

## K. Adjustment of Carburetor Linkage and Idle

Before adjusting the carburetor linkage it is advisable first to check the attachment of the intake pipe, the exhaust manifold, the carburetor flange, the throttle valve lever, and the control lever, and to apply grease to the ball joints of the linkage. Any excessive end play at the control and angle levers or at the control shaft on Model 190 SL should be removed by inserting suitable shims.

### I. Models 180 a, 180 b, 220 a, and 219

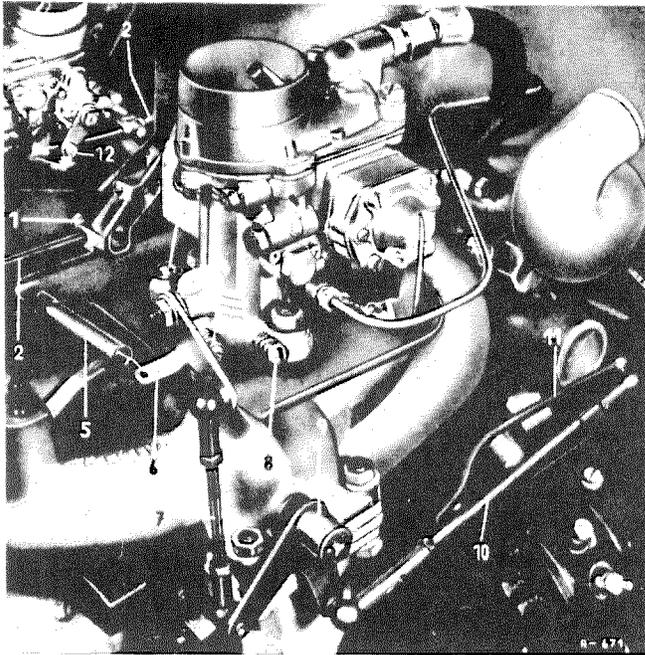


Fig. 01-3/16

- 1 Clamping screw for choke control sleeve
- 2 Choke control
- 3 Aperture limiting screw
- 4 Idle adjustment screw
- 5 Return spring
- 6 Throttle valve lever
- 7 Push rod
- 8 Idle mixture adjustment screw
- 9 Relay lever
- 10 Push rod
- 11 Double lever
- 12 Clamping screw for choke control

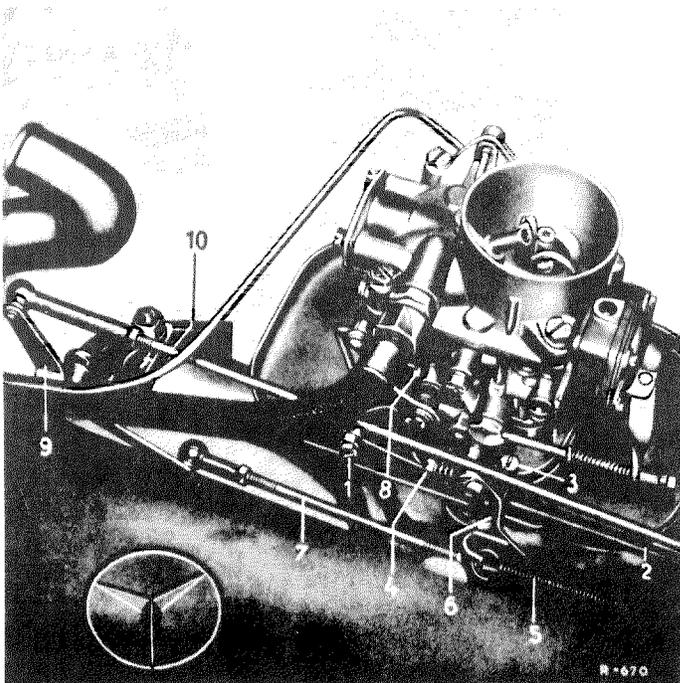


Fig. 01-3/17

- 1 Clamping screw for choke control
- 2 Choke control
- 3 Aperture limiting screw
- 4 Idle adjustment screw
- 5 Return spring
- 6 Throttle valve lever
- 7 Pull rod
- 8 Idle mixture adjustment screw
- 9 Relay lever
- 10 Pull rod

#### a) Adjustment of Carburetor Linkage

1. Check the throttle valve shaft for freedom of movement. To do this, detach the pull or push rod (7) at the throttle valve lever (6) and, if necessary, detach the return spring (5) (Figs. 01-3/16 and 01-3/17).
2. Turn out the idle adjustment screw (4) on the throttle valve lever until the throttle valve or in the case of double downdraft carburetors the throttle valves, are completely closed. Then turn in the idle adjustment screw until the throttle valve lever is on the point of moving. From this position the screw should be turned in one turn.
3. Press the throttle valve lever as far as the full load stop and check whether the aperture limiting screw (3) is resting against the full load stop of the carburetor housing.
4. Attach the pull or push rod (7) and the return spring (5) to the throttle valve lever. Again check the throttle valve position, actuating the carburetor linkage by depressing the accelerator pedal from inside the car (see also Job No. 30-3).

