TECHNICAL SERVICE BULLETIN

BRITISH LEYLAND jaguar DIVISION

NO. 1 G 8

May, 1970

SUBJECT:	MODELS:
1970 Specifications	All Models

Attached is a copy of Service Training Notes SSJ1, outlining 1970 specifications covering timing details and evaporative loss equipment for Jaguar models.

BRITISH LEYLAND

SERVICE DIVISION

DEALER TRAINING

AID # SS 1

SUBJECT: S. U. CARBURETTERS - BASIC PRINCIPLES

MODEL: ALL

AUSTIN JAGUAR MG ROVER LAND ROVER TRIUMPH

JAGUAR 1970 DATA XKE AND XJ 6

Idle Speed r.p.m. (Automatic transmission)	650
Idle Speed r.p.m. (Standard transmission)	750
Distributor Dwell Setting	33° to 37°
Distributor Points Gap	.015"
Ignition Timing - Static	10° B.T.D.C.
Ignition Timing - Dynamic - Idle Speed	T.D.C.
C.O. Level - Engine at Normal Running Temperature	2% to 5%
Spark Plugs	Champion N11Y
Carburetters	Twin Stromberg 175 C.D.S.E.
Valve Tappet Clearances Inlet and Exhaust	.012" to .014"

Note: Latest Type Camshaft (See Page 22)

Locations of Vehicle Serial No.	Left Side Windshield Post. Left Side Door Post. Commission Plate Engine Compartment.
Location of Engine No.	Engine Block at Bell Housing Left Side.

EXHAUST EMISSION CONTROL SYSTEM

Controlled Air Temperature Intake

The control system fitted to 1970 models is a further development of the Duplex manifold system first introduced on 1968 Jaguars in this country, to comply with regulations introduced at that time.

The amount of carbon monoxide (CO) gas produced by the engine and exhausted to atmosphere has been reduced from 1.5% to 1.0% approximately by operating the engine on weaker air/fuel mixtures. In order to help achieve this reduction a control device, has been incorporated. This is called a controlled air temperature intake system. This system makes sure that the air fed to the carburetters is maintained at approximately 120° F. (See Figures 1, 2, and 3).

A stainless steel shroud is placed over the exhaust manifold from which hot air is collected and fed through a duct to a control valve situated in the intake tube of the air cleaner box.

The position of this control valve determines the amount of hot air taken from the exhaust manifold shroud compared with the cold or unheated air taken from the underhood area. The control valve is operated by a Servo which positions the valve according to the vacuum supplied to the Servo.

A thermostat type sensor is positioned in the back plate of the air cleaner box, which senses the temperature of air entering into the carburetters.

Inlet manifold pressure is supplied to a valve in this sensor, which according to the temperature of the inlet air, alters the vacuum supplied to the Servo. In this way the control valve moves so that the temperature of the air around the sensor remains approximately constant. On opening the throttle fully, the control valve shuts off the hot air from the exhaust manifold duct in order to maintain full throttle performance.

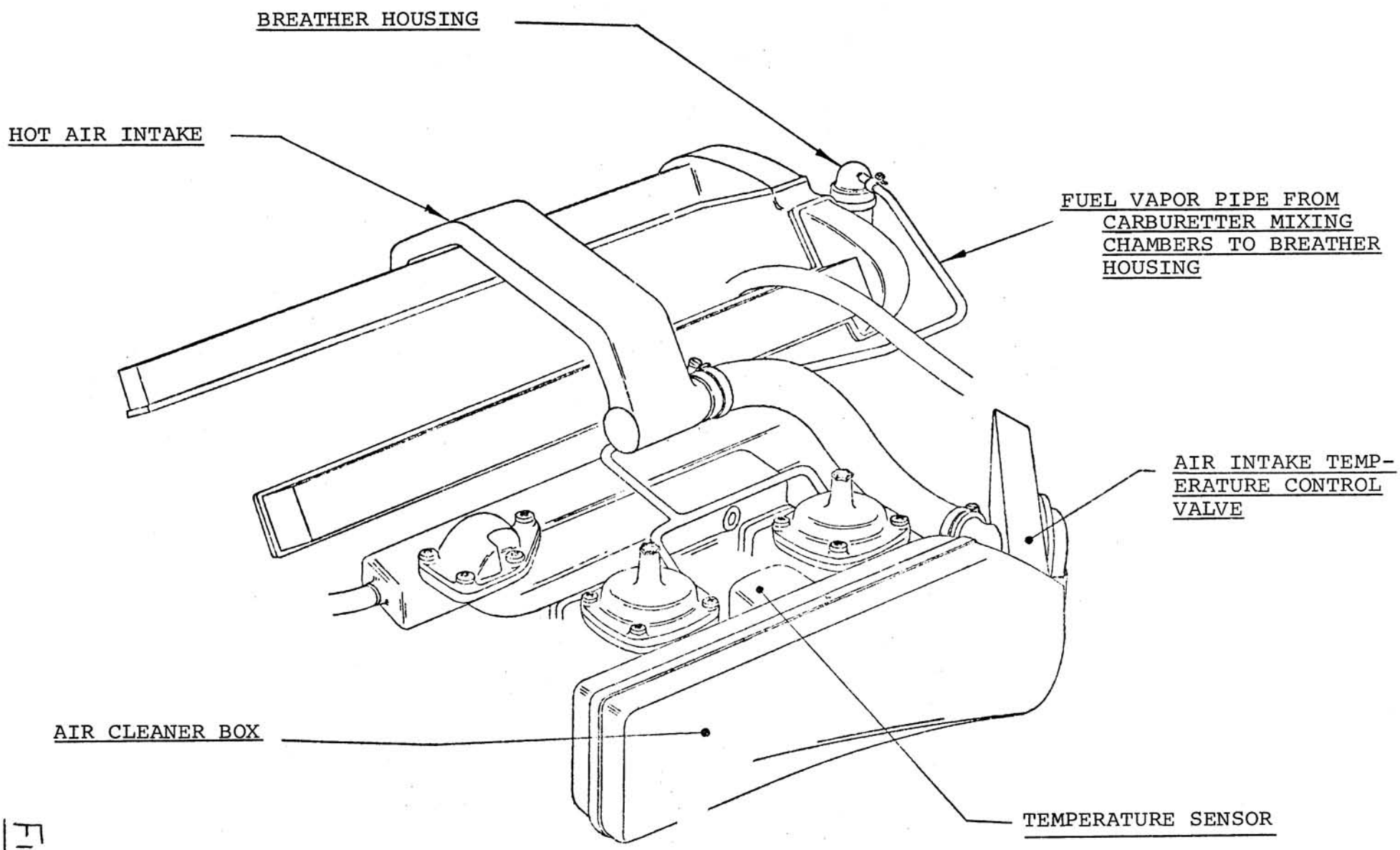

BREATHER HOUSING
HOT AIR INTAKE
FUEL VAPOR PIPE FROM CARBURETTER MIXING CHAMBERS TO BREATHER HOUSING
AIR INTAKE TEMPERATURE CONTROL VALVE
AIR CLEANER BOX
TEMPERATURE SENSOR

FIG. 1.

