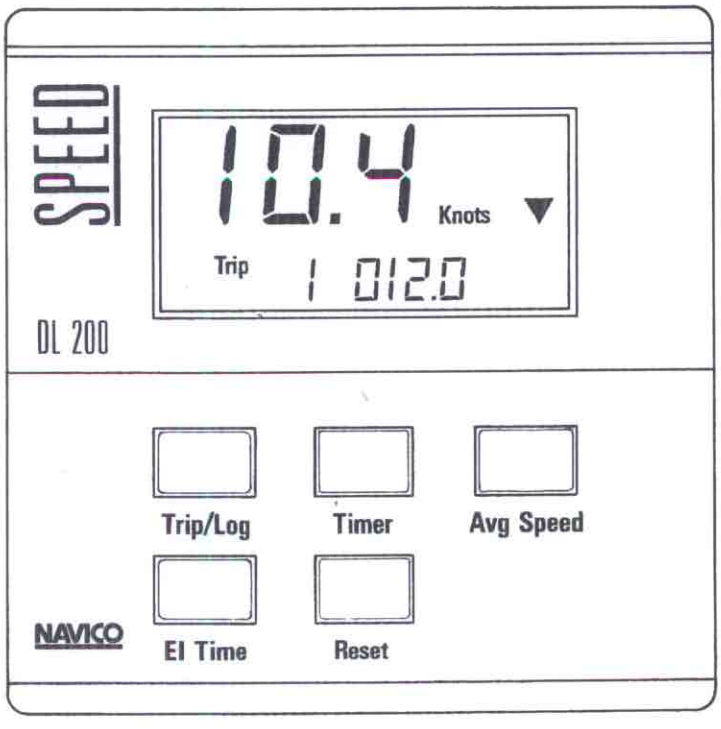
NOTES

NAVICO digital speed & distance log DL200

suitable for all classes of vessel: sail and power

Features

- Designed for continuous use
- Low current consumption; only 30mA
- Designed for external mounting
- Race timer built in
- 1 cumulative and 2 trip logs
- Easy installation
- Ultra slim meter case
- Suits all hull materials
- Calibration facility
- Average speed computation
- Adjustable damping
- Speed trend indicators
- Matches other NAVICO System 200 instruments
- Satnav interface built in
- Advanced electronic memories retain data with all power off



See centre pages for mounting template and quick-reference operating guide

ISSUE 3

Fault Finding & Diagnosis

Symptom	Possible causes	Remedy
No meter display	Power supply break	Check volts at junction box. Trace back. Check illumination function. If volts are present, this is unlikely to have failed simultaneously. Check 0.5amp fuse in junction box.
	Wiring error	Recheck colour codes and supply polarity
	Terminal corrosion	If signs of verdigris, clean and spray all terminals
No waterspeed	Bad circuit	If all connections are sound and voltage is correct, refer to dealer
	Fouled transducer	Withdraw, clean, and watch display while spinning the paddlewheel
Erratic reading	Intermittent joint	Check all connections and for cable damage
	Partly fouled transducer	If timer and illumination are in order, fault is likely to be in transducer or its connection.
	Electrical interference	Look for phenomenon relating to use of other equipment by turning on and off the engine, radio, refrigerator etc in turn. Fit suppression, especially to ignition cables and heavy current devices, and check cable runs to avoid running parallel over long lengths next to cables carrying strong current or signals
Display locks, or behaves abnormally	Interference such as a powerful nearby radio transmission can affect any circuitry temporarily and upset computation	Switch off power supply and switch on again
Jumbled display	Low voltage	Try with engine charging
No memory retention	Persistent electrical interference	Check wiring/ replace switch
	Intermittent contact on power switch	Re-route supply back to battery on a dedicated line.

