Installation Instructions
Bracket Mount Synchronizers

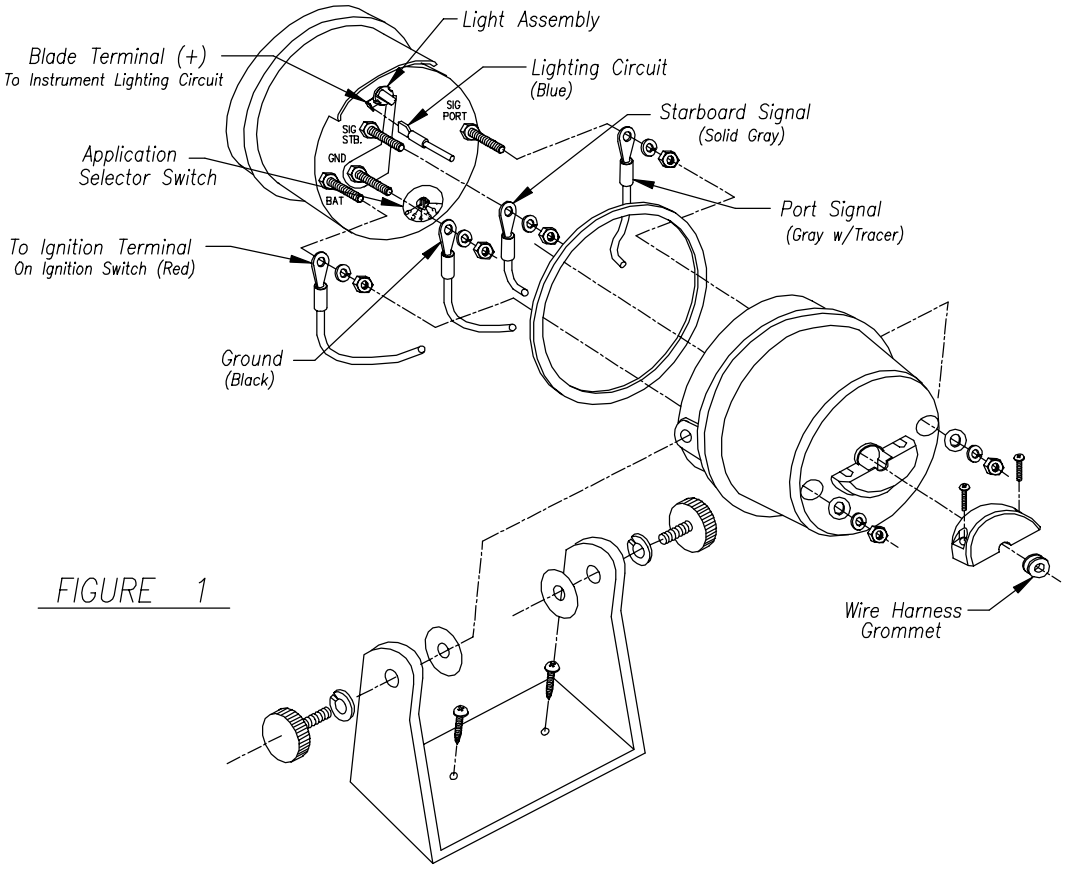

FIGURE 1

CAUTION: Diesel mag pick-up synchronizers cannot be used for any other application. Be sure you have selected the proper synchro for your engine.

The Faria Marine Instrument Bracket Mount Dual Engine Synchronizer is designed to provide an extremely accurate indication of when the RPM's of both engines are the same - or when they are "synchronized". There are many reasons why it is desirable to operate dual engines "in synchronization" ranging from improved efficiency and reduced vibration to greater passenger comfort. Use of the Faria Synchronizer greatly simplifies the task of controlling the engine throttle position to maintain synchronization.

Before proceeding with the actual installation instructions, a few general comments are in order. First of all, for operation, both engines (and tachometer signal sources) must be of the same type and have the same number of pulses (per crankshaft revolution). This means they must both have the same number of cylinders and the same type of ignition (or other tach signal source, such as the number of alternator 'poles' in the case of outboard engines).

Like a tachometer, the Synchronizer counts "pulses" from the ignition or tach signal source of each engine, compares them to each other, and displays any difference as a pointer swing toward the engine that is running slower. If both are running at the same RPM, the pointer will be in the mid "synchronized" position. If one engine is slower than the other, the pointer will swing toward that engine. The engines can then be synchronized by adjusting the RPM's of either engine.

As with any other piece of electronics equipment, certain precautions must be taken during installation to minimize the influence of electrical interference caused by noise spikes, Radio Frequency Interference (RFI), Electromagnetic Interference (EMI), and other sources.

Care must be taken to avoid routing tachometer and synchronizer wiring in close proximity to these sources of electrical interference. If any extreme electrical interference is present, synchronizer performance may be momentarily degraded, but no damage will occur to the unit. For instance, high powered radio transmissions may be picked up by the boat's wiring, because of electrical interference, and temporarily impair the performance of the unit. However, normal operation will resume immediately upon termination of the radio transmission. Additional information about RFI/EMI is given below.

The Faria Bracket Mount Dual Engine Synchronizer is supplied completely assembled. Under most circumstances all that is necessary is to secure the bracket to the deck or panel top, install the synchronizer into the bracket, and connect the wires as detailed below and in Figure 1. The Application Selector Switch on the rear of the instrument's case has been pre-set at the factory as follows:

For Mag pick-up synchros, the switch is in position #1 (for 81-160 flywheel teeth).

