

## 1. TUNE-UP SPECIFICATIONS

Firing order	1-3-2-4
Spark plug type	NGK BP6ES
Spark plug gap	0.7-0.9 mm
Spark plug tightening torque	24 Nm
Breaker point distributor, 1979-1984 and Utility models:	
Breaker point gap	0.45-0.55 mm
Dwell angle	49-55 deg
Ignition timing	8±2 deg btdc
Idle speed	800±50 rpm
Valve clearances, 1979-1984 and Utility models (cold):	
Inlet	0.23-0.27 mm
Exhaust	0.33-0.37 mm
Drive belt deflection	See text
Compression pressures at 350 rpm:	
1979-1984 and Utility models —	
1600 cc (ohv)	1078 kPa
1800 cc (ohv)	1128 kPa
1985 Sedan and Station Wagon models —	
1800 cc (ohc)	1108 kPa
1986-1987 Sedan and Station Wagon models —	
1800 cc (ohc)	1079 kPa

\* Use specifications on emission control label inside the engine compartment if different to above.

## 2. TUNE-UP OPERATIONS

### TO ADJUST DRIVE BELTS

It is essential that all belts be adjusted to prevent slip but without imposing excessively upon the component bearings, particularly the alternator or water pump bearings.

The drive belts should be adjusted using the following procedure:

(1) Using the finger and thumb pressure push firmly on the belt concerned in the middle of the longest run to assess deflection.

(2) Drive belts with a longest run of less than 300 mm should have a deflection of between 3 and 6 mm, whereas drive belts with a longest run of more than 300 mm should have a deflection of between 3 and 13 mm.

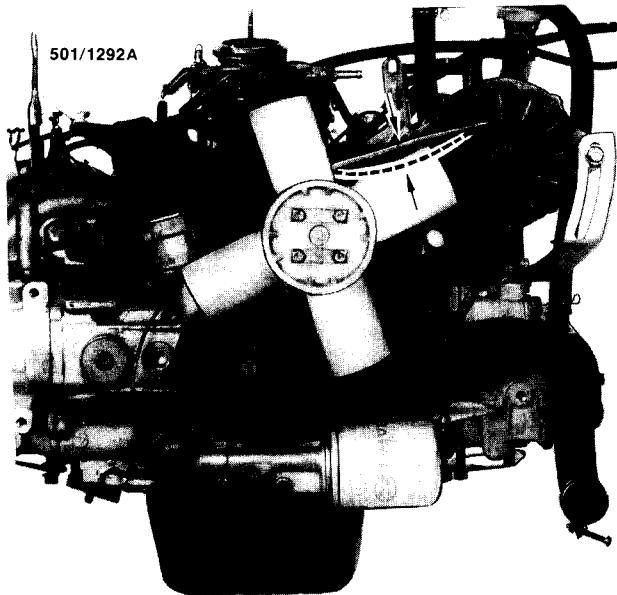
### 1979-1984 and Utility Models Without Power Steering

(1) Loosen the alternator mounting and adjusting bolts.

(2) Using a suitable lever and prying on the alternator, carefully move the alternator out to adjust the drive belt.

(3) Tighten the adjusting bolt and check the drive belt deflection as previously described. Re-adjust the drive belt if necessary.

(4) When the drive belt deflection is correct, tighten the adjusting and mounting bolts securely.



Drive belt deflection measuring point, 1979-1984 and Utility models without power steering.

### 1979-1984 and Utility Models With Power Steering

(1) Adjust the alternator drive belt as described for models without power steering.

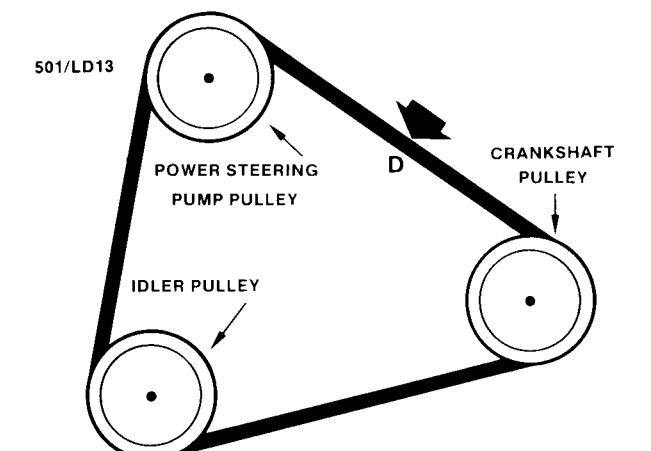
(2) To adjust the power steering drive belt, remove the dust cover from the idler pulley and loosen the idler pulley retaining nut.

(3) Working under the vehicle, rotate the adjusting bolt to move the idler pulley and tension the drive belt.