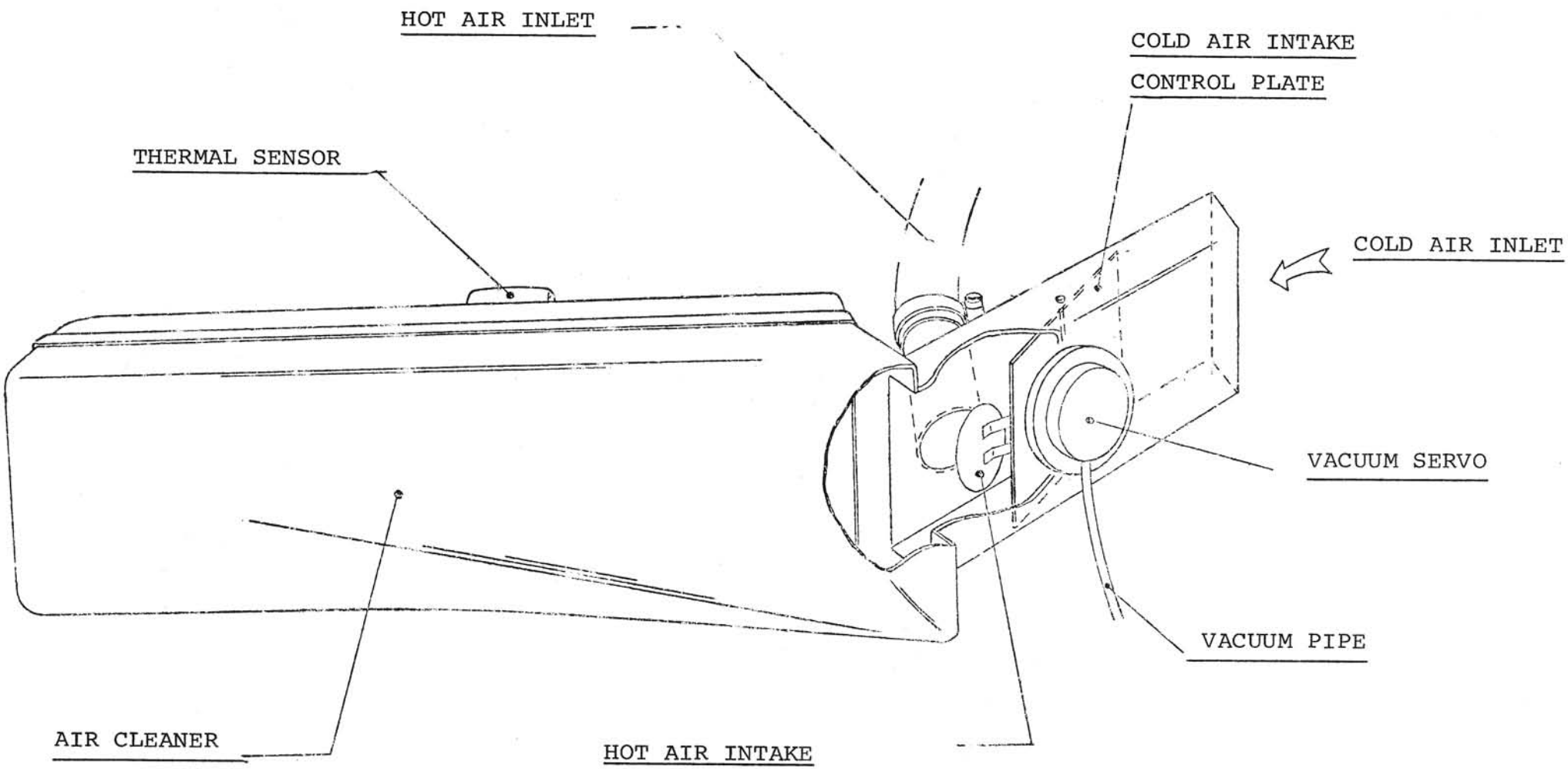


FIG. 2

EMISSION CONTROL AIR INTAKE SYSTEM

EMISSION CONTROL AIR INTAKE SYSTEM

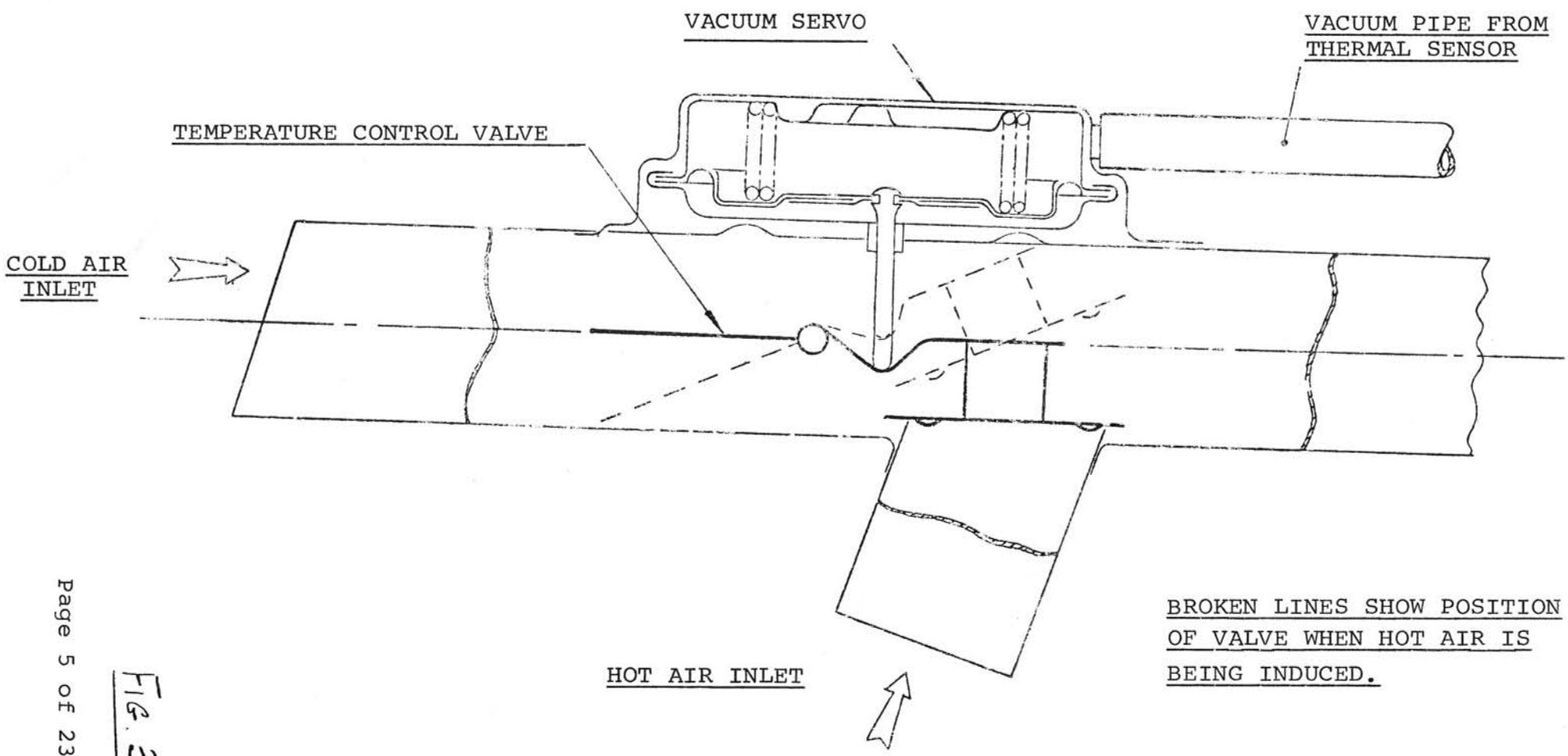


FIG. 3

Carburetter

Minor carburetter changes include a new jet needle and changed setting for the throttle by pass valves which blend fuel/air mixture into the manifold during closed throttle overun conditions.

The jet needle still incorporates the spring loading device and is biased towards the engine.

Carburetter needles are identified by the letters Bl.A R.

Distributor

The distributor incorporates a vacuum retard capsule which retards the ignition by 10° with the throttle closed at idle r.p.m.

A vacuum pipe from the retard capsule connects to a drilling in the base of the front carburetter and picks up manifold depression when the throttle is closed.

Opening the throttle reduces the vacuum and allows the distributor to advance by spring action.

CRANKSHAFT R.P.M.	CRANKSHAFT DEGREES
1,400	6 to 10
1,800	14 to 18
3,000	18 to 22
4,000	23 to 27

The retard characteristics of the capsule are quoted below and should be checked with a falling vacuum.

VACUUM IN INCHES OF MERCURY	DISTRIBUTOR MOVEMENT (DEGREES RETARD)
12	4 to 6
8	4 to 6
6	2 to 4
5	0 to 2½

Distributor Part Number
Manual Transmission - 41322A
Automatic Transmission - 41323A

EVAPORATIVE LOSS CONTROL SYSTEM

XKE Models

On all 1970 Jaguar XKE models a sealed filler cap is used to prevent fuel vapors escaping to atmosphere. In addition the neck of the fuel filler is extended into the tank to help control the fill level. A small fuel expansion tank is fitted above the level of the main tank. Expansion of fuel in a full system under higher temperature conditions is controlled by a pipe connection which allows fuel to overflow into the expansion tank. As the fuel in the main tank is used, the overflow fuel in the expansion tank will be drawn back through a pipe connecting the bottom of the expansion tank with the main tank. (See Figure 4, 5, and 6).

Two additional restricted vent pipes feed from the upper part of the expansion tank to the filler neck side and the rear corner of the main fuel tank. (See Figure 7).

A fourth pipe vents the top of the expansion tank and runs over the rear subframe and along the underside of the vehicle to the engine compartment where it is connected to a charcoal canister. An additional pipe from the canister connects to the crankcase breather housing at the front of the cylinder head and, subsequently via piping to the constant depression area of the carburetters. Thus when the engine is running, any vapors stored in the charcoal will be purged into the engine. (See Figure 8 and 9).

The carburetter float chambers are vented to the engine side of the air cleaner element, therefore preventing these vapors from escaping to the atmosphere.