Specification

Range	0 to 40 knots
Power supply	12 to 24v dc ship's supply (not to exceed 30v) Reverse polarity and surge protected Consumption: average 30mA : with illumination 90mA
Accuracy	Within 1% after calibration
Averaging period	Adjustable 2,4,8,16 or 32 seconds
Display head	Safe operation and storage in worldwide boat environment
Transducer	Three position paddlewheel assembly Cable length supplied 7metres (23ft.)
Compass	No detectable effect on compass within 0.3m (1ft.)
Weight	Instrument head 0.1kg (6oz.) Transducer & junction box 0.3kg (11oz.)
Illumination	Long-life filament bulb controlled at keypad
Interface	Dedicated satellite navigator interface as standard

Contents

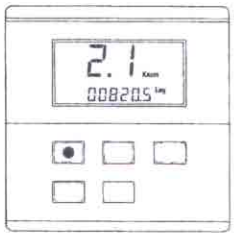
NAVICO designed instruments are produced in our own modern factory under close quality control and inspection. Every product undergoes comprehensive functional checks and has run for a specified test period before despatch. Random samples are taken from the line and subjected to intensive environmental testing to maintain quality assurance. Others are user-tested on long duration voyaging.

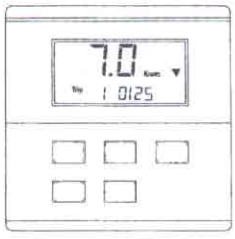
In maintaining continuous developments and updating, specifications may be varied at any time.

Operation

Operation is easily mastered by reference to the diagrams below. The display will give a reading as soon as the power supply is switched on at the ship's instrument panel. No on/off function is provided by the instrument keys. The keypad is designed so that casual key pushing is unlikely to disturb your important settings. No harm can be caused by random key pushing, so do not hesitate to learn by trial and error. **Primary adjustments** are the most frequently used; they involve pressing single keys. **Secondary adjustments** involve holding the right hand button until a **second bleep** is heard then, **still holding the right hand key,** pressing one of the other keys.

A colon between the first and second digit when not in timer mode indicates that the paddlewheel is not rotating.





Cumulative log

This is indicated on the lower scale by selection, and is not resettable. The reading is retained in the memory to 99,999.9nm.

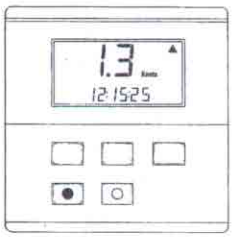
Press ● to alternate the cumulative log reading with the Triplogs. Either 'trip' or 'log' will be indicated with the display.

Speed.

Speed is resolved to tenths of a knot and the trend arrow indicates acceleration or deceleration. It is normally indicated on the upper large display except when the timer is running and it appears in place of the log display.

Triplogs 1 & 2

Triplogs can be selected alternately with the cumulative log by keying ●
When selected, 'Trip' appears on the display followed by a number 1 or 2.
Triplog 1 can be **Reset** by hitting ○
Tripog 2 can be reset by holding ○ down for 2 bleeps. This also resets Elapsed Time.
Both Triplogs are automatically reset as the Race Timer runs through zero.



The instrument will continue to function at low voltage down to 10 volts. Its ultra modern circuitry will retain log and calibration settings even through severe voltage dips when, for example, starting an engine.

Fasten the junction box in a convenient place protected from any wetness, where it can receive cables from the meter, the supply, the transducer, and other meters if any. Preferably mount the box on a vertical surface such that the wires run up into it to avoid the possibility of condensate running down the wires towards the terminals. The power supply cable (not provided) should be taken to the junction box, where the two terminals are marked clearly with their polarity. If a mistake is made in polarity, the instrument is protected. For the protection of the equipment, all connections should be made with the power off, and the power leads should be connected last after careful checking.

Wiring to the junction box is easily carried out by following the colour coding and marks on the terminal blocks (see diagram on page 6). Provision is made for leads from the Display Head, the Transducer, the Power lead, a Satnav, a Log Repeater, and links to a VMG meter. All leads, including those of the log transducer may be trimmed to length, but trim so that the sheath does not terminate outside the entry point to the box. After completing all connections, give a light spray over the clamping screws with water displacing fluid to inhibit subsequent seizing of the threads.

