

# INSTRUCTION MANUAL

*Airguide*

MODEL #610 ENGINE POWER METER  
(For 4-Cycle Gasoline Marine Engines)



**AIRGUIDE INSTRUMENT COMPANY**

CHICAGO 47, ILLINOIS

Purpose of the Airguide Power Meter is to indicate to the boat owner the percent of power or the amount of power he is demanding of his engine at any given moment. Whether the marine engine is being operated at  $\frac{1}{4}$ ,  $\frac{1}{2}$  or full throttle, it is laboring, i.e., as the engine of an automobile or truck always pulling the vehicle uphill. For this reason, power boat operators are frequently surprised to learn after a relatively short time, their engine is in need of an overhaul to replace or repair parts damaged through overheating or excess wear as a result of long periods of operation in a virtually 100% of power position. To restate the purpose, we would say this Airguide Power Meter is designed to help the boat owner and operator to longer engine life and happier cruising through more reasonable demands on the engine as indicated by the various zones on the Power Meter dial.

Although a tachometer is helpful in many ways, it is best when used with an Airguide Power Meter. A quick example is the situation where you are moving through a following sea as contrasted with your moving against the wind and waves. Your tachometer might very properly show the same RPM reading in each situation. Yet, to maintain the RPM's going into the wind and waves demands more power from your engine.

Airguide's Engine Power Meter dial is divided actually into three separate scales. The top scale reads from 0 to 20 inches of mercury (vacuum). The colorful scale directly below is divided into zones of operation.

Without a doubt, every boat will from time to time be operated with the meter indicating in the red zone. This for "short periods only" is not harmful. Prolonged operation in this zone will hasten an overhaul.

The next zone is marked for high-speed cruising and although it may add longevity to the engine's life, it is not particularly an economical zone in which to operate. For economy, the engine should be operated in the next zone, i.e., "economy cruise."

In use, the Airguide Engine Power Meter will:

Continuously monitor engine performance under all operating conditions in terms of vacuum level (inches of mercury), economy level and percent of total power being used, at a given RPM.

Provide a reference source for accurate engine tune-up and adjustment.

Prevent engine failure and the need for costly repairs by indicating any variation in engine behavior that could result in such failure.

Locate the probable causes of erratic engine performance.

Provide the boat owner with a visual source of information for evaluating the various modes of operation and a ready means for duplicating such ranges whenever desired.

The Airguide Engine Power Meter when used with your engine tachometer, further serves to illustrate the advantages of adequate instrumentation. A boat being operated through a following sea at a specific engine RPM could also be run at the same engine RPM when moving

against the wind and waves. The difference in engine loading, however, may be considerable. The Engine Power Meter makes it possible to properly adjust for any condition. Its continued use will enable the boat owner and/or operator to obtain longer engine life by the use of more conservative levels of engine operation and proper adjustment to the loads encountered. This contributes to happier cruising.

**AIRGUIDE ENGINE POWER METER DIAL  
VACUUM LEVEL (Inches of Mercury)  
COLOR GRADUATED ZONES**

**RED** (Short period only)

Operation with the pointer in this zone for extended periods will shorten engine life and hasten the need for overhaul.

**ORANGE, HALF-TONE** (High Speed Cruise)

Sustained operation in this zone can be tolerated without undue wear, but economy is poor.

**GREEN, HALF-TONE** (Economy Cruise)

Predominate operation in this zone will assure the greatest economy and materially extend the engine life.

**GREEN** (Slow-Idle)

Operation in this zone only lightly loads the engine—with engine just idling, no load, a reading of 18-20 inches steady should exist if engine is in proper tune and condition.

**PERCENT POWER**

The opposite end of pointer continuously indicates the percent of total available power at any RPM being utilized at any instant due to loading.

**USING POWER METER TO OBTAIN BEST DISTRIBUTOR SPARK SETTING**

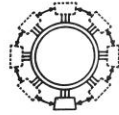
When new ignition points and/or plugs are installed, it is necessary to reset the distributor. This setting is most easily accomplished in the following manner: With the distributor set at an approximate position that will permit operation and engine brought to operating temperature, it is only necessary to rotate the distributor until a maximum steady meter reading is reached. Reverse distributor from this position for a 1" meter reading less than maximum and lock distributor in this position. This is the ideal setting which is now complete. Manufacturers recommendation should be followed if different from above.

**METER INDICATION OF FAULTY ENGINE PERFORMANCE**

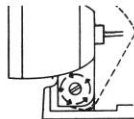
| <b>Meter Reading and/or Pointer Action</b>                                      | <b>Indicated Source of Irregular Engine Operation</b>   |
|---|---|
| Low vacuum reading<br>12"-16" steady/idle                                       | A. Late ignition setting<br>B. Over-rich carburetor adjustment  |
| Irregular pointer action/idle   | (Indicates irregular misfiring)<br>A. Water or other foreign substance in fuel<br>B. Weak fuel pump—loose fitting<br>C. Sticking valve<br>D. Loose, broken or shorting ignition wire(s)   |
| Pointer tends to move up and down scale without change in throttle setting/idle | A. Carburetor defective<br>(Engine in proper tune and good condition will pull a steady 18"-21")  |
| Fluttering pointer action/idle  | A. Valves in poor condition and require servicing   |
| Wide pointer fluctuation<br>1"-2" regularly/idle                                | (Indicates one cylinder is misfiring)<br>A. Spark plug failure<br>B. Stuck or burned valve<br>C. Broken valve spring<br>D. Defective high-tension wire and/or connection(s)<br>E. Cracked distributor cap<br>F. Blown head gasket |