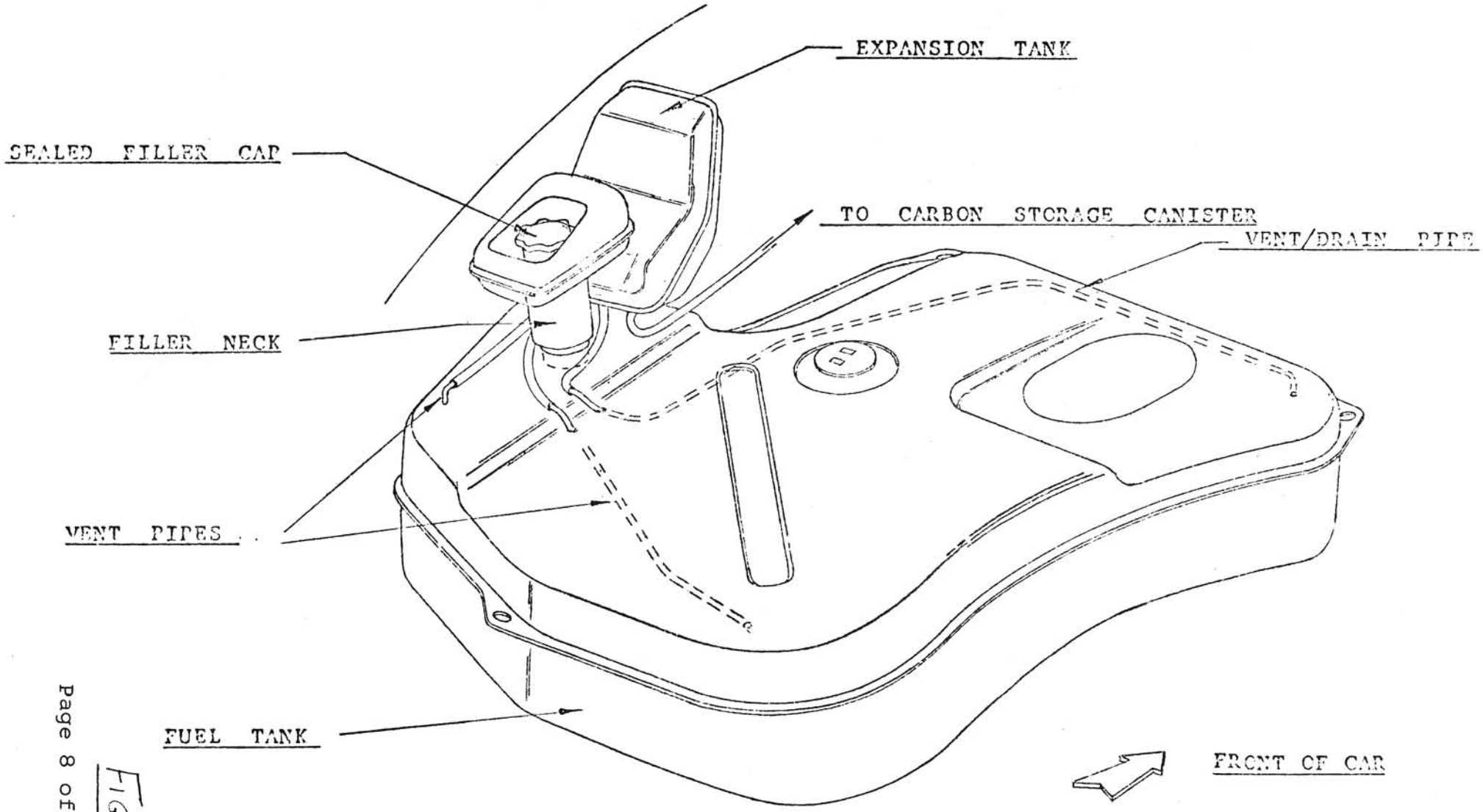

EXPANSION TANK
SEALED FILLER CAP
TO CARBON STORAGE CANISTER
VENT/DRAIN PIPE
FILLER NECK
VENT PIPES
FUEL TANK
FRONT OF CAR

FIG 4.

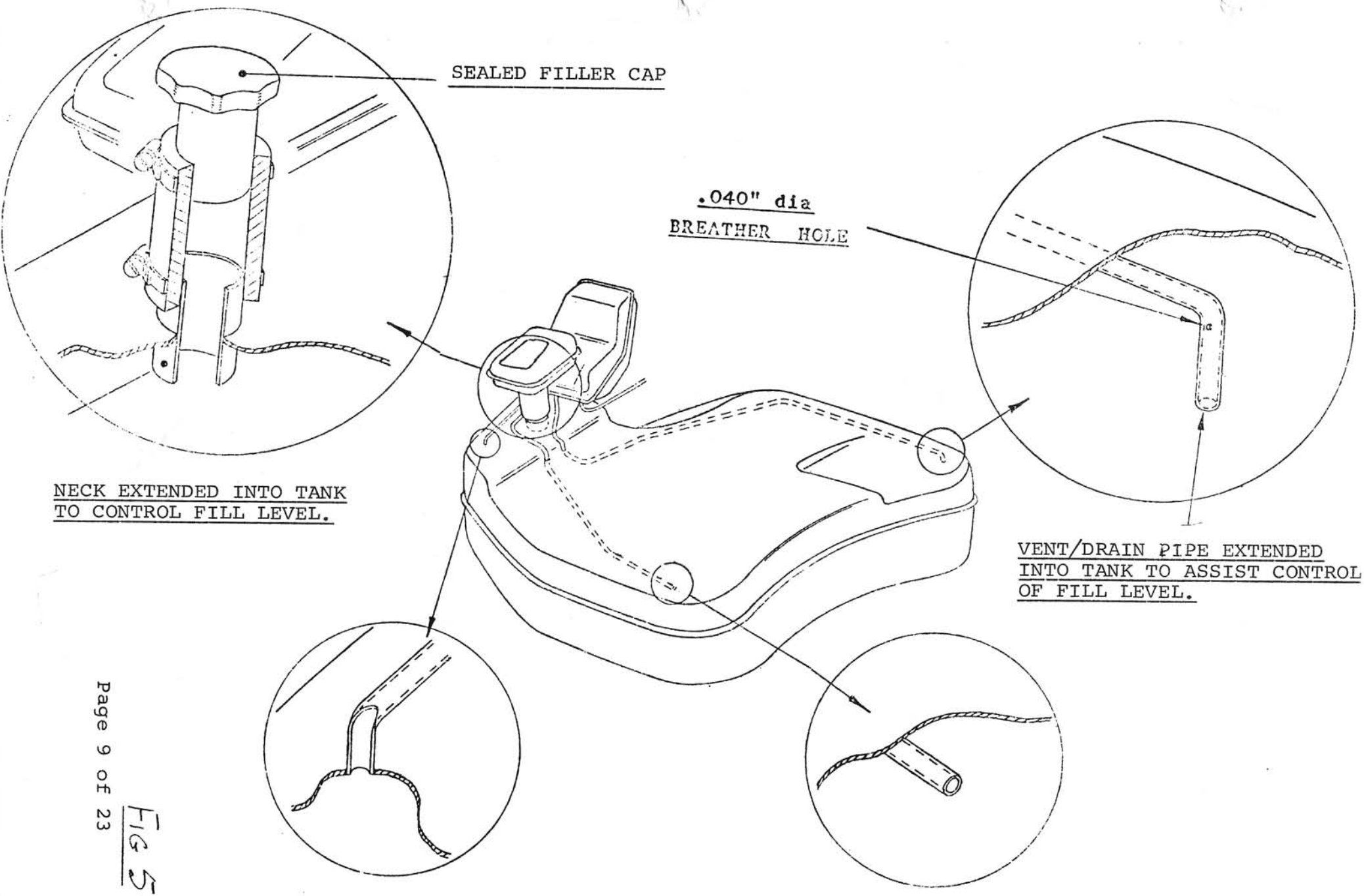

SEALED FILLER CAP
.040" dia
BREATHER HOLE
NECK EXTENDED INTO TANK
TO CONTROL FILL LEVEL.
VENT/DRAIN PIPE EXTENDED
INTO TANK TO ASSIST CONTROL
OF FILL LEVEL.

