Driving

Computer

Installation

Manual

INTRODUCTION

We believe your driving computers will mount on and function on all vehicles, foreign or domestic, automatic or manual transmission. This includes passengers cars, light and heavy trucks, vans and recreational vehicles.

As supplied your driving computers include all necessary mechanical and electrical hardware to install on vehicles with gasoline carbureted engines without fuel return lines. Adaptors or kits are available to allow installation on other vehicles. These kits include:

1. Fuel Return Kit part no. 1283. Designed to make installation of your driving computer easier on any vehicle having a "constant flow" fuel system. This kit is required whenever there is a return line runs from the carburetor back to the fuel tank. It is not required if a fuel return line runs from the carburetor back to the tank.

2. Electronic Fuel Injection kit no. 1300. This allows your driving computer to be used on a vehicle having an EFI system. Vehicles sold in the USA having EFI include Datsun 280z, 810 and 200SX; Toyota Supra; All BMW's except 320-1; and late model Cadillacs with fuel injection.

3. Fuel Injection—Diesel or CIS. Kit no. 4711. This allows your driving computer to be used on vehicles (including trucks) equipped with continuous injection systems (CIS) or diesel systems.

4. Speed Pulse Generator—kit no. 4710. This kit is required when either the drive shaft is enclosed or when there is no space in the drive shaft area to attach the coil and magnets used to sense speed.

SYMPTOM	PROBABLE CAUSE	REMEDY
Display does not dim when headlights are turned on.	Blue wire not properly connected	Connect blue wire to a souce, that is hot when headlights are on (parking lamps).
2. FLOWSENSOR FUEL PROBLEMS		
MPG and other fuel functions inoperative.	Incorrect flowsensor wiring.	Recheck the wiring according to the wiring instructions.
	Flowsensor installed backwards.	Reverse direction of flowsensor.
	Defective flowsensor, or Defective command module.	See testing FUEL mode page 18
3. SPEEDSENSOR		
MPH and other speed or distance functions	Short or ground in speed or sensor wiring.	Check & Repair black speedsensor wire.
	Speed sensor gap excessive or magnets improperly installed.	Set gap to 1/4" to 1/2". Check magnet installation correct, if required.
	Defective Speedsensor	Check continuity of speedsensor (500 ohms) Replace speedsensor.

TESTING FUEL MODE. If there are no readings other than 0.00 when the engine is running and the command module is in the FUEL mode, either the command module or the flowsensor is defective. To determine which is at fault, disconnect the gray pair of wires from the wiring harness to the flow sensor (16). Using the two gray wires from the wiring harness, touch the ends together at a rate of approximately once per second. This should give a reading on the command module display.

If there is no reading then the command module is defective and should be returned for repair. If there is a reading then the flowsensor may be defective, and should be returned for repair.

1 COMMAND MODULE

SYMPTOM	PROBABLE CAUSE	REMEDY
Display on all the time. (Step 1:Electrical and Safety Check-out)	Orange accessory wire connected to an always hot battery lead.	Connect the orange wire to accessory power see wiring instructions. Page 14
Display is dark when the ignition is turned on. (Step 2: Electrical and Safety Check-out)	Fuse blown in _red_ battery wire.	Check or replace fuse. (2 AMP)
	Red battery wire not connected to always "hot" power.	Recheck connections according to the wiring instructions. Page 14
	Fuse in orange accessory wire blown.	Check or replace fuse. (2AMP.)
	Orange accessory wire not properly connected to accessory power.	Recheck connections according to the wiring instructions. Page 14
	Module not grounded	Check green wire from module for improper grounding
Time and/or data is lost when ignition is turned off. (Step 2: Electrical and Safety Check-out)	_Red_ battery wire connected to switched accessory power.	Reconnect _red_ wire to always hot battery power. Page 14
	Poor electrical connections.	Recheck & repair _red_ or _green_ ground connections.
	Weak battery or corroded terminals.	Clean terminals and replace battery if necessary
Time and/or data is ocassionally lost.	If your car has a long ground cable on the battery the voltage may be dropping below 5 volts for a fraction of a second when starting car.	Run _green_ ground wire (18 Ga) from module directly to the negative terminal of the battery.

The following is a list of tools that will be required to install this unit properly on your vehicle:

a. A socket set or a set of hand wrenches
b. Screwdrivers
c. Pliers
d. Hammer
e. Center punch
f. Electric drill
g. Tubing cutter-small
h. Drill bits, sizes 1/8" (3.2mm), 3/16" (4.8mm) and 1/2" (12.8mm)
i. Jack
j. Two jack stands
k. 12-volt test light

NOTE: All of these items with exception of the test light are commonly found around most "do-it-yourselves" homes. If you don't have a test light, we would suggest that you purchase one.

