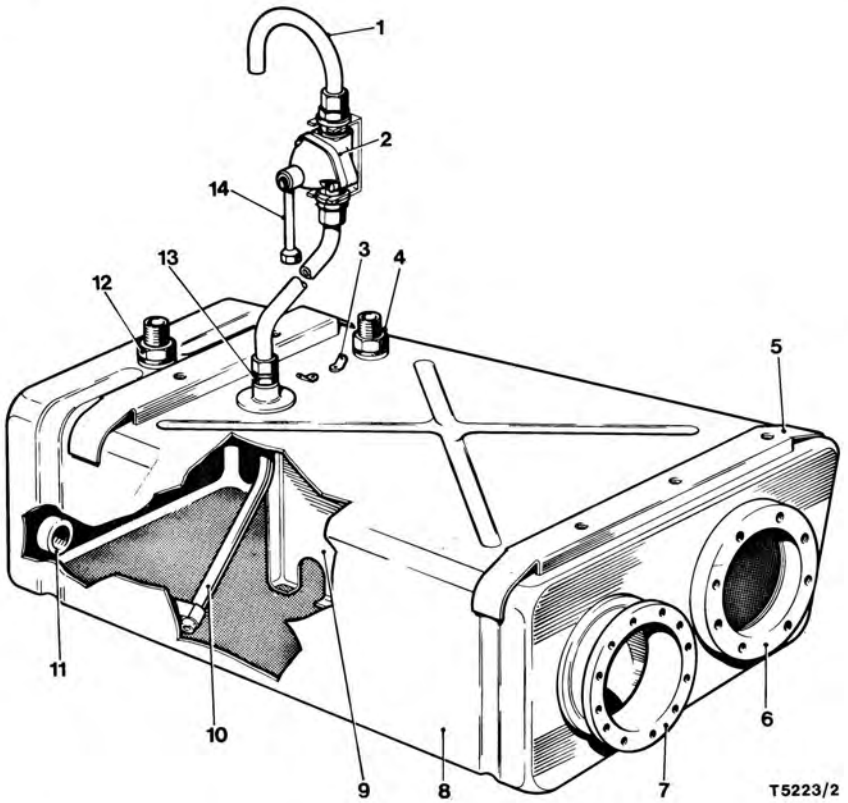


1 Outlet tube
2 Water drain valve
3 Locking wire tags
4 Breather pipe adaptor
5 Tank mounting channel
6 GUE fuel pump flange
7 Main engine left fuel pump mounting flange
8 Tank
9 Baffle
10 Water drain riser tube
11 Drain outlet adaptor
12 Inlet adaptor
13 Water drain connector
14 Valve lever

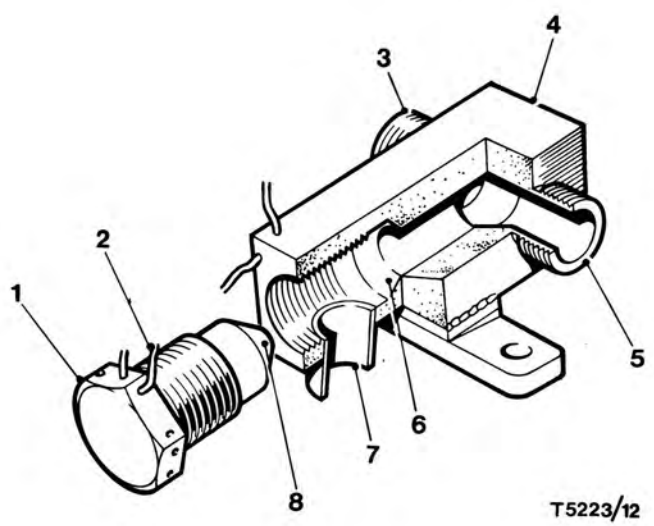
Fig 5 Left lower fuel tank

24. There are ten non-return valves in the system (see Fig 1 and 4), they are used to isolate sections of the system for servicing purposes and directing the fuel to the generating unit engine when the emergency tap is opened.

Gravity check valve

25. The gravity check valves (Fig 4(12) and (35)) differ from the non-return valves only in respect of valve opening pressure. The spring setting is calibrated to 34.5 kN/m^2 (5 lbf/in^2) pressure.

26. The valves prevent any loss of fluid when the engine supply feeds are disconnected and the fuel pumps are switched off. The valve opening pressure is greater than that of the gravity head in the system.



