

# 1981 MAZDA EMISSIONS CHECK GUIDE



**GLC  
626  
RX-7**

**mazda**

**FOREWORD**

This manual was prepared as reference material for the service personnel of authorized Mazda dealers. It will enable them to correctly carry out the task of rendering service and maintenance on Mazda vehicles.

To ensure that customers are satisfied with Mazda products, proper servicing and maintenance must be provided. For this purpose, service personnel must fully understand the contents of this manual. At the same time, they are reminded to keep the manual handy where it can be referred to readily.

The information, photographs, drawings and specifications in this manual were the best available at the time of publication. Any alterations to the vehicle(s) covered by this manual that occur after publication as a result of factory modifications will be included in Service Bulletins or supplementary volumes. It is, therefore, requested that this manual be kept up to date and carefully maintained.

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## BASIC ASSUMPTIONS

This manual assumes that you have and know how to properly use certain special tools which are necessary for the safe and efficient performance of service operations on Mazda vehicles. The manual also assumes that you are familiar generally with automobile systems and basic service and repair procedures. You should not attempt to use this manual unless these assumptions are correct and you understand the consequences described below.

## SAFETY RISK

This manual may contain certain Cautions, which you should carefully read and follow, in order to minimize the risk of personal injury to you or others. These Cautions will reduce the risk of improper service methods, which may damage or render the Mazda on which you are working unsafe. The fact that there may be no Cautions with respect to a specific service method does not mean there is no safety risk involved. **YOU SHOULD SATISFY YOURSELF IN EVERY CASE THAT NEITHER PERSONAL SAFETY NOR VEHICLE SAFETY WILL BE JEOPARDIZED BY THE SERVICE METHOD OR TOOLS YOU SELECT.**

## POSSIBLE LOSS OF WARRANTY

The manufacturer's warranty on Mazda vehicles and engines can be voided by improper service or repairs performed by persons other than authorized Mazda dealers. Strict compliance with the instructions in this manual is necessary to prevent loss of coverage under such warranties.

## GENERAL SERVICE INSTRUCTIONS

1. Always verify any complaint(s) before performing any service on a vehicle.
2. If a vehicle is to be jacked up at either the front or rear end only, be sure to block the wheels at the opposite end in order to ensure safety. After a vehicle is jacked up, do not fail to support it with stands (rigid racks).
3. Use fender covers, seat covers and floor covers to keep vehicle clean and prevent any damage.
4. Before servicing an electrical system, disconnect the negative cable at the battery (-) terminal.
5. Do not start to disassemble at once. First, always make sure the trouble is the kind that requires disassembly.
6. If a complicated piece is to be disassembled, place punch marks, match marks, etc., in a location that will not affect function. These marks will make reassembly work easier.
7. Always replace used gaskets, O-rings and split pins with new ones.
8. Apply sealer or grease on any parts where it is called for.
9. Tighten bolts and nuts to specified torque with a torque wrench.
10. Some of the service operations require special tools. Be sure to use the special tools where specified and follow the correct working procedures.

## INTRODUCTION

This manual is intended for use in checking the correct operation of the various emissions systems only. If any repairs are necessary, please refer to the applicable workshop manual. The procedures covered herein follow a clockwise direction around the engine compartment, allowing the technician to complete the entire examination with a minimum of time and motion. Many of the included procedures are condensed from more lengthy checking methods, and they may test more than one device simultaneously, so follow the directions closely.

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## SYMBOLS

Symbols are used in some pictures to clarify the operation involved.