Now it's time to familiarize yourself with the parts in the kit. An illustration of all the parts and a parts list to use in checking the contents of the kit follows:

FLUSH MOUNTING TEMPLATE

PARTS LIST

Item	Part No.	Description	Quantity
1.	1135	1/4" (6m/m) Lockwasher	1
2.	4187	No. 6 x 1/4" Sheet Metal Screw	2
3.	1129	No. 8 x 1/2" Sheet Metal Screw	5
4.	1114	6m/m Hex Nut	1
5.	1071	1/4" x 3/4" Long Sheet Metal Screw	2
6.	1142	Wire Tie	6
7.	1163	Grommet	1
8.	3941	Blue Wire Connector	3
9.	1207	Flush Mounting Bracket	1
10.	3790	Stainless Steel Wire	2
11.	5901	Magnet With Protector	4
12.	1164	Speedsensor Coil	1
13.	3754	Fuel Line Clamps - Screw	4
14.	1166	Fuel Line	1
15.	1046	Bracket, Speedsensor	1
16.	1154	Flowsensor	1
17.	3967	Mounting Stand	1
18.	4950	Command Module	1
19.	3346	Wire Harness	1
20.	4792	Fuel Return Line Kit	1

NOTE: When ordering replacement parts, please order by part number and description.

ELECTRICAL & SAFETY CHECKOUT

During the checkout procedure, if trouble is encountered, refer to the trouble shooting guide on page 17–18.

1. With the ignition switch off, verify display is off.
2. Turn on ignition switch. Verify the display shows 12:00. (or 0:00). Press MPH. the display should show O. Turn ignition off. Verify display goes dark. Turn ignition back on again. Verify display still shows O not 1200. (or 0:00).

The next few steps verify that all the sensors operate properly.

3. Turn on the headlight switch. The display should dim. Turn off headlights.
4. Press FUEL button. The display should 0.00 . Turn the slide switch to "M". (Metric units)
5. Start the engine and verify that the display begins to change showing fuel consumption. (This may take several seconds.)

> WARNING: Make sure you have adequate ventilation. Exhaust gasses are deadly. Do not run the engine in a closed garage.
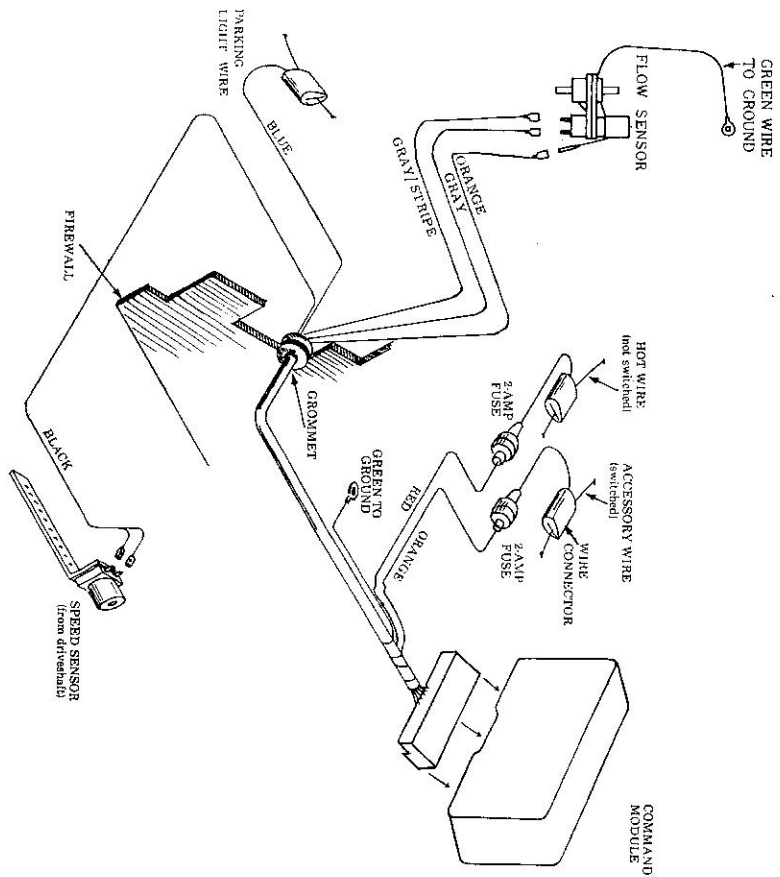
6. Press MPH. The display should show O. Put the car in gear and accelerate slowly up to about 5 or 10 miles per hour. The display should begin showing your vehicle speed at about 2 miles per hour.

