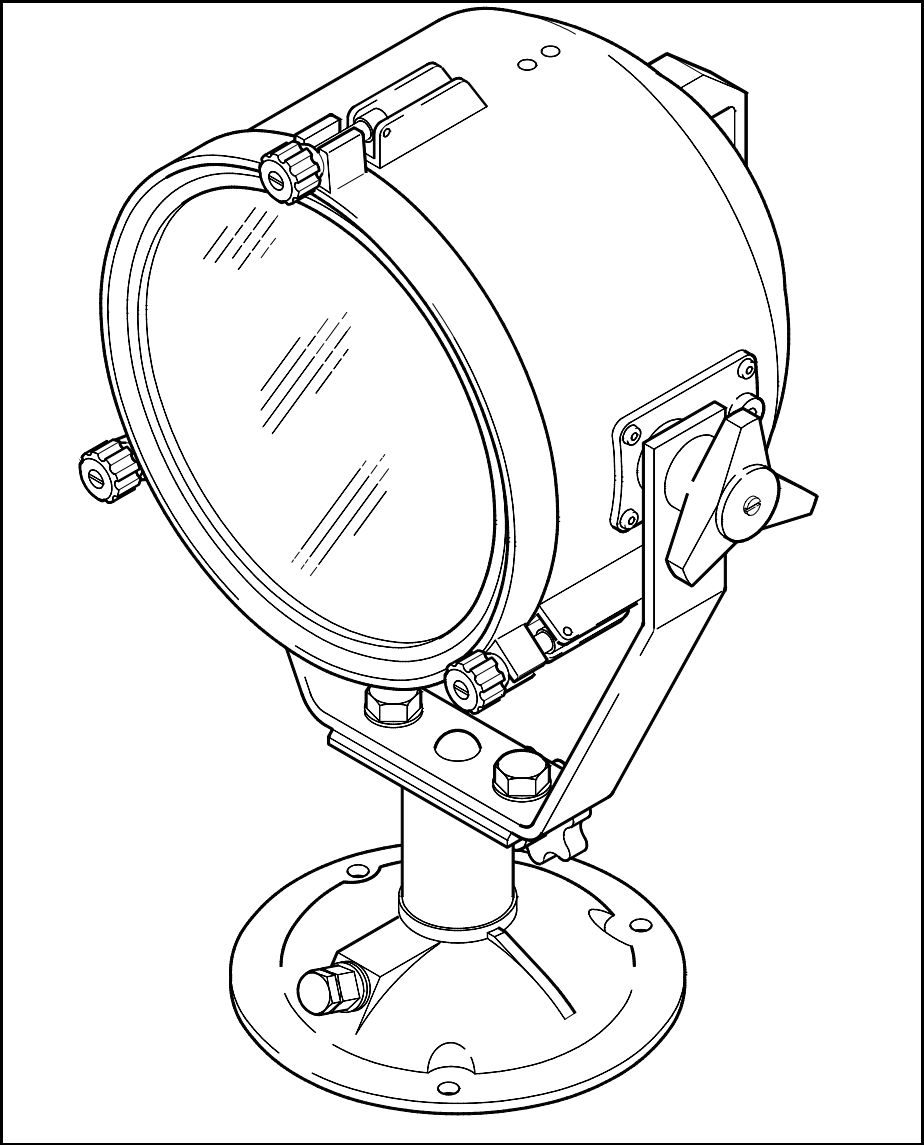


FR
230mm

Francis
SEARCHLIGHTS



**FR 230 Searchlight
User Information**

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USER INFORMATION FOR FR 230 SEARCHLIGHT

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User Information for FR 230 Searchlight

It is imperative that this manual is read carefully before installing or using your equipment. For your future reference this manual should be kept in a safe place.

Introduction

Thank you for specifying a product from the Francis Searchlights Ltd range. All Francis products are designed to give complete customer satisfaction and are manufactured to the highest engineering standards in order to ensure optimum performance and service life.

The Francis FR Series Searchlights combine design features proven over many years of service in the most hazardous conditions in both marine and land installations.

In order to prolong the life and performance of your product, we recommend that you only specify Francis Searchlights spare parts. This will also ensure that any warranties on your equipment will not be invalidated. Information on spares ordering and parts is provided in this manual.

