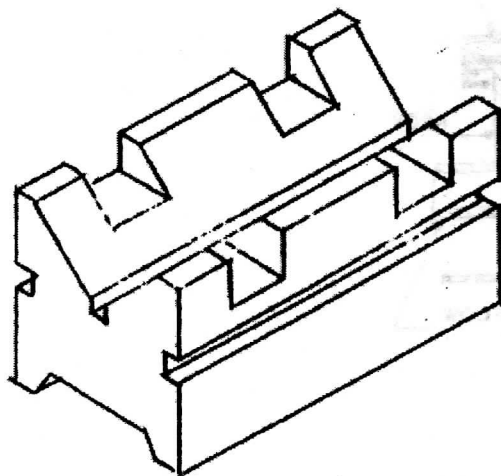


- (b) **STARTING S.C. ENGINE**
 Check the oil level
 Close the choke valve
 Open the fuel tap
 Switch on the ignition system
 Crank the engine
 Open the choke once the engine start. (6 x ½)
5. (a) **BEARING LOADS**
 Radial - main bearing of crankshaft.
 Thrust - Transmission system. (2 x 1)
- (b) **MUFFLER**
 Reduces the level of exhaust noise.
 Carry away exhaust gases and heat. (2 x 1)
6. (a) **ELECTRICAL CIRCUITS.**
 Starting
 Charging
 Ignition
 Lighting (4 x ½)
- (b) **STATOR WINDING**
 Delta - in heavy duty motor
 Wye or star - in standard starter motor. (2 x 1)
- (a) **LOW OIL PRESSURE**
 Worn engine bearing
 Engine overheating
 Oil dilution or foaming
 Malfunctioning oil pump. any (3 x 1)
- (b) **SERVICING DRUM BRAKES**
 Check - brake shoes friction materials
 - drum wear condition
 - wheel cylinder leakage
 - drum clearance
 - spring tensions any (4 x ½)

8. (a) RIMS
- (i) pressed steel disc
Disc centre lock wire
Light alloys
 - (ii) flat base - two piece rim
flat base - three piece rim
semi-drop centre rim
flat base divided rim. any (4 x ½)
 - (ii) flat base - two piece rim
flat base - three piece rim
semi-drop centre rim
flat base divided rim.
- (b) STEERING SYSTEM
- Gearbox - converts turning motion to side to side motion
 - Track rod - transfers pitman arm motion to the tie rods
 - Ball joint - provides the necessary flexibility to tie rods. (3 x 1)

9. BODY CONSTRUCTION
- Relatively light
 - Good resistance to corrosion. (2 x 1)

10. DIAGONAL SCALE
- (a) 2m 80mm or 2.080m
 - (b) $RF = \frac{30}{500} = 3:50$
 - (c) $\frac{3}{50} \times 5000 \times 100 = 300mm$ (3 x 1)



FACES:	Plan (10x½)	=	5
	FE (3x½)	=	1½
	EE (5x½)	=	2½
	Grooves (4x½)	=	2
	Corner X	=	2
	Isometric	=	1
	Scale/Proportion	=	<u>1</u>
	TOTAL	=	<u>15</u>

12. (a) A. Battery or Ammeter
 B. Control Unit
 C. Fuse box
 D. Lighting switch (4 x ½)

- (b) Control Unit - regulates current to different electrical circuits.
 Fuse box - houses fuses which protect the circuits from overload. (2 x 1)

