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SECTION 4 — CONTROL LINKAGE

It is recommended that the control linkage be checked before road testing the car to investigate a suspected defect, but if the symptoms exhibited on road test are shown by fault diagnosis to be attributable to control linkage another check should be made before proceeding any further.

Shortening the T.V. rod or screwing in the T.V. adjusting screw (if fitted) may correct such defects as a high up-change and rough up and down-changes. Lengthening the rod or screwing out the T.V. adjusting screw may correct such defects as low heavy throttle up-changes, slipping or incorrect 'kick-down'. Sticking throttle linkage will give inconsistant oil pressure and may cause a rough down-change when the car is slowing to a halt.

Selector linkage should be checked by disconnecting the selector rod on the side of the gearbox and checking the lever through its full range. The lever should click into each of its five positions. If the linkage is correctly adjusted it should be possible, with the steering column lever in the appropriate position, to connect the rod without springing the lever from any of its notches.

If necessary, adjust the controls to obtain the correct changes following the procedure given under 'Controls — To adjust'. If a fault still persists after road test, refer to the Fault Diagnosis Table for the next check.

Controls — To adjust

S2 and S3 cars

The following paragraphs explain the correct method of adjusting the throttle and selector controls on both R.H. and L.H. cars, commencing with throttle controls.

On right-hand drive cars, drive the car onto a ramp or over an inspection pit, then disconnect the T.V. rod at the gearbox end by removing the split pin and clevis pin (see (2) in Figure 28).

Ensure that the choke is in the 'Off' position and that the 'fast-idle' cam is out of action.

Remove the split T.V. lever (1) by slackening the 2 B.A. pinch bolt. Slacken the lock-nut on the 2 B.A. adjusting screw so that it lies approximately half-way through the lever (early 'S2' and Silver Cloud II cars were not fitted with a split T.V. lever).

Tighten the lock-nut and refit the lever to the gearbox.

Detach rod (3) by removing the pinch bolts and ball joint adjusting screws. Check the distance between the ball joint centres as indicated in Figure 28. This should be approximately 6·200 in.

Slacken the clamp holes on the carburetter levers (7) and the throttle stop lock-nut. Screw out the throttle stop screw slowly until the joint (6) begins to toggle over. Screw in the throttle stop screw one full turn and lock the lock-nut.

Refit rod (3); there should be a minimum clearance in the ball joints without being tight.

Slacken the clamp bolt (5) on the manifold shaft and insert a 0·3125 in. distance piece between the boomerang lever and the bell housing as indicated in Figure 28. If no assistance is available to hold this in position it may be secured with adhesive tape.

Hold the throttle stop lever (7) against the throttle stop screw, ensure that there is approximately 0·020 in. end float in shaft (4), then push the two levers towards each other; tighten the clamp bolt.

