL DETAILS SEE SECTIONS 4 AND 5 IN THE HAMMER MANUAL AND THE HYCOS SERVICE MANUAL)

POWER PACK MAINTENANCE

6.1 Power pack specification

6.1.1 Basic specification

Engine power output - 470 kW @ 2100 rpm

Engine maximum rpm - 2100

Hydraulic flow output - 850 l/min

Max hydraulic pressure output - 280 Bar

Dimensions(l x w x h) - 5250 x 2200 x 2400mm

Weight - 12000 kg wet (Hyd.oil and Diesel)

6.1.2 Lubrication specification

Hydraulic oil type - Fina Hydran LZ 32 or equivalent

Hydraulic oil capacity - 1875 litres

Diesel engine oil type - 15 W 40

Diesel engine oil capacity - 14.2 litres (incl. filter)

Diesel fuel type - DIN 51601-DK

Diesel fuel capacity - 1200 litres

6.2 Daily maintenance checks (for full details of diesel engine maintenance see Cummins 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 Cummins 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)

(con't)
6.4 Maintenance procedures

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
(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 265 bar) tighten the lock nut

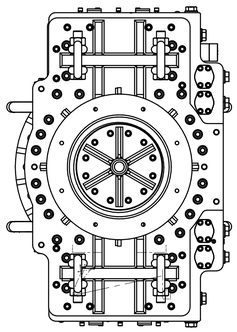
NOTE: Should the required pressure be exceeded, wind the adjuster back and increase again. Never wind the pressure downwards to set

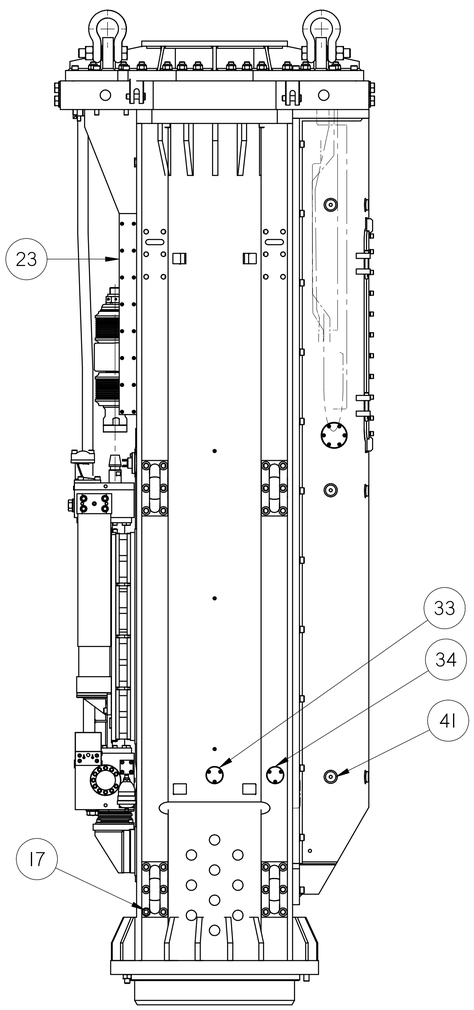
b. Engine gauges replacement.

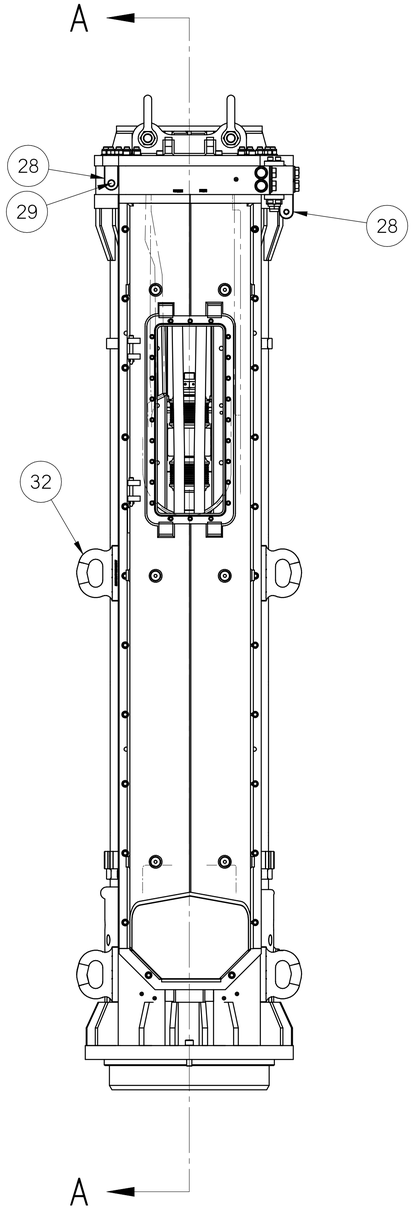
(i) There is a resistor fitted to all gauge power lines. This must be replaced after maintenance to prevent damage to the gauges.

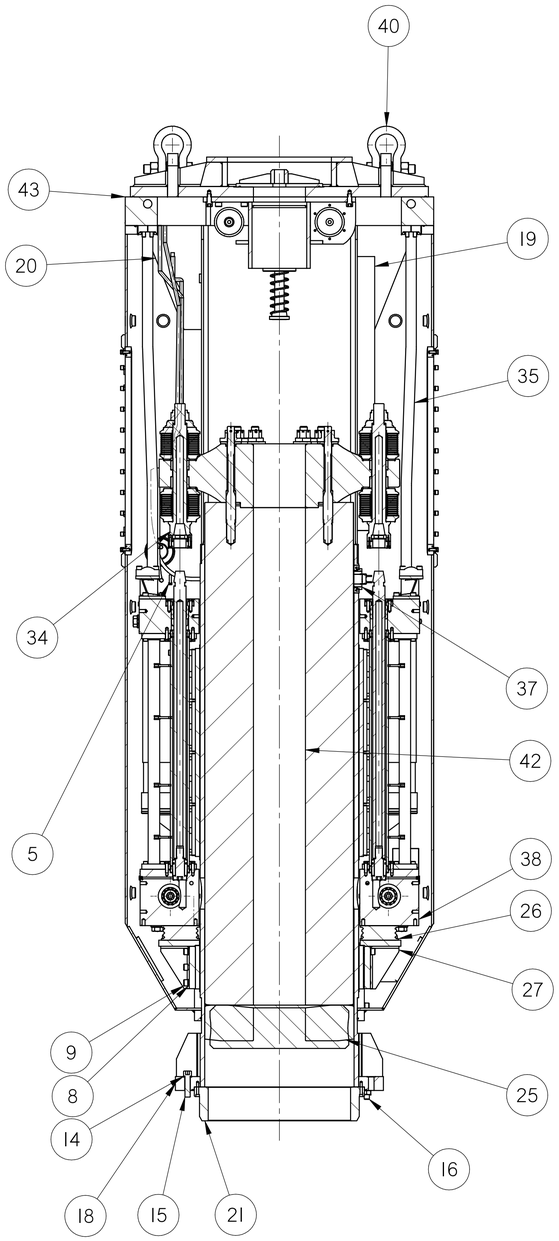
Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

3RD ANGLE









SECTION A-A

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
43	1	MANIFOLD ASSEMBLY			SA-150-090-00-02E
42	1	DROP WEIGHT ASSEMBLY			SA-150-001-50-02E
41	2	COVER ASSEMBLY			SA 150-060-00-01
40	1	TOP PLATE ASSEMBLY			SA 150-017-00-01
39*	2	BUFFER ASSEMBLY			SA 150-009-00-01
38	2	JET PACK ASSEMBLY			SA 150-008-00-01
37	1	PROXIMITY MODULE			E150-802-00-01
36*	1	GRAVEL HOPPER			150-150-001-GRAVEL
35	1	HOSE KIT-01			150-113-00-01
34	2	TRANSPORT PIN BLANKING			150-084-02-01
33	2	TRANSPORT PIN			150-084-01-01
32	8	LIFTING EYE			150-080-01-01
31*	2	GUIDE KEY			150-035-02-01
30*	1	BLANKING PLUG 2" BSP			150-018-18-01
29	4	ROPE CLEVIS PIN			150-017-06-01
28	4	ROPE ANCHOR			150-017-05-01
27	2	BUFFER REACTION BRACKET			150-010-01-01
26	2	BUFFER PAD		VS 3701 N60	150-008-23-01
25	1	DOLLY			150-006-00-01
24*	1	GUIDE RAIL 2			150-003-35-01
23	1	GUIDE RAIL			150-003-34-01
22*	2	GUIDE RAIL KEY			150-003-15-01
21	1	DOLLY RETAINER			150-003-11-01
20	4	GUSSET PLATE			150-003-09-01
19	2	WEAR STRIP			150-003-02-01
18	1	15K MAIN BODY			150-003-00-02
17	48	SOCKET HEAD CAP SCREW			0M30-70-02
16	16	SOCKET HEAD CAP SCREW		M30 x 130L	0M30-130-02
15	16	SOCKET HEAD CAP SCREW		M30 x 120	0M30-120-02
14	16	NORD-LOCK WASHER		M30	0M30-000-27
13*	1	HEXAGON NUT		M30	0M30-000-10
12*	12	SOCKET HEAD CAP SCREW		M24 X 180 LG	0M24.180.02
11*	4	SOCKET HEAD CAP SCREW		M24 x 100 LG	0M24-100-02
10*	48	SOCKET HEAD CAP SCREW		M24 x 60 LG	0M24-060-02
9	23	SOCKET HEAD CAP SCREW		M24 x 50 LG	0M24-050-02
8	22	NORD-LOCK WASHER		M24	0M24-000-27
7*	8	SOCKET HEAD CAP SCREW		M16 x 40 LG	0M16-040-02
6*	2	NORD-LOCK WASHER		M16	0M16-000-27
5	1	SOCKET HEAD CAP SCREW		M12 x 45	0M12.045.02
4*	6	SOCKET HEAD CAP SCREW		M10 x 30 LG	0M10-030-02
3*	12	SOCKET HEAD CAP SCREW		M10 x 25 LG	0M10-025-02
2*	1				
1*	1				

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
M.D.B	M.D.B	–	–	A2	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

15000 HAMMER
OVERALL ASSEMBLY

Sheet 1 of 1 | Date 23/12/2010

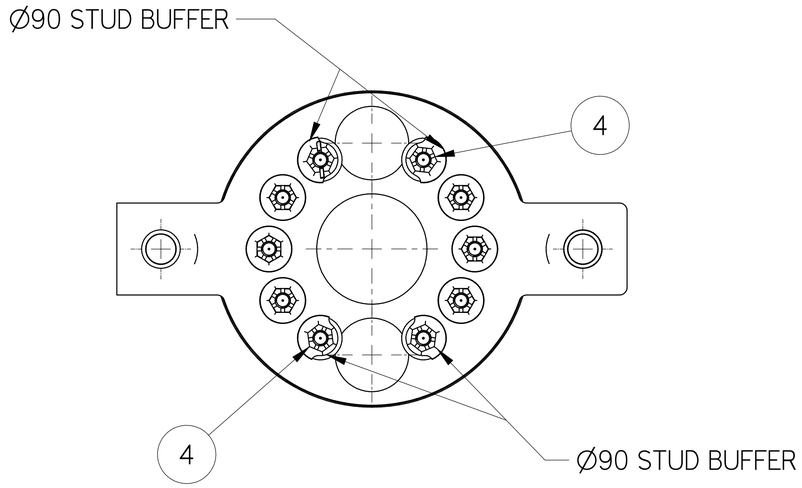
Drawing no. SA 150-000-00-02E

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

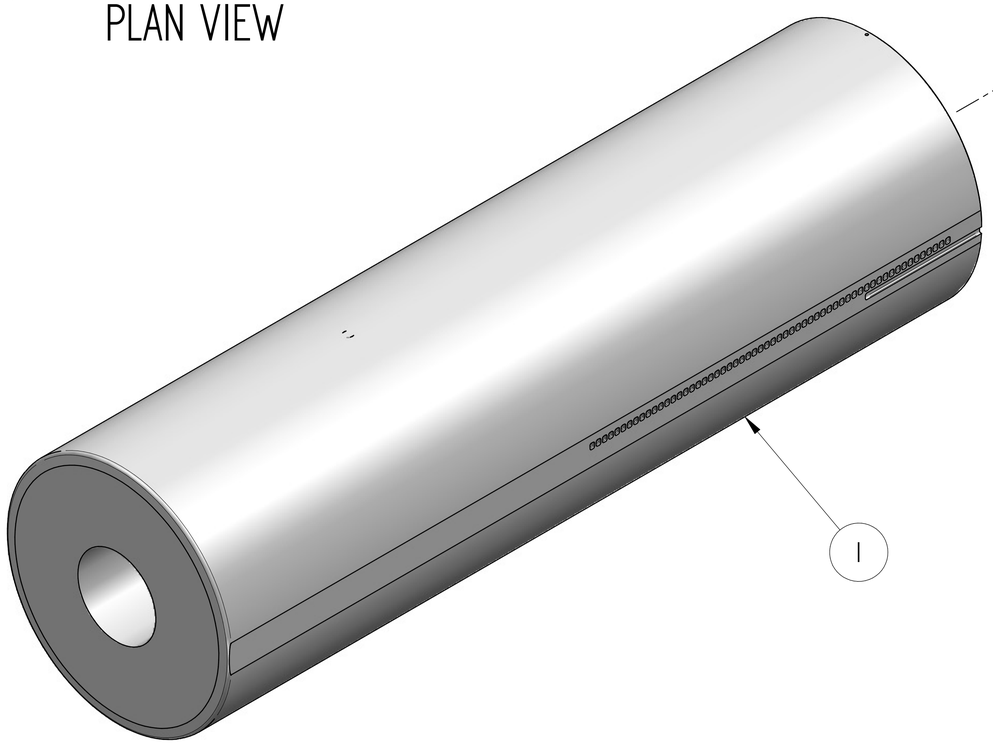
MACHINING TOLERANCES
UNLESS STATED OTHERWISE
X = +/- 0.5
X . X = +/- 0.25
X . XX = +/- 0.05
ANGLES +/- 0.5°
DIMENSIONS IN MILLIMETERS

