

SY 220 / SY 225 & SY 250 Series Underwater lights and Cameras

MECHANICAL INSTALLATION OF A WELD-IN FLANGE

Please read ALL the following pages before attempting installation to ensure complete understanding of what is required

BEFORE YOU START

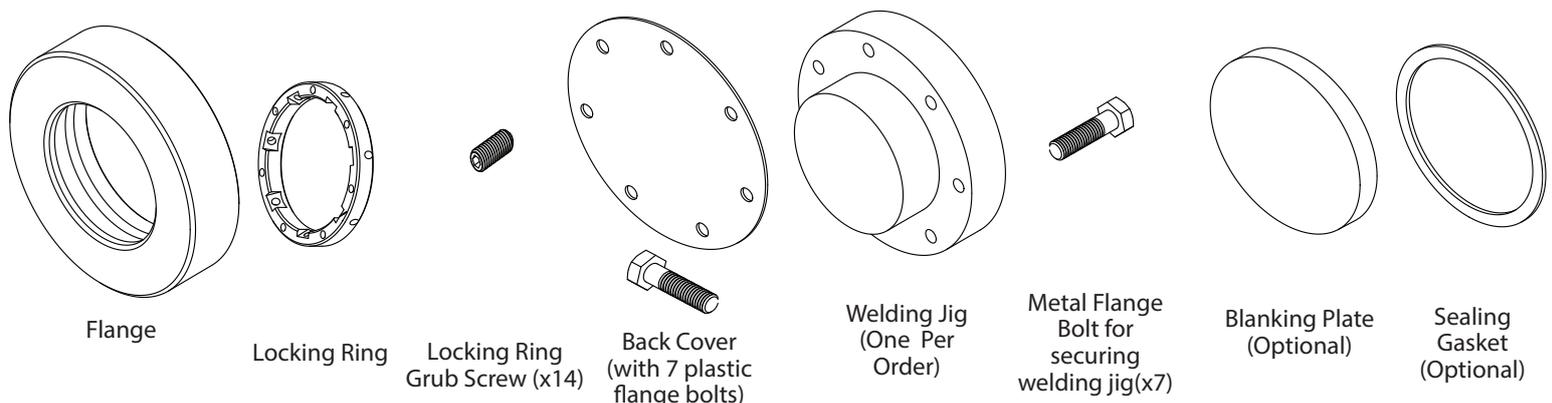
This document describes the recommended method for installing the weld-in flanges of Lumishore SY 220 and SY 250 series lights and cameras in order to provide a water tight seal between the flange and the hull. The weld placement, and recommended practices are described below.

CAUTION

- During Welding Care is to be exercised to avoid excessive heat build-up which could cause distortion. Regular checks should be made during and after welding to ensure the flange has not distorted, and that the locking ring fits in with ease.
- EXERCISE EXTREME PRECISION WHEN CUTTING THE HOLE IN THE VESSEL. The hole should be cut with an even gap of 2mm around the flange.
- Remove the installed Glass retaining ring prior to welding.
- ALWAYS use the welding jig when welding the flange
- Locate the flange centrally to the hole before welding. If the flange is off centre the larger gaps will cause excess heat build up and could cause distortion.

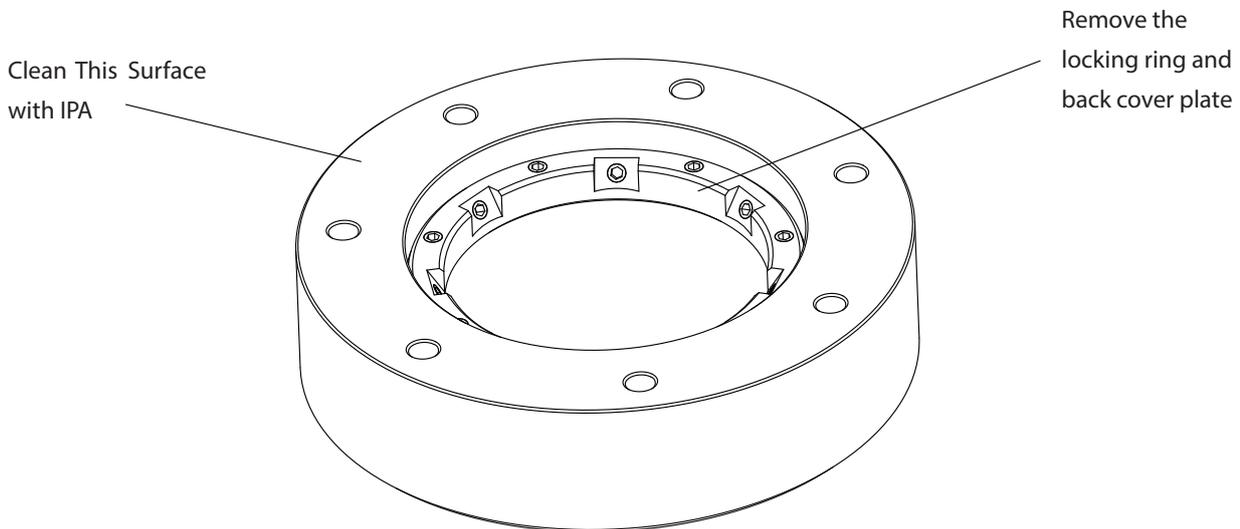
Note: The hole size will vary with flange size and angle – refer to product drawings for further information. The welding practice described below is the recommended practice, however it is the yards responsibility to ensure that all welding and underwater light arrangements are compliant to practices as required by the appropriate classification society and rules. In some circumstances, as required by appropriate classification society and rules, it may be necessary to install a coffer dam to contain the light / flange assembly.

