CITROEN

Supplement

to the brochure

Hydraulic System DS.19

Hydraulic System ID.19

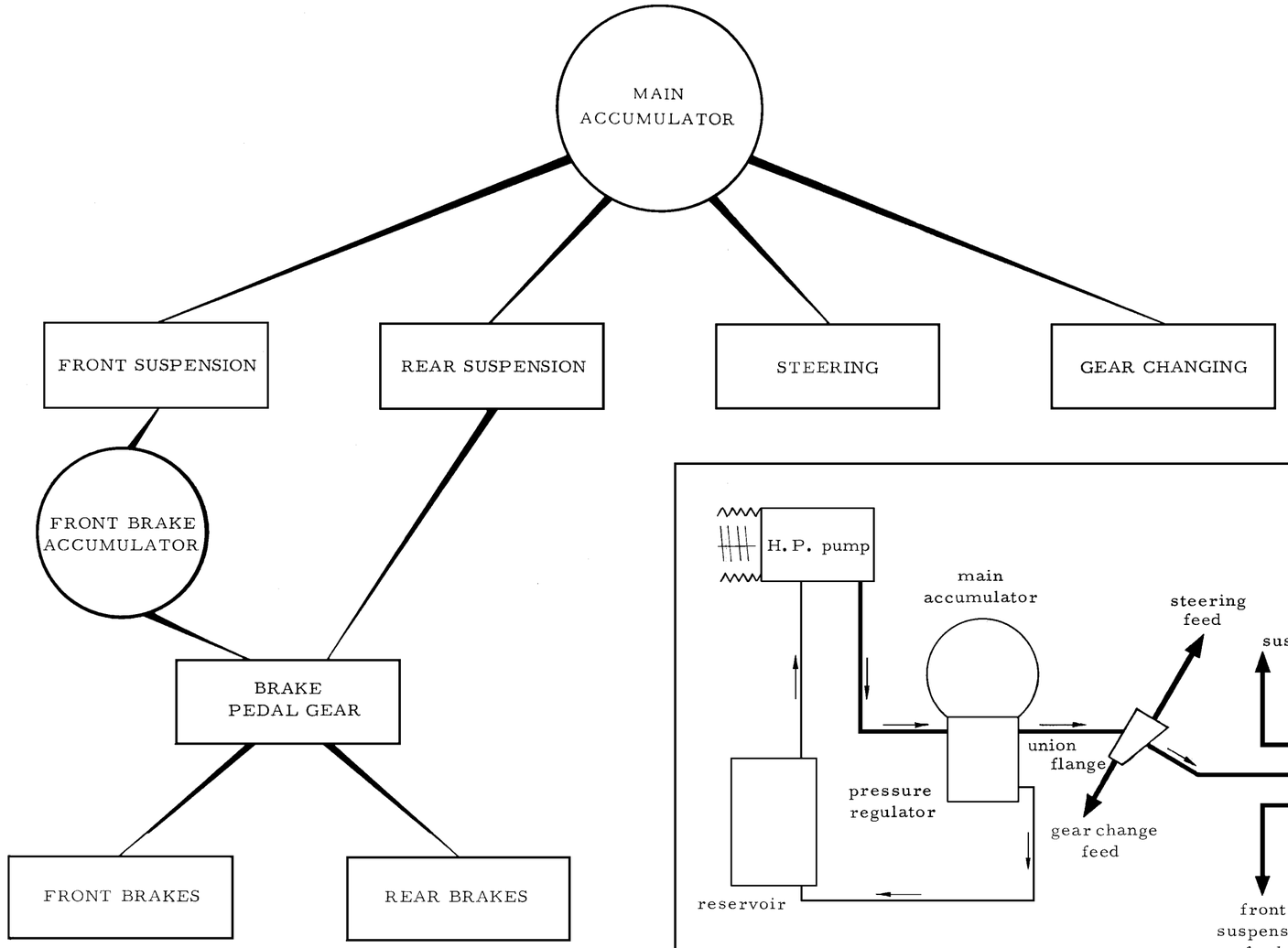
SUPPLEMENT

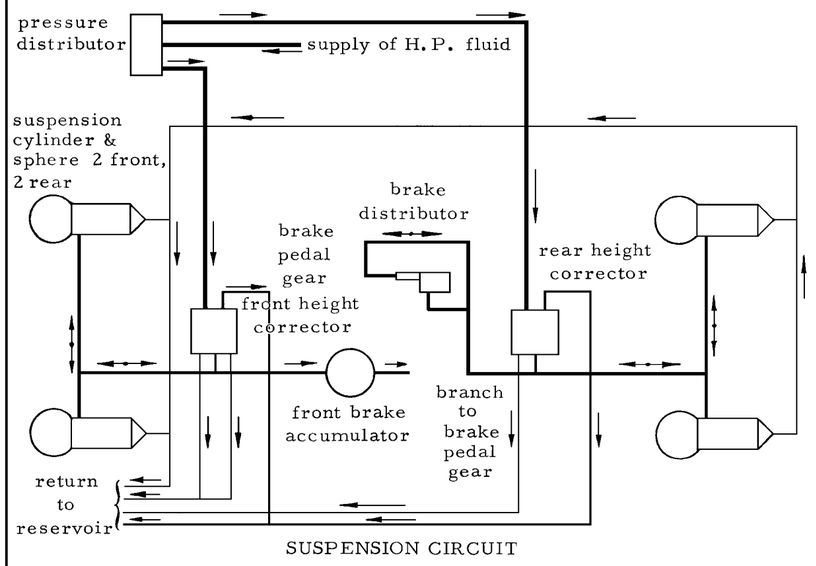
TO THE BROCHURE "HYDRAULIC SYSTEM DS 19"

"HYDRAULIC SYSTEM ID 19"

The purpose of this supplement is to show the significant modifications, which appear in the assembly drawings.

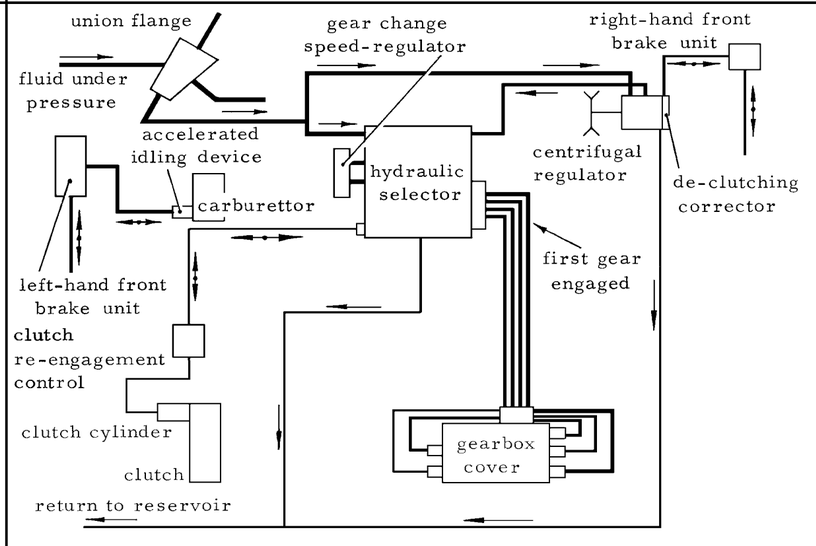
The diagrams and the new plates show the differences between the circuits of the DS 19 and those of the ID 19.