Your Driving Computer should now be functional. To obtain all of the functions it is important the following be performed:

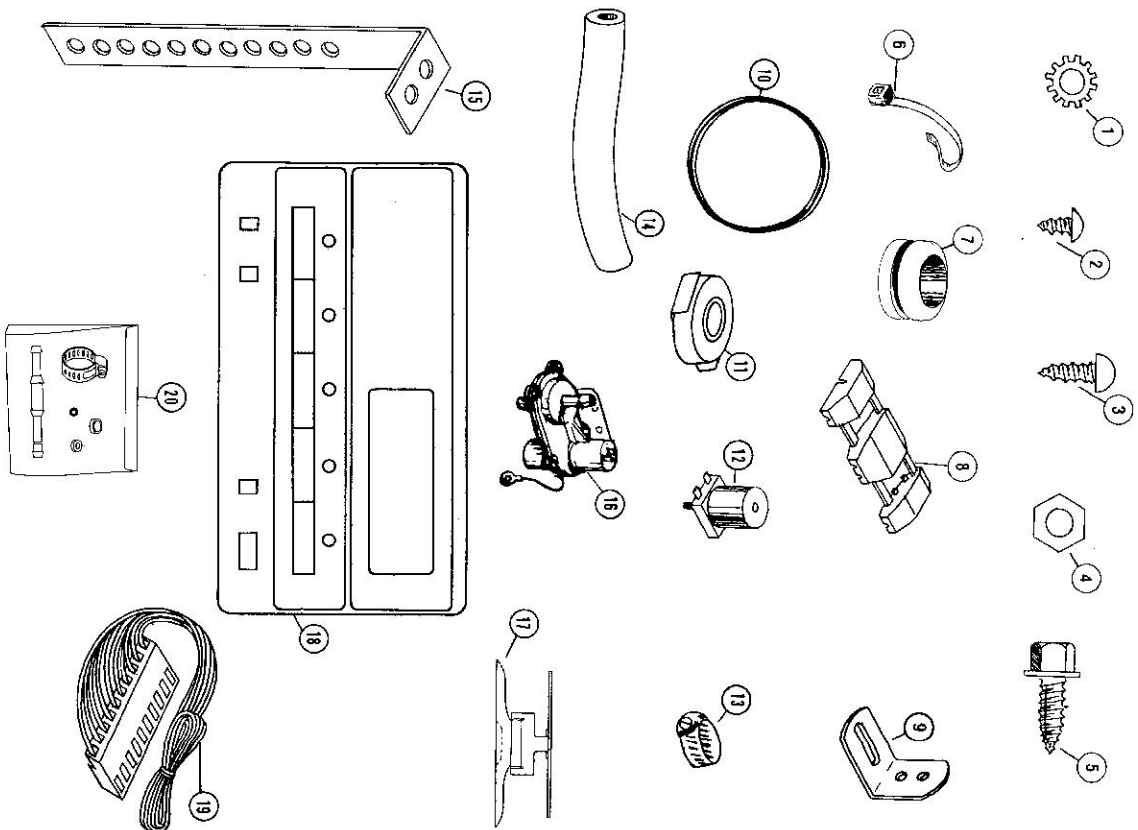1. Set the digital clock.
2. Calibrate distance and speed.
3. Calibrate the fuel function.

> CAUTION: For safety reasons, do not perform setting operations while you are driving.

Proceed to the introduction section of operating manual for the above.

WIRING DIAGRAM
Figure O

GREEN WIRE
TO GROUND

FLOW SENSOR

PARKING
LIGHT WIRE

BLUE

GRAY/STRIPE
ORANGE
GRAY

FIREWALL

BLACK

GROMMET

HOT WIRE
(not switched)

2 AMP
FUSE

GREEN TO
GROUND

RED

ACCESSORY WIRE
(switched)

WIRE
CONNECTOR

2 AMP
FUSE

ORANGE

SPEED SENSOR
(from driveshaft)

COMMAND
MODULE

PARTS PICTORIAL
(ILLUSTRATIONS NOT TO SCALE)

15

14

10

6

1

7

2

11

8

3

16

12

4

20

18

17

13

9

5

19

COMMAND MODULE MOUNTING
(See Page 6 for Figures)

First you must decide where you are going to mount the command module (18) Above, below, cantilevered, or in the dash (See Figure B). Keep the following in mind when you make your decision:

Select a location that:

A. Lets you view the display without taking your eyes off the road.

B. Does not interfere with your legs or knees.

C. Is out of the direct sunlight that could damage the command module.

CAUTION: It is absolutely imperative that the site selected allows you to view the road while you look at the display. Otherwise, a vehicle accident could result. Frequently the safest location is just below the lip of the dash.