Parts Supplied

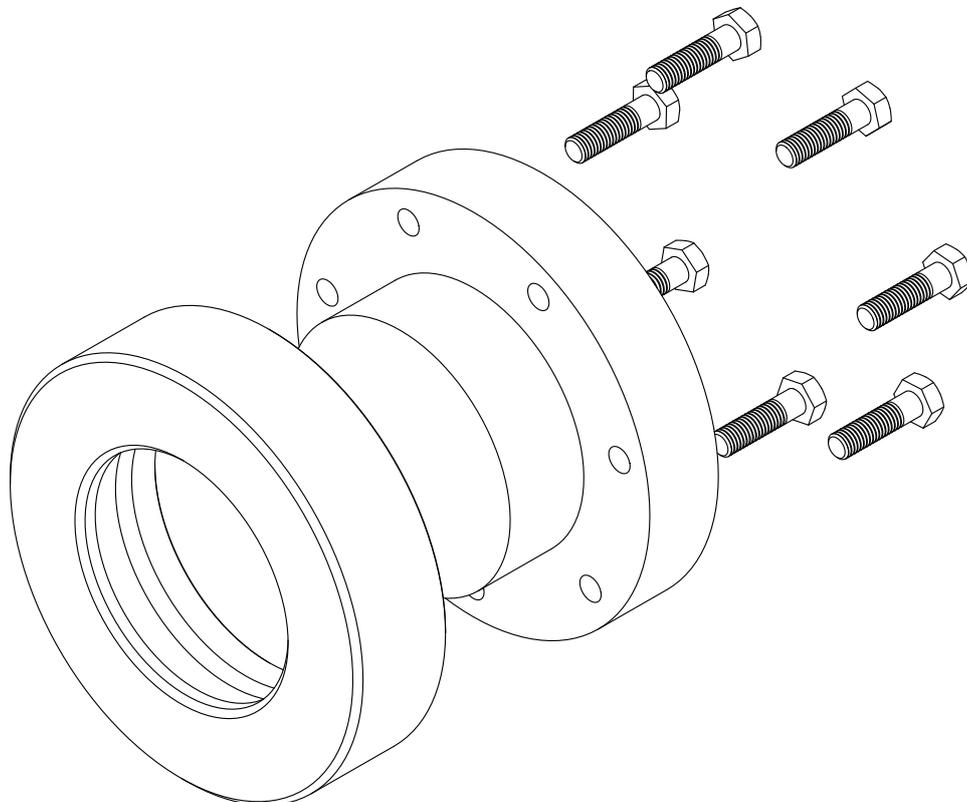


FLANGE PREPARATION

- 1) If installed remove the retaining ring, blanking plate and rear cover from the flange prior to welding. KEEP THE PARTS SAFE AS THEY WILL BE NEEDED LATER.
- 2) Using IPA thoroughly clean the mating surfaces of the flange and welding jig. Ensure that there is no damage, dust, grease or dirt particles on this surface.