FIG 5

1970 JAGUAR XK-E TYPE
EVAPORATIVE EMISSION CONTROL SYSTEM

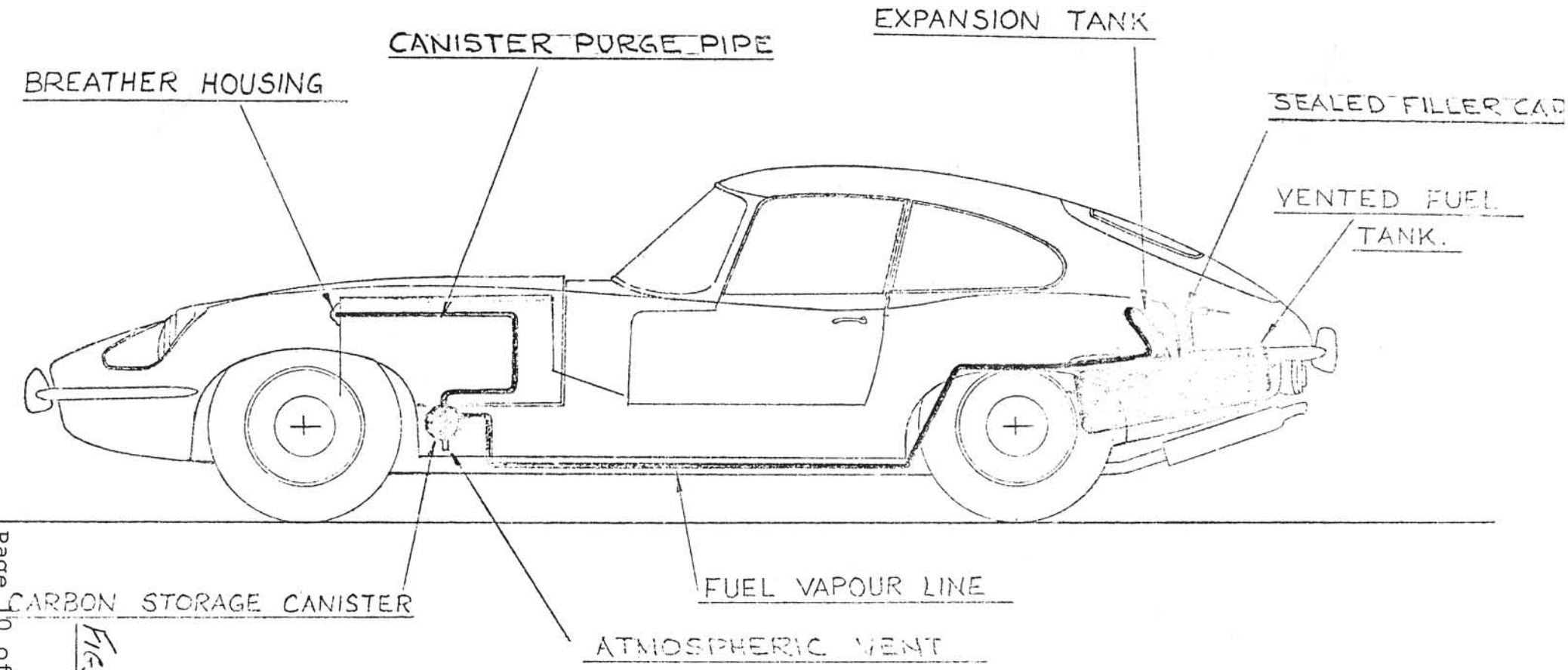
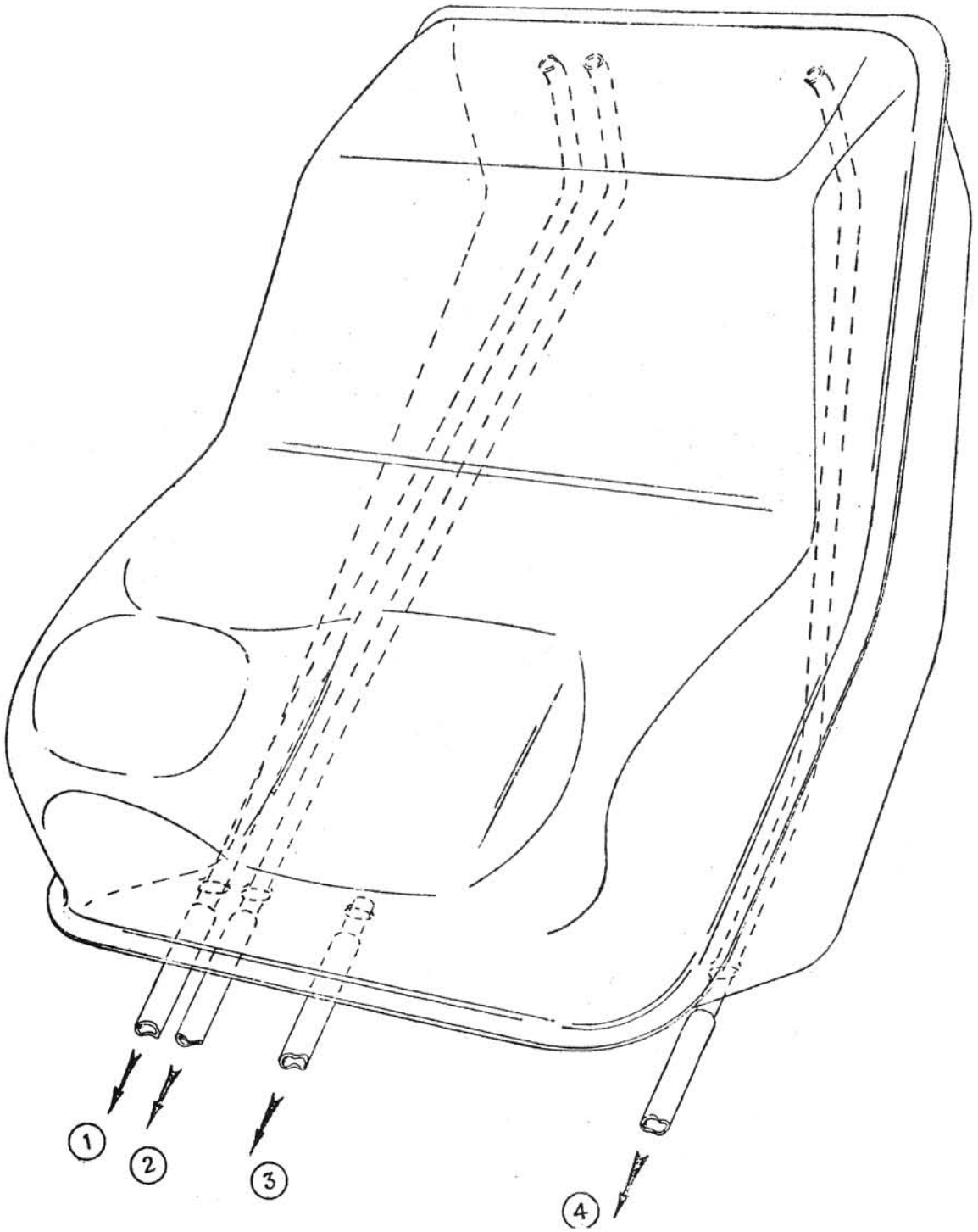


Fig. 6

FUEL EXPANSION TANK



(1) RESTRICTED VENT PIPE TO FILLER NECK SIDE OF FUEL TANK.

(2) RESTRICTED VENT PIPE TO REAR CORNER OF FUEL TANK.

(3) VENT/DRAIN PIPE TO FRONT (LOWEST) CORNER OF FUEL TANK.

(4) FUEL VAPOR PIPE TO CARBON STORAGE CONISTER.