Mounting Below, Above, or Cantilevered in Dash:
The mounting stand (17) is a ball and socket type, and when mounted to the top, bottom, or back of the command module (18), will allow you to rotate and tip the computer to the most desired position. After this position is found, the stand is locked by tightening the nut, Figure A, as shown.
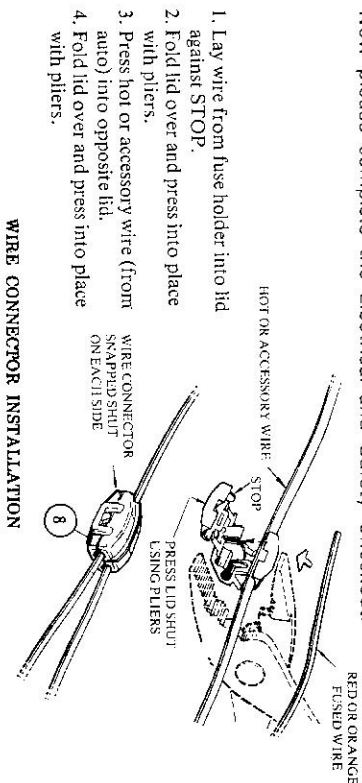
1. Refer to Figure B. After selecting the site, disassemble the mounting stand (17) as shown in Figure A

2. Place the large section of the stand at the location you have selected, mark the mounting hole locations, and drill two 1/8" (3.2mm) holes.

3. Mount the base of the stand using two sheet metal screws (3).(No.8 x 1/2")

CAUTION: When mounting the stand to the command module, be sure to use the shortest screws included (Item #2 No.6 x 1/4") -See illustration on page 4 drawn to scale. Use of longer screws will damage module.

4. Assemble the top of the stand to the command module, using two sheet metal screws (2).
Please note that holes have been predrilled into the metal case of the command module. Do not attempt to drill additional holes, as you are likely to damage electronic components in the case.

5. Assemble wire harness (19) onto the command module (18).

6. Reassemble the mounting base, position the command module and lock in place by tightening nut.

FINAL WIRING

1. Refer to the wiring diagram. (Figure O Page 15)

2. Using your test light, locate a 12 volt power wire or source at the fuse block which is "hot" when the key is turned on and "hot" when the key is off. A good source for this is the cigarette lighter. Mark this location "Hot Wire"

3. Using your test light, locate a 12 volt power wire or source at the fuse block which is "hot" when the key is on, "cold" when the key is off, and also "cold" when the key is in the start position. (This is typical of wires supplying voltage to accessories - radio, etc.) Mark this location "Accessory".

4. Now, under the hood of your car, find a wire which goes to the parking lights. Make sure this is not a turn signal wire. (should be hot when headlights are on hight or low beam.)

5. Route the blue wire from the firewall over to the parking light wire and connect the two using a blue wire connector (8). The illustration below shows how to use the connectors.

6. Disconnect the battery ground cable.

7. Using a blue wire connector (8), attach the red wire to the "Hot Wire" wire (always "hot") marked in Step 2.

8. Using the remaining blue wire connector, attach the orange wire to the "Accessory" wire marked in Step 3.

9. Reconnect the battery ground cable.

10. Refer to wiring and installation diagrams to double check all electrical and mechanical connections. Secure excess wire with wire ties (6).

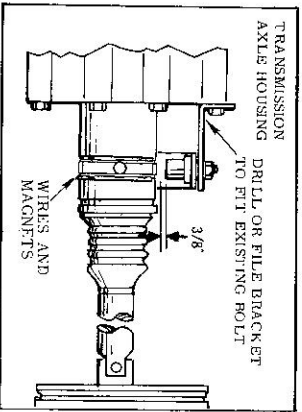11. Now please complete the Electrical and Safety Checkout.

WIRE CONNECTOR INSTALLATION

HOT OR ACCESSORY WIRE
STOP
WIRE CONNECTOR SNAPPED SHUT ON EACH SIDE
PRESS LID SHUT USING PLIERS
RED OR ORANGE FUSED WIRE
8

1. Lay wire from fuse holder into lid against STOP.
2. Fold lid over and press into place with pliers.
3. Press hot or accessory wire (from auto) into opposite lid.
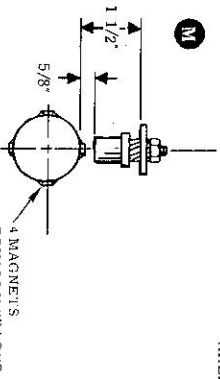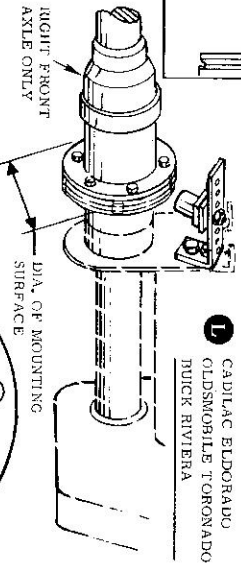4. Fold lid over and press into place with pliers.