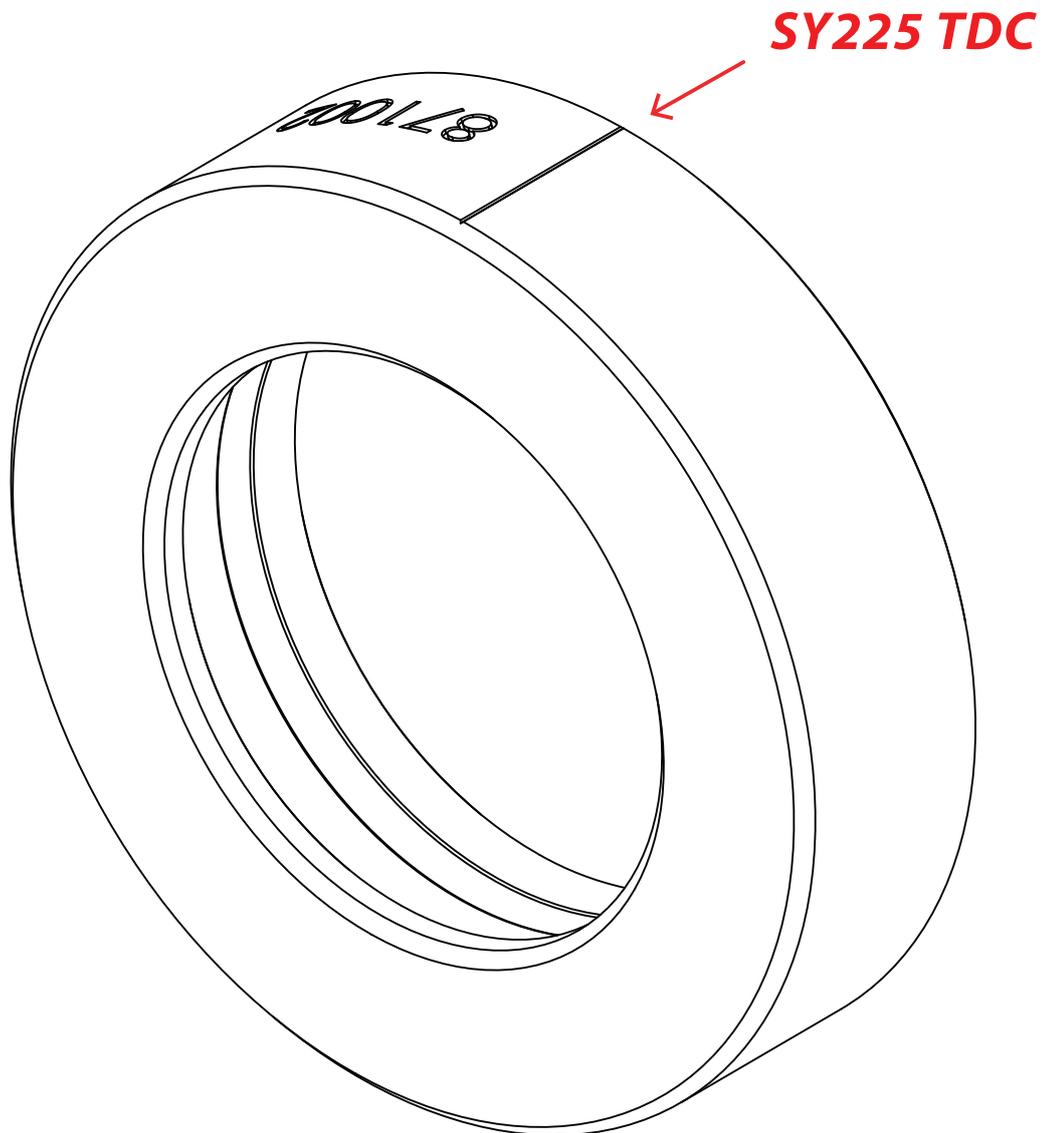
- 3) Mount the welding jig to the flange and position so that the mounting holes align correctly.
- 4) Secure the welding jig to the flange using the METAL bolts provided. Tighten each bolt to $25\text{Nm} \pm 2\text{Nm}$. The flange and welding jig are now ready to be mounted in position ready for welding.



Note: The welding jig is provided to assist with the welding procedure, use of the welding jig does not guarantee distortion free welding, care should be exercised to ensure hole cut accuracy, correct flange positioning, and ensure excess heat is avoided during welding.