1 Valve plug
2 Locking wire
3 Inlet adaptor, right
4 Valve body
5 Inlet adaptor, left
6 Valve seat
7 Drain spout
8 Valve cone

Fig 6 Drain valve

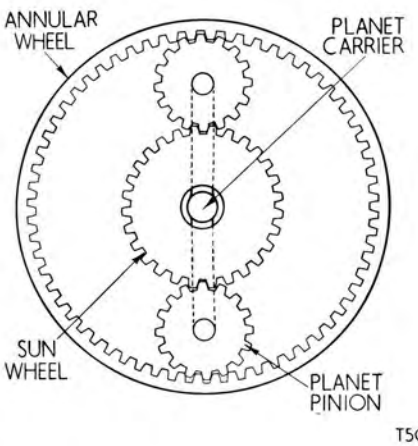


Fig 6 Simple epicyclic gear train

OPERATION OF A SIMPLE EPICYCLIC GEAR TRAIN

23. Each train in the compound change-speed train is a simple epicyclic gear train (Fig 6) comprising an annular wheel and a sun wheel geared together by equally spaced planet pinions freely mounted on pins secured to a planet carrier.

24. When the sun wheel is held by a brake and the annular wheel is driving, as in Fig 7(a), the planet carrier is driven in the same direction as the annular wheel at a speed equal to:-

$$\frac{\text{Revs of annular wheel x number of teeth on annular wheel}}{\text{Sum of teeth on annular and sun wheels}} = F_1 \text{ revs}$$

25. When the annular wheel is held and the sun wheel is driving, as in Fig 7(b), the planet carrier is driven in the same direction as the sun wheel at a speed equal to:-

$$\frac{\text{Revs of sun wheel x number of teeth on sun wheel}}{\text{Sum of teeth on annular and sun wheels}} = F_2 \text{ revs}$$

26. When the annular wheel and the sun wheel are driving in the same direction as in Fig 7(c), the planet carrier will be driven in the same direction at a speed equal to $F_1 + F_2$ revs.

27. Should the annular wheel and sun wheel be driving in opposite directions as in Fig 7(d), the planet carrier will be driven in the same direction as the annular wheel when F_1 is greater than F_2 , ie when the speed of the annular wheel exceeds:

$$\frac{\text{Speed of sun wheel x number of teeth on sun wheel}}{\text{Number of teeth on annular wheel}}$$