Should you ever need to contact Francis Searchlights Ltd. regarding your equipment, please quote the Product Serial Number at all times. Please complete the following boxes for your future reference purposes.

| Product Number | Serial Number |
|----------------|---------------|
| | |

Safety Precautions

The following instructions must be adhered to in order to ensure a safe working environment and the safety of the user.

Note: *When manoeuvring the searchlight into its fixing position, suitable lifting points must be chosen in order to prevent damage to the equipment or personal injury.*

- Prevent rain, snow, condensation and water droplets from contacting the lamp as this may cause bulb failure, and possible shattering;
- Quartz halogen lamps run with a high internal pressure in excess of atmospheric. Whilst the construction is inherently strong, there is a slight risk of the lamp shattering;
- Never look directly into an illuminated searchlight as this may cause severe damage to eyesight. If it is necessary to inspect a lamp whilst in operation, always wear suitable protective goggles;

- Should it be necessary to examine the lamp with the front bezel removed, always use a protective shield to ensure a safe working environment;
- Never attempt to clean the lamp when in use;
- Searchlights get hot. Never touch the unit when lit and always allow at least ten minutes for cooling down after turning off;
- Ensure the lamp has cooled sufficiently before removal. During the cooling down period avoid mechanical or thermal shock to the lamp as this may cause shattering;
- If undue force appears necessary to remove the lamp, the equipment should be inspected by a competent person, or contact the manufacturer;
- When breaking a lamp for disposal, care must be taken to ensure that the fragments are safely contained. Precautions must be taken against flying glass and other fragments. This operation should be performed outdoors or in a well ventilated area. In ALL cases reference should be made to the lamp manufacturers instructions packed with the lamp;

- Due to the vast range of lamps available, it may appear possible that more powerful lamps can be used in the equipment for which it was designed. Even when the unit will physically accept a higher wattage lamp, this substitution is not recommended as it could be dangerous.

Technical Data

| Voltage (V) | Range (M) | PBCP (x1000) | Divergence (°) | Watts (W) | Lamp Cap |
|-------------|-----------|--------------|----------------|-----------|----------|
| 12 | 643 | 414 | 2 | 100 | GX6.35 |
| 24 | 784 | 614 | 2 | 150 | GX6.35 |
| 120 | 912 | 832 | 4.9 | 300 | GX6.35 |
| 240 | 888 | 790 | 4.9 | 300 | GX6.35 |

Unpacking Instructions

Care should be taken when unpacking the searchlight, so as not to cause damage to the equipment or cause personal injury. A visual inspection of the equipment should be conducted to check for damage during transit or damaged lamps.

Enclosed in the packing is the flange sealing gasket. This should be retained for installation purposes.

Installation Instructions

The following instructions should be read and fully understood prior to installing the equipment to ensure correct procedures are followed and all safety precautions are observed.

Note: *If the equipment has been in storage for a considerable time, it is advisable to conduct a routine maintenance check on all parts before installation.*

Safety Precautions

This equipment should not be connected to an electrical supply before being installed. Installation procedures should be adhered to in order to ensure a safe working environment and reduce the risk of damage or injury.

Preparing the Mounting Position

Using the template provided mark out and drill the fixing holes through the deck or cabin roof. In the case of cabin control models, a centre hole is also required to allow the mechanism to pass through.

Mounting the Searchlight

Fit the 'O' ring in position and bolt the searchlight base securely down. On an uneven surface it is necessary to use a suitable sealant, such as silicone, in order to ensure a weather proofed joint.

For cabin control models it is necessary to remove the underdeck control assembly prior to installation. Using the allen key provided, the five

grubscrews on the underdeck mechanism should be loosened to allow the underdeck control assembly to be removed. The outer tube can then be positioned through the centre hole. The searchlight base can then be securely fixed as stated above. Upon installation, re-assemble the underdeck control mechanism, ensuring that the grubscrews are secure and the mechanism operates correctly.

Power Supply Requirements

For safety purposes, only competent personnel should perform the electrical installation. All equipment should be installed to current Electrical Regulations and Standards.

In order to obtain maximum light output from the searchlight, it is essential that the full operating voltage of the lamp fitted is applied to the lampholder contacts.

Method of Electrical Connection

Disconnect the supply before working on the electrical system.

The searchlight must be connected to a fused electrical supply, using suitably sized cable.