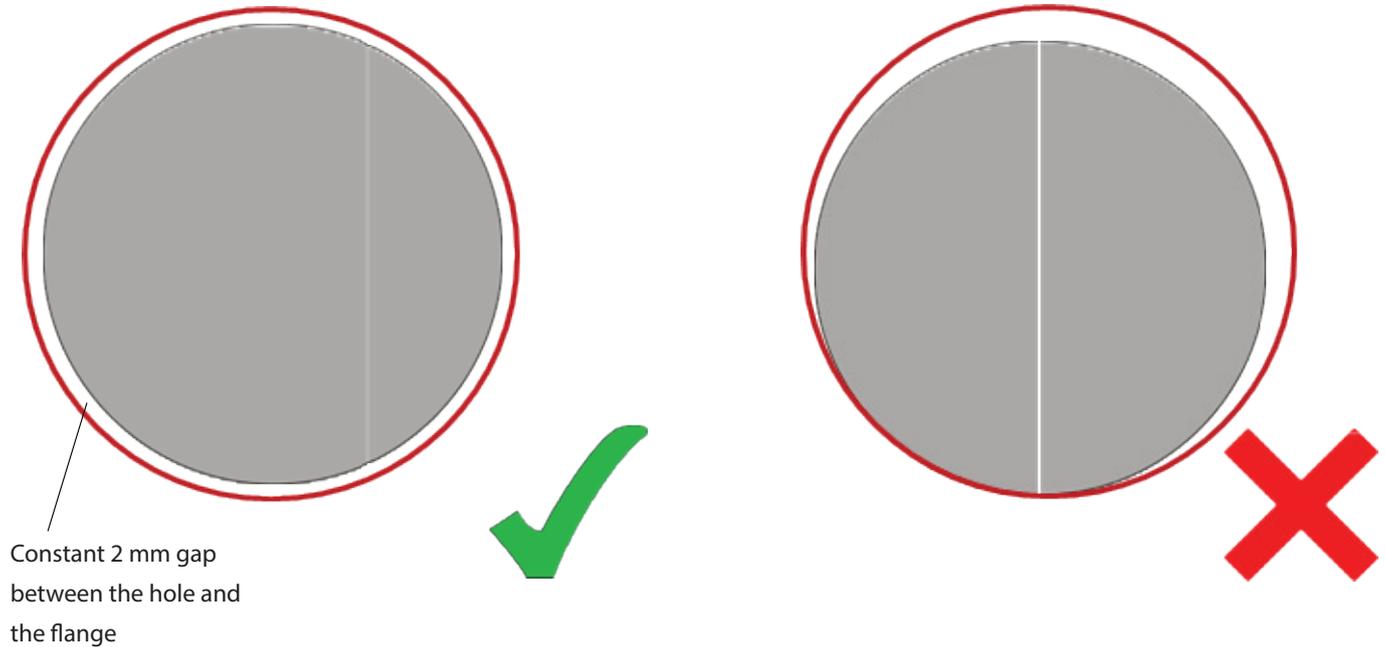
SY225 FLANGE TOP DEAD CENTER

NOTE : IT IS IMPORTANT TO KNOW THAT THE SY225 FLANGE REQUIRES TO BE INSTALLED IN THE CORRECT ORIENTATION. A TOP DEAD CENTER (TDC) MARK HAS BEEN ADDED TO THE FLANGE TO AID IN IDENTIFYING THE CORRECT ORIENTATION



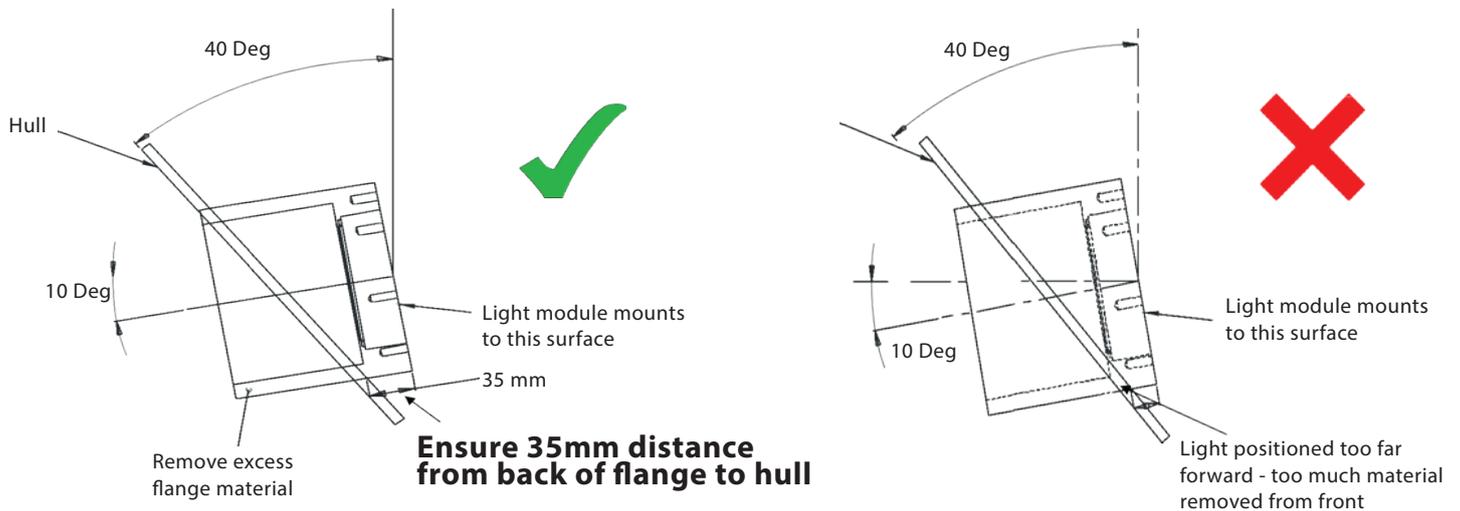
Positioning The Flange

Place the flange in the centre of the cut out - Maintain a constant 2mm gap around the flange diameter



The flanges should be installed with a minimum distance of 35mm from the inner hull surface to the back face of the flange. Do not position the flange further forward as this will result in too much material being removed from the front of the flange.