Operation of change-speed gear trains

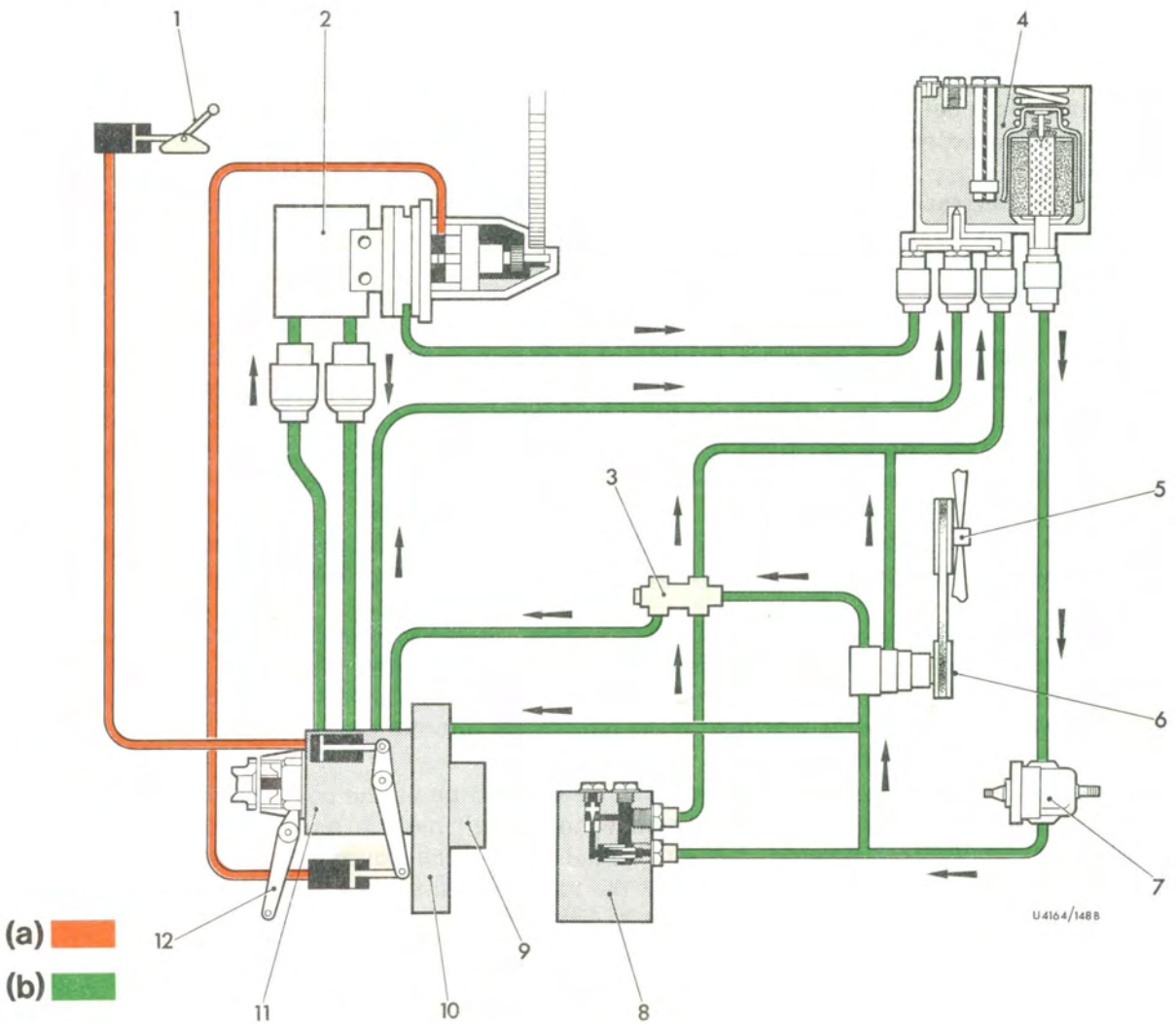
28. A diagram of the gear trains in Fig 8 shows how the trains are interconnected. The sun wheels of trains 1, 2 and 3 (also described as the 1st, 2nd and 3rd trains), are integral with a gear which is driven as a constant ratio of the engine speed. The 3rd train planet carrier is integral with the 2nd train annular wheel while the planet carriers of the 2nd and 1st trains and that of the high train are integral with each other. The sun wheels of the high (H), reverse (R) and low (L) trains are also integral with each other and with a brake drum. Another brake drum is attached to the reverse train planet carrier. The annular wheels of the reverse and low trains are shown as an integral unit and the high train annular wheel and low train planet carrier as both being integral with the cross-shaft. Finally, each train is surrounded by a brake.

AUTOMOTIVE HYDRAULICS

GENERAL

1. The automotive hydraulic system shown diagrammatically (Fig 1) is provided to start the main engine when cold, or if the hull main batteries are in a low state of charge. The system also operates the left fan of the power pack to cool the generating unit engine when it is run independently for long periods .

2. The variable delivery hydraulic pump (11) is driven by the generating unit engine through a dog clutch. The pump supplies the fixed capacity hydraulic starter motor (2) with fluid at a flow and pressure dependent upon the load required to turn the main engine. The pump delivery is varied automatically to suit the load.



1 Starter motor control lever
2 Hydraulic starter motor
3 Low pressure relief valve
4 Reservoir
5 Main engine left fan
6 Fan motor
7 Boost pump
8 High pressure relief valve
9 Hydraulic pump relief valve
10 Stroke control valve
11 Hydraulic pump
12 Clutch control lever

(a) Hydraulic control circuit
(b) Hydraulic starting and fan drive circuit

Fig 1 Hydraulic circuit (diagrammatic)