1. Review Figures K & L to determine which mounting you are going to use.
2. Jack up the side of the car on which you are going to install the sensors and remove the wheel to facilitate installation.

WARNING: Never get under a vehicle supported only by a jack. Many injuries result from vehicles falling off jacks. Before working underneath vehicle, support solidly with jack stands.

3. Form the speedsensor bracket (15) to mount on an existing bolt or transmission axle housing (left or right side) so that you have approximately 1 1/2" (3.8 c/m) between the magnet mounting surface and the bracket. Refer to Figure M.

4. Refer to Figure N. Insert the speedsensor (12) into the hole of the speedsensor bracket (15) and assemble with lockwasher & nut (4 & 1). Do not tighten.

5. Refer to Figure M. Align bracket and tighten speedsensor in place leaving 5/8" (16mm) clearance between the sensor and driveshaft.

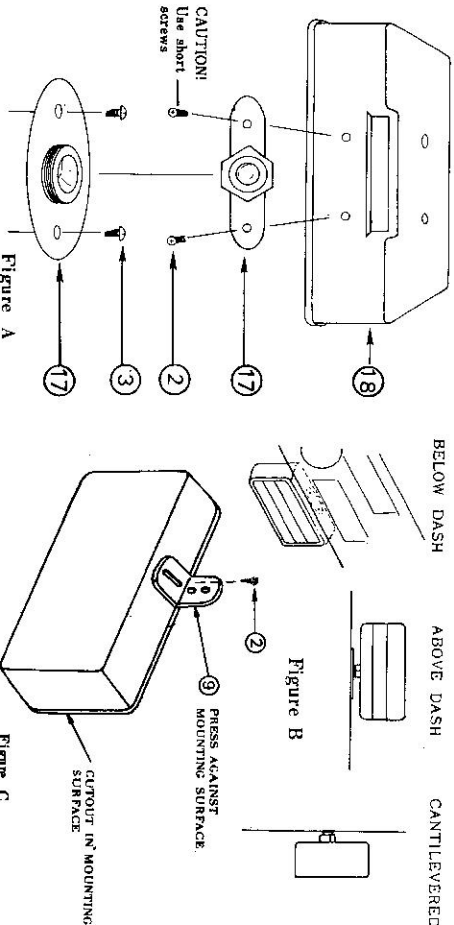6. Continue with steps 9 thru 15 on page 10 to install the magnets and wires.

K

TRANSMISSION AXLE HOUSING

WIRES AND MAGNETS

DRILL OR FILE BRACKET TO FIT EXISTING BOLT

3/8"

FOREIGN TYPE VEHICLES

L

RIGHT FRONT AXLE ONLY

DIA. OF MOUNTING SURFACE

CADILLAC ELDORADO
OLDSMOBILE TORONADO
BUICK RIVIERA

FIGURES-FRONT WHEEL DRIVE

M

1 1/2"

5/8"

4 MAGNETS EQUALLY SPACED

SPEED SENSOR INSTALLATION

Figure K-N

– 13 –

N

15 12 4 1

Mounting Flush:
This method requires a flat surface approximately 2-3/4" x 5" (7cm x 12.7cm).

1. Using the template supplied on the Page 2, carefully mark the outline of the area to be removed.

2. Make sure there is at least 3/4" (19 mm) clearance behind the cutout area, and that there is clearance for the flush mounting brackets (9) to attach to the top of the module.

3. Cut and remove the area marked. mount the module as shown in Figure C, using the flush mounting brackets (9) and sheet metal screws (2).

CAUTION! Use short screws

Figure A

17 3 2 17 18

BELOW DASH

ABOVE DASH

CANTILEVERED

Figure B

PRESS AGAINST MOUNTING SURFACE

9

Figure C

CUTOUT IN MOUNTING SURFACE

PRELIMINARY WIRING
(See Page 15 for Wiring Diagram)

1. Locate a suitable existing hole or drill a 1/2" (12.8mm) diameter hole through the firewall near the steering column for the wiring harness. If a hole is drilled, install the grommet (7) into this hole. Many times an existing hole or grommet for the speedometer cable may be used.
CAUTION: Be careful and do not drill into wires or vital parts on the opposite side of the firewall.