(4) Check that the drive belt deflection is correct, tighten the idler pulley retaining bolt securely and instal the dust cover to the idler pulley.

### 1985-1987 Sedan and Station Wagon Models Without Power Steering or Air Conditioning

(1) Loosen the alternator mounting and adjusting bolts.

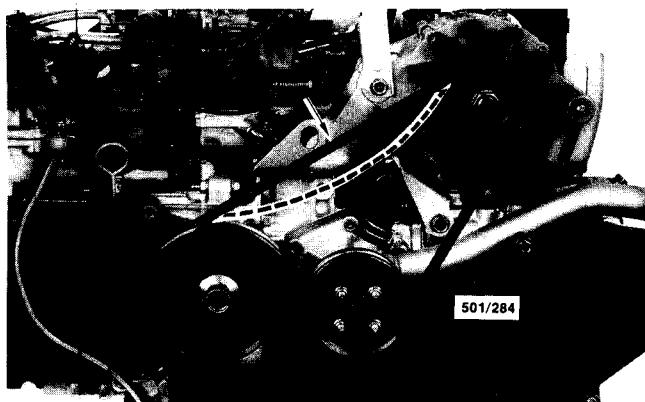


D = Power steering drive belt measuring point, 1979-1984 and Utility models.

(2) Using a suitable lever and prying on the alternator, carefully move the alternator out to adjust the drive belt.

(3) Tighten the adjusting bolt and check the drive belt deflection as previously described. Readjust the drive belt if necessary.

(4) When the drive belt deflection is correct, tighten the adjusting and mounting bolts securely.



Drive belt deflection measuring point 1985-1987 Sedan and Station Wagon models.

#### 1985-1987 Sedan and Station Wagon Models With Power Steering

(1) Adjust the drive belts as described for models without power steering.

(2) When checking the drive belt deflection, ensure that both belts have equal deflection. Renew the belts as a pair if equal deflection cannot be achieved.

#### 1985-1987 Sedan and Station Wagon Models With Air Conditioning

(1) Adjust the alternator drive belt as described for models without power steering or air conditioning.

(2) To adjust the air conditioning compressor

drive belt, loosen the idler pulley retaining bolts and pry the idler pulley out to adjust the drive belt deflection.

(3) Tighten the idler pulley retaining bolts and check that the drive belt deflection is correct. Readjust the drive belt if necessary.

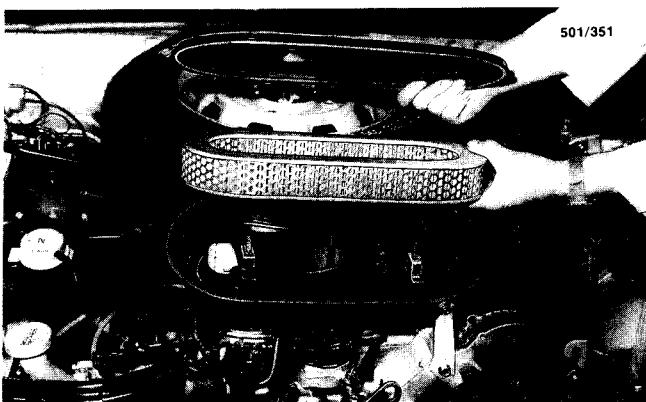
#### 1985-1987 Sedan and Station Wagon Models With Air Conditioning and Power Steering

Adjust the drive belts as described for models with air conditioning.

#### TO SERVICE AIR CLEANER

The air cleaner is equipped with a viscous paper type element. The element should be regularly inspected, it should be renewed at the recommended intervals. Refer to the Lubrication and Maintenance section for the correct intervals. The distance is only a guide for normal operating conditions and should be reduced accordingly if the vehicle is operating under extremely dusty conditions.

*NOTE: Paper air cleaner elements should not be washed in petrol or any other type of cleaning solvent. If the element has been washed in solvent or has become oil soaked it should be renewed.*



The air cleaner element should be renewed at the recommended intervals.

(1) Remove the wing nuts retaining the air cleaner top cover to the air cleaner body and remove the top cover.

(2) Remove the element from the air cleaner body. Inspect the element and renew it if its serviceability is in doubt.

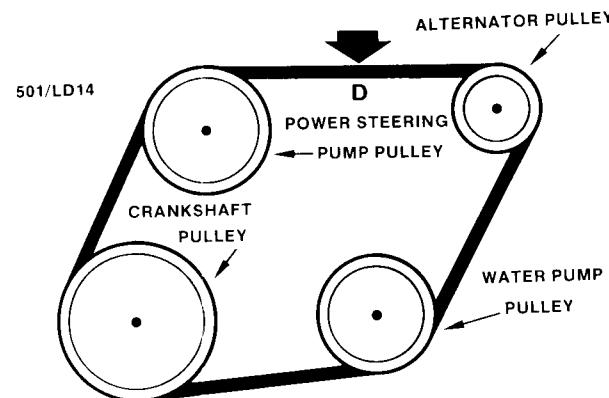
(3) Clean the body and top cover and inspect the positive crankcase ventilation (PCV) filter. Renew the PCV filter if its serviceability is in doubt.