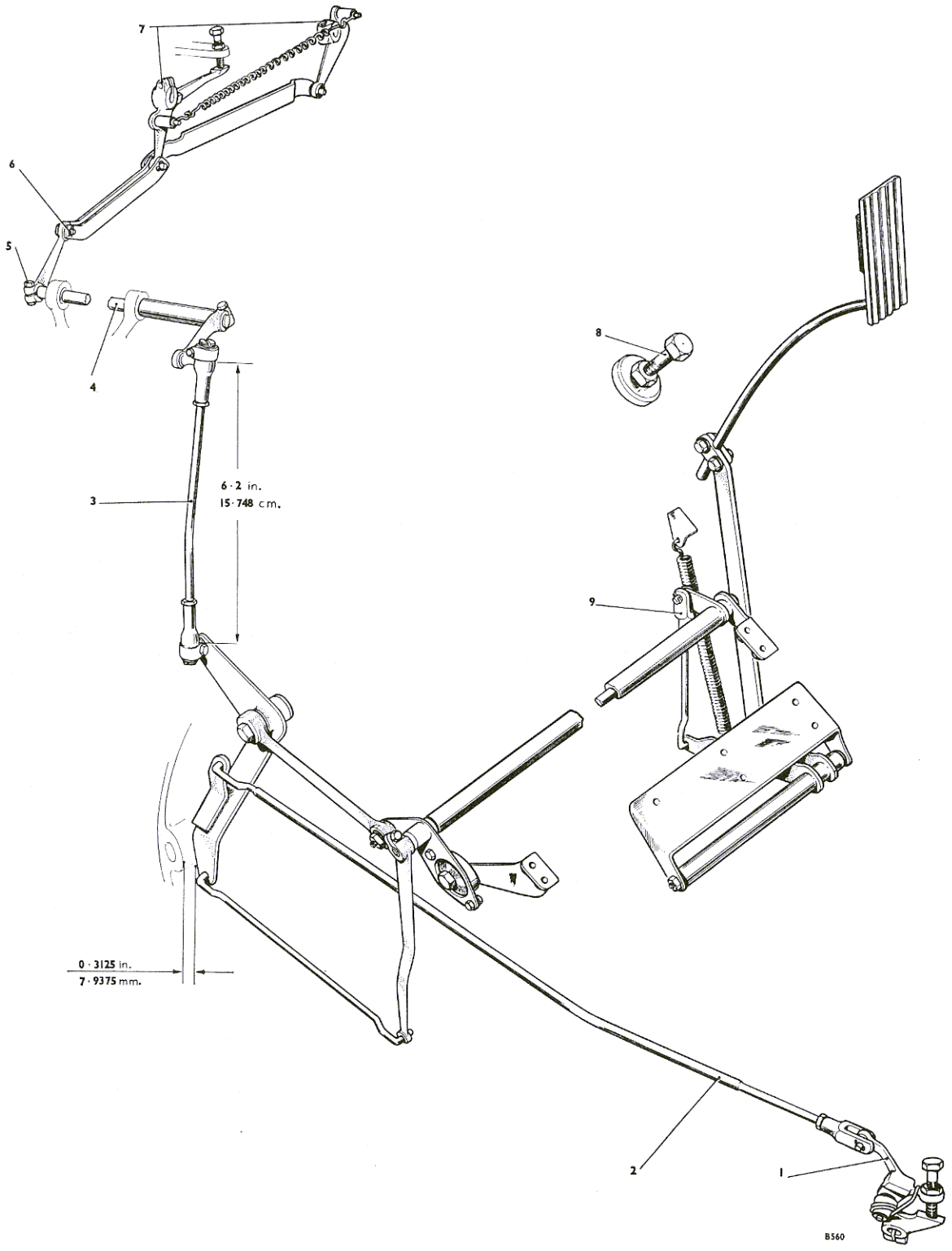

Fig. 28 Throttle and T.V. control linkage — R.H. drive cars

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Remove the 0·3125 in. distance piece; check that the boomerang lever does not foul the bell housing when it is released. If this does occur, the size of the distance piece must be increased.

Adjust the T.V. rod (2) so that when the clevis pin is inserted into the hole in the split lever, the lever will be held forward to the limit of its travel. Lengthen rod (2) by two full turns of the jaw, then tighten the lock-nut.

It will then be necessary to synchronise the carburetters (see T.S.D. 729 Section K4).

Before fitting the dashpots check that the butterflies are opening fully by depressing the accelerator pedal onto the full throttle stop.

If the butterflies do not open fully, screw down the full throttle stop (8) or shorten the rod (9). This is dependent upon the position of the accelerator pedal and the customer's requirements.

If rod (9) is shortened, the pedal will be higher in the throttle closed position.

If the throttles open too wide, reverse the two adjustments.

Check throughout that the split pin, lock-nuts and pinch bolts are fitted then road test the car.

On left-hand drive cars, first drive the car onto a ramp or over an inspection pit, then disconnect the T.V. rod (2) (see Fig. 29) at the gearbox end by removing the split pin and clevis pin.

Ensure that the choke is in the 'Off' position and the 'fast-idle' cam out of action.

Remove the split T.V. lever (1) by slackening the 2 B.A. pinch bolt. Slacken the lock-nut on the 2 B.A. adjusting screw and adjust the screw so that it lies approximately half-way through the lever. Lock the 2 B.A. nut. Refit the lever to the gearbox. (The split T.V. lever is not fitted to early 'S' Series cars).

Detach rod (3) by removing the pinch bolts and ball joints adjusting screws. Check the distance between the centres as indicated in Figure 29. This should be approximately 6·200 in.

Slacken the clamp bolts on the carburetter levers (7), and the throttle stop lock-nut. Screw out the throttle stop screw slowly until the joint (6) begins to toggle over. Screw in the stop screw one full turn and lock the lock-nut.

Refit rod (3) ensuring that the clearance in the ball joints is at a minimum, but that the joints are not tight.

Slacken the clamp bolt on lever (5) on the manifold shaft and insert a 0·250 in. distance piece between lever (11) and the steady bracket boss (10) as indicated in Figure 29. If no assistance is available to hold this in position it may be secured with adhesive tape.

Hold the throttle stop lever (7) against the throttle stop screw, ensure that there is 0·020 in. end float in shaft (4), then push the two levers toward each other and tighten the clamp bolt. Remove the 0·250 in. distance piece.

Adjust rod (2) so that when the clevis pin is inserted into the hole in the split T.V. lever, the lever will be held forward to the limit of its travel. Lengthen rod (2) by two full turns of the jaw and tighten the lock-nut.

It will then be necessary to synchronise the carburetters (see T.S.D. 729 Section K4).

Before fitting the dashpots, check that the butterflies open fully, by depressing the accelerator pedal onto the full throttle stop.

If the butterflies do not open fully, screw down the full throttle stop (8) or shorten rod (9). This is dependent upon the position of the accelerator pedal and the customer's requirements. Shortening rod (9) will raise the accelerator pedal; if the stop (8) is screwed in, the pedal will be lower in the full throttle position. If the throttles open past full throttle, reverse the two adjustments.

Check throughout that all split pins, lock-nuts and pinch bolts are fitted then test the car on the road for correct gear changes and 'kick-down'.

Final adjustment — Split T.V. lever

Gear change adjustments should be made on the split T.V. lever.

If the changes are too 'jerky' and 'hang-on' screw **out** the adjusting screw.

If the changes are 'slippy' and too close together screw **in** the adjusting screw.

Tighten the adjusting screw after each adjustment.

'Kick-down' adjustments should be made on the accelerator pedal stop.

If 'kick-down' is too easy **raise** the throttle stop.