SUSPENSION CIRCUIT

PRESSURE RESERVE



GEAR - CHANGE CIRCUIT

DS.19

HYDRAULIC CIRCUITS

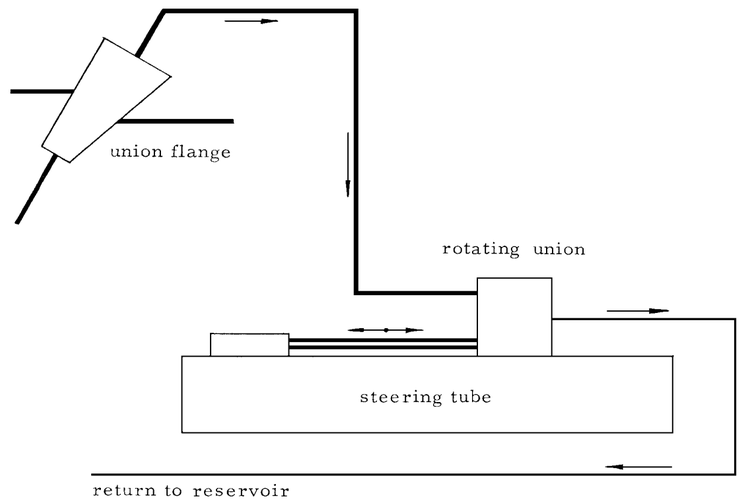
DS 19 since August 1960

HIGH-PRESSURE FLUID

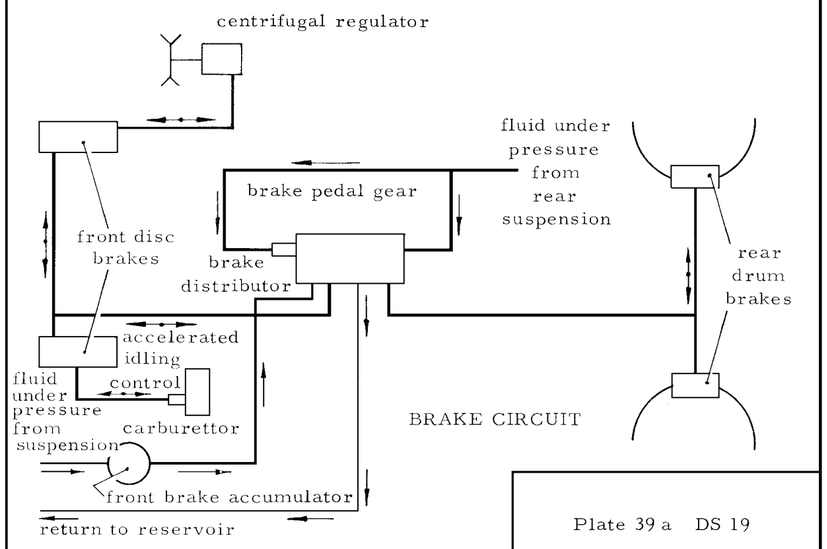
SERVICES

RETURNS AFTER USE

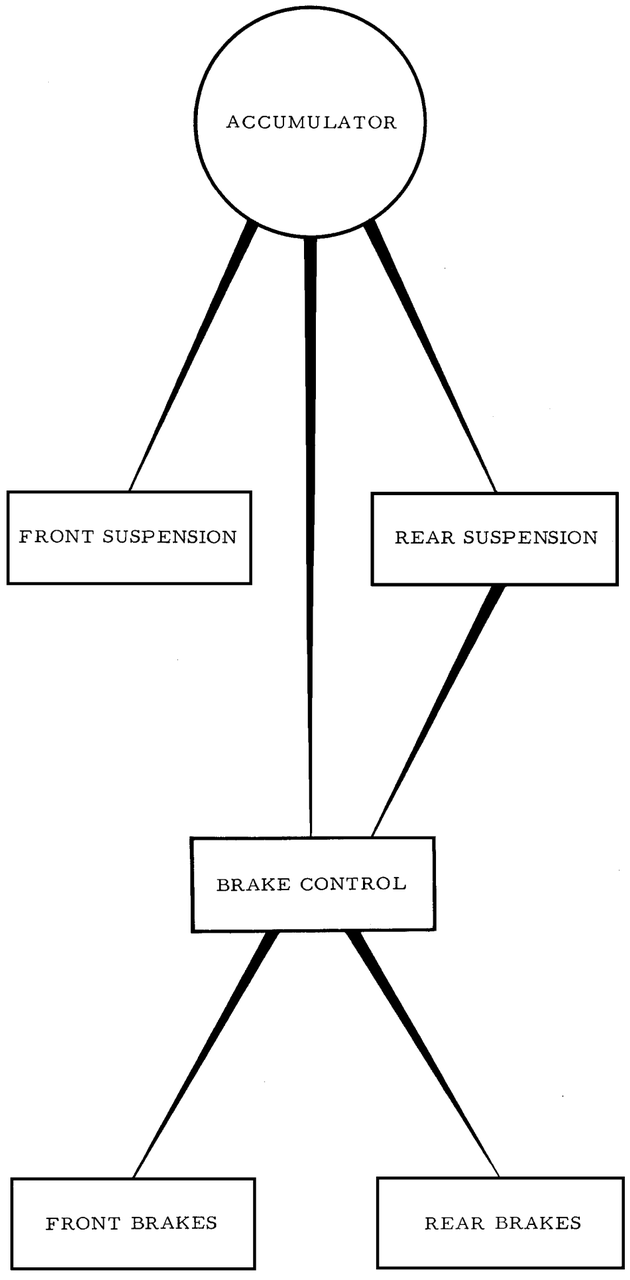
OVERFLOW RETURNS

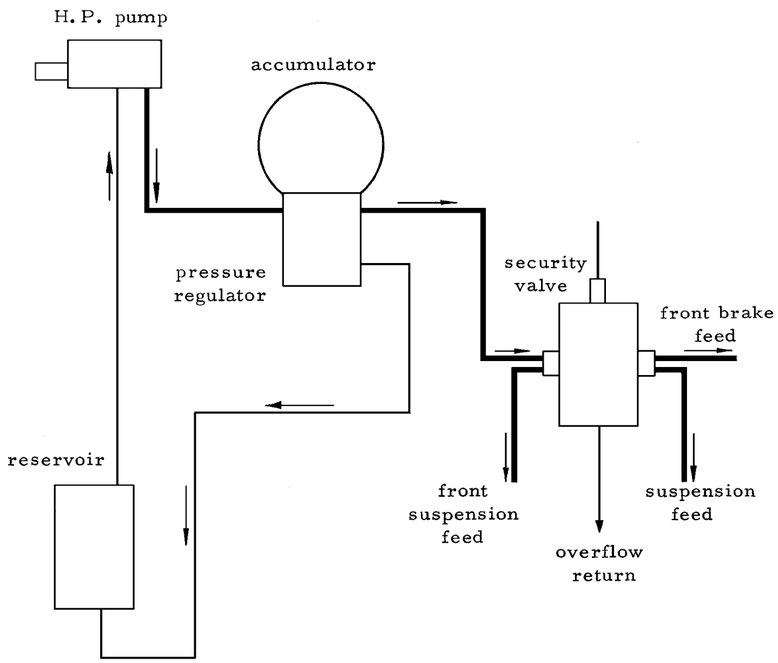


STEERING CIRCUIT

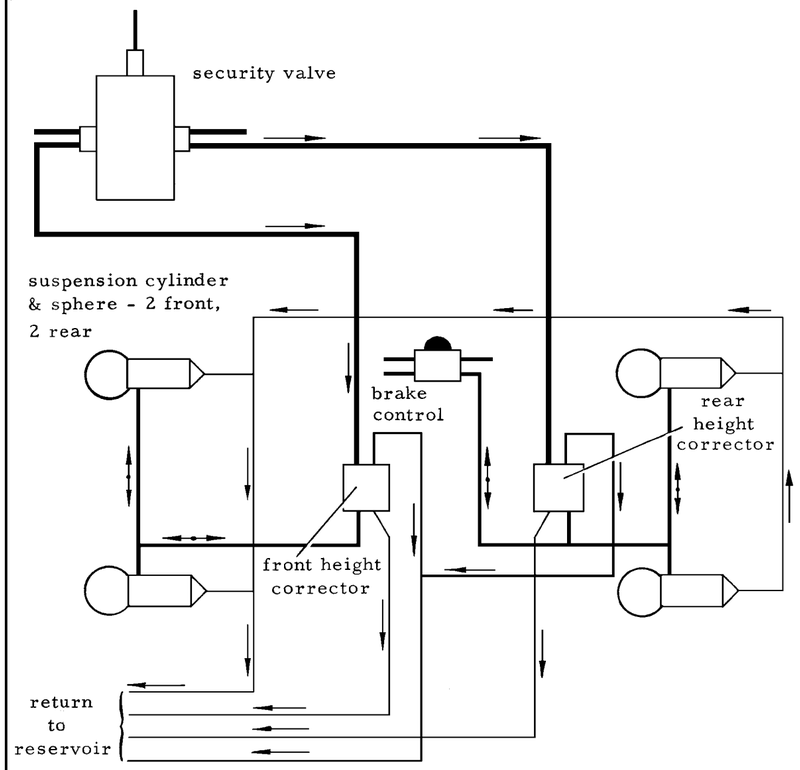


BRAKE CIRCUIT





PRESSURE RESERVE



SUSPENSION CIRCUIT

ID.19

HYDRAULIC CIRCUITS

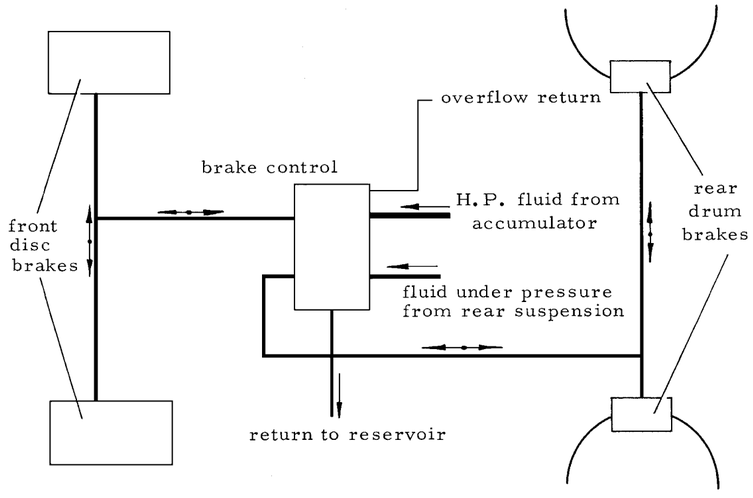
ID 19 since August 1961

HIGH-PRESSURE FLUID

SERVICES

RETURNS AFTER USE

OVERFLOW RETURNS



BRAKE CIRCUIT

LEFT-HAND REAR BRAKE

REAR HEIGHT CORRECTOR

articulated piping

LEFT-HAND REAR SUSPENSION SPHERE

LEFT-HAND REAR SUSPENSION CYLINDER

PRESSURE DISTRIBUTOR

to hydraulic unit

to steering

FRONT HEIGHT CORRECTOR

RESERVOIR

outlet to H. P. pump

MAX MIN

steering return

return

from pressure regulator

hydraulic unit return

FRONT BRAKE PRESSURE CUMULATOR

LEFT-HAND FRONT SUSPENSION CYLINDER

LEFT-HAND FRONT SUSPENSION SPHERE

LEFT-HAND FRONT BRAKE UNIT

HYDRAULIC BRAKE CONTROL

ACCELERATED IDLING DEVICE
before February 1961

since February 1961

to hydraulic gear selector

high pressure from hydraulic unit

bleeds

CENTRIFUGAL REGULATOR

overflow

RIGHT-HAND REAR SUSPENSION SPHERE

RIGHT-HAND REAR SUSPENSION CYLINDER

articulated piping

RIGHT-HAND REAR BRAKE

RIGHT-HAND FRONT SUSPENSION SPHERE

RIGHT-HAND FRONT SUSPENSION CYLINDER

RIGHT-HAND FRONT BRAKE UNIT

NOMENCLATURE

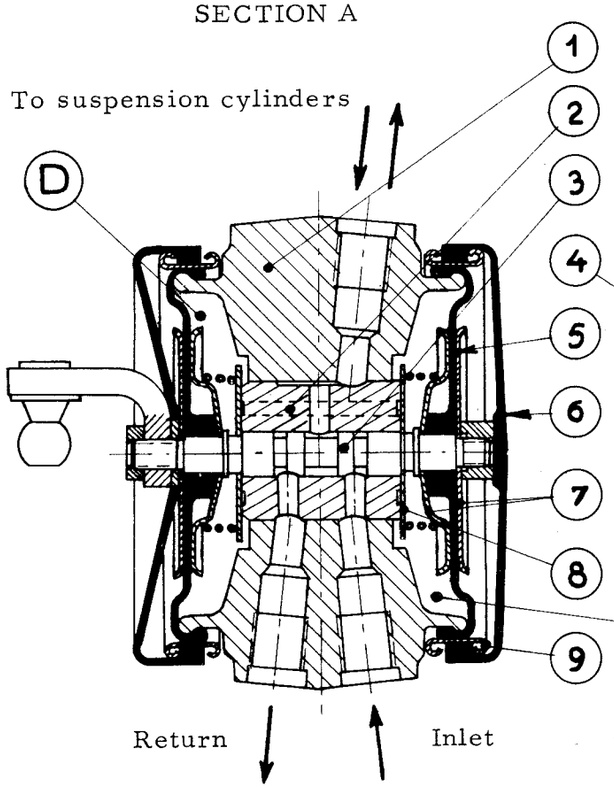
