

SEPTEMBER 1954.

15 GH CAR HYDROPNEUMATIC SUSPENSION.

Front: Longer torsion bars and an anti-roll bar.

Rear: The normal torsion bar has been replaced by a piston compressing by means of a liquid, gas enclosed in an air tight chamber.

DESCRIPTION OF THE REAR SUSPENSION.

Consisting on each side of:

- an arm pivoting with the wheel,
- the cylinder and its piston connected to the pivoting arm by a lever,
- a sphere and a shock-absorbing arrangement fixed to the end of the cylinder,
- an anti-roll bar connected to the pivots of the two arms.

this system is fed and controlled by:

- a fluid supply reservoir and its filter,
- a high pressure pump,
- a control valve,
- an accumulator in one piece with the control valve,
- an isolating valve,
- a height corrector.

FUNCTION OF EACH COMPONENT.

Reservoir: This reservoir is fitted with a filter. The liquid used is the same as that used for the hydraulic brakes. You can obtain it from our Spare Parts Department.

High Pressure Pump: Takes the liquid from the reservoir and compresses it in an accumulator. It comprises seven pistons operated by a swash plate. The pump is driven from the engine by a vee belt.

Control Valve: Controls the pressure of the pump, between two limits. It is placed between the pump and the accumulator. Above the top pressure limit the liquid from the high pressure pump returns to the reservoir. At the lower pressure limit the output from the pump goes to the accumulator.

Accumulator: A reservoir receiving the liquid from the pump and feeding the suspension cylinders.

Isolating Valve: Placed between the accumulator and the height corrector. Allows the rear part of the suspension to be isolated and retain the car at its normal height when standing. The isolating valve is automatically put out of action when first declutching.

Height Corrector: This is a sliding valve allowing the rear height of the car to be held constant whatever the load, and to limit the movement of the arm by the inlet or outlet of liquid under pressure.

This component is placed between the accumulator and the suspension cylinders.

The movement of the sliding valve is controlled by a lever connection to a torsion rod. This rod is fixed at its two ends to the anti-roll bar.

Suspension Arrangement: Comprising a cylinder and a piston. The movement of the piston is tied up with the movement of the wheel.

At one end of the cylinder is fitted a sphere (pneumatic unit) fitted with a shock absorber comprising a system of valves.

The sphere contains gas under pressure.

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Anti-Roll Bars, Front and Rear: Conventional working. Further, at the rear the bar ensures the balance of the vehicle.

Control for Changing the Rear Wheel: A manual control working on the height corrector, raises or lowers the car and allows a crutch or stand to be placed under it, permitting the rear wheel to be changed.

REPAIRS.

I. FRONT SUSPENSION.

Torsion Bars: To replace a torsion bar, first remove the top conical buffers then proceed as for the other cars.

Anti-Roll Bar: The adjustment of the bar is correct when the end of the fixing screws on the lower arms is 0 ± 1 mm. from the top face of the locknuts (see fig. 1).

II. REAR SUSPENSION.

IMPORTANT REMARKS.

Cleanliness: Before any work is commenced carefully wash the car, or at least the part on which work is to be carried out.

The correct working of the suspension demands meticulous cleanliness in any work carried out. The tubes must be blocked up at each end immediately after removal, by means of plugs. Suitable plugs can be obtained from our Spare Parts Department. Also, block up the openings on the hydraulic components.

Pipe and components must be stored and protected from dust.

Preliminary Operations: Before any work is started on the hydraulic components or pipes, lower the pressure. Unscrew the bleeding screw 'A' located in front and at the bottom of the control valve. Place the control lever for changing wheels (situated in the rear boot, to the right) to the position 'BAS', the lock (4) being open.

- 1). **Reservoir (5).** This reservoir is fitted with a filter, the cleaning of this filter is done in alcohol. This applies also to the reservoir.

From time to time make sure that the filter is not blocked.

- Total capacity at the maximum : 2.100 litres.
- Capacity at the minimum : 0.600 litres.
- Between maximum and minimum : 1.500 litres.

This last quantity (1.5 litres) allows for several thousand kilometres running. Refill when the level approaches the minimum.

To drain the reservoir, disconnect the rubber return pipe from the control valve.

- 2). **High Pressure Pump (1).** (see fig. 3). If the pump is not working, return it to us without disassembly. A very slight leakage is admissible at the front gland. If the leakage is excessive you can replace the gland by removing the pulley without taking the pump off the engine.
- 3). **Control Valve (2).** (see fig. 4). No work on this component is possible. If it is not working, return it to us.
- 4). **Accumulator (3).** (see fig. 4). No maintenance. Only the gasket can be replaced. The accumulator is screwed on by hand.
- 5). **Isolating Valve (lock) (4).** (see fig. 5). No work can be done on this part.
- 6). **Height Corrector (6).** (see fig. 5). For its adjustment see the paragraph 'Adjustments' heights.

No work on the inside is possible. If it is not working return it to us. If replacing the height corrector, close the isolating valve to avoid emptying the reservoir.

With the height corrector in the position of rest, make sure that the control lever is parallel with the slot in the yoke. Set it if necessary.

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A dust cover protects the height corrector, a slight leakage is admissible in this component. The rear height of the car and correct functioning depend on the position of the corrector.

7). *Arrangement of the Suspension* (7). (see fig. 7). Comprising the pneumatic group, the cylinder and the shockabsorbers.

- a). *Pneumatic group*: The sphere is filled at a predetermined pressure at the Works. No work on this is possible.

The screwing and unscrewing of this sphere is carried out by hand. Leakage is prevented by a rubber gasket which can be replaced.

