Brake actuation linkage assembly

Contents

9/86
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Introduction

The brake actuation linkage assembly is mounted just rearward of the toeboard. On right-hand drive cars the assembly is positioned just inboard of the body sill. On left-hand drive cars the assembly is fitted adjacent to the inner side of the body longeron.

The assembly houses the distribution valves, speed control switch, stop lamp switch, and on cars not fitted with an anti-lock braking system, the deceleration conscious pressure limiting valve. The assembly being the same for both right and left-hand drive cars.

Always ensure that replacement distribution valves and the deceleration conscious pressure limiting valve (if fitted) are for use with hydraulic system mineral oil and bear the relevant identification markings (see Sections G10 and G11).

Under no circumstances must valves for use with conventional brake fluid systems (i.e. RR363) be used for replacements.

Brake actuation linkage assembly – To remove

1. Place the car on a ramp; depressurize the hydraulic systems as described in Section G3.
2. Disconnect the battery.
3. Remove the undershield from around the linkage assembly.
4. Disconnect the Lucar connections, then remove the brake stop lamp switch, speed control switch, and mounting bracket.

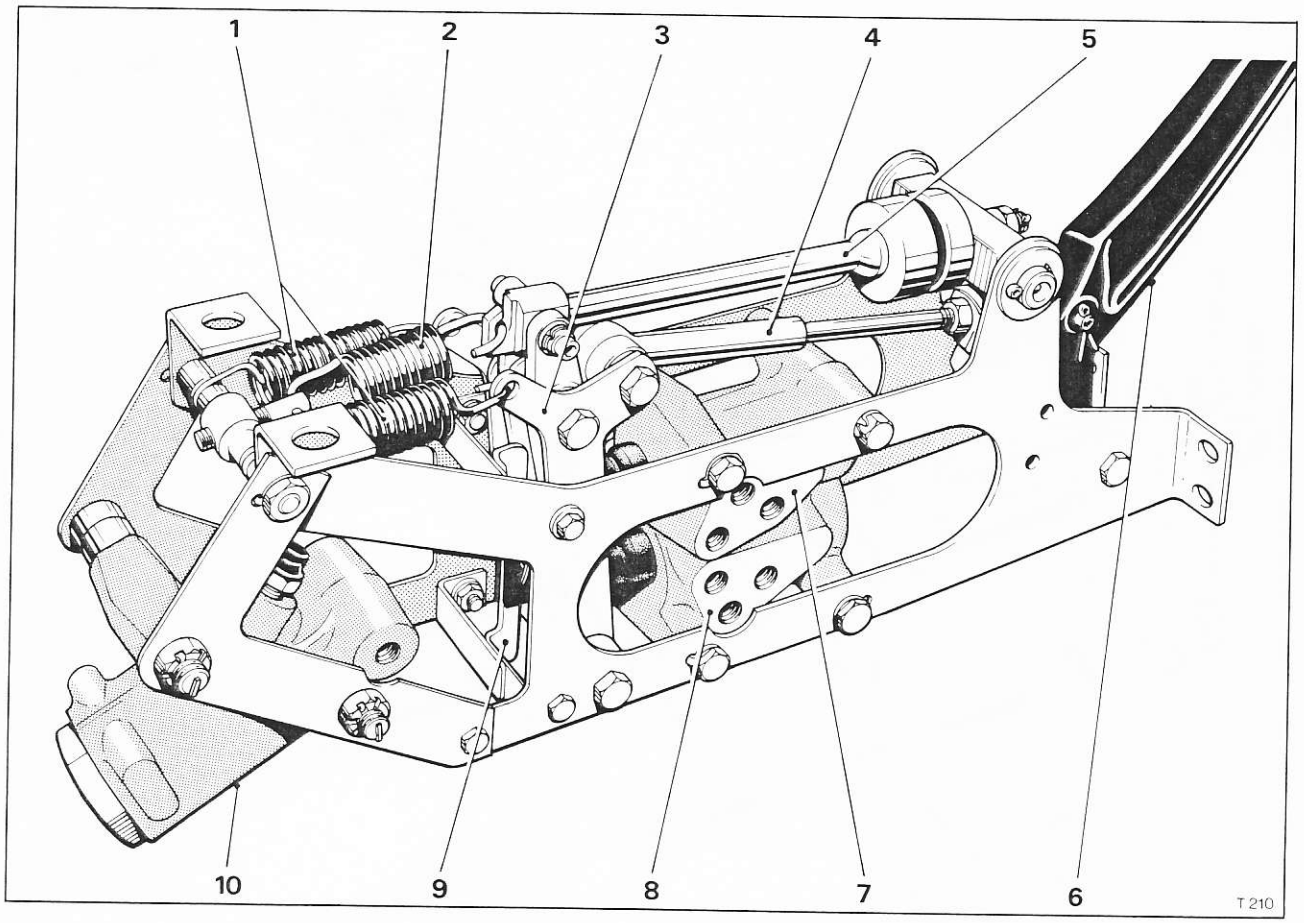

Fig. G12-1 Brake actuation linkage assembly

1 Return springs
2 Pedal 'feel' spring