FIG. 7

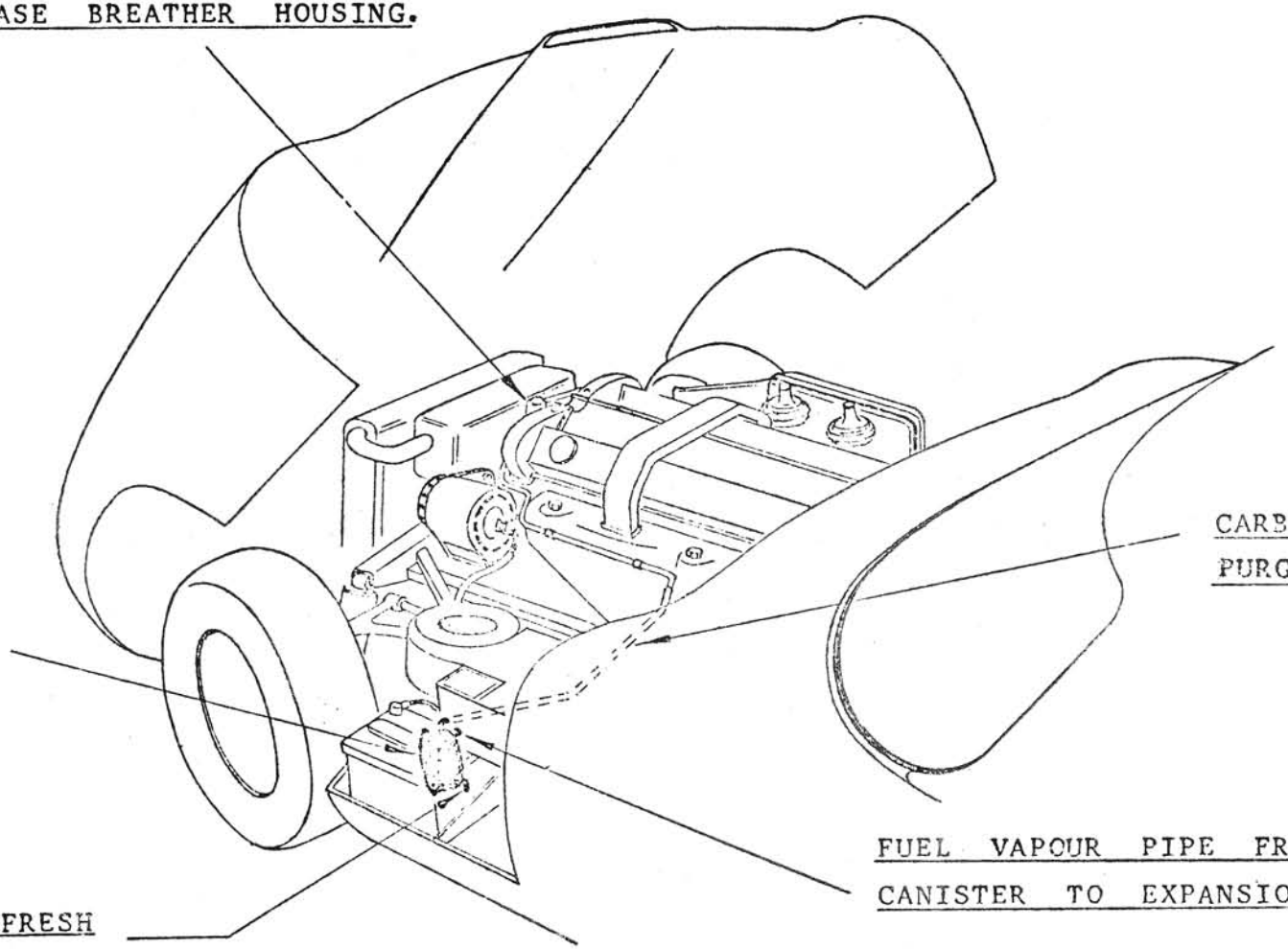
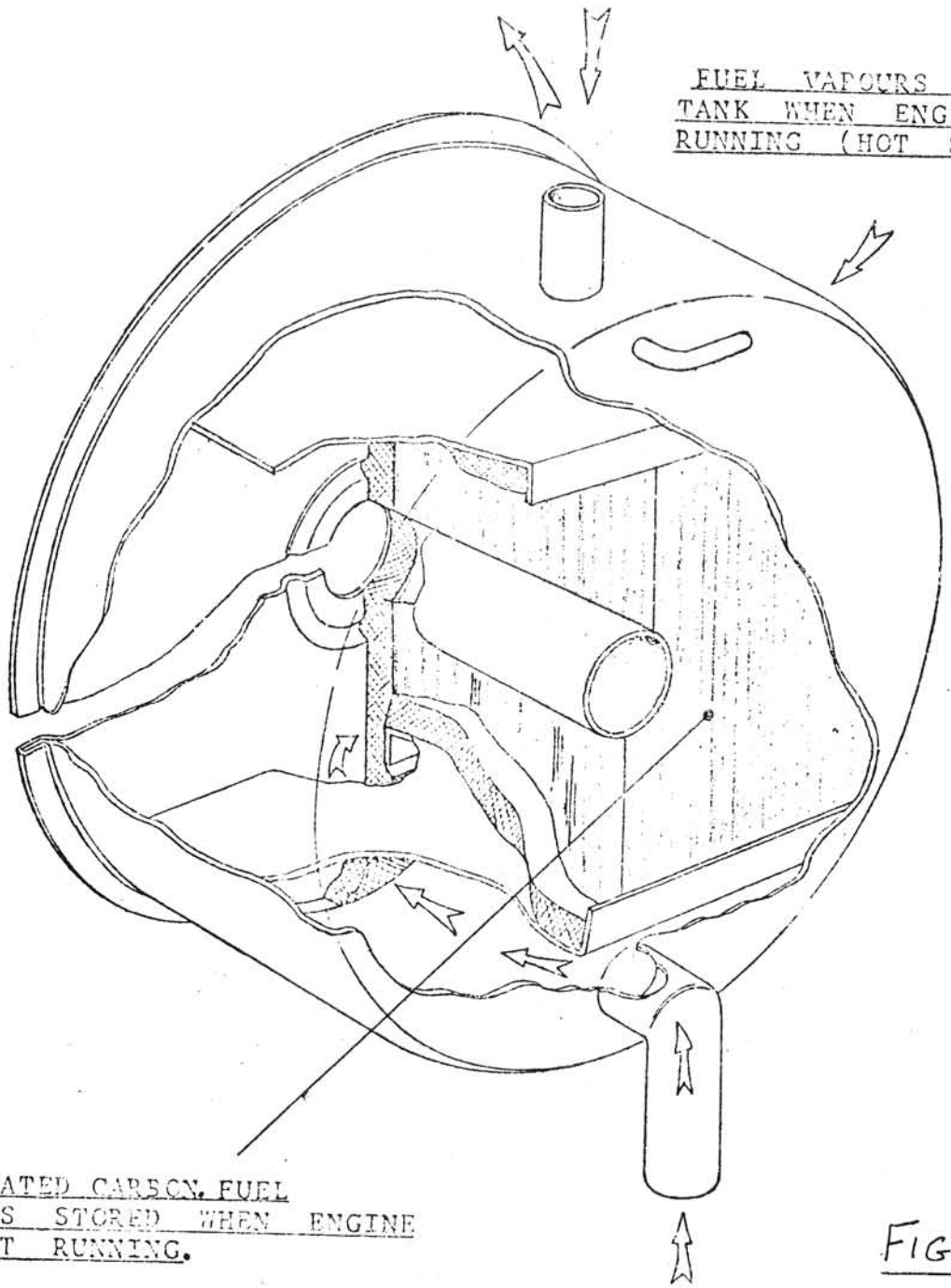

CRANKCASE BREATHER HOUSING.
CARBON CANISTER PURGE PIPE.
CARBON STORAGE CANISTER.
FUEL VAPOUR PIPE FROM CARBON CANISTER TO EXPANSION TANK.
CARBON CANISTER FRESH AIR INTAKE.

FIG. 2

CARBON STORAGE CANISTER

TO CARBURETTORS VIA CRANKCASE BREATHER WHEN ENGINE IS RUNNING.

FROM CARBURETTORS AND CRANKCASE WHEN ENGINE IS NOT RUNNING.



FUEL VAPOURS FROM FUEL TANK WHEN ENGINE IS NOT RUNNING (HOT SOAK).

ACTIVATED CARBON. FUEL VAPOURS STORED WHEN ENGINE IS NOT RUNNING.

FIG. 9

FLOW OF FRESH AIR TO PURGE STORED FUEL VAPOURS WHEN ENGINE IS RUNNING.

EVAPORATIVE LOSS CONTROL SYSTEM

XJ 6 Models

On all 1970 Jaguar XJ 6 models two fuel tanks are mounted each side of the trunk. Both tanks incorporate sealed filler caps to prevent fuel vapors escaping to atmosphere. Both filler necks extend into the tanks and prevent filling to maximum capacity the resulting air space allows for any fuel expansion due to higher temperature conditions.

Venting pipes are connected to the top of each gas tank and are taken up the inside of the left rear quarter panel forming a fuel vapor separator, running into a single line along the underside of the car to a charcoal canister in the engine compartment.

An additional pipe from the canister connects to the crankcase breather housing at the front of the cylinder head and, subsequently, via piping to the constant depression area of the carburetters. Thus when the engine is running, any vapors stored in the charcoal will be purged into the engine. (See Figure 10 and 11).

CRANKCASE BREATHER SYSTEM

XKE and XJ 6 Models

To ensure that piston blowby does not escape from the crankcase to the atmosphere, a small depression or vacuum is maintained under all engine operating conditions.

This is achieved by connecting a 3/8" diameter tube from the engine breather housing situated at the front of the cylinder head to the constant depression area of the carburetters.

The breather housing incorporates a flame trap and an oil separator elbow. The evaporative emission purge pipe from the charcoal canister feeds into this housing and then via the breather pipe to the carburetters. (See Figure 12).