for the hydraulic brake control

1 rear-brake system
2 brake-distributor supply
3 rear-brake supply
4 hydraulic-brake-control return
5 front-brake supply
6 front-brake system

SUSPENSION AND BRAKING CIRCUIT

from August, 1960

SECTION A



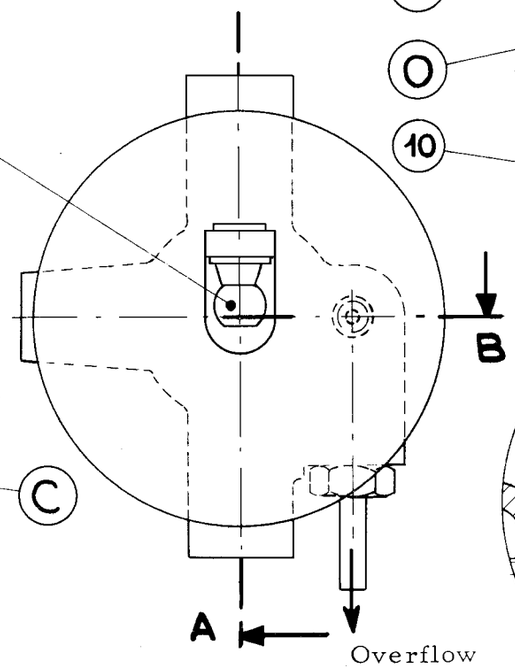
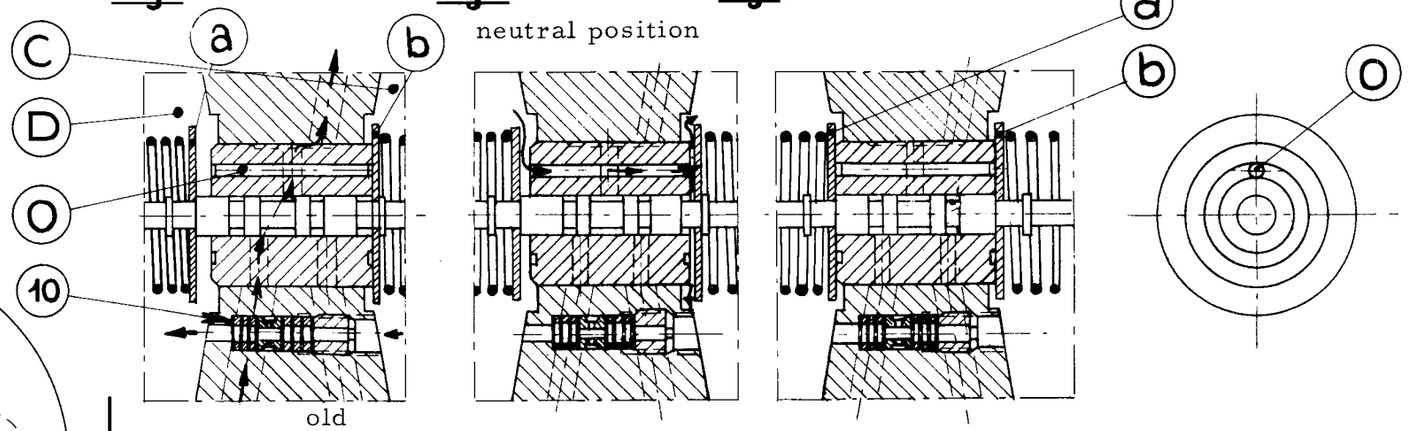


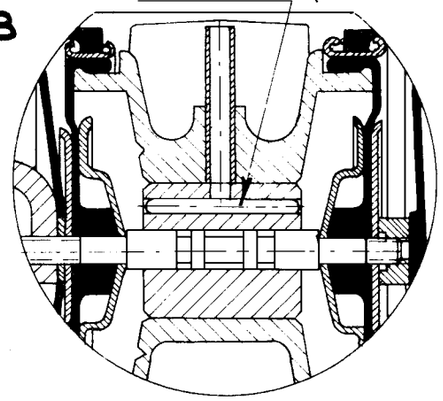
Fig 1: Inlet

Fig 2: Return to neutral position

Fig 3: Neutral position

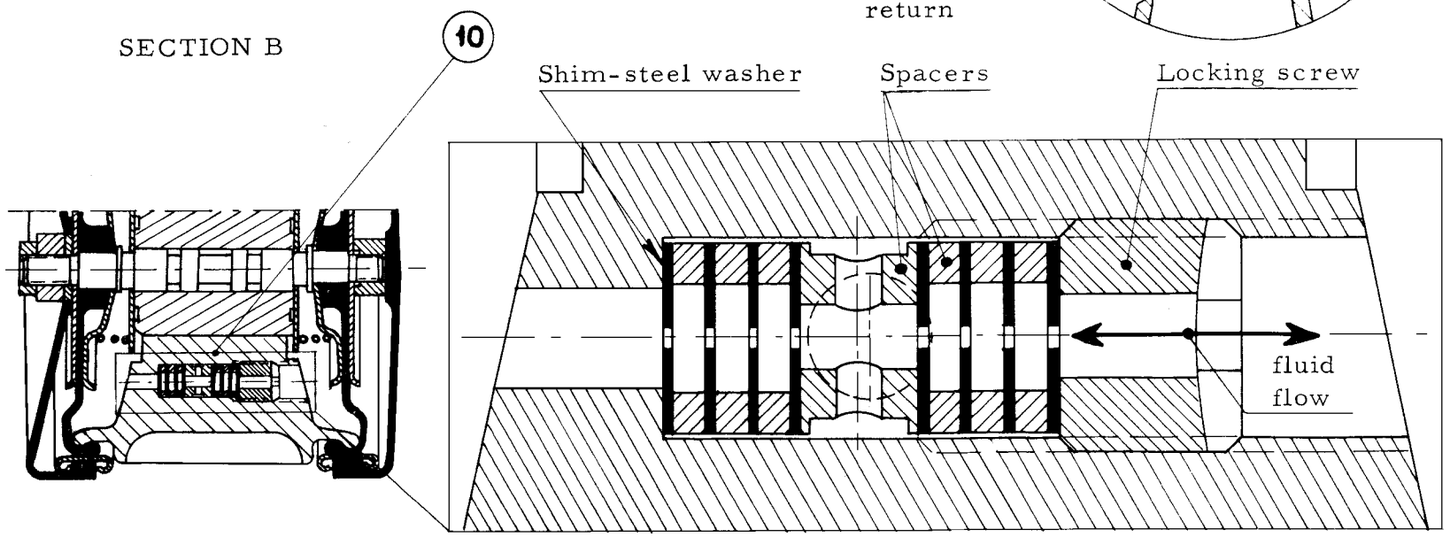


old dashpot (before August 1962)



Hole in sleeve partially blocked by curved needle

SECTION B



Scale 5 : 1

DASH-POT - SLIDE VALVE DAMPING

Operation:

When the slide valve is acted on in either direction - i.e. tends to move away from the neutral position (fig. 1) (inlet direction in the example chosen) the valve (b) is hard up against the surface of the sleeve of the corrector, blocking the smooth hole (O) connecting chambers (C and D)

The fluid contained in chamber (C) is then constrained to pass through the dash-pot (10) consisting of washers with small holes drilled in them (separated by spacers) causing the fluid to undergo a considerable restriction; this has a significant damping effect on the slide valve, which is thus unable to apply sudden and repeated corrections. When the slide valve returns towards the neutral position, the fluid contained in chamber (D) will no longer use the same path to enter chamber (C) but will pass through the smooth hole (O) no longer obstructed by valve (a), which is resting on the shoulder of the slide valve; hence a "clean" fast return to the neutral position.

