

## ENGINE

## General description

On the cars equipped with an exhaust gases emission control system, several modifications have been introduced; specifically:

- Idle speed operation, controlled by the engine oil temperature.
  - Microswitch, actuating on the the dual points distributors.
  - Special carburetors adjustment.
  - Exhaust collector headers tubes equipped with gas analysis connections.
- All these units ensure gas exhaust emissions of low levels, as long as these units are kept in correct adjustment and maintenance.

## Mechanical checks and adjustments

## Spark plug maintenance

Champion UN 19V spark plugs are used which have a central recessed electrode, and an additional surrounding circular electrode. The electrode gap is set by the manufacturer ( $1.27 \pm 0.4$  mm.) and is not adjustable.

When the central electrode is worn or the porcelain is cracked or dark grey in appearance, replace the plug.

Every 5,000 km., check plugs accurately and replace if necessary.

During checking operations, run engine at idle speed in order to check for electrical discharges at the spark plug connections.

With the high tension Dinoplex unit the sparks produce an audible sound and a luminous spark.

If necessary, replace faulty cable connections.

Every 10,000 Km., replace plugs.

## Carburetors maintenance

Periodic maintenance is suggested by the factory and its authorized dealers. The cars have a specially designed adjustment for exhaust gases emission controls and this must not be altered under any circumstances. The carburetors are supplied with special screws for the adjustment of the mixture, and must only be adjusted during the periodic maintenance.

The mixture adjustment screws have a friction ring and a spring which control

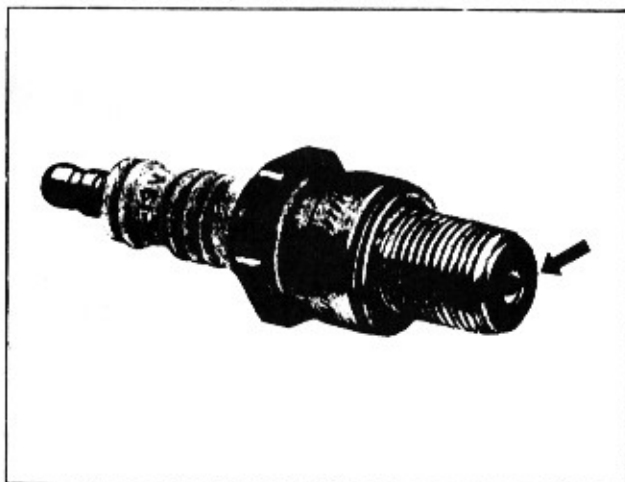


Fig. 1 Champion spark plug UN 19V

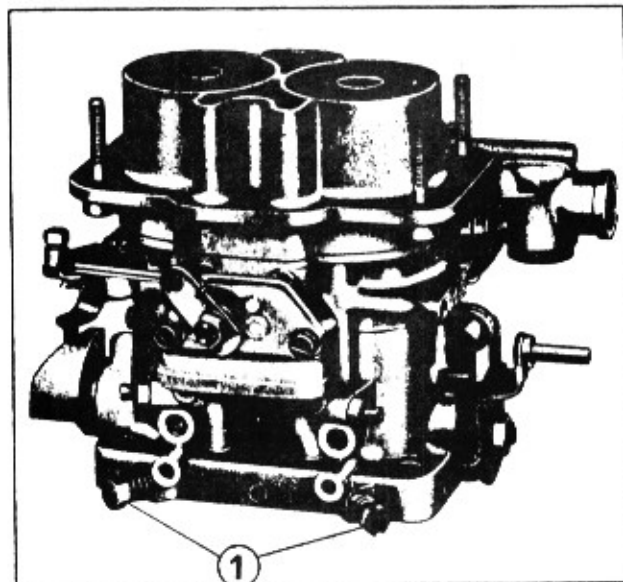


Fig. 2 Carburetor Weber 40 DCNF 19  
1. Mixture adjustment screws.

this free movement and assure a slight mixture enrichment in a progressive loosening of the screws.

#### Mixture control operations

These operations must be carried out every 15,000 Km.

Do not, under any circumstances, alter the adjustment of the mixture control screws after these operations are completed.

If the air and gas filters maintenance operations have been scrupulously followed, the carburetors should not need any additional maintenance in the periods between maintenance schedules.