1970 JAGUAR XJ SEDAN
EVAPORATIVE EMISSION CONTROL SYSTEM

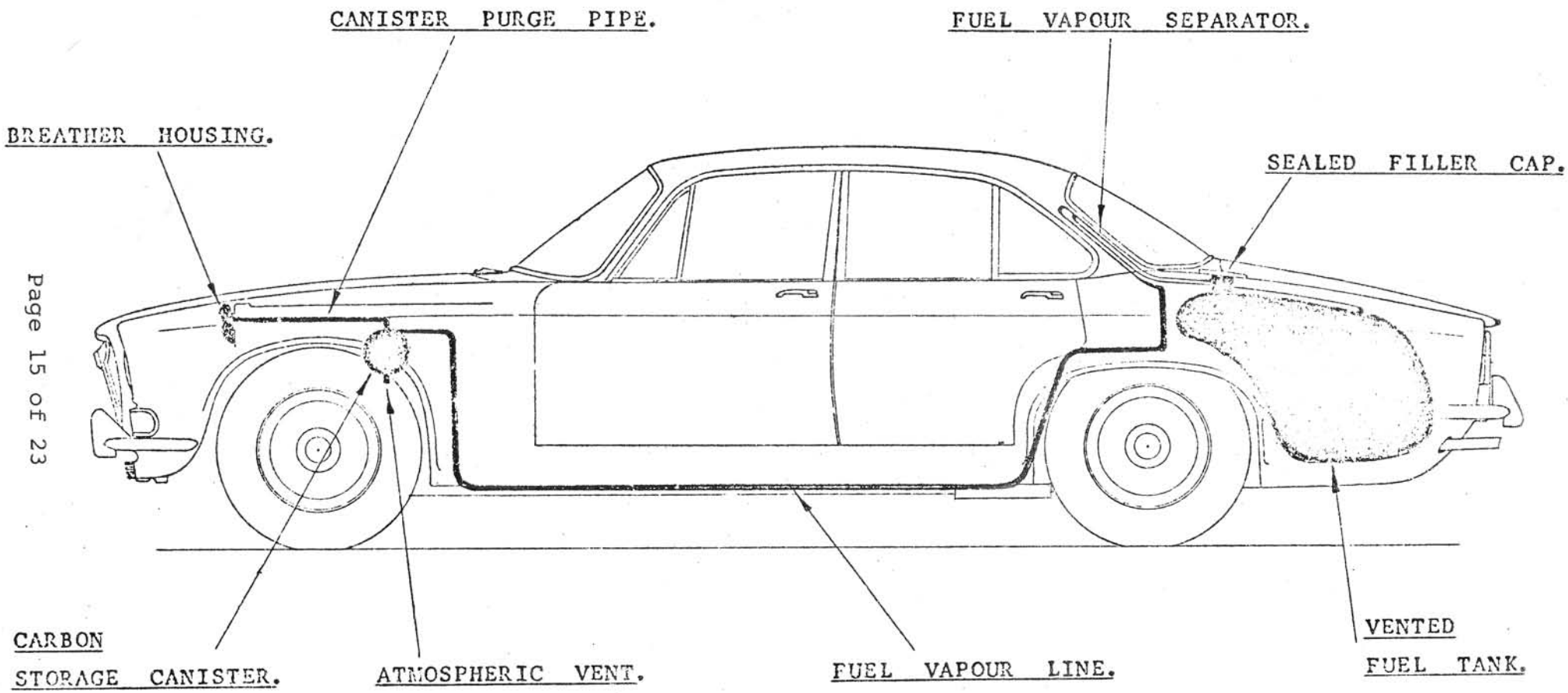


FIG 10

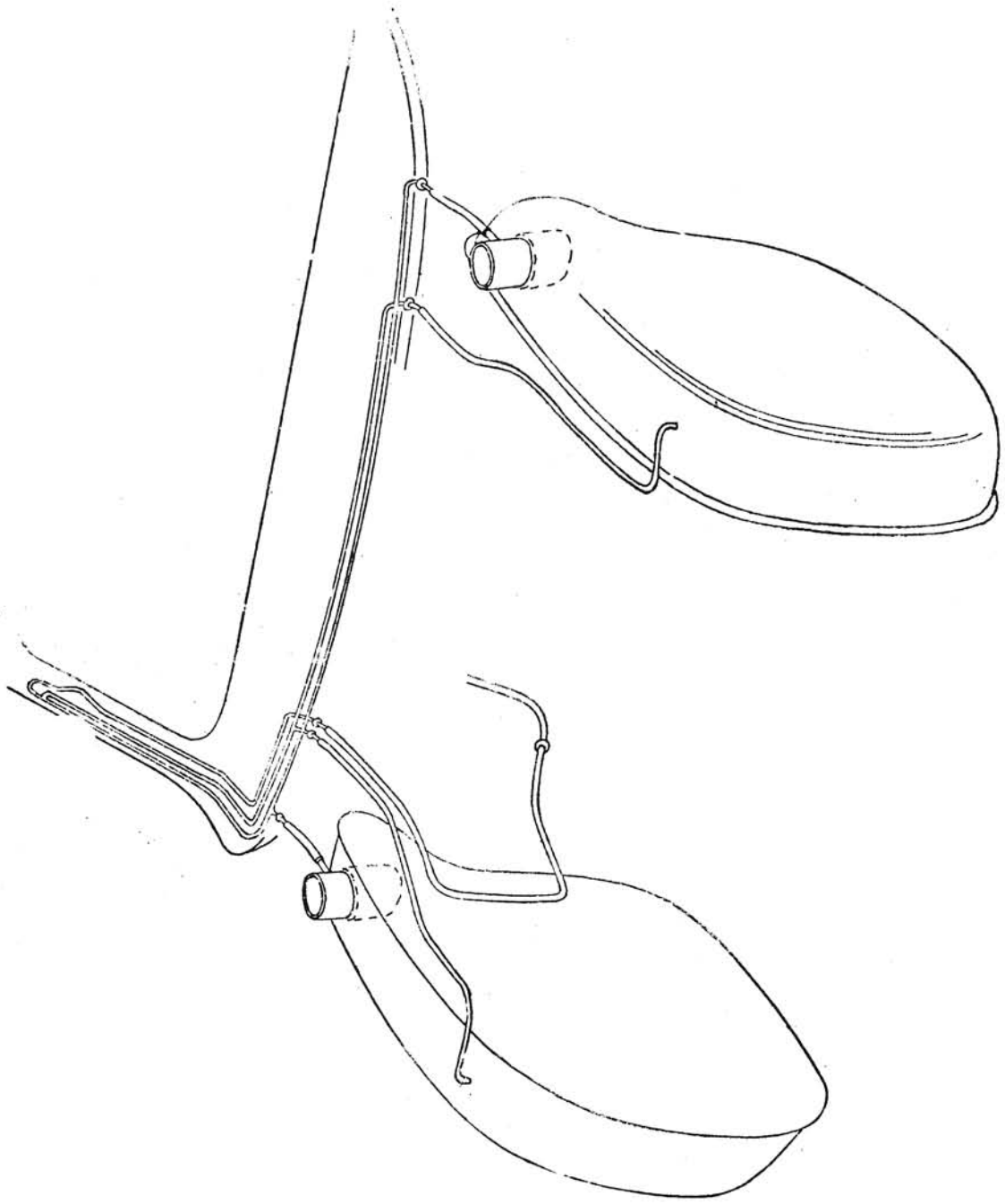


FIG 11

CRANKCASE BREATHER HOUSING

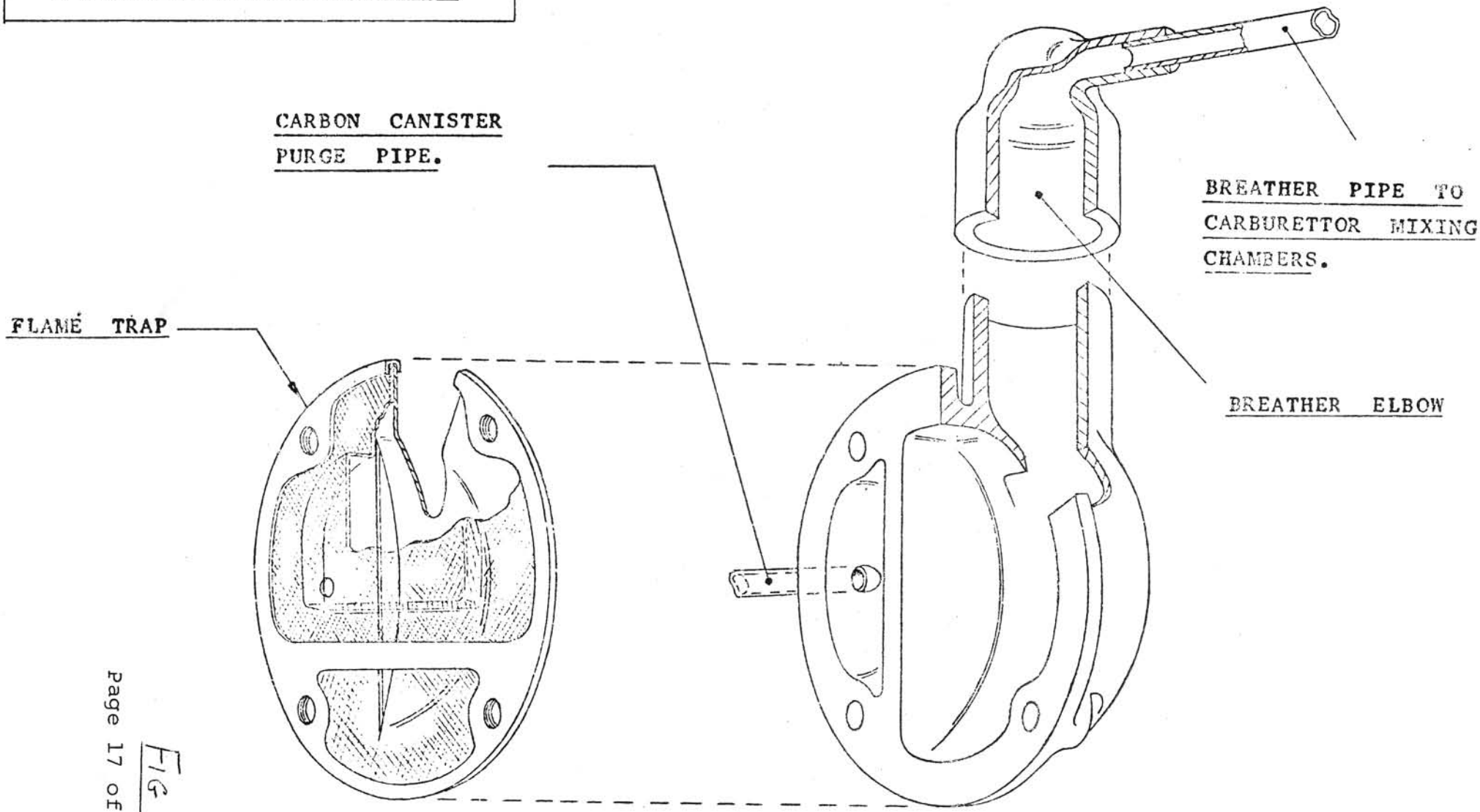


FIG 12

BALLAST RESISTER IGNITION SYSTEM

DESCRIPTION

The purpose of the ballast ignition system is to provide maximum spark efficiency at high engine R.P.M. and assist engine starting under very cold conditions.

A ballast resistor is connected in series with the coil primary winding therefore a coil with a lower operating voltage than the normal electrical system can be used under all normal running conditions the voltage to the coil is being reduced by the ballast resistor.

During starting conditions when the starter cranks the engine it is normal for the system voltage to drop due to the starter motor load.conditions and therefore a lower than normal voltage would be applied to the coil .

In the case of a ballast ignition system however the resistor is short circuited during starter motor operation therefore the full amount of voltage available is applied to the coil.

If the battery and starter are in good condition the voltage applied to the coil should always be slightly higher than the normal operating voltage of the coil and for the limited period of time when the starter is operated will ensure adequate voltage for starting.

The ballast resistor is short circuited by the closing of normally open contacts of a double contact relay (Model 6 RA Lucas 33231) mounted on the bulkhead. The additional contact close simultaneously with the resistor contacts to supply the starter solenoid.

One end of the operating winding (terminal marked W1) of the dual-purpose relay is connected to the ignition-and-start position of the starter control switch and the other end of the operating winding is connected to ground (vehicle frame). When the starter control switch is operated and the relay is automatically energised, battery voltage permanently connected to the relay terminal marked 'C2' is transferred to the relay terminals marked 'C1' and 'C4', which are connected to one end of the ignition coil primary winding and ballast resistor, and the starter solenoid operating windings respectively. Battery voltage (or system voltage) available at the relay terminal 'C1' short-circuits the ballast resistor and the full available voltage applied direct to the ignition coil primary winding.