- b). *Shockabsorber*: A double valve screwed on to the sphere. In case of irregularity in the suspension make sure it is clean. Clean it in alcohol and with compressed air and replace it if necessary.

- c). *Cylinder*: Slight leakage is possible in working.

To remove it, remove the connecting pin 'B' (see fig. 2) withdraw the sphere, remove the piston rod.

Remove the cylinder from its bracket from the front by turning it through 180°.

8). *Unions* (see fig. 8). These unions are of a special type.

The union comprises a swelling in the tube and a rubber bush of accurate size, a nut compresses the rubber bush. No leakage occurs if the following assembly instructions are observed:

- 1). Make sure that the rubber bush is set back from 2 to 3mm. from the end of the tube.
- 2). Centre the tube in the bore by passing it through the centre of the hole (very important). Hold the tube in this position.
- 3). Tighten the nut moderately (a force of 0.8 to 1 m/kg).

This comparatively light tightening is sufficient to ensure absence of leaks. Excessive tightening is harmful and can cause leakage.

The rubber bushes must be protected as far as possible from light, heat and dust.

These bushes must be replaced whenever the pipe is disconnected.

- 9). *Liquid*. The liquid used is the same as employed for the hydraulic brakes. (It can be obtained from our Spare Parts Department). This liquid should be stored in its original containers and handled with the strictest cleanliness.

Never re-use liquid drained from a car in service.

- 10). *Bleeding*. After any work on the oil pipes, bleeding is carried out automatically.

- 11). *Anti-Roll Bar* (9). (see fig. 2). Fixed by clamps on the two arms.

III. **HYDRAULIC BRAKES.**

- 1). *Front brakes*: see Repair Manual.

- 2). *Rear Brakes*: for any work, the hub brake drum carrying the stub axle is removed by unscrewing the inside nut (remove the cap).

When re-assembling, be sure to use the same parts which are paired.

Any work carried out on the bearings of the hubs require special adjustment. Consult us.

- 3). The banjo union feeding the brake liquid, fixed on the arm *must never be disconnected*.

Replace the assembly of the pipe from the three-way union under the crossmember to the wheel cylinder, the banjo union is held on the arm by a lock screw.

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ADJUSTMENT OF THE SUSPENSION.

- 1). Make sure that the pressure of the tyres is correct:

- at the front : 1.6 kg/sq.cm.
- at the rear : 1.7 kg/sq.cm.

This is the working pressure whatever the load is.

We would remind you that the red mark on the cover must be located opposite the valve and to the outside of the wheel.

- 2). **Front Heights:** These are measured from under the tube supporting the torsion bar to the ground as near as possible to the front silentblocs.

Height = 251 ± 5 mm.

Make the adjustment as on other vehicles, after having uncoupled the front shock absorbers.

- 3). **Rear Heights** (see fig 9):

- a). **Adjustment:** The front heights being correct, uncouple the front shock absorbers. Release the handbrake.

Raise the car to 0.50m. approximately from the ground, support it under the rear door.

Remove from one arm the bump stop (rear buffer) and on the other arm the bounce stop (front buffer).

Drain the accumulator (see para. 2, Preliminary Operations). Put the wheel change control in the position 'BAS', move one of the arms up and down, so as to completely lose all pressure.

Fit in place of the front buffer (bounce stop) previously removed, the packing piece MR.4098 (see fig. 10).

Bear on the opposite wheel in order to put in place of the rear buffer previously removed, another packing piece MR.4098.

Put the wheel change control in the position 'ROUTE'. The control should be free in the yoke of the height corrector slide rod.

The cross rod must be free in its bearings and must not hinder the working of the slide rod.

Move the height corrector by distributing equally on either side of the lever, the play existing between this lever and the yoke. Fix the corrector valve. Remove the packings MR.4098 and put in their place the rubber buffers. Start the engine, put the wheel change control in the position 'HAUT'. Lower the vehicle to the ground. Put the lever back into the position 'ROUTE'.

- b). **Inspection:** Put the car on a flat, horizontal surface. With the engine ticking over put the wheel change control in the position 'HAUT', let the car stabilize itself.

Put back the lever in the position 'ROUTE', let the car stabilize itself. Check the height between the underside of the tubular crossmember and the ground.

Put the wheel change control in the position 'BAS'; let the car stabilize itself. Put the lever back in the position 'ROUTE', let the car stabilize itself. Check the height as above. The average of the two measurements should be 277 ± 5 mm.

If this is not the case move the height corrector in the suitable direction 1mm. of movement of the height corrector corresponds to a variation of 7mm. approximately of the height of the car.

- 4). **Caster:** This adjustment is made as on other vehicles.

- Caster angle = $1^{\circ} \pm 15'$

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- 5). **Camber and weights:** The camber should be from 0 to 4mm. on the diameter of the wheel, it is altered by modifying the front heights.

Adjustment of weights: see Service Manual.

- 6). **Steering Lock:** It should be from 33° to 34° : see Service Manual.

VERY IMPORTANT REMARKS.

If any work is necessary on the suspension you should advise us immediately (Telephone VAUgirard 72-10, Extension 470).

We will give you all the necessary advice regarding the repair, and will eventually send one of our Inspectors.

The following components:

- high pressure pump,
- control valve,
- accumulator,
- isolating valve,
- height corrector,
- suspension cylinders,
- suspension spheres,

are sealed ('Citroen' braid stuck by means of a special product).

These components must not be disassembled *under any circumstances. Their disassembly will automatically nullify the guarantee.*

In case of damage, return the complete component to us. There is no change in the method of returning these parts, which should be addressed as usual to 15 rue d'Alsace, Levallois, with the customary request for guarantee.

We ask you to be very precise in indicating the reasons for returning the parts, both in your correspondence and on the labels, which must be attached to each part.

