

Abacus[®]

Leaders in Lighting

Part No: INS-GL

Grand Lume (GL) Masts

Applicable products:

- GL400
- GL520
- GL620
- GL720
- GL800
- GL880
- GL1000
- RLH12
- RLH13
- RLH14/RLT
- RLH15
- RLH16
- RLH17

Product Manual

November 2022

**WE STRONGLY RECOMMEND THAT THESE
INSTRUCTIONS ARE READ CAREFULLY BEFORE
ATTEMPTING TO INSTALL, OPERATE AND MAINTAIN
THIS EQUIPMENT**

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1. Safety

WE STRONGLY RECOMMEND THAT THESE REQUIREMENTS ARE READ CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE AND MAINTAIN THIS EQUIPMENT.

- i) It is essential that all operators are trained and authorised in the safe use of the counterbalance unit.
- ii) It is recommended that certified operator training be carried out by Abacus personnel.
- iii) The counterbalance unit must only be used for the purpose intended, as described in these operating instructions. Abacus Lighting Limited will not be held responsible for any misuse or abuse of the unit. Similarly no repair, modification or maintenance work, other than that specified in these instructions, must be carried out unless authorised by Abacus.
- iv) During the lowering and raising operation the operator must ensure that all non essential personnel and members of the public are kept clear from the areas adjacent to and in front of the mast. These areas should be clearly defined and cordoned off to prevent access.
- v) It is important that hands and loose items of clothing are kept away from moving parts, both on the mast and counterbalance unit.
- vi) Head protection must be worn at all times when operating a counterbalance unit on a raise and lower mast.
- vii) When manhandling or lifting the counterbalance the operator should ensure that they are physically capable of carrying out the task. Ensure good manual handling techniques are employed at all times and for heavy units two people should carry out the task.
- viii) Refer to the appropriate performance data sheet, supplied on request, for details of maximum permitted head-load weights and wind areas.
- ix) The counterbalance must be visually checked, before and after use, for signs of damage or worn parts. If repairs are necessary they must be carried out prior to using the counterbalance unit. For hydraulic units it is essential that the ram be closed after use. Failure to do so could result in damage to the piston rod and seals, which in turn could compromise the safe working of the unit.
- x) It is recommended that the counterbalance unit be stored indoors when not in use.
- xi) When using hydraulic counterbalance units it is essential that the operator is aware of the COSHH regulations relating to the safe handling of hydraulic oil. Reference should be made to the COSHH data sheet supplied in these instructions.

2. Installation

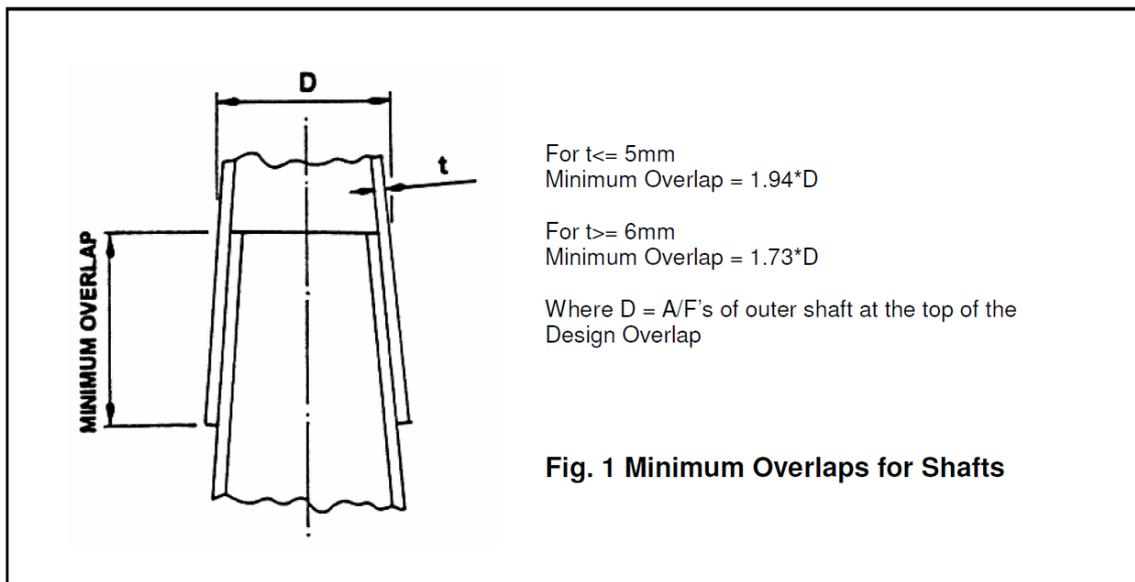
2.1. General

The masts are used for sports lighting and general floodlighting applications typically from 20m up to 60m in height. Each mast is supplied in kit form for on-site assembly. The foundation bolts should be cast in concrete 3 to 4 weeks prior to erection of the mast to allow time to cure. Foundation block sizes for a variety of ground conditions can be supplied on request.

Masts are constructed from steel to EN10025 grade S275 and S355, pressed to form a series of tapering polygonal shaft sections. The shafts are slotted together and require no on site welding or bolting. The mast and foundation bolts are finished galvanised with small fasteners being from stainless steel.

In the following instructions mention is made of the minimum permissible shaft overlap distances relating to tapered octagonal shafts. In addition, because these masts are designed for specific applications it is essential that reference is made to the engineering drawings during assembly. These will give details of the shaft design overlaps. The overlaps achieved on site will vary due to manufacturing tolerances.

For shafts of 5mm or less in thickness the **minimum permissible overlap** can be determined from Fig 1.



2.2. Mast Assembly

Reference should be made to the illustrations which follow the text.

Before commencement of assembly examine the items and ensure that there are no missing or damaged parts. The following items of equipment will be required (not Abacus supply);

- Mobile crane to lift mast and headframe, typically 5 tonne
- 1 no. 3.0 tonne Tirfor c/w wire ropes.

- Various wire ropes, soft slings and shackles
- Supply of liquid soap
- Ø30 steel bar or steel beam with attachment points for 'D' shackles
- Supply of timber supports and packing
- Torque multiplier and wrench

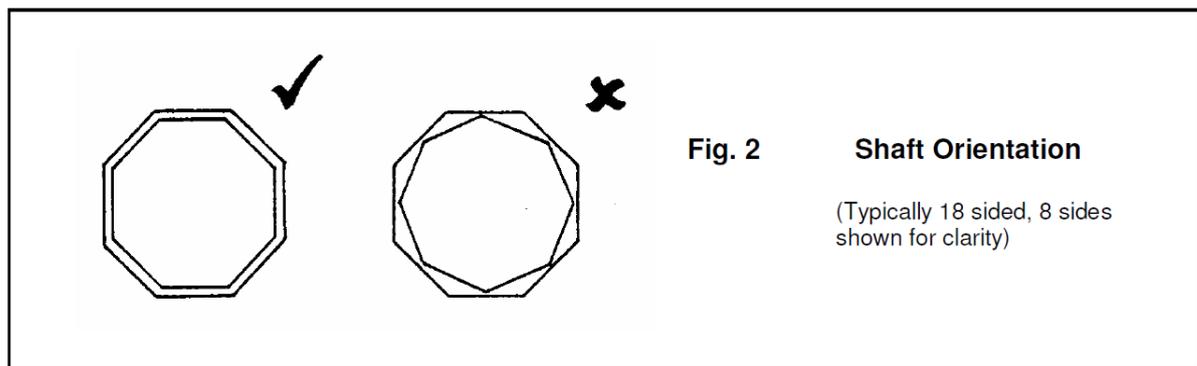
For export orders the masts will be containerised. If the smaller shafts are fitted inside larger ones, they will need to be carefully unpacked on site to avoid damaging the galvanised finish.