3 Balance lever assembly
4 Brake actuation operating rod
5 Pedal 'feel' rod
6 Brake pedal lever
7 Upper distribution valve (No. 1 system)
8 Lower distribution valve (No. 2 system)
9 Off stop bracket
10 Deceleration conscious pressure limiting valve on cars not fitted with an anti-lock braking system

9/86
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5. Remove the brake pedal pinch bolt from the upper end of the brake pedal lever and ease the pedal stem out of the lever. Collect the rubber seal.
6. Disconnect the pipes from the distribution valves and deceleration conscious pressure limiting valve (if fitted). Blank off all exposed pipe ends and valve ports.
7. Remove the setscrews (right-hand drive cars) or bolts and nuts (left-hand drive cars) securing the linkage assembly side plates at the forward end. Support the linkage assembly and remove the two rear securing setscrews. Lower the assembly from the car.

On left-hand drive cars, the brake pedal lever must be withdrawn from the rubber sealing boot when lowering the actuation linkage from the car.

Important Under no circumstances should the brake actuation assembly be allowed to hang from the brake pedal, supported by the actuation rod, as this may result in the rod being bent.

Brake actuation linkage – To dismantle

Prior to dismantling the linkage a note should be taken of the relative positions of the distance pieces and bolt direction (see figs. G12-1 and G12-2).