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ADDITIONAL PARAGRAPH ON NOTE 600 DATED 26th JULY, 1954.

IV. ACCELERATOR CONTROL.

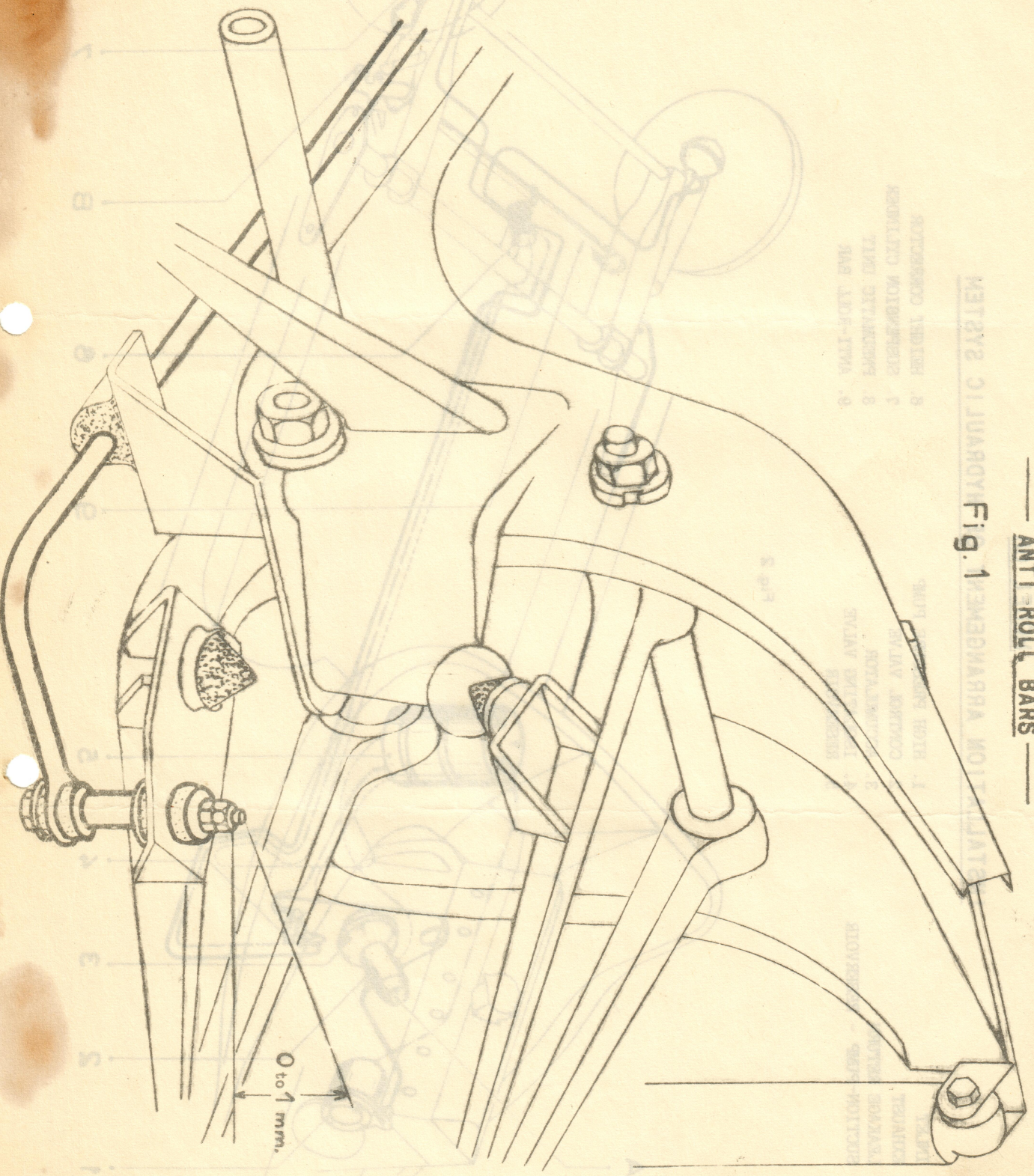
Modified to give more progressive pick-up.

Adjustment of slow running: with this new control, the adjustment must be made in the following manner (see fig. 11. Tech. Note No. 600) :-

- Uncouple the throttle control rod (2) from the rear ball pin (4).
- Loosen this ball pin.
- Adjust the volume control screw and the tick-over, as usual (500/550 r.p.m.).
- Slide the ball pin (4) to the rear. Tighten it lightly.
- Couple up the throttle control rod (2) and move the ball pin (4) forward in its slot, until the clearance between pivot pin (3) and the control rod (2) is between 1mm. and 1.5mm. This dimension will give the minimum lost motion on the accelerator pedal.
- Lock the ball pin.

