

SL 11

Instruction Manual

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SIGNET Machine

The Measure of Excellence

SL 11

Instruction Manual

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SL 11 SELF-POWERED KNOTMETER

INSTRUCTION MANUAL

1.0 INTRODUCTION

The SL11 Self-Powered Knotmeter consists of a precision indicator and accurate sensor to provide definitive speed indication for both racing and cruising yachts. Both units are capable of sensing and displaying variations in speed as low as 0.1 knots. This unit is the result of continuous development by Signet instrumentation specialists. The SL 11 comes complete with mounting hardware and a paddlewheel sensor, mounted in a thru-hull fitting.

Read this manual carefully before installing your Signet Knotmeter. It will answer most of your questions about installation, calibration, and maintenance. By carefully following these instructions, you will prevent problems stemming from improper installation and calibration.

1.1 FEATURES

The SL 11 features a 5 1/2" dial. The dial face is sealed to withstand weather and washdown. Internal electronics are completely solidstate to insure reliability and lasting accuracy after initial calibration.

The heart of Signet's Knotmeter is a patented paddlewheel sensor which generates its own signal and is accurate to 1%. This non-fouling unit presents negligible drag. The companion thru-hull fitting and plug allow easy removal for cleaning or storage even while under way.

The SL 11 incorporates a damped meter movement for steady indication. The sensor output signal drives the indicator. For night use, soft red illumination, diffused through a full 360 degree lens, is provided. The lighting requires 12 VDC.

2.0 UNPACKING AND INSPECTION

When unpacking your Signet knotmeter, be sure that all parts are present. Carefully check each part for any damage incurred during shipment. If damage has occurred, promptly notify your dealer and the carrier.

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The SL 11 package contains the following items:

| | | |
|----|--------------------------------------|--------------|
| 1. | SL 11 Indicator | M1140 |
| 2. | Indicator | M0201-01 |
| 3. | Protective Cover | M0212-01 |
| 4. | Sensor Assemble with Integral Cable | 1-2200.100-1 |
| 5. | Thru-hull and Plug | M1532 |
| 6. | Instruction Manual and Warranty Card | |

The self-powered feature of this knotmeter allows easy testing of its operational status after unpacking. Connect the sensor cable to the sensor input cable of the indicator (see figure 1). Spin the paddlewheel; the meter should reflect this movement.

3.0 INSTALLATION

3.1 SENSOR INSTALLATION

The paddlewheel transducer should be installed forward of the keel in an area of minimum turbulence (i.e. free from protruding fittings) as close to the centerline as is possible (see figure 2). A clearance radius of 5" is necessary inside the bilge for transducer insertion and/or removal.

Installation Tools:

1. 5/16" diameter drill
2. 1-5/8" diameter hole saw, or
3 blade Signet production thru-hull cutter (M1580)
3. Bedding compound (Kuhl's Bedlast or similar compound)
4. 1-7/8" open wrench or crescent wrench

Installation:

1. Remove the boat from the water.
2. Select sensor location forward of the keel, as close to the centerline as possible, and free of turbulence. Allow 5" clearance radius on inside of hull. A flat run of 6" to 12" ahead of the thru-hull fitting is desirable.

3.2 INDICATOR INSTALLATION

The indicator may be installed in a bulkhead or instrument panel. The location must have a clean diameter of 5 1/2" and a rear clearance of 4".

Installation of Tools:

1. 4-5/8" diameter hole saw
2. Screwdriver
3. Bedding Compound

Installation:

1. Choose location. Make sure it has suitable clearances.
2. Cut a 4-5/8" diameter hole.
3. Install the indicator with bedding compound or sealant around the rear of the flange.
4. Loosen the ring clamp. Install on the case from the rear as shown in Figure 7. With the indicator flange against the bulkhead, position the clamp against the rear of the bulkhead, and tighten securely. Turn the three bracket screws clockwise until the indicator flange is seated snugly against the bulkhead. Do not over-tighten; this may cause the clamp to slip.
5. Connect cables as shown in Figure 1.
6. It is recommended that the lights be connected to the required 12 VDC source through a switch or dimmer.