The diagram below shows an example position for a 40 degree hull angle with a light position of 10 degrees downwards



TOOLS

- Hole cutting and edge preparation tool (e.g. Hole saw, router, Plasma cutter or other appropriate shipbuilding method.)
- Drill (if necessary).
- Welding equipment.
- Welding consumables (classification society approved and appropriate for this installation)
- Stainless Steel Wire brush.
- Cleaning chemicals and solvents.

PREPARATION

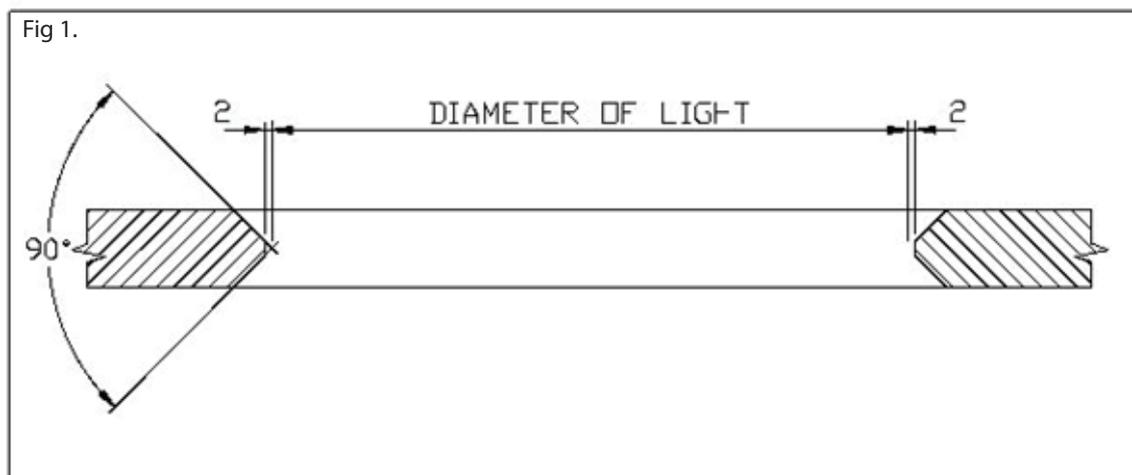
The position of the underwater lights requires careful consideration prior to installation. The designer needs to ensure that the position of the lights give the desired effect and level of illumination within the practical limitations described here.

It is recommended that the light is installed at least 250mm below the vessels light waterline. This is to minimise the effect of 'wave slap' upon the fitting, and lessen the likelihood of mechanical damage due to impacts with flotsam or moorings. The inner hull space around the light needs to be checked to ensure that there is adequate clearance for both the light fitting itself and to permit good access for installation and inspection. Cabling and other services need to be secured to prevent inadvertent damage during installation.

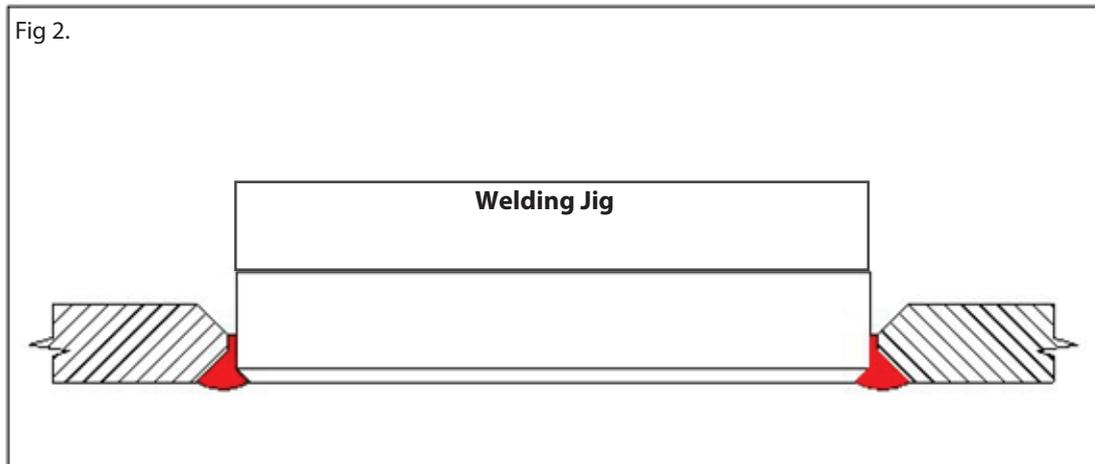
PROCEDURE

For illustration purpose the 'Flush type' light fitting flange has been used, however the procedure is also applicable to 'Angled type' fittings except where stated otherwise.

