SMITHS INSTRUMENT MOUNTING PANELS AND SUPPLEMENTARY INSTRUMENTS

FITTING INSTRUCTIONS

SUPPLEMENTARY INSTRUMENT PANELS

Select a suitable mounting position, such as the underside of the dashboard or the top of the glove pocket, and offer up the panel for checking at the same time ensuring that there is sufficient space to accommodate the depth of the instruments which are to be mounted in the panel. Using the instrument panel as a guide, mark and drill the required number of $\frac{1}{4}$" dia. (6.35mm.) holes (depending on which panel is being fitted), and mount the panel in position using the nuts, bolts, and spring washers provided. The instruments are mounted in the panel with the simple strap fixing, provided, and the lighting attachment lead is connected to a convenient point on the dashboard light circuit. If a temperature gauge or dual gauge is being fitted, the capillary tubing should be straightened out and passed through the panel first.

DUAL GAUGES

These are combined oil pressure/water temperature gauges. Fitting details given for the individual oil pressure gauges and water temperature gauges are also applicable to dual gauges.

ELECTRIC CLOCKS 12 volt

CE 2160/08 for positive earth ignition systems.
CE 2160/10 for negative earth ignition systems.

These instruments are supplied complete with wiring. Connect the yellow lead, which is supplied already connected to the clock, to the A.2 terminal on the fuse box or any live fused circuit. Ensure that the clock is properly earthed—if necessary making a separate earth connection.

OIL PRESSURE GAUGES

To facilitate installation, 6ft. (1829mm.) oil pipelines, connectors and tee pieces are available as separate items. Most cars not fitted with an oil pressure gauge have an oil pressure warning light. To fit the oil pressure gauge, remove the oil pressure warning light switch which is normally located on the side of the engine, and screw the connector in its place. Then fit the pipe line to the connector, ensuring that the end of the pipe line which terminates with a coned union is used (Fig. 1). Take the pipe line by the most convenient route to the gauge through a $\frac{5}{8}$" dia. (15.87mm.) hole drilled in the bulkhead. Coils of not less than 2" dia. (52mm.) should be made near each end of the tubing to take up engine vibration. The other end of the pipe line, which terminates with a flat union, should then be connected to the gauge, ensuring that the small leather washer is in position. If it is required to retain the use of the oil pressure warning light, the tee piece provided should be used to enable both the warning light switch and pipe line to be fitted (Fig. 2). (In the case of B.M.C. 'A' series engines, it is advisable to remove the main oil feed pipe in order to screw the tee piece home. The pipe line should be refitted to the branch of the tee piece so that it points forward along the cylinder block, before curving back towards the bulkhead).

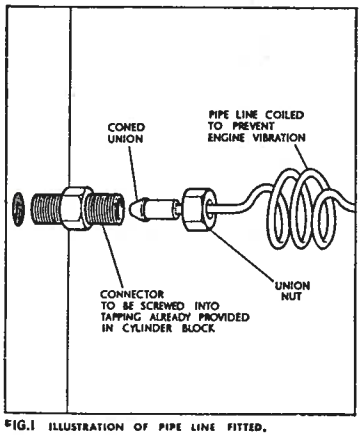


FIG.1 ILLUSTRATION OF PIPE LINE FITTED.

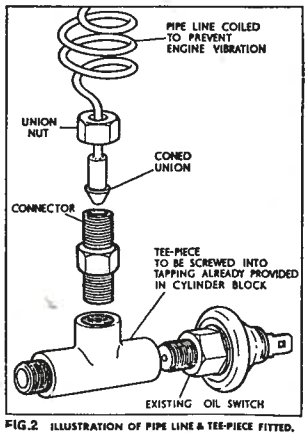


FIG.2 ILLUSTRATION OF PIPE LINE & TEE-PIECE FITTED.