Electrical power is present



No power present



Engine speed is indicated by rpm



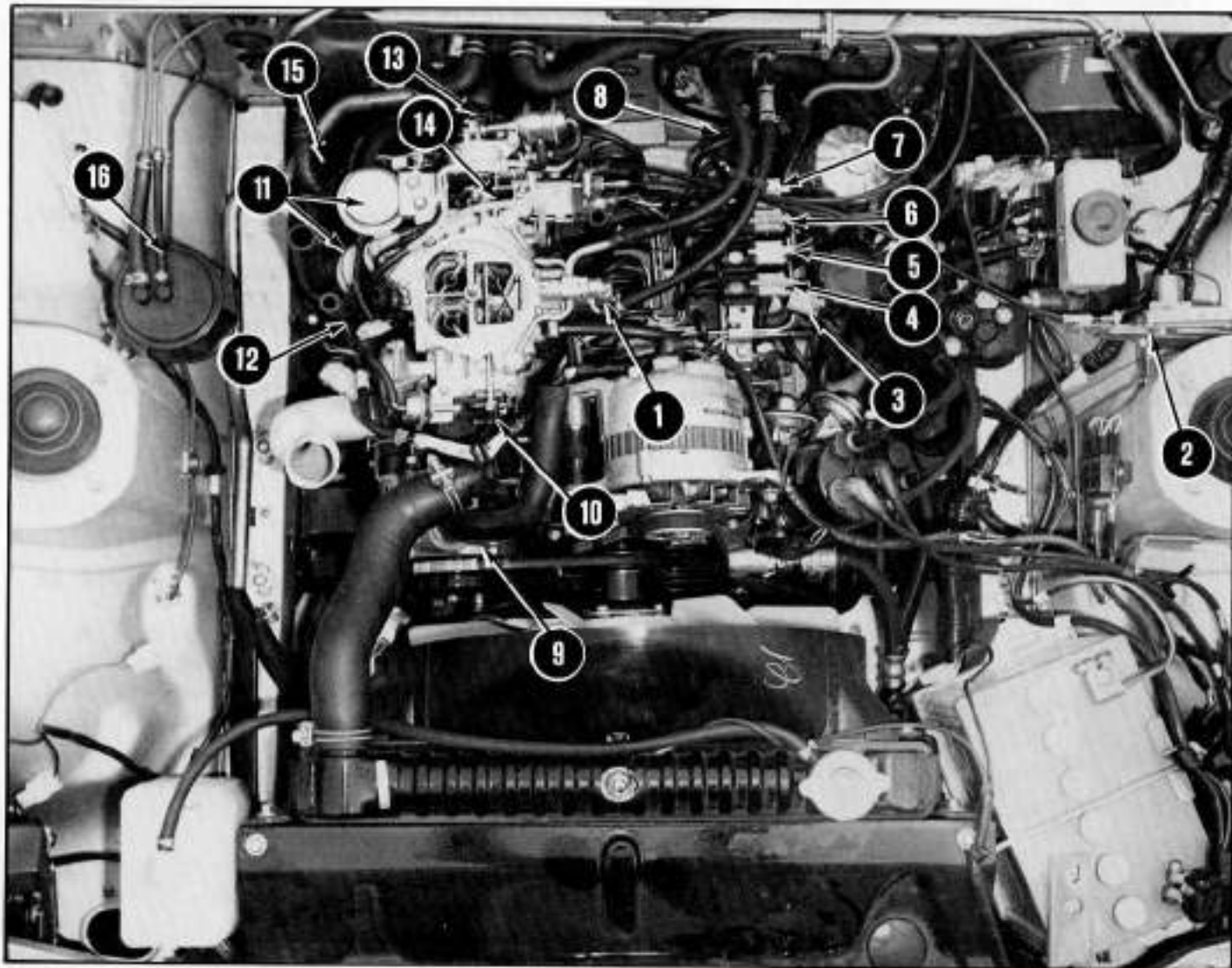
Quick acceleration



Deceleration



Amount of time

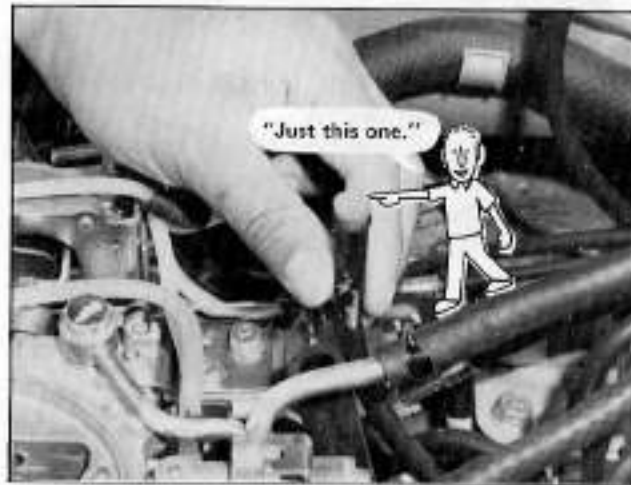


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1 & 2 Not tested

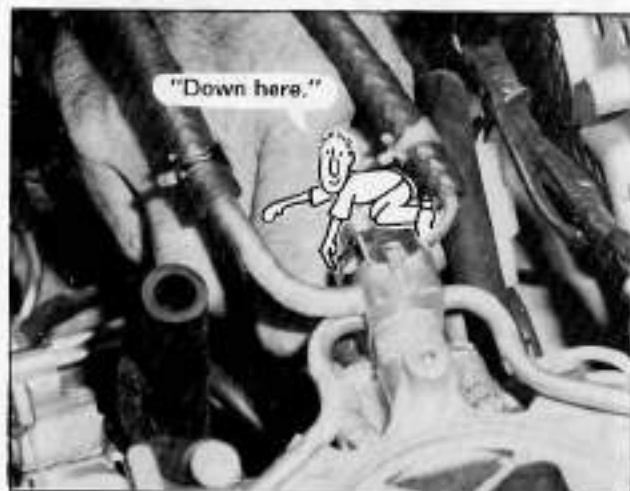
## Engine Preparation

- A. Remove the air cleaner and plug the vacuum hose, as shown.
- B. After making sure the carburetor throat is clear, warm the engine to its normal operating temperature.
- C. Stop the engine.
- D. Attach a tachometer.



### 1. Air Vent Solenoid

- A. Touch the air vent solenoid.
- B. Turn the ignition on and off.
- C. Solenoid operation can be felt.



### 2. Hot Start Assist Motor

- A. Without touching the accelerator, start the engine.