— ANTI-ROLL BARS —

Fig. 1



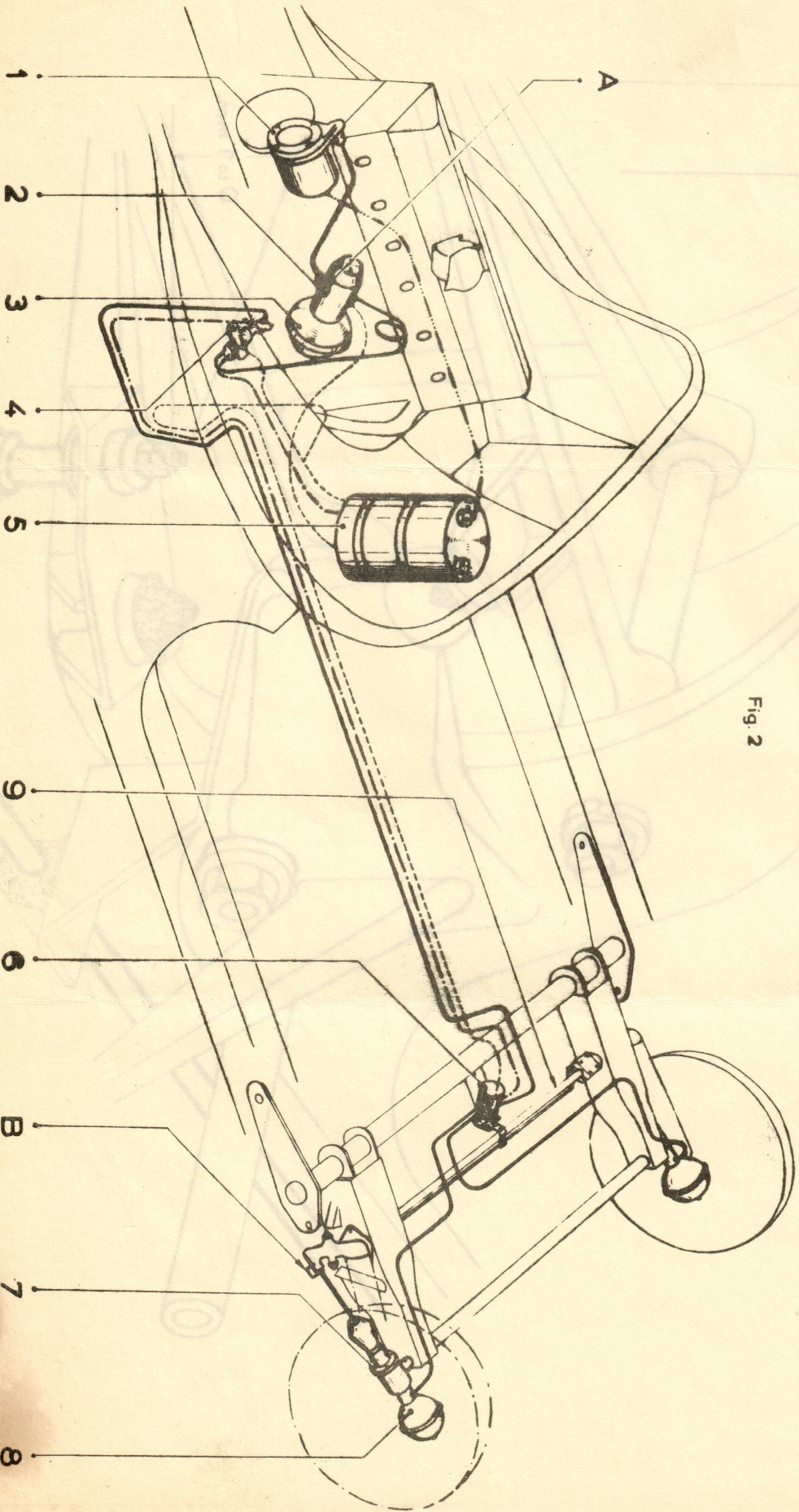
MODEL 6H

INSTALLATION ARRANGEMENT OF HYDRAULIC SYSTEM

— INLET
 --- EXHAUST
 - - - LEAKAGE RETURN
 - - - SUCTION-PUMP - RESERVOIR

1. HIGH PRESSURE PUMP
2. CONTROL VALVE
3. ACCUMULATOR
4. ISOLATING VALVE
5. RESERVOIR
6. HEIGHT CORRECTOR
7. SUSPENSION CYLINDER
8. PNEUMATIC UNIT
9. ANTI-ROLL BAR