1. The holding down bolts are each fitted with two nuts and washers. The upper nuts and washers and template should be removed. The threads should be examined for any damage and rectified using a die nut if necessary. The nuts should be set in level plane using a steel bar and spirit level across each opposing pair of nuts. Check, referring to the counterbalance operating instructions, that the base section is fully closed and locked. Using a crane lift the column base and place over the foundation bolts and on to the lower set of nuts, ensuring the direction of lowering is as required and that the mast will clear any obstructions.

2. Fit the retaining washers and nuts to the bolts and roughly 'plumb up' the mast (levelling may be easier if only 4 levelling nuts are initially used). Referring to the appropriate operating instructions fit the counterbalance unit and lower the mast base to the horizontal.

3. Before assembly lay the shaft sections end to end on the ground and ensure by sighting from one end that the shafts are straight. Check the overlap area for any damage, excess zinc or weld which may impede fitting of the shafts together and rectify if necessary. It may be necessary to rotate one or all of the sections to achieve the best alignment. Care should be taken to ensure that seam welds on adjoining shafts are not in line.

4. Mark the minimum overlap position on the stub shaft of the mast using the method described in Fig 1. With the base section lowered, pick up, locate and slide home as far as possible the larger shaft sections. Ensure the flats do not rotate relative to each other since a shaft wedged with a corner to a flat will be very difficult to separate. Refer to Fig. 2 for details.



5 - 6. The minimum overlap distance must be covered and in most cases exceeded. To achieve this it may be necessary to mechanically pull the shafts together. For the smaller shafts this may be achieved by knocking the shaft with a hammer, ensuring that a wooden block is placed over the end of the shaft which is to be hit. Smearing liquid soap over the end of each inner shaft before assembly may also help. For the larger shaft sections, which require assembly by mechanical means it will be necessary to use a Tirfor with a pulling capacity of 3000Kg. Position the Tirfor

within the side door of the mast base and attach it via a wire rope and a steel bar to the open base of the mast. Feed the Tirfor wire down the length of the two shafts being assembled and connect it to an attachment plate or bar as illustrated. Protect the shaft edges from deformation using timber packers. The Tirfor wire can then be tensioned and the shaft pulled into position whilst at the same time agitating the shaft up and down. As sliding takes place periodically sight down the assembly to check for straightness. Ensure the minimum overlap has been achieved and remove the attachment plate in readiness for pulling the next shaft into position. Remove any surplus soap from the base section. Repeat the procedure for all remaining shafts. Remove the equipment before attempting to operate the mast.

7. Fit the floodlight mounting bracket to the top shaft section and secure with the screws provided. It should be noted that the power supply cable can be installed during assembly or, if preferred, after assembly is completed, but prior to fixing the floodlighting bracket. All the electrical work should now be carried out.

8 - 9. Follow the appropriate counterbalance operating instructions and raise the mast into its vertical position and dock the lid into the base castellations. Remove and store the counterbalance unit.

After completion of assembly and with the mast raised, recheck for vertical alignment. Use the lower set of nuts to accurately 'plumb up' the column. It should be noted that the base sides are parallel, whereas the shafts are tapered. Once satisfactory all bolts should be tightened to the required torque setting;

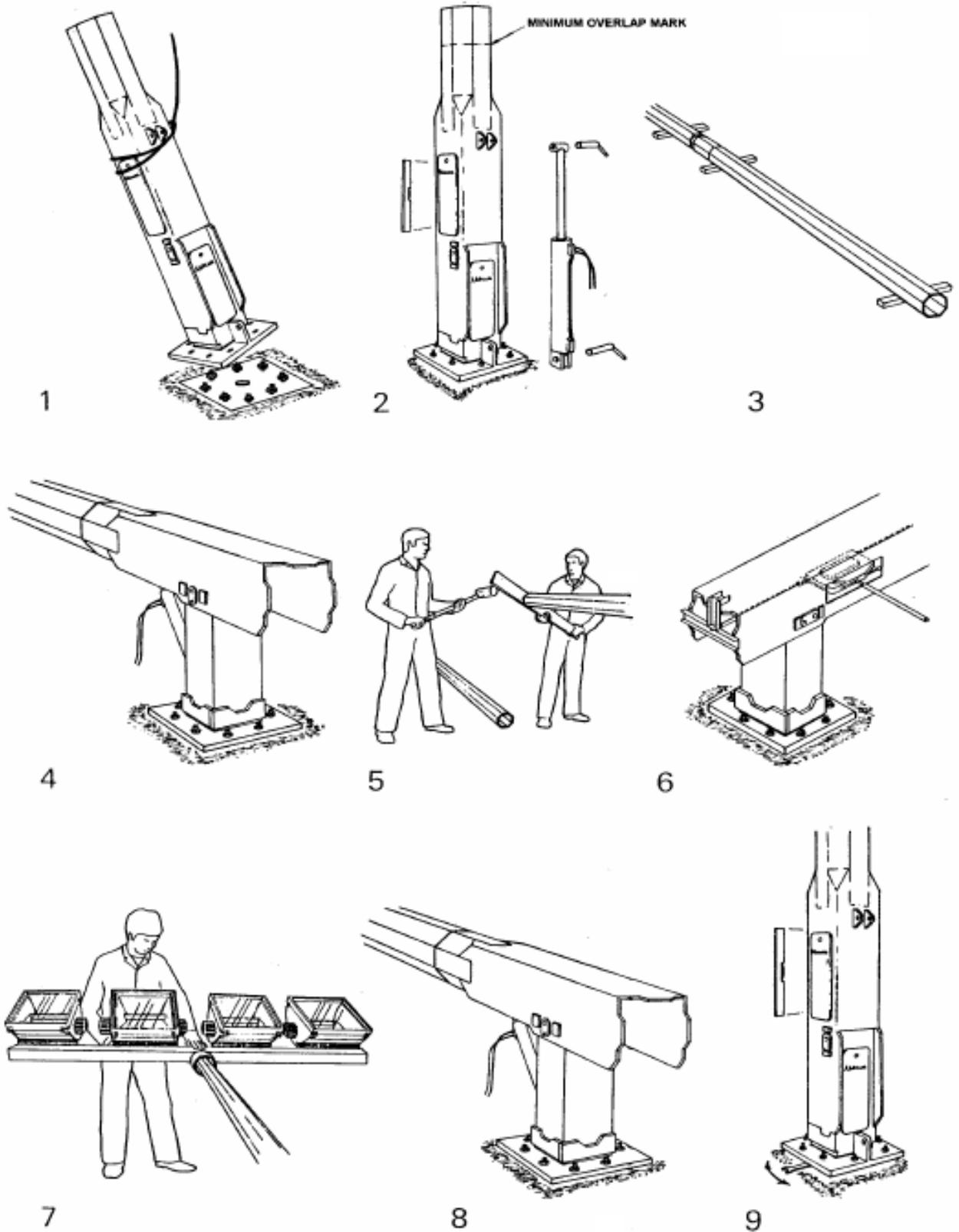
Bolt Size	Torque Setting (Nm)	
	Grade 4.6	Grade 8.8
M20	50	250
M24	160	425
M30	310	850
M36	550	1450
M42	875	2350
M48	1300	3500