- B. Watch the hot start assist motor, it will pull the throttle partially open.

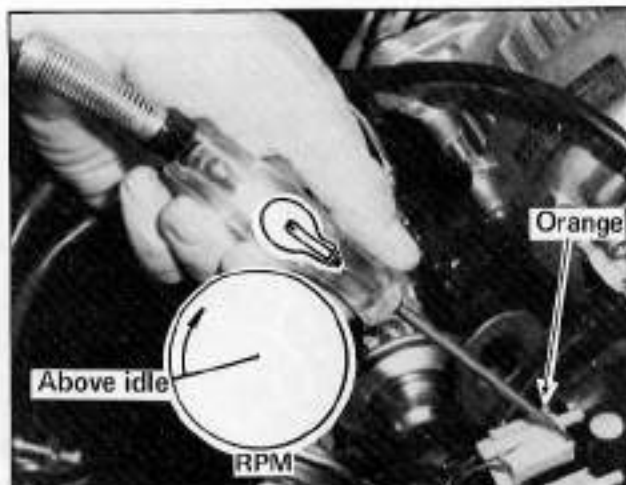


### 3. Vacuum Control Solenoid

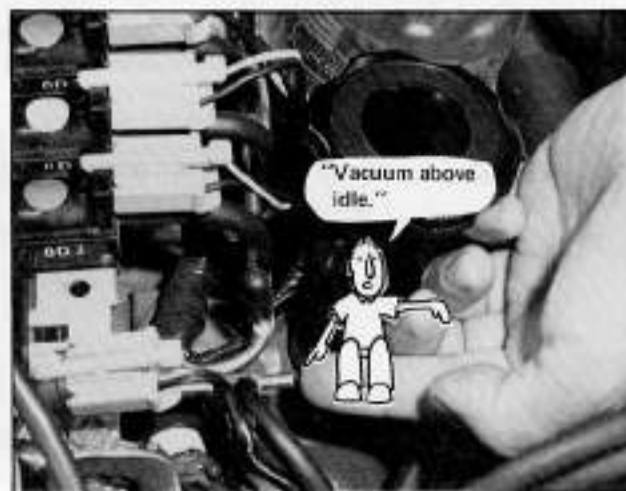
- A. Attach a testlight (circuit tester) to a solid ground.

**Note:** The black wire on each solenoid is ground, always check on the side with the colored wire.

- B. On all models with manual transmissions, except California-equipped vehicles, the vacuum control solenoid (orange) will have power whenever the engine speed exceeds an idle.
- C. On vehicles with automatic transmissions, place transmission in gear (not in P or N).

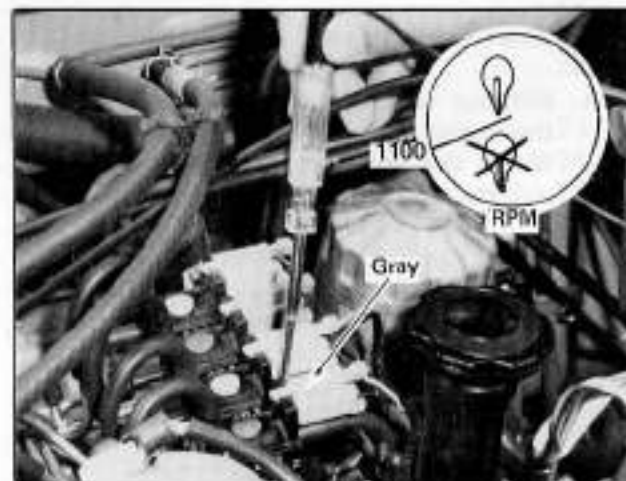


**Note:** California-equipped vehicles with manual transmissions do not have a vacuum control solenoid. Vacuum advance is taken directly from ported vacuum.