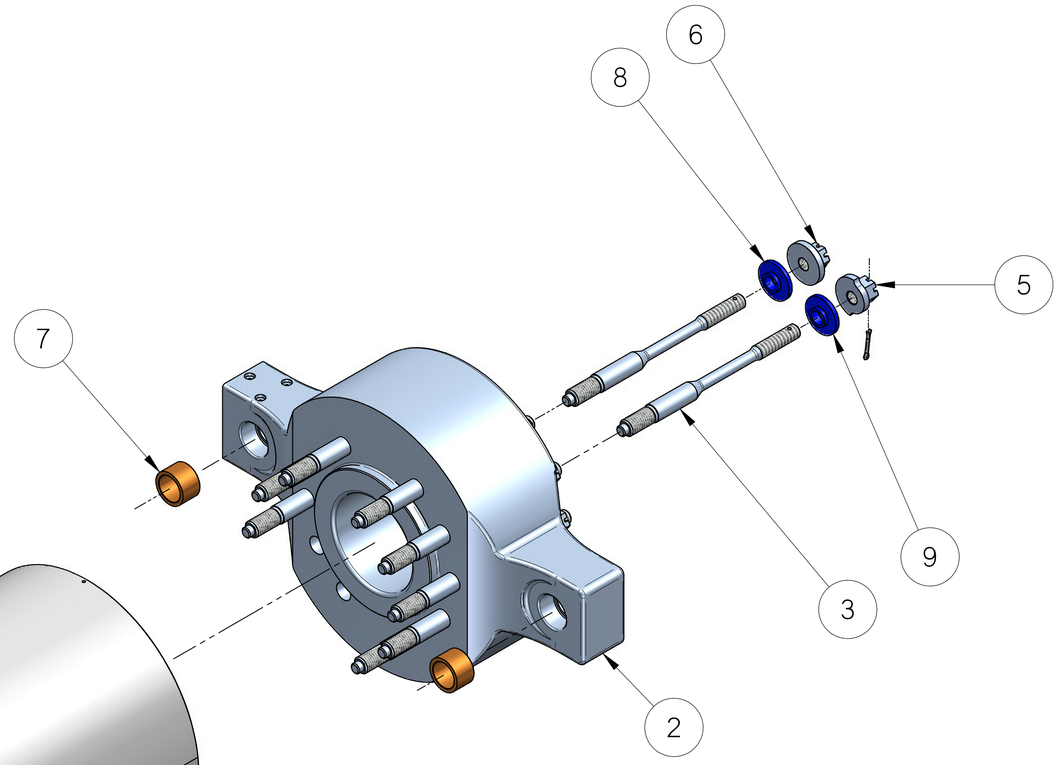
Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by

3RD ANGLE



PLAN VIEW





Ref.no.	Qnt.	Part name	Material	Dimension	Remark
9	9	STUD DAMPER			150-001-16-01
8	5	STUD BUFFER		Φ118	150-001-16-01
7	4	BUSH - RAM CONNECTOR			150-001-10-01
6	6	M42 x 2 NUT			150-001-07-02
5	2	M42 x 3 NUT			150-001-07-01
4	2	M42 x 3 NUT			150-001-07-01
3	10	STUD TOP CONNECTOR			150-001-06-01
2	1	RAM CONNECTOR			150-001-01-03
1	1	15 K DROP WEIGHT			150-001-00-01

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

DAWSON CONSTRUCTION PLANT LTD.

DROP WEIGHT ASSEMBLY

Sheet 1 of 1

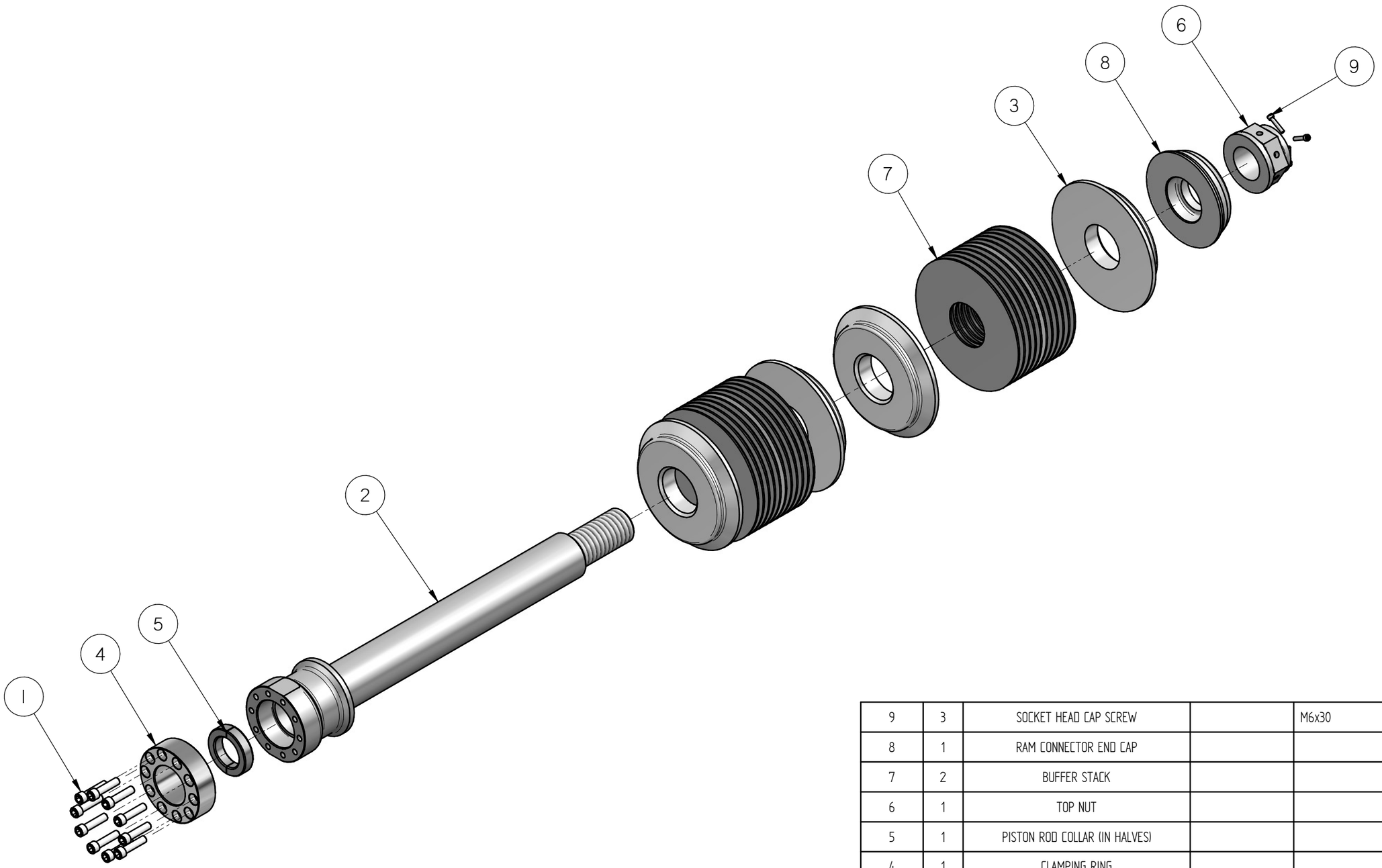
Date 13/01/2011

Drawing no. SA-150-001-50-02E

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

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

3RD ANGLE



Ref.no.	Qnt.	Part name	Material	Dimension	Remark
9	3	SOCKET HEAD CAP SCREW		M6x30	0M06-030-02
8	1	RAM CONNECTOR END CAP			150-009-10-01
7	2	BUFFER STACK			150-009-08-02
6	1	TOP NUT			150-009-07-01
5	1	PISTON ROD COLLAR (IN HALVES)			150-009-04-01
4	1	CLAMPING RING			150-009-03-01
3	4	BUFFER SEAT			150-009-02-01
2	1	RAM CONNECTOR			150-009-01-01
1	10	SOCKET HEAD CAP SCREW		M12 x 50 LG	0M12-050-02

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
M.D.B	M.D.B	–	–	A3	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

BUFFER ASSEMBLY

Sheet 1 of 1

Date 05/05/2009

Drawing no. SA 150-009-00-01

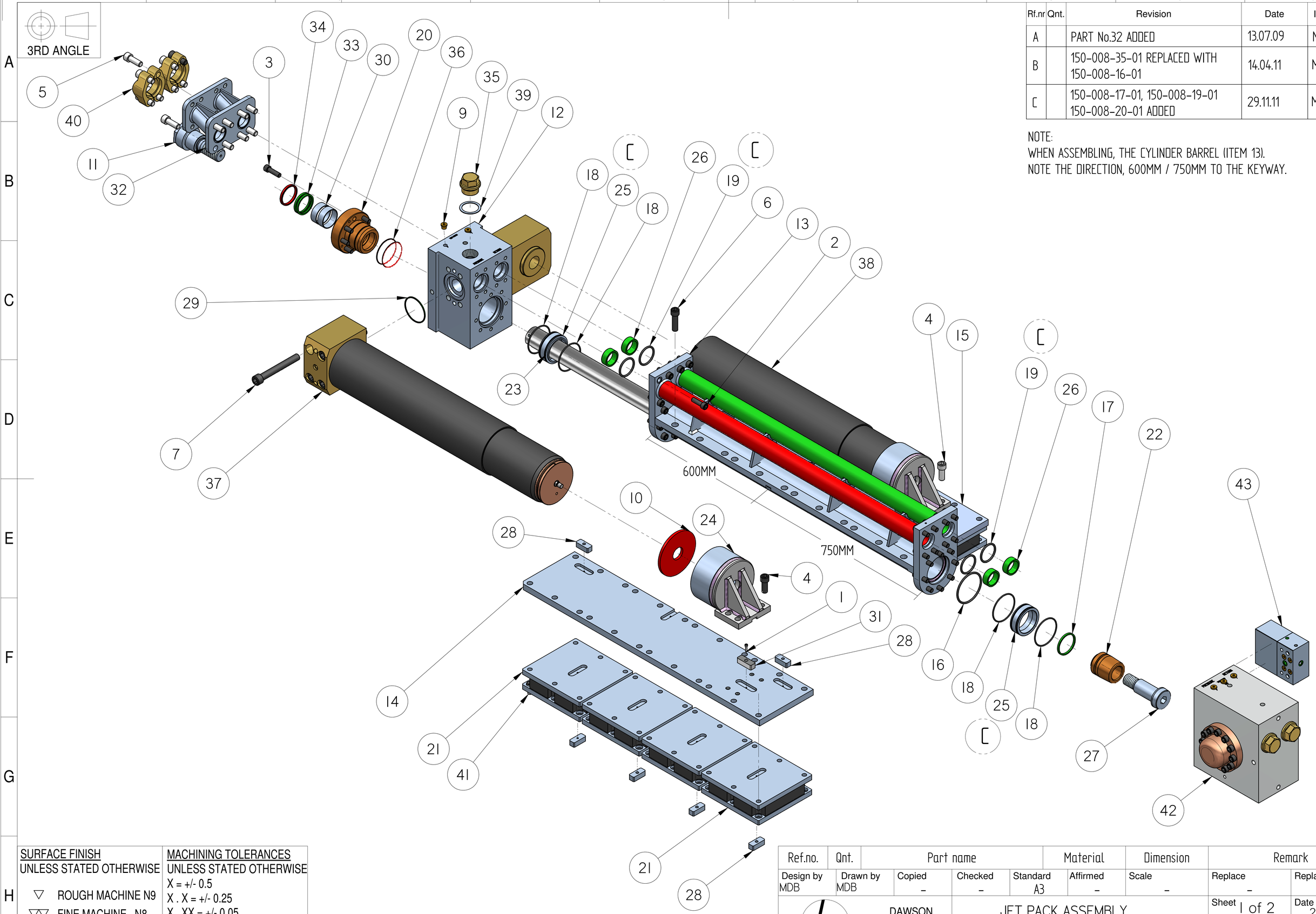
SURFACE FINISH
UNLESS STATED OTHERWISE
▽ ROUGH MACHINE N9
▽▽ FINE MACHINE N8
▽▽▽ GRIND N6

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

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by
A		PART No.32 ADDED	13.07.09	M.D.B	S.D.D
B		150-008-35-01 REPLACED WITH 150-008-16-01	14.04.11	M.D.B	P.W
C		150-008-17-01, 150-008-19-01 150-008-20-01 ADDED	29.11.11	M.D.B	S.D.D

NOTE:
WHEN ASSEMBLING, THE CYLINDER BARREL (ITEM 13).
NOTE THE DIRECTION, 600MM / 750MM TO THE KEYWAY.