NOMENCLATURE

1	Body	4	Ball-pin end (for control)	7	Cup	10	Dash-pot
2	Sleeve	5	Flexible diaphragm	8	Valve	C & D	Chambers filled with fluid
3	Slide valve	6	Protecting cover	9	Retaining ring		

AUGUST 62.

HEIGHT CORRECTOR with rapid return

Plate 12 a

since February 1961

Section A

GEAR CHANGING

neutral - engine idling

fluid from brake pedal gear

ACCELERATED IDLING DEVICE

(disconnected)

adjusting screw tightened

H.P. inlet

to steering

GEAR CHANGE SPEED REGULATOR

CENTRIFUGAL REGULATOR

bleeds

overflow

selector slide valve

automatic-gear change-control slide valve

fluid from brake pedal gear

LEFT-HAND FRONT BRAKE UNIT

to pressure distributor

manual clutch control lock slide valve

HYDRAULIC SELECTOR

RIGHT-HAND FRONT BRAKE UNIT

CLUTCH RE-ENGAGEMENT CONTROL

return from height correctors

steering return

fluid from brake pedal gear

section A

The fluid return (from gears, clutch-control pistons and synchro delay device) takes place at the bottom of the unit through four longitudinal grooves in the selector slide valve

return from pressure regulator

RESERVOIR

to H.P. pump

GEARBOX COVER

CLUTCH CYLINDER

CLUTCH

2 1 4 3 AR

overflow return from suspension cylinders

return from brake pedal gear

overflow return from height correctors

Plate 25 a

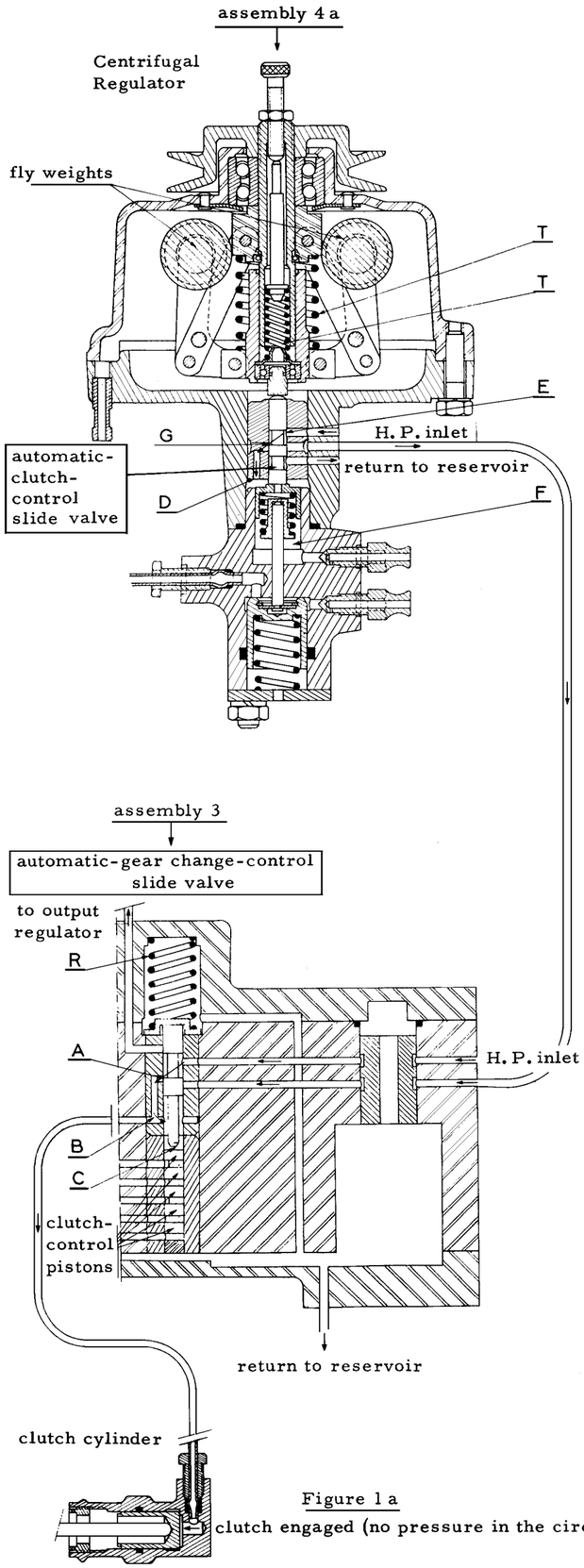


Figure 1 a

clutch engaged (no pressure in the circuits)

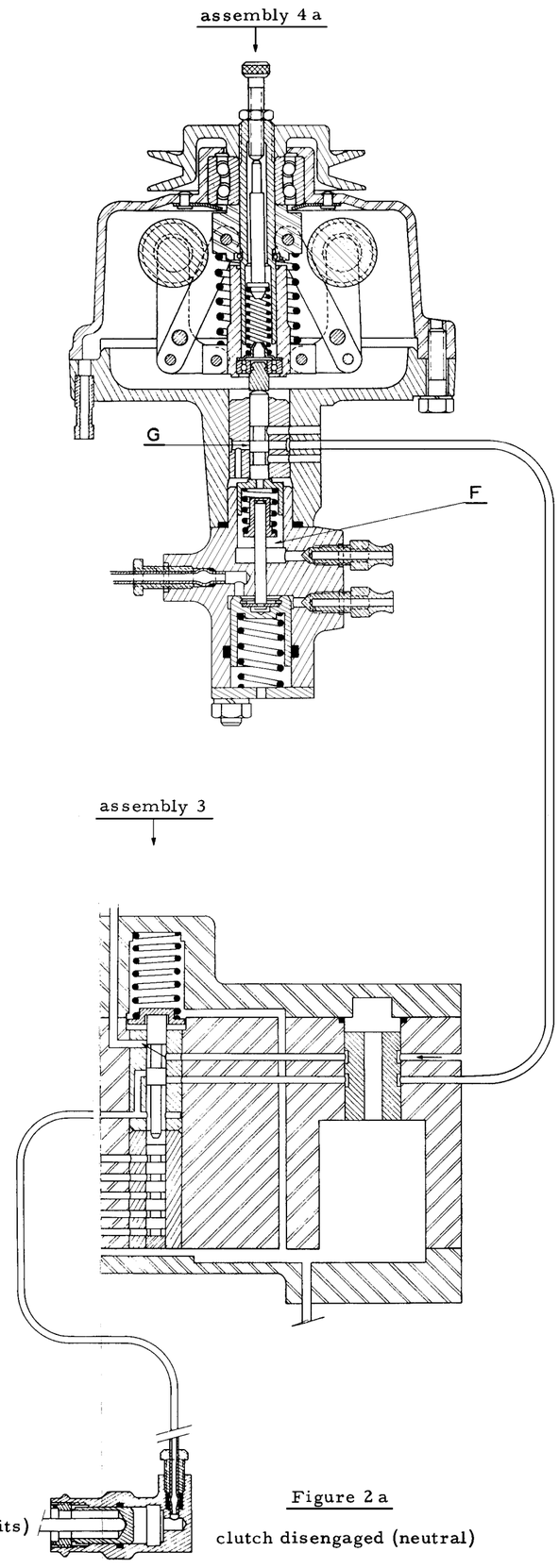


Figure 2 a

clutch disengaged (neutral)