### 4. Switching Solenoid

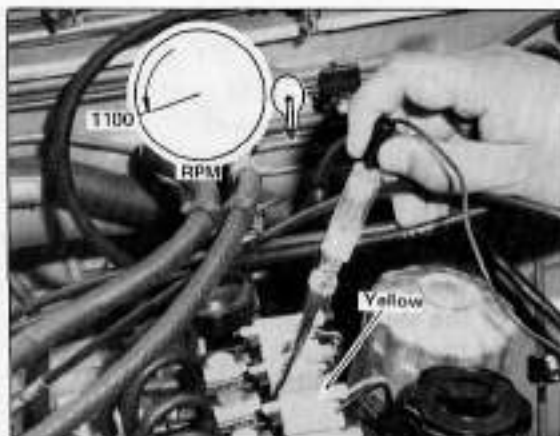
Increase engine speed to above 1100 rpm, check that power is present at the air switching solenoid (gray). Power is not present below 1100 rpm.



## 5. Shutter Solenoid

M/T: Over 1100 rpm, during deceleration only, power is present at the shutter valve solenoid (yellow).

A/T: Difficult to check safely because the shutter valve solenoid provides vacuum (power present) to the coasting valve only when A/T is in gear.



A. Additional check; disconnect the yellow coupler momentarily. Engine will shutter severely and/or stall.

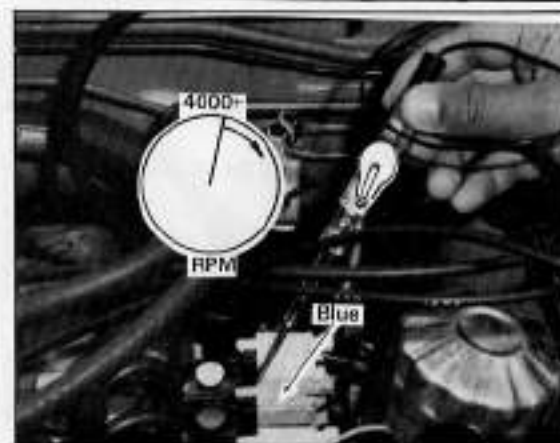
B. Reconnect coupler.

C. Start engine, if necessary.



## 6. Relief Solenoid

A. Rev engine quickly to above 4000 rpm, power will not be present at the relief solenoid (blue) below 4000 rpm but will appear above that speed.



## 7. Purge Valve

A. Remove both hoses from the bottom of the purge valve.

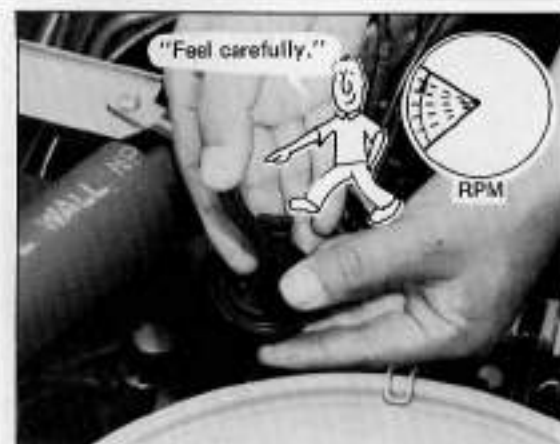
B. Seal the smaller hole and feel very carefully for suction at the larger hole.

C. Rev the engine quickly.

D. Very slight suction should be present.

E. Reconnect both hoses.

F. Return the purge valve to its bracket.





## 8. Air Pump

- Pinch the inlet hose as shown and increase the engine speed.
- The hose should compress.
- Release the hose.

**Note:** If the hose does not compress, determine if:

- the pump is faulty,
- the V-belt is loose, or
- the V-belt is broken.

Correct, if necessary.



## 9. Throttle Sensor

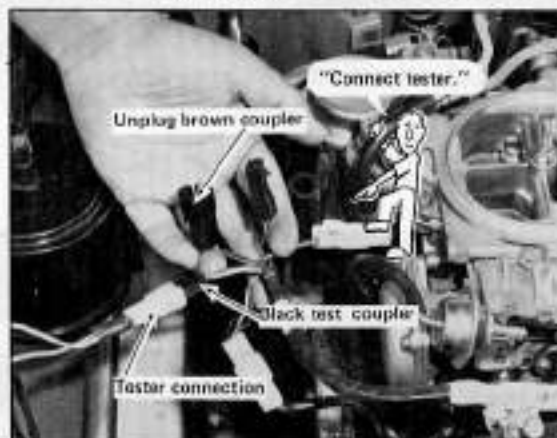
- Disconnect the throttle sensor's coupler (black/yellow to green/black wires).
- Connect a pair of testlights to the light-green/yellow and green/yellow wires in the black coupler.