3RD ANGLE



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
MDB	MDB	–	–	A3	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

JET PACK ASSEMBLY

Sheet 1 of 2

Date 29/11/2011

Drawing no. SA 150-008-00-01

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

3RD ANGLE

21	8	RAM BUFFER			150-008-25-03
20	1	TOP BUSH			150-008-22-01
19	4	O-RING 64x6	80 SHORE	VITON	150-008-20-01
18	4	O-RING 104x4	80 SHORE	VITON	150-008-19-01
17	1	PISTON SEAL CLARON CS50850/B			150-008-18-01
16	2	O-Ring 112x6	80 SHORE	VITON	150-008-17-01
15	1	BUFFER MOUNT PLATE, OPP. HAND			150-008-14-01
14	1	BUFFER MOUNT PLATE			150-008-13-01
13	1	CYLINDER BARREL ASSEMBLY			150-008-12-01
12	1	TOP BLOCK			150-008-11-01
11	1	RAM CONNECTOR SPIGOT			150-008-043-01
10	2	ACCUMULATOR BUFFER			150-003-14-01
9	2	BLANKING PLUG	VS-R 3/8 WD	3/8" BSP	1-018-28-01
8*	1	BLANKING PLUG	VS-R 1/4WD	1/4" BSP	1-018-18-01
7	15	SOCKET HEAD CAP SCREW		M24 x 190 LG	0M24-190-02
6	24	SOCKET HEAD CAP SCREW		M20 x 70	0M20-070-02
5	16	SOCKET HEAD CAP SCREW		M20 x 55	0M20-055-02
4	8	SOCKET HEAD CAP SCREW		M20 x 50 LG	0M20-050-02
3	15	SOCKET HEAD CAP SCREW	4	M16 x 55 LG	0M16-055-02
2	63	SOCKET HEAD CAP SCREW		M16 x 50 LG	0M16-050-02
1	1	SOCKET HEAD CAP SCREW		M6 x 25	0M06-025-02

43	1	SUN MANIFOLD ASSEMBLY			SA 2-118-00-01E
42	1	VALVE ASSEMBLY			SA 150-018-00-01
41	1	SOCKET HEAD CAP SCREW			0M16-030-02
40	2	S.A.E 2" SPLIT FLANGE			H00335
39	1	DOWTY WASHER			H00031
38	1	LOW PRESSURE ACCUMULATOR			150-048-00-01
37	1	HIGH PRESSURE ACCUMULATOR			150-048-00-01
36	3	O-RING 94.5x3			150-018-19-01
35	3	BLANKING PLUG 2" BSP			150-018-18-01
34	1	WIPER SEAL			150-018-17-01
33	3	ROD SEAL CLARON CS60700/8			150-018-16-01
32	1	PIPE ADAPTOR			150-008-41-01
31	2	KEY			150-008-40-01
30	2	WEAR STRIP			150-008-38-01
29	2	O-RING 95 x 5		VITON	150-008-37-01
28	17	BUFFER KEY			150-008-34-01
27	1	PISTON HEAD ADAPTOR			150-008-32-01
26	4	LOCATION RING			150-008-31-01
25	2	MAIN RAM LOCATOR RING			150-008-30-01
24	2	ACCUMULATOR STEADY			150-008-29-01
23	1	COMPLETE PISTON ROD			150-008-27-03
22	1	PISTON			150-008-26-01

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

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

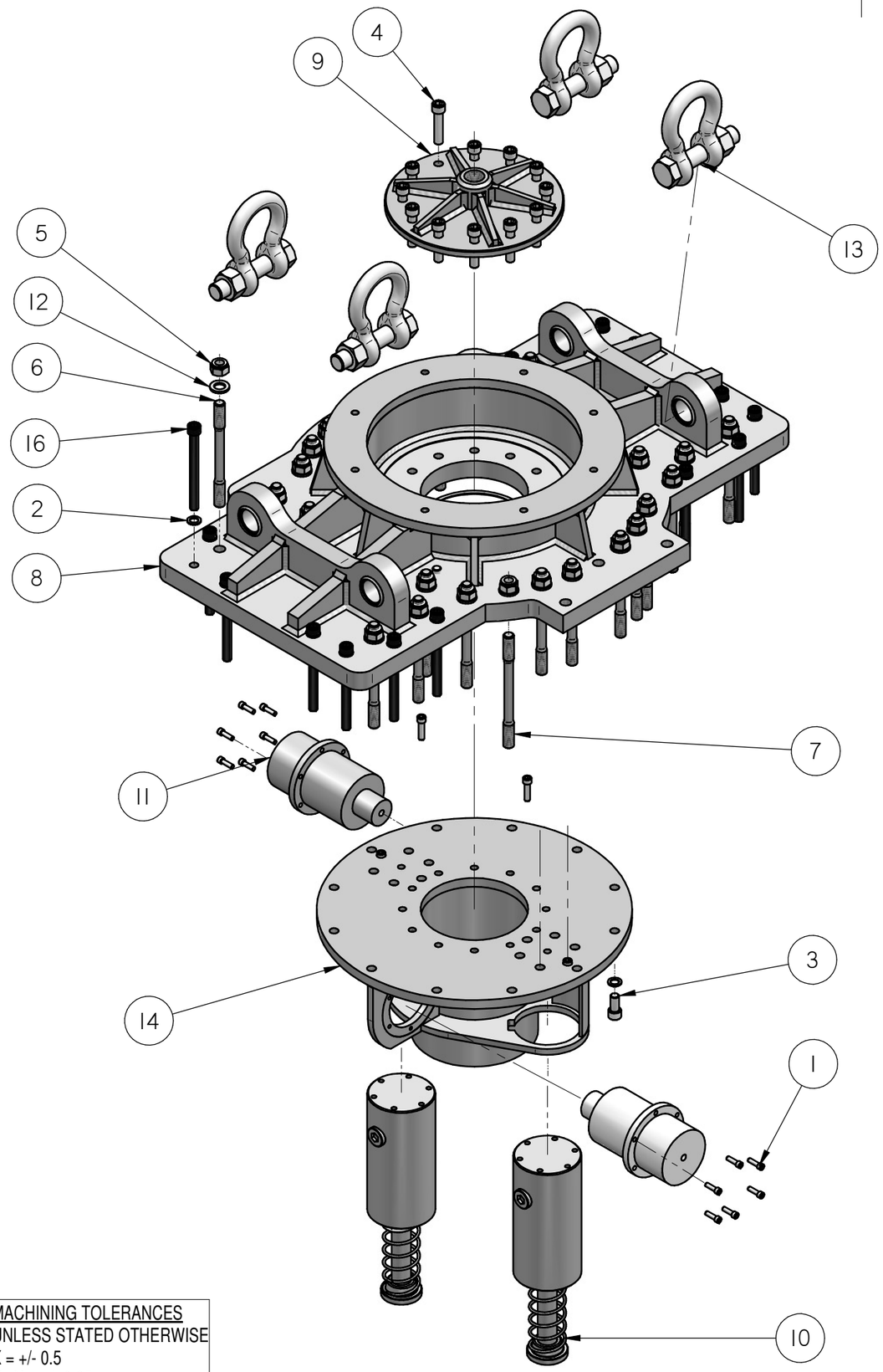
DAWSON CONSTRUCTION PLANT LTD.

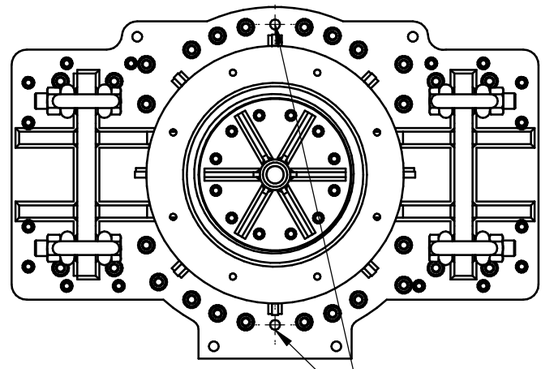
JET PACK ASSEMBLY

Sheet 2 of 2
Date 29/11/2011
Drawing no. SA 150-008-00-01

3RD ANGLE

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by
A		ADD VIEW	03/5/11	M.D.B	





NO STUD IN THESE 2 POSITIONS

16	16	SOCKET HEAD CAP SCREW			0M24-260-02
15*	4	SOCKET HEAD CAP SCREW	12.9	5/8" UNFx 2-1/2" LONG SKT	150-087-00-01
14	1	DECELAROMETER HOUSING			150-017-11-01
13	4	SHACKLE		40T	150-017-09-01
12	28	TOP STUD WASHER			150-017-08-01
11	2	4 LITRE ACCUMULATOR		65324	150-017-04-01
10	2	DECELAROMETER			150-017-03-01
9	1	AIR ADAPTOR			150-017-02-01
8	1	TOP PLATE			150-017-01-01
7	4	M30 STUD			150-003-24-01
6	24	M30 STUD - 350			150-003-23-01
5	28	NYLOCK NUT		M30	0M30-000-11
4	12	SOCKET HEAD CAP SCREW		M24 x 110 LG	0M24-110-02
3	12	SOCKET HEAD CAP SCREW		M24 x 50 LG	0M24-050-02
2	28	NORD-LOCK WASHER		M24	0M24-000-27
1	12	SOCKET HEAD CAP SCREW		M12 x 40 LG	0M12-040-02

Ref.no.	Qnt.	Part name	Material	Dimension	Remark

Design by	Drawn by	Copied	Checked	Standard	Affirmed	Scale	Replace	Replaced by
M.D.B	M.D.B	-	-	A3	-	-	-	-

DAWSON CONSTRUCTION PLANT LTD.

TOP PLATE ASSEMBLY

Sheet 1 of 1

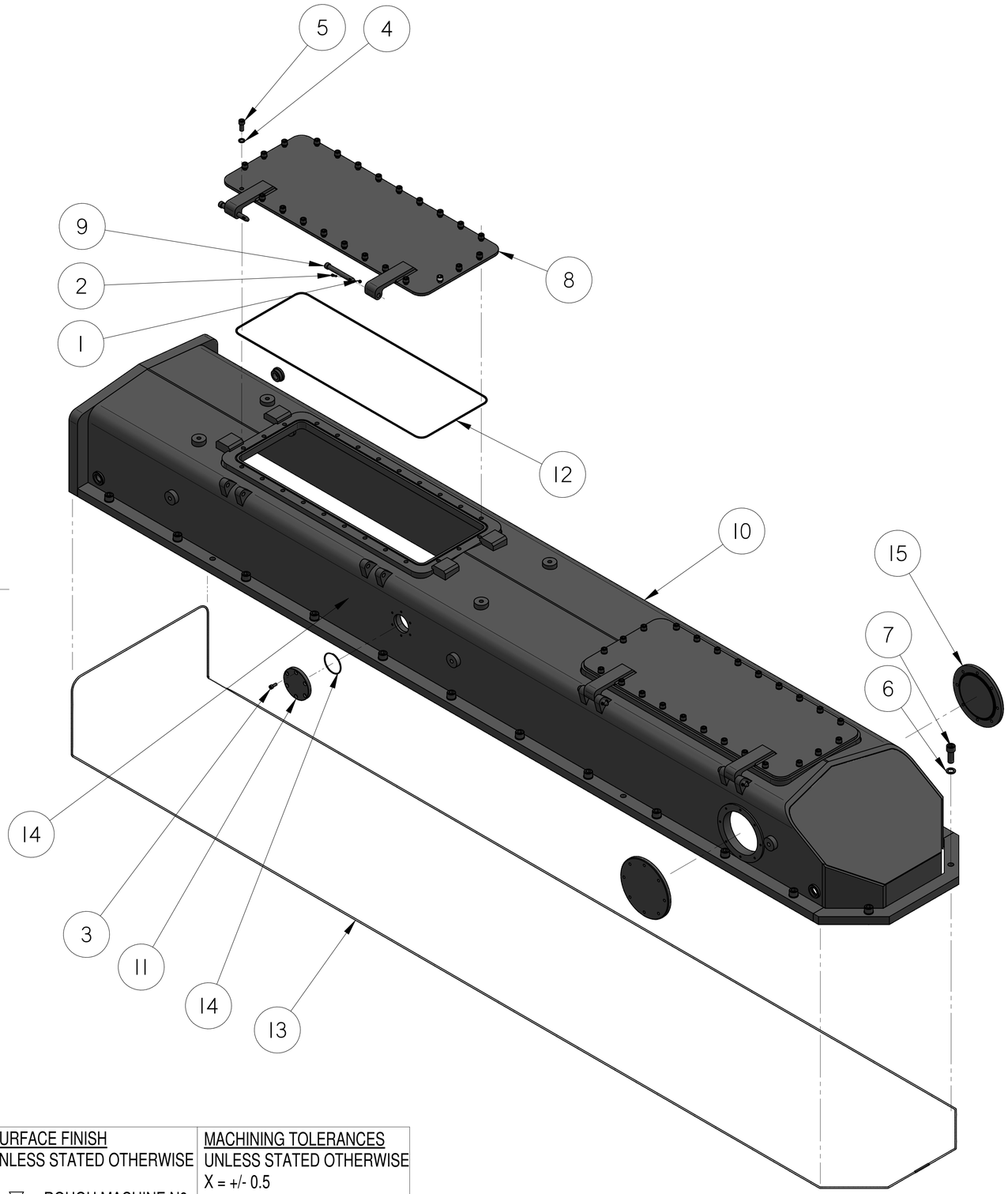
Date 30/04/2009

Drawing no. SA 150-017-00-01

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

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by
A		EXTRA DOOR / PORT COVER	16/04/12	MDB	



Ref.no.	Qnt.	Part name	Material	Dimension	Remark
15	3	COVER PLATE			150-060-11-01
14	1	O-RING			150-060-10-01
13	2	COVER SEAL			150-060-09-01
12	1	INSPECTION COVER SEAL			150-060-08-01
11	1	EMS PORT HOLE COVER			150-060-06-01
10	1	COVER FABRICATION			150-060-04-01
9	4	COVER HINGE PIN			150-060-03-01
8	2	INSPECTION COVER			150-060-02-01
7	24	SOCKET HEAD CAP SCREW		M24 x 60 LG	0M24-060-02
6	24	NORD-LOCK WASHER		M24	0M24-000-27
5	48	SOCKET HEAD CAP SCREW		M16 x 35 LG	0M16-035-02
4	48	NORD-LOCK WASHER		M16	0M16-000-27
3	6	SOCKET HEAD CAP SCREW		M10 x 25 LG	0M10-025-02
2	4	SOCKET HEAD CAP SCREW		M6 x 25	0M06-025-02
1	4	HEXAGON NUT		M6	0M06-000-10

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

DAWSON CONSTRUCTION PLANT LTD.