4.0 CALIBRATION

Your SL 11 was tested at the factory and calibrated for ideal conditions. However, variations caused by hull configuration and sensor location may cause an error of up to 25% in the meter's indication, requiring recalibration after the unit is installed.

Calibration Procedure:

1. Under power, use a stopwatch to time a measured 1/2 mile or 1 mile run at a constant rate of speed. Run the course first in one direction, record the time, and then run it in the opposite direction at the same speed.

NOTE: COURSE MUST BE RUN IN BOTH DIRECTIONS TO MINIMIZE THE EFFECTS OF WIND AND CURRENT.

2. Average the two time measurements.

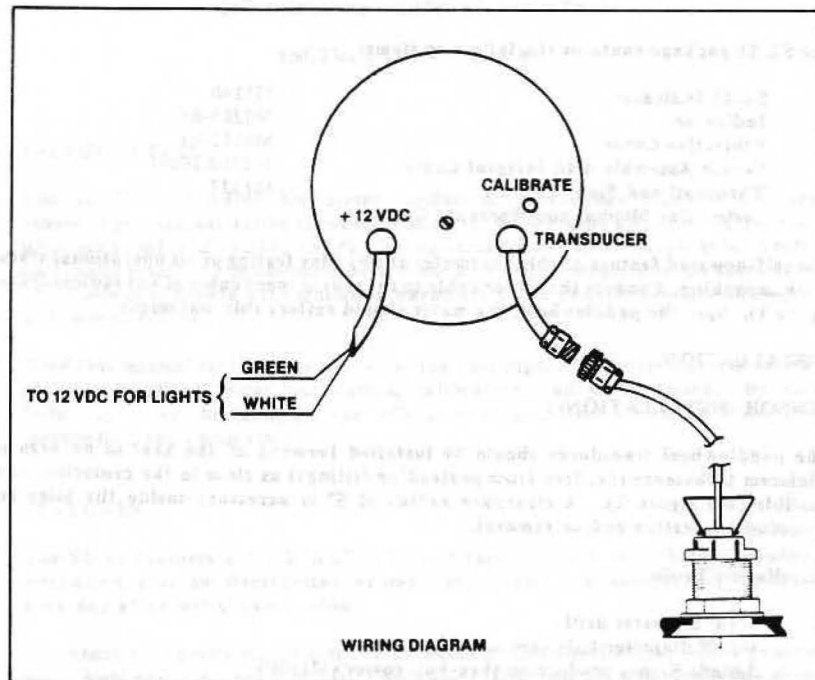


Figure 1

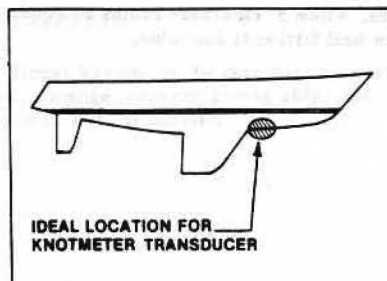


Figure 2

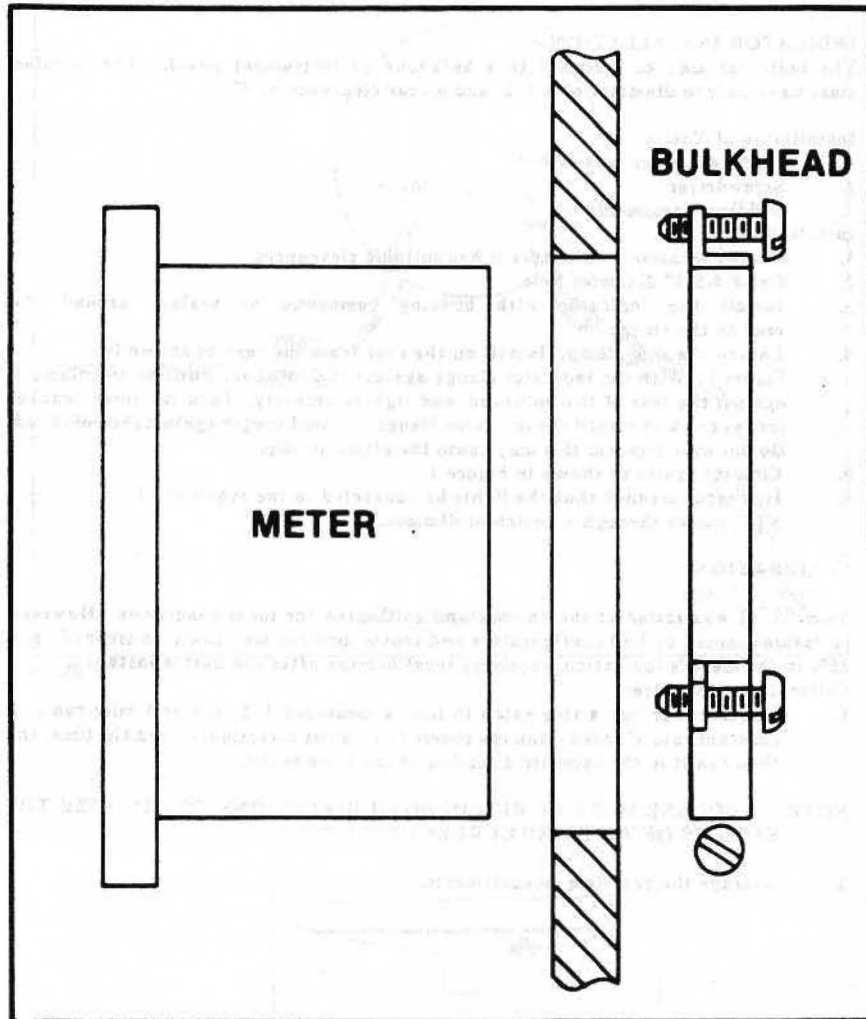


Figure 7

3. Drill a 5/16" pilot hole through the hull from the inside of the bilge.
4. a) If a M1580 thru-hull cutter is used, it will cut the 1-5/8" hole and countersink the bore in one step. Drill the hole for the fitting using the 5/16" pilot hole as a center guide (see figure 3).
- c) If you do not possess a Signet thru-hull cutter, drill the 1-5/8" hole with the hole saw using the pilot hole as a guide. Use a rasp to countersink the hole to a 2-1/2" diameter to make its shape acceptable to the thru-hull fitting.
5. Install the thru-hull fitting using the bedding compound. Make sure the arrow stamped on the outer face of the fitting points towards the bow of the boat, parallel to the flow of water over the hull (see figure 5).
6. Install the large nut on the fitting using a wrench. Insert the thru-hull installation tool into the notches of the fitting to hold it in place while the nut is tightened. Once installed, the fitting should not move or rotate.
7. Check the position of the arrow to insure correct direction (refer to step 5). Reposition if necessary.
8. Check the inside of the fitting for any foreign materials. Clean if required.
9. Make sure the paddlewheel transducer spins freely.
10. Insert the transducer into the thru-hull fitting. The wire handle should be aligned fore and aft (see figure 6). Make sure it clicks down into the notch on the thru-hull fitting. When properly installed, the transducer body will not rotate.
11. A plug is provided to seal the thru-hull bore when the transducer is not in use, or the boat is being moved into or out of the water.