- The two lights come on simultaneously at 1100 rpm as the engine decelerates.

**Note:** If not, adjust with the screw on the throttle sensor.

Testlights must not be more than three watts.

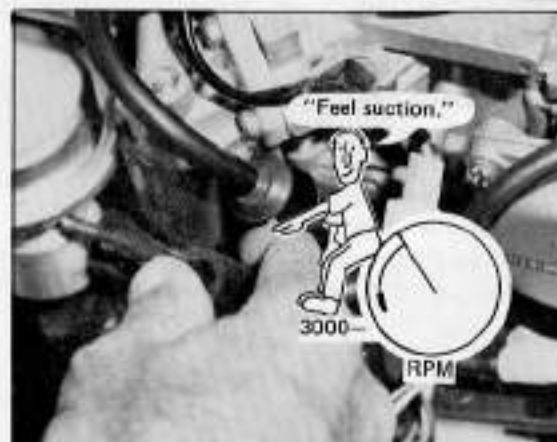
- Reconnect the brown coupler.



## 10. No. 2 Anti-afterburn Valve (AAV)

- Seal the smaller hose with a thumb, as shown.
- Increase engine speed to about 3000 rpm and release the throttle.
- Suction should be felt momentarily during initial deceleration.

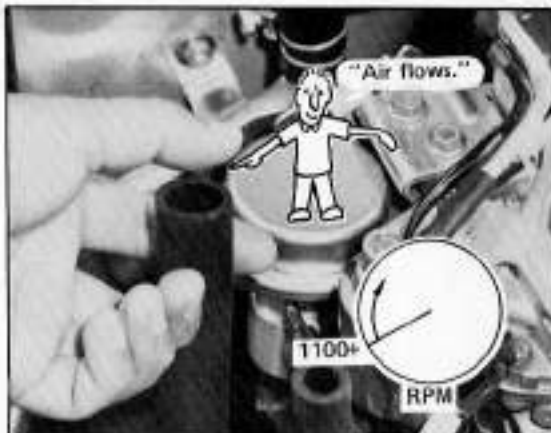
**Note:** No. 1 AAV cannot be tested, it is inside the air control valve.



### 11. Air Control Valve

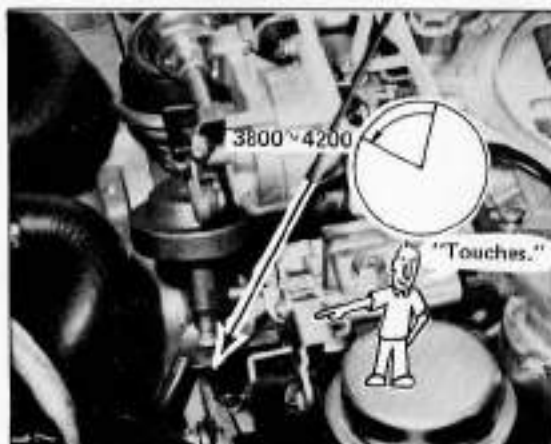
- Check airflow at the relief hose, as shown.
- Rev the engine quickly above 1100 rpm.
- Air should flow whenever engine speed exceeds 1100 rpm.

**Note:** Beyond this point the air control valve cannot be tested because its passages are internal.



### 12. Dashpot (M/T only)

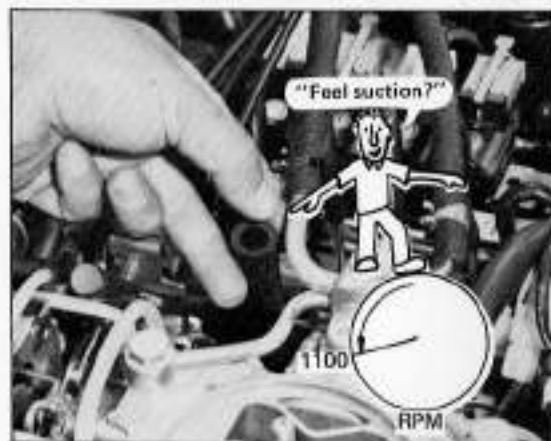
- Observe the dashpot rod; increase the engine speed.
- As the throttle lever releases it, the rod extends downward. (The lever and rod stop touching at 3800 ~ 4200 rpm.)
- Release the throttle.
- As the engine speed drops below 3800 ~ 4200 rpm, the dashpot rod contacts the throttle lever and controls deceleration until idle is reached.