If 'kick-down' is too difficult or unobtainable screw **in** the throttle stop.

Final adjustment — Plain T.V. lever

Gear change adjustments should be made on rod (2).

If the changes are too 'jerky' and 'hang-on' **shorten** rod (2).

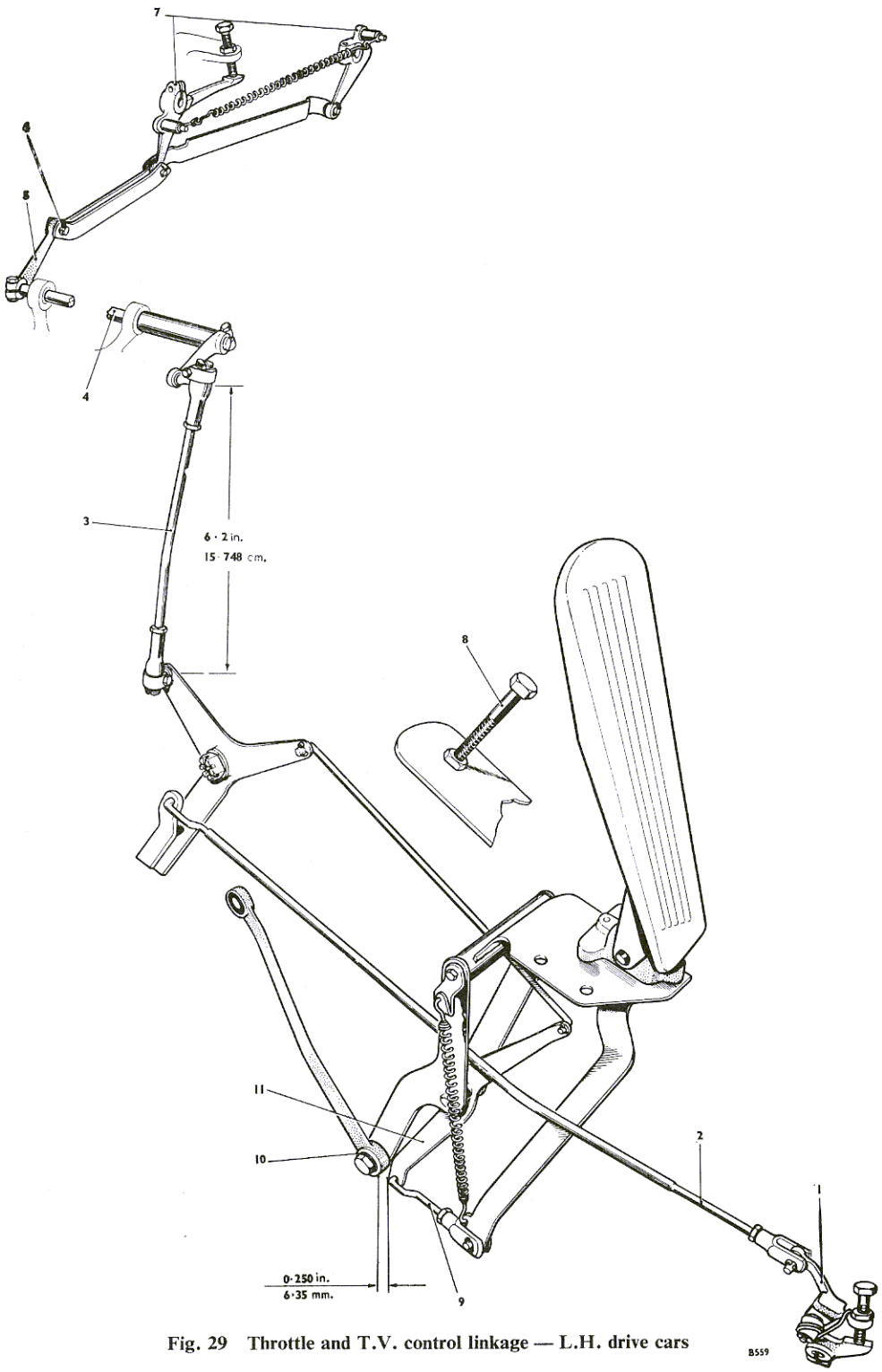

Fig. 29 Throttle and T.V. control linkage — L.H. drive cars

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If the changes are 'slippy' and too close together **lengthen** rod (2).

'Kick-down' — Fixed throttle stop

'Kick-down' adjustments should be made on rod (9).

If 'kick-down' is too easy **lengthen** rod (9).

If 'kick-down' is too difficult or unobtainable **shorten** rod (9).

Selector control setting is comparatively simple and one rod only need be adjusted.

Set the selector lever, mounted on the steering column, to its Neutral position. Ensure that the selector lever on the gearbox is in its most forward position, then check that slight 'sponge' exists on either side of the Neutral stop position of the lever on the steering column.

On right-hand drive cars, if the selector lever on the column is hard against the top of its stop in the Neutral position, adjust the control rods as follows

Slacken the lock-nut fitted to either side of the ball socket on the end of the rod, between the cross-shaft lever and the fulcrum lever; unscrew the ball joint adjusting screw and disconnect the socket from the ball end. Lengthen the control rod by unscrewing the socket until the correct adjustment is obtained. Assemble the joint and tighten the lock-nuts; the joint must be free but without excessive movement.