COVER ASSEMBLY

Sheet 1 of 1

Date 05/05/2009

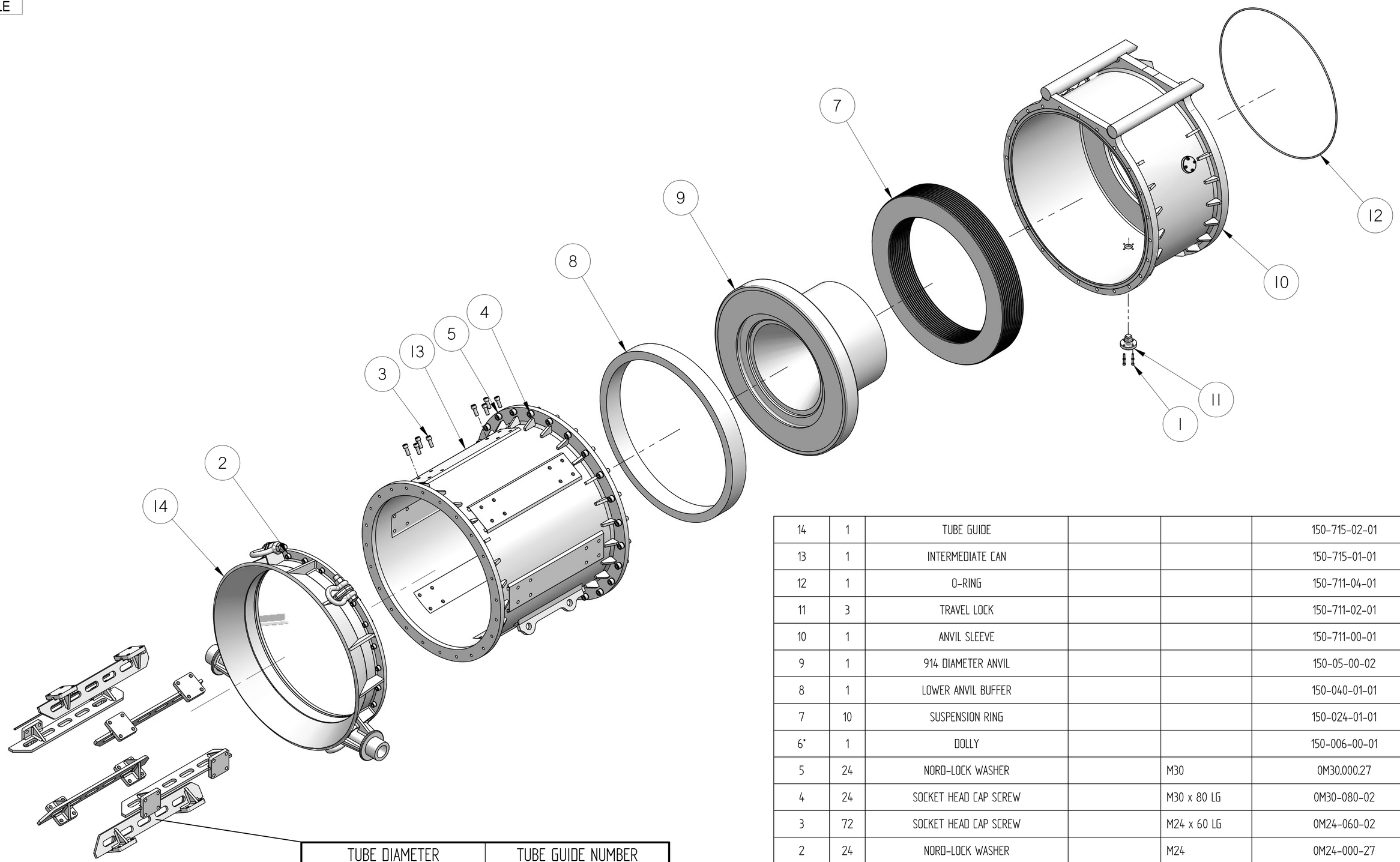
Drawing no. SA 150-060-00-01

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

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

3RD ANGLE



TUBE DIAMETER	TUBE GUIDE NUMBER
ϕ914 / 36"	150-300-27-01
ϕ813 / 32"	150-300-28-01
ϕ1067 / 42"	150-300-29-01

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
14	1	TUBE GUIDE			150-715-02-01
13	1	INTERMEDIATE CAN			150-715-01-01
12	1	O-RING			150-711-04-01
11	3	TRAVEL LOCK			150-711-02-01
10	1	ANVIL SLEEVE			150-711-00-01
9	1	914 DIAMETER ANVIL			150-05-00-02
8	1	LOWER ANVIL BUFFER			150-040-01-01
7	10	SUSPENSION RING			150-024-01-01
6*	1	DOLLY			150-006-00-01
5	24	NORD-LOCK WASHER		M30	0M30.000.27
4	24	SOCKET HEAD CAP SCREW		M30 x 80 LG	0M30-080-02
3	72	SOCKET HEAD CAP SCREW		M24 x 60 LG	0M24-060-02
2	24	NORD-LOCK WASHER		M24	0M24-000-27
1	12	SOCKET HEAD CAP SCREW		M12 x 40 LG	0M12-040-02

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
S.D.D	M.D.B	–	–	A3	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

Ø750 - Ø1220 CAN ASSEMBLY

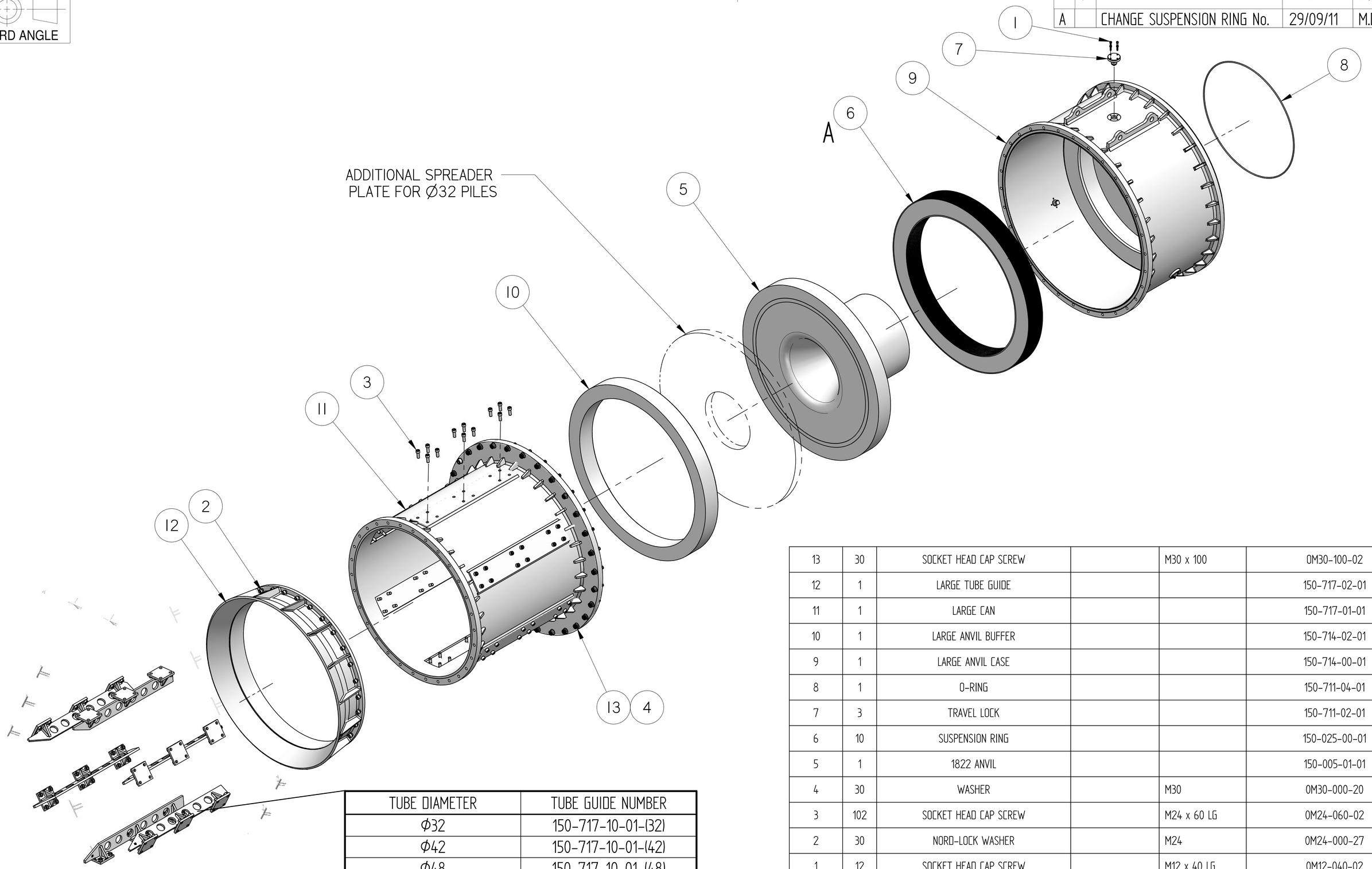
Sheet 1 of 1

Date 16/06/2009

Drawing no. SA 150-715-00-01

Rf.nr	Qnt.	Revision	Date	Intro.	Appr.by
A		CHANGE SUSPENSION RING No.	29/09/11	M.D.B	

3RD ANGLE



TUBE DIAMETER	TUBE GUIDE NUMBER
Φ32	150-717-10-01-(32)
Φ42	150-717-10-01-(42)
Φ48	150-717-10-01-(48)
Φ56	150-717-10-01-(56)
Φ49	150-717-11-01-(49)
SPREADER PLATE	
Φ32	150-717-12-01

Ref.no.	Qnt.	Part name	Material	Dimension	Remark
13	30	SOCKET HEAD CAP SCREW		M30 x 100	0M30-100-02
12	1	LARGE TUBE GUIDE			150-717-02-01
11	1	LARGE CAN			150-717-01-01
10	1	LARGE ANVIL BUFFER			150-714-02-01
9	1	LARGE ANVIL CASE			150-714-00-01
8	1	O-RING			150-711-04-01
7	3	TRAVEL LOCK			150-711-02-01
6	10	SUSPENSION RING			150-025-00-01
5	1	1822 ANVIL			150-005-01-01
4	30	WASHER		M30	0M30-000-20
3	102	SOCKET HEAD CAP SCREW		M24 x 60 LG	0M24-060-02
2	30	NORD-LOCK WASHER		M24	0M24-000-27
1	12	SOCKET HEAD CAP SCREW		M12 x 40 LG	0M12-040-02

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
M.D.B	M.D.B	-	-	A3	-	-	-	-

DAWSON CONSTRUCTION PLANT LTD.

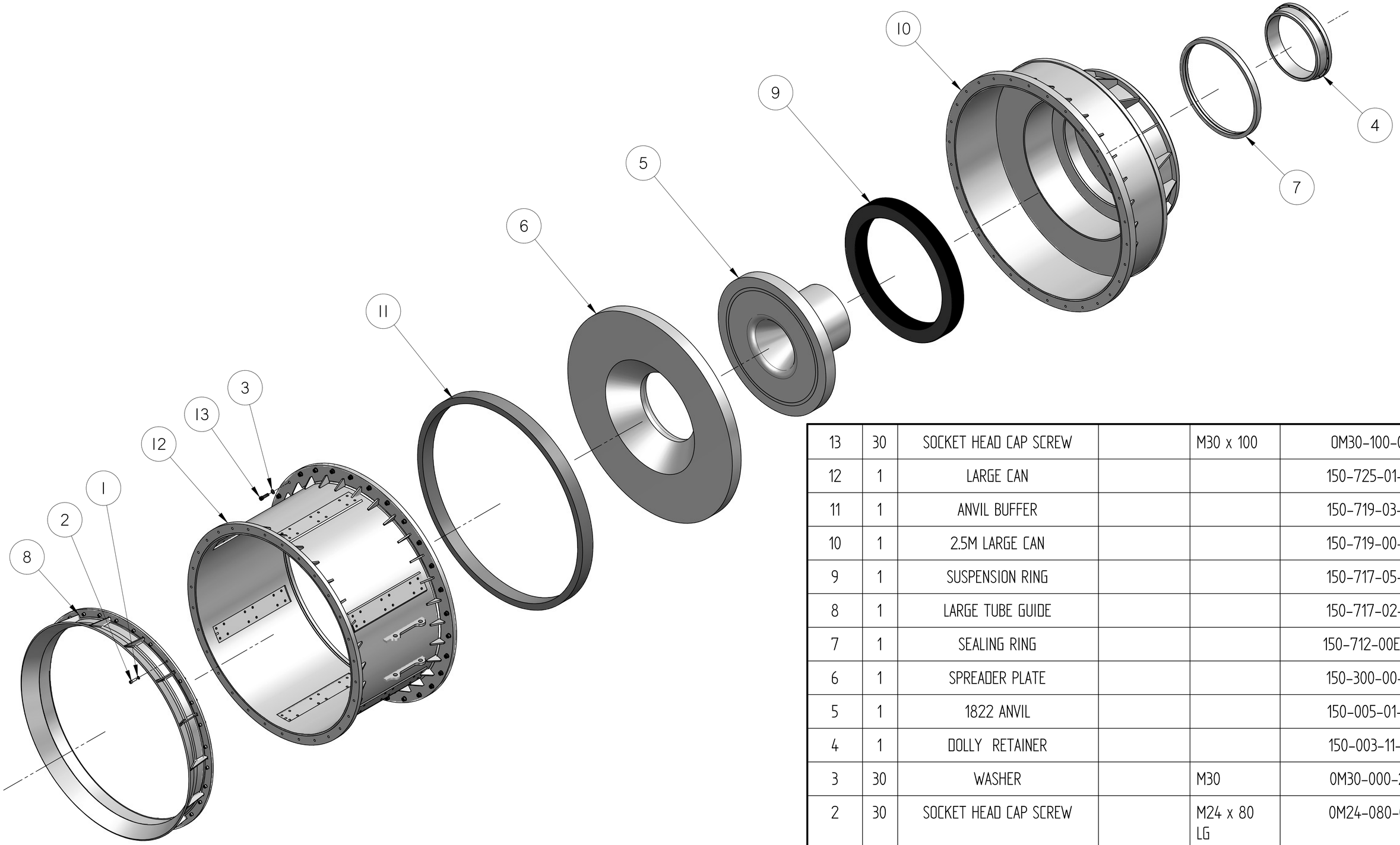
Ø860 - Ø1530 CAN ASSEMBLY

Sheet 1 of 1

Date 16/06/2009

Drawing no. SA 150-717-00-01

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



Ref.no.	Qnt.	Part name	Material	Dimension	Remark
13	30	SOCKET HEAD CAP SCREW		M30 x 100	0M30-100-02
12	1	LARGE CAN			150-725-01-01
11	1	ANVIL BUFFER			150-719-03-01
10	1	2.5M LARGE CAN			150-719-00-01
9	1	SUSPENSION RING			150-717-05-01
8	1	LARGE TUBE GUIDE			150-717-02-01
7	1	SEALING RING			150-712-00E-01
6	1	SPREADER PLATE			150-300-00-01
5	1	1822 ANVIL			150-005-01-01
4	1	DOLLY RETAINER			150-003-11-01
3	30	WASHER		M30	0M30-000-20
2	30	SOCKET HEAD CAP SCREW		M24 x 80 LG	0M24-080-02
1	30	NORD-LOCK WASHER		M24	0M24-000-27