If the gap below the flange is to be grouted it is essential that adequate provision is made for ventilation and drainage of any water collecting inside the base.

The mast can then be commissioned.

'Plumbing up' in hot weather or climates. To minimise the effect of the sun on one side of the mast, which can cause considerable temporary curvature of the mast it is recommended that the 'plumbing up' be carried out very early or late in the day.

ASSEMBLY AND INSTALLATION INSTRUCTIONS FOR GRANDELUME MAST
(SINGLE RAM COUNTERBALANCE SHOWN FOR CLARITY - PROCEDURES ARE THE SAME FOR TWIN UNITS)



3. Operation

WE STRONGLY RECOMMEND THAT THESE INSTRUCTIONS AND THE HEALTH & SAFETY REQUIREMENTS SHEET SUPPLIED WITH THE UNIT ARE READ CAREFULLY BEFORE ATTEMPTING TO OPERATE THIS EQUIPMENT.

IF THERE IS MORE THAN ONE TYPE OF HYDRAULIC RAISE & LOWER MAST ON SITE, THEN EACH MAST SHOULD BE COLOUR CODED TO MATCH THE APPROPRIATE COUNTERBALANCE UNIT.

3.1. General

The units consist of one, two or three double acting hydraulic rams mounted on a hand trolley or non-highway use towable trailer, which also houses the electrically driven pump unit. The rams and pump unit are permanently connected by means flexible hoses. The units have been designed to allow a safe method of attaching heavy counterbalance rams to masts without the need for manual lifting.

The counterbalances are individually colour coded, identified as such by checking the upper end of the piston rod and the upper and lower ram anchor pins, to correspond to the different grand-lume masts as detailed in the table below.

Note that the safe working load (SWL) of a counterbalance unit is dependent on the mast height and design. Further information is available from Abacus on request.

The base of the ram is fitted with a flow control valve which will allow the mast to lower at a fixed rate in the event of a major hydraulic failure such as a severed hose. The valve is of the fixed orifice type and is not adjustable.

The hydraulic circuit is fitted with 3 filters. A suction strainer is fitted inside the reservoir, a return line filter is located below the tank and a micro strainer is located inside the flow control valve poppet. All filters are adequate for the life of this unit and will only need replacing if contaminated oil has been used to refill the unit.

The pump unit is operated by an electric motor. The ram(s) are controlled by a 3 way, self centralising spool valve mounted on the motor/pump unit module. Because the spool valve is not fully leak proof, oil will slowly transfer from the rams to the tank. It is essential that any trestle used to support the shafts during maintenance is capable of carrying the load that will be transferred to it.

The unit is supplied ex works with Renolin Hydraulic Oil CL Range Ref CL46 (or equivalent) in the tank. For export the unit is supplied empty and the tank must be filled with oil before use. The correct oil level is to the centre of the gauge with the tank horizontal. Note that if this level is exceeded with the ram extended, oil will be ejected during operation of the equipment and it may also pressurise and damage the return line filter. During use the oil level of a correctly filled tank may go below the bottom of the gauge and this is quite normal. The pump incorporates a breather unit/filler port in the top of the tank and when not in use the counterbalance should be stored with the tank in an upright position to avoid leakage.

Mast	Counterbalance	Rams	Bore (mm)	Max Bar	Col. code	KG	Supply	Pin dia.
GL400	 RLH12	1	127	170	Black	153	240v	38
GL520	 RLH13	2	127	170	Black	183	240v	38
GL620	 RLH14/RLT	2	127	340	Blue	620	2.2KW 3 ph.	55
GL720	 RLH15	2	160	340	Green	1000	4.4KW 3 ph.	65
GL800 & GL880	 RLH16	2	178	340	Silver	1140	4.4KW 3 ph.	75
GL 1000	No picture available RLH17	Details on request						

3.2. Moving the Counterbalance

The RLH12 and RLH13 are smaller units and are designed to be moved by hand.

The RLH13 comprises two separate trolleys. The quick release couplings must be disconnected from the rams and the free end stowed on the dummy male/female couplings provided on the motor/pump unit. It is important that the rams and hoses are depressurised before separating the couplings otherwise reconnection will not be possible. To depressurise, switch off the pump motor and operate the control valve back and forth several times. Fit the upper and lower ram anchor pins to the rams and secure with the retaining pins.

The larger units are supplied with an ISO standard 50mm tow hitch to allow manoeuvring using a vehicle. **THE TRAILER IS NOT DESIGNED FOR USE ON PUBLIC HIGHWAYS.**

3.3. Checks Before Use

- 1 Examine the trolley framework for damage. Check that the wheels are operating and retained in position.
- 2 Examine the rams in particular the area around the seals for signs of damage and leakage of oil.
- 3 Check the oil level is to the centre of the gauge with the tank top horizontal and the rams closed.
- 4 Check the electrical flex on both the power lead and remote control for damage and loose connections.
- 5 Check the hydraulic hoses for damage and ensure that they are securely connected.
- 6 Check that the upper and lower ram anchor pins are the correct diameter and colour code for the mast type (see table above).
- 7 Connect to a suitable electric supply and switch on. Check the function of the control valve by extending the ram a short distance and the retracting it. During extension the pressure should read 200 to 300psi. The pressure during retraction will be a minimum 1500psi. As the rams fully close the pressure should rise to the relief valve pressure of 5000psi. If no pressure is noted, check that the tap under the gauge has not been turned off.
- 8 Check that the safety bar is present.
- 9 On road trailer models check the stabiliser legs and hand brake function satisfactorily. Note that the hand brake is heavily spring loaded and that to apply and release it is a two handed operation.

