

SECTION O

PART II

THE INSTRUMENTS

THE CENTRE INSTRUMENT PANEL

DESCRIPTION Fig. O30.

The centre instrument panel carries the four small instruments and the switches. It is positioned in the centre of the cockpit facia beneath the protective pad and remains the same for both L. and R. H. drive cars. Its removal can be effected with or without the instrument in situ.

REMOVAL AND REPLACEMENT CENTRE INSTRUMENT PANEL

1. REMOVAL

Detach the earthing lead from the battery and remove the facia padding as detailed in THE BODY, SECTION O. Partially withdraw the centre instrument panel from the cockpit facia by removing nine screws. Remove the oil pressure feed pipe from the rear face of the oil pressure gauge, the bulbs from the four instruments and the electrical harness from the instruments and switches.

2. REPLACEMENT

The replacement of the centre instrument panel is the reversal of the removal sequence, but particular attention must be given to the following point.

That the electrical harness is fitted to the instruments and switches as detailed on the wiring diagram.

THE INSTRUMENT ILLUMINATION

DESCRIPTION

Each instrument has its own illumination bulb positioned approximately at twelve o'clock in the rear face of the instrument and so obviates any glow under the cockpit facia. The bulbs are controlled by an on and off switch situated second from the L.H. side of the centre instrument panel which in turn is controlled by the side and headlamp switch.

REMOVAL AND REPLACEMENT INSTRUMENT ILLUMINATION SWITCH

1. REMOVAL

Detach the earth lead from the battery. Withdraw the instrument illumination switch from the centre instrument panel by removing the front nut and detaching the electrical harness from the terminals in its rear face.

2. REPLACEMENT

The replacement of the instrument illumination switch is the reversal of the removal sequence.

REMOVAL AND REPLACEMENT INSTRUMENT ILLUMINATION BULB

Detach the earth lead from the battery. Withdraw the bulb holder from the rear face of the instrument in the twelve o'clock position. Remove the spent bulb, fit the replacement and clip the bulb holder back into position.

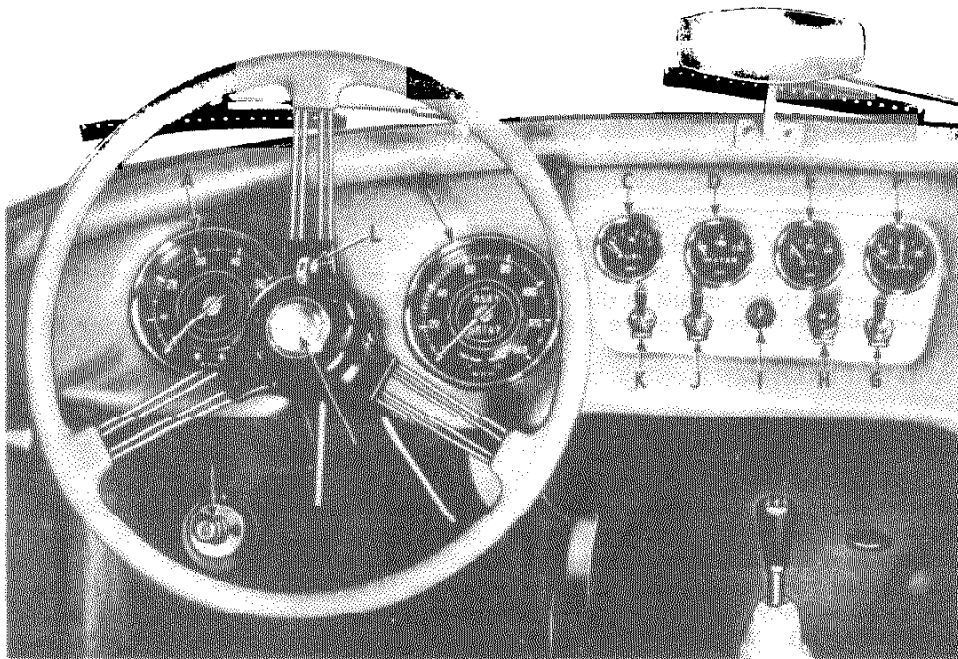


Figure O30.

