

but no mechanical causes can be found, refer to Chapter 4.

### 39 Ignition timing check and adjustment

Refer to illustrations 39.1, 39.2 and 39.6

1 The proper ignition timing setting for your vehicle is printed on the VECI label located on the underside of the hood. Some special tools will be required for this procedure (see illustration).

2 Locate the timing plate on the front of the engine, near the crankshaft pulley (see illustration). The 0 mark is Top Dead Center (TDC). To locate which mark the notch in the pulley must line up with for the timing to be correct, count back from the 0 mark the number of degrees BTDC (Before Top Dead Center) noted on the VECI label.

3 Locate the timing notch in the pulley and mark it with a dab of paint or chalk so it'll be visible under the strobe light. To locate the notch it may be necessary to have an assistant temporarily turn the ignition off and on in short bursts to turn the crankshaft. **Warning:** Stay clear of all moving engine components if the engine is turned in this manner!

4 Before attempting to check/adjust the timing, make sure the air gap is correct (Chapter 5).

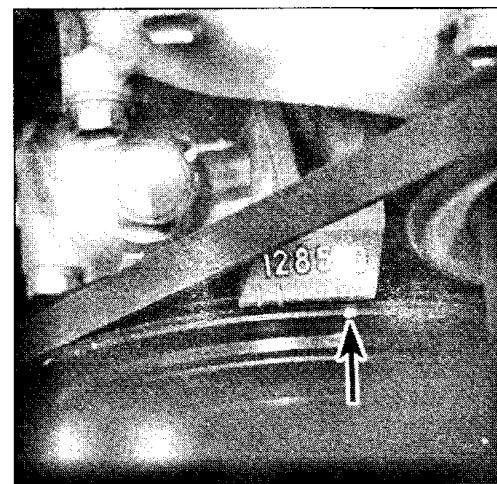
5 Connect a tachometer according to the manufacturer's instructions and make sure the idle speed is correct. Adjust it if necessary as described in Section 17. **Note:** The tachometer may be connected to the Ig terminal of the check connector (see illustration 39.6)

6 Allow the engine to reach normal operating temperature. Be sure the air conditioner, if equipped, is off. On some models, as noted on the VECI label, you must disconnect the distributor vacuum advance hose and plug it or connect a jumper wire between terminals TE1 and E1 of the check connector (see illustration).

7 With the ignition switch off, connect the pick-up lead of the timing light to the number one spark plug wire. On four-cylinder engines, it's the front one. On V6 engines it's the first spark plug on the right side as viewed from the driver's seat. Use either a jumper lead between the wire and plug or an inductive-type pick up. Don't pierce the wire or attempt to insert a wire between the boot and plug wire. Connect the timing light power leads according to the manufacturer's instructions.

8 Make sure the wiring for the timing light is clear of all moving engine components, then start the engine. Race the engine two or three times, then allow it to idle for a minute.

9 Point the flashing timing light at the timing marks, again being careful not to come in contact with moving parts. The marks you highlighted should appear stationary. If the marks are in alignment, the timing is correct. If the marks aren't aligned, turn off the



39.2 The timing plate and pulley notch (arrow) are located low on the front of the engine - be careful of moving engine parts when checking the timing!

engine.

10 Loosen the distributor locknut until the distributor can be rotated.

11 Start the engine and slowly rotate the distributor until the timing marks are aligned.

12 Shut off the engine and tighten the distributor locknut, being careful not to move the distributor.

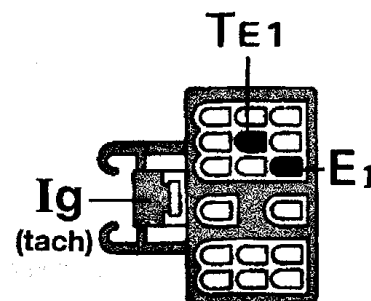
13 Restart the engine and recheck the timing to make sure the marks are still in alignment.

14 Disconnect the timing light.

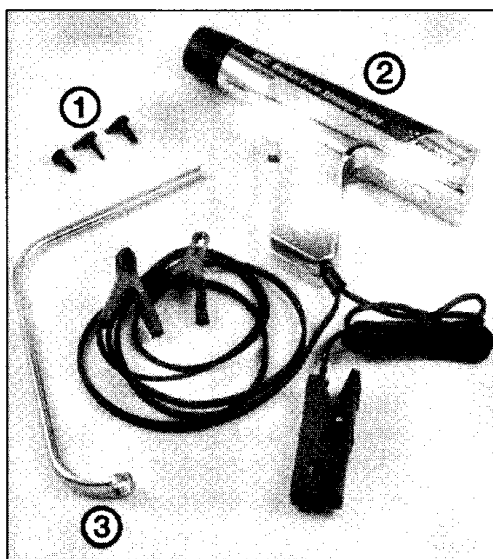
15 Race the engine two or three times, then allow it to run at idle. Recheck the idle speed with the tachometer. If it has changed from the correct setting readjust it.

16 Drive the vehicle and listen for "pinging" noises. They'll be noticeable when the engine is hot and under load (climbing a hill, accelerating from a stop). If you hear engine pinging, the ignition timing is too far advanced (Before Top Dead Center). Reconnect the timing light and turn the distributor to move the mark 1-degree or 2-degrees in the retard direction (clockwise). Road test the vehicle again to check for proper operation.

17 To keep "pinging" at a minimum, yet still allow you to operate the vehicle at the specified timing setting, use gasoline of the same octane at all times. Switching fuel brands and octane levels can decrease performance and economy, and possibly damage the engine.



39.6 Connect a jumper wire between terminals TE1 and E1 before checking or adjusting timing on later models



39.1 Tools needed to check and adjust the ignition timing

- 1 **Vacuum plugs** - Vacuum hoses will, in most cases, have to be disconnected and plugged. Molded plugs in various shapes and sizes are available for this
- 2 **Inductive pick-up timing light** - Flashes a bright concentrated beam of light when the number one spark plug fires. Connect the leads according to the instructions supplied with the light
- 3 **Distributor wrench** - On some models, the hold-down bolt for the distributor is difficult to reach and turn with conventional wrenches or sockets. A special wrench like this must be used

could backfire, causing serious burns! When the engine starts, the choke plate should open slightly.

5 Allow the engine to continue running at an idle speed. As the engine warms up to operating temperature, the plate should slowly open, allowing more air to enter through the top of the carburetor.

6 After a few minutes, the choke plate should be completely open to the vertical position. Blip the throttle to make sure the fast idle cam disengages.

7 You'll notice that engine speed corresponds to the plate opening. With the plate closed, the engine should run at a fast idle speed. As the plate opens and the throttle is moved to disengage the fast idle cam, the engine speed will decrease.

8 With the engine off and the throttle held half-way open, open and close the choke several times. Check the linkage to see if it's hooked up correctly and make sure it doesn't bind.

9 If the choke or linkage binds, sticks or works sluggishly, clean it with choke cleaner (an aerosol spray available at auto parts stores). If the condition persists after cleaning, replace the troublesome parts.

10 Visually inspect all vacuum hoses to be sure they're securely connected and look for cracks and deterioration. Replace as necessary.

11 If the choke fails to operate normally,