AMMETERS

When fitting the ammeter ensure that the main lead from the battery is disconnected. Then locate the lead (coloured brown on most vehicles), which runs from the starter solenoid via the junction box, fuse box or terminal strip to the starter switch. Disconnect this lead at the most convenient point and connect it to the ammeter using suitable wire to extend the lead if necessary. If the car has a "positive earth" circuit connect this lead to the negative ammeter terminal, If the car has a "negative earth" circuit connect it to the positive ammeter terminal. Connect the other ammeter terminal, using suitable wire, to the point where the original lead was disconnected. Check that the electrical connections have been securely made and are properly insulated, then reconnect the main lead to the battery and check the circuit by starting the engine and accelerating. The pointer should move towards the "+30" (or "+50") marking. If it does not, the connections are incorrect and should be reversed on the ammeter terminals. (Disconnect the main battery lead before doing this).

TEMPERATURE GAUGES

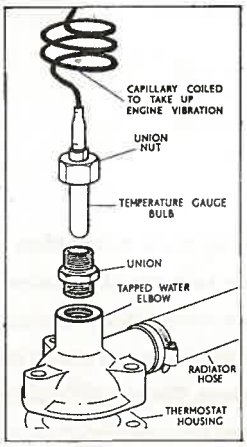


FIG. 3 B.M.C. 'A' Series Engine

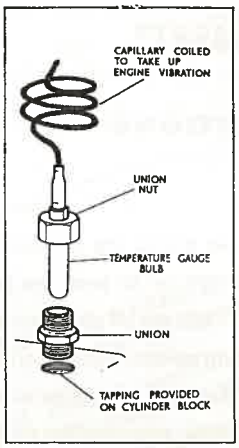


FIG. 4 Ford Engine

To enable the bulb and capillary to pass through the bulkhead it is necessary to cut a 1" dia. (25.4mm.) hole. After fitting the instrument, the grommet provided should be inserted in this hole to hold the capillary tubing steady and to prevent draughts. The method of connecting the temperature gauge bulb to the engine varies according to the car on which the instrument is to be fitted.

Ford Models

On some engines a tapping is provided for a temperature gauge in the cylinder head. To fit the gauge, remove the plug from this tapping and screw in the double ended union supplied. The temperature gauge bulb is then inserted into the union and the union nut screwed down (Fig. 4).

B.M.C. "A "Series Engines (Austin A.30, A.35, A.40, Morris Minor II and Minor 1000), Austin Seven and Morris Mini-Minor

For all B.M.C. "A" series engines, other than the 1100 series, a tapped water elbow is available separately; to fit this elbow, partially drain the radiator, disconnect the top radiator hose and remove the existing water elbow, replacing it with the tapped water elbow. The double ended union is then screwed into the tapped water elbow, the temperature gauge bulb inserted into the union and the union nut screwed into position (Fig. 3).

B.M.C. 1100 Series Engine

On these engines a tapping is provided on the side of the thermostat housing. After removing the plug from this tapping, screw in the double ended union provided, insert the temperature gauge bulb into the union and screw on the union nut.

Other Models

Where no provision for fitting a temperature gauge has been made by the car manufacturer, the remaining alternative is to fit the temperature gauge bulb to the header tank. For this type of installation, it is necessary to cut a $\frac{5}{8}$" dia. (15.87mm.) hole in a suitable position in the header tank into which should be soldered the double ended union provided, ensuring that the shorter thread on the union is inserted into the hole in the header tank. The temperature gauge bulb is then inserted into the union and the union nut screwed into position (Fig. 5).

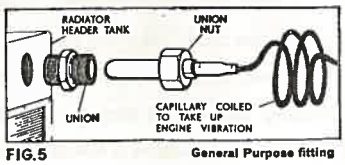


FIG.5 General Purpose fitting

General

When the gauge has been fitted, coils of not less than 2" dia. (52mm.) should be made near each end of the tubing at right angles to the bulb to take up engine vibration. Finally, the tubing should be cleated or fastened by insulating tape at suitable points along its route, keeping it clear of parts of the engine which become excessively hot.

Important: The tubing must not be sharply bent or twisted and all bends should be made by the fingers. No sharp tools should be applied to the tubing and on no account must it be disconnected from the bulb or gauge.