The centre instrument panel and drivers instruments

- | | |
|------------------------------|---|
| A. Engine speed indicator. | H. Carburettor mixture control. |
| B. Speedometer and odometer. | I. Ignition/starter switch. |
| C. Fuel contents gauge. | J. Instrument panel illumination switch |
| D. Engine temperature gauge. | K. Side and headlamp switch. |
| E. Oil pressure gauge. | L. Flasher direction indicator switch. |
| F. Ammeter. | M. Horn button. |
| G. Windscreen wiper switch. | N. Foot dipper switch. . |

THE AMMETER

DESCRIPTION

The ammeter will indicate the charge or discharge of the battery caused by the running of the dynamo or by the use of the lights or ignition, the discharge of current to the starter motor is not shown by this instrument. Immediately after the starting of the engine, it is quite normal for this instrument to show a heavy charge, but this is by design and will, after a few minutes, show a

lesser charge according to the general charge state of the battery.

When a persistent abnormal high charge or discharge is shown on the ammeter, the cause should be investigated and corrected.

When the engine fails to start, it is possible to check the operation of the ignition by observing the "kicking" of the ammeter needle when the ignition is switched on and the engine is being cranked by the starter motor.

REMOVAL AND REPLACEMENT AMMETER

1. REMOVAL

Detach the earthing lead from the battery and withdraw the instrument illumination bulb from the rear face of the ammeter. Remove the electrical harness from the Lucar tabs on the rear face of the instrument. Withdraw the ammeter through the front face of the centre instrument panel after removing the knurled nut and bridge piece.

2. REPLACEMENT

The replacement of the ammeter is the reversal of the removal sequence, but particular attention must be given to the following point:

That the earthing tabs are replaced between the bridge piece and knurled nut.

THE OIL PRESSURE GAUGE

DESCRIPTION

The oil pressure gauge will indicate the pressure of the oil circulating the engine lubrication system. The instrument operates on the bourdon tube principle and is accurate to quite close limits. It is connected to the engine at the top of the oil filter body by a small bore tube, and every precaution must be taken to ensure that this pipe is not kinked or damaged in any way.

REMOVAL AND REPLACEMENT OIL PRESSURE GAUGE

1. REMOVAL

Detach the earthing lead from the battery and withdraw the instrument illumination bulb from the rear face of the oil pressure gauge. Remove the small bore pipe from the union on the rear face of the oil pressure gauge. Withdraw the oil pressure gauge through the front face of the centre instrument panel after removing the two knurled nuts and bridge piece. Ticker the ignition/starter switch so the engine will not inadvertently start; should it be started engine lubricating oil will spray from the open end of the pipe.

2. REPLACEMENT

The replacement of the oil pressure gauge is the reversal of the removal sequence, but particular attention must be given to the following point:

When a replacement oil pressure gauge is fitted, crank the engine with the starter motor until oil issues from the small bore pipe which is then connected to the union on the instrument.

REMOVAL AND REPLACEMENT OIL PRESSURE PIPE

1. REMOVAL

Remove the unions from both ends of the oil pressure small bore pipe, one on the rear face of the instrument and one on the oil filter head. The pipe is then withdrawn into the cockpit of the car without any kinking.

2. REPLACEMENT

The replacement of the oil pressure pipe is the reversal of the removal sequence, but particular attention must be given to the following point:-

- (i) That the engine is cranked with the starter motor until oil issues from the end of the pipe before it is fitted to the instrument.

CHECKING OIL PRESSURE GAUGE

When no reading is recorded on the oil pressure gauge the following items should be checked:

- (i) Check the oil level in the engine sump.
- (ii) Detach the oil pressure gauge from the rear face of the instrument and check that oil appears at its open end by cranking the engine with the starter motor.
- (iii) Detach the oil pressure pipe at both ends and ensure an unobstructed passage by passing air through it.
- (iv) Ensure that the pipe hole in the oil pressure gauge is unobstructed.

THE ENGINE TEMPERATURE GAUGE

DESCRIPTION

The engine temperature gauge is of the semi-conductor type and consists of two units; one, a temperature sensitive transmitter fitted in the thermostat housing of the engine unit, and the second, an indicator fitted in the centre instrument panel. The performance of this type of system relies on the correct functioning of the transmitter and many of the apparent faults in the indicator can be traced to the transmitter fitted in the cooling system. Because of the close association of the transmitter with the cooling system, reference to this component should be made to THE COOLING SYSTEM, SECTION C.

In exceptionally cold weather an abnormally high temperature may be recorded, indicating that the bottom of the radiator is beginning to freeze, restricting the flow of the coolant.

REMOVAL AND REPLACEMENT ENGINE TEMPERATURE GAUGE INDICATOR UNIT

1. REMOVAL

Detach the earthing lead from the battery and withdraw the instrument illumination bulb from the rear face of the engine temperature gauge indicator unit. Remove the electrical cable from the Lucar tab on the rear face of the instrument. Withdraw the engine temperature gauge indicator unit through the front face of the centre instrument panel after removing the two knurled nuts and bridge piece.