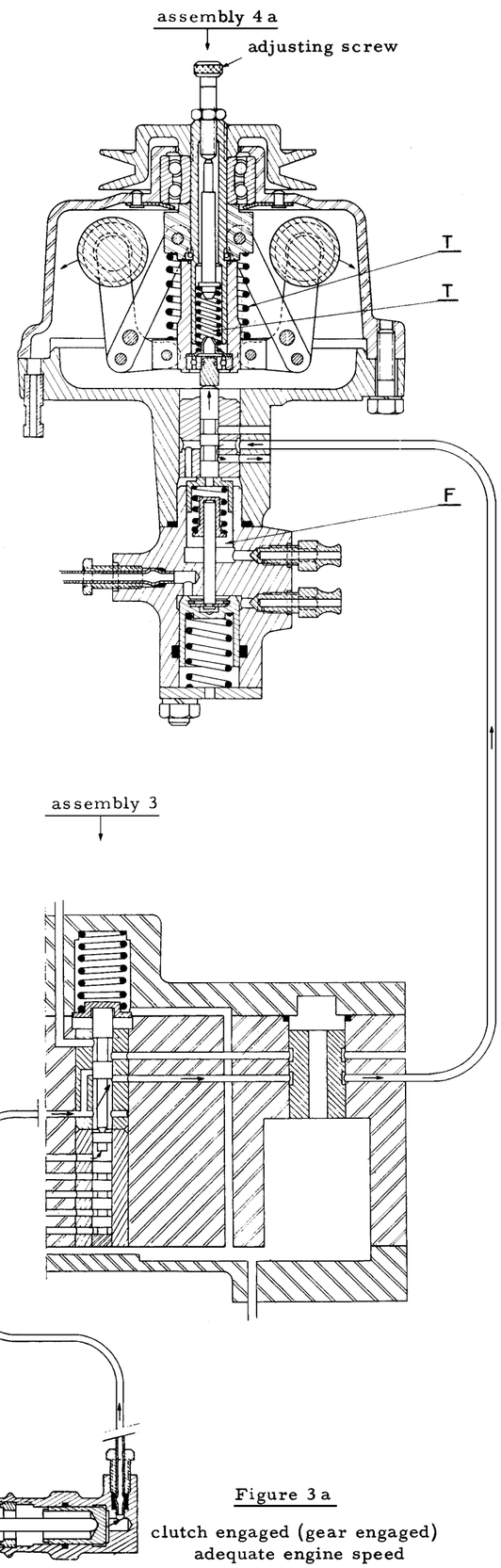


Figure 3 a

clutch engaged (gear engaged) adequate engine speed

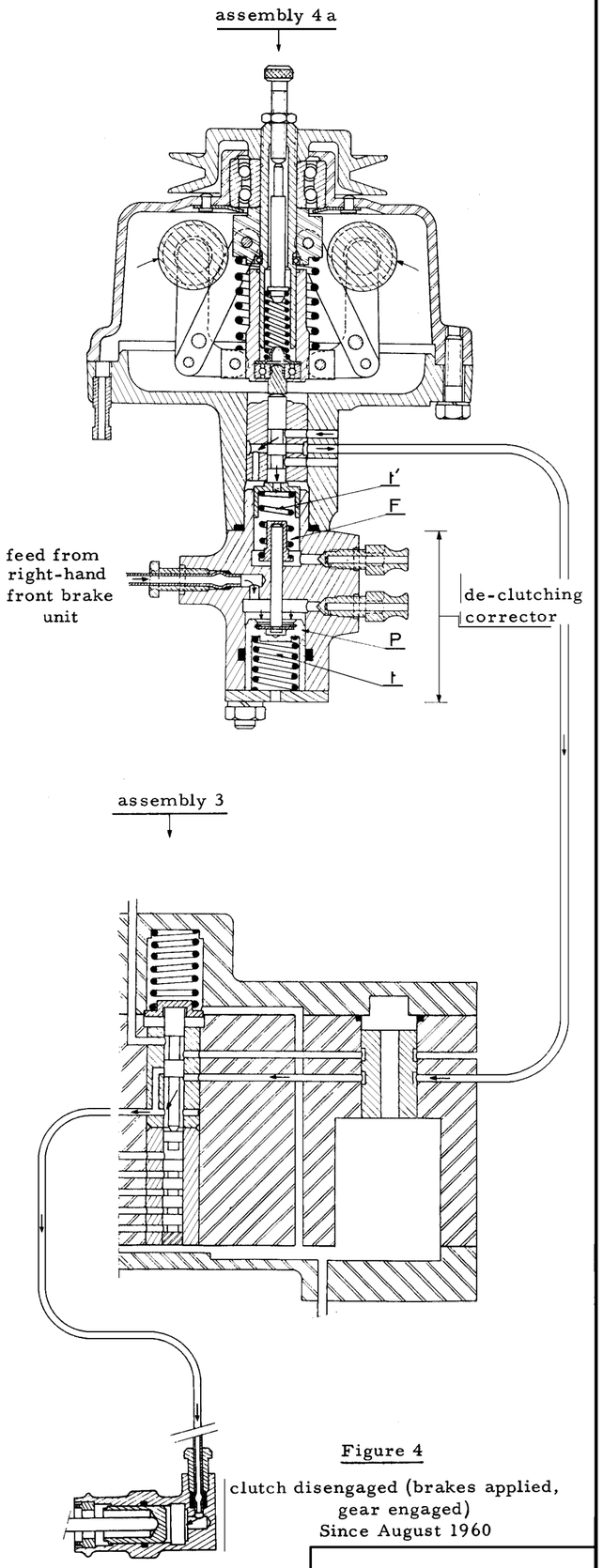


Figure 4

clutch disengaged (brakes applied, gear engaged)
Since August 1960

Plate 28 a

ADDITION TO PAGES 33 - 35 OF THE MANUAL ON THE HYDRAULIC SYSTEM

HYDRAULIC SERVO

Assembly 3 : no change

Assembly 4 a : (replaces assembly 4). See Pl. 28 a.

Centrifugal Regulator (C. R.)

Automatic-clutch-control slide valve - Flyweights.

The slide valve is controlled :

- by the high pressure : the slide valve takes up its position (fig. 1 a).

The fluid under pressure flows through duct (E-D) (passing round the cup) and acts on the underside of the top section of the slide valve; an assembly of calibrated springs (TT') - the mechanical part of the C. R. allows the high-pressure inlet at (G) to close when the pressure in chamber F is slightly higher than P_1 (see page 29, paragraph 'Clutch Mechanism').

- by the opening out of the flyweights of the C. R. under centrifugal force (fig. 3a); the slide valve moves.

Automatic clutch control (replaces the same paragraph on page 33).

The flyweights, opening out under centrifugal force, compress the springs (TT'); the automatic-clutch-control slide valve is then free; a direct connection is established between the hydraulic chamber of the C. R. and the reservoir.

Centrifugal regulator (replaces paragraph "low-pressure pump", page 35). See plate 40.

This is an assembly consisting of two parts, one hydraulic, the other mechanical.

The mechanical part, comprising the flyweights and springs, is driven at practically the same speed as the engine. The separation of the flyweights is therefore a function of engine speed.

Hydraulic part (see paragraph Assembly 4 a).

Adjusting the point at which the clutch engages (fig. 3 a) (clutch drag).

With the engine turning at about 750 r. p. m., the compression of spring T' is adjusted by means of its adjusting screw so that the pressure in chamber (F) (and so in the clutch cylinder) (the two being connected by the automatic-gear change-control slide valve) is equal to P_1), see page 29, paragraph "Clutch Cylinder".

The flexibility of the spring assembly (TT') is such that the clutch is fully engaged at 1200 r. p. m.

ADDITION TO PAGE 41

Brake applied with a gear engaged.

Example: 4th gear (see Pl. 33 & 28 a, fig. 4, for clutch part).

When the brakes are applied - and the vehicle amost stopped, or stopped - the clutch must be disengaged while the gear remains engaged.

Since the automatic-gear change-control slide valve is held in its top position, it cannot, in these circumstances, cause the clutch to be disengaged. As the engine speed drops, and the separation of the C.R. flyweights consequently decreases, the automatic-clutch-control slide valve is affected; it breaks the connection between the clutch cylinder and the reservoir, and so causes pressure P_1 to be re-established; the clutch is disengaged (in point of fact, this will be pressure P'_1, see next paragraph).

De-clutching corrector (giving $P'_1 > P_1$ - see Pl. 28 a, fig. 4).

- Improves the disengagement.

The de-clutching corrector (fitted at the end of the hydraulic part of the C.R.) is connected to the right-hand front brake unit.

When the brakes are applied (main brakes) the fluid under pressure acts on the surface of piston P, which compresses the spring (t). Spring (t') is released and the force it exerts decreases.

To compensate for this loss and to hold the automatic-clutch-control slide valve in the same position, the pressure in chamber F rises above P_1, i.e. to P'_1.

Note: If P_1 = 430 lb/sq.in. (30 kg/cm^2)

P'_1 = 570 lb/sq.in. (40 kg/cm^2)

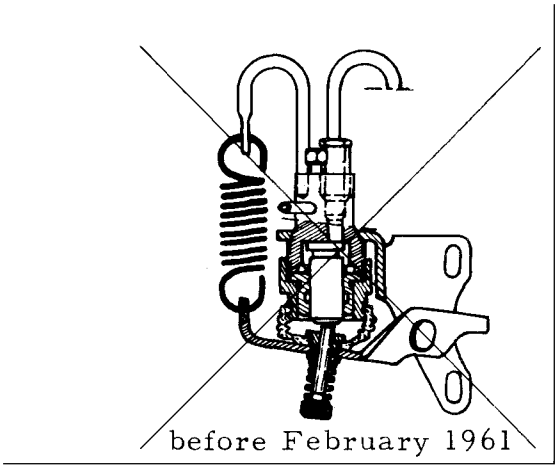
the difference between P_1 and P'_1 is always about 140 lb/sq. in. (even when the brakes are only lightly applied).