#### b) Adjustment of Idle

1. In order to adjust the idle on Models 180 a and 180 b, turn the idle mixture adjustment screw (8) right in and back it out by exactly two turns. On Models 220 a and 219 also

turn in the two idle mixture adjustment screws completely and back them out by exactly one turn.

2. After warming up the engine to normal working temperature (cooling water temperature at least 70° C), adjust the idle by means of the idle adjustment screw (4) to 700–750 rpm on Models 180 a and 180 b and to 700–800 rpm on Models 220 a and 219. Use a revolution counter for this adjustment.
3. Adjust the idle mixture adjustment screw by slowly turning it in or out, so that
  - a) the engine turns smoothly and
  - b) the highest possible idle engine speed is obtained.

**Note:** On double downdraft carburetors the two idle mixture adjustment screws should be adjusted evenly.

4. Then readjust the idle speed by means of the idle adjustment screw (4) once more to a speed of 700–750 rpm on Models 180 a and 180 b and to 700–800 rpm on Models 220 a and 219.
5. By making a further slight correction with the idle mixture adjustment screw check whether the idle can be further improved. If necessary, again adjust the idle speed with the idle adjustment screw.

## II. Model 220 S

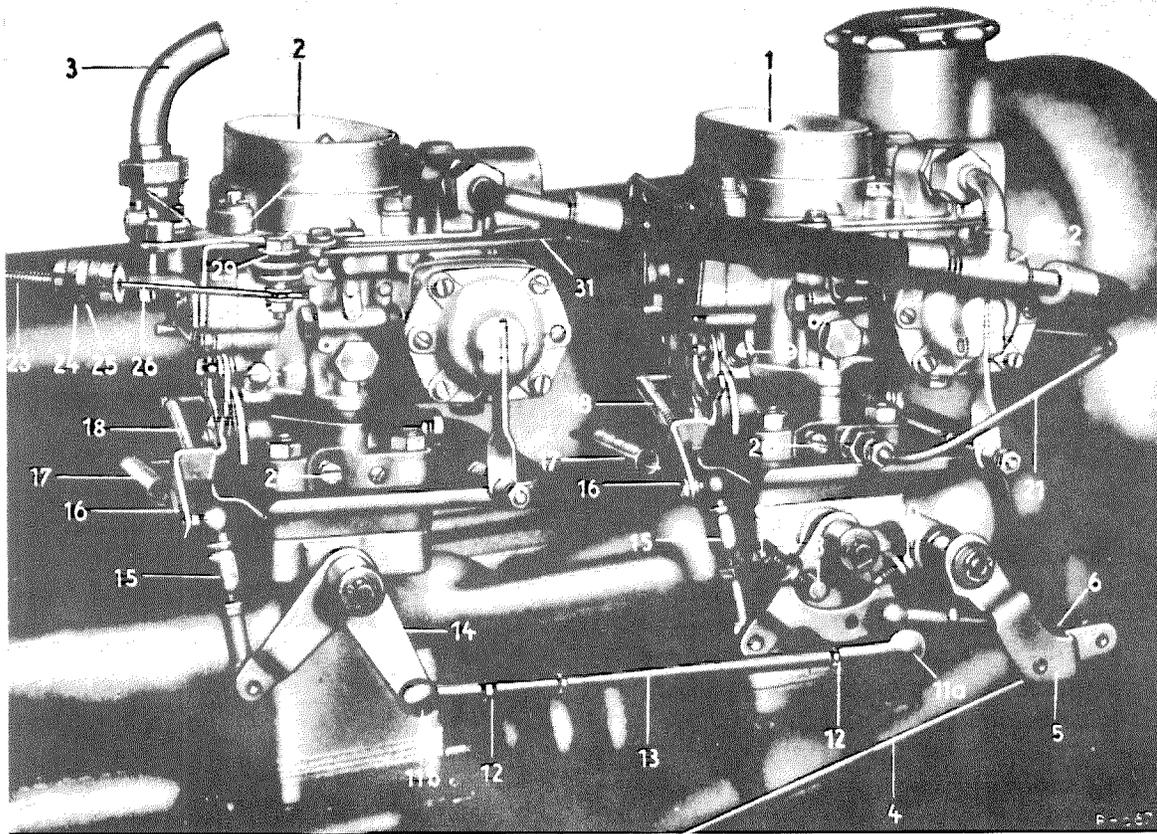


Fig. 01-3/18

- |                            |                                  |                      |
|----------------------------|----------------------------------|----------------------|
| 1 Front carburetor         | 11b Ball socket                  | 22 Fuel line         |
| 2 Rear carburetor          | 12 Hexagon nut                   | 23 Coil spring       |
| 3 Vent tube                | 13 Push rod                      | 24 Rubber bushing    |
| 4 Pull rod                 | 14 Angle lever                   | 25 Adjusting nut     |
| 5 Relay lever              | 15 Spring-loaded push rod        | 26 Spring steel wire |
| 6 Push rod                 | 16 Throttle valve lever          | 27 Angle lever       |
| 7 Control lever            | 17 Return spring                 | 28 Clamping screw    |
| 8 Stop bolt                | 18 Tension spring                | 29 Rubber bushing    |
| 9 Idle stop screw          | 19 Idle adjustment screw         | 30 Hexagon nut       |
| 10 Aperture limiting screw | 20 Idle mixture adjustment screw | 31 Connecting rod    |
| 11a Ball socket            | 21 Vacuum line to distributor    | 32 Hexagon screw     |

Fig. 01-3/18 shows the 2<sup>nd</sup> version of the carburetor linkage (installed as from Engine End No. 75 06477).