2. REPLACEMENT

The replacement of the engine temperature gauge indicator unit is the reversal of the removal sequence, but particular attention must be given to the following point:

That the earthing tabs are replaced between the bridge piece and knurled nut.

CHECKING ENGINE TEMPERATURE GAUGE INDICATOR UNIT

- (i) Check for broken or disconnected wires between the two units of the engine temperature gauge and the battery.
- (ii) Check that the engine temperature gauge unit is earthed sufficiently.

- (iii) Disconnect the "T" terminal cable on the rear face of the engine temperature gauge indicator unit and switch on the ignition, a HOT reading should be recorded. When any other reading is recorded the instrument is faulty and a replacement must be fitted.
- (iv) Test the transmitter unit as detailed in THE COOLING SYSTEM, SECTION C.

THE PETROL TANK CONTENTS GAUGE

DESCRIPTION

The petrol tank contents gauge consists of two units; one, in the top of the petrol tank, and the second, the gauge unit mounted in the centre instrument panel. The gauge unit registers the level of the petrol in the petrol tank according to the position of the tank unit float. There is a limited reserve of petrol left when the gauge unit first reads "empty". Because of the close association of the tank unit with the petrol tank, reference to this component should be made to THE FUEL AND IGNITION SYSTEMS, SECTION E, Pt. I.

REMOVAL AND REPLACEMENT FUEL CONTENTS GAUGE UNIT

1. REMOVAL

Detach the earthing lead from the battery and withdraw the instrument illumination bulb from the rear face of the fuel contents gauge unit. Remove the electrical harness from the Lucas tab on the rear face of the instrument. Withdraw the fuel contents gauge unit through the front face of the centre instrument panel after removing the knurled nut and bridge piece.

2. REPLACEMENT

The replacement of the fuel contents gauge unit is the reversal of the removal sequence, but particular attention must be given to the following point:

That the earthing tabs are replaced between the bridge piece and knurled nut.

CHECKING PETROL TANK CONTENTS GAUGE UNIT

- (i) When no reading on the petrol tank contents gauge unit records empty, check that the gauge unit is properly earthed and that the electrical harness from the gauge unit to tank unit is not short circuiting to earth.
- (ii) Disconnect the "T" terminal cable on the rear face of the petrol tank contents gauge unit and switch on the ignition, a "full" reading should be recorded. When any other reading is recorded, the instrument is faulty and a replacement must be fitted.

THE SPEEDOMETER AND ODOMETER

DESCRIPTION

The speedometer and odometer is positioned immediately in front of the steering wheel and toward the centre line of the car. It is a combined instrument, indicating the car's speed in number 20 m.p.h. divisions, which are sub-divided into 10 m.p.h. divisions and these are again sub-divided into 2 m.p.h. divisions. Two odometers are also included, one giving the total mileage of the car, and the second, a trip mileage of the car, providing the latter has been set to zero at the commencement of the journey. The instrument is driven by a flexible drive from the R.H. side of the gearbox unit rear casing.

Also incorporated in the face of the instrument are two warning lamps, the J.H. lamp in circuit with the main headlamp beam and will give a steady glow when the main headlamp beam is in use. The R.H. lamp is included in the ignition circuit and will glow at all times when the ignition is switched on and the battery is not being charged.

Identification Number

SN.6315/00

1,000

MAINTENANCE

EVERY 20,000 MILES (32,300 kms.)

Lubricate the flexible drive.

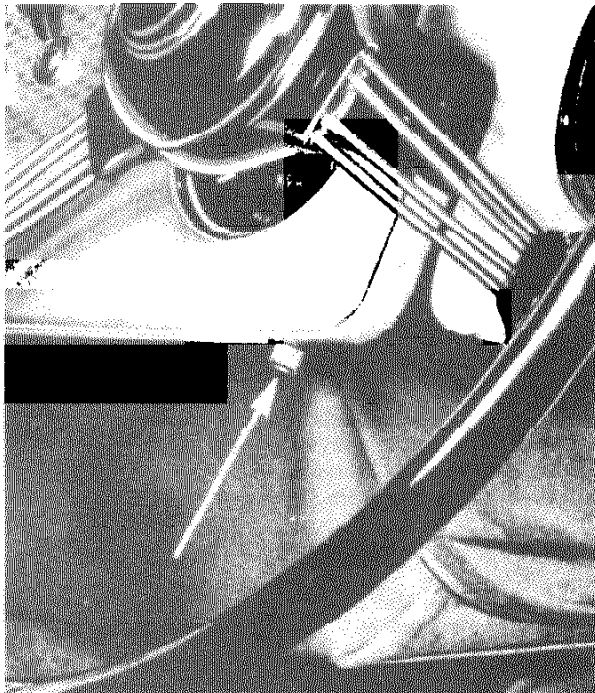


Figure O31. (Left)

Location of trip odometer resetting knob.