Fig. 2



— PUMP —

Fig. 3

FLOW TO CONTROL VALVE

INLET

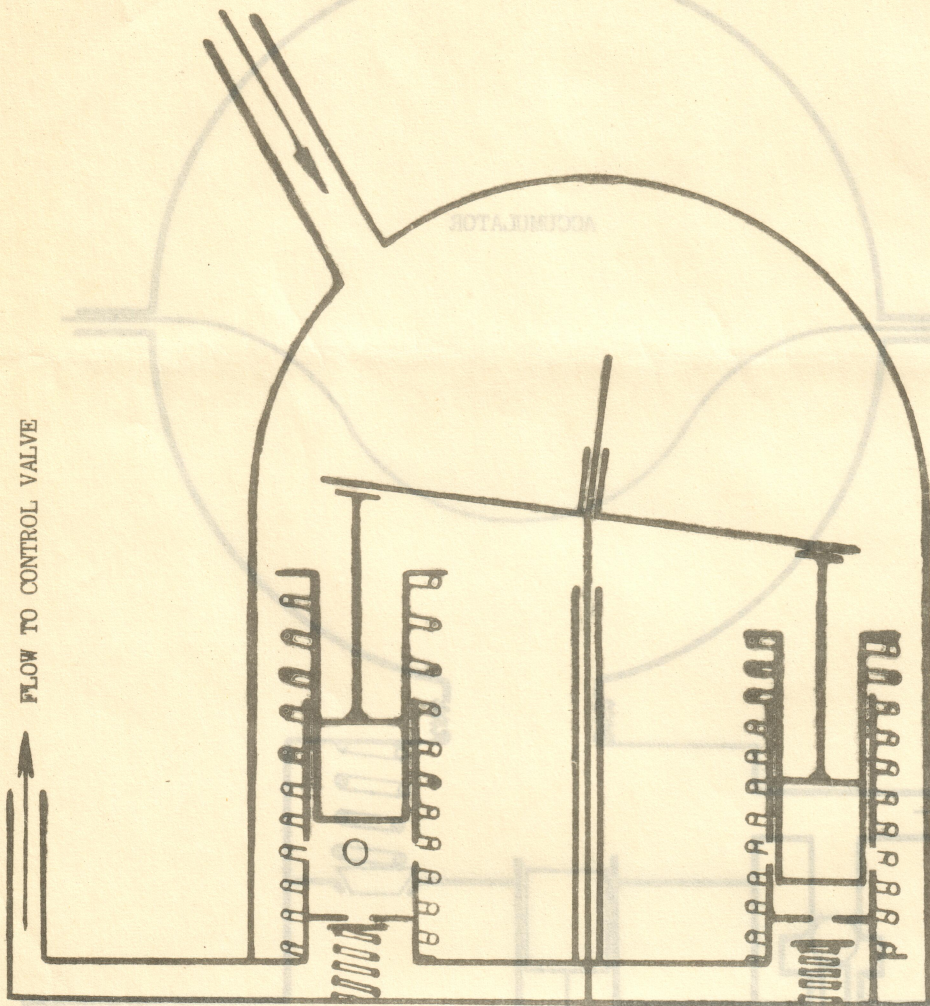


Fig. 4

OUTLET TO
CORRECTOR

RETURN TO
RESERVOIR

BLEEDING SCREW A