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
MDB	MDB	–	–	A3	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

Ø2600 CAN ASSEMBLY

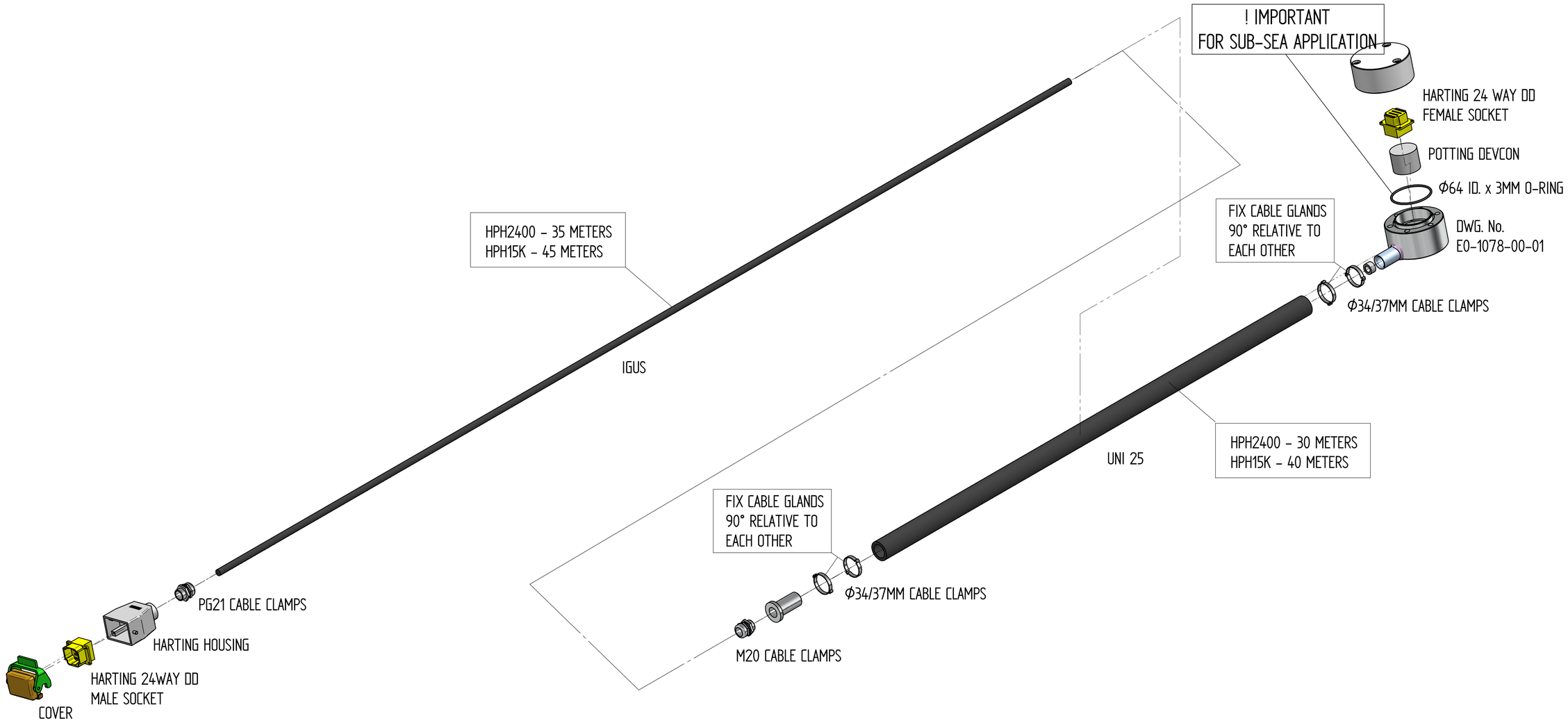
Sheet 1 of 1

Date 03/08/2010

Drawing no. SA 150-719-00-01

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

3RD ANGLE



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
MDB	MDB	–	–	A2	–	–	–	–

DAWSON CONSTRUCTION PLANT LTD.

ELECTRIC CABLE HOSE

Sheet 2 of 2

Date 08/05/2013

Drawing no.

7.0 TROUBLE SHOOTING

7.1 Power pack engine will not start	a. Check battery condition. b. Check diagnostics panel for fault LED showing (see fig. 2.) c. Check panel switches are in their default positions.
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. (7) 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 (6) to 'warm-up' on the instrumentation panel (fig. 2.) This gives a 265 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.
7.5 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 (2 off) Low pressure accumulator - 3 bar (2 off) d. Not enough hydraulic flow/pressure from power pack - check flow rate.
7.6 Excessive hose 'jumping'	Check accumulator pressures/condition - see Appendix 8.2.
7.7 Hammer 'jumping' excessively on pile top - reduce stroke immediately and/or stop piling	a. Too much hydraulic oil input . 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.

7.8 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 -

HPH15000
HYDRAULIC HAMMER

PARTS LISTS FOR ALL CONFIGURATIONS

This includes the following drawings:

150-000-00-01 Basic Hammer Configuration
150-715-00-01 Small Can for Tube Diameter Ø29.5 - Ø48”
150-717-00-01 Intermediate Can for Tube Diameter Ø48”- Ø60”
150-719-00-01 Large Can for Tube Diameter Ø60” - Ø102”

8.2 SAFETY NOTES

Important Safety Notes for Bladder 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.

8.3 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.

8.4 APPENDIX

Hydraulic Hammer Tool Kit

(PART NO. 6.150.00.01)

PART NO.	QTY.	DESCRIPTION
065	1 off	3mm Allen Key
066	1 off	4mm Allen Key
067	1 off	5mm Allen Key
068	1 off	6mm Allen Key
2.150.01.01	1 off	8mm Allen Key
2.150.02.01	1 off	12mm Allen Key
2.150.03.01	1 off	14mm Allen Key
070	1 off	17mm Allen Key
1.150.02.01	1 off	19mm Allen Key - long series
1.150.03.01	1 off	22mm Allen Key
2.150.04.01	1 off	10mm Combination Spanner
1.150.12.01	1 off	19mm Combination Spanner
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
1.150.09.01	1 off	18” Adjustable Spanner
1.150.21.01	1 off	External/Internal Circlip Pliers
1.150.20.01	1 off	5/16” Parallel Pin Punch
1.150.24.01	1 off	Soft Hammer
1.150.18.01	2 off	M24 Lifting Eye
1.150.16.01	1 off	¾” Sliding T Bar
1.150.23.01	1 off	¾” 200m Extension
2.150.06.01	1 off	65mm Socket 1” Square Drive
2.150.07.01	1 off	¾” Fem to 1” Male Convertor
2.150.05.01	1 off	2¼” A/F Open End Spanner
1.150.25.01	1 off	Grease Gun
1.070.00.01	1 off	Gas Filling Apparatus
6.150.18.01	1 off	M33 Lifting Point
0M16.130.01	4 off	M16 x 130 Socket Head Cap Screw

DAWSON
CONSTRUCTION PLANT LTD

HPH 15000e
HYDRAULIC HAMMER

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Fax: +44 (0) 1908 240222

CE

REV.DCP15Ke-02

DAWSON
CONSTRUCTION PLANT LTD

ELECTRICAL HAMMERS
SYSTEM CHECK

WORLDWIDE DEALER NETWORK

GLOBAL SUPPLY, LOCAL SUPPORT.

A GUIDE TO THE
ELECTRICAL HAMMER
SYSTEM

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

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HOW DOES THE HAMMER WORK

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

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

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

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

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

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

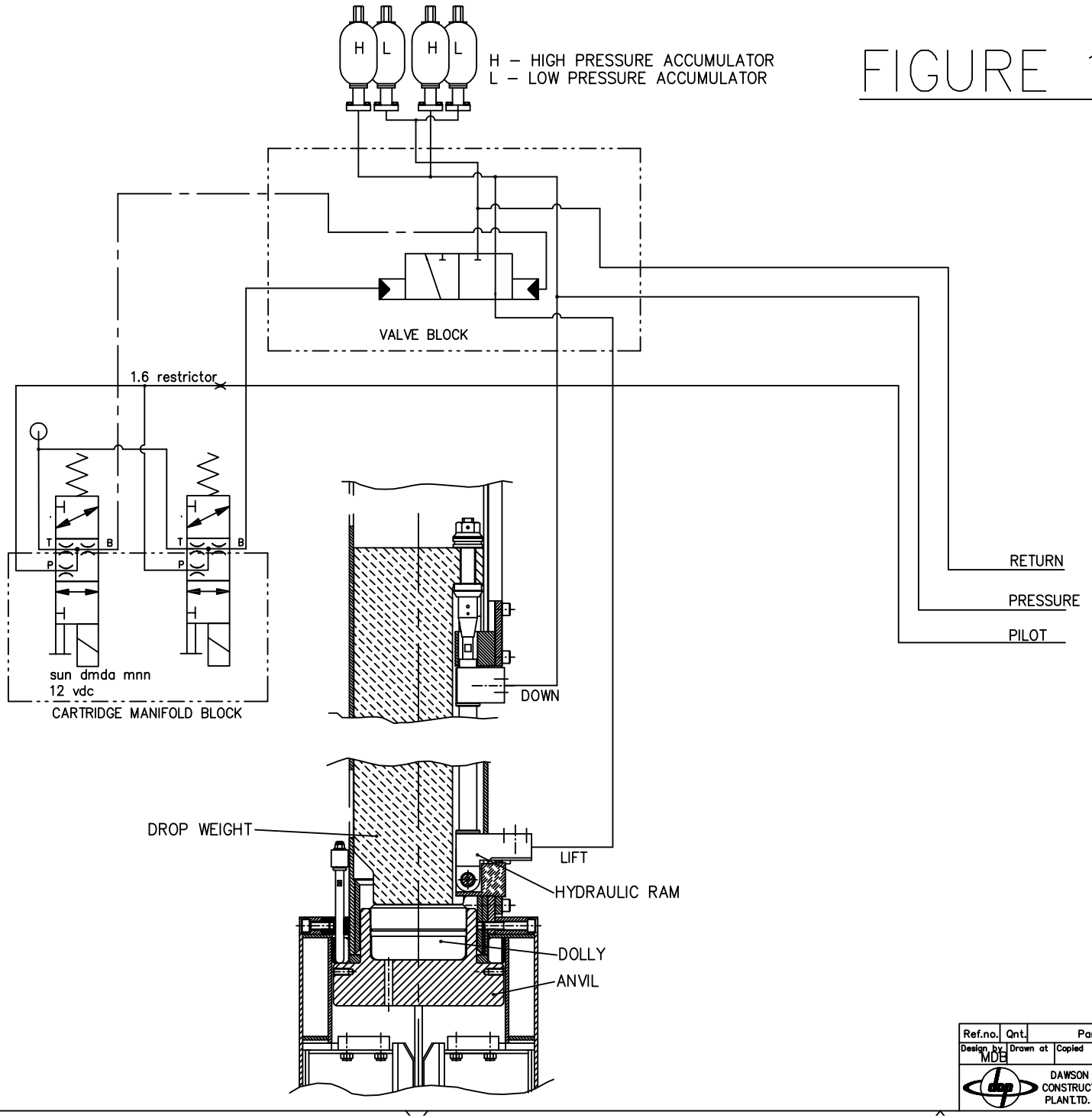
There are numerical read outs showing blows per minute, energy per blow and total blows. The lower reading shows blows in LAP cycle. (Measuring blows per increment). The units can be changed from imperial to metric.

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

INTERFACE SCREEN MOUNTED ON POWER PACK

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

FIGURE 1



Ref.no.	Qnt.	Part name	Material	Dimension	Part number
Design by: MDB	Drawn at	Copied	Checked	Standard: A3 / Affirmed	Scale:	Replace	Replaced by
DAWSON CONSTRUCTION PLANT LTD.	HYDRAULIC SCHEMATIC DIAGRAM OF HPH 2400E HYDRAULIC HAMMER					File name	Date
						Drawing no. 2400e hydcirlift	

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ELECTRICALLY CONTROLLED VALVE SWITCHING

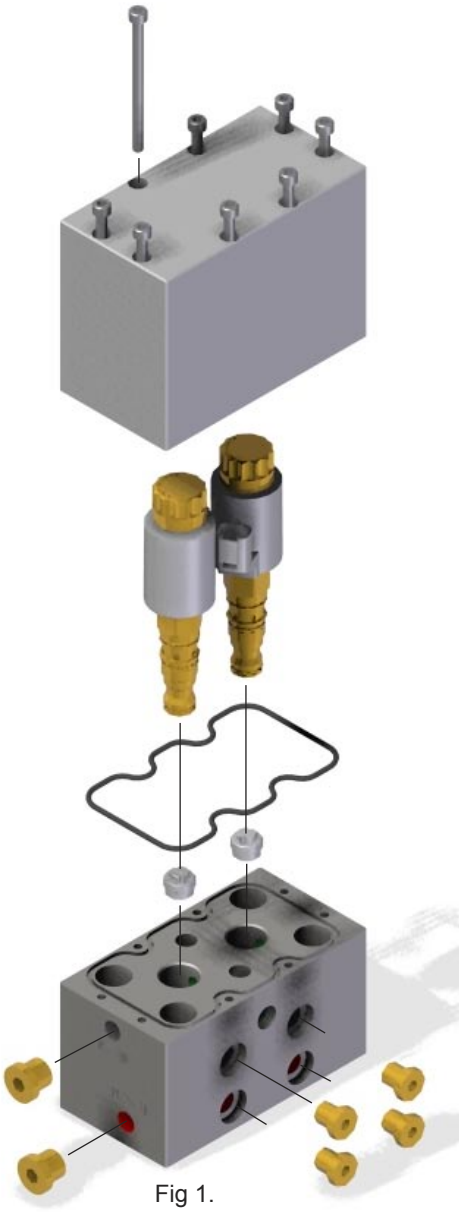


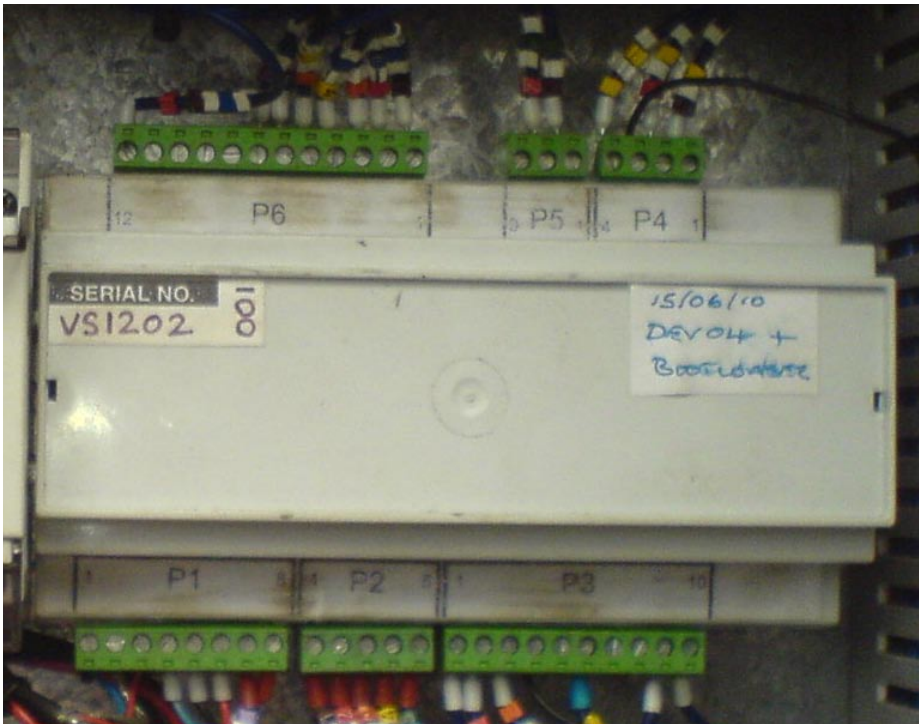
Fig 1.
Manifold block

SYSTEM OVERVIEW

The hammers main valve is similar to the previous non-electric hammers, but the spool position is now controlled with 2 SUN cartridge valves (DMDA MNN) instead of limit valves. Each cartridge valve is pulsed for 150ms in order to set and reset the main spool. These 2 cartridge valves are mounted into a manifold block (fig.1), which is bolted on to the main valve body.