IF ANY OF THESE CHECKS ARE FAILED THE COUNTERBALANCE MUST NOT BE USED.

3.4. Fitting the Ram to the Mast

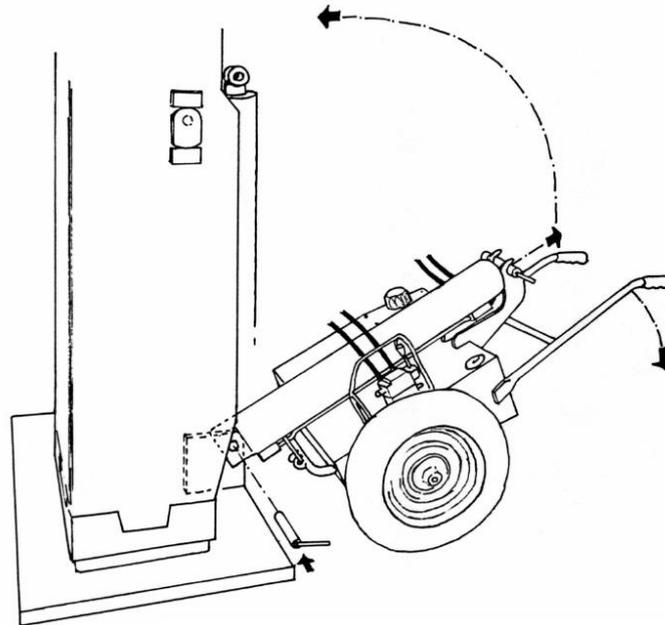
Ensure the preliminary checks are completed satisfactorily before attempting to attach the ram(s) to the mast.

Single ram attachment procedure;

Connect the unit to a suitable power source either from within the mast base or via a portable generator, minimum 2.5Kva. With the ram attached to the motor/pump unit as described in the previous section, switch on the power supply and remove the lower ram anchor pin. Wheel the unit up to the mast and align the ram with the ram anchor gusset on the mast. Tilt the

handles upwards and offer the lower end of the ram to the anchor gusset as indicated. Align the holes and insert the lower ram anchor pin and secure with the retaining pin provided.

With the pump unit still inclined, operate the control valve to extend the ram and allow the upper ram anchor pin to be released. Grasp the upper end of the ram and lift it towards the mast whilst simultaneously releasing the ram support/lifter bracket from the lower location bracket on the motor/pump body.



The ram is finely balanced at this position and must therefore be supported against the mast by hand to prevent it being accidentally toppled backwards.

Extend the ram until the upper end is aligned with the upper ram anchor gusset. Insert the pin and secure with its retaining pin.

Double ram attachment procedure;

When to use the brake or stabiliser legs is a matter of personal preference. As a general rule the legs are not required when fitting the rams to the mast.

Remove the upper ram anchor pins from their transit position and free the upper ends of the rams. Remove the safety bar from its transit position (upper holes), and swing the rams to the vertical. Insert the safety bar through the lower ready position holes to prevent the rams from toppling. The rams are now ready to be attached to the mast. Never attempt to swing the rams with the piston rods extended. They are very heavy and will not be balanced.

Remove the lower mast door cover. Push the counterbalance up to and around the mast with the lower ends of the rams adjacent to the lower ram anchor gussets. Operate the remote control switch to extend the rams towards the upper ram anchor gussets.

On models with two rams the rams may not extend at the same rate due to slight differences of internal friction. It is essential that the upper end of **BOTH** rams are extended **BEYOND** the holes in the upper ram anchor gussets before attempting to fit either of the upper ram anchor pins.

Retract the rams and insert upper anchor pin to the first ram and gusset to align. Ensure the pin is fully inserted with the pin handle touching the gusset. Continue to retract the rams and fit the second pin as the holes align. The first ram will begin lifting the trunnion pins from their slots on the counterbalance frame.

With both rams secured at their upper end and the trunnion pins clear of the slots, pull the safety bar from the counterbalance frame and carefully allow the lower end of the rams to swing towards the mast. Pull the counterbalance chassis rearwards away from the mast and manoeuvre to one side of the base.

Extend or retract the rams as necessary to align the lower holes and insert the lower ram anchor pins. If the horizontal axis of the lower holes through the rams is misaligned, it is possible to rotate the ram body using the safety bar as a lever whilst the ram is extending or retracting. The order in which the lower ram anchor pins are inserted is unimportant.

3.5. Lowering the Mast

DO NOT ATTEMPT TO LOWER THE MAST IF THE WIND SPEED IS 30KPH (18MPH) OR GREATER.

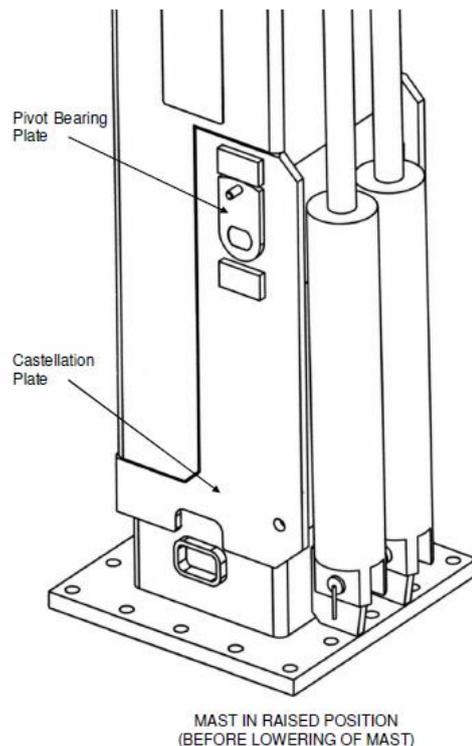
The pivot bearing plates may be fitted with transit bolts which may be retained after installation for locking purposes. Slacken these bolts sufficiently to allow the bearing plates to rotate. The relative positions of the pivot bearing plates and the bearing lugs for various stages of the lowering and raising process are shown in the operating sequence diagram as illustrated below. Reference should be made to these sequence diagrams during operation of the mast.

Turn the bearing plate through 90° and extend the hydraulic ram(s). As the ram(s) extend, the hinged part of the mast will be observed lifting relative to the fixed part. Continue to lift until the pivot tube limits the travel of the slot behind the pivot bearing plate. Turn the pivot bearing plate a further 90° until it is pointing vertically upwards.

Retract the ram(s) to begin the lowering sequence and maintain a steady pressure on the lever of the control valve. There may be some slight vibration of the mast shaft at the commencement of lowering due to the reversal of the clearances in the pivot components and anchor pins, but this will cease very quickly provided the control valve lever is not released.