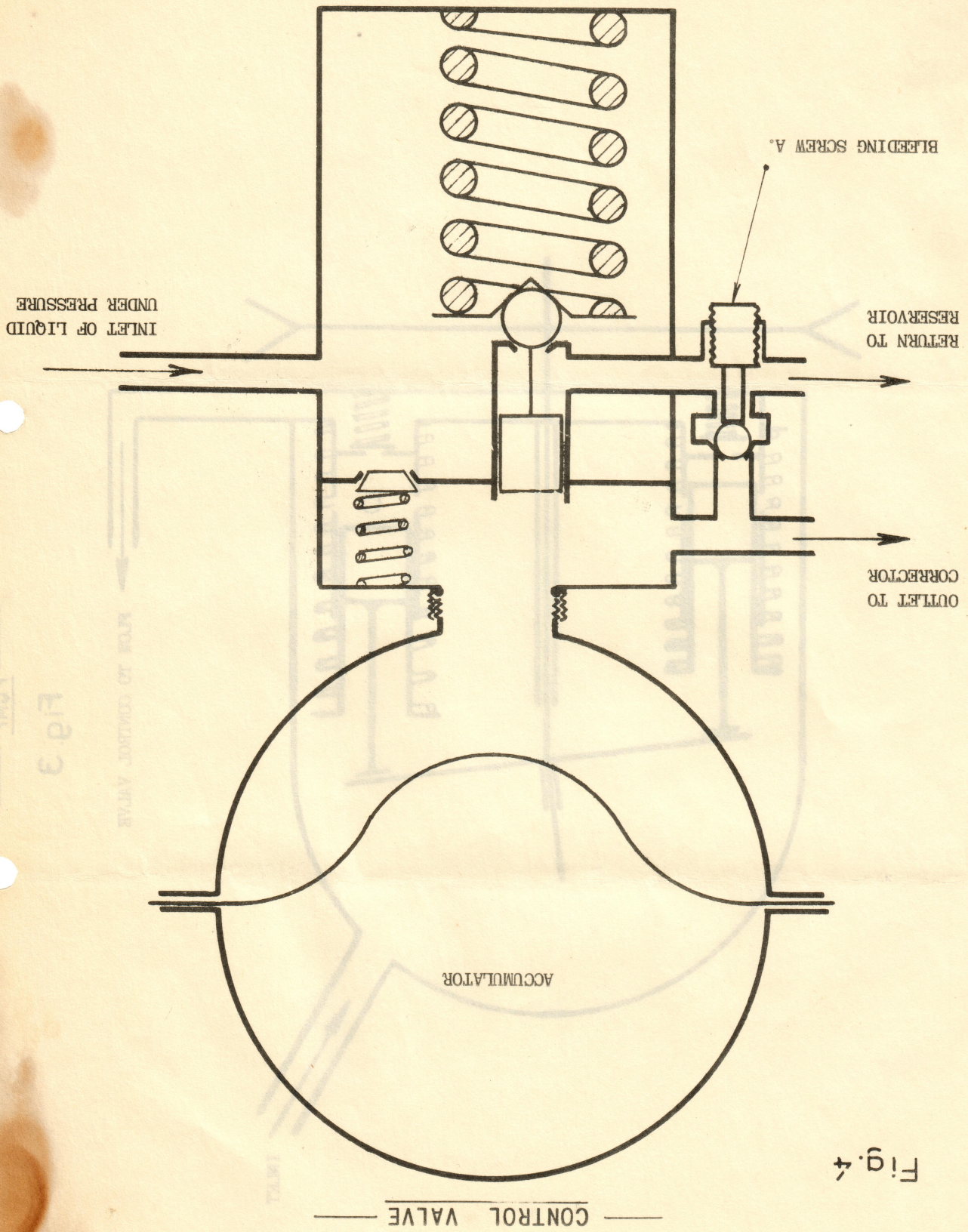


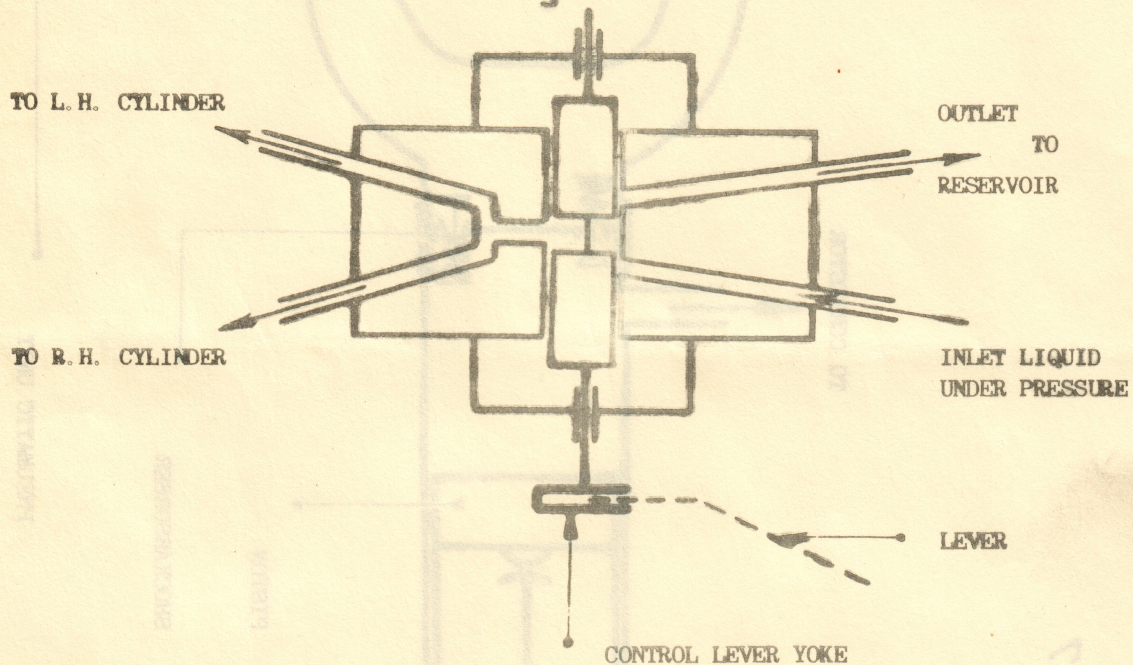
Fig. 4

Fig 3

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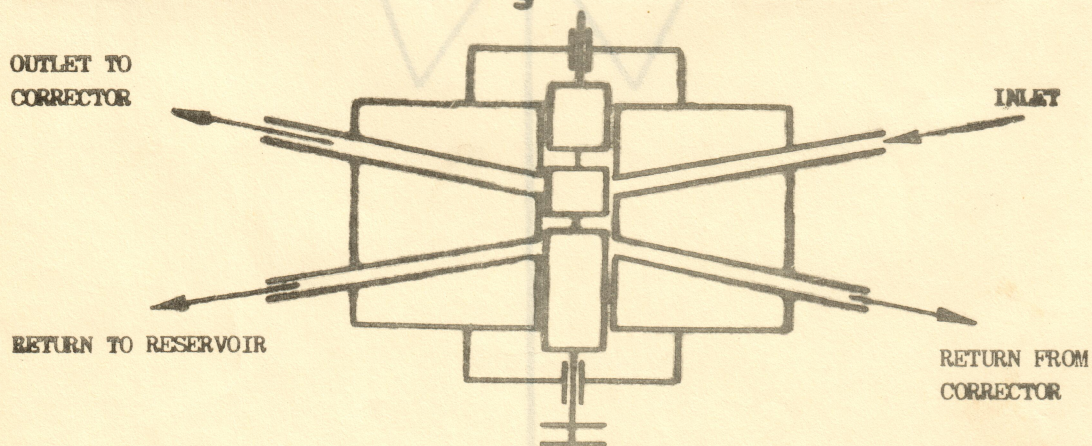
CORRECTOR