Both cartridge valves are controlled from the hammer controller (fig.2) which resides inside the electrical cabinet on the power pack; the valves are connected to the controller via a 12-way heavy-duty cable.

Fig 2.
Hammer Controller



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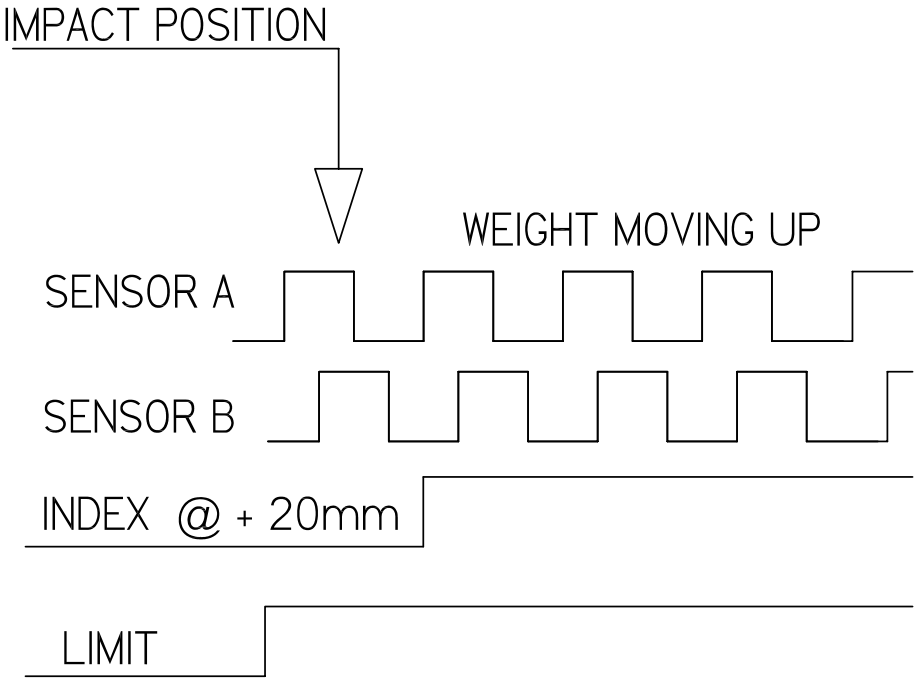
SENSING THE POSITION OF THE DROP WEIGHT

For the system to be able to fire the cartridge valves at the correct time, the position of the dropweight must always be known.
To achive this **4 proximity sensors** are used.



One and Two sensors work as A and B inputs to form an encoder, the sensors read a series of pockets milled into the dropweight resulting in a rising or falling edge every 6mm.

The Third sensor the “index” resets the encoder count just after the dropweight starts to lift, this ensures that no cumulative errors creep in.

The Forth sensor “limit” checks the position of the dropweight before the hammer is started, this limit sensor turns on when the dropweight is at its impact position and above, if the hammer is lifted the dropweight will fall causing the limit sensor to turn off and inhibit the starting of the hammer. The limit sensor is used to drive a visual indicator (off pile) on the panel. When the hammer is running the limit sensor is monitored, if the dropweight drops below the impact position for too long then the hammer will stop, this could happen if the hammer energy is too high and the pile is advancing too quickly or the crane line goes tight.

All **4 proximity sensors** are mounted in a shock resistant housing which is simple to change, it’s mounted on the side of the hammer under a removable port hole in the cover.

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ELECTRICAL SYSTEM CHECK

FRONT PANEL

UP LED

DOWN LED

INSIDE ELECTRICAL ENCLOSURE

UP BUTON

DOWN BUTTON

CHECKING SOLENOID CIRCUIT ✓

Method:
With electrical power turned on and the pack NOT running

Open the electrical enclosure, inside there are two buttons,

These buttons force the solenoid outputs on and can be used to test various functions of the hammer manually.

Assuming that the hammer cable is connected to the power pack pressing either button will cause the up or down solenoid to turn on for 200ms, on the front panel there are LEDs for the up solenoid and the down solenoid, when a override button is pressed its corresponding LED should flash, this confirms that the circuit is ok and there is current flowing.

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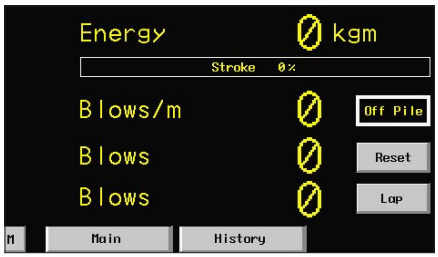
CHECKING THE CABLE

Method:
Disconnect the cable from the hammer and plug in the test box.

Turn on the electrical power on the power pack, (don't start the engine)



When the display screen has booted up select the mimic screen
(press M in bottom left of screen then MIMIC from menu)

You should see all the inputs and outputs of the controller displayed as indicators.

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POWER LIGHT

SCREEN INDICATORS

CHECKING THE CABLE

Method:
First check that the test box has power (a red LED)

The on screen indicators we are checking are on the top left of the screen.

ENCA ENCB ENCI ENCL

Press button 1 on the test box , ENCA should illuminate

Press button 2 on the test box, ENCB should illuminate

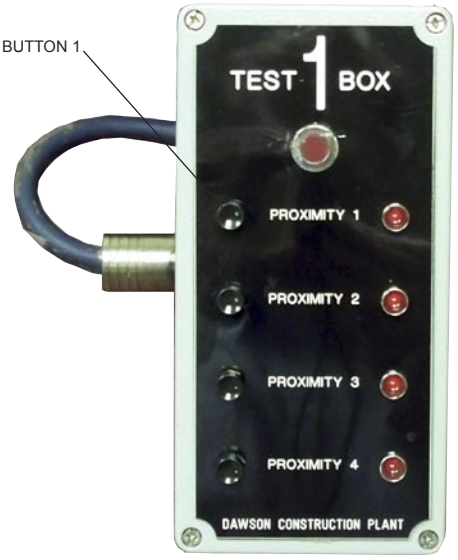
Press button 3 on the test box, ENCI should illuminate.

Press button 4 on the test box, ENCL should illuminate.

CHECKING THE CABLE

Example:
Press button 1 on the test box , ENCA should illuminate

PRESS BUTTON 1



ENCA SHOULD LIGHT UP

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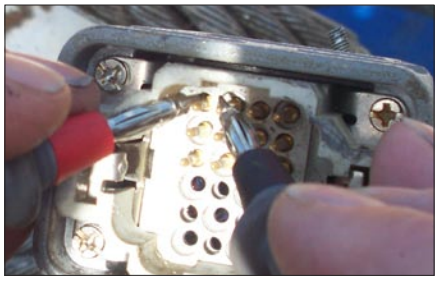
METER SET TO MEASURE RESISTANCE

CHECKING THE CABLE

Method:
For the final cable check unplug the cable from the power pack.
(The test box is still plugged in the hammer end of the cable)

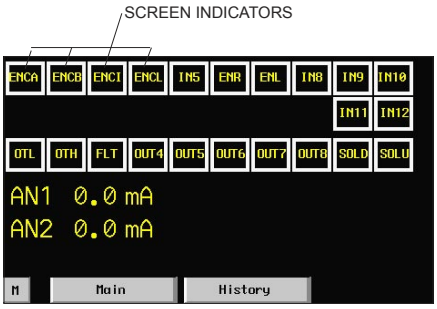
With a meter set to measure resistance,

check between pin 1 and 2



then pins 3 and 4

The meter should read between 8 and 10 ohms on both checks (there's a 6.8 ohm resistor in the test box + 4 ohms in the 40 mt. cable.



CHECKING IF THE PROXIMITY SENSORS ARE WORKING

Method:
Remove sensor module, (the drop weight will need to be moved up by 300mm from the absolute bottom)

Make sure cable is connected both ends (don't forget the o-ring)

Turn on electrical power

Select the "Mimic" panel on the hammer display

Place something metallic (a spanner) over each sensor,
have a colleague watch the mimic screen, you should see the on screen indicators light for each sensor as it is energized.
ENCA ENCB ENCI ENCL

METER SET TO MEASURE RESISTANCE

CHECK CARTRIDGE VALVE SOLENOIDS (The cable is plugged into the hammer)

Method:
All that can be done with the hammer on the ground is to check the continuity of the solenoids. Each solenoid has a resistance of 6.4 ohms and there are 2 valves connected in parallel, this gives a total resistance of 3.2 ohms for the pair + the cable resistance of 4 ohms.

Unplug the cable from the power pack end

Place meter across pins 1 and 2 and check resistance

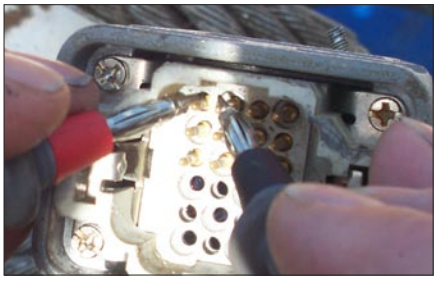
Then check across pins 3 and 4

A reading of 8 to 10 ohms = ok

A reading of 3 or less ohms = a short probably in the cable

A reading of open circuit (OL) both sols or a cable problem.

check between pin 1 and 2



check between pin 3 and 4

each valve can be check separately

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HAMMER CONTROL UNIT

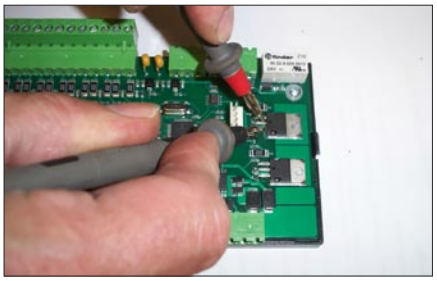
Method:
(housed in the electrical enclosure)

the quickest way to test is to exchange the unit for a proven unit.

If the unit is found to be defective the likely cause would be one of the MOSFETs

TO CHECK THE MOSFET's

Method:
(Remove the plastic cover from the VS1202 module



With the 2 mosfets at the top measure between the middle pin and the right hand pin

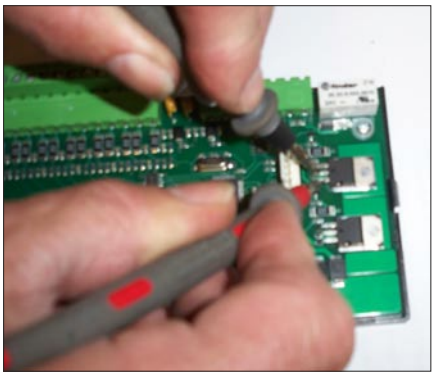
Positive lead on the middle pin and check resistance.

There should open circuit between these two pins (or more than 10m)

Now set the meter to diode check (set selector to continuity sounder then press yellow button on the right of the meter)

With the positive lead on the right hand lead there should be a voltage drop of 0.5 to 0.6 across the right hand and middle pins.