TRANSMISSION

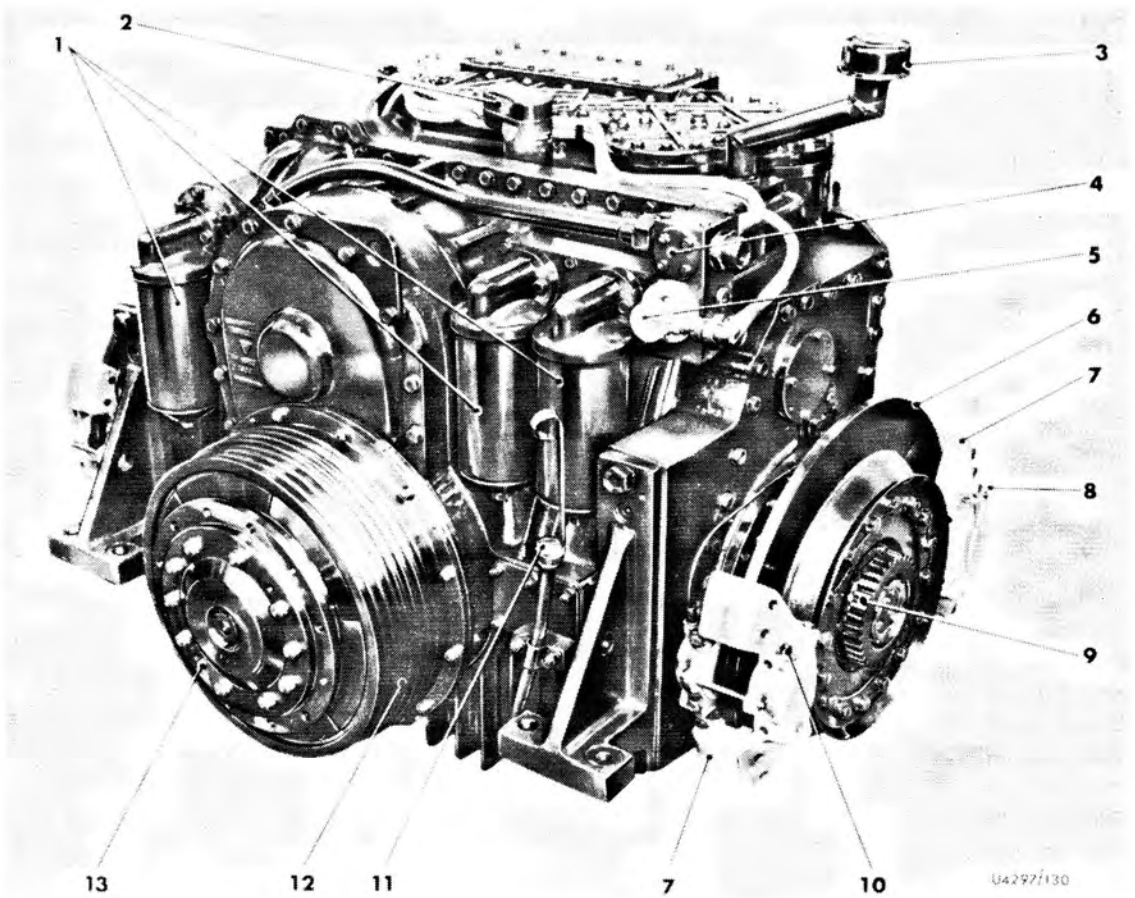
GENERAL

1. The power of the engine is transmitted rearward through a flexible coupling, gearbox, quill shafts to the final drives. The main and parking brakes are fitted to the final drives. Steering brakes are fitted at the sides of the gearbox.