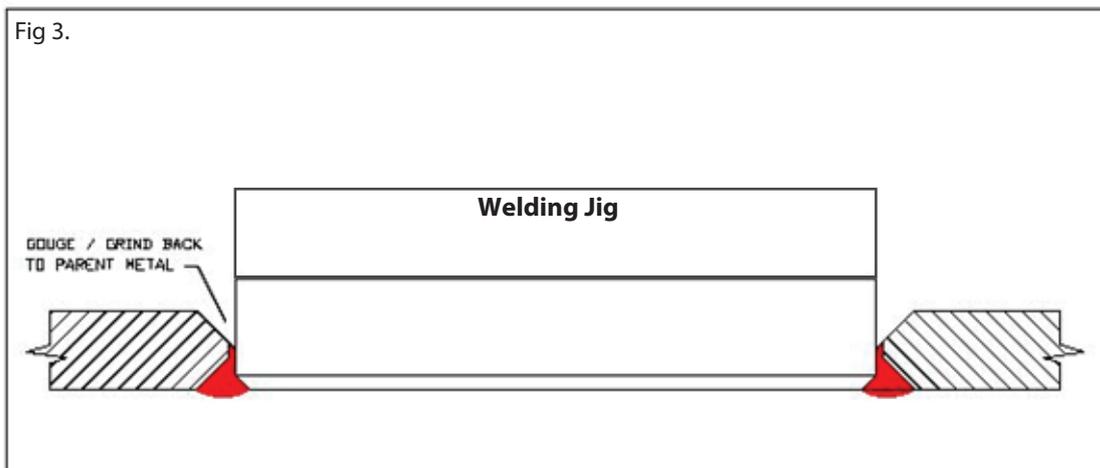
- 1) Mark centre of hole to be cut out. (Drill if required).
- 2) Cut hole (method to be decided by shipyard according to class society rules) to the diameter of the light fitting flange + 4mm (i.e. so that there will be a 2mm gap between the flange and the plating on either side).
- 3) Prepare edges of hole according to Fig. 1.



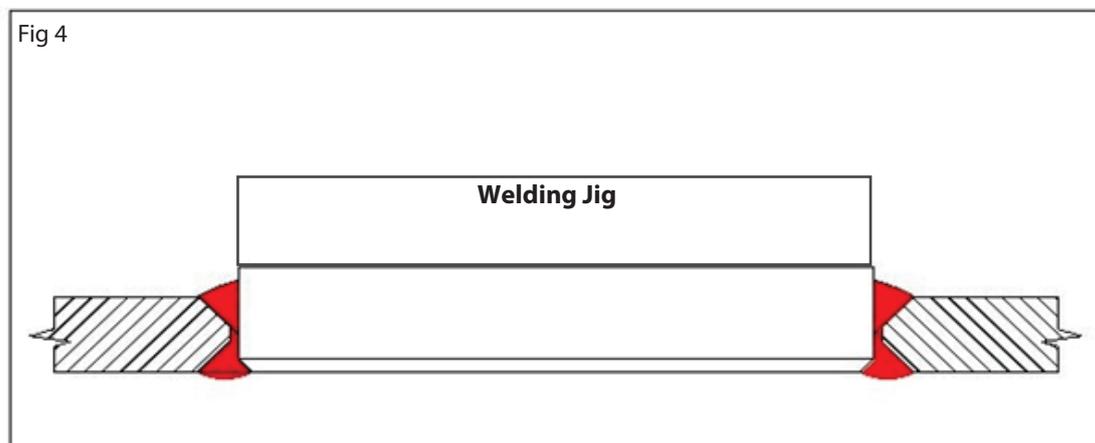
- 4) Degrease welding surfaces on light fitting flange and the hole using an appropriate cleaning chemical. Wear gloves to prevent body oils reaching the surface.
- 5) Brush surfaces using an abrasive brush.
- 6) Preheat surfaces if required (refer to appropriate classification society rules).
- 7) Secure light fitting flange in position (tack weld or other means).
- 8) Weld outer seam according to Fig. 2. Care is to be exercised to avoid excessive heat build-up which could cause distortion.