When the temperature gauge is fitted to B.M.C."A" series engines, or to the header tank, no reading will be obtained on the gauge until the engine has reached normal operating temperature, i.e. when the thermostat opens. If a reading is obtained immediately when the car is started from cold, the thermostat is not operating correctly and should be replaced.

TEMPERATURE INDICATORS & TRANSMITTERS

On Ford cars the transmitter can be screwed direct into the tapping on the cylinder block. On B.M.C. "A" series engines, a tapped water elbow, which is available separately will be required. (Note: On certain of the later B.M.C. "A" series engines, and particularly the 1100 engine, a tapping is already provided on the existing water elbow or in the thermostat housing into which the transmitter can be fitted. The separate tapped water elbow is therefore not required.)

To fit this elbow, partially drain the radiator, disconnect the top radiator hose, remove the existing water elbow and replace it with the tapped water elbow. Screw the transmitter into the tapping ensuring that the fibre washer provided is in position. On all Triumph Herald cars a tapped water elbow is already fitted to the car, and after removing the plug from this tapping, the transmitter will screw direct into the tapping provided. Having fitted the transmitter in position, it should then be wired up by taking a long lead to the terminal marked 'T' on the rear of the instrument. Taking a shorter lead, from the second terminal marked 'B' on the rear of the temperature gauge, connect it to the ignition switch or any switched fused circuit (See Fig. 7). Ensure that the instrument case is properly earthed making a separate connection if necessary.

ENGINE PERFORMANCE GAUGE KIT

This Kit contains the gauge and the items required for fitting as illustrated below.

Connect the union to the back of the instrument, making sure that the small leather washer is seated correctly around the restricter hole, to ensure an air tight joint. Connection to the induction manifold is effected by drilling (No. 6 drill—5.16mm.) and tapping ($\frac{1}{4}$" BSF) at a point on the manifold as near top centre as possible. Then fit the hose connector and copper washer into the tapping, insert the restrictor valve into the rubber tubing at the manifold end with the "tail" pointing towards the instrument and push the rubber hose on to the connector on the manifold. The hose should then be taken by the most convenient route to the gauge through a $\frac{1}{2}$" dia. (12.70mm.) hole drilled in the bulkhead and pushed on to the union on the back of the instrument. (See Fig. 6).

Important: When drilling and tapping the induction manifold, it is recommended that the manifold is removed before drilling to obviate the risk of metal particles falling into the manifold and thus being drawn into the engine. For twin carburettor installations, ideally the connection should be made in a central position on the balance pipe but due to the differences between various types of twin carburettor installations it is recommended that reference is made to the manufacturer for his advice regarding the most suitable point at which the union should be fitted.

See back page for performance chart.

OIL TEMPERATURE GAUGES

To enable the bulb and capillary to pass through the bulkhead it is necessary to cut a 1" dia. (25.4mm.) hole. After fitting, the grommet provided should be inserted in this hole to hold the capillary tubing steady and to prevent draughts. To fit this instrument it is necessary to drill and tap the engine sump, and it is essential to seek the guidance of the vehicle manufacturer as to the exact position where the sump should be drilled.

Having ascertained the correct position a $\frac{19}{32}$" dia. (15.08mm.) hole should be drilled and tapped $\frac{3}{8}$" B.S.P. If the wall of the sump is not of sufficient thickness to allow tapping then the double ended union provided should be sweated into position. After passing the capillary tubing through the instrument bracket and the hole in the bulkhead, insert the temperature gauge bulb into the union. Finally screw on the union nut using sealing compound where necessary to ensure that all joints are oil-tight. When the connection has been completed, coils of not less than 2" dia. (52mm.) should be made near each end of the tubing, at a right angle to the bulb, to take up engine vibration. Finally the tubing should be cleated or fastened by using insulating tape at suitable points along its route, keeping it clear of parts of the engine which become excessively hot. Important—the tubing must not be sharply bent or twisted, and all bends should be made by the fingers. No sharp tools should be applied to the tubing, and on no account must it be disconnected from the bulb or gauge.