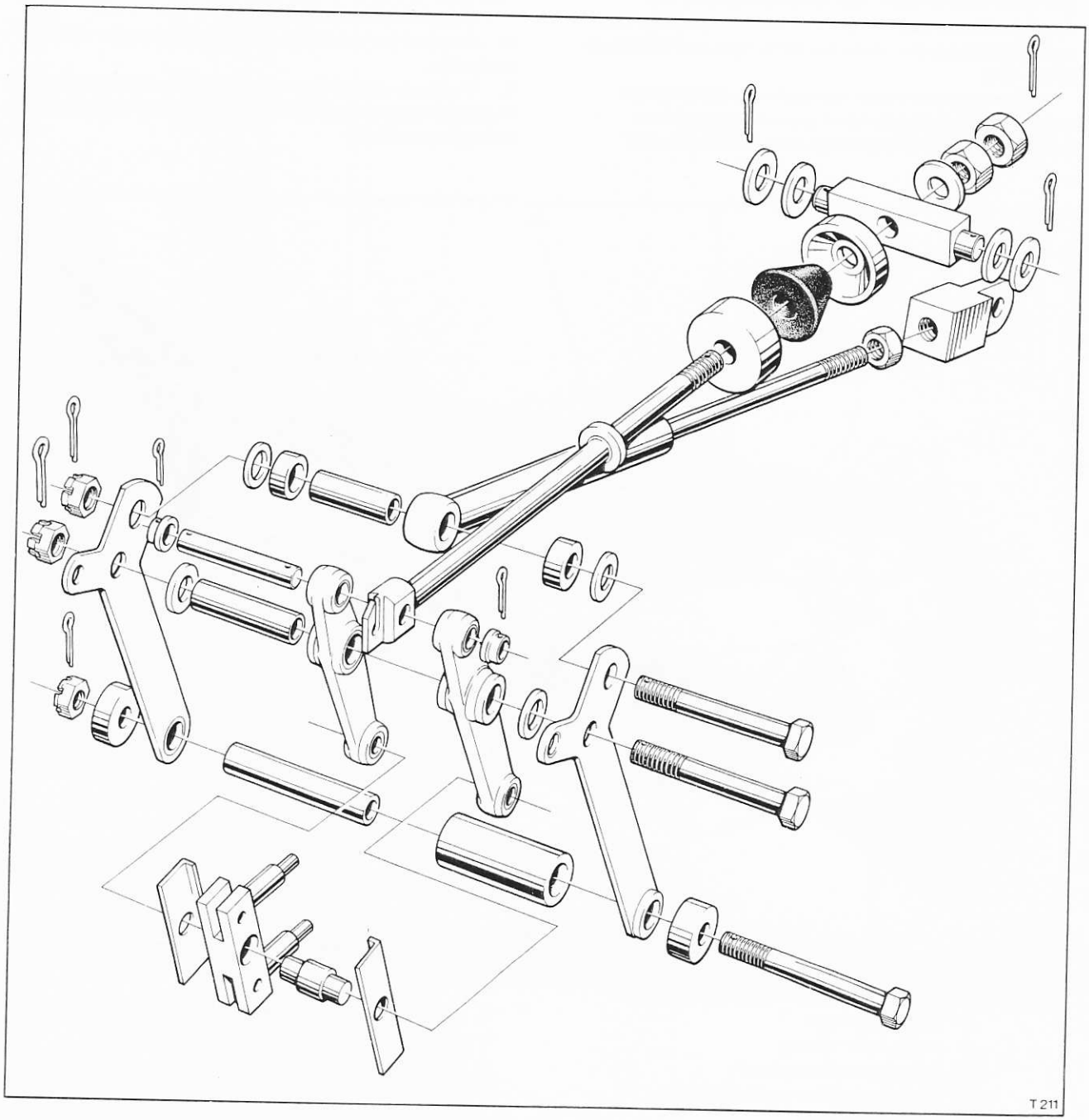

Fig. G12-2 Brake actuation linkage balance lever assembly

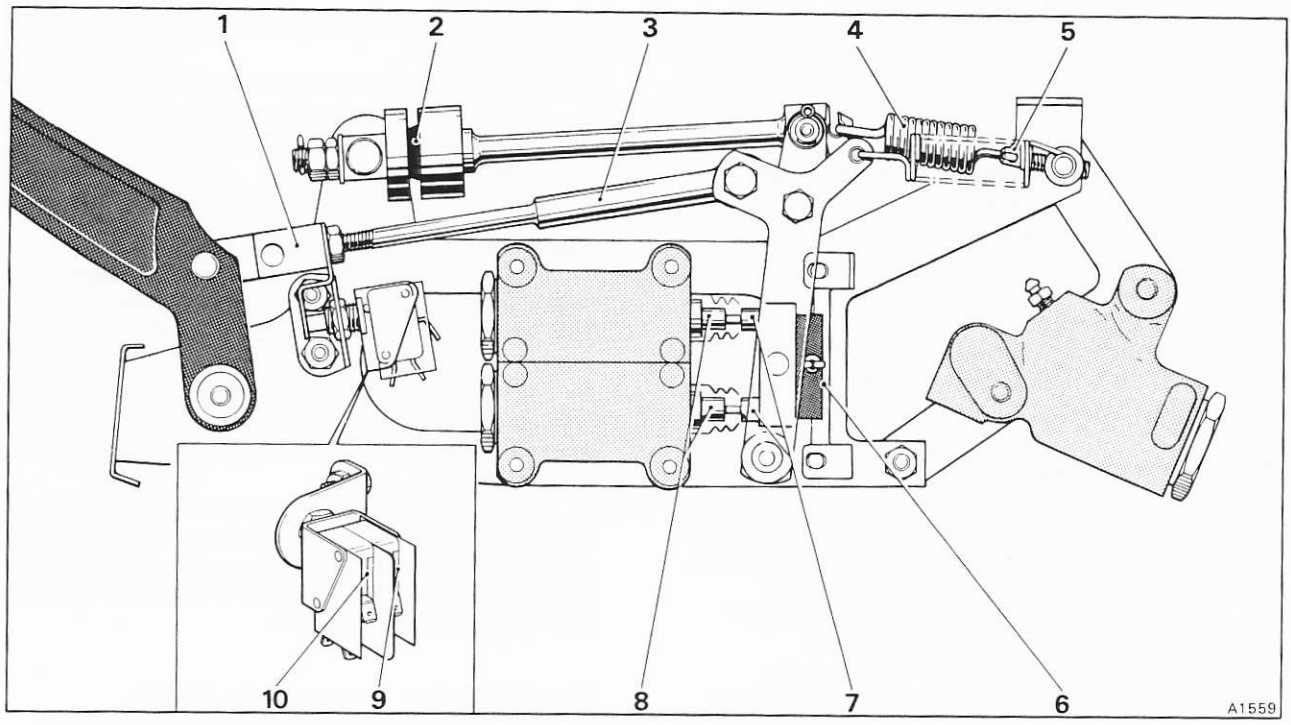

Fig. G12-3 Brake actuation linkage adjustment points

1 Brake pedal lever adjustment block
2 Rubber 'feel' cone
3 Brake actuation operating rod
4 Main 'feel' spring
5 Feel spring adjustment screw
6 Off stop bracket
7 Balance lever push rods
8 Distribution valve stems
9 Brake stop lamp switch
10 Speed control switch

1. Remove the brake actuation linkage from the car as described previously.
2. Remove the split pin and clevis pin from the operating rod pivot on the brake pedal lever.
3. Remove the three springs from the rear of the linkage.
4. Remove the split pin and nuts from the end of the pedal 'feel' rod.
5. Remove the 'off' stop bracket from behind the balance levers.
6. Remove the pivot bolt from the lower end of the balance levers. Ease the levers rearward and carefully withdraw the balance lever push rods from the distribution valves. Remove the distance pieces and pivot tube from the lower end of the balance levers.
7. Lift the levers clear of the side plates and withdraw the 'feel' rod from its retaining bar. Collect the conical rubber and abutment cups.
8. Remove the split pin from one side of the 'feel' rod pivot pin, withdraw the pin and collect the collar.
9. Remove the two bolts retaining the pivot arms to the balance levers. Noting their positions collect the washers, distance pieces, and pivot tubes.
10. Remove the balance levers from each side of the distribution valve push rod equalizing block, collect the pin retaining plates.

Note The levers and pivot pins are clearance fits and are easily removed.

Brake linkage assembly bushes and pivot pins – To renew

1. Remove and dismantle the brake linkage as described previously.
2. Carefully press the bushes requiring renewal out of their locations and fit new bushes. The bush bores are machined to final size, therefore no reaming or boring is necessary.
3. Any pivot pins that are worn or damaged must be renewed.

Brake actuation linkage – To assemble