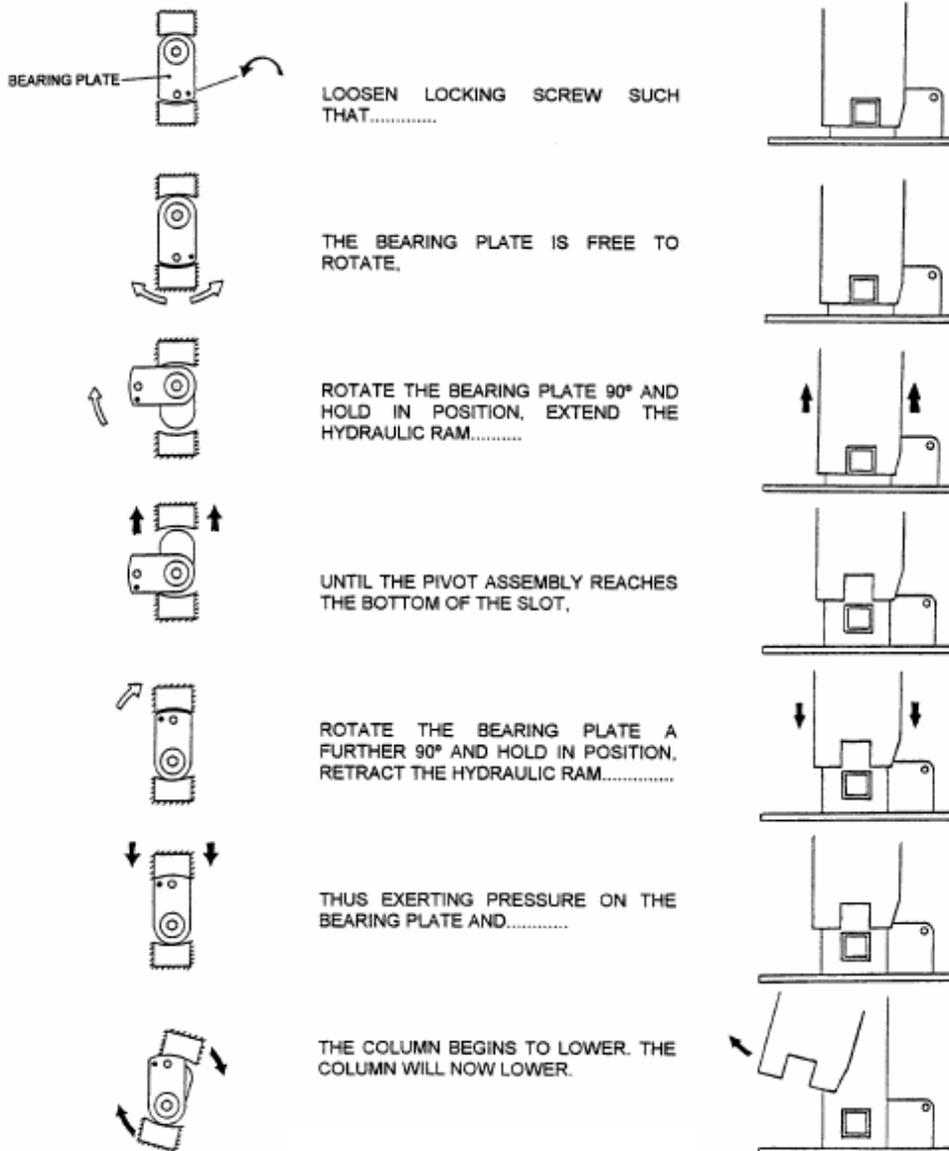
Once a smooth descent is under way, this lever can be released to stop the mast at any desired position.

When the mast is nearly horizontal, position a suitable support below the shaft at approximately 2/3 its height and on an overlap joint (see section 3.1).



LOWERING SEQUENCE FOR DMD MASTS

(GL620 to GL1000 Masts)



3.6. Raising the Mast

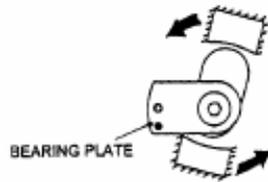
Operate the up button of the remote control box such that the rams extend and the hinged part of the mast is raised into a vertical position. Ensure as the raising progresses that the flexible conduits do not get trapped between the fixed and hinged parts of the mast. Fully extend the rams and wait for any oscillations of the shafts to decay. Insert the safety bar through the holes in the lid side plates as illustrated.

Swing the bearing plate through 90° away from the bearing lug and reverse the control valve to retract the rams. Ensure that the castellations locate on their respective mating faces. When the castellations are fully engaged, rotate the bearing plate through a further 90° such that it is pointing vertically downwards and tighten the transit bolt.

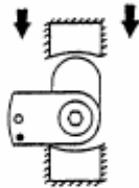
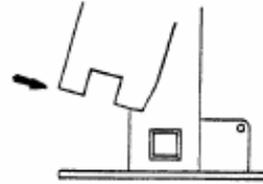
Remove the safety bar.

RAISING SEQUENCE FOR DMD MASTS

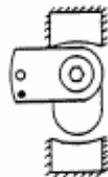
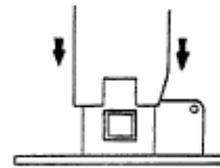
(GL620 to GL1000 Masts)



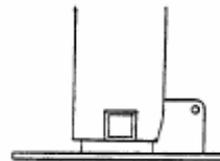
EXTEND HYDRAULIC RAM UNTIL COLUMN IS VERTICAL AND OSCILLATIONS HAVE CEASED.



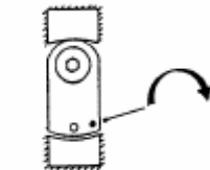
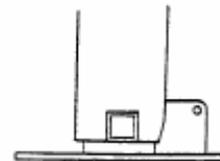
HOLD THE BEARING PLATE IN POSITION AND RETRACT THE HYDRAULIC RAM SUCH THAT.....



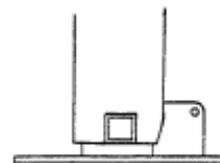
THE PIVOT ASSEMBLY MOVES TO THE TOP OF THE SLOT, CHECK THAT THE SIDE PLATES HAVE LOCATED ON THE LUGS AT THE SIDE AND REAR OF THE COLUMN BASE.



RELEASE THE RAM CONTROL AND ROTATE THE BEARING PLATE 90°.



TIGHTEN THE LOCKING SCREW AND ENSURE THAT THE BEARING PLATE CANNOT ROTATE.



3.7. Removing the Ram(s)

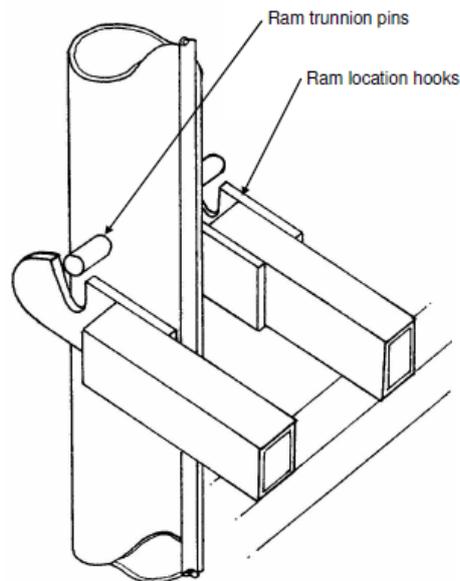
CHECK THAT THE MAST IS PROPERLY DOCKED AND THAT THE BEARING PLATES ARE IN THEIR LOCKED POSITION.