NOTE if the log output is being used to interface with an electronic Navigator such as Satnav, ensure that the output is compatible because no responsibility will be accepted by NAVICO Ltd for damage caused to other equipment. The DL200 produces 12volt, 50mS pulses every 100th of a nautical mile.

The Transducer

A **skin fitting** is supplied for through-hull mounting of the transducer. Included in the kit is a plug for use when the transducer is withdrawn for cleaning, or during long periods when the boat is not in use.

The transducer and housing incorporate a three-position twist and lock bayonet mechanism. When the stainless steel pin is parallel to the fore and aft line of the vessel, the bayonet is locked and the paddlewheel is aligned fore and aft in one of three vertical positions, either well out into the stream, just protruding, or withdrawn. (See calibration notes concerning use of these positions). When the pin is athwartship, the paddle may be moved up or down into one of the vertical positions. It cannot be pulled out so long as the knurled nut remains tight on the housing.

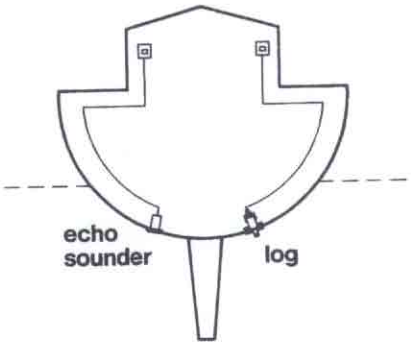
Correct siting of the paddle wheel is different for planing hulls (fast power boats) or semi-displacement hulls (yachts and motor sailors/ motor cruisers); see illustrations on page 6.

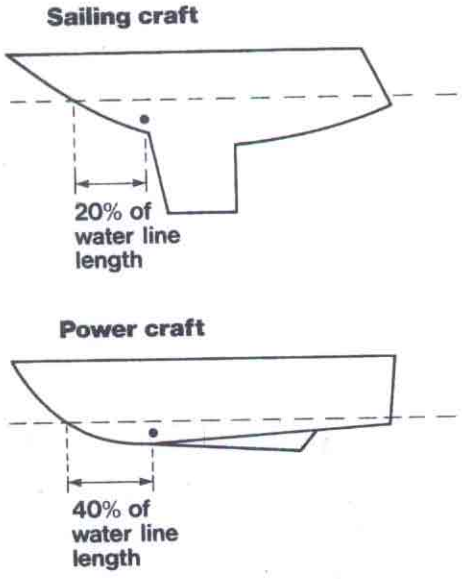
To work well, the transducer must be positioned so that it is always under water, even in a rough sea, In a yacht it should preferably be near the centreline (to work symmetrically on either tack) and forward of the keel to be in less disturbed flow. In boats which normally sail upright and without high rates of turn, centre mounting is less important, but mount at least 160mm (6 inches) away from a keel.

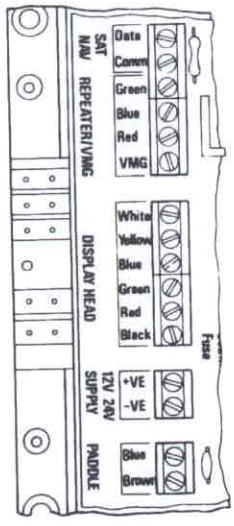
The hole for the hull fitting should be positioned well clear of any internal frames and stringers. Ensure good access for removal of the paddlewheel assembly, and for clearing water spilled during this operation. Drill a pilot hole first. Then, working from the **outside** of the boat, a 50mm (2inch) hole cutter in a hand brace or electric drill can be used. **Do not forget** to file a small key cutout to match the hull fitting at the front of the hole (see arrow ➔ on the underside of the skin fitting which should **face forward).**

Assemble the skin fitting and nut to the hull using a good sealing compound; silicon rubber is recommended. **Do not overtighten the nut.** Little more than hand tight is required, and overstressing the components must be avoided for safety reasons.