If the searchlight is positioned a considerable distance from the supply, provision must be made in the cable size in order to overcome the voltage drop. The following table should be used for indication only.

| 12v | 100w |
|--------------------|-------------|
| <u>Cable Size</u> | <u>Max</u> |
| 1.5mm ² | 2 M |
| 2.5mm ² | 3 M |
| 4mm ² | 5 M |
| 6mm ² | 7 M |
| 10mm ² | 12 M |

| 24v | 150w | 250w |
|--------------------|------------|------------|
| <u>Cable Size</u> | <u>Max</u> | <u>Max</u> |
| 1.5mm ² | 5 M | 3 M |
| 2.5mm ² | 8 M | 5 M |
| 4mm ² | 13 M | 8 M |
| 6mm ² | 20 M | 12 M |
| 10mm ² | 34 M | 20 M |

| 120v | 300w |
|--------------------|------------|
| <u>Cable Size</u> | <u>Max</u> |
| 1.5mm ² | 13 M |
| 2.5mm ² | 21 M |
| 4mm ² | 32 M |
| 6mm ² | 50 M |
| 10mm ² | 84 M |

| 230v | 300w |
|--------------------|------------|
| <u>Cable Size</u> | <u>Max</u> |
| 1.5mm ² | 24 M |
| 2.5mm ² | 39 M |
| 4mm ² | 62 M |
| 6mm ² | 96 M |
| 10mm ² | 161 M |

Whenever possible cable terminations should be made below deck and with approved terminal devices.

If a spare auxiliary fuse or circuit breaker is not available, one of the correct type and rating should be fitted and connected to a positive supply. It is advisable to locate a bus bar or main connection and avoid any direct connection to the supply.

When wiring the negative supply, the direct connection to a battery or supply, or metal hull/object, should be avoided. It is advisable to use a suitable commoning block or connection.

For ease of use a single pole switch, of the appropriate rating, should be

fitted in a convenient location. All cable lengths should be kept to a minimum.

Operating Instructions

This equipment is designed for use out of doors, in free air.

Never place anything on, or cover, the searchlight when in operation as this may present a hazard.

The searchlight can be positioned using the elevation and baseplate lockwheels. When in the desired position the lockwheels must be securely fastened to prevent damage.

The beam of the searchlight can be adjusted to give a variety of 'spreads'. Using the focus knob underneath the searchlight barrel the beam can be moved from 'spot' to 'flood' positions.

The searchlight is fitted with an IP66 Drainage Plug to allow efficient water draining should any ingress occur. The Breather Unit at the rear of the searchlight ensures a steady airflow to prevent any vacuum forming within the barrel.

After use, the searchlight should be returned to the horizontal position in order that a level plane is provided to allow for any water drainage.

Note: *This product should not be used for any purpose other than for which it was designed. Any modifications to the product should not be undertaken before consulting the manufacturer or agent.*

Setting to Work

Safe service in use necessitates the strict observance of the following precautions.

Any article fabricated from quartz or glass is inherently fragile and care should therefore be taken at all times when handling lamps.

Eye protection must be worn when handling lamps that have been removed from their packaging materials. The protective sleeve should not be removed from the lamp for safety reasons as there is a remote possibility of the lamp shattering violently, especially if it is submitted to mechanical shock or vibration.

Quartz lamps should not become contaminated with oils, grease or come into contact with skin.

When fitting the lamp:

- Always isolate the equipment from the supply before inserting a lamp;
- Ensure the circuit is suitably fused;
- Ensure that the lamp is of the recommended type and rating;
- Check the lampholder is in good condition. If the contacts show any sign of corrosion the lampholder should be replaced;
- Check that the lampholder is in a good dry condition. Never allow water to collect in the lamp fitting or come into contact with the lamp.

To fit the lamp:

- Loosen all the thumbscrews on the front of the searchlight, allowing the bezel and glass to hang clear on the captive bolt;
- For easier access the light shield may be removed by firstly undoing the centre screw;
- Cut open one end of the protective sleeve surrounding the lamp;
- Using the sleeve to prevent the fingers coming into contact with the lamp, position the two lamp pins above the holes in the lampholder;
- Gently push the lamp into the lampholder and discard the protective sleeve;
- Replace the light shield, fixing the centre screw in position;
- Position the front bezel onto the searchlight and tighten the thumbscrews until hand tight.