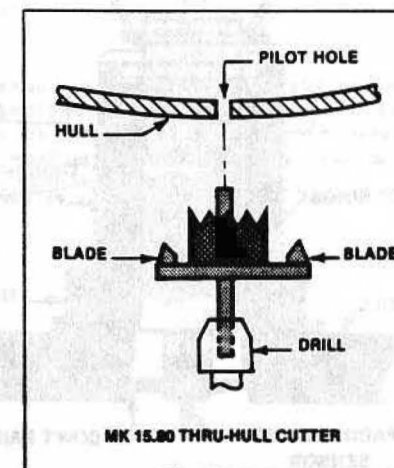


Figure 3

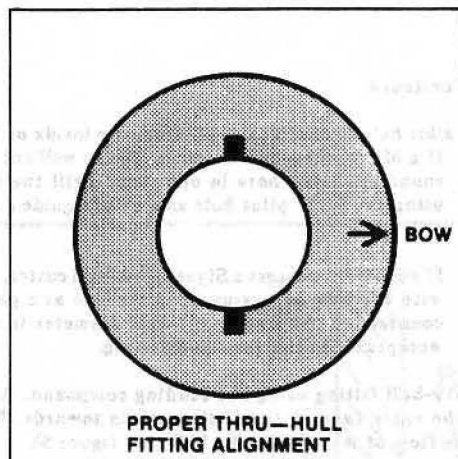


Figure 5

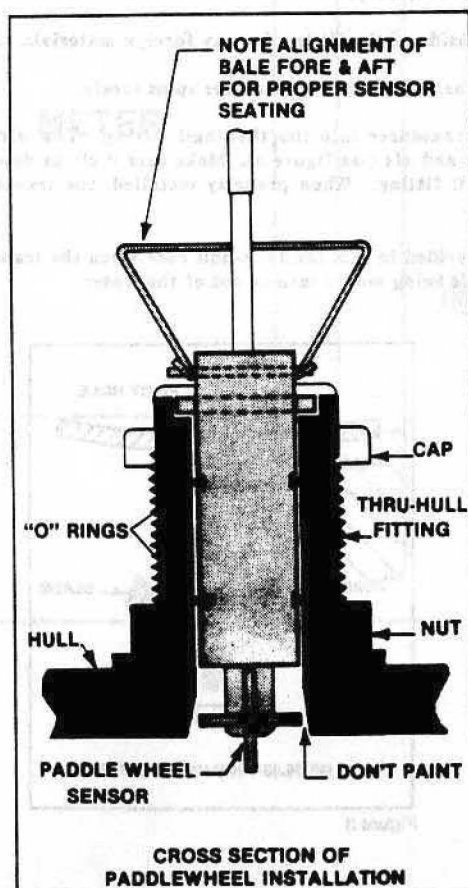


Figure 6

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3. Determine the boat's average speed by referring to Table 1. Without reducing speed, compare the calculated speed from the table with the displayed speed on the indicator. If they differ, use the calibration screwdriver to turn the "CALIBRATION" pot on the back of the indicator until the display speed equals to calculated speed (see figure 1).

NOTE: THE PLASTIC CAP SEALING THE CALIBRATION POT MUST BE REMOVED BEFORE ADJUSTMENTS ARE MADE. BE SURE TO REPLACE THIS CAP AFTER CALIBRATION.

Example: Over a 1/2 mile course, the first run required 5 minutes, 44 seconds. A second run in the opposite direction required 5 minutes, 36 seconds. The average time is 5 minutes 40 seconds which indicates a speed of 5.3 knots on the table. The display must be adjusted to indicate this speed.

If you do not have a marked 1/2 mile or 1 mile course near you, the following formula will allow you to calculate your speed over any known distance:

$$\frac{\text{Distance (in nautical miles)} \times 60}{\text{Time (in minutes)}} = \text{KNOTS}$$

NOTE: SECONDS MUST BE CONVERTED TO TENTHS OF A MINUTE.

Example: a run over a 5/8 mile course between two bouys required 8 minutes, 6 seconds.

$$\frac{5/8 \times 60}{8.1} = 4.6 \text{ KNOTS}$$

Meter should be adjusted to this speed. (See Table 1).