Assemble the linkage by reversing the dismantling procedure, noting the following.

1. Clean all components prior to assembly. Lightly lubricate the linkage pivots, the protruding parts of the distribution valve stems, and the push rod location bores with Molytone 'C' grease or any approved alternative.
2. All bolts and nuts must be torque tightened to the figures quoted in Chapter P before split pins are fitted and tab-washers secured.
3. The linkage should operate freely when located between the assembly side mounting plates. All levers must be absolutely free to move with negligible friction on their pivots. Distance tubes must be similarly free in the Oilite bushes.

Note All bolts should be fitted in the directions

shown in figure G12-1 in order that certain individual items may be removed without removing the complete assembly from the car.

Brake actuation linkage – To adjust
Adjustment of the actuation linkage should be carried out in the following sequence.
a. Distribution valve push rod clearance.
b. Rubber 'feel' cone setting.
c. Main 'feel' spring setting.
d. Brake pedal height setting.

Note Adjustment 'a', 'b', and 'c' can be carried out with the actuation linkage assembly removed from the car.

Distribution valve push rods – To set (see fig. G12-3)
1. Slacken and unscrew the brake 'feel' rod adjusting nuts until clearance is obtained between the 'feel' rod mounting block and the rubber cone seat.
2. Remove the 'feel' rod and return springs.
3. Slacken the four bolts securing the 'off' stop bracket to the actuation linkage side plate.
4. Slide the 'off' stop bracket forward on the elongated holes until a clearance of up to 0,25 mm (0.010 in) is obtained between the balance lever push rods and the distribution valve stems; with no pre-load being applied to the valve stems. Ensure that the setting is equal on each valve, then tighten the bracket securing bolts.

Note It will be necessary to draw back the two rubber dust covers on the distribution valves in order to check the push rod to distribution valve stem clearance.