Testing

Upon correct installation and connection to an electrical supply, the equipment can be tested in order to ensure it's correct performance. This work must be carried out by a competent person with some knowledge of electrical equipment.

Equipment required:

- Multi-meter with leads;
- Ammeter.

Using the equation $P=VI$ the approximate power output of the equipment can be calculated in the following way:

- Using the multi-meter take a voltage reading;
- Using the Ammeter, take an amps reading from the live cable to the lamp;
- Multiply these values together to give an approximate wattage.

For Example:

Using a 240v 1000w Tungsten Halogen lamp,

Voltage reading : 240v

Amps reading: 4 amps

Therefore:

$$\text{Wattage} = 240 \times 4 = 960 \text{ watts.}$$

- 2) Check fuse for visual failure. If none noticeable check fuse for continuity. If fuse found to be faulty, replace with new part. If found to be working correctly see remedy 3.
- 3) Firstly, check supply at lampholder connecting block (within searchlight barrel). If supply present, disconnect unit from power supply before removing lamp. If noticeable damage to filament is present, the lamp will have failed. The lamp can also be checked using a multimeter for continuity of the filament. Replace new lamp following all precautions mentioned previously and lamp manufacturers instructions.

Fault Finding

If a fault occurs the following procedures should be adopted. Any work to be carried out should be conducted by a competent person. A multimeter should be used for fault finding purposes.

Fault

Lamp Fails to light

Causes

- 1) Power not supplied
- 2) Fuse blown
- 3) Failed lamp

Remedy

- 1) Check voltage at supply/battery. If necessary recharge battery. If supply is not present fault is at customer supply. If power is present, see remedy 2.

Maintenance and Servicing Requirements

In order to prolong the service life and performance of your searchlight, the following maintenance guidelines are recommended:

- Maintenance checks should be conducted before every voyage or every three months;
- Before checking, disconnect the equipment from the supply;
- Visually check the condition of the equipment;
- Any major or minor structural damage or defect should be rectified immediately;
- After inspection it may be necessary to clean the inside of the searchlight. The following procedure should be adhered to:
 - Remove the front bezel;
 - Clean the front glass inside and out using a proprietary glass cleaner or metal polish;
 - Clean the reflector, if required;
 - Check the rubber reflector mounting pads. If signs of corrosion or damage are evident, replace as necessary;
 - Ensure the lampholder is free from corrosion or damage;
 - Check the earthing point for conductivity;
 - Check lampholder assembly for signs of damage or wear. If required apply a little grease to the focus assembly; Upon completion of these checks, the searchlight should be

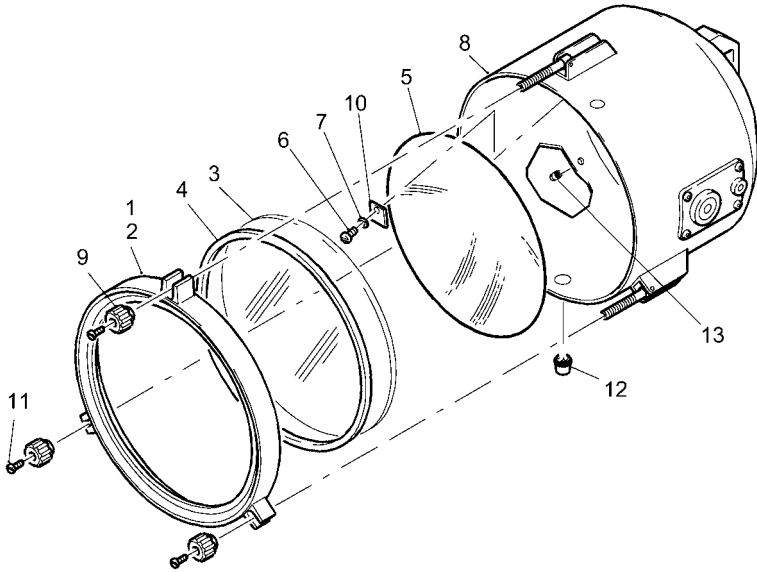
tested for full working order (approximately 15 minutes);

- Every six months the external movement mechanisms, i.e. lockwheels, elevation and pan mechanisms, may be lightly lubricated.