After connecting the controls, check that there is slight 'sponge' on either side of each position of the selector lever mounted on the steering column.

On left-hand drive cars, if the selector lever on the steering column is hard against the top of its stop in the Neutral position, adjust the control rods as follows

Slacken the lock-nut fitted to either side of the ball socket on the end of the rod between the selector lever on the side of the gearbox and the fulcrum lever. Unscrew the ball joint adjusting screw and disconnect the socket from the ball end. Shorten the control rod by screwing the ball socket up the rod until the correct adjustment is obtained. Finally, re-assemble the ball joint and tighten the lock-nuts; ensure that the joint is free but without excessive movement.

After connecting the controls, check that there is slight 'sponge' on either side of each position of the selector lever mounted on the steering column.

It may be necessary, after setting the selector controls, to reset the starter and reverse light micro switches.

The setting instructions are the same for R.H. and L.H. drive cars.

Micro-switches — To set

Reverse and Neutral

Move the selector lever on the steering column into the Neutral position. Set the starter switch so that, with the peg on the gear change operating lever touching the starter switch button, the starter switch is heard to actuate. Move the switch approximately 0·030 in. nearer to the operating peg and secure it in this position.

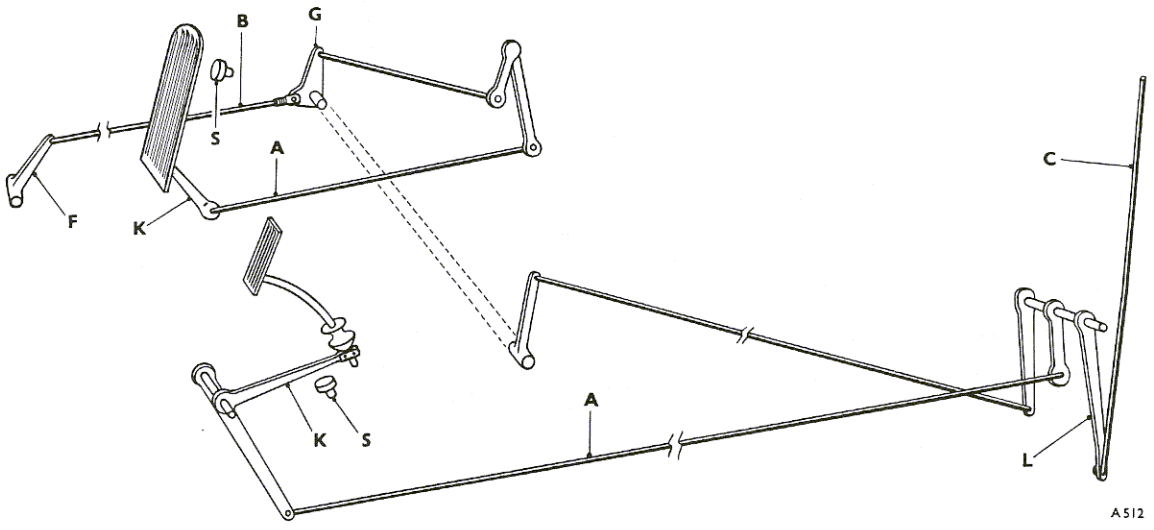

Fig. 30 Throttle and T.V. control linkage — early S1 cars

To set the reversing light switch, move the selector lever on the steering column into the Reverse position. Set the reversing light switch so that, with the peg on the gear change operating lever touching the reversing light switch button, the switch is heard to actuate. Move the switch approximately 0·030 in. nearer to the operating peg and secure it in this position.

Controls — To adjust

S1 cars

On early S1 cars, disconnect rods (A) and (B) (see Fig. 30).

With the lever (F) held forward to the limit of its travel check the distance between the rear face of the gearbox and the centre of the hole in lever (F); this should be 8·375 in.–0·060 in. If necessary, remove the lever and bend it to suit.

Ensure that the choke is in the 'Off' position and the fast idle cam out of action. Adjust rod (C) so that the lever (L) hangs vertically or just rearward of the vertical position. It is sufficient to ascertain the position of this lever by eye.

With lever (F) held forward to the limit of its travel, adjust rod (B) until it will just fit the hole in lever (G) then lengthen rod (B) by $1\frac{1}{2}$ turns of the jaw.

Adjust the pedal of left- or right-hand drive cars as follows

On right-hand drive cars, adjust rod (A) so that in the full throttle position the accelerator pedal will just make contact with the pedal stop. Check that lever (K) is clear of the toe board in the closed throttle position.

On left-hand drive cars, select one of the three holes in lever (K) which will give the nearest approximation to the 0·375 in. clearance as shown in Figure 31. Connect rod (A) in the selected hole and adjust to give the 1·750 in. dimension shown in Figure 31 in the throttle **closed** position. Adjust the pedal 'on-stop' so that at full throttle the pedal just makes contact with it.

When the controls have been set initially it will be necessary to test the car on the road.

