



Diving system winches

Diving Information Sheet No 2

Introduction

1 This diving information sheet is part of a series of information sheets providing guidance on diving at work. It replaces the following diving safety memoranda: DSM 8/1977 and DSM 2/1987. The remaining DSMs have either been replaced by other diving information sheets, or will be cancelled when the Diving at Work Regulations come into force on 1 April 1998.

2 There are two sections, containing guidance on the following aspects of diving system winches:

- (a) air-driven winches (air tuggers);
- (b) diving bell hydraulic winch brake systems.

Air-driven winches (air tuggers)

3 Note the safety points in paragraphs 4-7 when using air-driven winches (air tuggers) in conjunction with personnel baskets, open bell handling systems, and as the second winch for horizontal pulling of a diving bell.

4 To comply with diving legislation, the diving contractor should provide, or arrange for the provision of all diving plant and equipment necessary for the safe conduct of the diving operation. The contractor must also make sure that the plant and equipment are of sound construction and suitable materials, in good working order at all times, and that they are adequate for the purpose. In particular, the contractor should make sure that all plant and equipment used at low temperatures are adequately protected against any malfunctions at low temperatures.

5 Any winch used in connection with a lifting appliance, which raises or lowers people, should be constructed so that a brake is automatically applied when the control lever, handle or switch is not held in the operating position. In addition, the winch should not be fitted with a pawl and ratchet gear on which the pawl has to be disengaged before raising or lowering operations.

6 The lifting wire for all winches should have a safety factor of 8 to 1 (ie a safety factor of 4 to 1 plus a 2 g factor to take dynamic loading into account).

7 Equipment which is not recommended by the manufacturer for use in the task of raising or lowering people should not be used.

Diving bell hydraulic winch brake systems

8 This section sets out the basic principles of hydraulic winch braking systems which should be adopted for diving purposes.

Winch design

9 All manriding hydraulic winches must incorporate two independent braking systems. The primary braking system may be achieved by an anti-runaway device, eg an overcentre valve.

10 The secondary braking system normally takes the form of a band brake or calliper brake although other methods exist. As most hydraulic winches are remotely operated, it is recommended that the secondary brake operates automatically whenever the operating lever is returned to neutral, or on loss of power. The brake is usually applied by a spring and released by hydraulic pressure.

11 In operation, the hydraulic circuit acts to stop the rotation on the winch and the secondary brake is then applied as pressure decays in the hydraulic system.

Testing

12 To avoid interference between the two brake systems, they must be tested separately. If a brake system fails during testing, then precautions must be taken. The hydraulic primary brake must be tested dynamically and the secondary brake tested statically.

13 All winch motors leak internally, but the creep that results should not cause the motor to go into freewheel if the secondary brake is disconnected. To make sure that the two brake systems are tested separately and safely, a safe method of carrying out these tests must be agreed with the competent person engaged for certification purposes.

Further reading

1 *Commercial diving projects offshore. The Diving at Work Regulations 1997. Approved Code of Practice* L103 HSE Books 1998 ISBN 0 7176 1494 8

2 *Commercial diving projects inland/inshore. The Diving at Work Regulations 1997. Approved Code of Practice* L104 HSE Books 1998 ISBN 0 7176 1495 6

3 *Recreational diving projects. The Diving at Work Regulations 1997. Approved Code of Practice L105*
HSE Books 1998 ISBN 0 7176 1496 4

4 *Media diving projects. The Diving at Work Regulations 1997. Approved Code of Practice L106*
HSE Books 1998 ISBN 0 7176 1497 2

5 *Scientific and archaeological diving projects. The Diving at Work Regulations 1997. Approved Code of Practice L107*
HSE Books 1998 ISBN 0 7176 1498 0

6 *The Diving at Work Regulations 1997 SI 1997/2776*
The Stationery Office 1997 ISBN 0 11 065170 7

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This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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