Note: *It is advisable to check all seals and gaskets for degradation. If replacement is necessary the kit numbers are quoted in the back of the spares lists.*

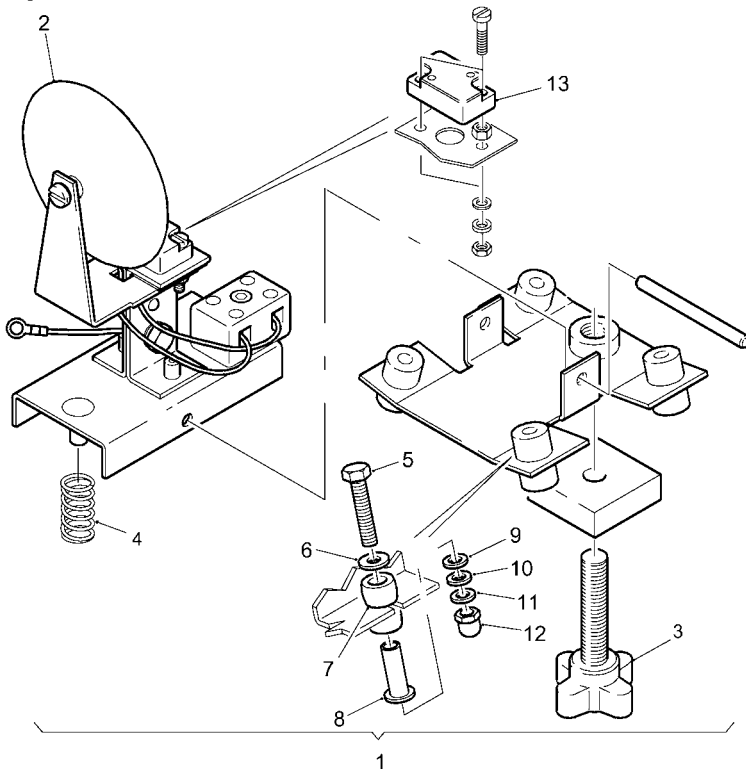
Spare Parts Lists

Barrel Assembly



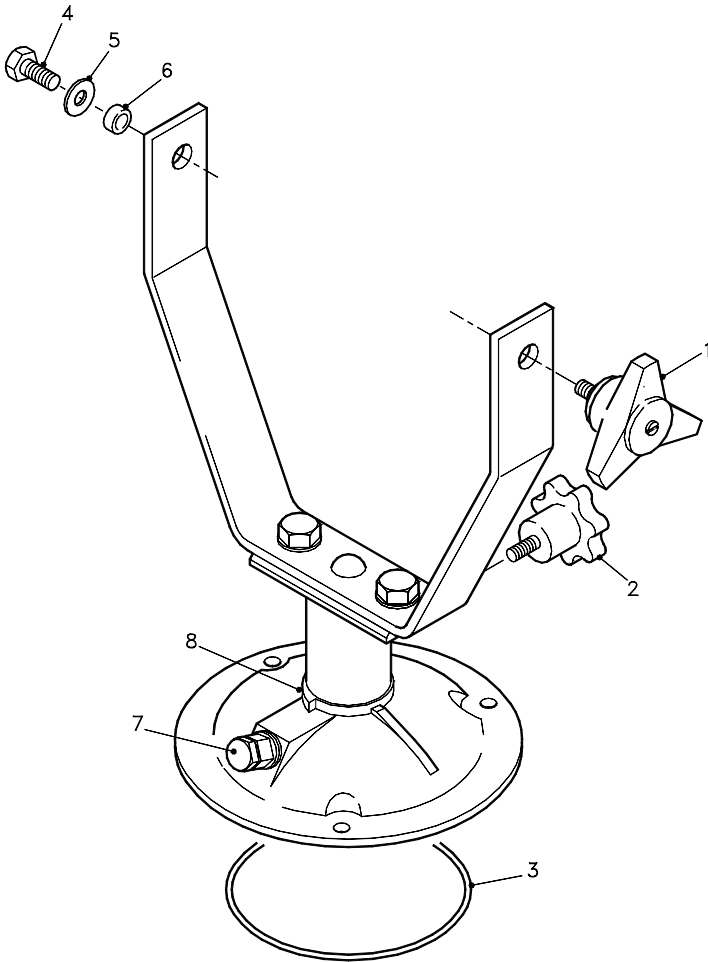
| Item No. | Description | Part No. | No. Off |
|----------|--------------------------|-----------|---------|
| 1 | Front Bezel Assembly | C14327-01 | 1 |
| 2 | Front Bezel | C10597-38 | 1 |
| 3 | Front Glass | C08865-00 | 1 |
| 4 | Front Glass Gasket | C08835-00 | 1 |
| 5 | Reflector | C06675-00 | 1 |
| 6 | Screw M5 x 8 Pan Hd. | C10140-00 | 3 |
| 7 | Washer M5 S/C Spring | C09231-00 | 3 |
| 8 | Barrel Sub-assembly | C16886-01 | 1 |
| 9 | Fluted Nut | C08812-22 | 3 |
| 10 | Mirror Clip Sub Assembly | C10055-01 | 3 |
| 11 | Screw M5 x 6 Pan Hd. | C15258-00 | 3 |
| 12 | Drainage Plug | C20070-00 | 1 |
| 13 | Breather Unit Assembly | C22268-01 | 1 |