### 13. Coasting Valve

**Note:** If the vehicle is equipped with an automatic transmission, and the transmission is in park or neutral, the coasting valve will not work at any engine speed.

- Check airflow into the coasting valve's supply hose.
- No airflow at idle or during acceleration.
- Air flows during deceleration whenever the engine speed is above 1100 rpm.



### 14. Check Valve

- Visually examine the braided injection inlet hose near the check valve.
- If deteriorated or heat damaged, disconnect the hose as shown.
- Test for exhaust leakage (refer to GLC section, page 8).



Mazda Technical Training  
**1981 Mazda**  
**EMISSIONS CHECK GUIDE**

Revised

**IMPORTANT**

This pamphlet is prepared for revising a portion of  
"1981 MAZDA EMISSIONS CHECK GUIDE"  
(P/N 9999-95-021E-80).

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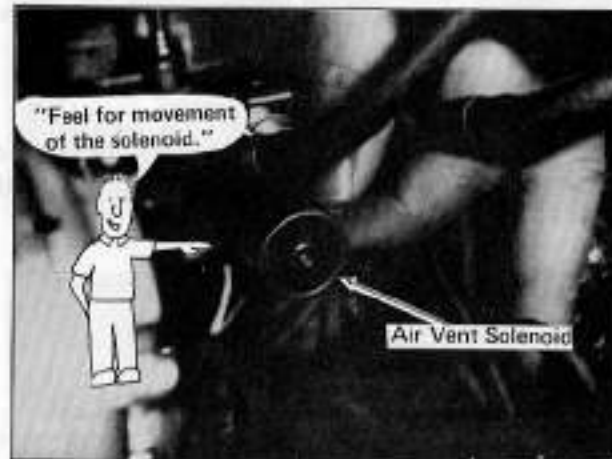
**Engine Preparation**

- A. Start the engine and warm it to its normal operating temperature.
- B. Stop the engine.
- C. Remove the air cleaner and plug the vacuum hose as shown.
- D. Attach a tachometer.
- E. A/T: raise rear of vehicle and support it safely.



**1. Air Vent Solenoid**

- A. Touch the air vent solenoid.
- B. Turn the ignition key on and off.
- C. Solenoid operation can be felt.



**2. Hot Start Assist Motor**

- A. Without pressing the accelerator pedal, start the engine.
- B. Watch the hot start assist motor, it will pull the throttle partially open.



**3. Vacuum Control Solenoid (Orange), Except Calif. M/T**

- A. Attach a testlight to the solenoid valve.

**Note:** The black wire on each solenoid is ground, always check on the side with the colored wire.

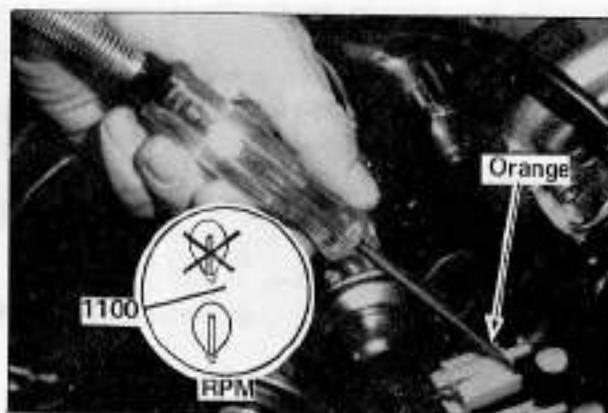
Fed M/T: Check that power is not present at any rpm.

A/T: Power should be present whenever transmission is in "P" or "N" below 1100 rpm.

Shift to "D," power is not present at any rpm.

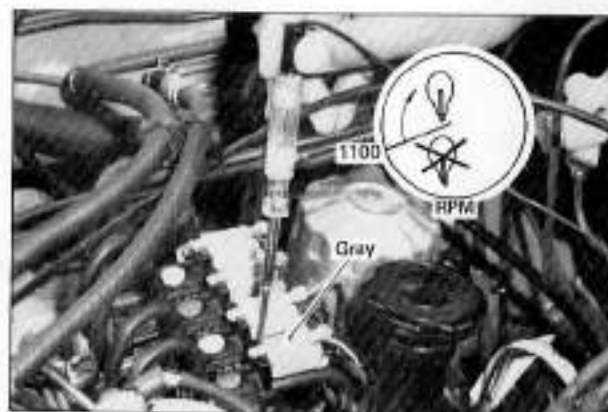
- B. Increase engine speed to above 2000 rpm and release the throttle.
- C. Power should be present momentarily as deceleration starts.
- D. A/T: Shift to "P."