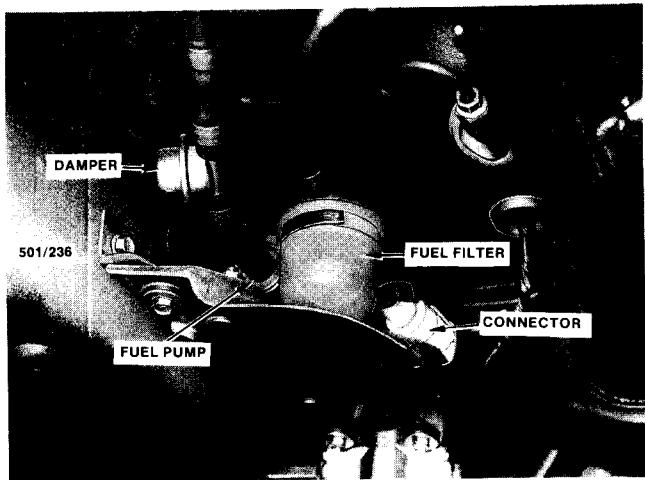
Installation is a reversal of the removal procedure.

#### TO CHECK AND RENEW FUEL FILTER

The fuel filter is located either in the engine compartment or under the vehicle to the left or right of the fuel tank.

D = drive belt deflection measuring point, 1985-1987 Sedan and Station Wagon models with power steering.

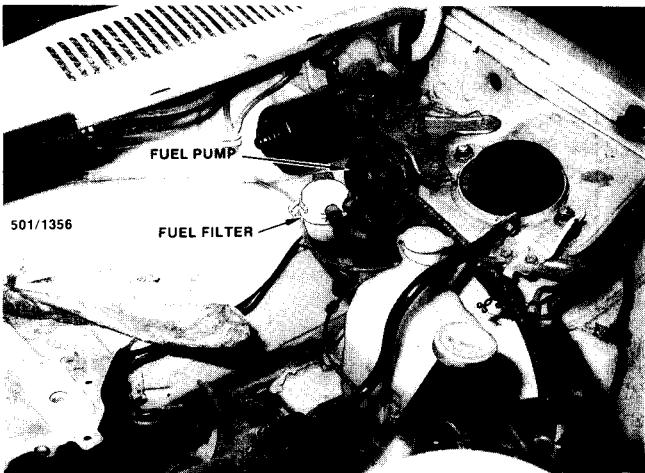




Underbody view of fuel pump and fuel filter, 1986 model shown.

- (1) If necessary, raise the rear of the vehicle and support it on chassis stands.
- (2) Inspect the fuel filter for any signs of dirt or water. If dirt or water are evident in the filter, renew it as follows.
- (3) Remove the filter from the retaining clip and clamp closed the fuel hose leading from the fuel tank using a brake hose clamp.

Ensure that the hose is not damaged when clamping closed.



Engine compartment view of fuel pump and fuel filter, 1983 model shown.

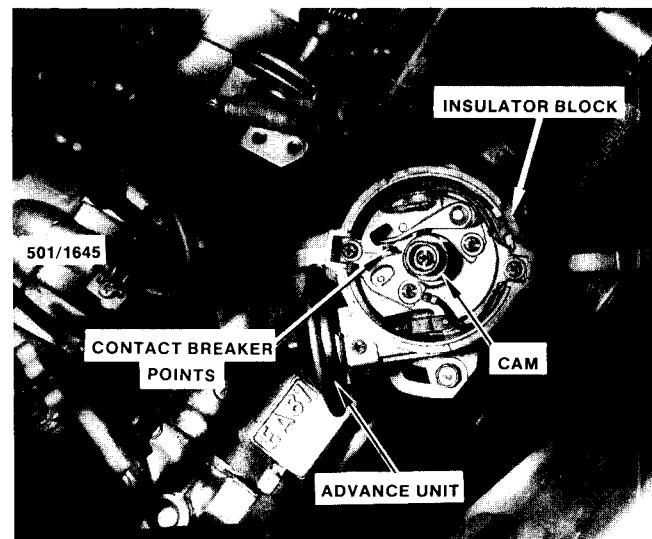
- (4) Place a suitable container under each hose in turn, squeeze the tangs on the fuel hose clamp to open the clamp and withdraw the fuel hose from the filter. Drain the fuel from the hoses into the container.
- (5) Push the hoses onto the new filter and secure them with the hose clamps.
- (6) Remove the brake hose clamp and instal the filter to the retaining clip.
- (7) Run the engine and check for fuel leaks.