Check that the bore of the skin fitting is absolutely clean and free of sealing compound. Now insert the sealing plug or the transducer, ensuring that the collar under the nut is correctly fitted in its key slot. When painting the hull, ensure that the skin fitting is not coated because paint on the inside of the tube can interfere with withdrawal.







Junction Box Terminals

Transducer setting and calibration

When in use the paddlewheel can be set either just protruding, with the spindle flush with the hull, or projecting on its fairing 25mm (1 inch) beyond the disturbed boundary layer of water immediately next to the hull. The deeper position is more accurate, though usually only significantly so on higher speed craft. At typical sailing speeds, with an efficient hull, the inner position is most commonly used. When not in use, or when in danger from crane strops, the paddlewheel can be withdrawn completely into the housing at the third position.

Weed can often be cleared without withdrawal, just by rotating or pumping the transducer within the housing. If withdrawing, have the plug ready, then with rolled up sleeves, or wearing an oilskin top, as the transducer is withdrawn, cap the fitting with the palm of your free hand. The pressure will not be great. To insert the plug or transducer, use a rapid movement in which the 'capping' hand curls around the skin fitting to guide the plug or transducer into place. When done properly, very little water will enter. Make sure the retaining nut is secured immediately so that it is not forgotten. Some silicon grease on the O-rings is beneficial to ease future withdrawal. Even without grease there should be no seepage. If there is any sign of droplets entering, the O-rings should be renewed.

Even when first fitted the log is likely to give fairly accurate results, but at the first opportunity it should be checked and calibrated. Calibration can be achieved in a number of ways. The ideal is to compare readings against a towed log over several miles. The result will be uninfluenced by any current.

Comparison with electronic Navigator positions is convenient but will be influenced by current, so adjustment should only be made for average error over a number of legs.

Almanacs explain how to use marked, measured distances, but beware of the fallacy often published, that going up and down a measured distance averages out the effect of current. The fallacy is revealed by the case where an adverse current equals the boatspeed; the time taken for the leg would then be infinite. There are complex formulae to allow for the effects of lesser currents, but it is more practical to choose a time when the current is very small compared to boatspeed so that the error is negligible.

When you have decided the percentage error of the log (it will be the same for speed or distance) it can be changed up or down by pressing the appropriate keys. (See operation section). The changes are made by plus or minus one percent per key stroke and will only calibrate if a speed of more than 1 knot is displayed at the time. The same percentage change is automatically applied to the log. Because the display only shows changes of 0.1knot, there may be no apparent change on the display, but it will have registered. Thus for example if one increment is applied at 3 knots, the increase to 3.03knots will not show, whereas if the actual speed had been 6.04knots (indicating 6.0), the increment of 0.0604 would take the display to 6.1knots.

Introduction

Thankyou for choosing NAVICO. Your DL200 instrument is carefully designed to need little maintenance and provide many years of trouble-free operation. It is designed for continuous working and is easily installed by an owner. It overcomes two particular disadvantages of former electronic logs; the distance can be displayed simultaneously with the speed, and the latest electronic memories are able to retain the log reading with no power supply whatsoever–not even an internal battery. The display meter is designed for internal or external mounting and can operate simultaneously with an optional extension meter. The functions provided are waterspeed, speed trend, total log, resettable trip log, elapsed trip time, average speed and countdown time for race starting. The damping period for speed readings can be controlled, and the calibration factor for the transducer position can be altered.

In common with most others, NAVICO instruments are not completely sealed because there are strong reasons for not doing so. Instead they are specially designed to resist wet atmosphere by being allowed to breathe but not accumulate internal moisture. If slight internal condensation occurs, it can be expelled by running the illumination. This instrument should not be cleaned down with a high pressure hose as water may be forced into the ventilation holes.