**Note:** Calif. M/T vehicles have no vacuum control solenoid, vacuum for advance is taken directly from the intake manifold.



**4. Switching Solenoid (Gray)**

- A. Attach a testlight to the solenoid.
- B. Increase engine speed rapidly to over 2000 rpm.
- C. Power should be present momentarily during acceleration.



- D. Stop the engine and disconnect hose from check valve. Restart the engine.
- E. Disconnect vacuum hose from the top of the solenoid.
- F. Check that air flows from the hose.
- G. Stop the engine again and reconnect the hoses. Start the engine.



## EMISSION CHECKING PROCEDURES

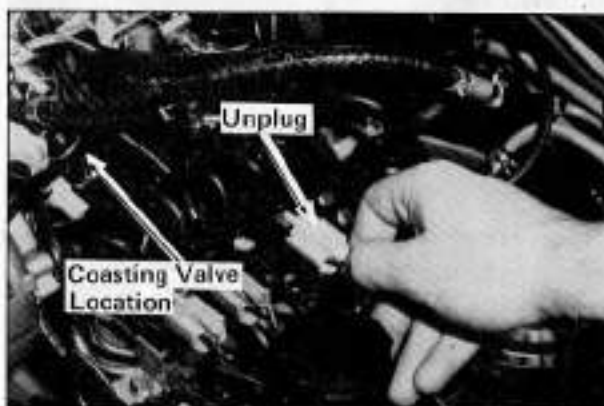
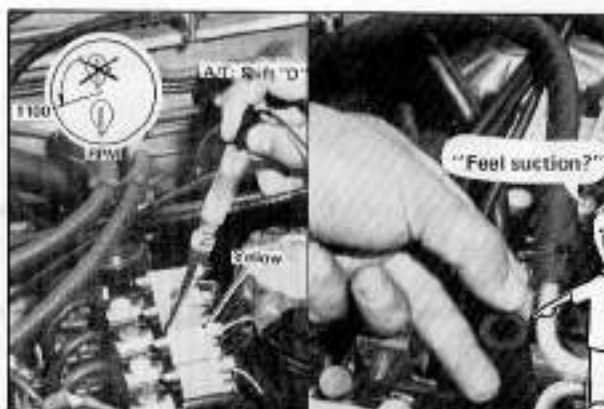
## 5. Shutter Solenoid (Yellow) &amp; Coasting Valve.

- A. Attach a testlight to the solenoid valve.
- B. Power should be present at any rpm.
- C. A/T: Shift to "D," power should still be present.

Increase engine speed to above 2000 rpm.

- D. Release the throttle.
  - E. At anytime over 1100 rpm as deceleration begins, momentary suction can be felt at the inlet hose and there will be no power present.
- A/T: Return to "P."

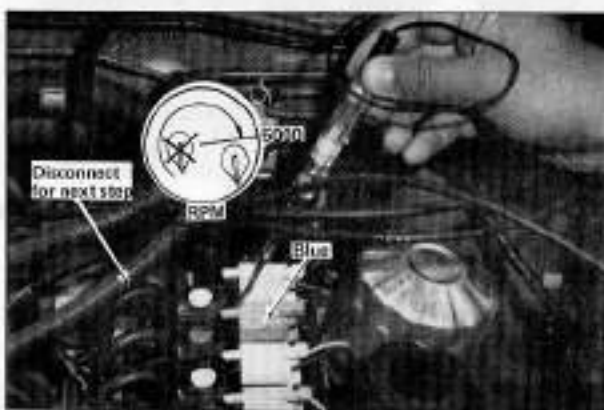
- F. Disconnect the yellow coupler and observe the coasting valve rod action, engine will shutter or stall.
- G. Reconnect the coupler.



## 6. Relief Solenoid (Blue)

- A. Attach a testlight to the solenoid valve.
- B. Gradually increase engine speed.
- C. Power should be present momentarily over about 5000 rpm.
- D. Release the throttle.

- E. Disconnect the vacuum hose at the top of the blue solenoid. Relief air will be at the large hose (air cleaner to air control valve).
- F. Reconnect the vacuum hose.



### 7. Purge Valve

- Remove the purge valve from its bracket.
- Remove the large hose from the bottom of the purge valve.
- Increase engine speed to about 2000 rpm.
- Feel for suction at the disconnected port during acceleration.
- Reconnect the hose and return purge valve to its bracket.



