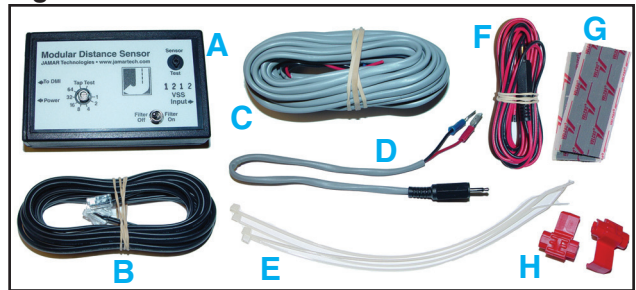


Installing the Modular Distance Sensor

The following instructions detail the installation of the Modular Distance Sensor. For the installation you will need the Modular Distance Sensor and Installation Kit shown in Figure 1 below.

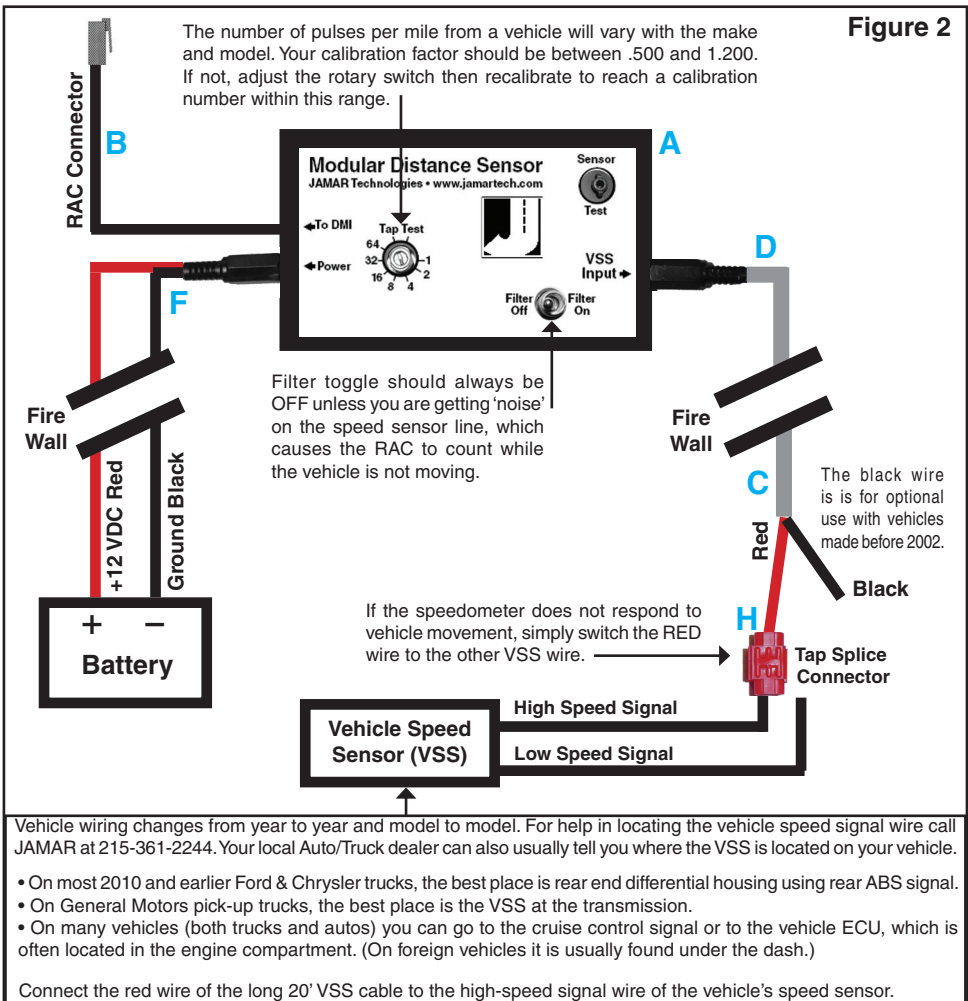
- A – Modular Sensor
- B – DMI Connector Cable
- C – VSS Extension Cable
- D – VSS Connection Cable
- E – Zip Ties
- F – Power Cable
- G – Velcro
- H – Tap Splice Connectors

Figure 1



Once you have finished the installation steps, your installation should look similar to Figure 2 below.

Figure 2



Installation Steps

1. Find a location under the vehicle dashboard that will allow fairly easy access to the MDS. **Do Not** mount the MDS on the heater ducts or where the heater vents will blow directly onto it. Attach the MDS using the nylon ties or Velcro provided, as shown in Figure 3.