Fig. 5



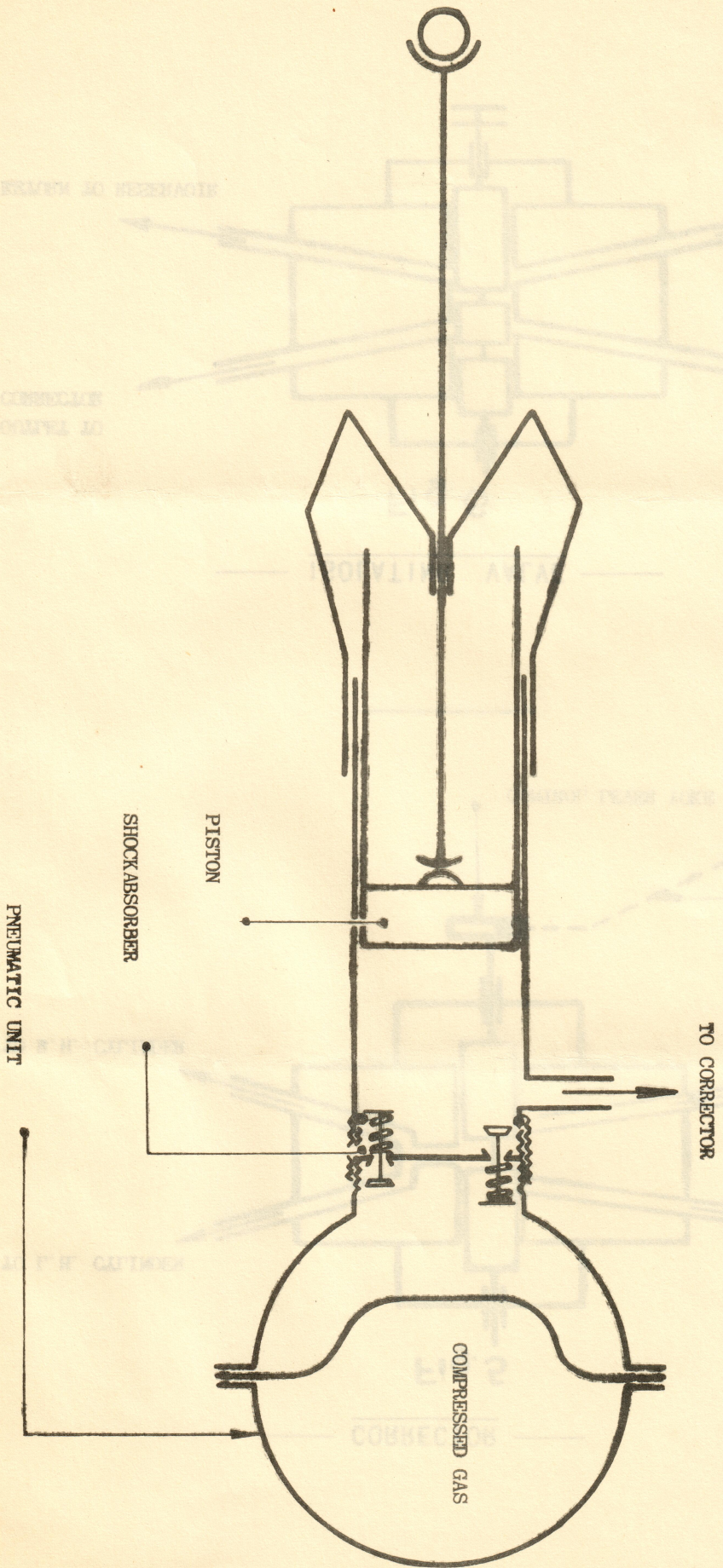
ISOLATING VALVE

Fig. 6



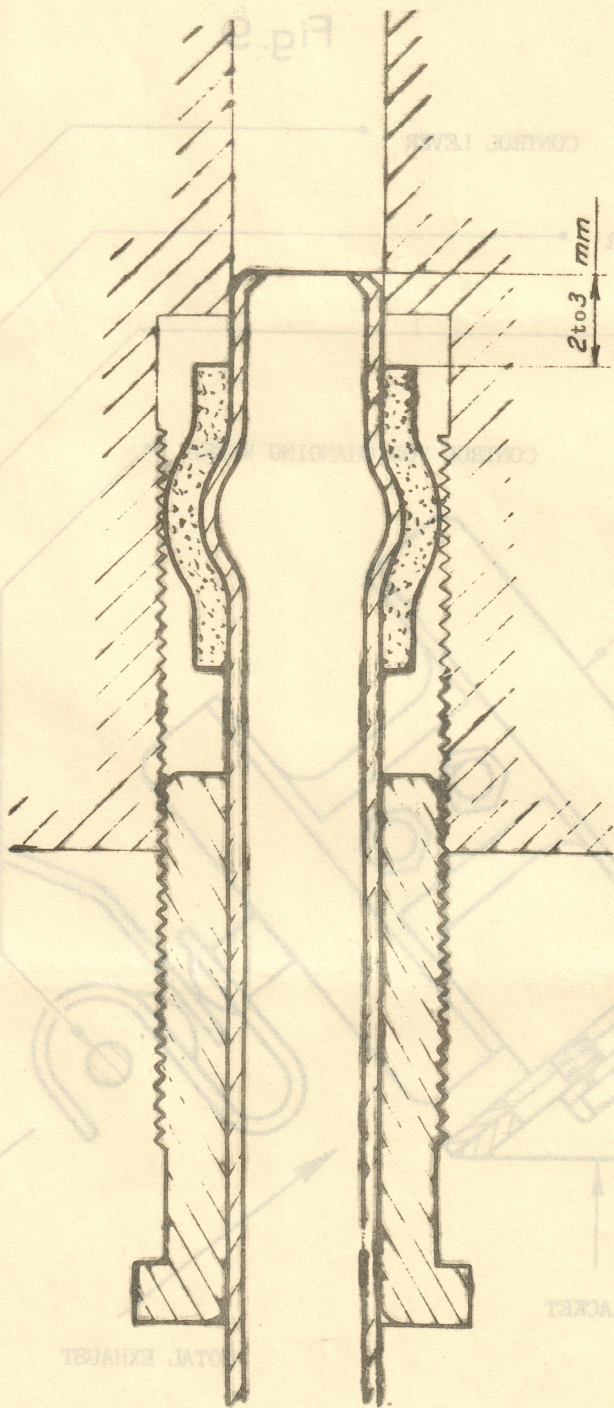
— CYLINDER —

Fig. 7



UNION

Fig. 8