## TO SERVICE CONTACT BREAKER POINTS

- (1) Remove the distributor cap and rotor arm. Secure the distributor cap to one side.
- (2) Loosen the screw retaining the wiring terminals to the insulator block and withdraw the contact breaker point lead from the insulator block.
- (3) Remove the screws retaining the contact breaker points to the breaker plate and withdraw the points from the distributor.
- (4) Inspect the contact breaker points and if they are not badly pitted, clean and reface them on a smooth oil stone or with a points file. Wash the contact breaker points in clean solvent to remove all traces of oil and dirt.

*NOTE: New contact breaker points should be washed in solvent to remove the anti-corrosive dressing, and thoroughly dried before installing.*

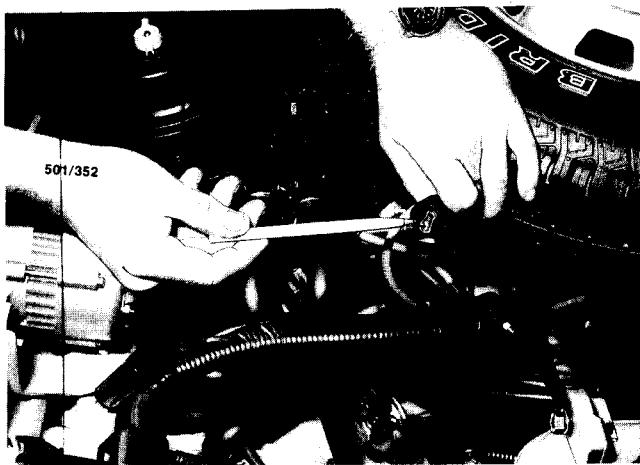
- (5) To instal the contact breaker points reverse the removal procedure.
- (6) Turn the engine clockwise as viewed from the front until the rubbing block of the moving contact is on the highest point of a cam lobe.
- (7) Slightly loosen the fixed contact plate retaining screws and using a suitable screwdriver, move the contact plate in the necessary direction until a clean feeler gauge blade of the specified thickness is a neat sliding fit in the point gap. Tighten the contact plate retaining screws and again check the fit of the feeler gauge blade between the contact points.
- (8) Sparingly lubricate the cam and contact breaker point spindle with engine oil and instal the rotor arm and the distributor cap.
- (9) Check and adjust the distributor dwell angle and the ignition timing as described under To Adjust Dwell Angle and Ignition Timing.



Installed view of the distributor with cap and rotor arm removed.

## TO SERVICE HIGH TENSION LEADS

Check the cables for perishing or cracking and renew as required. Never attempt to repair defective carbon impregnated core cables.



**Check the high tension terminals for corrosion and burning.**

The cables may be carefully cleaned, using a cloth moistened with kerosene, then wiping completely dry.

Also check the distributor cap for cracks or tracking between the high tension terminals on both the inside and outside of the cap. Renew the cap if cracks or tracking are evident.



**Check the distributor cap for cracks and tracking.**

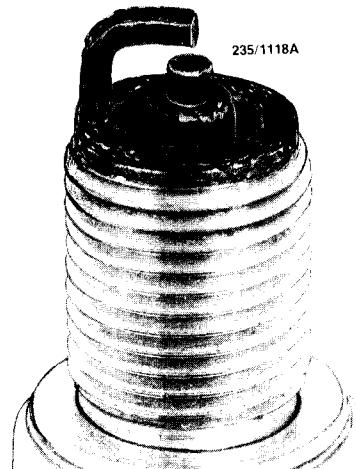
Check the carbon brush in the centre of the distributor cap for evidence of arcing and renew as necessary.

*NOTE: Care must be exercised when removing the cables from the spark plugs to ensure that the cables are not damaged by stretching. Always remove the cable from the spark plug by pulling on the rubber insulator.*

## TO SERVICE SPARK PLUGS

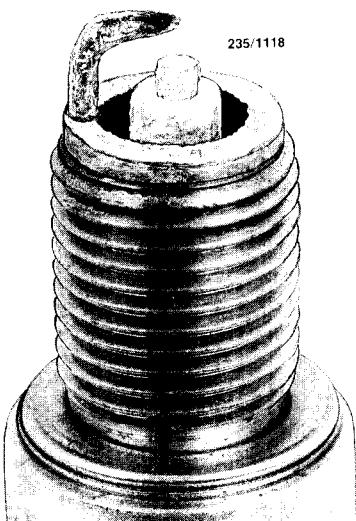
The spark plugs should be removed for inspection, cleaning and resetting at the recommended intervals.