5.0 TROUBLESHOOTING

5.1 SENSOR

If the indicator display suddenly reads zero, is erratic, or consistently reads low, the problem is usually in the cables or at the transducer location. First, check the power and sensor cables. If they are aged or broken they must be repaired or replaced. If the cables appear to be working properly, then the problem is probably a jammed paddlewheel or a dirty thru-hull bore.

| RATE (KNOTS) | 1 MILE TIME | ½ MILE TIME |
|-----------------|----------------|----------------|
| 4.0 | 15:00 | 7:30 |
| 4.1 | 14:38 | 7:19 |
| 4.2 | 14:17 | 7:09 |
| 4.3 | 13:57 | 6:59 |
| 4.4 | 13:38 | 6:49 |
| 4.5 | 13:20 | 6:40 |
| 4.6 | 13:03 | 6:31 |
| 4.7 | 12:46 | 6:23 |
| 4.8 | 12:30 | 6:15 |
| 4.9 | 12:15 | 6:07 |
| 5.0 | 12:00 | 6:00 |
| 5.1 | 11:46 | 5:53 |
| 5.2 | 11:32 | 5:46 |
| 5.3 | 11:19 | 5:40 |
| 5.4 | 11:06 | 5:33 |
| 5.5 | 10:54 | 5:27 |
| 5.6 | 10:43 | 5:21 |
| 5.7 | 10:32 | 5:16 |
| 5.8 | 10:21 | 5:10 |
| 5.9 | 10:10 | 5:05 |
| 6.0 | 10:00 | 5:00 |
| 6.1 | 9:50 | 4:55 |
| 6.2 | 9:41 | 4:50 |
| 6.3 | 9:31 | 4:46 |
| 6.4 | 9:22 | 4:41 |
| 6.5 | 9:14 | 4:37 |
| 6.6 | 9:05 | 4:33 |
| 6.7 | 8:57 | 4:29 |
| 6.8 | 8:49 | 4:25 |
| 6.9 | 8:42 | 4:21 |
| 7.0 | 8:34 | 4:17 |

Table 1

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To check the paddlewheel sensor, remove it from the thru-hull fitting and replace it with the dummy plug. (If done quickly, very little water will enter the bilge.) The paddlewheel can be cleaned with a small, stiff brush (e.g., a tooth brush) and a toothpick. The paddle can be removed for a thorough cleaning by carefully prying the transducer 'ears' apart with a screwdriver and pressing the rotor out (see figure 8). After cleaning, the paddle should spin freely. If the paddlewheel appears to be clean, then the problem may be growth fouling the thru-hull fitting. If this is the case, the fitting must be cleared by a diver.

5.2 INDICATOR

The SL 11 Indicator is virtually trouble-free. If the indicator reading is wrong, the trouble can usually be traced to the transducer or cables. If the trouble does appear to be in the indicator, contact your dealer or Signet Marine.

6.0 CARE AND MAINTENANCE

6.1 SENSOR

Other than occasional cleaning (see section 5.1), the sensor requires no regular maintenance. Local experience with bottom fouling will dictate the frequency of cleaning.

In areas of rapid bottom growth, it is recommended that the transducer be removed, and the plug inserted, when the boat is not in use.

6.2 INDICATOR

Except for infrequent replacement of the internal lamp, the indicator needs no routine maintenance. Frequent fogging of the glass indicates the breather hole (located at the bottom rear of the case) is fouled and needs to be cleared. Persistent fogging may require the use of a commercially available defogging spray (may be purchased at auto supply stores). The glass front at the indicator may be cleaned with any commercial window cleaner (e.g., Windex).

To change the internal lamp, remove the three small screws from the side of the instrument case. Gently pull the indicator out. All internal components are mounted to the rear panel of the instrument case; be careful not to damage these components when removing. Pull the old lamp from its socket and replace. Carefully reassemble the indicator.

7.0 REPLACEMENT PARTS LIST

| PART | NUMBER |
|---------------------|--------------|
| Dial Lamp | 6900-0004 |
| Protective Cover | M0212-01 |
| Spare Rotor Kit | M1531 |
| Cap for Plug/Sensor | M1542 |
| Sensor (complete) | 1-2200.100-1 |
| Plug | MK 1536 |

SIGNETMARINE
LIMITED TWO YEAR WARRANTY

SIGNETMarine's Limited Two Year Warranty warrants its instruments to be free from defect in material and workmanship under normal use two years from date of purchase by initial owner, or three years from date of manufacture, whichever is earlier. Products not purchased within three years from date of manufacture will not be covered by warranty. Proof of date of purchase is required to validate all warranty service.