TEST DATA

The model 16C6 ignition coil primary winding resistance is 1.43 - 1.58 ohm, and the model 3 BR ballast resistor resistance is 1.3 - 1.4 ohm.

Note: Performance testing of the ballast-ignition type coil must always be carried out in conjunction with the ballast resistor (or an equivalent resistance) in circuit.

The special coil fitted with the ballast resistor ignition system is NOT interchangeable with a normal 6 or 12 volt coil used in conjunction with the basic ignition system.

IGNITION/STARTER CIRCUIT

Load Shedding

Due to the increasing load continually being placed on the battery with introduction of additional electrically operated equipment, it has now become necessary to introduce a modification to the ignition starter switch circuit.

This modification is known as "Load Shedding", the object being to ensure that ALL equipment, including auxilliaries, is momentarily isolated whilst the starter switch is being operated. Maximum battery power is thereby available for operating the starter motor. The ignition coil and fuel pump feeds are not affected.

IGNITION SWITCH/STEERING COLUMN LOCK

A new ignition switch/steering column lock was fitted. The new switch has only four operative positions conpared with five on the switch it replaced.

Operation

O - This is the'OFF' position. Withdrawing the key when in this position will allow the steering column to operate. Inserting the key and turning to an operative position will unlock the column.

I - This position will allow the operation of accessories with the ignition 'OFF'. The key cannot be removed.

II - This is the driving position. The key cannot be removed and the ignition is 'ON'.

III - This is the start position. On release the key will automatically return to the ignition 'ON' position (II).

Key Alarm

In addition to the operations detailed above, the switch has an additional feature to conform to U.S.A. Federal Regulations known as 'key alarm'.

A warning buzzer will sound whenever the driver's door is opened if the ignition key has been left in the lock.

Removal of the key will disconnect the buzzer. Fig. 13 below illustrates the circuit diagram for the key alarm system. The buzzer is a sealed unit and no repair or adjustment is possible. Faulty units must be replaced with a new one.