On the 1<sup>st</sup> version (installed up to Engine End No. 75 06476) the push rod (13) was carried not by ball heads, but by bolts (see Fig. 01-3/19).

### a) Adjustment of Carburetor Linkage

1. Detach the push rods (6) and (13) at the control lever (7) and the spring-loaded push rods (15) at the two carburetors (Fig. 01-3/18).

On the 1<sup>st</sup> version push rod (13) loosen the hexagon nut (3) and the knurled nut (1) at the angle lever (14) for the rear carburetor and slacken it off until the pivoted drive pin (2) is completely free (Fig. 01-3/19).

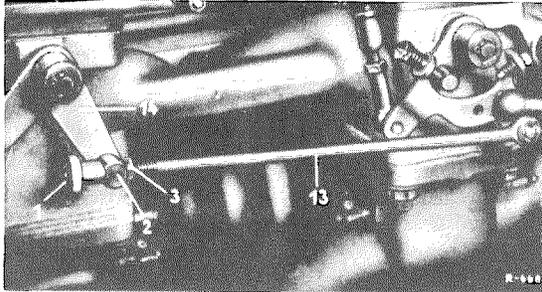


Fig. 01-3/19

- |               |                |
|---------------|----------------|
| 1 Knurled nut | 13 Push rod    |
| 2 Drive pin   | 14 Angle lever |
| 3 Hexagon nut |                |

2. Check the throttle valves of the carburetors for freedom of movement and if in doubt detach the return springs (17) and (18) (Fig. 01-3/18).
3. On both carburetors back out the idle adjustment screws (19) until the throttle valves of Stage 1 are completely closed. Then turn in the idle adjustment screws once more until the throttle valves are on the point of opening. From this position turn the screws in by exactly one turn.
4. Now back out the idle stop screw (9) on the control lever (7) until the lever rests against the stop bolt (8). Then turn in the screw by about two turns.
5. Check the length of the spring-loaded push rod (15) of the front carburetor. The push rod is adjusted to the correct length if both the control lever (7) and the throttle valve lever (16) rest against the idle stop. On no account should the push rod be extended against the spring pressure.

Then check the length of the spring-loaded push rod (15) of the rear carburetor. The

front and rear push rods must be of equal length. If necessary, adjust the length of the rear push rod to that of the front push rod.

After adjusting the spring-loaded push rods, tighten the hexagon nuts on the ball sockets.

6. When the spring-loaded push rods have been adjusted to equal length, push them into position on the two throttle valve levers (16). Then make an accurate adjustment of the idle stop screw (9). To do this, back out the idle stop screw a little and screw it in again to the point where the control lever (7) is on the point of being moved. Then back out the idle stop screw  $\frac{1}{8}$  turn. This will ensure that there is no play in the mechanism even if the ball joints are slightly worn.
7. Press the push rod (13) in position on the control lever (7) and the angle lever (14).