Installation

Display Head

Having chosen a position with a good line of sight for the helmsman and where the meter is not vulnerable to physical damage, use the template on the centrepages to position the instrument and prepare holes for fastenings and cable. Make pilot holes at the centres, then enlarge with a 7mm (5/16inch) drill.

Lead the cable through the hole, and fasten the head in position (a gasket is already attached). Do not overtighten the screws. If you intend to use the optional push-on covers, give regard to whether it is to be a combined cover or single covers. If the latter, a 6mm (¼ inch) gap will need to be left between each instrument to accommodate the sides of the covers.

The meter will barely affect a compass even within 150mm (6inches) distance, but it is wise to route the signal cables away from other cables carrying powerful radio signals or currents.

Junction Box and Powersupply

The DL200 will operate from a dc ship's supply of 12 to 24 volts. Preferably it should be individually fused or shared with other instruments at around 1 amp rating through a good quality switch or circuit breaker. In addition to the fuse which should be in the line from your pow source, there is a 0.5amp fuse inside the junction b

Elapsed Time

Measured from switch-on or the instant triplog 2 is reset. Press ● to show time on the lower display, which autoreverts to Log after 3 seconds. If this key is held for a second bleep, the Elapsed Time and Triplog 2 will lock their present values for later recall (useful when crossing a finishing-line). Press ○ to restart Timer and Triplog 2 without resetting them. Reset as for Triplog 2.

Average Speed

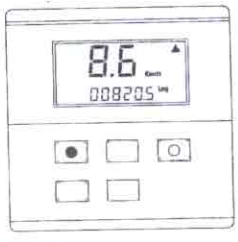
Computed from the quotient of Triplog 2 and Elapsed Time. Press ● to indicate on the main display which autoreverts to Speed after 2 seconds.

Timer

Pres ● at the ten minute race-gun. Countdown time is shown on the main display while Speed continues temporarily on the log display. Pressing ● again at the five minute gun resynchronises if necessary. A bleep sounds at 5 minutes, and at each of the last 5 seconds. A long bleep is given at the Start, and the Timer and Triplogs are reset automatically while Speed shows again on the main display. Keying a third time before the end of the 5 minutes, cancels the timer without resetting Triplogs and Elapsed Time.

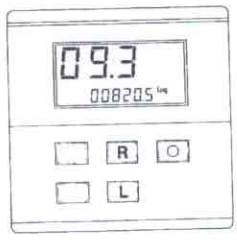
Damping

Damping periods can be set at: 2,4,6,8,16 or 32 seconds. To adjust, hold ○ and after 2 bleeps press ● in quick succession to select the damping period. Larger periods give more damped readings.



Illumination

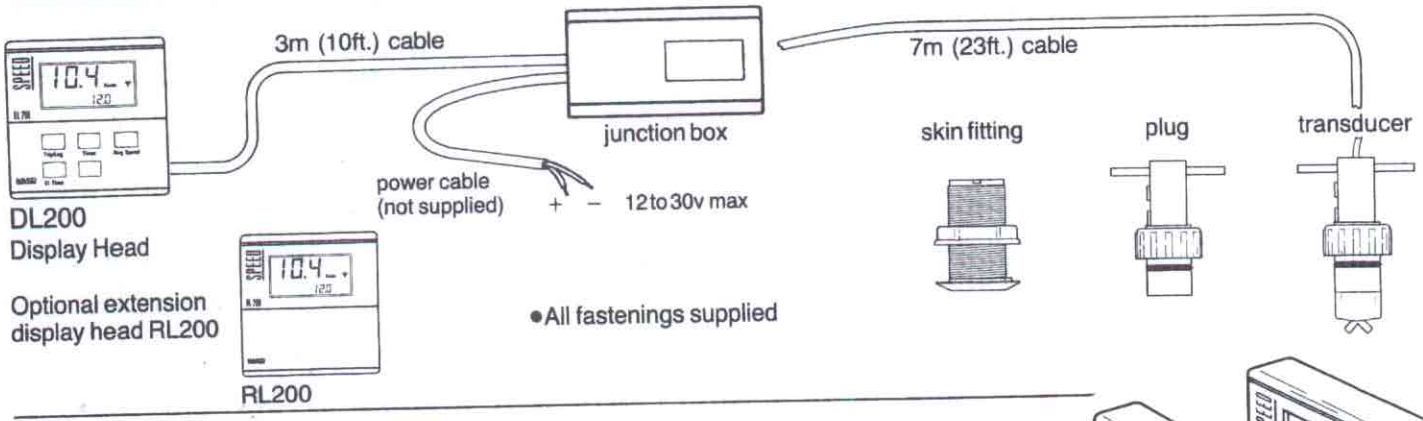
Illumination can be toggled **on** or **off** by holding ○ and after 2 bleeps, pressing ● for **on** or **off.**