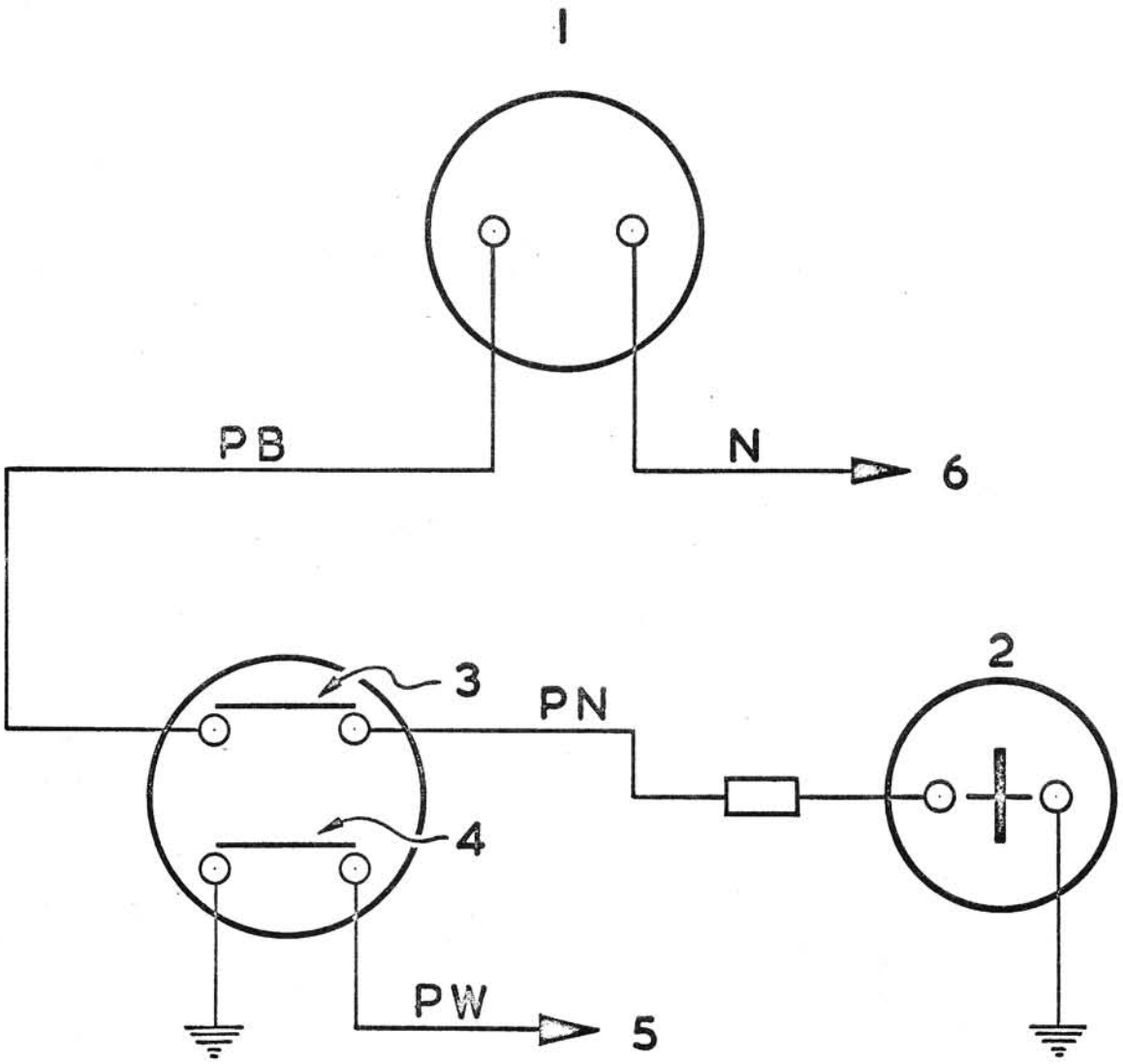


Fig. 13. Circuit diagram for Key Alarm system

1. Alarm buzzer
2. Ignition switch
3. Door switch (buzzer)
4. Door switch (courtesty lights)
5. Feed to courtesy lights
6. Feed to buzzer

Color Code
B. - Black
N. - Brown
P. - Purple
W. - White

CAMSHAFTS

XKE and XJ 6

New camshafts with redesigned cam profiles are fitted (C 31818 Exhaust and C 31819 Inlet).

The shafts can be identified by the addition of a groove machined on the periphery of the end flange as shown below. They may be changed IN PAIRS ONLY with the original shafts fitted to earlier engines.

The groove which is visable on removal of the cam cover indicates the required valve clearance and timing. Revised valve clearances are .012" to .014" INLET AND EXHAUST VALVES.

All engines fitted with the new camshafts will have a label on the valve cover quoting the new valve clearance.

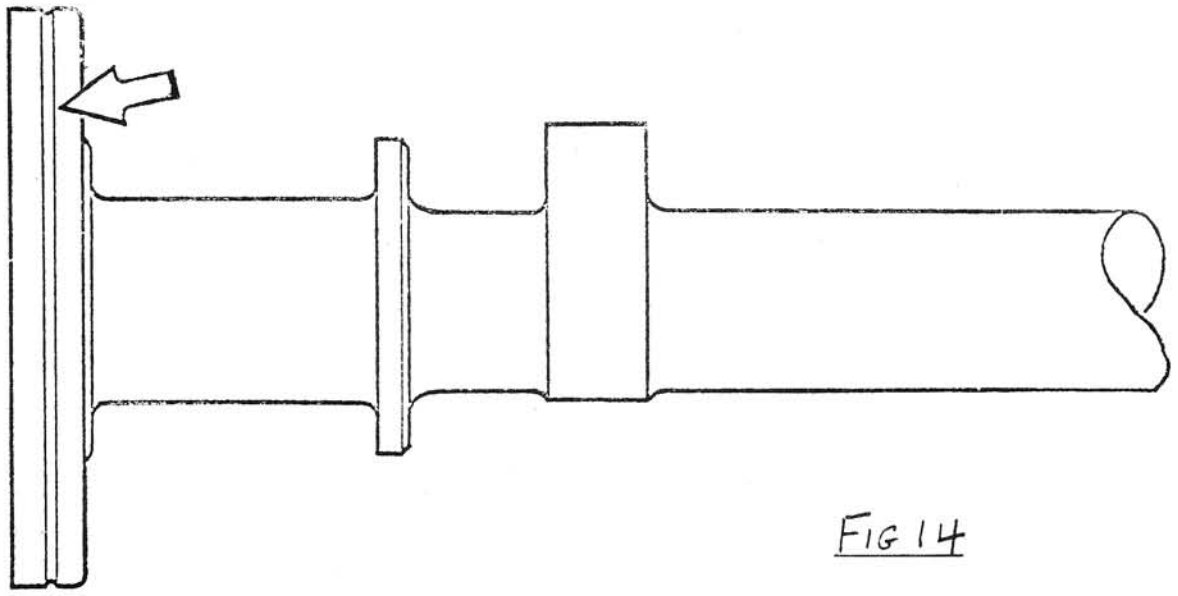
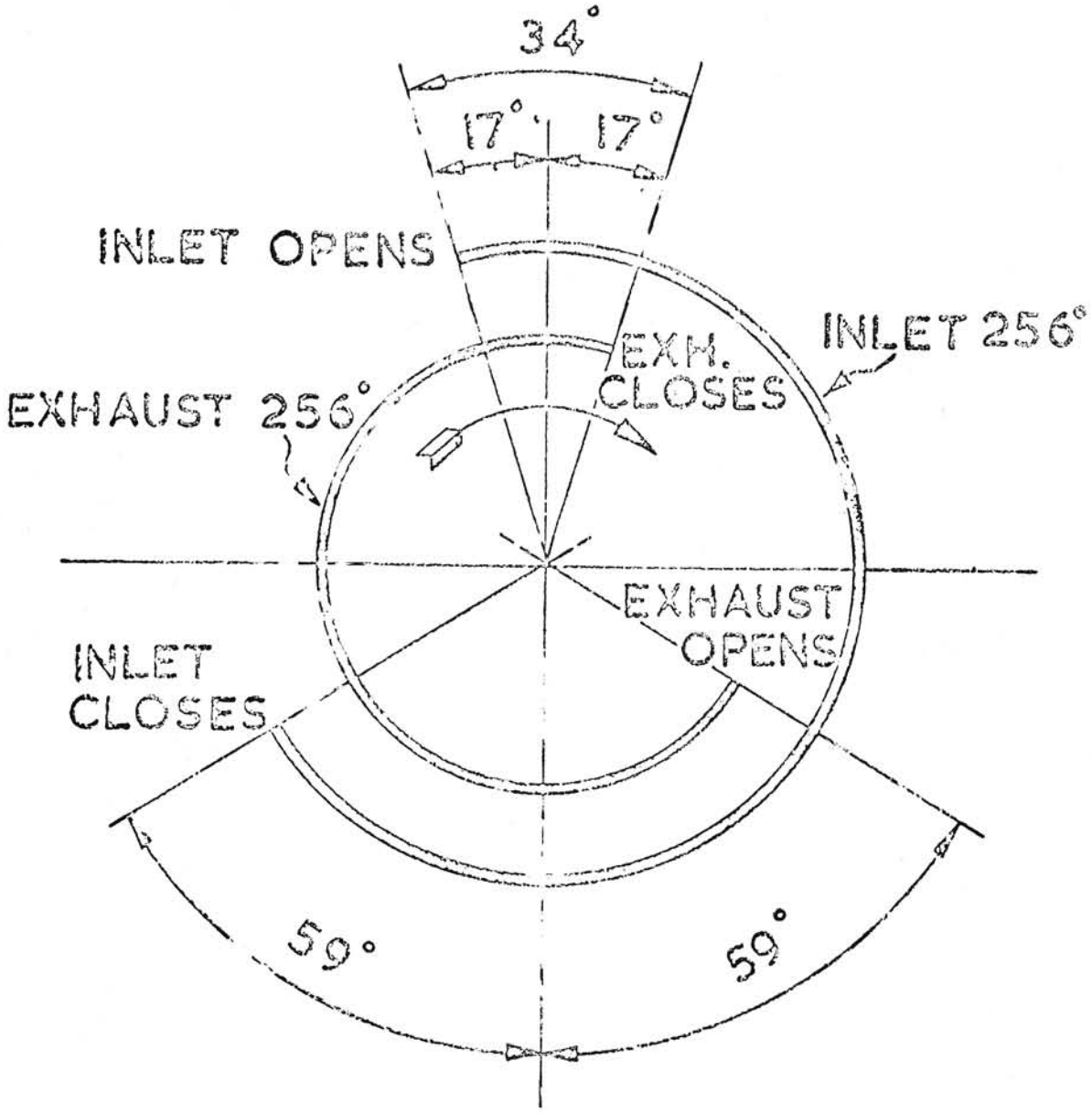


FIG 14



Valve Timing Diagram

FIG 15