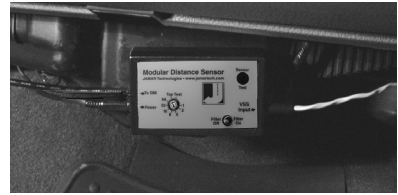


Fig. 3 – MDS Mounted Under Dash

2. Locate the 2 wires coming from the Vehicle's Speed Sensor (VSS).

Note: Vehicle wiring changes from year to year and model to model. For technical support in locating the vehicle speed signal wire call JAMAR at 215-361-2244. Your local Auto/Truck dealer can also usually tell you where the VSS can be located on your vehicle.

- On most 2010 and earlier Ford and Chrysler pick-up trucks, the best place is on the rear end differential housing using the rear ABS signal.
- On General Motors pick-up trucks, the best place is the VSS at the transmission.
- On many vehicles (both trucks and autos) you can go to the cruise control signal or to the vehicle ECU, which is often located in the engine compartment. (On foreign vehicles it is usually found under the dash.)

3. Route the red and black end of the 20' grey VSS cable through the firewall. This can usually be done by using an existing rubber grommet where other wires pass through the firewall. If you cannot locate an existing hole, **CAREFULLY** drill a small hole large enough for both the VSS cable and the +12Volt/Ground wires. **EXTREME CAUTION** must be taken to insure you do not drill into anything mounted on the opposite side of the firewall or cut any existing wiring.

Use the cable ties provided while routing the cable to the location for getting the speed signal that you previously identified. Attach the **red** wire of the VSS cable to the *high-speed signal wire* of the vehicle's speed sensor using the tap splice connectors provided. The **black** wire is for optional use with vehicles made before 2002. In these vehicles, it should be connected to the *low speed signal wire* of the vehicle's speed sensor or chassis ground. If you are unsure which wire from the VSS is the high-speed signal and which is the low-speed signal, pick one and connect the red wire to it. If the RAC counts when the vehicle moves, you are good to go. If not, connect the red wire to the other wire from the VSS.

NOTE: The tap splice connectors are supplied for convenience for initial installation. However, we recommend that once the installation is completed and you have verified the instrument is working properly, remove the tap splice connectors and solder the connections. Insulate using electrical tape or silicone.

4. Plug the connector of the VSS cable into the hole labeled *VSS Input* located on the right side of the MDS, as shown in Figure 4.

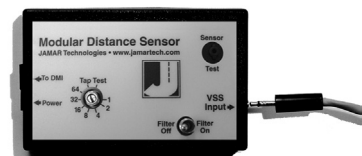


Fig. 4 – VSS Plug-in

Warranty: The Modular Distance Sensor has a warranty of 90 days against defects in material or workmanship. During the warranty period, JAMAR will either repair or replace this product at no charge. The Modular Distance Sensor is not user serviceable. Opening the MDS case will void the warranty. Contact JAMAR for technical assistance with the MDS.

5. Route the black DMI cable from the MDS to the desired instrument location. This will usually be routed between the doorpost and the dashboard. Make sure the cable will not be pinched when closing the door. If the instrument is going to be mounted to the front of the dashboard, you may want to bring the cable straight up the front of the dash. There is adequate cable length to allow mounting the DMI in any desired location inside the vehicle. Plug the cable into the MDS jack labeled *To DMI*, as shown in Figure 5. It does not matter which end of the cable is plugged into the MDS or DMI.

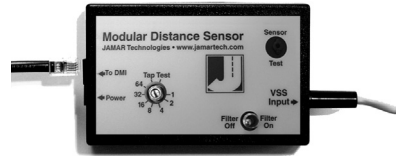


Fig. 5 – DMI Plug-in

6. Route the Red (+12 Volts) and Black (Ground) power cables directly to the vehicle's battery. This can be done using the same feed through location that was used for the VSS Cable. If, out of convenience, you elect to obtain the +12VDC and ground from a fuse panel or other location under the dashboard, **make sure it is a constant 12 volt source and not** one that is switched off with the ignition key. We also recommend the circuit should have as few devices as possible to avoid voltage fluctuations from Turn Signals, Brake Lights, etc. Plug the power cable into the hole labeled *Power* on the MDS, as shown in Figure 6. A diagram of the complete installation for the MDS is shown on the back page.