Lampholder



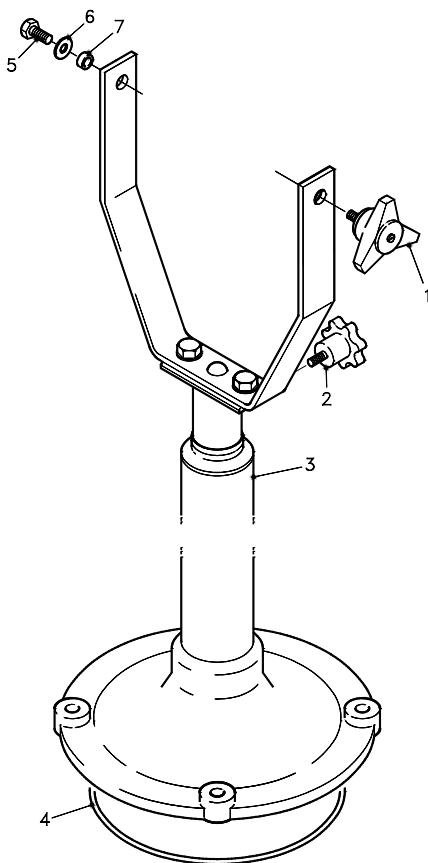
| Item No. | Description | Part No. | No. Off |
|----------|--|-----------|---------|
| 1 | FR230 L.V L/H Conversion Kit | C13033-01 | |
| 1 | FR230 H.V L/H Conversion Kit | C16888-01 | |
| 2 | Lampholder Assembly (FR 230 L.V.) | C16982-01 | 1 |
| 2 | Lampholder Assembly (FR 230 H.V.) | C16891-01 | 1 |
| 3 | Focus Wheel Assembly | C09888-01 | 1 |
| 4 | Spring | C08827-00 | 1 |
| 5 | Screw M4 x 30 Hex. Hd. | C16764-00 | 4 |
| 6 | A.V. Washer | C16763-55 | 4 |
| 7 | A.V Mount | C16761-55 | 4 |
| 8 | A.V. Bush | C16762-55 | 4 |
| 9 | Washer M4 Nylon | C15272-00 | 4 |
| 10 | Washer M4 Plain | C04376-00 | 4 |
| 11 | M4 S/C Washer | C08793-00 | 4 |
| 12 | Domenut M4 | C11183-00 | 4 |
| 13 | L.V. & H.V. GX6.35 Lampholder | C16878-00 | 1 |

