



Programmable Fuel Sender Installation and Calibration for Ford Trucks (180E-10Fohms)

WARNING: DO NOT ATTEMPT TO CALIBRATE IN WATER

HOW THE SENDERS MEASURE LIQUID LEVEL

The senders work by measuring capacitance, which means no moving parts are required. This makes them ideal for road, off-road, and boat racing. Electronics in the head convert this measured capacitance to the programmed output of ohms or volts. Capacitance is measured between the inner sensing tube and the grounded outer tube, and requires the fluid to be non-conductive.

SHORTENING AND BENDING SENDERS (if required)

Fuel senders are calibrated by the manufacturer or by **HARMON Racing Cells** prior to shipment. However, to shorten the sender after receiving it please follow these instructions (Note: 12" senders can be shortened to 3" max; 24" senders can be shortened to 13" max):

1. Cut the outer tube to desired length using a tube cutter or saw (Note: We recommend leaving approx. ¼" between the bottom of sender and bottom of bladder to prevent damage).
2. Cut or snip the inner tube to desired length as well.
3. Re-calibrate the sender.

For bending, most senders provided by **HARMON Racing Cells** are bendable at or above the 3" mark on the outer tube. Senders that are not bendable will not have this mark. To bend senders:

1. Identify the mark that is 3" on the upper end of the outer tube, near the head.
2. Bend the sending unit within the 3" range up to 90° (Note: Bending the sender anywhere other than within the 3" range risks shorting the inner to outer tube, causing a false "Empty" reading).

Once bending is complete there is no need to re-calibrate the sender.

CONNECTIONS

Refer to diagram A-1 for wiring the sender to the stock instrument cluster.

All senders must be wired **PRIOR** to calibration. Failure to correctly wire the sender to the gauge may result in false readings or even damage to the sending unit or gauge.

Sender Connections

NEG: connect this to DC ground or a clean chassis ground (Note: Our senders work with *negative-ground* systems only).

SEND: connect this to the YE-VT (yellow-violet) input coming from the display (or from the fuel pump wiring harness). This is the direct signal to the ECU.

POS: Most senders have an ignition-voltage POS terminal to run their electronics. A fused (1 amp) voltage between 11-28 vdc should be wired to the POS connection. The voltage should turn off when the system is turned off, both for safety and to avoid running down the battery.

Vehicle Connections

GN-BU (green-blue): connect this to a clean chassis ground (do not connect it to the NEG terminal of the sender).

YE-VT (yellow-violet): connect this to the SEND terminal on the sending unit.

WH-BN (white-brown) & YE-GY (yellow-gray): can be connected to a fuel pump or capped off (do not leave exposed) if not needed to power a fuel pump.