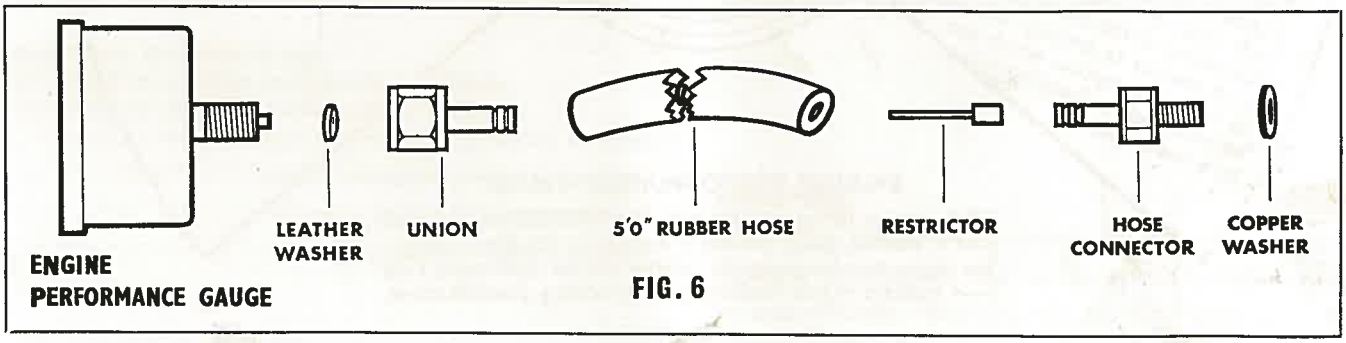


FIG. 6

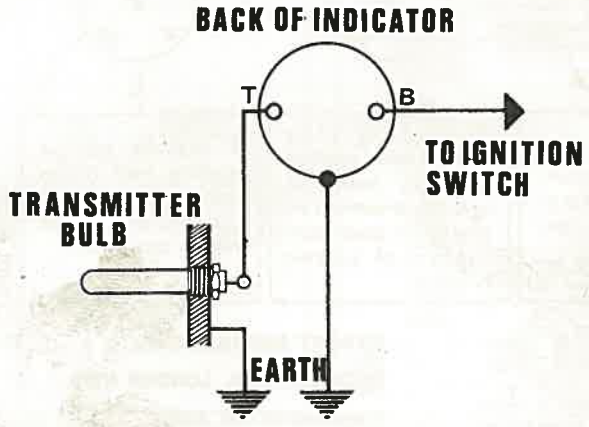


FIG.7

For the following instruments detailed fitting instructions are supplied with each kit.