Reposition the counterbalance in front of the mast.

As with fitting the rams to the mast, when to use the brake or stabiliser legs is a matter of personal preference. As a general rule the legs are of greatest use when attaching the rams onto the trailer since the uneven weight transfer will compress the suspension and misalign the trunnions.

Extend or retract the ram(s) such that the lower ram anchor pins come loose and can be removed (one at a time). Retract the ram(s) until they clear the lower ram anchor gussets. Pull the counterbalance up to and around the mast. Pull the lower end of the ram(s) away from the mast and insert the safety bar through the lower ready holes such that the ram(s) will be retained in a near vertical position when the ram trunnion pins are sat in their location hooks.

Extend the ram(s) and guide the trunnion pins into their location hooks. Remove the upper anchor pin of the FIRST ram to fully engage in its slots.



When the second ram is engaged in its location hook remove the upper ram anchor pin.

Fully retract both rams BEFORE removing the safety bar. Tilt the rams back to the transit position and secure their upper end to the counterbalance using the upper ram anchor pins.

Refit the safety bar to the transit position on the counterbalance and refit the lower ram anchor pins to the rams.

Lower the safety barrier to its transit position on top of the safety bar and refit the retaining pins and clips.

Switch off the electric motor and disconnect power supply.

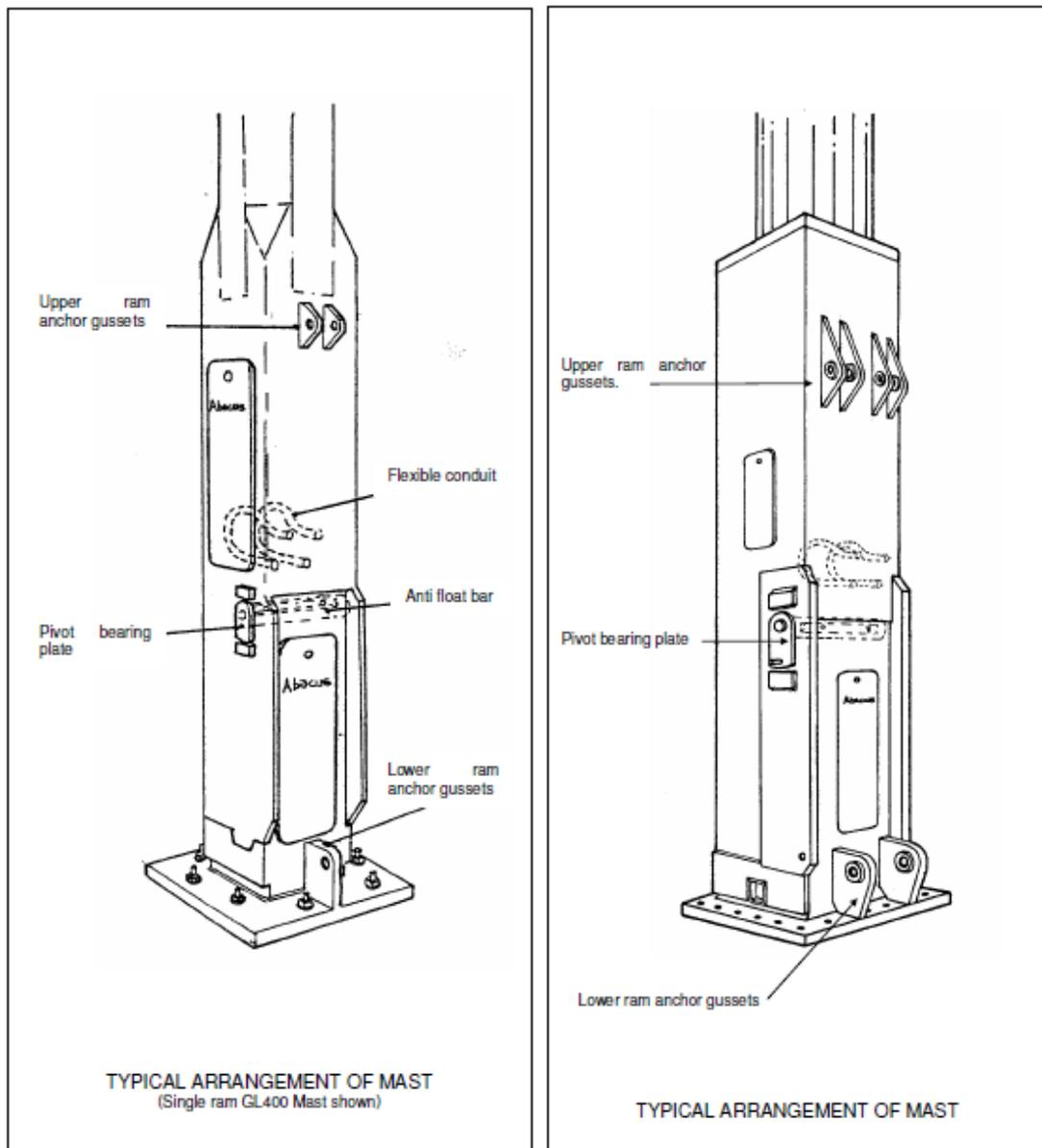
Refit the lower door cover to the mast and secure with the retaining screw.

4. Maintenance

WE STRONGLY RECOMMEND THAT THESE INSTRUCTIONS ARE READ CAREFULLY BEFORE ATTEMPTING ANY MAINTENANCE ON THIS EQUIPMENT.

4.1. Mast Type Identification

The masts are of galvanised steel construction typically with tapering slip joint type multisided shafts. They can be identified by measuring the width of the base at hinge level. The width, in millimetres, forms the numerical part of the product code - i.e. 400, 520, 620, 720, 800, 880 or 1000mm respectively. The illustrations below are typical arrangements of the grand-lume mast types (single and double ram variants shown).



4.2. Masts

Maintenance requirements are minimal but the following checks are recommended at the intervals stated.

Note that lubrication of the hinge assembly is not recommended.

4.2.1. Every Time the Mast is Lowered

1. Check that all external hinge components are present and undamaged before attempting to lower the mast.
2. Check that the flexible conduits are not damaged.

4.2.2. Every 12 Months

1. Check that all hinge components are present and undamaged.
2. Check the anti float bar is present and the screws securing it to the pivot are present and tight.
3. Check that the foundation bolts have not worked loose. The required torque settings are given in section 2.2.
4. Check that the upper and lower ram anchor gussets are not damaged.
5. Check warning label is attached to the base.
6. Check the door covers are secure and that the screw functions satisfactorily. Lightly grease the screw thread.