2. Route the black pair of speedsensor wires through the grommet into the engine compartment and down toward the floor.

3. Route the blue, gray pair, and orange wires through the grommet into the engine compartment.

4. Attach the green wire to chasis ground.

5. The red and orange wires with the fuse holders will be connected later.

FLOWSENSOR INSTALLATION

The flowsensor must be mounted (if possible) between fuel pump and carburetor with the fuel passing through it vertically bottom to top (soft plastic cover down, and wire connectors up).

If your vehicle does not have any fuel return lines from the fuel pump to the tank, and if no space exists to install between fuel pump and carburetor, the sensor can be installed between pump and tank, however accuracy and hot weather performance will be decreased.

NOTE: For Fuel Return Line equipped vehicles, parts and instructions are supplied in the hardware bag.

The flowsensor is provided with an L bracket which when mounted on a vertical surface, gives proper orientation or bend to suit. However if a suitable surface is not close at hand, additional fuel hose will have to be purchased from a local automotive store. If you are unable to utilize the L bracket, tie the fuel sensor in a preferred orientation and provide physical support.

The flowsensor is susceptible to failure when subjected to temperatures above 200°F (100°C). Try to locate away from engine heat and preferably as low as possible (heat rises), but not subject to wetting or road dirt stones etc.
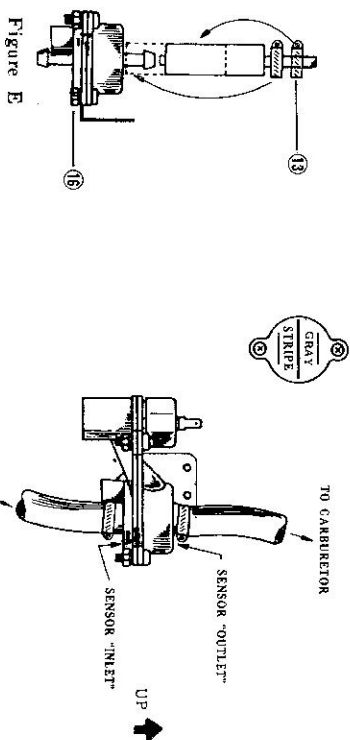
Figure E

1. SLIP ON 2 HOSE CLAMPS
2. SLIP HOSE OVER METAL LINE
3. HOLD SENSOR (OUTLET TOWARD CARBURETOR) AND PULL HOSE OVER SENSOR AS SHOWN BY DOTTED LINES.
4. PLACE HOSE CLAMPS IN PROPER POSITION
5. REPEAT FOR OTHER SIDE.

FLOW SENSOR INSTALLATION

GRAY STRIPE

FROM FUEL PUMP

SENSOR "INLET"

SENSOR "OUTLET"

TO CARBURETOR

UP

Figure D

PREFERRED MOUNTING ORIENTATION
MUST BE USED ON ALL CARS WITH
HIGH MPG.

– 7 –

---

11. Snap two wires (10) into the slots of magnet holders and draw up wires until the magnets are tightened, then twist ends with pliers as shown below.
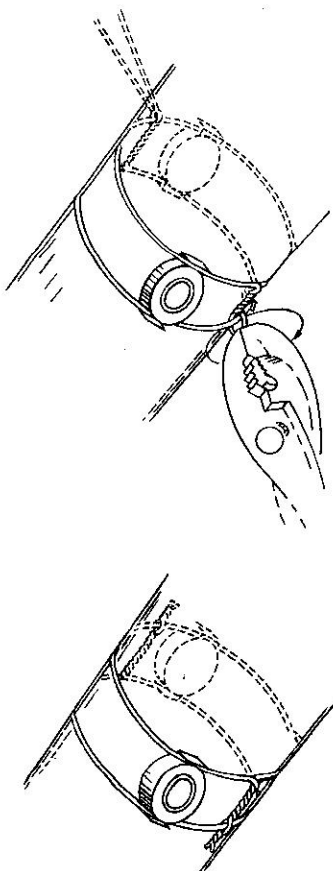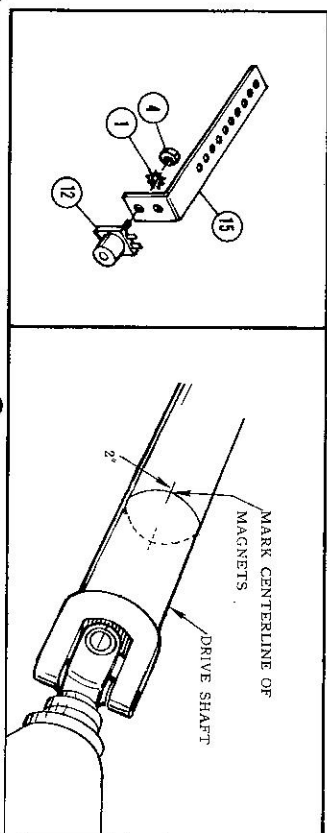