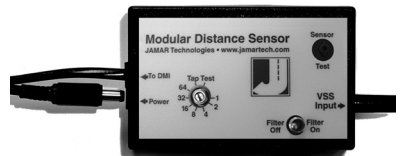


Fig. 6 – Power Plug-in

Adjusting the Vehicle Speed Sensor Pulse Rate

The signal pulses coming from the vehicle speed sensor are generated for use by the vehicle's computer, engine/transmission control, fuel management, ABS brakes, etc. The pulse rate can vary from 4,000 to in excess of 100,000 pulses per mile. The MDS will condition and amplify these pulses for use by the DMI. Since the higher pulse rates are not required for accurate distance measurements, the MDS incorporates a divider circuit to reduce the pulse rate. This is done by adjusting the **rotary switch** on the front of the MDS, as shown in Figure 7.

The adjustments go from 1 to 1 (1 pulse into the sensor, 1 pulse out) through 64 to 1 (64 pulses into the sensor, 1 pulse out). Although your particular vehicle may vary, generally Chrysler and Ford vehicles use a 4 to 1 ratio (position 4 on the switch) while General Motors vehicles use a 16 to 1 ratio (position 16 on the switch).

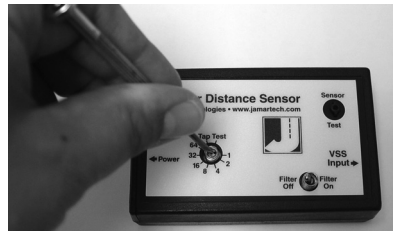


Fig. 7 – Rotary Switch Adjustment

To adjust the ratio, use a small screwdriver turn the switch to align it with the number you want. Note that the switch is at the '1' position when switch is turned fully counterclockwise. It is at the 'Test' position when the switch is turned fully clockwise.

Filter Toggle

As a default, the Filter toggle should be set to 'Filter Off'. However, on some vehicles there is 'noise' on the speed sensor line that causes the DMI to count up while the vehicle is not moving. The filter toggle should be flipped to 'Filter On' in these cases.



Fig. 8 – Filter Toggle

Troubleshooting

If the RAC is not counting correctly, first check to see that the Filter Toggle is in the OFF position. This should only be 'ON' if the RAC counts while the vehicle is not moving.

The most common reason a DMI won't count is because the calibration factor has been accidentally cleared from the DMI memory. If you are using the JAMAR RAC DMI, the calibration factor is displayed for 4 to 5 seconds every time the instrument is turned on. Make sure the factor is not showing all zeros (0.000). If you are using a different brand of DMI, make sure it does have a calibration number in its memory.

If the calibration number is entered correctly but the DMI still does not count, perform the following **Sensor Test**. *Note: For both the Sensor Test and Tap Test to work correctly, the filter toggle must be set to the 'Filter Off' position.*

Locate the **Sensor Test** button on the front upper right of the MDS, shown in Figure 9. When pressed, this will generate an internal low-level signal that is fed directly into the VSS Input circuit. First, **unplug** the VSS Input connector from the right side of the MDS. Second, turn on the DMI and press the CH key just like you would prior to starting a measurement. Next, using a small pointed object (pen, pencil, screwdriver, etc.) or your finger press the Sensor Test button for a few seconds. The DMI should count when the button is pushed. What number it counted doesn't matter as long as it did count.

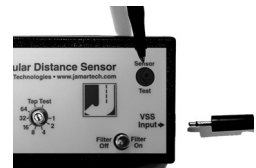


Fig. 9 – Sensor Test

If the DMI did count, everything from the Sensor up to the DMI is okay and the problem is most likely either a poor connection at the Vehicle's Speed Sensor or the connection is not at the correct location to get the vehicle speed signal. Check to make sure you are at the proper location to get the vehicle speed signal and also make sure you have a good electrical connection at the tap in point. Once you are sure you tapped into the correct location, it is always better to wire solder the connection. If after checking connections the DMI still did not count, perform the following **Tap Test**.

The Tap Test will determine if the distance pulses being sent from the MDS are getting to, and being processed by, the instrument. First **make sure** you note the current position of the rotary switch (1, 2, 4, 8, 16, 32 or 64), as you will have to return the switch back to this same position after the test is completed. Next, turn on the DMI. Press the CH key just like you were beginning to measure. Rotate the switch between the Tap and Test positions four or five times. (The Tap Test positions are shown in Figure 8.) The DMI should register. The count shown does not matter, just as long as the DMI did register a count. If it did count, the cable from the MDS to the DMI and the instrument itself are OK. If the DMI did not count, it is most likely a bad cable to the DMI or the DMI itself is bad. If available, try another DMI and repeat the TAP TEST. If the second DMI doesn't count, it has to be the cable between the MDS and the DMI.

Once the test is complete, return the Rotary Switch to the previous position and plug the VSS Connector back into the MDS.



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