4.2.3. As Required

1. Paint the shafts and base. Aesthetically the galvanised finish will typically last 5 - 7 years before painting is required. In polluted or saline environments this may be shorter and in a mild climate considerably longer.

4.3. Counterbalances

WE STRONGLY RECOMMEND THAT THESE INSTRUCTIONS ARE READ CAREFULLY BEFORE ATTEMPTING TO CARRY OUT MAINTENANCE ON THIS EQUIPMENT.

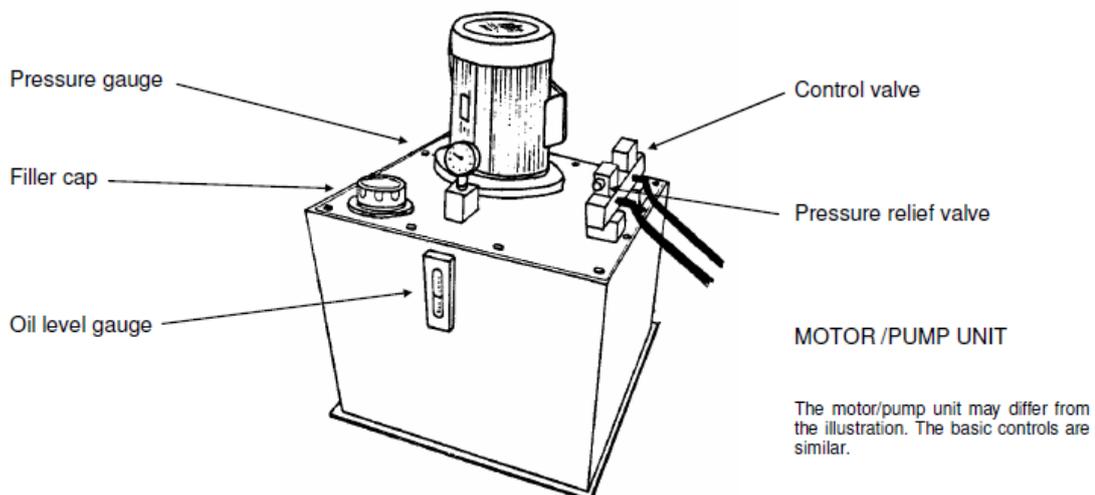
4.3.1. Routine Maintenance

Due to its irregular usage it is difficult to specify a periodic maintenance schedule. However we recommend that the following simple checks be carried out at 12 monthly intervals and any defective items replaced.

Check the oil level in the tank. This should be carried out with the tank as near horizontal as possible and with the rams fully closed. The oil level should be to the centre of the clear indicator panel on the tank side or to the level mark if one is provided. Tank capacity is 80 litres and should be topped up with Renolin Hydraulic Oil CL Range Ref CL46 (or equivalent). Note that If the oil level is exceeded with the rams extended, oil may be expelled from the filler cap during lowering of the column.

Examine the hydraulic hoses that link the rams to the pump unit control block and ensure that the couplings and connections are firm, intact and free from leaks. Refer to 4.4 **Error! Reference source not found.** for detailed information on hose inspection and replacement.

Check that the electrical flex and plug for damage and then connect it to the mains, ensure the same voltage is being used i.e. 110v, 240v or 415v. Check that the electric motor is running by operating the up button on the remote control box to extend the ram a short distance. Press the down button to retract the ram. Both movements up and down should be smooth and jerk free.



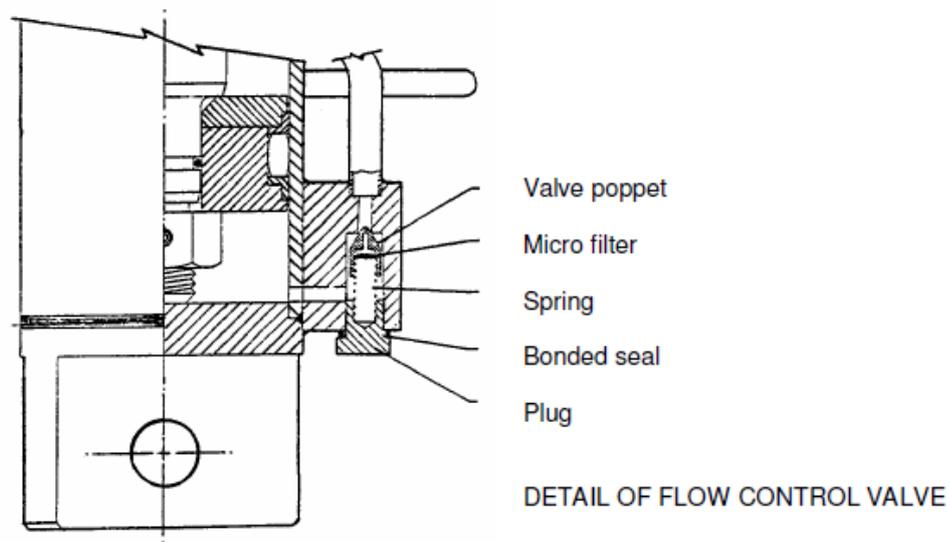
Before attempting any work on the flow control valve ensure the ram is fully closed and supported in the vertical position, with the flow control valve uppermost. Switch off the electric motor and operate the up and down buttons on the remote control several times to depressurise the hydraulic circuit. Clean the area around the large plug.

Removing it will expose the spring and valve poppet. Check that the micro filter inside the valve poppet is present and remove. Clean and dry all components and check that the orifice (0.7mm bore) is unobstructed. Check that the filter has not collapsed due to heavy contamination. Carefully reassemble the components paying particular attention to cleanliness. Replace the bonded seal and plug and tighten securely. **CAUTIONARY NOTE: THE RAMS WEIGH 300Kg EACH. ENSURE THE CORRECT MANUAL HANDLING TECHNIQUES ARE USED AT ALL TIMES WHEN LIFTING OR MOVING THE RAMS. USE MECHANICAL HANDLING EQUIPMENT TO REMOVE THE RAMS FROM THE TROLLEY.**

The hydraulic ram can, if necessary be bled to remove any air that has entered the system. To do this requires the ram to be removed from the trolley and laid horizontally with the flow control valve blocks uppermost. (See cautionary note above). The procedure is as follows. First, slightly raise the top end of the ram and fully extend the piston. Second, slightly raise the flow control valve end of the rams and fully close. The ram can then be returned to the trolley.

Check that the flow control valve is functioning correctly. This is accomplished by extending the ram about 300mm then retracting it. During retraction the reading on the pressure gauge should not be less than 1500psi. The pressure will increase to the relief valve pressure of 5000psi as the end of the stroke is reached.