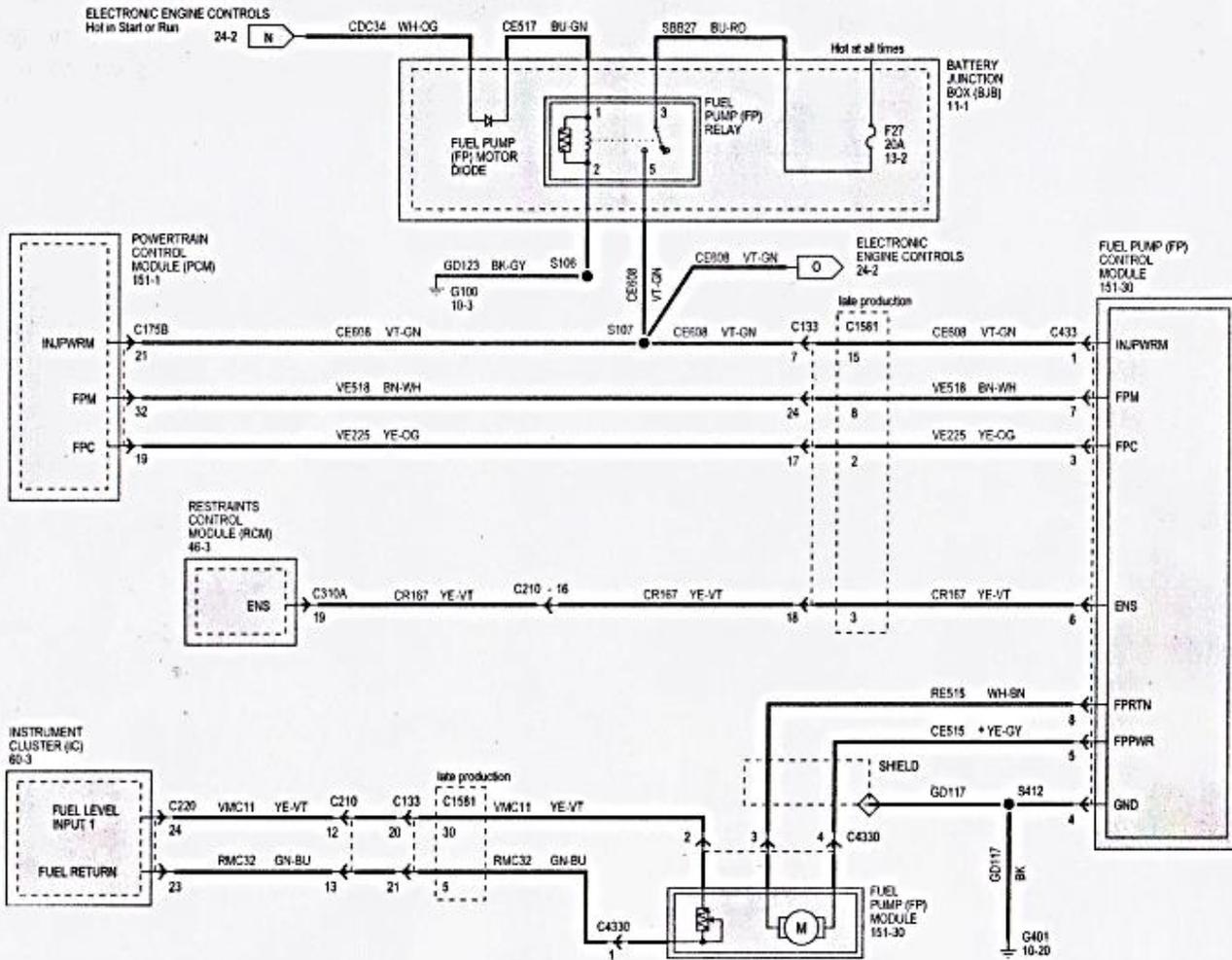


Diagram A-1

CALIBRATION FOR PROGRAMMABLE FUEL SENDERS

The output range (e.g. E240/F33 ohms) and alarm levels (if ordered) are set at the factory and not by **HARMON Racing Cells**. They cannot be changed by either **HARMON Racing Cells** or by the end user but can be changed back at the factory if needed.

The senders are calibrated at the factory but must be recalibrated if shortened. In order to do so, first determine if you have an AUTOCAL sender (which have an AutoCal stamp or sticker on the head) or a non-AutoCal sender (will not have a stamp or will have a "MAG" in the label). Make sure all connections are correct, then follow the steps below:

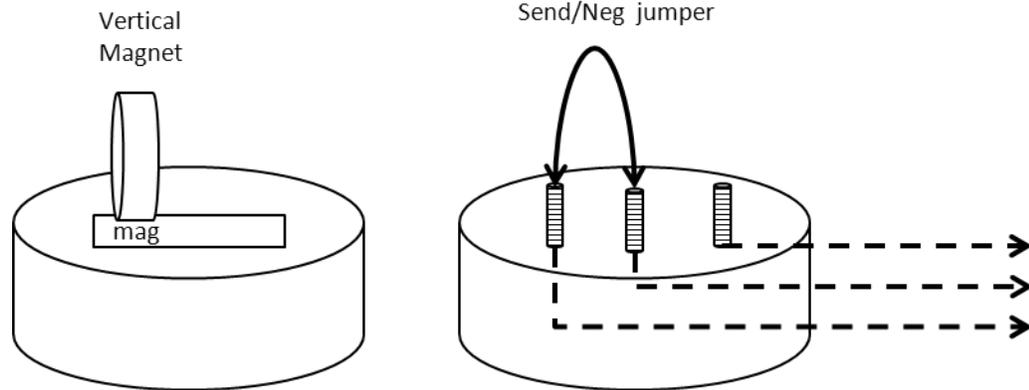
AUTOCAL Senders

SETTING EMPTY: After shortening and with the sender removed from the tank (or in an empty tank), connect the sender to the system wiring, and turn on the power. The gauge needle should bounce between Empty and Full a couple of times and return to Empty as the sender discovers its shorter length. Once the needle settles on Empty, turn OFF the power.

SETTING FULL: With the power turned OFF install the sender into a full tank of gas (or in a PVC tube or fuel line to simulate a full tank). **ONLY HYDROCARBON FUELS CAN BE USED.** Once installed, turn ON the power. The reading should go above Full and then finish on Full. This Autocal Full will use Full Detection at each fillup.

MANUAL CAL for non-AutoCal Senders

For senders where the label shows "MAG", a magnet can be applied on the word as shown in this picture. Otherwise, a jumper such as a clip lead should be applied between Send and Negative. Timing is **important**, and therefore it is a two-person job; one person to switch the power and count, and one person to handle the jumper/magnet. If it doesn't work right away, please email for advice rather than torturing yourself.



SETTING EMPTY: 1) Have the sender out of the tank and wired normally to the gauge, with the power turned **OFF**; 2) have the jumper or magnet **applied**; 3) have someone turn the power **ON** and count "1000-1, 1000-2" (ie 2 sec), at which point you **remove** the jumper or magnet; 4) the needle should bounce several times between Empty and Full over about 5 seconds before finishing on Empty. If you don't see these multiple bounces, the sender did not see your attempted calibration.

SETTING FULL: The Full is set automatically by the Full Detection sensor at power up each time the tank has been filled, so there is no need to calibrate Full.

HELP

For general questions about sender shortening, bending, or calibrating feel free to contact **HARMON Racing Cells** directly.

1-949-583-7191

jim@harmonracingcells.com

For technical or specific questions about sender performance, including issues with calibration, please contact the manufacturer directly by email or fax only.

Centroid Products

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