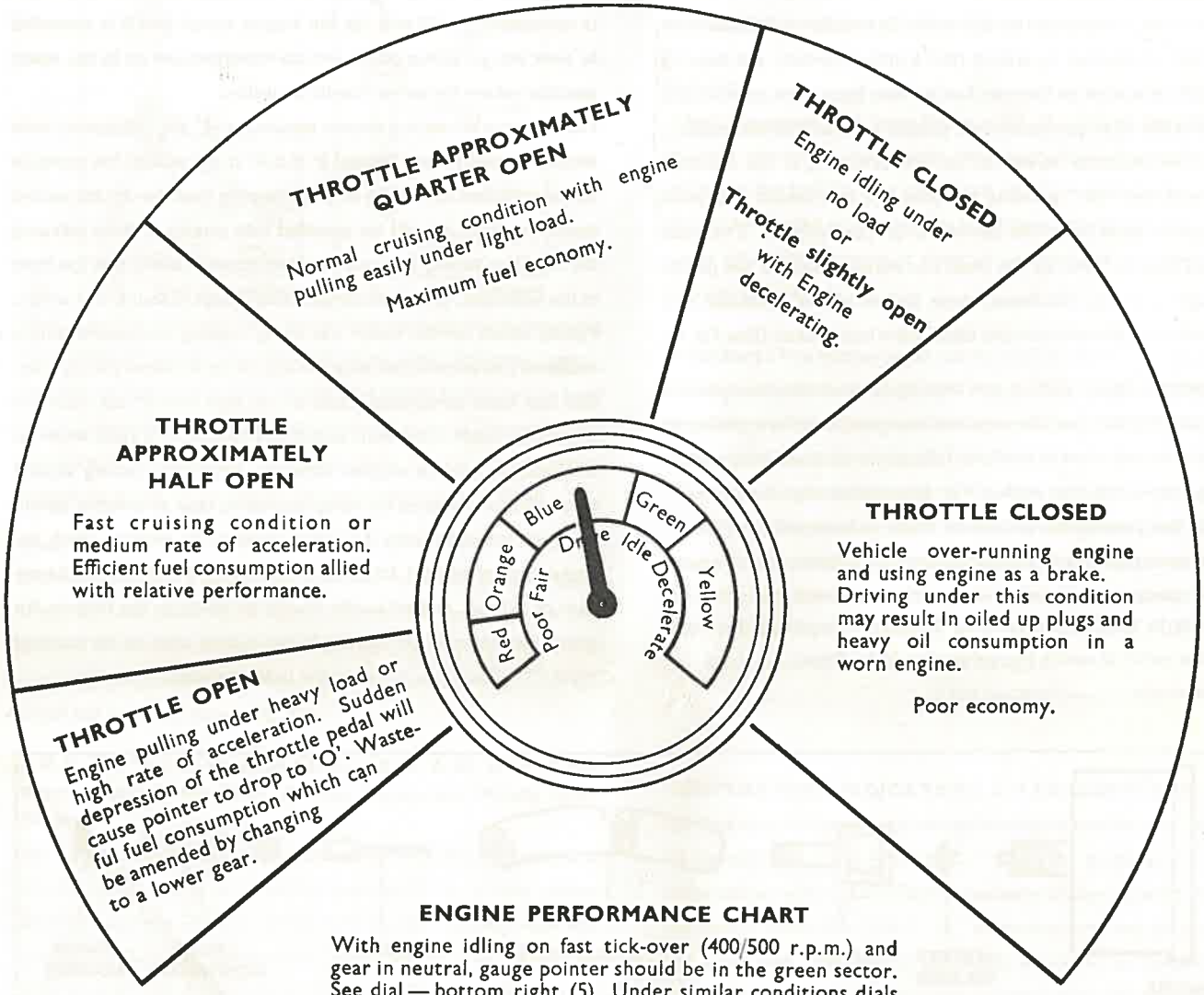
IMPULSE TACHOMETERS
OUTSIDE AIR TEMPERATURE GAUGE
BATTERY CONDITION INDICATOR
SEAT BELT INDICATOR
OIL LEVEL CHECK
TRANSISTOR CAR CLOCK

ENGINE PERFORMANCE GAUGE

OPERATING INFORMATION WITH ENGINE IN GOOD CONDITION

(See Engine Performance Chart at bottom of page)

The main chart shows gauge indication generally obtained. It should be noted that throttle opening under load will cause pointer to move towards the red sector and deceleration cause pointer to move towards the yellow sector.



ENGINE PERFORMANCE CHART

With engine idling on fast tick-over (400/500 r.p.m.) and gear in neutral, gauge pointer should be in the green sector. See dial — bottom right (5). Under similar conditions dials 1—4 indicate engine inefficiency and relating possible cause.

Pointer remaining in red sector indicates leak in manifold, carburettor or carburettor gasket.	Slow oscillation in blue sector indicates incorrect sparking plug gapping or contact breaker points pitted—or carburettor out of adjustment.	Pointer drops slightly from normal position suggests leaky or burnt valves.	Pointer giving steady low reading indicates incorrect ignition or valve timing or poor condition of piston rings.	A steady gauge reading well inside the green sector indicates good engine condition.

SMITHS INDUSTRIES LIMITED

MOTOR ACCESSORY DIVISION

EXPORT DEPARTMENT

CRICKLEWOOD, LONDON NW2

Telephone: 01-452 3333

Telegrams: Speedofac, London. Telex: 22671

Printed in England by Roadcraft Press Ltd, London NW2 February 1969

Ref. No. SE. 1855/4