12. Refer to Figure J: Adjust bracket and coil assembly to obtain 3/8" (10mm) clearance between coil and magnets.

CAUTION: If the coil is closer than ¼ inch, there is a possibility that the magnets will strike the coil. If the coil is more than ½ inch from the magnets, errors in speed and distance measurements will occur at low speeds.

13. Route the black pair of wires from the firewall back to the speedsensor coil (12) and connect to the two terminals.

14. Using wire ties (6), secure the speedsensor wires so they do not touch any rotating or hot automobile parts. Draw excess wires into passenger compartment.

15. Remove jack stands.

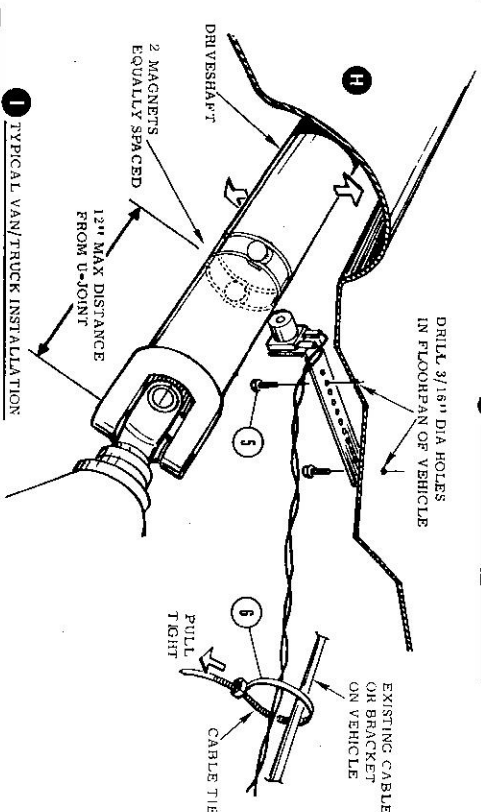This completes the installation of the speedsensor. Now proceed to "FINAL WIRING".
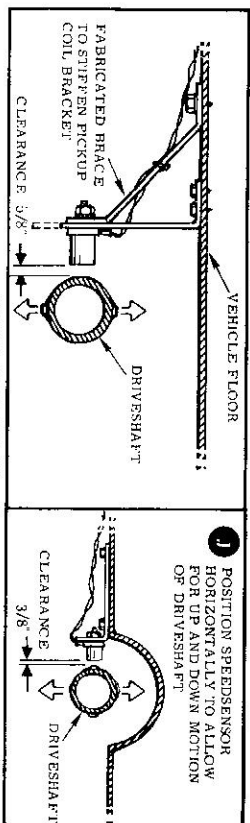
– 12 –

FIGURES-DRIVE SHAFT

F PICKUP COIL AND BRACKET ASSEMBLY

G MARKING MAGNET LOCATION

MARK CENTERLINE OF MAGNETS

DRIVE SHAFT

2"

H

DRILL 3/16" DIA HOLES IN FLOORPAN OF VEHICLE

EXISTING CABLE ON BRACKET ON VEHICLE

PULL TIGHT

CABLE TIE

I TYPICAL VAN/TRUCK INSTALLATION

VEHICLE FLOOR

2 MAGNETS EQUALLY SPACED

DRIVESHAFT

12" MAX DISTANCE FROM U-JOINT

FABRICATED BRACE TO STIFFEN PICKUP COIL BRACKET

CLEARANCE 3/8"

DRIVESHAFT

J POSITION SPEEDSENSOR HORIZONTALLY TO ALLOW FOR UP AND DOWN MOTION OF DRIVESHAFT

CLEARANCE 3/8"

DRIVESHAFT

SPEEDSENSOR INSTALLATION

Figure F-J

Mounting On Rubber Hose Fuel Line:
1. Select a location in the fuel line that provides optimum orientation Cut the rubber hose. *Be prepared for gasoline spillage.* Clean up fuel spillage before continuing.
2. Slide a hose clamp (13) on each end of the cut hose. Then, slide the hose ends over the ends of the flowsensor inlet and outlet as shown in figure D. Be sure that the fuel enters from the fuel pump into the flowsensor inlet, and that the outlet feeds the carburetor.