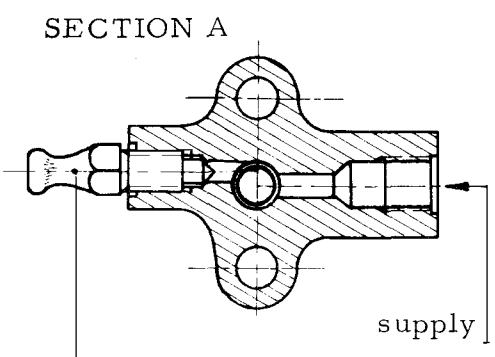
RELATIONSHIP
BETWEEN ENGINE SPEED
AND CLUTCH OPERATION (starting)
(ADDITIONAL INFORMATION: SPECIFIC EXAMPLE)

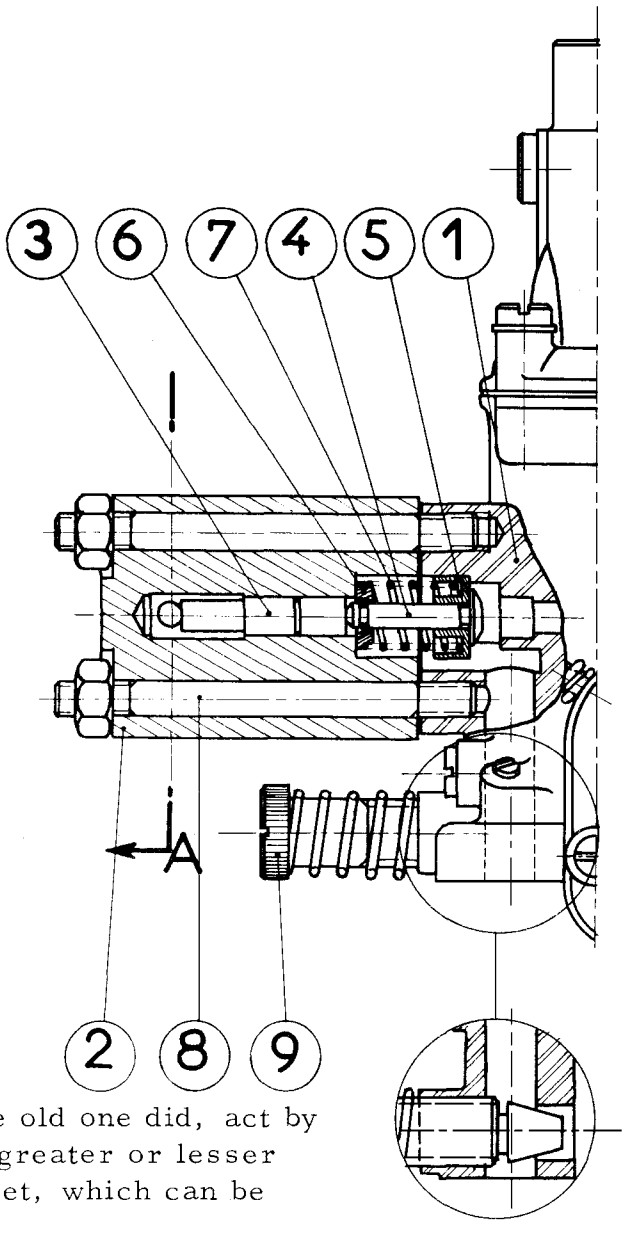
ENGINE SPEED r.p.m.	ENGINE SPEED Description	CLUTCH CYLINDER Pressure in lb/sq.in.	CLUTCH Position	Hydraulic Selector Gear-Selector Position	REMARKS
Any engine speed or engine stopped		850-925	Clutch out	Neutral	Vehicle stopped.
≃550	Normal slow running	≃ 425	Clutch out	Any gear engaged	Foot on main brake, as for example, when the vehicle is ready to start.
≃725	"Drag" speed	≃ 325	Clutch "drag" the clutch plates are touching	e.g. 1st.	Brake released the vehicle starts to move.
≃925	Fast idling	≃ 140	Clutch "drag" harder than before	e.g. 1st.	Vehicle continues to move (slightly more torque transmitted than before)
≃1200		0	Clutch fully in	e.g. 1st	Foot on the accelerator. Maximum torque obtained.

NOTE: The pressures quoted may not be obtained on all DS cars, but will not be far from these figures.

- engine idling speed increases from 550 r.p.m. to 925 r.p.m. automatically when the main brakes are released, due to the action of the Accelerated Idling Device.







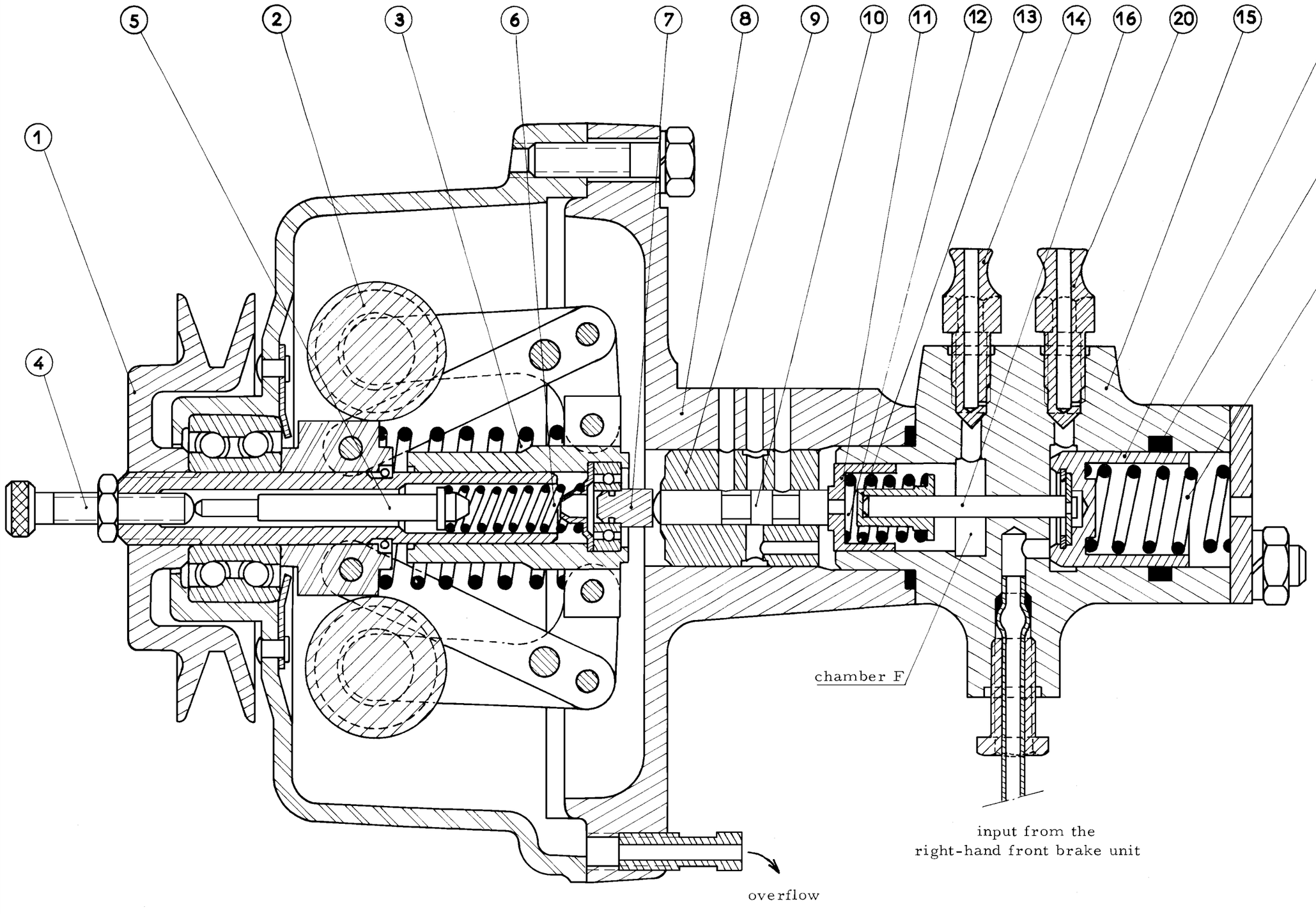
Note: This device does not, as the old one did, act by operating the butterfly valve to a greater or lesser extent, but through an additional jet, which can be brought into use or not.