METER SET TO
DIODE CHECK



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VS1202

Hammer Controller
Operator Panel

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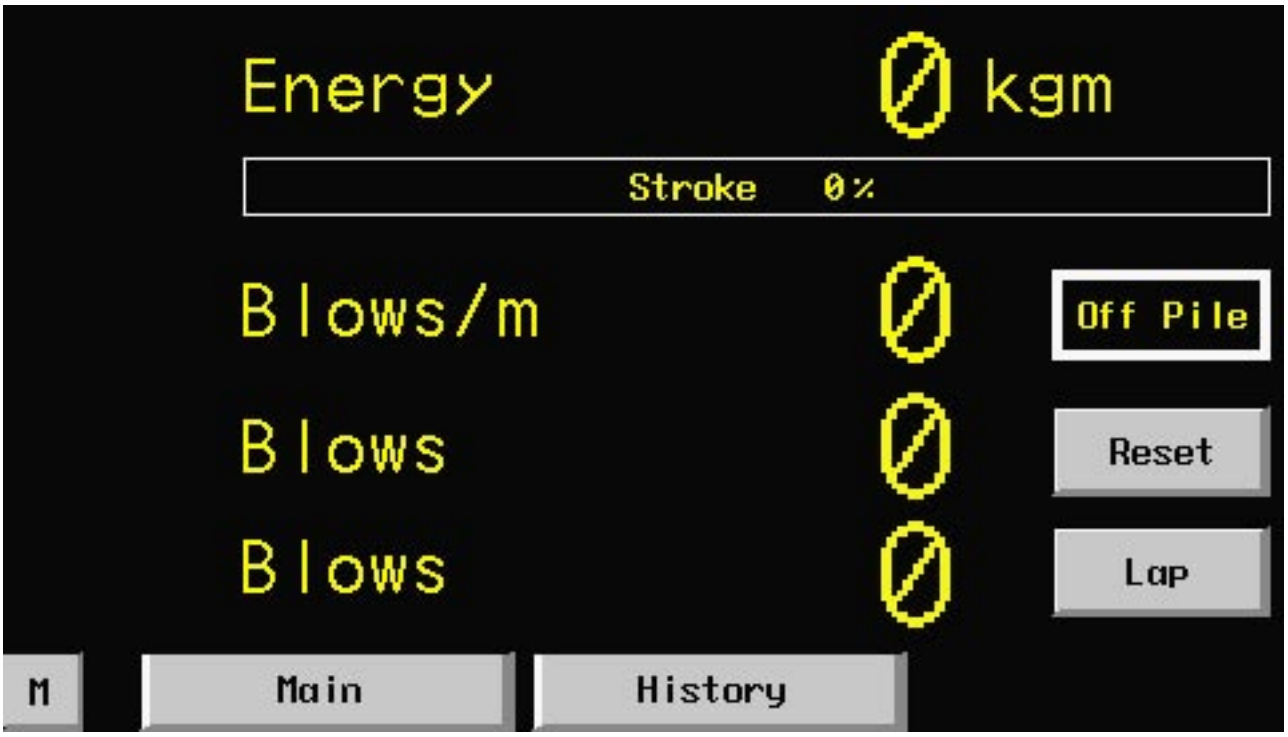
Main Page



The left of the sreen contains an oil temperature bar display (which can not easily be reproduced in this documentation). The ‘M’ button bottom left selects the Maintenance page. The Reset button resets the adjacent blow counter. The Lap button resets another blow counter and freezes the adjacent blow count, a second press of the Lap button unfreezes the adjacent display.

History Page

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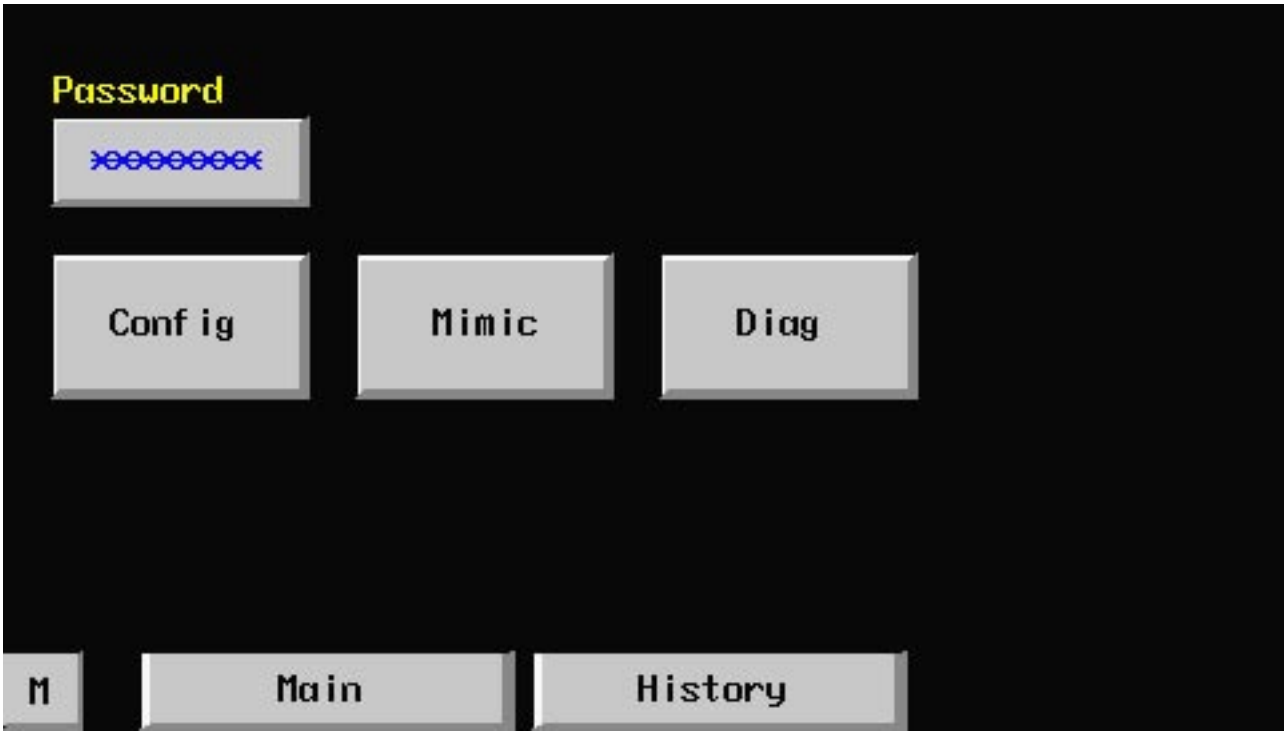
Maintenance Page



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

Mimic Page

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Diag Page

All values on this page are in encoder pitch units (usually 6mm), velocities are pitch units per second.

Hpos = hammer current position

hpos_max = hammer maximum height during last blow

hpos_min = hammer minimum height during last blow

hveld_max = hammer downward velocity maximum during last blow

hvelu_max = hammer upwards velocity maximum during last blow

hvel_impact = hammer velocity on impact for last blow

codown_pos = hammer position when down valve was activated on last blow

coup_pos = hammer position when up valve was activated on last blow

cint_overflows = a count of errors where encoder edges occurred faster than the controller could process them, may indicate noisy or supurious encoder A and B signals.

enc_err_cnt = a count of events where encoder A and B edges occurred in an invalid sequence – more than 1 or 2 counts here indicates a problem with the encoder sensors.

Not shown above are are two numbers indicating HMI and controller firmware versions.

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Config Page

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

Enc Pitch mm = distance between each edge of the encoder, the pitch of the encoder holes is 4 times this value.

Hammer positions are referenced to a zero datum which should be the lowest possible position of the drop weight.

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

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

Top Limit = maximum allowable height for the drop weight. The system automatically decreases stroke if the drop weight gets within 2 encoder pitches of this limit.

Hmr Mass kg = drop weight mass used to calculate blow energy.

UV Op Time ms = This value sets a notional time change over of the shuttle valve to the upwards direction. When the drop weight is falling the system will activate the up valve when it predicts impact will occur within this time value. This value is important, too high and the drop weight will be decelerating before impact, too low and speed will be reduced, much too low and the drop weight will drive into the pile causing the hammer to lift.

DV Op Time ms = this value is currently unused.

V Pulse ms = Duration of pulse in ms applied to up and down solenoids.

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

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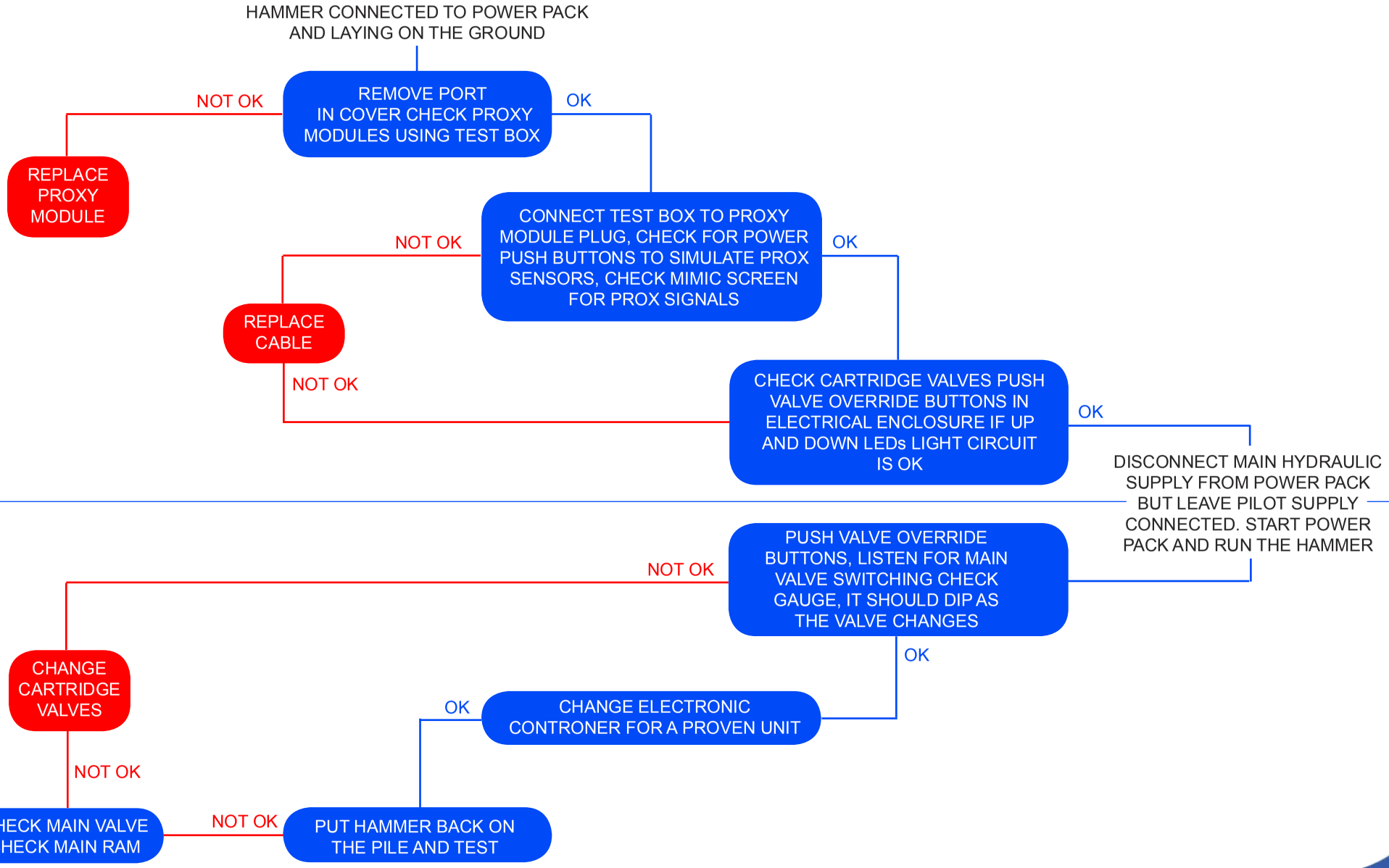
FAULT FINDING CHART FOR ELECTRIC HAMMER

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



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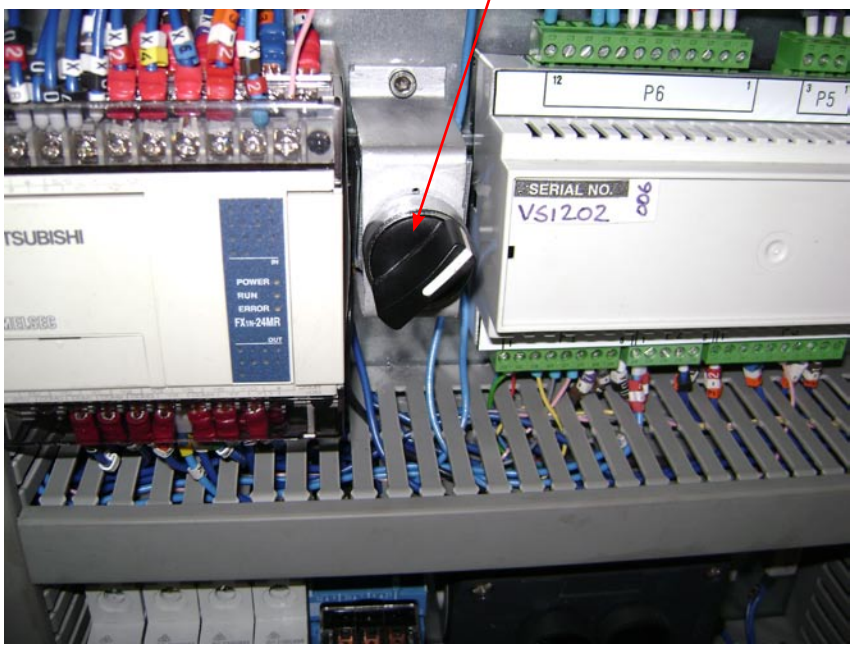
Instructions for testing HPH18/2400e hammers

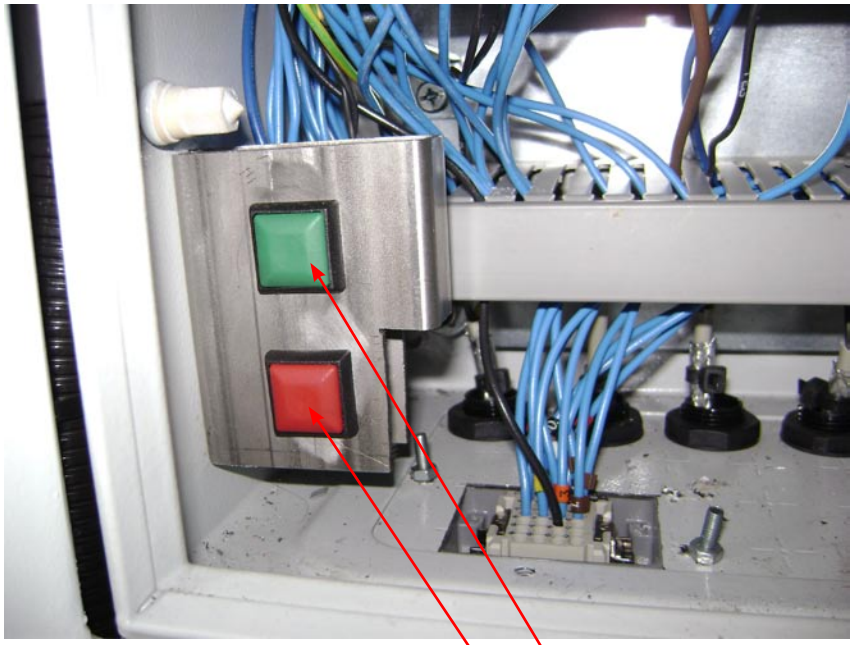
“on the ground”



1 Start pack, warm up, and select “idle” and “manual on the panel

2 Open the electrical cabinet and rotate the selector switch clockwise.

3 All 3 warning LEDs on the panel should now be flashing. The pilot line should be pressurized (check the gauge)



4 Select which way that you want to stroke the hammer by pressing the cartridge valve override buttons, green is up, red is down, this only changes the valve, the dropweight will not move.