IMPORTANT: The flowsensor will not function if installed backwards.

3. If the flowsensor needs additional support, attach a wire to the L bracket on flow-sensor.
4. Proceed to steps 8, 9, 10, & 11 on page 9.

Mounting Flowsensor in a Metal Line:
1. Select a location in the fuel line that provides proper orientation, see Figure E.(Page 7) Be sure that the flowsensor is to be located beyond any return lines.
2. Mark the fuel line where the fuel line is to be cut.

SUGGESTION A small tubing cutter works best. If there is not enough room around the tubing for the tubing cutter to rotate around the tubing, the fuel line will have to be removed from the vehicle. Often, removing one end of the line will provide sufficient clearance to rotate the cutter. If a tubing cutter is not available, you can use a hacksaw, but the fuel line must be removed from the engine, so that the line can be blown clean of any hacksaw filings. DO NOT use a hacksaw while the fuel line is on the vehicle. The saw filings may damage the carburetor.

3. Cut the fuel line where marked. It may be necessary to remove a 3"(7.6cm)section of line for insertion of flowsensor if tubing cannot be spread by this amount.
4. Refer to Figure E: Slide two fuel line clamps (13) over each end of the metal fuel line.

5. Install the flowsensor into the fuel line by cutting the rubber fuel line (14) into two pieces. Be sure that the fuel enters the inlet side of the flowsensor, from the fuel pump and the outlet feeds the carburetor.

> IMPORTANT: The flowsensor will not function if installed backwards.

NOTE: The 5/16" rubber hoses provided will fit over 3/8" fuel line, but will be a tight fit. Place a small amount of lubricant on the fuel lines to ease installation. Do not allow excess lubricant to get inside the fuel lines.

6. **Position and tighten clamps.**

7. If flowsensor needs additional support, attach a wire to L bracket.

8. Route gray pair with stripe and orange wires to the flowsensor. Connect the orange wire from the command module to the orange wire coming from the flowsensor.

9. Connect the striped wire to the terminal on the flowsensor marked striped.

10. Connect the gray wire to the terminal on the flowsensor marked gray.

11. Attach the green wire from the flowsensor to chassis ground.

12. Draw excess wire into passenger compartment and secure routing with wire ties (6).

Testing Of The Flowsensor:

1. Position the wire coming from the flowsensor so it will not be caught in any moving parts when you start the engine.

> WARNING: Before you start the engine in the next step, make sure you have adequate ventilation. Exhaust gases are deadly. Do not run the engine in a closed garage.

2. Start the engine and inspect all the connections for fuel leaks.

3. Shut off the engine and proceed to next step.

> WARNING: Engine should be run for several minutes to be sure there is no fuel leakage from either the flowsensor or the fuel connections.

SPEEDSENSOR INSTALLATION-DRIVE SHAFT

(See Page 11 for Figures)

The purpose of the speedsensor coil (12) is to provide the command module with pulses to obtain distance driven and miles per hour.

1. Block both front wheels.

2. Place the transmission in neutral, being sure that the handbrake is disengaged.

3. Jack up the rear of the vehicle so that there is adequate room to work comfortably in the drive shaft area.

4. Support the vehicle on jack stands under the axle.

> WARNING: Never get under a vehicle supported only by a jack. Many injuries result from vehicles falling off jacks. Before working underneath vehicle, support solidly with jack stands.

5. Refer to figure F: Assemble coil (12) and bracket (15) together in hole best suited to your auto, using nut (4) and lockwasher (1). Position the coil so the terminals will point up.

6. Refer to Figures H, I, and J: Place the bracket assembly against the floor pan as close to the front universal joint as possible. Do not exceed 12" (30.5cm) from this universal joint or damage may result to magnets or coil from side movement of drive shaft. Position the bracket to obtain 5/8" (16mm) clearance between the coil and drive shaft.

7. Use the bracket as a template and mark two hole locations. Then drill two 3/16" diameter holes. Mount the bracket with two 1/4" x 3/4" long sheet metal screws (5).

8. The next step will be to install the magnets on the drive shaft.

> CAUTION: Remove your wrist watch while working with the magnets.

9. Clean the magnet mounting area using a wire brush or coarse sand paper. Refer to Figures G and H: With a pencil, using the center of the speedsensor coil as a guide, rotate the drive shaft and mark a line where the magnets (11) are to be located.

Using the knuckles of the universal joint as a guide, mark equally spaced magnet locations around the drive shaft. Be sure the mark extends beyond the length of the magnet. (Approximately 2 inches long).

10. Remove paper from adhesive of two magnets (11)(four for front wheel drive) and press firmly on drive shaft where marked. See diagram for orientation.