For all other synchros, the switch is in position #2 (for gas inboards and I/O's).

Refer to the tables below for other applications and switch settings.

Mag Pick-up Only	
Flywheel Teeth	Switch Setting
30 - 80	2
81 - 160	1

All Other Synchronizers	
Application	Switch Setting
All gas inboards & I/O's	2
Most outboards 50 HP and above	1
All other outboards	2
Diesel tach gen. @ 0.5:1 or 1:1 ratios	2
Diesel tach gen. @ 1.5:1 or 2:1 ratios	1
Diesel using alternator for tach signal	1

Installation Procedure:

Caution: Disconnect the battery during installation. This safety precaution is recommended any time that electrical wiring is done and/or any piece of electronics is being installed.

1.) Location: Since the unit will likely be viewed frequently, it is prudent to mount it in a fairly central location on top of the instrument console where it can be seen with a casual glance. This unit should also be mounted so that it is viewed "straight on" to avoid parallax viewing error. Care should be taken to avoid mounting in close proximity with a sensitive magnetic card compass. Although the meter movement in the synchronizer is shielded, it is an electronic item and the residual magnetic fields set up by the unit's circuitry plus the ferrous material of the movement shield may disrupt the Earth's magnetic field in the immediate area. As a general rule, a separation distance if 18" will be more than adequate to avoid magnetic influence on the compass. If it is desirable to mount the Synchronizer closer to the compass, it may be necessary to re-compensate the compass per instructions supplied with it. Once the optimum location has been identified, make sure that there is sufficient room underneath deck area for routing the wiring and securing the mounting bracket and cable clamp / feed through. The deck material itself must be thick enough to provide a rigid mounting platform for the Synchronizer (or any other equipment for that matter).

2.) Mounting: Assuming that the "Application Switch" position is suitable for your application, proceed to mount the Synchronizer's mounting bracket (if not, see note "A"). Use the bracket itself as a template to mark the location of the mounting screw holes. Then, drill pilot holes at these locations and secure the mounting bracket in position. Next, locate a suitable spot for the wire feed thru hole behind the mounting bracket, and using the cable clamp as a template, mark the location of the cable clamp mounting screws. Remove the cable clamp and mark the location for the wire at the exact midpoint between the mounting screw locations. Drill a hole at this location large enough to pass the 5 wires to the Synchronizer (but not larger than 5/8" diameter). Drill pilot holes for the cable clamp mounting screws. See Figure 2.

Mount the Synchronizer head assembly into the mounting bracket and pass the 5 wires exiting the rear of the unit through the feed thru hole. Connect the 5 wires to the boat's circuitry as follows:

a.) RED wire to a fused (+)12VDC line normally used for ENGINE WIRING. A 1/4 Amp slow-blow fuse is recommended for this application.

b.) BLACK wire to the (-) GND system for ENGINE WIRING.

c.) BLUE wire to the instrument panel's lighting circuit.

d.) Solid GRAY to the STARBOARD engine tachometer signal circuit (available at the STARBOARD tachometer "SIG" terminal).

e.) GRAY w/TRACER to the PORT engine tachometer signal circuit (available at the PORT tachometer "SIG" terminal).

In the event that the wires are not long enough to reach their respective connection points, they may be extended with #16 AWG marine grade wires color coded as above. USCG and ABYC standards for DC electrical systems require this type and size for instrumentation wiring.

Once the wiring has been completed, the harness of wires can be bundled and taped. Loop the wire bundle and secure the clamp in place. Install the cable clamp as shown to finish off the installation. (See Figure 2). Reconnect the battery.

3.) Calibration: This gauge has been calibrated at the factory, and should never need adjustment. An exception to this is a diesel engine application where the alternator is the tack signal source. Due to variations in belt tension, and /or belt dimensions, engine alternators may actually spin at different speeds with the engines running at the same RPM's. If you are experiencing problems with this type of application, the synchro can be adjusted to work with these differences by slightly rotating the adjustment potentiometer with a 5/64" Allen wrench. This adjustment can also be used to fine tune a synchro in any application. (See Note A)

Notes:

A.) If it is necessary to move the "Application Switch" to another position, remove the nuts, lockwashers, and flat washers that secure the Synchronizer head assembly into the mounting cup. Loosen the two screws that secure the strain relief clamp, and separate the synchronizer head from the mounting cup. Move the "Application Switch" by slightly depressing and rotating it with a small screwdriver. Reassemble in a reverse order.

B.) To change the light bulb, twist black socket assembly one-eighth turn counterclockwise until it pops out. Bulb pulls straight out of socket assembly. It is a GE #194 instrument lamp.

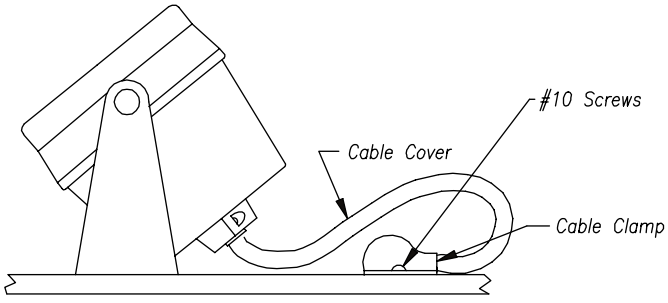

FIGURE 2