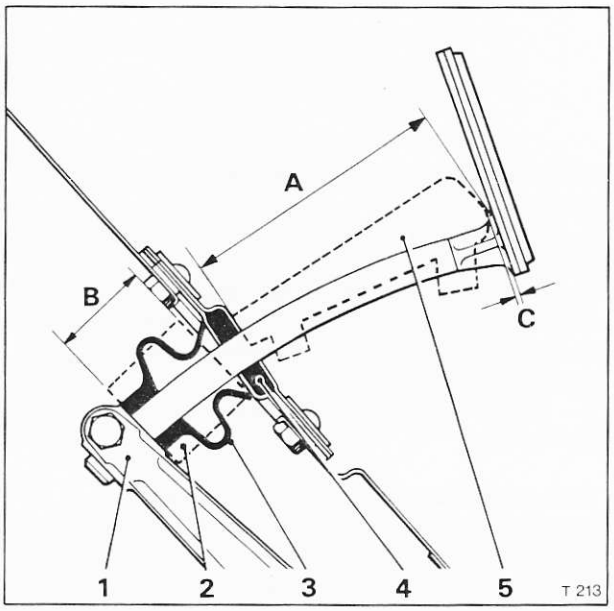

Fig. G12-4 Brake pedal height settings
1 Brake lever
2 Brake lever setting gauge
3 Rubber seal
4 Toeboard seal and housing
5 Pedal height checking template
A 99,06 mm to 98,30 mm (3.90 in to 3.870 in)
B 38,10 mm to 37,97 mm (1.50 in to 1.495 in)
C 0,38 mm to 5,08 mm (0.015 in to 0.20 in)

Rubber 'feel' cone – To set (see fig. G12-3)
1. Fit the two return springs to the linkage assembly. At this point the two abutment cups and the rubber 'feel' cone should be loose and free to slide on the shaft.
2. Tighten the adjusting nut until the clearance between the abutment cups and the rubber cone has been removed, without a pre-load being applied to the rubber cone.
3. Securely tighten the lock-nut onto the adjusting nut, then depress and release the brake pedal several times to ensure that the cone is seated correctly. Re-check the cone setting. Ensure that a security split pin is fitted to the end of the shaft.

Main 'feel' spring – To set (see fig. G12-3)
1. Ensure that the actuation assembly remains in the 'off' position.
2. Fit one end of the 'feel' spring into the adjusting screw located in the centre of the spring anchor rod.
3. Rotate the spring and screw half a turn at a time in the direction required until the spring can be fitted into the 'feel' rod hook. With no clearance between the spring and hook, ensure that there is no spring pre-load.

Note It is necessary to stretch the spring over the hook to obtain the correct position where clearance is determined.

4. Remove the spring from the hook and rotate the spring and screw 1½ turns clockwise, when viewed from the brake pedal end of the assembly (i.e. effectively tensioning the spring). Fit the spring onto the hook.

Note It is essential to follow both of the previous setting instructions accurately as deviations will completely alter the subjective feel and acceptability of brake control.

Clearance between the rubber 'feel' cone and its abutments will cause a spongy, long travel pedal feel at low decelerations. Any pre-load on this rubber will cause jerky initial braking under these conditions. Inadequate pre-load on the rear tension spring will produce unwanted free travel at the pedal followed by jerky initial braking. Too much pre-load will give jerky initial braking followed by a period of 'spongy' pedal travel.

Brake pedal height setting (see figs. G12-4 and G12-5)
This setting can only be carried out with the actuation linkage assembly fitted to the car.
1. Locate the setting gauge into the brake pedal stem hole in the end of the pedal lever (see fig. G12-4). Raise the pedal lever until the gauge touches the underside of the toeboard seal housing.

2. Adjust the block on the lever operating rod until the hole in the block aligns with the hole in the pedal lever.

Note Shortening the rod length reduces the gap between the pedal lever and seal plate, half a revolution of the block being equal to approximately 3,17 mm (0.125 in) of pedal lever movement.

3. Remove the setting gauge from the brake lever. Connect the rod to the lever by inserting the clevis pin. Fit the split pin.

4. Fit the rubber seal between the brake pedal lever and toeboard seal plate.

On left-hand drive cars slide the convoluted rubber seal over and down the brake pedal lever; fit the two retaining screws and washers. Ensure that the seal does not prevent the lever and linkage returning to the fully 'off' position.