Ensure that the upper and lower ram anchor pins are present and undamaged. The pins are colour coded green and are 65mm diameter. The lower pins and the upper pins are both 245mm long.



Check that the relief valve pressure is correctly set at 5000 ± 100 psi, by operating the remote control unit to retract the rams when they are already fully closed. The pressure should rise quickly and stabilise at the correct value. If the reading is incorrect adjust the pressure relief valve setting as follows:-

The relief valve is located below or adjacent to the control valve. Some valves are fitted with a screwed cap which must be removed to allow the adjustment to be made. Hold the centre adjusting screw with an Allen key and slacken the locknut. With the ram fully closed, operate the control valve such that the relief valve pressure can be read on the pressure gauge. Turn

the Allen key clockwise to increase the relief valve pressure and anticlockwise to decrease it. When the correct reading has been obtained, tighten the locknut and recheck the pressure setting. Refit the screwed cap if provided.

Examine the hydraulic rams, in particular the area around the seal, for any signs of damage and oil leakage. Fully extend the piston rod of each ram in turn and check the polished surface for signs of bruising and corrosion pitting. Either will cause failure of the gland seals.

Check that the safety bar is present, undamaged and of the correct size at 30mm dia. x 1110mm long. The two retaining clips should also be present and fitted to the safety bar.

Ensure that the safety barrier is in place and undamaged. Check that the retaining pins and clips are present, undamaged and fitted correctly.

Check that the wheels on the unit are operational and retained in position. The tyres should be fully inflated to a maximum pressure of 36psi.

DO NOT USE THE UNIT UNLESS ALL THESE CHECKS ARE SATISFACTORY.

4.4. Hydraulic Hoses

Hydraulic hoses have a finite life and must be inspected, tested and replaced in accordance with the table below;

Age	Recommendation
Up to 3 years	Use without further testing
3 to 5 years	Use after representative samples subjected to a proof pressure test.
5 to 8 years	Use after representative samples subjected to proof, impulse and burst pressure tests and cold bend and electrical tests.
Over 8 years	Scrap

5. EN 1090 Certificate of Conformity

Certificate of Conformity of the Factory Production Control GB14/91485

In compliance with the Construction Products Regulation 2011 (retained EU law EUR 2011/305) as amended by the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and the Construction Products (Amendment etc.) (EU Exit) Regulations 2020, this certificate applies to the construction product(s)

Execution of steel structures and aluminium structures.

placed on the market under the name or trademark of

Abacus Lighting Ltd

Oddicroft Lane Sutton in Ashfield Nottinghamshire NG17 5FT United Kingdom

and produced in the manufacturing plant(s)

Abacus Lighting Ltd

Oddicroft Lane Sutton in Ashfield Nottinghamshire NG17 5FT United Kingdom

has been assessed and certified as meeting the requirements of

EN 1090-1:2009+A1:2011

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard(s) under system 2+ for the performances set out above are applied and that the factory production control fulfils all the prescribed requirements for these performances.

This certificate is valid from 01 August 2022 until 01 August 2025 and will remain valid as long as the test methods and/or factory production control requirements included in the designated standard, used to assess the performances of the declared essential characteristics, do not change, and the construction product and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the factory production control certification body.

Issue 6. Certified since 06 June 2014.

Authorised by



H. Crick – UK Business Manager

SGS United Kingdom Ltd Approved Body 0120
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Certificate of Conformity of the Factory Production Control
GB14/91485, continued

Abacus Lighting Ltd

EN 1090-1:2009+A1:2011

Issue 6	
Description	Execution of steel structures and aluminium structures.
Steel Type	Steel in grades: S235, S275, S355
Complementary designated Standard of Technical Requirements	EN 1090-2:2018
Execution Class	EXC2
Method of Declaration acc. to table A.1 of EN 1090-1	Method 2, 3b
Welding Process	111, 131, 141
Durability	No performance declared



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6. CE Marking

 0120	
Abacus Lighting, Oddicroft Lane, Sutton-in-Ashfield, Nottinghamshire, NG17 5FT, UK 14 GB14/91485, GB14/91821, GB14/91819	
EN 1090-1:2009+A1:2011 Grand-Lume mast	
Tolerances:	EN1090-1
Weldability:	S275 & S355
Fracture toughness:	27J at 0°C
Reaction to fire:	Class A1
Release of cadmium:	NPD
Emission of radioactivity:	NPD
Durability:	Galvanised
<u>Structural characteristics:</u>	
Standards:	ILP PLG07
Load bearing capacity:	See calculations
Deformation at SLS:	See calculations
Fatigue strength:	NPD
Resistance to fire:	NPD
Calculation reference:	GL-RANGE
Manufacturing:	EN1090-2: EXC2

7. Environmental Advice

7.1. General

WE STRONGLY RECOMMEND THAT THIS ENVIRONMENTAL INFORMATION IS READ CAREFULLY BEFORE ATTEMPTING TO OPERATE AND STORE THIS EQUIPMENT.

Operatives should be familiar with the requirements of the following documentation-

- i) Pollution Prevention and Control Regulations
- ii) Control of Pollution (Oil Storage) Regulations
- iii) Control of Substances Hazardous to Health Regulations
- iv) Hazardous Waste Regulations
- v) Environmental Protection Act

7.2. Information

Hydraulic counterbalances incorporate the use of hydraulic oil to successfully raise and lower a range of Abacus Lighting columns and masts.

Each counterbalance unit will have an oil reservoir, whether this will be separate on a trolley (usually for raising and lower bigger masts) or on the same assembly as the hydraulic ram. Each reservoir will have a 'breather cap' on top of the tank which is required for using a hydraulic system, the breather cap will leak out oil if the unit is tipped at any point therefore it must be kept upright to prevent this from happening.

Before use ensure that all the hydraulic hoses are connected properly to prevent any spillages when in use.

If you store or use oil you should be prepared for any spillages, keeping a stock of absorbent materials and ensuring the operatives are trained to deal with any spills that may occur. If there is a spill immediate action should be done to prevent the oil from entering any drains or water courses.

If absorbents are used to combat a spill, they may well be classified as hazardous waste and should be treated as such.

8. Equipment Classification

The counterbalance for use with a base hinged mast should be considered as an integral part of the mast which may sometimes be partly or wholly situated on a removable unit. The primary function of the product, including sub-components, is as a mast for lighting purposes or otherwise. The raising component of the mast cannot be readily altered. It should not therefore be considered as 'lifting equipment' in the normal sense of the term (such as a crane, fork lift truck or accessories such as chains, slings or eye bolts) and as such does not fall under the Lifting Operations and Lifting Equipment Regulations (LOLER) 1998.

Abacus appreciates however that some customers may make an internal decision to classify the equipment, either partly or wholly, under LOLER 1998 in order to maintain continuity with existing asset management protocols. If this is the case then Abacus can supply the necessary Safe Working Load signage and advise on the requisite maintenance.