**Note:** The push rod has a ball socket with a right-hand thread on the one side and a ball socket with a left-hand thread on the other side. The ball socket with left-hand thread should be pressed onto the angle lever for the rear carburetor.

8. In order to adjust the push rod (13), loosen the hexagon nuts (12) and slacken them off. Then adjust the push rod in such a way that the throttle valve lever (16) of the rear carburetor is on the point of being moved. From this position turn the push rod about  $\frac{1}{8}$  turn and tighten both hexagon nuts, making sure that the adjustment is not altered.

**Note:** When adjusting the push rod (13), do not pull it out too far, since otherwise the throttle valve lever (16) of the rear carburetor will be opened; on the other hand, it must not be turned too little, since otherwise the rear spring-loaded push rod (15) will be extended.

In order to adjust the 1<sup>st</sup> version push rod, turn the hexagon nut (3) toward the angle lever (14) as far as is necessary to ensure that the throttle valve lever (16) is on the

point of being moved; then turn the hexagon nut back  $\frac{1}{8}$  turn and tighten the knurled nut and lock by tightening the hexagon nut (see Fig. 01-3/19).

9. Adjust the idle stop screw (9) on the control lever (7) in such a way that there is a clearance of 0.1–0.2 mm between the stop screw and the bolt (8).

**Note:** Turning back the stop screw on the control lever has the following effect: When the accelerator pedal is released quickly, the shock force is absorbed by the spring-loaded push rods and as a result the throttle valves are relieved to a large extent.

10. To adjust the full-load stop, loosen the aperture limiting screw (10) on the control lever (7) and back it out. Then move the carburetor linkage to the full-load position and turn the aperture limiting screw toward the stop bolt to the point where the control lever is on the point of being moved. The mechanical throttle valves of both Stage 1 and 2 of both carburetors must be fully opened in this position. Then lock the limiting screw by tightening the hexagon nut.
11. After attaching the push rod (4) to the relay lever (5) again check the position of the throttle valves, actuating the carburetor linkage by depressing the accelerator pedal from inside the car (see also Job No. 30-3).

#### b) Idle Adjustment

1. To adjust the idle, screw the idle mixture adjustment screw (20) on both carburetors right in and back it out by two turns.
2. Warm up the engine to normal working temperature (cooling water temperature 70–80° C) and adjust the idle by evenly adjusting the idle adjustment screws (19)

of both carburetors to  $n = 700\text{--}800$  rpm by means of a revolution counter.

3. Adjust the two idle mixture adjustment screws by turning them evenly in or out, so that
  - a) the engine turns smoothly and
  - b) the highest possible idle engine speed is obtained.
4. Readjust the idle speed to  $n = 700\text{--}800$  rpm by adjusting the idle adjustment screw (19).
5. By making a further slight correction with the idle mixture adjustment screws check whether the idle can be further improved. If necessary, again adjust the idle speed with the idle adjustment screws.
6. After adjusting the two carburetors, check whether the control linkage and the throttle valve levers work properly. The same applies to the two start mechanisms, which are connected by the connecting rod (31) (see also Job No. 30-6).

**Note:** When adjusting the idle, the mechanical throttle valves of Stage 2 and the start mechanism of the two carburetors must be completely closed.

7. Check the functioning of the vacuum valves of Stage 2 and of the oil shock-absorber. The cushion effect of the oil shock-absorber must be noticeable almost down to the end of the stroke. If necessary, check the oil level in the shock-absorber and top up (see Model 190 Workshop Manual, Job No. 07-3).

**Note:** On no account should the idle speed be adjusted by means of the idle stop screw (9), since otherwise the carburetor linkage adjustment is no longer satisfactory (see under a) Adjustment of carburetor linkage, para 9).