Instruments which prove to be defective in the first year of the warranty period will be repaired or replaced free of charge including labor, F.O.B. our factory, or designated Service Centers (addresses furnished upon request). Transducers or cables are not covered after installation.

The limited warranty for the second year of the warranty period covers only non-moving parts, such as electrical components. Meter movements will not be covered after one year. All units qualifying for warranty repair after one year are subject to a service charge of \$20.00.

Items returned for warranty repair must be prepaid and insured for shipment. Warranty claims are processed on the condition that prompt notification of a defect is given to SIGNETMarine within the warranty period. SIGNETMarine shall have the sole right to determine whether in fact a warranty situation exists.

SIGNETMarine warranty does not cover travel time, mileage expenses, removal, reinstallation or calibration.

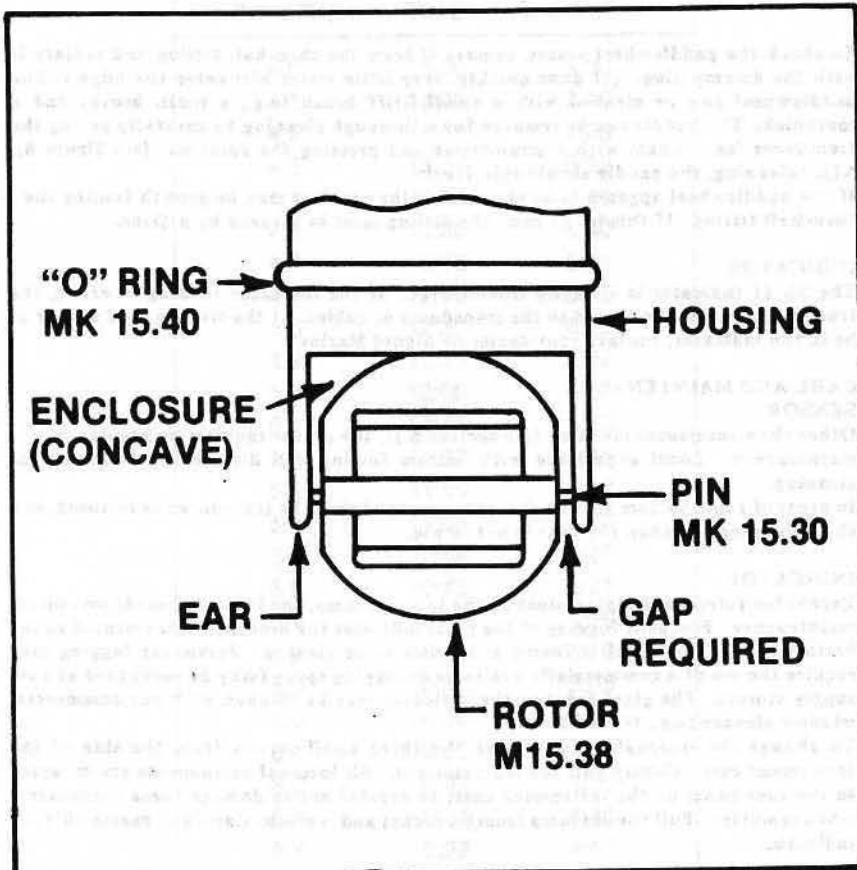


Figure 8

This warranty does not cover defects caused by installation, abuse, or electrical damage. SIGNETMarine will not warranty any instruments damaged during shipment to the factory which arrive either less the case or were improperly packed. Repair attempts by other than authorized Service Centers will void warranty.

SIGNETMarine is continually making design changes and improvements that adapt to original circuit configuration. These may be incorporated as required in older units on a minimal charge basis. Pre-authorization must be given by SIGNETMarine before any field upgrades are undertaken.

CONSEQUENTIAL DAMAGES

SIGNETMarine shall not be liable for special consequential damages of any nature with respect to any merchandise or service sold, rendered, or delivered.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.