10	bleed screw for left-hand front brake	6	cup
		5	cup
9	Adjusting screw for fast idling	4	valve
		3	piston
8	2 studs	2	body of accelerated idling device
7	return spring	1	carburettor

ACCELERATED IDLING DEVICE

Since February 1961

Plate 36 a

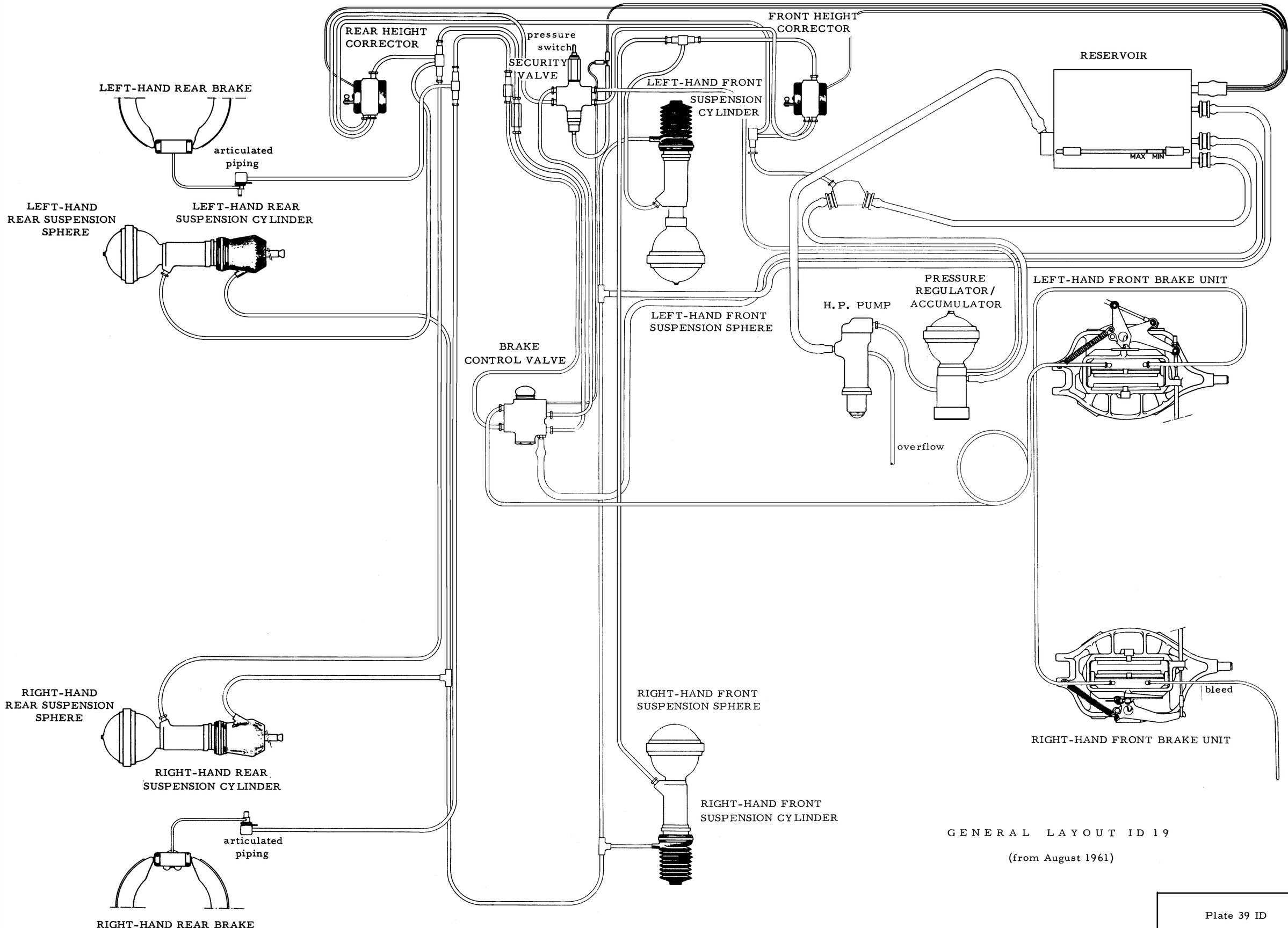


20	bleed screw (right-hand front brake unit)
19	seal
18	calibrated spring
17	piston
16	push-rod
15	body (de-clutching corrector)
14	bleed screw (chamber F)
13	push-rod guide
12	calibrated spring
11	cup
10	slide valve (automatic-clutch-control)
9	sleeve
8	body
7	pad
6	adjusting spring
5	push-rod
4	adjusting screw
3	calibrated spring
2	flyweight
1	driving pulley

Since August 1960

CENTRIFUGAL REGULATOR

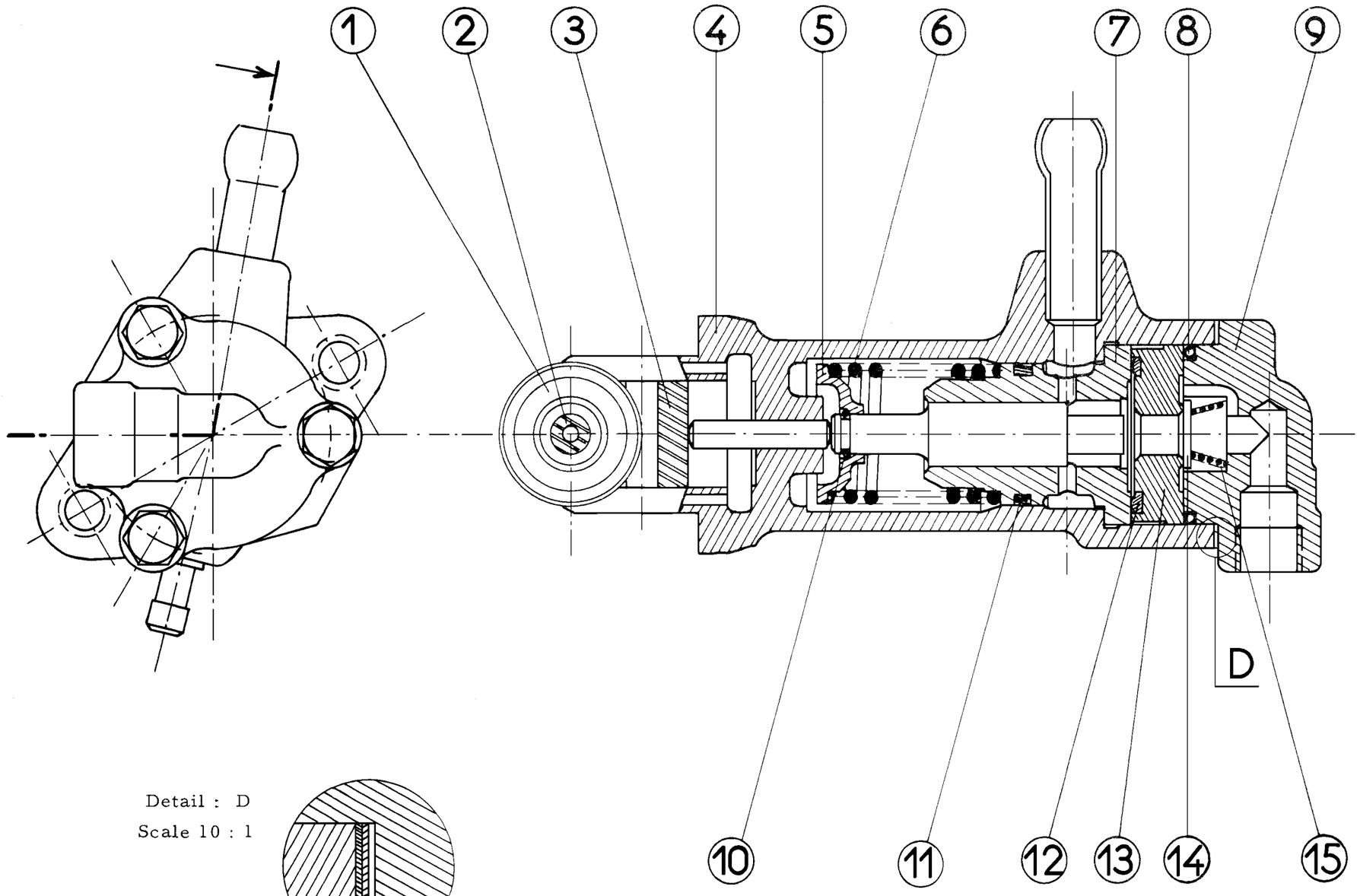
Plate 40



GENERAL LAYOUT ID 19

(from August 1961)

1	Roller
2	Spindle
3	Plunger
4	Body
5	Cup
6	Spring
7	Sleeve
8	Seal
9	Cap
10	Circlip
11	Seal
12	Seal
13	Seat
14	Valve
15	Spring
16	Shim