On late S1 cars (see Fig. 32), to set the controls, follow the instructions given in the first four paragraphs of 'Controls — To adjust,' on early 'S1' and

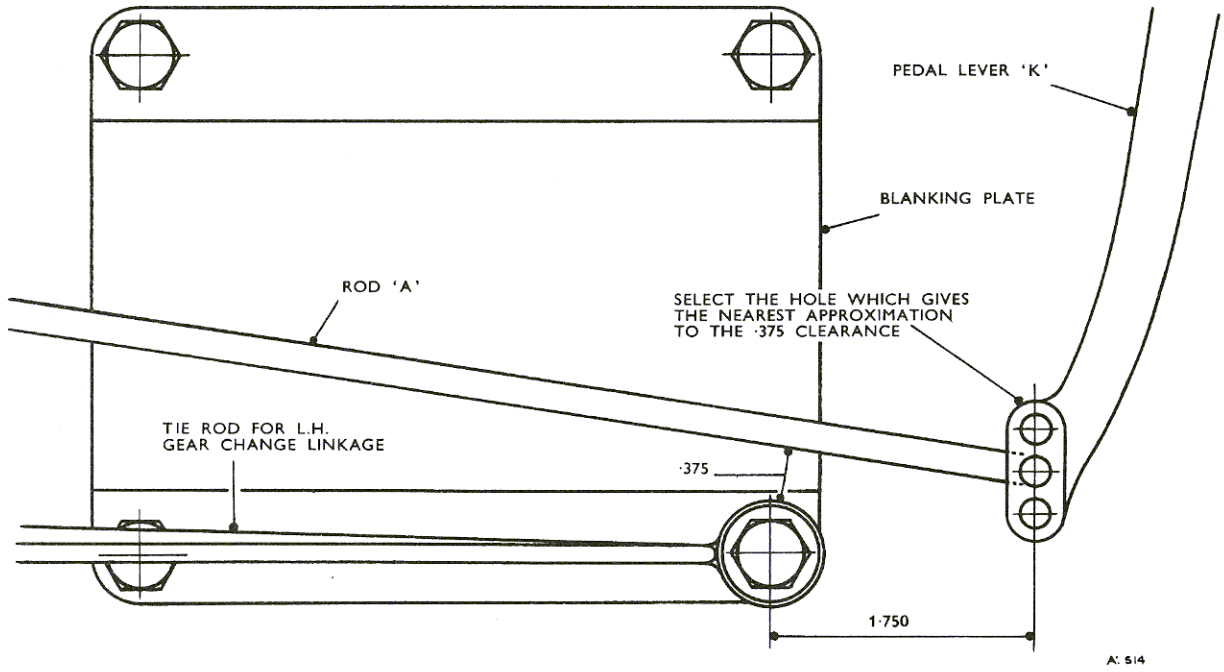

Fig. 31 T.V. linkage — S1 cars

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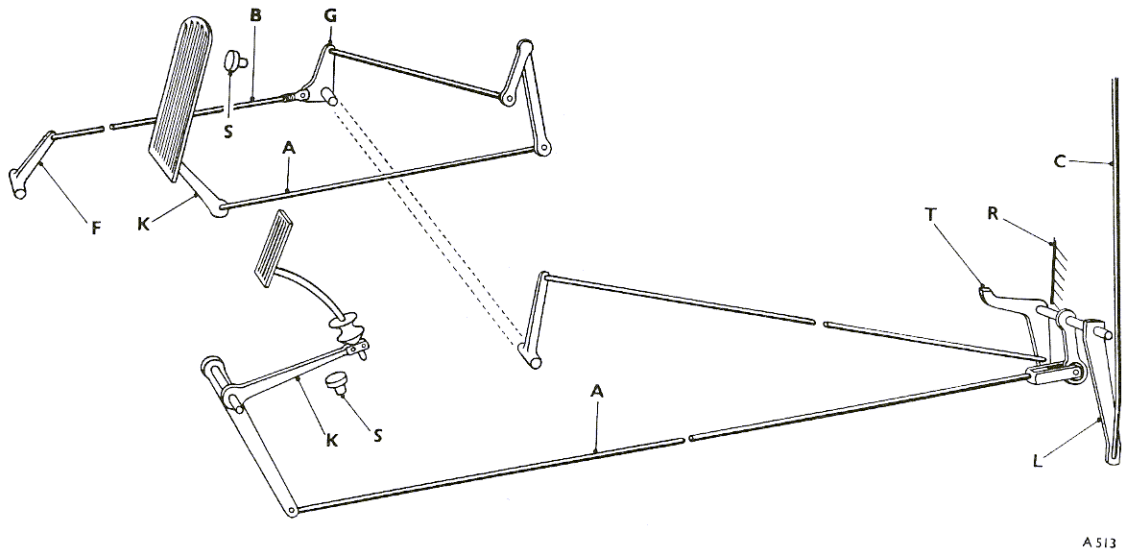

Fig. 32 Throttle and T.V. control linkage — late S1 cars

Silver Cloud cars, then adjust the pedals of left- or right-hand drive cars as follows.

On right-hand drive cars, hold the lever (T) in contact with the 'on-stop' (R) (carburetters in the full throttle position) and with the accelerator pedal in contact with the 'on-stop' (S), adjust rod (A) so that it will just fit the hole in the pedal lever. Lengthen rod (A) by 0·250 in. (8 turns of the jaw).