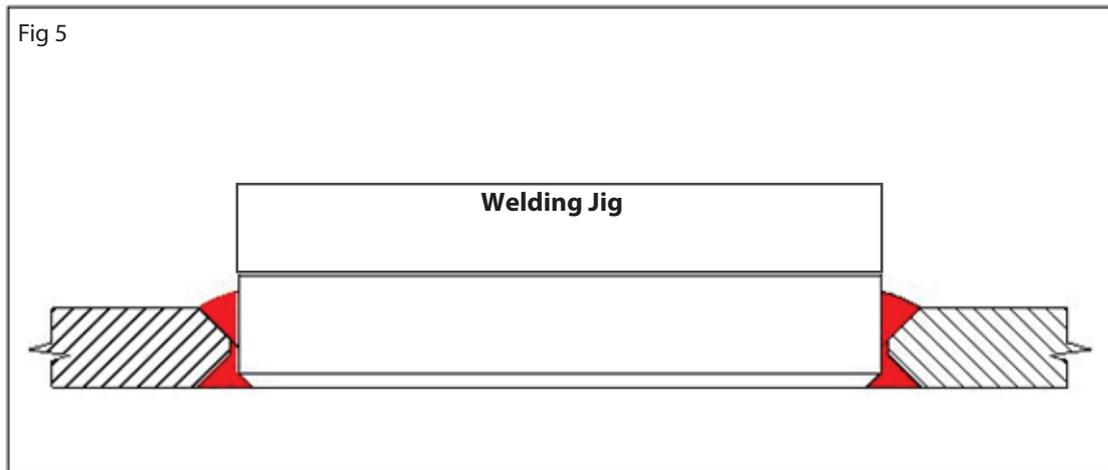
- 9) Gouge or grind back the reverse side of the weld to remove spatter, deposits etc. (Fig 3).



- 10) Repeat step 8 for inner sealing weld. (Fig 4).

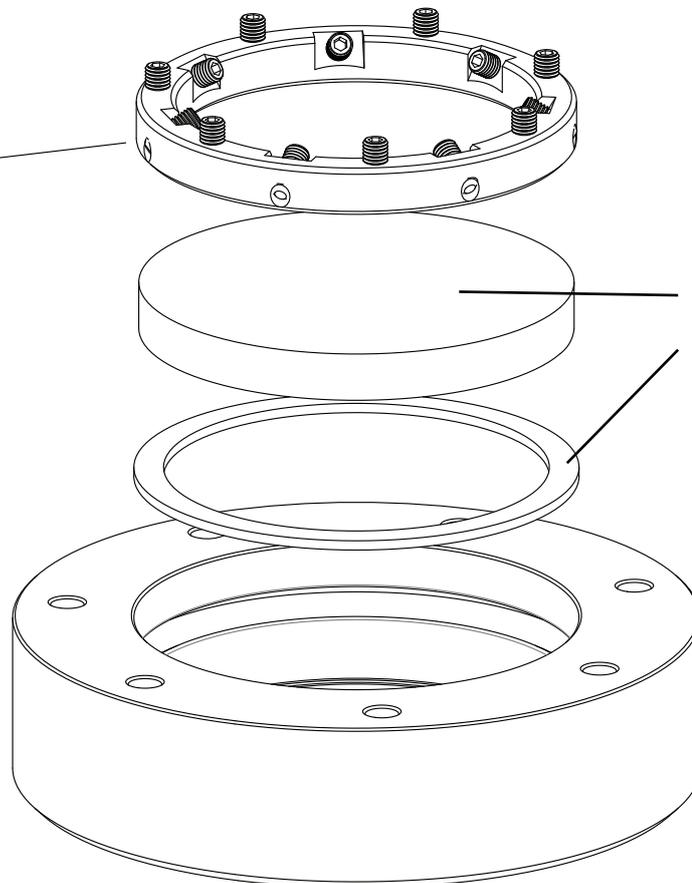


- 11) When cool, the outer weld is to be ground flush with the surrounding hull surface (Fig 5).



- 12) Visually inspect weld for porosity, voids etc. (class surveyor may require supplementary examination also).
- 13) Remove the welding jig from the flange.
- 14) Perform the following checks on the flange to ensure there has been no damage or warping:
- Using a straight edge, check the back of the flange is flat and has not warped
 - Check there is no warping or damage to the inside lip of the flange
 - Visually inspect the inside of the flange for any weld spatter, or damage