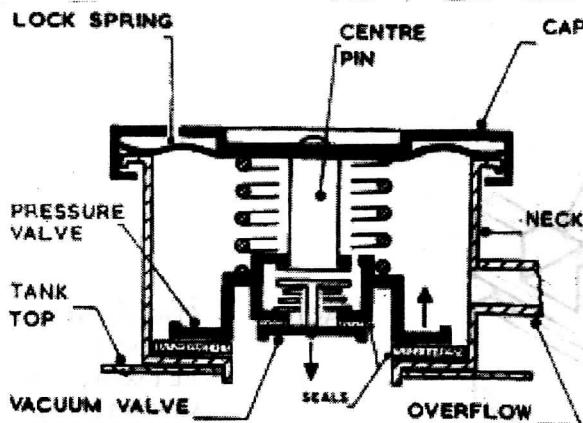
(c) OPERATION OF LIGHTING CIRCUIT.
 When S_1 is switched on;
 Current flows from battery to Ammeter, then A terminal of control unit and out through A, to the lighting switch, D. S_1 controls rear and front lights and No. Plate and back to earth.

When S_2 is switched on:
 Current flows to lighting switch S_2 terminal which control the main beam or Dip. beam and to earth. When the lighting switch is not on either S_1 or S_2 position no lighting takes place. (11 marks)

13. (a) (i) Radiator core
 - Film type
 - Flat tube
 - Pack any (2 x ½)

- (ii) Thermostat
 - Wax pellet
 - Bellows
 - Bimetallic any (2 x ½)

(b) Radiator Pressure cap.

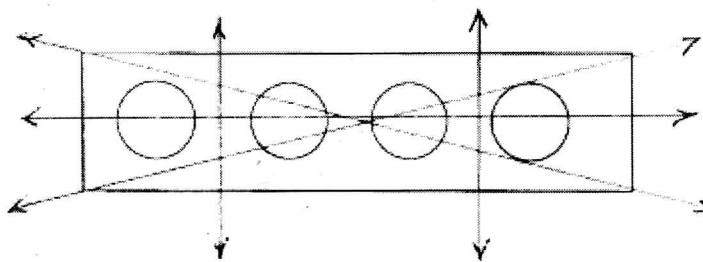


OPERATION

When the engine overheats the excessive pressure due to steam generated in the radiator is released by lifting the pressure valve against the spring action. The water released escapes through the overflow pipe. (4 x 1)

As the engine cools down vapour formation creates a partial vacuum in the radiator. This is relieved by opening of vacuum valve due to pressure difference. Air enters the system through the overflow pipe and pressure valve is closed by the spring for situation to return to normal. (4 x 1)

14. (a) **CHECKING C.H. FOR WARPAGE**
Placing C.H. on a flat surface.
cleaning the C.H. surface.
placing straight edge and checking using the feeler gauge at six different positions as shown in the figure below:



diagonally (2)
transversely (2)
longitudinally (2)
3 x 1
tools - 1 mark

- (b) **MEASURING C.H. BORE**
measure the diameter at the top
measure the diameter at the bottom
taper is the difference between the two.

3 x 1
tools 1 mark

- (c) **STATIC TIMING OF DISTRIBUTOR**
Turn crankshaft until piston 1 is at TDC compression stroke.
check to ensure timing marks on pulley and gear chain cover are aligned.
insert distributor and rotate so that its rotor points to the terminal for no. 1 at the distributor cap.
Adjust distributor until contact breaker points are about to open.
Tighten the breaker point screws to ensure that the points are securely mounted.

6 x 1
tool - 1 mark

15. (a) (i) **DIAPHRAM CLUTCH**

(1 mark)

- (ii) A. Cover
B. Release Bearing
C. Pressure Plate
D. Diaphragm Sprint
E. Flywheel
F. Driven Plate.

(6 x ½)

(b)

OPERATION

Disengagement:

The driver presses clutch pedal which causes the release bearing to push the diaphragm spring towards the flywheel causing the pressure plate to move away from the flywheel thus disengaging the clutch and interrupting the torque transmission.

(5 x 1)

Engagement:

When the driver releases the clutch pedal which in turn relieves the bearing forcing the diaphragm spring away from the flywheel. The diaphragm spring pressure is transmitted to the pressure plate which in turn presses the pressure plate firmly against the flywheel to engage the clutch and thus transmit to the gearbox input shaft.

(6 x 1)