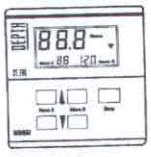
Calibration

Hold ○ and after 2 bleeps press R to raise, or L to lower the **present** speed reading by 1% per keystroke. The log calibration will be changed proportionately. (See 'Transducer setting and calibration page 7.)

DL200 kit comprises:



Matching Instruments

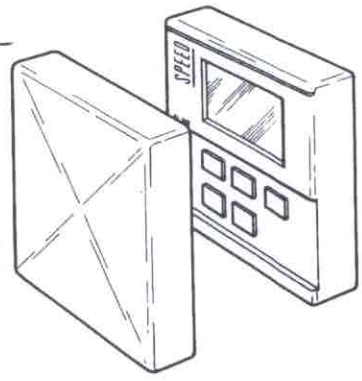


DS200
Digital Sounder

WD200
Digital windspeed
& analogue windangle

RS200
Extension sounder

Optional
smart white
cover



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New Hamburg, N.Y.12560, USA
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Fax: 914298-0277

Service

Your instrument should seldom need servicing, apart from keeping the transducer clean and electrical joints in good order. Remember that 30% of equipment returned for service has no internal fault, so for your own benefit work through the basic diagnostic checks before returning it.

The instrument is guaranteed for 12 months from date of retail sale. If it is necessary to have the unit repaired, return it, carriage paid to the agent in the country of purchase with a copy of the receipted invoice showing date of purchase. Where possible return all the components unless you are certain that you have located the fault. If the original packing is not available, cushion well; the shock loading of freight handling can be very different from the marine environment for which the instrument is designed.

If a fault occurs outside the country of purchase, return the unit to the official NAVICO agent in the country of use. The appointed agent will rectify the fault and make a charge for labour and return carriage and packing. Any component that has failed under the terms of the warranty may be replaced free of charge.

If your NAVICO instrument is purchased outside the country of your permanent residence, the agent is at liberty to charge for the repair, parts and labour at local rates. Reimbursement will not be made.

A list of official international NAVICO distributors and service centres is available upon request.

Template for use in marking mounting positions of the display meter, with exact positions of the holes.

TOP

Drill five holes 7mm (5/16inch) diameter four the four fastenings and the cable. The gasket is ready attached. Do not overtighten the screws.

Record the serial number of your instrument before fixing. This will be needed in the case of correspondence or theft.