On left-hand drive cars, select one of the three holes in lever (K), to give the nearest approximation to the 0·375 in. dimension, as shown in Figure 31. Connect rod (A) using the selected hole, then adjust to give the 1·750 in. dimension as shown in Figure 31. With the throttles closed, adjust the pedal 'on-stop' (S) so that the pedal will just make contact with it at the same time as lever (T) contacts the 'on-stop'. Raise the pedal 'on-stop' (S) by $2\frac{1}{2}$ turns.

When the controls have been set initially it will be necessary to test the car on the road.

Final adjustment

Gear change adjustments should be made on rod (B).

If the gear changes are 'jerky' and 'hang on' **shorten** rod (B).

If the gear changes are slippy and too close together **lengthen** rod (B).

'Kick-down' adjustment

R.H. drive cars

'Kick-down' adjustments should be made on rod (A).

If the 'kick-down' is too easy **lengthen** rod (A).

If the 'kick-down' is too difficult or unobtainable **shorten** rod (A).

'Kick-down' adjustment

L.H. drive cars

'Kick-down' adjustments should be made on throttle stop (S).

If the 'kick-down' is too easy **raise** stop (S).

If the 'kick-down' is too difficult or unobtainable **lower** stop (S).

Selector controls

If necessary, adjust the gearbox selector controls, Neutral and Reverse micro-switches in a similar manner to that described in 'Controls — To adjust', 'S2' and 'S3' and Silver Cloud II and III cars.

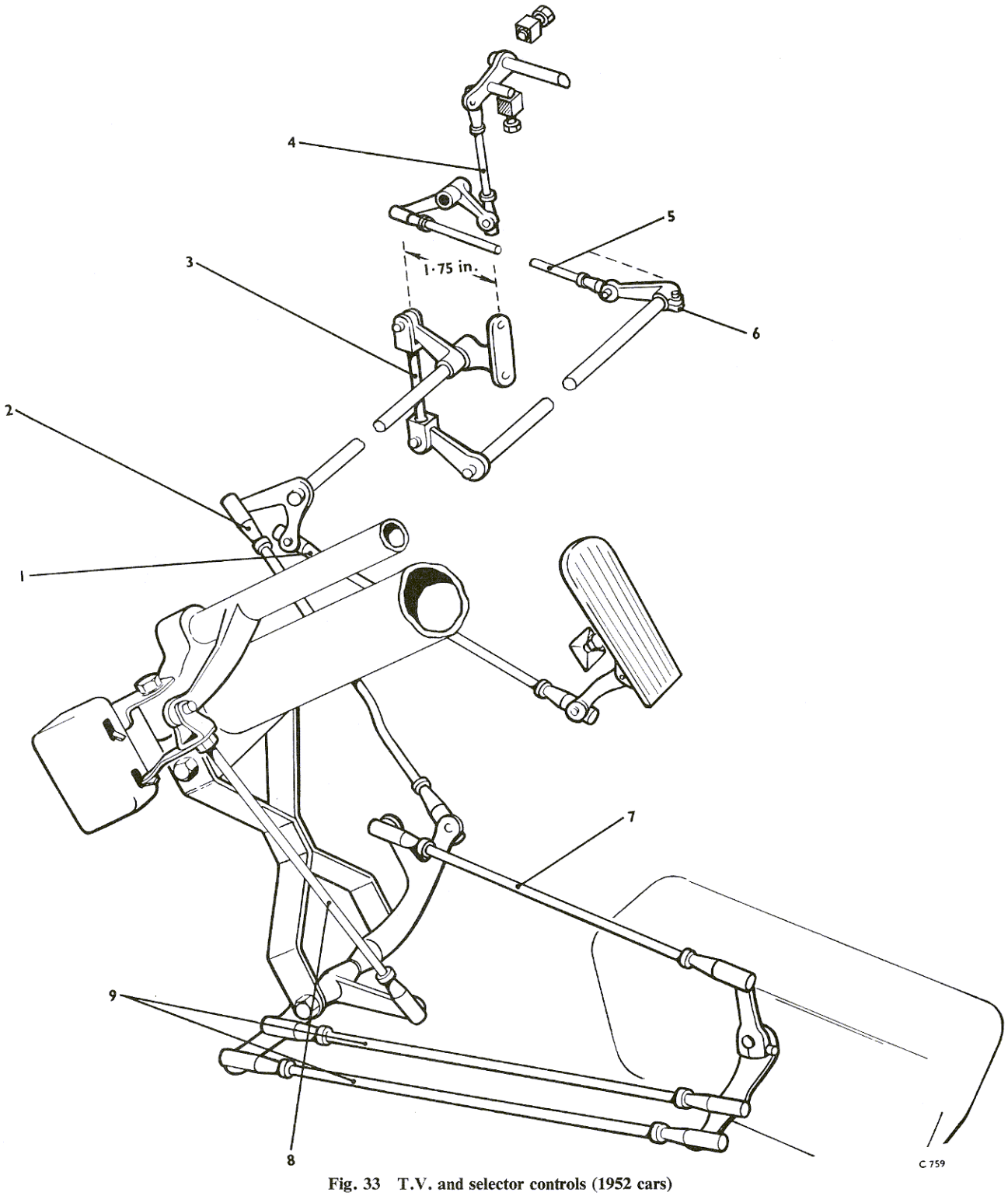

Fig. 33 T.V. and selector controls (1952 cars)

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Controls — To adjust

'R' Series 1952 cars

To adjust the selector control setting disconnect the accelerator to cross-shaft control rod (1) at its upper end (see Fig. 33). Select range '3' and adjust the two parallel rods (9) to bring the swinging link to a position at right angles to the steering column; these rods must be maintained at equal lengths. If necessary, adjust rod (8) to maintain the steering column control in its central position in the quadrant (range '3'). This completes the selector link setting.