### 8. Air Pump

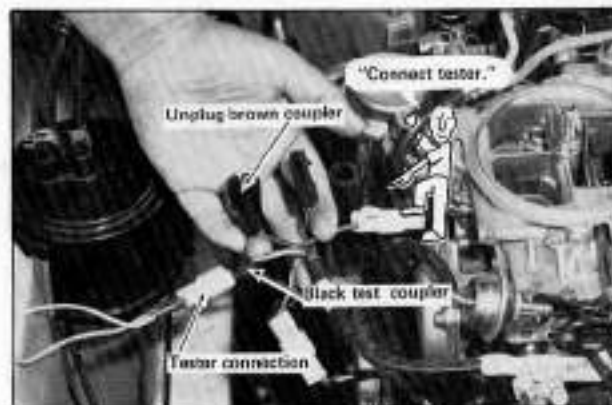
- Pinch the inlet hose as shown and increase engine speed.
- The hose should compress.
- Release the hose.

**Note:** If the hose does not compress, determine if:  
 (1) the pump is faulty  
 (2) the "V" belt is loose, or broken.  
 Correct if necessary.



### 9. Throttle Sensor

- Disconnect the brown coupler.
- Locate the black test coupler (Lg Y & GY wires).
- Insert two testlights into the openings of the black coupler.
- Power should be present at idle.
- Increase engine speed to about 3000 rpm and decelerate.



- Both testlights should come on simultaneously at about 1100 rpm.

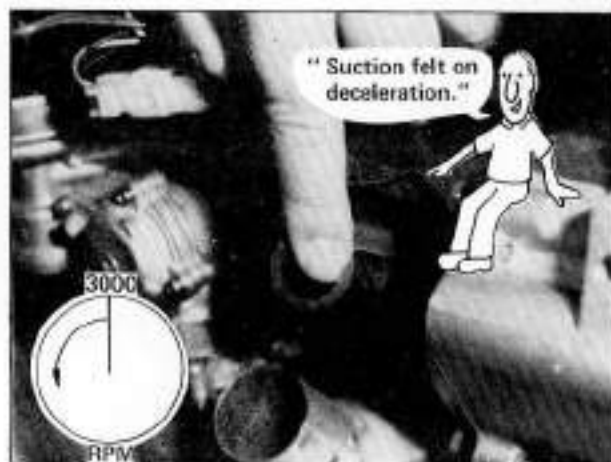
**Note:** If both lights do not come on simultaneously, adjust the timing with the screw on the throttle sensor.

- Reconnect the brown coupler.



## 10. No.1 Anti-Afterburn Valve. (No.1 AAV)

- A. Stop the engine and disconnect the hose at the air pump.
- B. Start the engine and increase the engine speed to 3000 rpm.
- C. Release the throttle and feel for momentary suction at the hose during deceleration.
- D. Stop engine and reconnect the hose. Start the engine.



## 11. No.2 Anti-Afterburn Valve. (No.2 AAV)

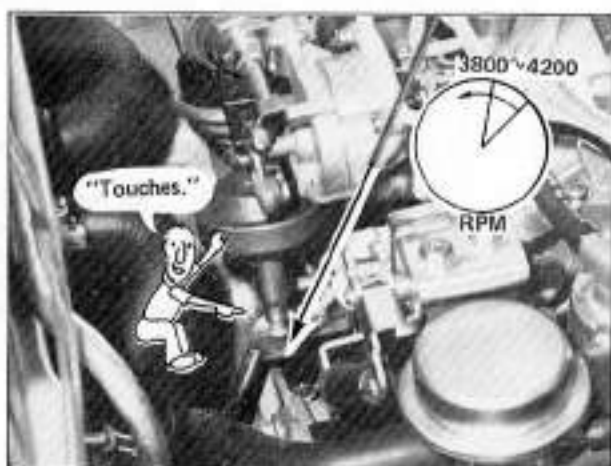
- A. Disconnect the vacuum hose at the No. 2 AAV.
- B. Suction can be felt momentarily at the small hose (No. 2 AAV to air cleaner) when reconnecting the vacuum hose.



## 12. Dashpot (M/T only)

- A. Observe the dashpot rod; increase the engine speed to about 5000 rpm.
- B. Release the throttle.
- C. The dashpot rod contacts the throttle lever at 3800 ~ 4200 rpm and controls deceleration until idle is reached.

**Note:** If not, loosen the lock nut on the top of the dashpot and adjust the engine speed 3800 ~ 4200 rpm by turning the dashpot body.





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