## INDICATOR INSTALLATION

Packed together with your Model 610 Power Meter are: 20' of heavy wall grey vinyl tubing, (2) connector nuts for securing tubing connections, (1)  $\frac{1}{8}$ " pipe thread special fitting, (1)  $\frac{1}{4}$ " pipe thread special fitting, plus plastic clips and mounting screws.



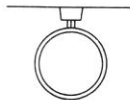
**Figure 1.**  
Base rotates 360° for easy mounting in any position.



**Figure 2.**  
Angle of indicator head can be adjusted for perfect visibility.



**Figure 3.**  
Mounting on top of dash or deck.



**Figure 4.**  
Base versatility permits mounting below dashboard.

## VERSATILE MOUNTING OF INDICATOR

Two very unique features make it adaptable to almost any installation. As shown in Figure 1, the meter housing can be rotated 360° on its base. Loosen the single nut in the center of the case back and it can be rotated to any desired position and re-locked by tightening the nut. **DO NOT OVERTIGHTEN OR INSTRUMENT MAY BE DAMAGED.** The base also can be tilted over a wide angle by loosening and re-tightening the set screw as shown in Figure 2. If the base is dismounted from case for installation, be sure to replace the lock washer as originally installed, i.e., between bracket and case. Note also rubber gasket to mount under base in all installations.

## WIDE VARIETY OF MOUNTING LOCATIONS

**FIGURE 3.** Mounted on top of dash, deck or any horizontal surface. Select location and dismount base for attaching. Use #8 self-tapping screws in metal or wood. Also drill  $\frac{9}{32}$ " hole for tubing and light wire entry.

**FIGURE 4.** Mounted below dashboard or other overhead surface. Use #8 self-tapping screws (large) furnished.

### ENGINE MANIFOLD CONNECTION

Locate the pipe plugged hole in the engine intake manifold most accessible, there is frequently more than one provided. Remove the pipe plug and replace it with the appropriate special pipe thread fitting provided. The tubing from the meter will be routed to and connected to this fitting after being connected to the meter.

### CONNECTING TUBING TO INDICATOR

Run (1) of the coupling nuts onto one end of the grey vinyl tubing about 2".

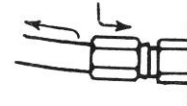
Attach this end of tubing to meter fitting as far as possible.

Bring the coupling nut down to fitting and while pulling slightly on the tubing in opposite direction, tighten coupling nut. See Fig. 5.

#### TO CONNECT

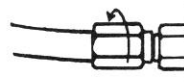


A. Push tubing as far up on fitting as possible.



B. Push coupling up firmly, at the same time pulling slightly on tubing in opposite direction. Screw coupling nut down snugly by turning it to the right while preventing tubing from turning.

#### TO DISCONNECT



C. Unscrew coupling by turning it to the left; move it off the fitting and then pull tubing off while holding on to coupling.

Figure 5.

Where meter is mounted over an enclosed area, feed tubing through hole in base together with light wires. When all tubing has been passed through, leave a small loop standing back of indicator, to avoid kinking or pinching. Route tubing in the most direct path possible to the fitting previously installed at the engine. Tubing should be located and secured, with the plastic clips provided, in a manner that will avoid kinking, interfering or contact with exhaust manifolds or other points of extreme heat.

Cut tubing to required length at engine and connect to fitting in the same manner as at indicator. Be sure to use coupling nut for leak-proof connection. See Fig. 5.

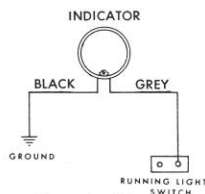


Figure 6.

#### CONNECTING LIGHT WIRES

Bare ends of grey and black wires from indicator cable. Attach black wire to any convenient ground point. Connect grey wire to running light switch on the side that will turn light on and off with other lights.

The Model #610 Engine Power Meter is equipped with a No. 53, 12-volt light bulb. Should a bulb of other voltage be required, refer to the list below:

| Voltage | Bulb. No. |
|---------|-----------|
| 1.3     | 351 Spec. |
| 2.5     | 43        |
| 3.2     | 45        |
| 6.0     | 51        |
| 12.0    | 53        |
| 28.0    | 313       |

#### REPLACING LIGHT BULB

Remove coupling nut and tubing, at back of indicator. See Fig. 5. Loosen and unscrew hex case nut while securely holding the meter case with one hand.

Separate case from case back sufficient to reach light socket under retaining clip.

Unsnap light socket and remove light bulb by slightly depressing bulb in socket and twisting counter-clockwise at the same time.

Reverse procedure for reassembly.

NOTE: When retightening special hex nut, tighten down to just a snug fit and no further. Tightening beyond this point could damage the instrument.