Before removing the spark plugs ensure that the area around the plugs is clean to prevent foreign matter entering the cylinders when the plugs are removed.

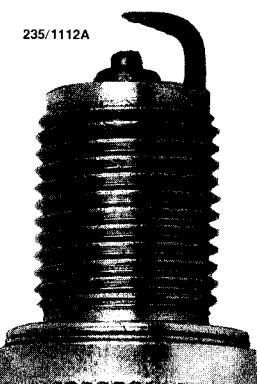


**Black damp deposits can be caused by excessive oil consumption or incorrect plug type. Spark plugs in this condition are usually not firing.**

Spark plugs removed from an engine in good condition operating under normal conditions should have a light powdery deposit ranging in colour from light brown to greyish tan. After considerable service the electrodes will show signs of wear or normal burning. Spark plugs showing a thick black oily deposit indicate an engine in poor mechanical condition or possibly that a plug with too low a heat range has been fitted.



**Spark plug with burnt electrodes and white blistered appearance, possibly due to incorrect plug type, loose plug or motor running too hot.**



When plug electrodes are eroded to this degree the spark plug can be considered worn out and should be replaced using a plug of the recommended heat range.

Spark plugs showing a white or yellowish deposit indicate sustained high speed driving or possibly that plugs of too high heat range have been fitted, particularly when these deposits are accompanied by blistering of the porcelain and burning of the electrodes.

If the heat range is correct, clean the plugs on a sand blasting machine and blow clean with compressed air.

Ensure that all trace of abrasive grit is removed from the well in the plug body.

Carefully open the electrodes and lightly file the electrodes flat with a points file.

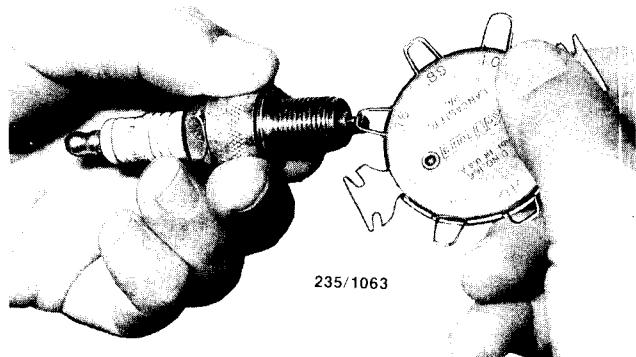


Lightly file the plug electrodes flat with a points file.

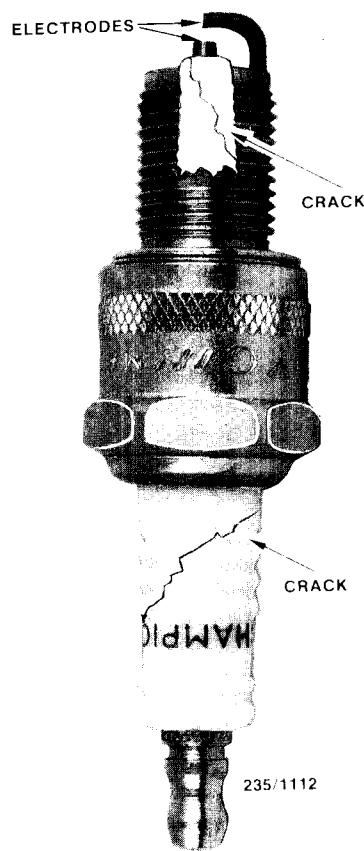
Check the gaps between the electrodes preferably with clean wire gauges. If wire gauges are unavailable then use clean feeler gauges. If necessary move the earth electrode towards or away from the centre electrode to obtain the correct gap. Never attempt to move the centre electrode otherwise damage to the porcelain insulator will result.

Clean the spark plug threads, screw the plugs into the cylinder head finger tight then use a tension wrench to tighten the plugs to the specified torque.

*NOTE: If a torque wrench is unavailable extreme care must be taken when tightening the spark plugs as overtightening may lead to stripping of the thread from the cylinder head. If new plugs are tightened with the fingers and then taken up an additional  $\frac{1}{4}$  of a turn with a spanner they will be quite tight enough. Wherever possible instal new gaskets to spark plugs that are going back into service.*



Checking spark plug electrode gap with wire gauge.



Cutaway view of spark plug showing crack in the insulator nose which can be caused by exerting pressure against the centre electrodes when adjusting the gap. Other crack shown on the insulator is caused by tilting the plug spanner.

## TO ADJUST VALVE CLEARANCES

On OHC engines (1985-1987 Sedan and Station Wagon models) the valves are operated by hydraulic tappets and are therefore non-adjustable.