TO RESET THE TRIP ODOMETER Fig. O31.

Push in the serrated knob situated at the bottom rim of the instrument panel and turn anti-clockwise; pull out the knob when zero is registered

NOTE:

The resetting of the odometer must not be effected when the car is moving.

REMOVAL AND REPLACEMENT FLEXIBLE DRIVE

1. REMOVAL

Detach the flexible drive from any securing clips.

Remove both ends of the flexible drive from their respective components by detaching the knurled nuts, eject the rubber draught excluding grommet from the rear engine bulkhead into the cockpit and withdraw the flexible drive cable.

2. REPLACEMENT

The replacement of the flexible drive is the reversal of the removal, but particular attention must be given to the following points:

- (i) That the run of the drive is kept as direct as possible and all sharp bends avoided.
- (ii) That when the flexible drive is being attached to the gearbox, withdraw the inner shaft at the instrument end a short distance and after fitting the outer cable to the gearbox feed in the inner shaft rotating it slowly while applying downward pressure. On completion the inner shaft should protrude above the outer cable 0.375" (9.525 mm.)
- (iii) That the knurled nuts are tightened up finger tight, the use of any tools is unnecessary.

LUBRICATING THE FLEXIBLE DRIVE

Detach the flexible drive at the instrument end and withdraw the inner shaft, keeping it as straight as possible and avoid coiling it too tightly. Wash the inner shaft in petrol and allow to dry. Coat the inner shaft sparingly with grease and feed back into the outer cable rotating it slowly. On completion of the feeding in, withdraw it approximately 8" (203.2 mm.) and wipe off any surplus grease, feed the inner shaft in for a second time. Excessive lubrication must be avoided as it may "climb" up the inner shaft and foul the instrument.

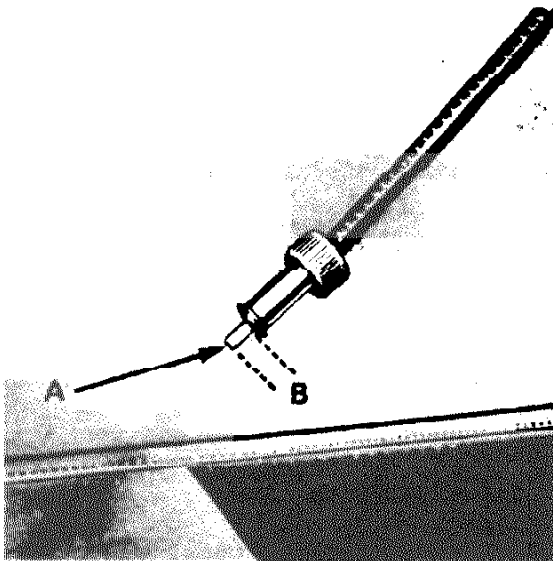


Figure O32. (Left)

Instrument end of flexible drive showing inner shaft.

A. Inner shaft.

B. Protrusion of inner shaft 0.375" (9.525 mm.)

EXAMINING INNER SHAFT

1. CONCENTRIC ROTATION

The engine can be started and a gear engaged with one wheel jacked up off the ground to effect this test.

Detach the flexible drive from the instrument and observe that the inner shaft runs concentrically inside outer cable. When

excessive eccentricity is observed the inner shaft should be withdrawn and examined.

2. CHECKING FOR KINKS

Withdraw the inner shaft, clean and lay out flat on a clean flat bench top. Roll the inner shaft with the fingers from one end, any "kinks" or other damage will readily be observed.

3. CHECKING FOR SNATCHING

Pick up the inner shaft with a hand at each end and allow it to hang down into a loop approximately 9" (228.6 mm.) diameter. Rotate it slowly with the fingers when it should be free from "snatch". "Snatch" is when the loop narrows or widens due to tight spots in the shaft.

4. SQUARED ENDS

Examine inner shaft squared ends for wear and other damage.

NOTE: Before fitting a replacement inner shaft ensure that the main spindle of the instrument is free.

DIAGNOSIS OF FAULTS

The correct performance of the instrument depends largely on its flexible drive and so an imperfect drive will reflect in the performance of the instrument but must not be diagnosed as such until the flexible drive has been certified as satisfactory and the following checks are suggested:

1. INSTRUMENT NOT OPERATING

- (i) Check that the flexible drive assembly is attached correctly at the drive and instrument ends.
- (ii) Check that the ends of the inner shaft are not rounded or damaged in any other way.
- (iii) Check that the inner shaft is connected to its drive in the gearbox or ignition distributor drive bracket.