Deck Mount - C15070-01



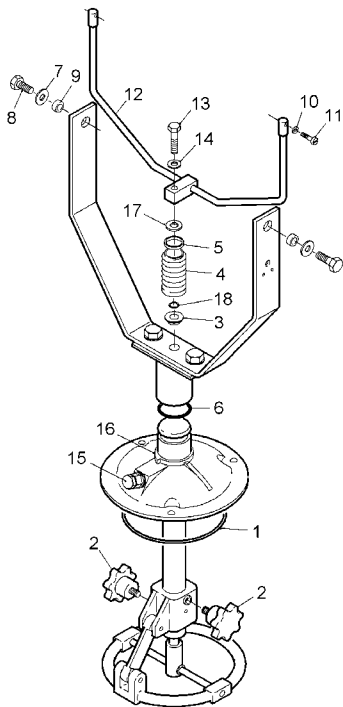
| Item No. | Description | Part No. | No. Off |
|----------|------------------------------|-----------|---------|
| 1 | Elevation Lockwheel Assembly | C15395-01 | 1 |
| 2 | Lockwheel Assembly | C11025-01 | 1 |
| 3 | 'O' Ring Seal | C10168-00 | 1 |
| 4 | Screw M10 x 20 Hex. Hd. | C08094-00 | 1 |
| 5 | Washer M10 Plain | C08091-00 | 1 |
| 6 | Trunnion Spacer | C10254-01 | 1 |
| 7 | Cable Gland | C10158-00 | 1 |
| 8 | Floating Stop | C08929-22 | 1 |

Deck Pedestal Mount - C15154-01



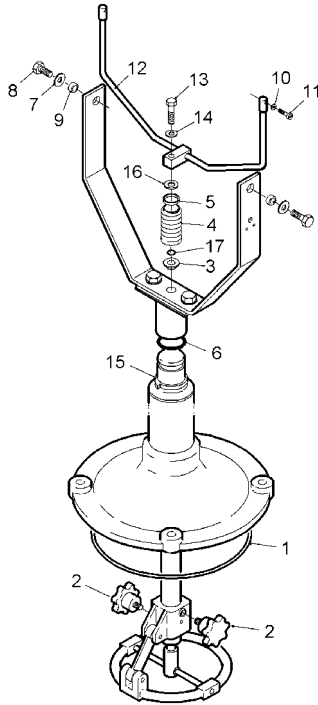
| Item No. | Description | Part No. | No. Off |
|----------|------------------------------|-----------|---------|
| 1 | Elevation Lockwheel Assembly | C15395-01 | 1 |
| 2 | Lockwheel Assembly | C11025-01 | 1 |
| 3 | Pedestal Assembly | C10073-38 | 1 |
| 4 | 'O' Ring Seal | C10170-00 | 1 |
| 5 | Screw M10 x 20 Hex. Hd. | C08094-00 | 1 |
| 6 | Washer M10 Plain | C08091-00 | 1 |
| 7 | Trunnion Spacer | C10254-01 | 1 |
| 8 | Floating Stop | C08929-22 | 1 |

Cabin Trainer Mount - C15164-01



| Item No. | Description | Part No. | No. Off |
|----------|------------------------|-----------|---------|
| 1 | Base 'O' Ring Seal | C10168-00 | 1 |
| 2 | Lockwheel Assembly | C11026-01 | 2 |
| 3 | Bellows Bottom Bush | C20269-01 | 1 |
| 4 | Bellows | C20281-00 | 1 |
| 5 | Bellows Top Bush | C20270-01 | 1 |
| 6 | Spigot 'O' Ring Seal | C10169-00 | 1 |
| 7 | Washer M10 Plain | C08091-00 | 2 |
| 8 | Screw M10 x 20 Hex Hd. | C08094-00 | 2 |
| 9 | Trunnion Spacer | C10254-01 | 2 |
| 10 | U-Piece Bush | C08932-01 | 2 |
| 11 | Screw M6 x 20 Pan Hd. | C10174-00 | 2 |
| 12 | U-Piece Assembly | C10086-38 | 1 |
| 13 | M8 x 35 Hex Screw | C08796-00 | 1 |
| 14 | M8 Plain Washer | C06999-00 | 1 |
| 15 | Cable Gland | C10158-00 | 1 |
| 16 | Floating Stop | C08929-22 | 1 |
| 17 | Washer M12 Plain | C08370-00 | 1 |
| 18 | 'O' Ring | C21967-00 | 1 |