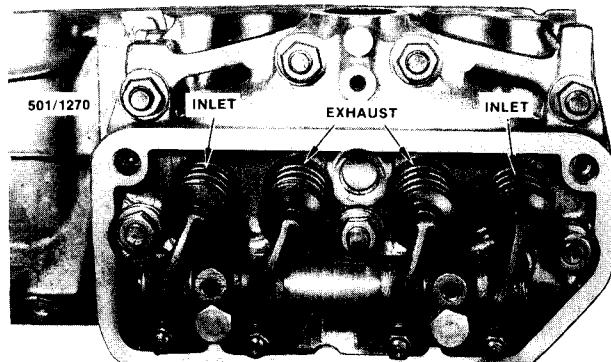
On OHV engines (1979-1984 and Utility models) proceed as follows.

- (1) Ensure that the engine is cold.
- (2) Disconnect the PCV hoses from the rocker covers.
- (3) Remove the bolts retaining the rocker covers to the cylinder heads, remove the rocker covers from the engine and discard the rocker cover gaskets.
- (4) Remove the distributor cap and secure it to one side.

(5) Remove the timing access plug from the flywheel housing and rotate the engine in the normal direction of rotation until the distributor rotor is pointing to the position of the number one spark plug lead in the distributor cap and the timing mark on the flywheel is at tdc. This will bring number one cylinder to tdc on the compression stroke.

(6) Insert a feeler gauge of the specified thickness between the rocker and valve stem of either valve of number one cylinder. The feeler should be a light sliding fit between the adjusting screw and the valve stem.

*NOTE: The arrangement of the valves in both cylinder heads are; inlet, exhaust, exhaust, inlet, as viewed from the front of the engine.*



**View showing the valve arrangement, OHV engines.**

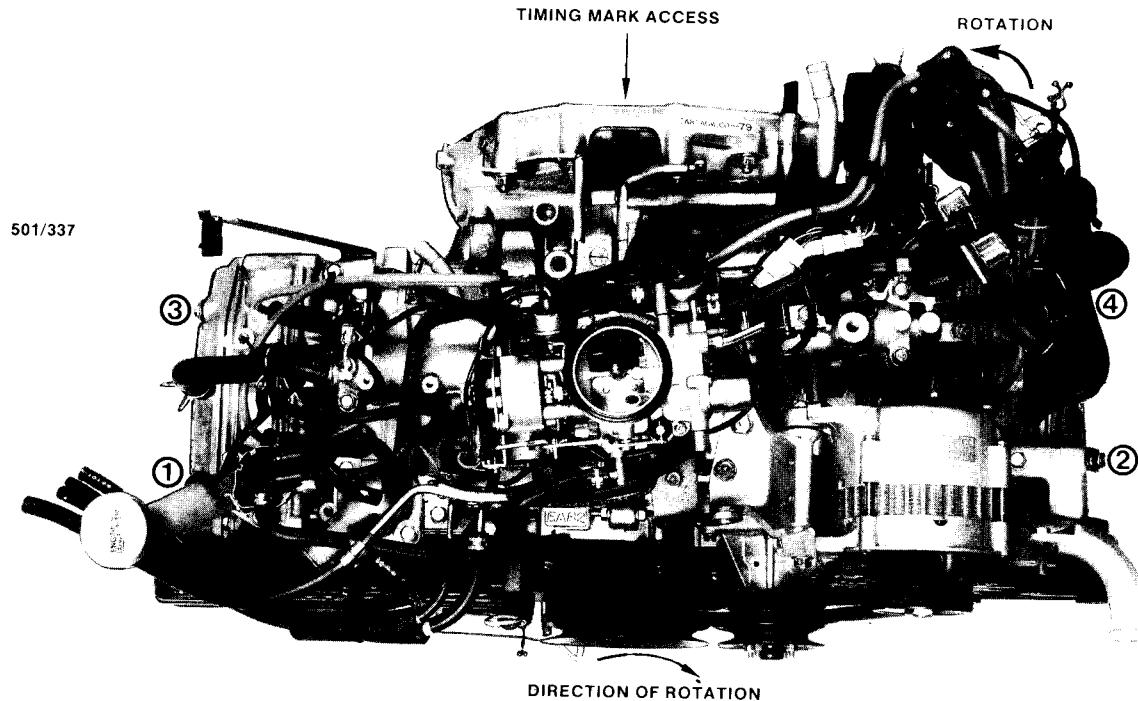
(7) If necessary, hold the adjusting screw with a suitable spanner and loosen the locknut sufficiently to allow adjustment of the adjusting screw to be made.

(8) With the feeler gauge in position, tighten the adjusting screw until the feeler gauge is a light sliding fit between the adjusting screw and the valve stem.