### III. Model 190 SL

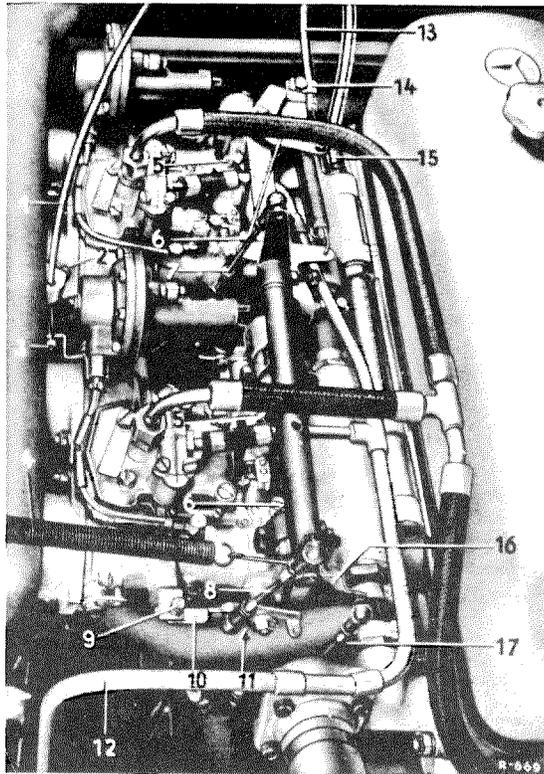


Fig. 01-3/20

- 1 Choke control
- 2 Clamping screw for choke control sleeve
- 3 Clamping screw for choke control
- 4 Return spring for carburetor linkage
- 5 Idle mixture adjustment screw of Stage 2
- 6 Idle mixture adjustment screw of Stage 1
- 7 Push rod for rear carburetor
- 8 Push rod for front carburetor
- 9 Idle adjustment screw
- 10 Throttle valve lever
- 11 Aperture limiting screw
- 12 Overflow line
- 13 Hot-start control
- 14 Clamping screw for hot-start control sleeve
- 15 Threaded union for vacuum connection of ATE Power Brake
- 16 Control shaft
- 17 Push rod from angle lever to control shaft

#### a) Adjustment of Carburetor Linkage

1. Detach the push rod (17) between the angle lever and the control shaft and detach the two push rods (7) and (8) between the control shaft and the throttle valve levers (see Fig. 01-3/20).
2. Back out the idle adjustment screw (9) on the two carburetors until the throttle valve of Stage 1 is closed. In this position the throttle valve of Stage 2 must have a certain amount of play; if this is not the case, the adjustment screw (3) on the relay lever of the throttle valve shaft of Stage 1 must be backed out (see Fig. 01-3/21).

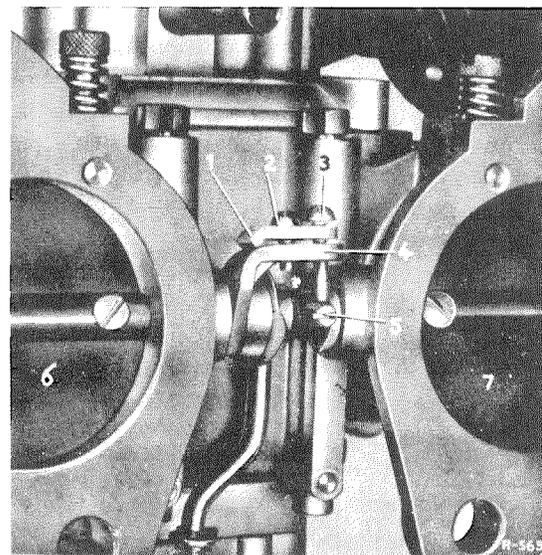


Fig. 01-3/21

- |  |  |
|--|--|
| 1 Clamping strap                                 | 5 Drive pin on throttle valve shaft of Stage 2 |
| 2 Clamping screw                                 | 6 Throttle valve of Stage 1                    |
| 3 Adjustment screw                               | 7 Throttle valve of Stage 2                    |
| 4 Relay lever on throttle valve shaft of Stage 1 |  |

**Note:** The picture shows the 2<sup>nd</sup> version of the adjustment screw locking device.

On the 1<sup>st</sup> version there was a lock nut instead of the clamping strap (1) and the clamping screw (2).

3. Now turn in the idle adjustment screw (9) on both carburetors to the point where the throttle valves are just about to open. From this position turn the screw in exactly one turn (Fig. 01-3/20).
4. Adjust the push rod (17) between the angle lever and the control shaft (16) to the prescribed length of 175 mm (measured from center ball socket to center ball socket) and attach it.
5. Adjust the push rod (8) between the control shaft (16) and the throttle valve lever (10) of the front carburetor to the prescribed length of 100 mm (measured from center ball socket to center ball socket) and attach the push rod.
6. Now press the push rod (7) onto the rear carburetor, making sure that the ball socket with left-hand thread points downward. Then adjust the push rod so that the throttle valve levers of both carburetors are in the idle stop position.