5. Insert the brake pedal through the toeboard felt and rubber seals into the hole in the brake pedal lever.

6. Fit and tighten the pinch bolt to secure the brake pedal lever.

7. Check that the rubber seal does not prevent the actuation linkage returning to the 'off' position and that the brake pedal does not foul the seal housing at any point along its travel.

8. Fit the brake stop lamp and speed control switches. Adjust the setting as described under, Brake stop lamp and speed control switches – To adjust.

Brake pedal height – To check (see fig. G12-4)

1. Place the checking template between the underside of the brake pedal and the upper surface of the pedal seal housing with the two lugs of the gauge located under the pedal stem. Rest the flat base of the template on the seal housing. Ensure that both carpet and underlay are removed from the housing surface.

2. If the clearance between the top of the template and the underside of the pedal is less than 0,38 mm (0.015 in) or more than 5,08 mm (0.20 in) adjust the length of the pedal lever rod as described in Brake pedal height setting.

Brake pedal lever – To remove

1. Place the car on a ramp and remove the undershield from around the brake actuation linkage.

2. Disconnect the battery.

3. Disconnect the Lucar connections and remove the stop lamp and speed control switches.

4. Remove the brake pedal stem pinch bolt from the top of the pedal lever and withdraw the stem out of the lever. Collect the rubber seal from the pedal stem.

5. Remove the split pin and clevis pin from the operating rod pivot on the pedal lever.

6. Remove the bolt and nut from the pedal lever pivot. Remove the lever and collect the pivot tube. On left-hand drive cars it is necessary to withdraw the lever from the convoluted rubber seal during final removal.

Brake pedal lever – To fit

To fit the brake pedal lever reverse the procedure

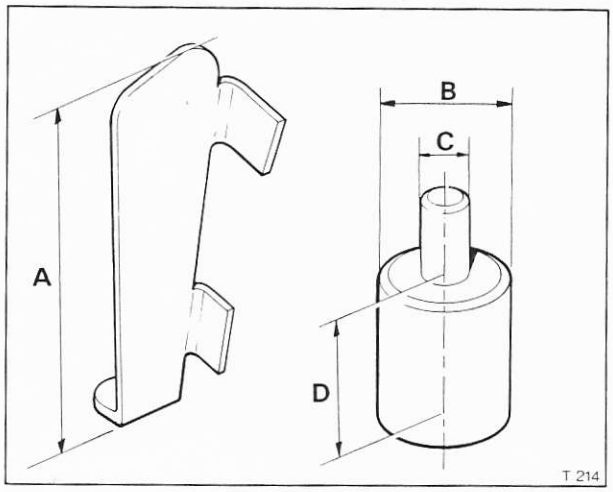

Fig. G12-5 Brake pedal setting and checking template

A 99,06 mm to 98,30 mm (3.90 in to 3.870 in)
B 34,92 mm to 34,29 mm (1.375 in to 1.350 in)
C 12,50 mm to 12,44 mm (0.492 in to 0.490 in)
D 38,10 mm to 37,97 mm (1.50 in to 1.495 in)

given for removal noting the following.

1. All nuts must be torque tightened to the figures quoted in Chapter P.

2. The pedal lever, stop lamp, and speed control switches must be checked for correct operation and adjusted if necessary, as described under the appropriate headings in this Section.

Brake stop lamp and speed control switches – To adjust

With all other adjustment to the brake actuation linkage and brake pedal completed, set the brake stop lamp and speed control switch as follows.

1. Ensure that the foot brake pedal is in the off position.

2. Slacken the nuts retaining the switch assembly. Allow the assembly sufficient movement to enable the push button to be depressed fully against the striker plate of the foot brake lever.

3. Position the switch assembly so that the push button is depressed against the foot brake striker plate, fully depressing the two switch contacts.

Note Care must be taken not to deflect the mounting bracket.

4. Tighten each lock-nut.

5. Check the efficiency of the stop lamp and speed control switches, using an ohmmeter. The stop lamps should operate and the speed control release, with less than 13 mm (0.50 in) of brake pedal travel.

6. Reset the switch assembly if the required setting is outside the specified tolerance.

7. Tighten each lock-nut.

8. Check that the whole mechanism operates smoothly.