To adjust the throttle valve controls adjust rod (7) to the same length as rods (9). Hold the T.V. lever onto its forward stop, then adjust rod (2) to position the lever on the right-hand end of the cross-shaft, 1·750 in. from the bulkhead; this should be measured at right angles from the bulkhead to the clevis pin centre. It may be necessary to slacken the pinch bolt (6) on the outer end of the countershaft to permit this adjustment.

If necessary, adjust rod (3) to 2·875 in. between clevis pin centres then check rod (4) and, if necessary, adjust to 4·500 in. between ball joint centres.

Adjust rod (5) to bring the cross-shaft lever approximately 2° below the horizontal to maintain the throttle fully closed and the T.V. lever against its forward stop. The slackened pinch bolt will allow the shaft to turn inside the lever to obtain these positions. Tighten pinch bolt (6) and move the linkage to the throttle open position. The T.V. lever should reach its rearward stop when the throttles touch their open stop.

Finally, connect rod (1), adjusting its length to slightly depress the accelerator pedal. Set the accelerator pedal maximum stop to contact the pedal in the full throttle position. If necessary, set the Neutral and Reverse micro-switches as previously explained.

Final adjustment

Gear change adjustments should be made on rod (7).

If the gear changes are 'jerky' and 'hang-on', **shorten** rod (7).

If the gear changes are 'slippy' and too close together, **lengthen** rod (7).

'Kick-down' adjustment

R.H. drive cars

'Kick-down' adjustments should be made on rod (1).

If the 'kick-down' is too easy, **lengthen** rod (1).

If the 'kick-down' is too difficult or unobtainable, **shorten** rod (1).

'Kick-down' adjustment

L.H. drive cars

'Kick-down' adjustments should be made on the accelerator full throttle stop.

If the 'kick-down' is too easy, **raise** the stop.

If the 'kick-down' is too difficult or unobtainable, **lower** the stop.

Controls — To adjust

'R' Series 1953 cars

On right-hand drive cars, disconnect the accelerator to bulkhead lever (5) (see Fig. 34 R.H. drive).

Adjust rod (4) to set the bulkhead lever 15° to 20° below horizontal then, with the throttle stop screw out of action, adjust rod (3) so that the carburetter lever is held against the closed stop.

The rearward edge of lever (2) should then be approximately vertical and the long lever on the other end of the cross-shaft should be at an angle which holds its connecting rod clear of the anti-toggle pin on the lever.

Adjust rod (1) so that the T.V. lever is held against its stop.

Move the controls from the throttle open to throttle closed position. If the limits of travel are not coincident with both throttle and T.V. stops, **lengthen** the rod connected to the lever which fails to reach its **open** stop, or, **shorten** the rod connected to the lever which fails to reach its **closed** stop.

To increase the movement of the T.V. lever relative to the carburetter throttle lever, shorten rods (1) and (3). Lengthening the rods will decrease the movement.

Adjust rod (5) to a length which permits the stop under the pedal head to just clear the toe board in the full throttle position. This should give clearance of 0·375 in. between the pedal lever and the toe board in the throttle closed position. If pedal travel is insufficient to allow this, remove a rubber stop from beneath the pedal and re-adjust the rod.