Procedure: a CO gas analyzer, warmed to the manufacturer's specifications, is used.



Fig. 3 CO analyzer, Hartmann type.

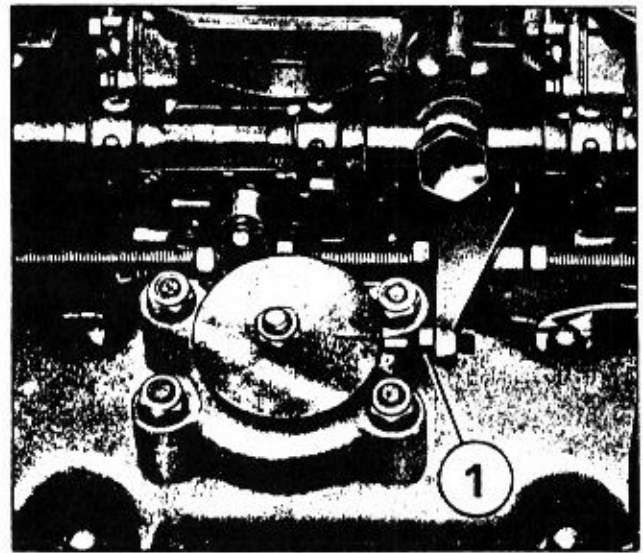


Fig. 4 Idle speed unit.

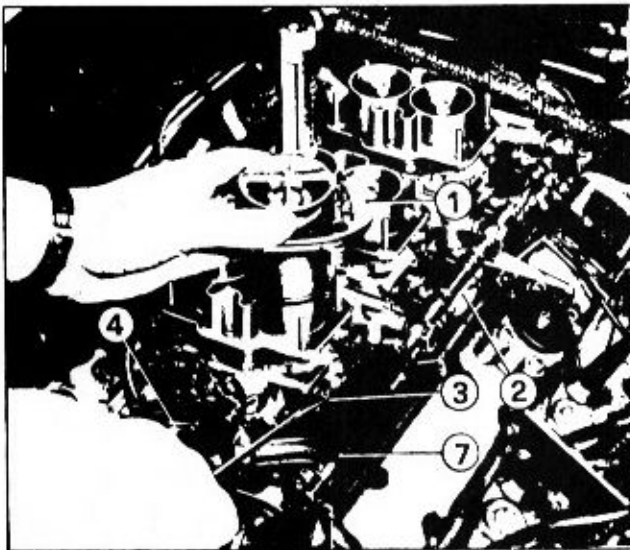


Fig. 5 Synchronizer unit for carburetors.

1. Motometer unit, 2. Butterfly valves control shaft, 3. Valves adjustment screws, 4. Idle speed adjustment screw, 7. Valves control unit.

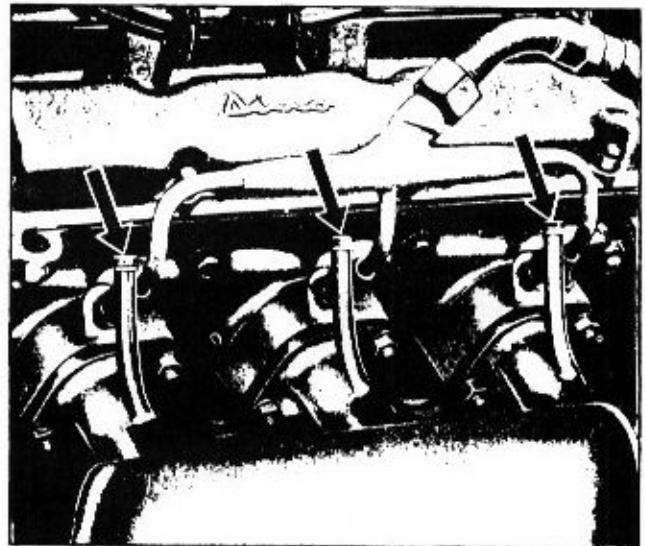


Fig. 6 CO gas check connections.

Run engine at idle speed, checking that all cylinders are functioning properly and that there are no electrical discharges across the spark plug caps. When oil and water temperatures are around 90°C., remove the air intake and check whether the idle speed cam is functioning freely.

With the engine speed at 1000 rpm's, equalize the butterfly valves openings using a carburetor synchronizer tool.