(9) Hold the adjusting screw and tighten the locknut securely.

(10) Check the valve clearance after tightening the locknut and readjust the clearance if necessary, making allowances for any alteration to the final clearance caused by tightening the locknut.

If the final clearance is too tight, set the adjusting screw to provide a looser fit of the feeler gauge when moving the adjusting screw and a firmer fit if the final clearance is too loose.



**Top view of the engine showing the cylinder numbering sequence and the direction of rotation of the distributor and engine, 1986 model shown.**

(11) Repeat steps (6) to (10) for the remaining valve of number one cylinder.

(12) Rotate the engine in the normal direction of rotation until the distributor rotor is pointing to the position of number three spark plug lead in the distributor cap and the contact breaker points are just beginning to open. This will bring number three cylinder to tdc on the compression stroke.

(13) Repeat the adjustment procedure for both valves of number three cylinder.

(14) Rotate the engine to bring number two cylinder to tdc on the compression stroke as described for number three cylinder and repeat the adjustment procedure for both valves of number two cylinder.

(15) Rotate the engine to bring number four cylinder to tdc on the compression stroke as previously described and repeat the adjustment procedure for both valves of number four cylinder.

(16) With all valve clearances correctly adjusted, instal the rocker cover to the engine using a new gasket and tighten the retaining bolts securely.

(17) Instal the PCV hoses to the rocker covers, the distributor cap to the distributor and the timing access plug to the flywheel housing.

(18) Start and run the engine and check for oil leaks.

## TO TEST COMPRESSION

It is advisable on vehicles equipped with adjustable tappets (1979-1984 and Utility models), to check and adjust the valve clearances prior to carrying out a compression test as insufficient clearances may show the same symptoms as burnt valves. On unleaded petrol models, remove the Ignition Coil/Fuel fuse from the fuse box to prevent excess fuel being drawn into the engine and possibly damaging the catalytic converter.

(1) With the engine at operating temperature, disconnect the high tension leads from the spark plugs.

(2) Ensure that the area around each spark plugs is clean to prevent foreign matter entering the cylinders and then remove the spark plugs.

(3) Isolate the ignition by removing the low tension lead from the coil positive terminal.

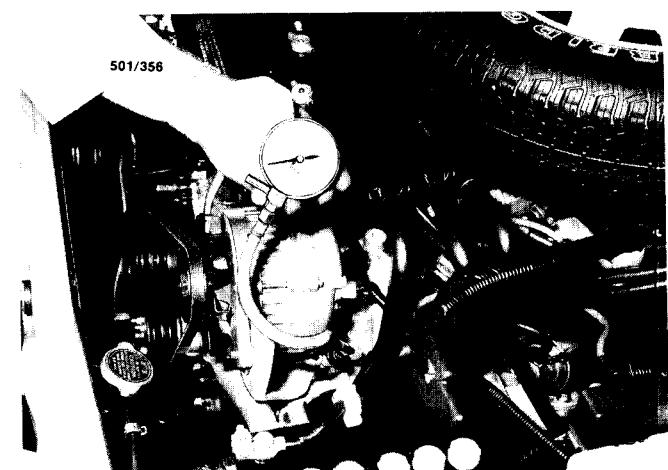
(4) Apply a compression gauge to number one spark plug hole according to the manufacturers instructions of the instrument being used.

(5) Have an assistant fully open the throttle and operate the starter switch to rotate the engine. Observe the compression gauge and stop the engine when the gauge has reached the highest reading.

(6) Record the reading and then check the compression of the remaining cylinders in the same manner.

(7) Compare all readings taken. Variation between cylinders should not exceed 10%.

(8) If a low reading is taken on one or more cylinders the trouble may be isolated as follows:



Checking the cylinder compression using a compression gauge.

(a) Inject a small amount of engine oil into the spark plug hole of the cylinder concerned ensuring that the oil is evenly distributed within the cylinder.

(b) Repeat the compression test on the cylinder concerned.

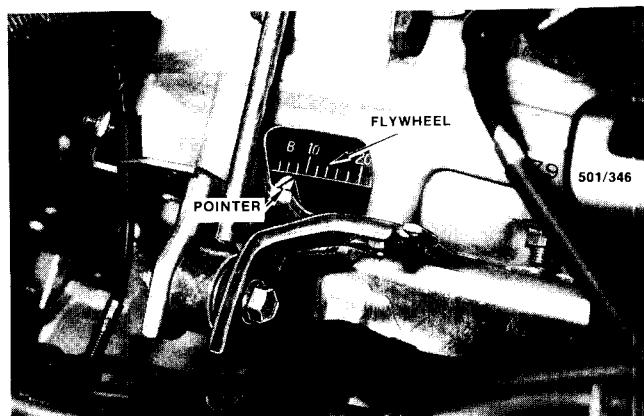
A substantial increase of compression pressure indicates faulty or worn piston rings, pistons or cylinder. No increase of compression pressure indicates burnt, obstructed or sticking valves, or a leaking or blown head gasket.