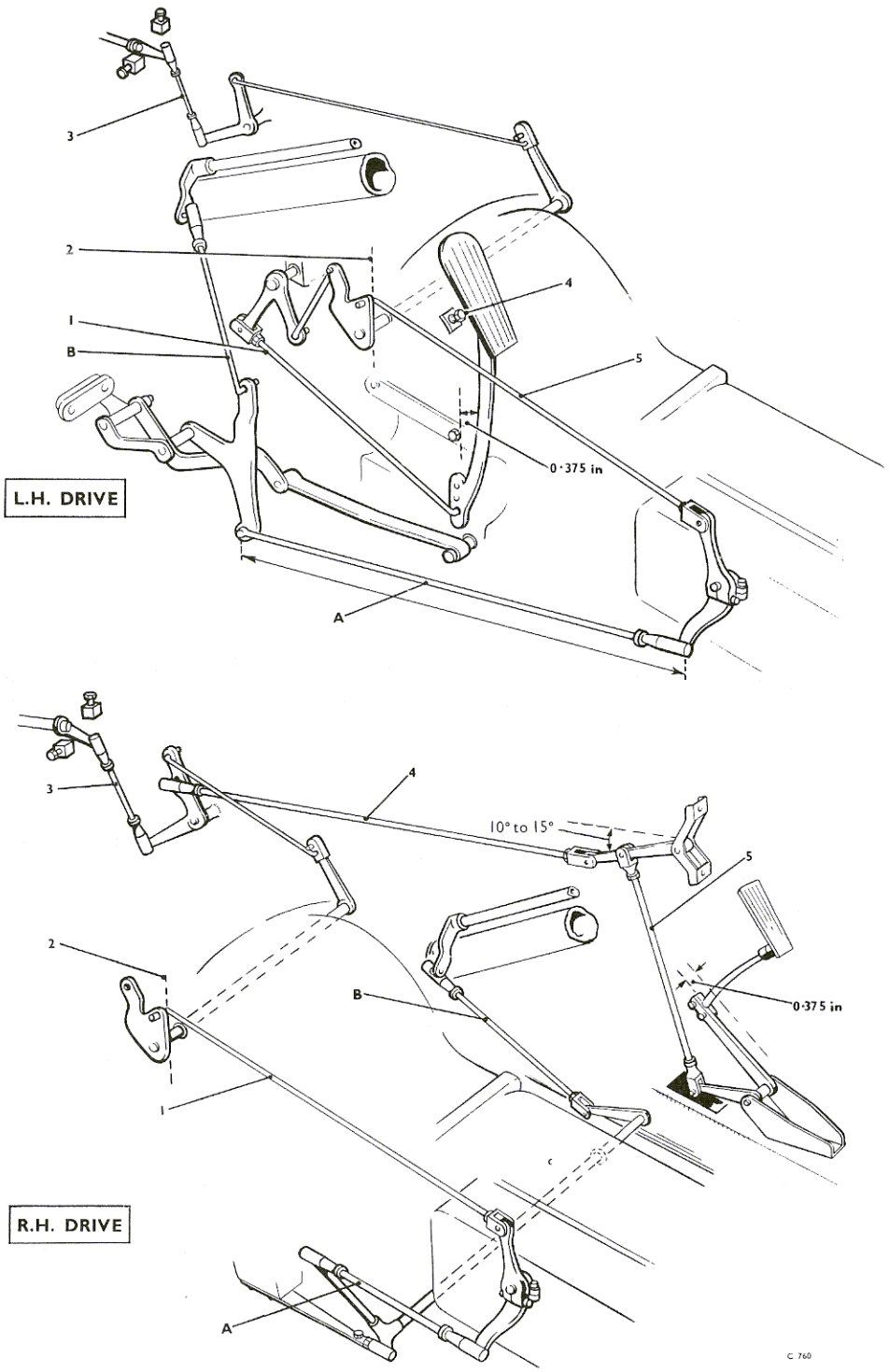

Fig. 34 T.V. and selector controls (1953 cars)

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On left-hand drive cars, disconnect rod (1) (see Fig. 34 L.H. drive).

Adjust rods (3) and (5) so that, with the throttle closed stop screw out of action, the carburetter throttle lever is held against the closed throttle stop and the T.V. lever is near, or up against its stop. The rearward edge of lever (2) should be approximately vertical whilst the long lever at the other end of the cross-shaft should be at an angle which holds its connecting rod clear of the anti-toggle pin on the lever.

If the rods need to be re-adjusted to enable a lever to reach a stop or if the T.V. lever travel needs increasing or decreasing relative to the carburetter lever, proceed as described for right-hand drive cars.

Adjust rod (1) so that, when coupled to the lowest of the three holes in the accelerator pedal lever, the arm clears the adjacent setscrew by at least 0·375 in. when in the throttle closed position. After adjusting the engine idling speed to 375 r.p.m. set the full throttle pedal stop to give a small pedal clearance in the full throttle position.

Final adjustment

Gear change adjustments should be made as follows

On right-hand drive cars, if the gear changes are 'jerky' and 'hang-on' **shorten** rod (1).

If the gear changes are 'slippy' and too close together, **lengthen** rod (1).

On left-hand drive cars, alter rod (5) if the conditions are similar.

'Kick-down' adjustment

R.H. drive cars

'Kick-down' adjustments should be made on rod (5).

If the 'kick-down' is too easy, **lengthen** rod (5).

If the 'kick-down' is too difficult or unobtainable, **shorten** rod (5).

'Kick-down' adjustment

L.H. drive cars

'Kick-down' adjustments should be made on throttle stop (4).

If the 'kick-down' is too easy **raise** the stop.

If the 'kick-down' is too difficult or unobtainable, **lower** the stop.

Selector controls — To set

The notches in the gearbox detent control lever should retain the controls in each selected position, the quadrant lever being just clear of the Neutral and gate stops in positions '4' and '3' respectively. If the selector lever vibrates during running it is permissible to spring it slightly towards the Neutral stop in range '4' position.

On left-hand drive cars the setting of the intermediate linkage is controlled by the length of rod (A) and should be 17·750 in. between ball and pin centres.

On right-hand drive cars rod (A) should be adjusted so that the lever on the right-hand side of the cross-shaft projects 0·500 in. below the level of the chassis frame with the selector in Neutral.

When the intermediate linkage is correct it should be necessary only to adjust the length of rod (B) to re-set the position of the selector lever relative to the gearbox lever on both left- and right-hand drive cars. If there is any tendency for the selector lever to vibrate when in range '4', lengthen the rod by one or two half turns as necessary.

If necessary, set the Neutral and Reverse micro-switches as explained earlier.