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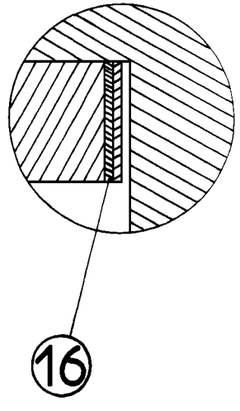
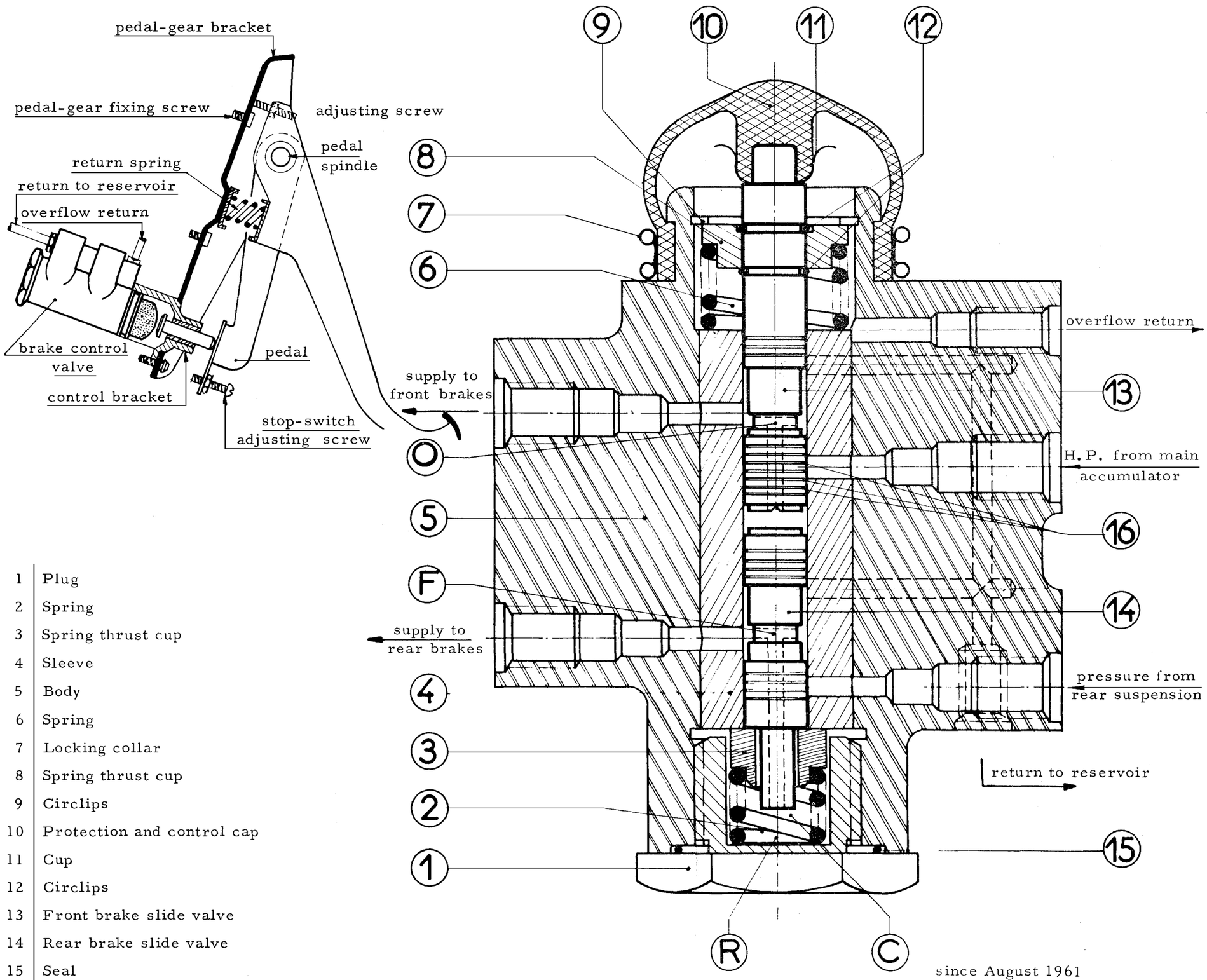


H.P. PUMP, SINGLE-CYLINDER ID 19

Plate 4 ID



1	Plug
2	Spring
3	Spring thrust cup
4	Sleeve
5	Body
6	Spring
7	Locking collar
8	Spring thrust cup
9	Circlips
10	Protection and control cap
11	Cup
12	Circlips
13	Front brake slide valve
14	Rear brake slide valve
15	Seal
16	Balancing grooves

since August 1961

PRINCIPLE

The front and rear braking circuits are independent. Each circuit has a pressure reserve.

Front brakes - main accumulator.
Rear brakes - rear suspension.

A mechanical control operates two distributor slide valves fitted one above the other.

The fluid under pressure is shared out and directed to the brake cylinders.

OPERATION

Pressure on the pedal is transmitted to the first slide valve, which drops, connecting the main accumulator with the front brakes. At the same time the liquid under pressure passes through orifice (O). The second slide valve drops, so connecting the rear suspension with the rear brakes.

This second slide valve communicates with chamber C through orifice (F). A back-pressure thus set up on the underside of the bottom section of the slide valve is added to the back-pressure contributed by spring (R), so that the pressure delivered to the brakes is proportional to the pressure the driver has exerted on the pedal, and it is a simple matter to control the braking effort. To increase the braking effort, the pressure on the brake pedal (always proportional to the braking effort) must be increased.

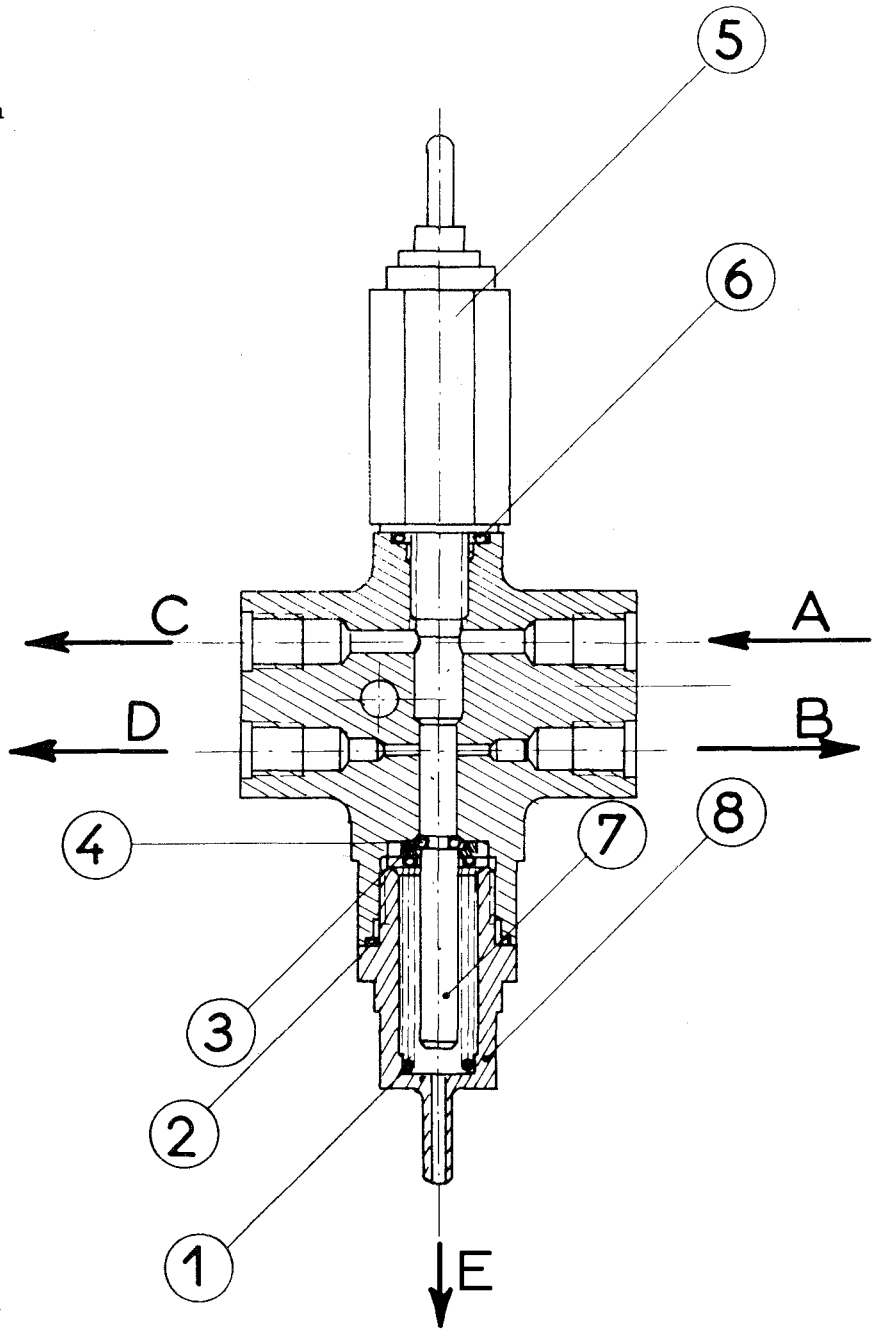
NOTES: If the brakes are applied as hard as possible, the pressure delivered will be: - the pressure in the main accumulator for the front brakes.

- the pressure in the rear suspension for the rear brakes. This pressure will be a function of the load the vehicle is carrying.

N. B. The second slide valve will drop, as determined by the first, when the pressure in the front brakes has reached about 57 lb/sq. in. This greater pressure will always ~~occur~~ first on the front brakes.

1	Spring
2	Seal
3	Cup
4	Circlip
5	Pressure switch
6	Seal
7	Slide valve
8	Plug

from August 1961 onwards



E	Overflow return
D	To suspension
C	To brake pedal
B	To suspension
A	From pressure regulator/accumulator

Addition to plate showing braking system; replaces pressure distributor

SECURITY VALVE ID

Plate 22 a ID

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