(iv) Check that there is sufficient protrusion of the inner shaft for it to connect with the instrument.

2. INSTRUMENT INACCURATE

Check the coded identification number on the face of the instrument with that specified or with the instrument manufacturer, stating year of car, manufacture and model.

3. SPEEDOMETER INACCURATE

(i) Check the tyre pressures, check the rolling radii with those specified in THE ROAD-WHEELS AND TYRES, SECTION K.

(ii) Check that the axle ratio has not been changed by a previous owner.

4. NEEDLE SWINGS OR SLUGGISH IN OPERATION

The swing of the needle, almost half way round the dial, indicates an oiled up instrument, check the condition of instrument end of flexible drive. Check oil seals at drive end before fitting new instrument.

5. NEEDLE HAS INTERMITTENT WAVER

The waver of the needle is approximately 20 m.p.h. and indicates that the inner shaft of the flexible drive is not connected correctly. Check the following items:-

(i) That the inner shaft projects at the instrument end of the flexible drive the specified amount.

(ii) That the knurled nuts attaching the flexible cable to the instrument and drive are fully closed up to the end of their threads.

(iii) That the inner shaft is in good condition and not partially broken.

6. PERSISTENT NEEDLE WAVER

The waver of the needle is still only 20 m.p.h. but never steadies down, it indicates a kinked or crushed flexible drive or the flexible drive itself having too acute a bend in its run from the drive to the instrument.

7. NEEDLE WAVER

The waver of the needle over a greater range of the dial and when the flexible drive is faultless, the instrument is defective. This must be removed and a replacement fitted.

8. TAPPING NOISES

Tapping noises usually emit from the flexible drive and must not be confused with the ticking noise of a faulty instrument. The following items should be checked:

(i) That the flexible drive is not crushed by over-tightening of a clip.

(ii) That an unnecessary sharp bend is present in the flexible drive.

(iii) That connections to drive or instrument are not slack.

(iv) That the inner shaft is not kinked or lacks proper lubrication or its squared ends are so damaged that it does not mate with its drive or driven components correctly.

9. GENERAL HIGH LEVEL OF NOISE

Detach the flexible drive shaft from the instrument and withdraw the inner shaft, replace the outer cable to the instrument and road test the car. When the noise still continues, but at a lower level, it indicates that the drive gear is at fault. Discontinuation of the noise

indicates the instrument end is incorrect.

10. PERIODICAL TICKING INCREASING WITH SPEED

Excessive regular ticking in time with speedometer decimal odometer. Fit a replacement instrument.

11. SCREECHING NOISE

Very often more prevalent in cold weather, indicates trouble in the instrument which must be replaced.

12. ENGINE SPEED INDICATOR

Much of the foregoing applies equally to the engine speed indicator and to ascertain which instrument is the offender, keep the engine running while the car is stationary and when the noise persists the engine speed indicator can be considered at fault.

INNER SHAFT PROTRUSION Fig. O32.

The inner shaft must protrude from the flexible outer cable.

0.375" (9.525 mm.)

REMOVAL AND REPLACEMENT
SPEEDOMETER

1. REMOVAL

Remove the padded trim panel from the top of the cockpit facia as detailed in THE BODY, SECTION Q. Detach the earthing lead from the battery, the illumination lamps and flexible drive from the rear face of the speedometer. Withdraw the speedometer through the front face of the cockpit facia by removing two knurled nuts and sleeves.

2. REPLACEMENT

The replacement of the speedometer is the reversal of the removal sequence, but particular attention must be given to the following point:

That the earthing tabs are replaced between the bridge piece and the knurled nuts.

THE ENGINE SPEED INDICATOR

DESCRIPTION

The engine speed indicator is positioned immediately in front of the steering wheel and towards the outside of the cockpit. It records the engine speed in numbered 100 r.p.m. divisions which are sub-divided into 10 r.p.m. divisions. The instrument is driven by a flexible drive from the ignition distributor pedestal situated between the two cylinder heads.

Also incorporated in the face of the instrument are two warning lamps; the L. H. lamp in circuit with the L. H. flasher direction indicator lamps and the R. H. lamp in circuit with the R. H. flasher direction indicator lamps. These warning lamps will give an intermittent glow when the flasher direction indicators are in use with the ignition switched on.

For the removal and replacement, the lubrication and other sequences connected with the engine speed indicator, reference should be made to THE SPEEDOMETER AND ODOMETER, page O48.