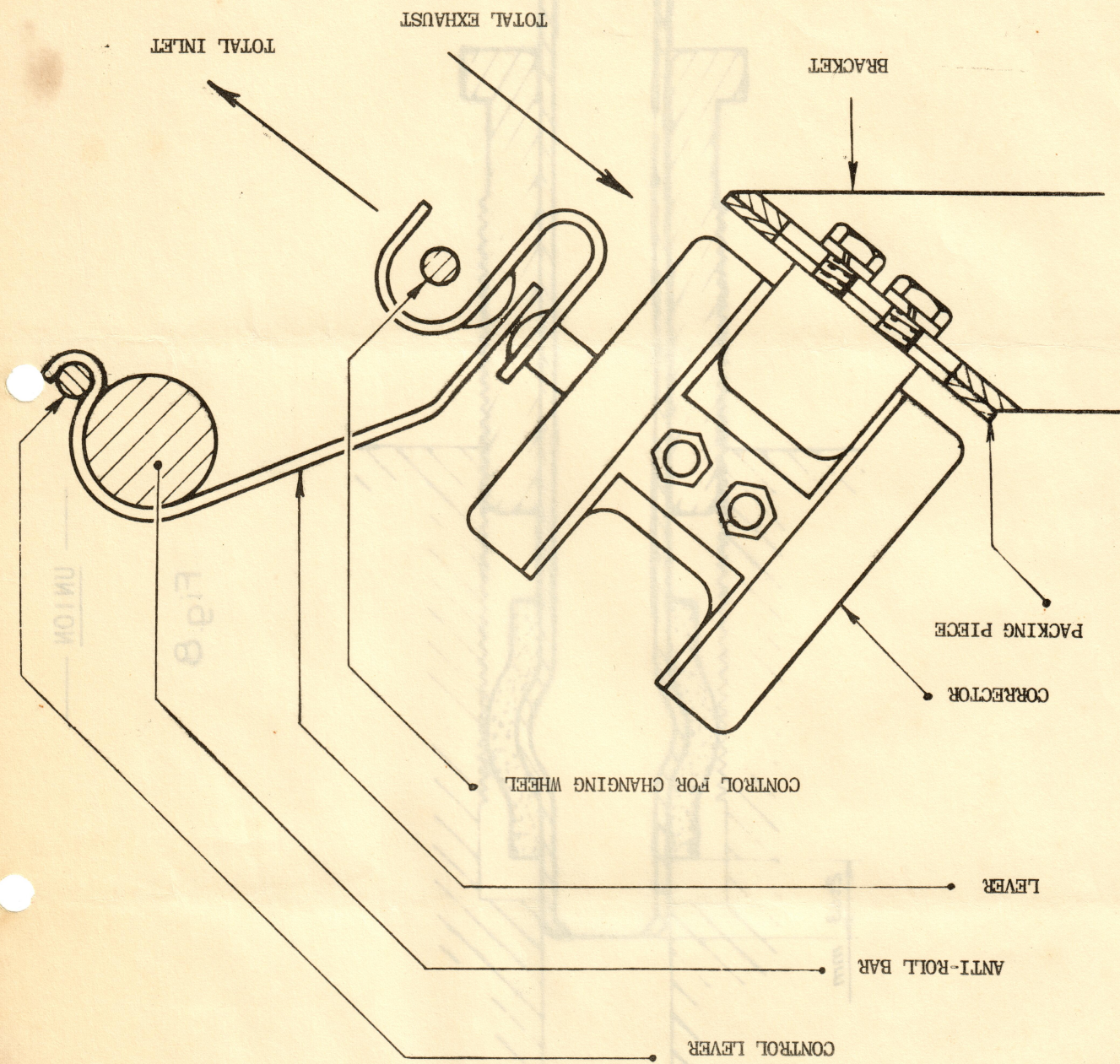
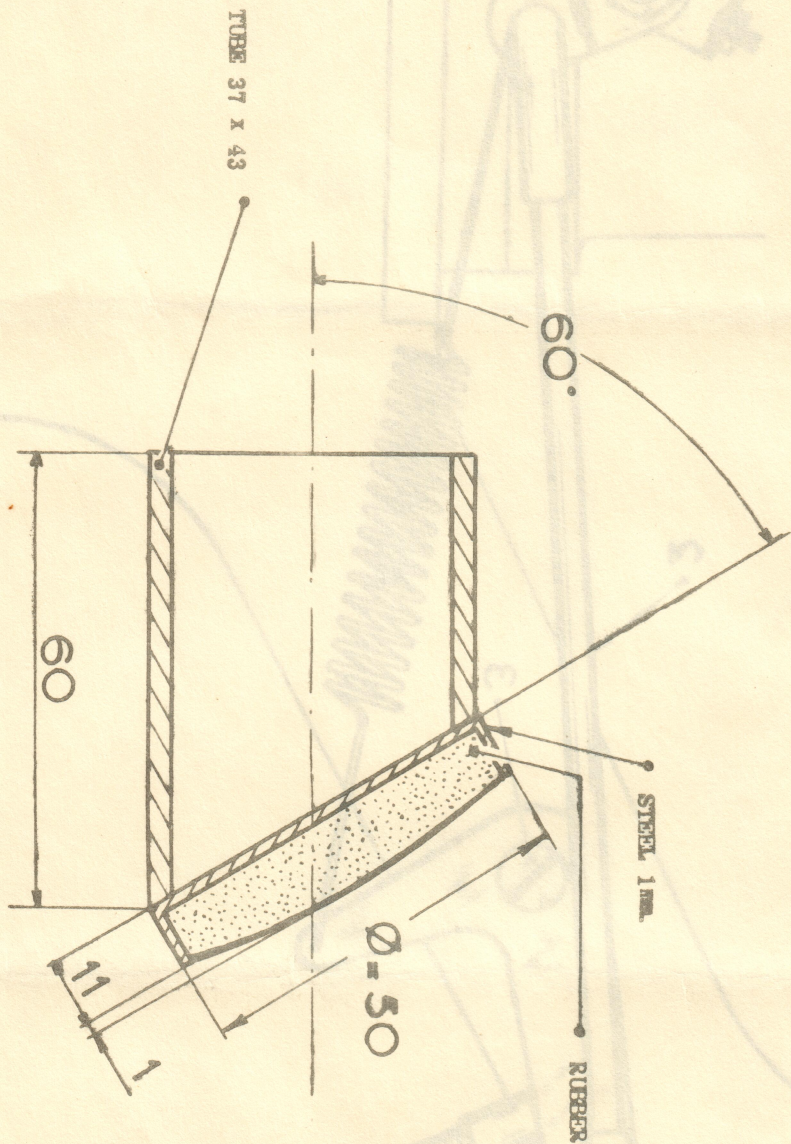


Fig. 9

CORRECTOR

— PACKING PIECE MR-4098 —

Fig. 10



— ACCELERATOR CONTROL —

Fig. 11