When the valves openings have been equalized, check whether the engine idle speed rpm's remain at the 1000 rpm's minimum with the idle speed cam in an inoperative position.

If the speed decreases, increase it by adjusting butterfly valves adjustment screws 3.

Prepare the CO analyzer by connecting the analyzer dip-stick to the tube at the top of the exhaust collector connected to the body of the first carburetor (each carburetor body feeds a cylinder). A connection is attached to each collector for the insertion of the analyzer dip-stick.

With the analyzer dip-stick connected, engine speed at least at 1000 rpm's, with air pump functioning, engine oil and water temperature at 90°C., the CO analyzer gauge count should be between 1.1% ± 0.2%.

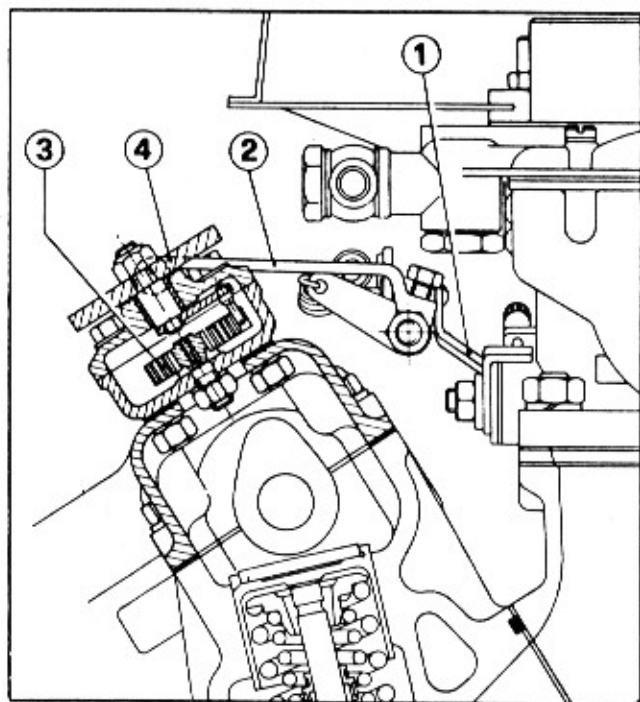
If the mixture is too rich, lightly close the mixture adjustment screws for each carburetor (ensuring each time that the analyzer indicator does not move) and adjust to reach the prescribed CO values.

Repeat the operation for all six carburetors, disconnect the analyzer dip-stick and reconnect the air intake.

Accelerate the engine to render inoperative the idle speed control cam and check for the last time the engine idle speed and the CO % count, which must not vary for each cylinder.

The idle speed unit contains a bimetallic spring which moves a circular diameter cam.

With oil temperature below 60°C., the high part of the cam surface is in contact with a small tappet connected through an arm with a butterfly valve control lever. Therefore, the butterfly valves are slightly open; if the engine is started, with ambient temperature of 20°C., a few seconds after starting it will automatically reach a minimum of 1200 rpm's.



Idle speed unit diagram.

1. Butterfly valves control lever,
2. Tappets, 3. Bimetallic spring,
4. Cam.

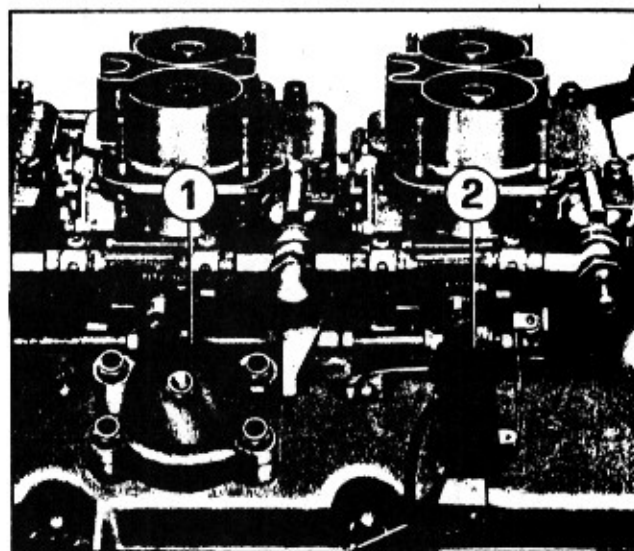


Fig. 8

1. Idle speed control cam.
2. Distributor microswitch.