When doing this, make sure that the two ball sockets are absolutely parallel after the lock nuts on the ball sockets have been tightened. The adjustment of the push rod must be very accurate, since too long a push rod will push open the throttle valve of Stage 1 of the rear carburetor and too short a push rod will push open the throttle valve of the front carburetor. When the control linkage is being operated, the throttle valves of both carburetors must open simultaneously without any idle travel.

7. Press the control linkage as far as the full load stop and check whether the aperture limiting screw (11) of the front carburetor rests against the full load stop of the carburetor housing.
8. On both carburetors check the drive pin (5) on the throttle valve shaft of Stage 2 for tightness and turn in the adjustment screw (3) for the automatic return of the throttle valve of Stage 2 until the adjustment screw just rests against the drive pin (5) (Fig. 01-3/21). In this position the control linkage must be in the idle position and the throttle valve (7) of Stage 2 must be closed.

This position can be checked at the throttle valve lever of Stage 2, which in this position should still have a small amount of play. On no account should the adjustment screw (3) be turned in till the throttle valve of Stage 1 is being turned open.

After having made the adjustment, tighten the clamping screw (2).

#### b) Adjustment of Idle

1. Turn in the idle mixture adjustment screw (6) of Stage 1 on both carburetors and from this position back it out by exactly 1½ turns.

**Note:** The idle mixture adjustment screw (5) of Stage 2 remains closed on both carburetors.

2. Warm up the engine to operating temperature (cooling water temperature 70–80°C) and adjust the idle by evenly adjusting the idle adjustment screws (9) on both carburetors by means of a revolution counter.

In the case of distributors

VJUR 4 BR 11 and VJ 4 BR 12

adjust to 1200–1300 rpm,

VJ 4 BR 11 and VJR 4 BR 24

adjust to 900–1000 rpm.

3. Adjust the idle mixture adjustment screw (6) of Stage 1 on both carburetors by turning it in and out evenly until
  - a) the engine turns smoothly and
  - b) the highest possible idle engine speed is obtained.
4. Readjust the idle speed to the specified values by means of the idle adjustment screws (9).
5. By making a further slight correction with the idle mixture adjustment screws check whether the idle can be further improved. If necessary, again adjust the idle speed with the idle adjustment screws.

6. After adjusting the idle again adjust the automatic return mechanism for the throttle valves of the 2<sup>nd</sup> stage (refer to a) adjustment of carburetor linkage, para 8).
7. Set the adjustment screw at throttle valve lever of rear carburetor in such a manner that there is a clearance of 0.4 mm between the screw and the relay lever. Then tighten the locking nut of the adjustment screw. During the adjustment the control linkage should be in idle position and the start mechanism should be completely disengaged, that is, the choke valves should be horizontal. The relay lever should be pressed to the choke valve lever and cam by means of the return spring. If required, the return spring should be replaced (Fig. 01-3/22).

**Note:** The start mechanism on the front carburetor has no cam and no relay lever. Raising of the 1<sup>st</sup> stage throttle valve with the start mechanism engaged is effected by way of the control linkage.

When the start mechanism is switched off the choke valves of both carburetors should be completely open. The stop lever of the choke valve shaft should then abut against the carburetor housing.

8. Check start mechanism for proper functioning (refer to Job No. 30-6 and Job No. 07-0, Section IV).

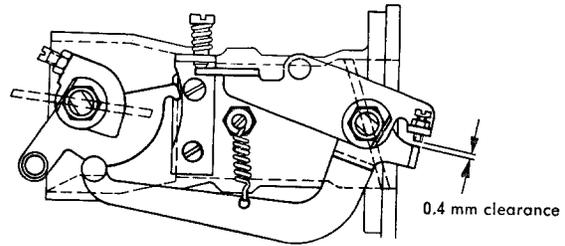


Fig. 01-3/22

9. Check return spring for carburetor linkage.

The 1<sup>st</sup> version of the return spring (free length 169 mm) has a connecting strap, which is attached at the bottom of the lever on the control shaft.

The 2<sup>nd</sup> version of the return spring (free length 214 mm) uses no such connecting strap. In addition, the lever on the control shaft is provided with a bolt to hold the return spring.

As from engine end No. 85 02730 the 2<sup>nd</sup> version of the return spring is installed as a standard part.

If a vehicle having a return spring of 1<sup>st</sup> version shows signs of chafing at bottom of control shaft lever, both the 2<sup>nd</sup> version of the return spring and control shaft should be subsequently installed.