Cabin Pedestal Trainer Mount - C15165-01



| Item No. | Description | Part No. | No. Off |
|----------|------------------------|-----------|---------|
| 1 | Base 'O' Ring Seal | C10170-00 | 1 |
| 2 | Lockwheel Assembly | C11026-01 | 2 |
| 3 | Bellows Bottom Bush | C20269-01 | 1 |
| 4 | Bellows | C20281-00 | 1 |
| 5 | Bellows Top Bush | C20270-01 | 1 |
| 6 | Spigot 'O' Ring Seal | C10169-00 | 1 |
| 7 | Washer M10 Plain | C08091-00 | 2 |
| 8 | Screw M10 x 20 Hex Hd. | C08094-00 | 2 |
| 9 | Trunnion Spacer | C10254-01 | 2 |
| 10 | U-Piece Bush | C08932-01 | 2 |
| 11 | Screw M6 x 20 Pan Hd. | C10174-00 | 2 |
| 12 | U-Piece Assembly | C10086-38 | 1 |
| 13 | M8 x 35 Hex Screw | C08796-00 | 1 |
| 14 | M8 Washer | C06999-00 | 1 |
| 15 | Floating Stop | C08929-22 | 1 |
| 16 | Washer M12 Plain | C08370-00 | 1 |
| 17 | 'O' Ring | C21967-00 | 1 |

Seal Kits

| Description | Part No. |
|--------------------------------|-----------|
| Deck Gasket Seal Kit | C17110-01 |
| Cabin Gasket Seal Kit | C17089-01 |
| Deck Pedestal Gasket Seal Kit | C17111-01 |
| Cabin Pedestal Gasket Seal Kit | C17112-01 |

Spare Parts Ordering

In order to prolong the life and performance of your searchlight it is recommended that only Francis Searchlights Ltd. spare parts are specified. Reference should be made to the relevant spares section in this manual. The part number should be quoted at all times so that a price and delivery time can be supplied.

Spare parts or accessories can be obtained from your distributor/agent or directly from the manufacturer.

Parts Disposal

It is essential that all parts are disposed of correctly and safely to ensure no risk to other personnel. When disposing of lamps the procedures outlined in this manual and the lamp manufacturers leaflet must be adhered to.

The reworking or modification of parts should not be undertaken before consulting the manufacturer or agent.

Sales and Service

For sales and service please contact your agent/distributor or contact the manufacturer direct at:

Francis Searchlights Limited
Union Road
Bolton
BL2 2HJ

England

Tel: +44 (0) 1204 558960

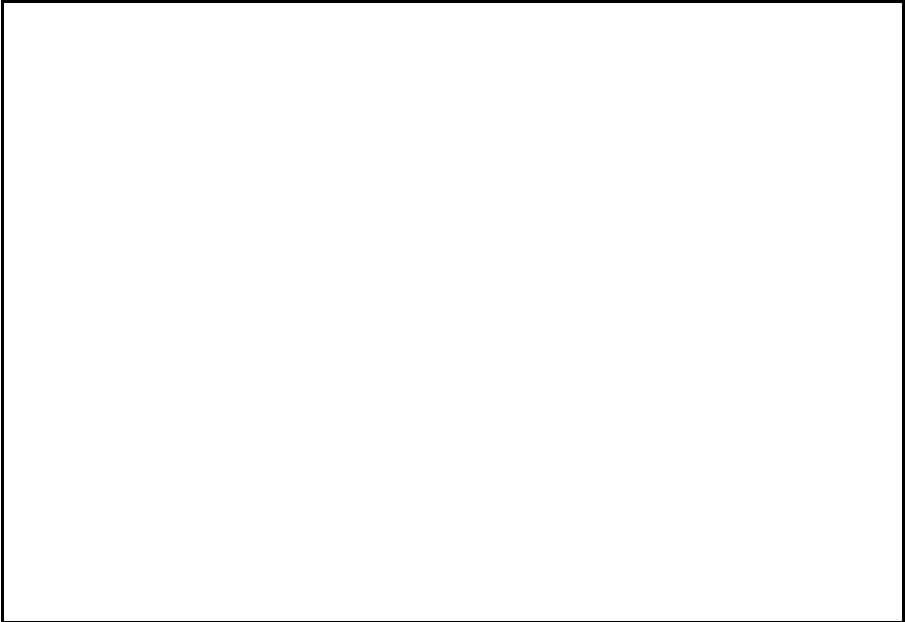
Fax: +44 (0) 1204 558979

E-mail: sales@francis.co.uk
<http://www.francis.co.uk>

Guarantee

This product is covered with a 12 month warranty. Any claim whilst under warranty should be addressed to the Quality Manager at Francis Searchlights Ltd.

Agent/Distributor Stamp



The manufacturer reserves the right to change the information contained within this booklet without prior notice



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