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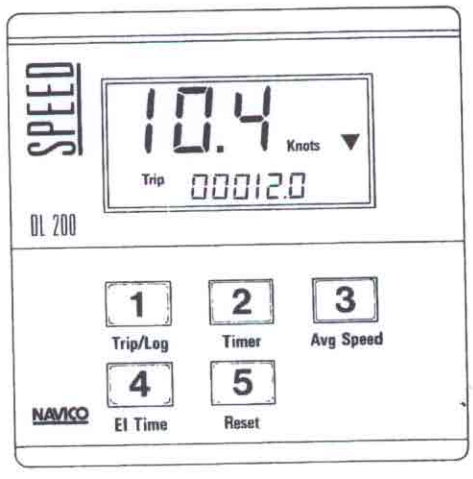
NAVICO DL200 – Quick guide to operation

Cumulative log

Key 1 alternates the reading with Triplog and either TRIP or LOG is indicated in the display.



Triplog

Selected by Key 1 alternating with Cumulative Log. When selected, TRIP appears in the display. Reset by holding Key 5 for 2 bleeps.

Elapsed time

Measured from switch-on or from reset by Key 5. Display by Key 4. Autoreverts after 3 seconds. Hold Key 4 for second bleep to lock Time and Triplog

Average speed

Called up on main display by Key 3. Autoreverts to speed after 2 seconds.

Timer

Key 2 starts 10-minute countdown. Key again for 5-minute countdown. Key again to cancel countdown without resetting current elapsed time and triplog.

Damping

Hold Key 3 for 2 bleeps, and press Key 4 in quick succession to select damping period.

Illumination

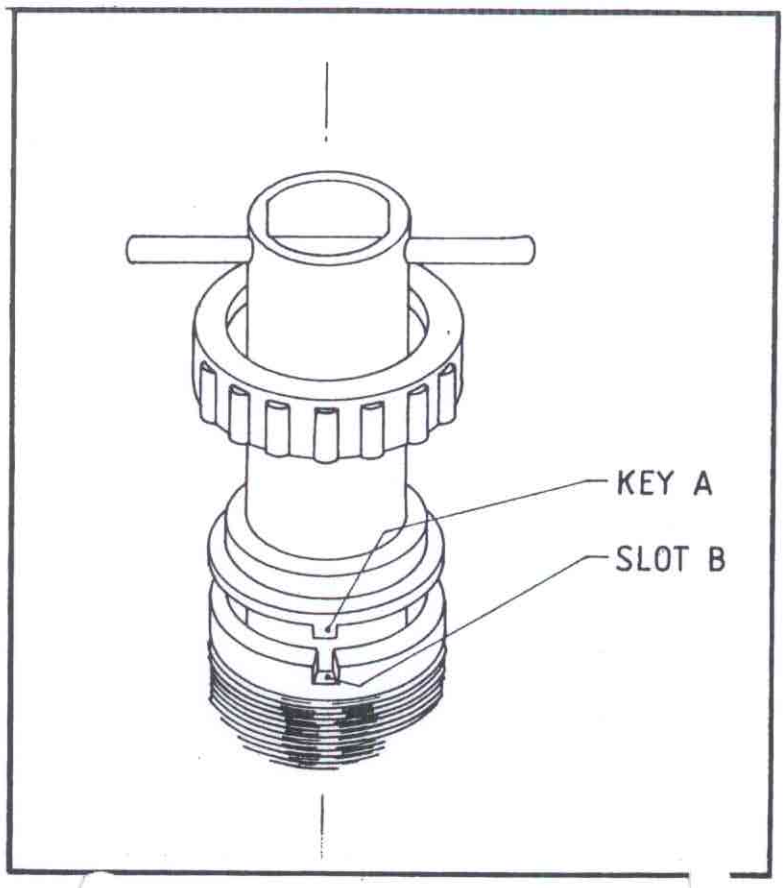
Can be toggled on or off by holding Key 3 for 2 bleeps and pressing Key 1.

Calibration

Hold Key 3 and raise or lower current speed reading by 0.1knot by pressing Key 2 or Key 5 respectively.

Please Note:

It is essential for the correct and **safe** operation of the bayonet locking mechanism featured on the skin fitting and caps, that the key marked 'A' is aligned and seated in key slot 'B' when the cap is tightened down.



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