GEARBOX

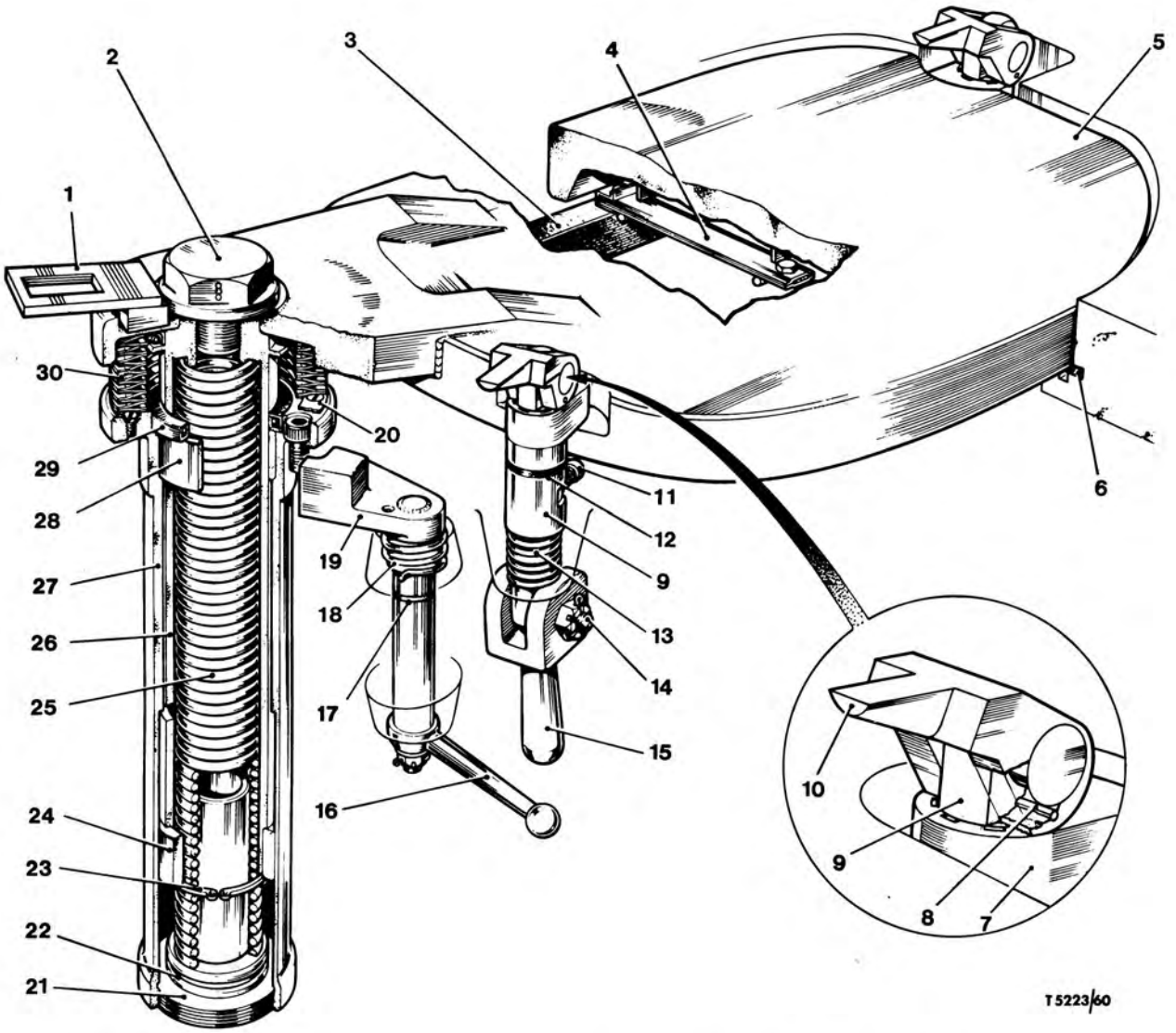
2. The TN12 gearbox combines the Wilson gear-change principle with a Merritt steering system, housed in an aluminium alloy casing, and provides six forward and three reverse ratios. Oil operated band brakes are used to hold the reaction members of the gear trains.

3. By means of an input driven pump, oil pressure for gear engagement is available whenever the engine is running. Thus the take-up of the drive from rest is confined to a centrifugal clutch thereby reducing the duty of the gear change bands. Oil pressure for gear engagement is also provided by an output driven pump which, in conjunction with a ramp and roller type free wheel, permits tow starting.



1 Oil filters
2 Hydraulic governor
3 Filler/breather
4 Temperature switch connecting block
5 Oil pressure switch block
6 Steering brake disc
7 Steering brake caliper
8 Brake pipe adaptor
9 Output coupling
10 Bleed nipple
11 Dipstick
12 Clutch drum
13 Input flange

Fig 1 Three-quarter front view of gearbox



1 *Padlock hasp*
2 *Securing screw*
3 *Driver's shoulder pad*
4 *Strap*
5 *Door*
6 *Door seal*
7 *Clamp arm*
8 *Shear pin*
9 *Clamp spindle*
10 *Release cam*
11 *Plunger*
12 *Seal ring*
13 *Clamp spring*
14 *Clamp handle bolt*
15 *Locking lever*
16 *Door retaining catch lever*
17 *Seal ring*
18 *Catch return spring*
19 *Door retaining catch*
20 *Retaining ring*
21 *Thrust cap*
22 *Thrust bearing*
23 *Circlip*
24 *Bearing bush, lower*
25 *Lifting spring*
26 *Inner tube*
27 *Outer tube*
28 *Bearing bush, upper*
29 *Seal*
30 *Dust gaiter*

Fig 2 Driver's access door