5 Make sure the hammer is seated firmly on the ground, if the hammer is standing on blocks the sudden dropweight movement could cause the hammer to move causing injury to personnel.

6 Make sure no-one is too close to the hammer then press the “start” button, this will deliver a pulse of oil to the hammer, the dropweight will move in the direction that the main valve has been set to previously (up or down) the start button will only turn on the main valve for 0.5 seconds per button push, to move the weight any significant amount many button presses will be necessary.

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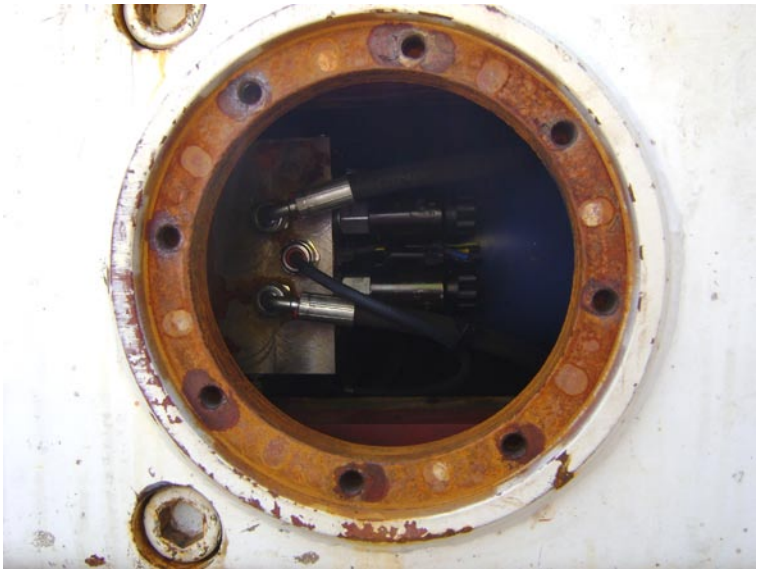
Instructions for
checking / replacing cartidge valves

1 REMOVE INSPECTION COVER



2 VIEW INSIDE

3 ON THE CONTROL PANEL SELECT THE CONFIG PAGE, (PASSWORD *9999*).
TURN ON “SOL TEST”
THIS WILL TURN ON PILOT LINE.
PRESSURE & PULSE EACH CARTRIDGE VALVE.
CHECK THAT THE PANEL LED’s (UP & DOWN VALVE) ARE FLASHING. THIS CONFIRMS THAT THERE IS A CIRCUIT.
i.e CABLE AND WIRING OK.

MAKE SURE HAMMER IS SAFE AS PILOT VALVE IS PRESSURISED

DAWSON
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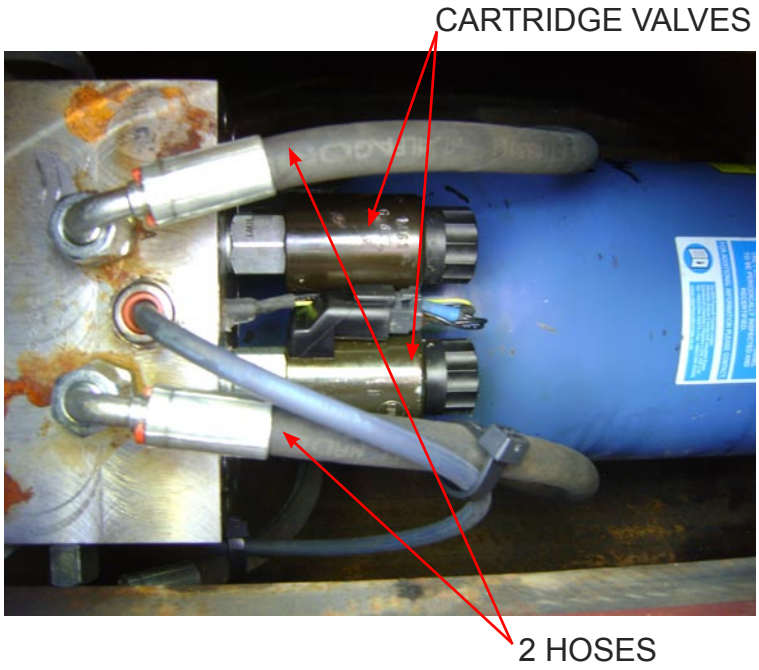
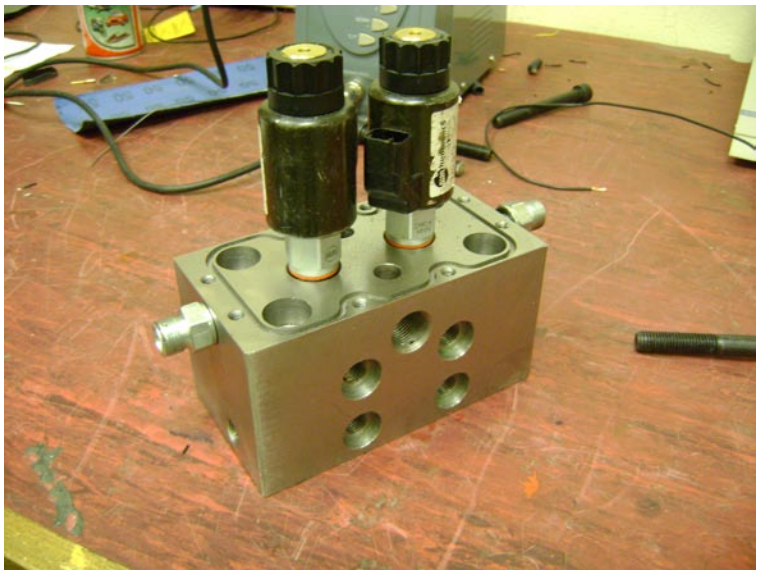
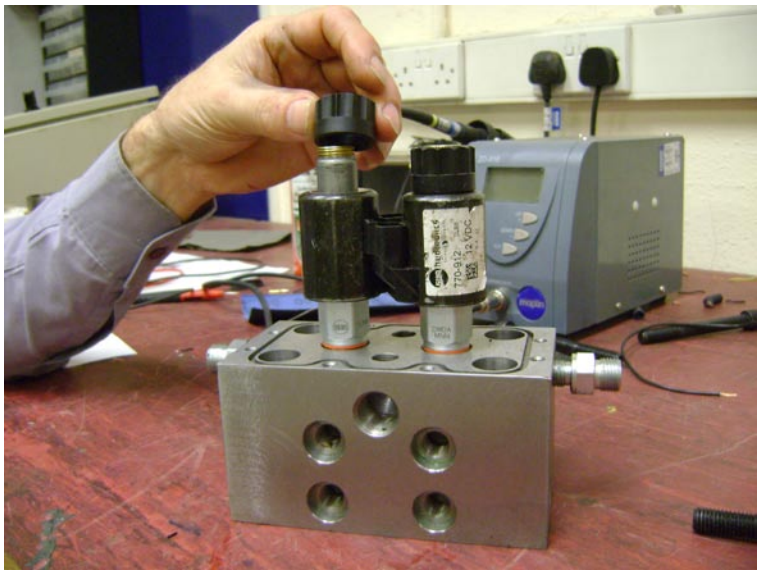
Instructions for
checking / replacing cartidge valves



4 LISTEN FOR THE SPOOL SWITCHING IN THE HAMMER. (SCREW DRIVER TO EAR). HOLD THE 2 HOSES, CHECK THAT THEY ARE KICKING.

5 CHECK THAT THE PLUG IS TIGHT





6 CARTRIDGE VALVE MANIFOLD

7 UNSCREW CAP

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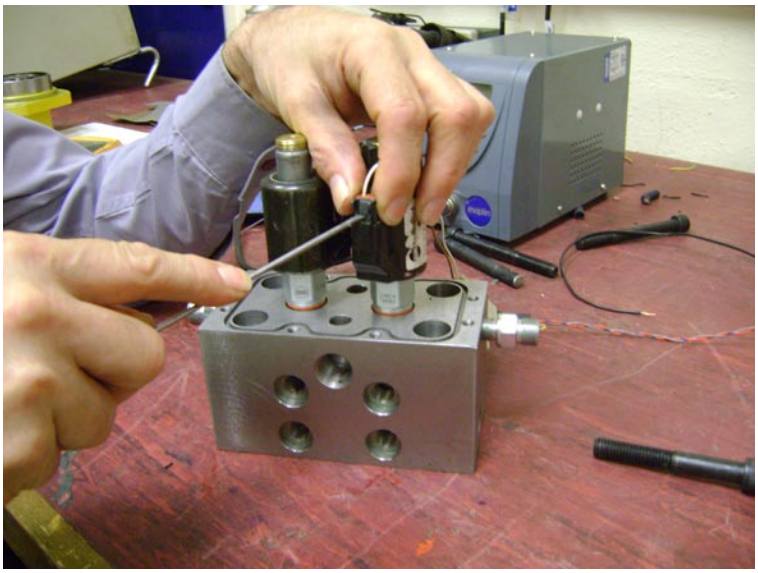
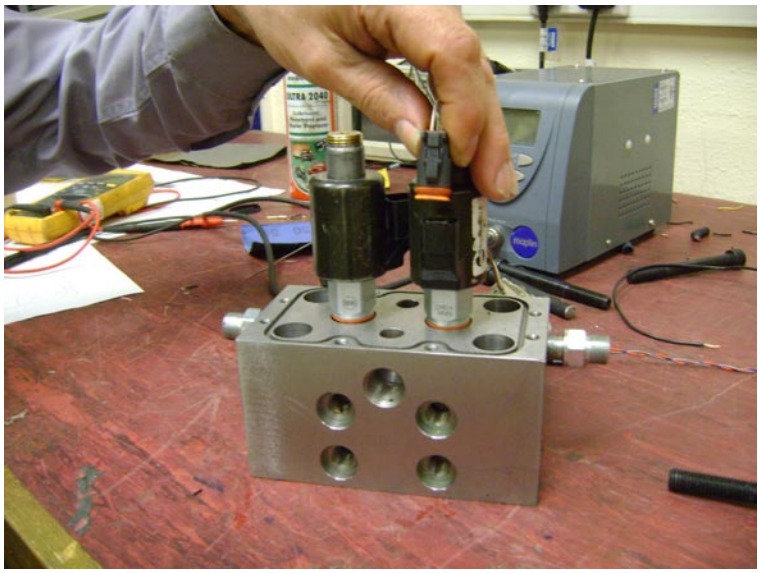
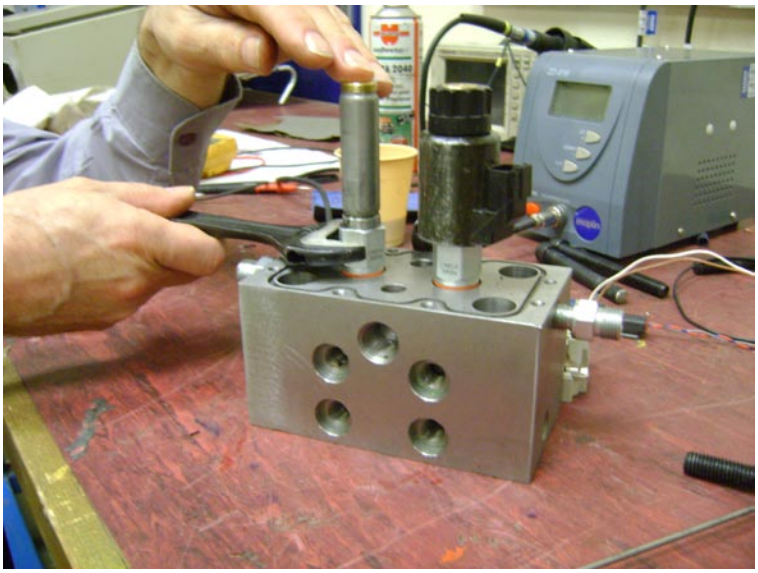
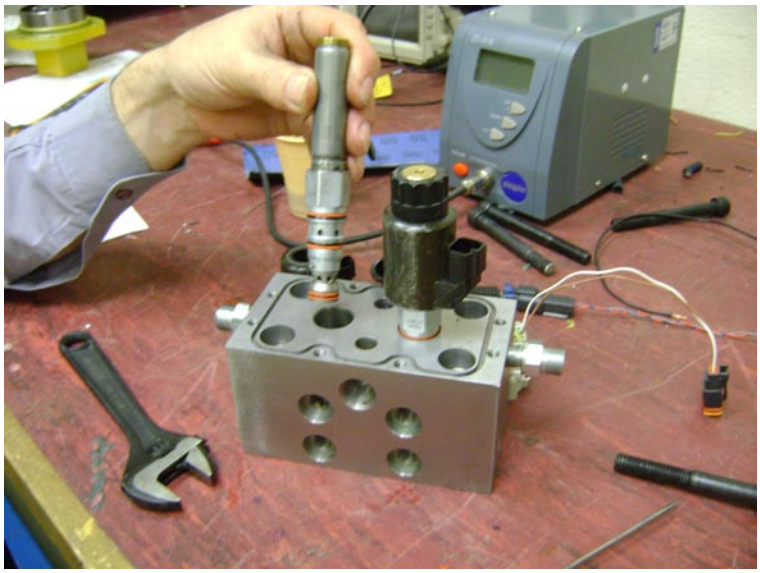
Instructions for
checking / replacing cartidge valves





8 PUSH IN LOCKING TAB & REMOVE CONNECTER (DON'T MIX THESE UP).
MAKE A NOTE OF THE COLOURS.





9 UNSCREW CARTIRIDGE & REPLACE

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ELECTRICAL HAMMERS
SYSTEM CHECK

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