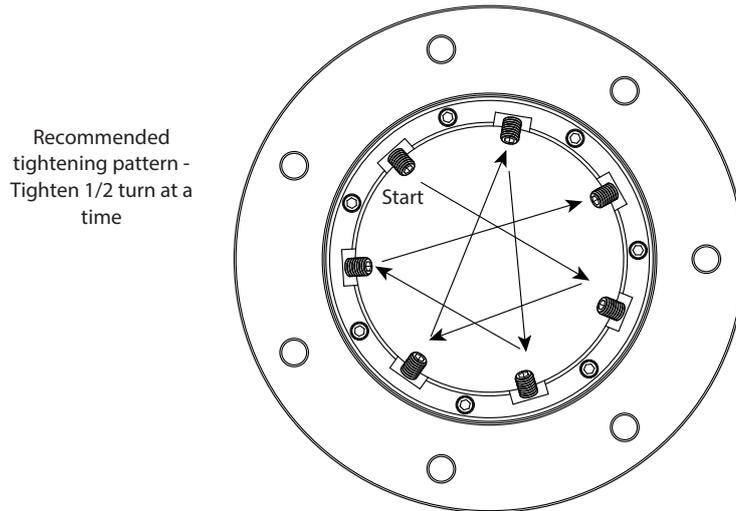
Place the sealing gasket, then blanking plate, then locking ring into the flange



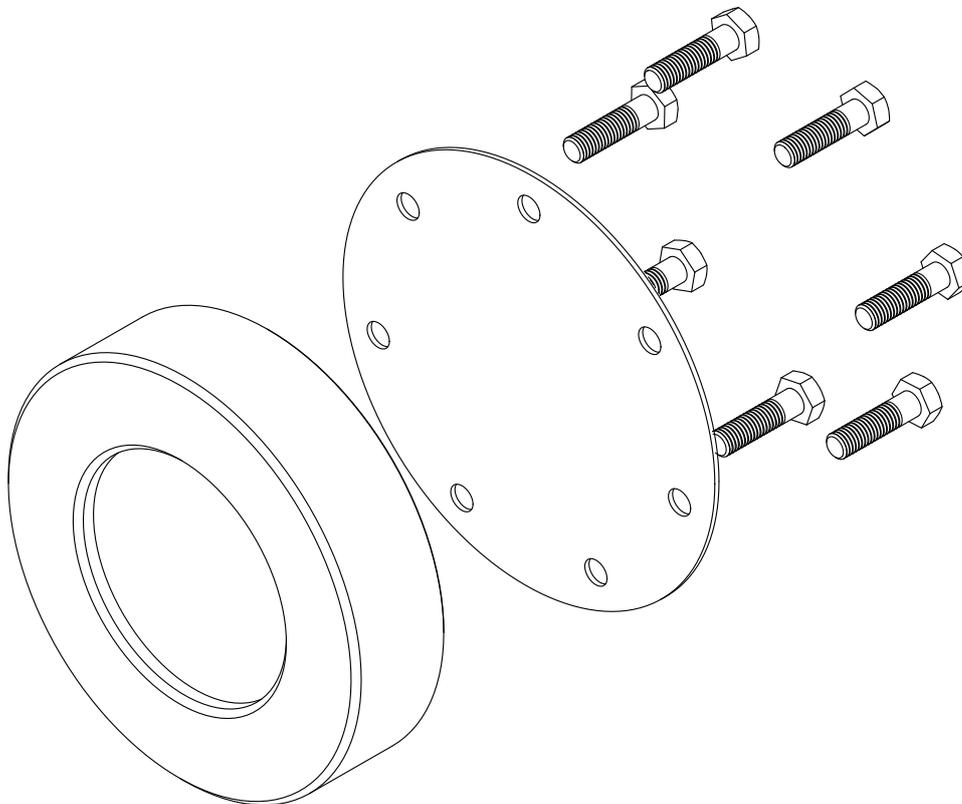
Note: The blanking plate and sealing ring are optional at the point of order

15) Place the sealing gasket and blanking plate into the flange - check they fit well and do not foul. Place the locking ring in. Tighten the angled screws first. USING A SUITABLE TORQUE DRIVER SET TO 1 Nm, tighten each grub screw one turn at a time, working in a cross tightening pattern (i.e. move to a screw opposite the one you have just tightened next - DO NOT move to the next screw in a the circle - see diagram below). Tighten until each screw achieves the desired torque.

16) ONLY IF A BLANKING PLATE IS FITTED - Tighten the screws on the flat face next. USING A SUITABLE TORQUE DRIVER SET TO 1 Nm, tighten each grub screw one turn at a time, working in a cross tightening pattern (i.e. move to a screw opposite the one you have just tightened next - DO NOT move to the next screw in a the circle - see diagram below). Tighten until each screw achieves the desired torque.



17) Fit the rear cover plate to the back of the flange and secure using the flange bolts



NOTE: Keep the rear cover plate, locking ring and blanking plate (if supplied) fitted until it is time to install the lens and light module.