## TO ADJUST DWELL ANGLE AND IGNITION TIMING

*NOTE: On electronic ignition systems the dwell angle is electronically controlled and pre-set and cannot be adjusted.*

*A tachometer suitable for conventional ignition systems may not operate when connected to electronic ignition systems.*

*Ensure that the timing light connected to electronic ignition systems does not produce transient voltages that could damage semi conductors.*



The timing marks are located on the flywheel and flywheel housing, 1986 model shown.

(1) Connect a suitable tachometer, timing light and where applicable a dwell meter to the engine according to the meter manufacturers instructions. Start the engine and bring it to normal operating temperature.

(2) Adjust the engine idle speed to Specifications. Disconnect and plug the distributor vacuum line.

(3) Where applicable check the dwell angle (see Specifications). Adjust by increasing the contact breaker point gap to decrease dwell or decreasing the point gap to increase dwell. The engine will have to be stopped and the distributor cap and rotor arm removed to carry out this operation.

(4) After setting the dwell angle at idle speed increase the engine speed to 1500 rpm. Slowly lower the engine rpm back to the idle rpm and at the same time observe the dwell meter. Dwell angle variation should not exceed two degrees.

Excessive variation in dwell angle indicates worn components within the distributor in which case the distributor should be removed for overhaul (see Electrical System section).

(5) Remove the timing access plug from the flywheel housing and with the engine running at the specified idle speed and the distributor vacuum line disconnected, aim the timing light beam to the graduated marks on the timing scale.

(6) Correct timing is achieved when the mark on the flywheel is adjacent to the specified timing mark on the timing scale.

(7) Adjust the timing position by loosening the distributor retaining nut and by turning the distributor slowly in the required direction.

(8) After the correct timing position has been determined make sure the distributor to engine retaining nut is firmly tightened.

(9) Reconnect the vacuum advance line to the distributor and adjust the engine idle speed to Specifications. (See to Adjust Idle Speed and Mixture).

(10) Switch off the engine, remove the test instruments and reconnect all disconnected wiring.

## TO ADJUST IDLE SPEED AND MIXTURE

*NOTE: Before finally adjusting the idle speed and mixture setting ensure that the following conditions are met:*

*The air cleaner element is clean and installed.*

*The ignition timing is correctly set.*

*The fuel float level is correct and the choke is fully open.*

(1) Connect a suitable tachometer to the engine following the manufacturers instructions.

(2) Start and run the engine until it reaches normal operating temperature.

(3) Adjust the throttle stop screw as required to obtain the specified idle speed. See Specifications.

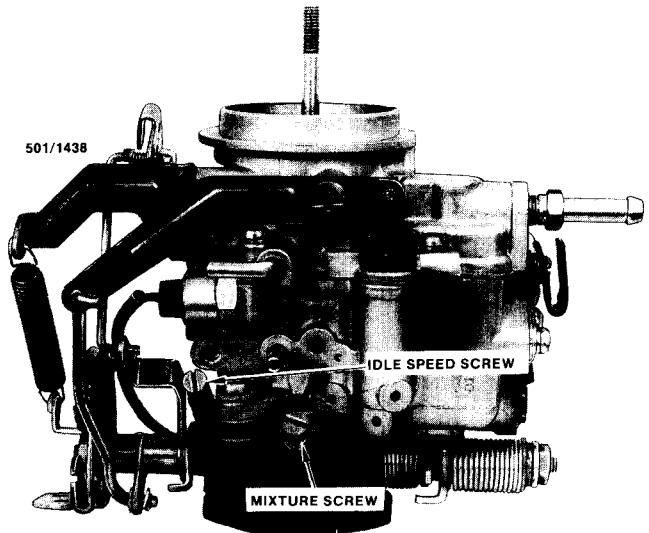
(4) On 1979-1984 and Utility models, if the engine does not idle smoothly at the specified rpm, the idle mixture may be adjusted temporarily as follows:

(a) Adjust the throttle stop screw to give an idle speed of approximately 800 rpm.

(b) Turn the idle mixture screw in clockwise until the engine slows and begins to falter, then turn the mixture screw slowly anti-clockwise until the engine runs smoothly again, but does not lose speed or hunt.

(c) Readjust the throttle stop screw to obtain the correct idle speed. See Specifications.

*NOTE: The above mentioned procedure to adjust the idle mixture is only a temporary measure. Final mixture adjustment must be made using a gas analyser.*



Side view of 1983 carburetor showing idle speed screw and mixture screw.