



CITROËN
HYDRAULIC SYSTEM

***Possible Incidents with
Suggested Causes and Remedies***

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GENERAL OBSERVATIONS

The suggested causes and remedies in the following pages include some which may seem obvious, but all are based on experience over a long period. In other instances it will be necessary to recourse to the appropriate repair manual, which these suggestions in no way supersede.

In relation to any work on the hydraulic system, it is important that strict cleanliness is observed. Before any part of the system is disconnected or disturbed all foreign matter should be cleaned off, including surrounding areas. Use only industrial alcohol or methylated spirit for such a cleansing operation and for the further cleaning of any dismantled part.

The following booklets are available upon application to Slough: -

F.137.	Overhauling Shock Absorbers.	All Models
F.139.	Draining & Flushing Hydraulic System.	All Models.
F.141.	Clutch Engagement & Gear Change.	DS 19

Reference is made to these booklets in the following pages.

Before disconnecting any high pressure pipe, release pressure from the main accumulator and from the circuit being disconnected.

To release the pressure from the whole hydraulic system it is necessary to: -

- (a) Unscrew the bleed screw on the pressure regulator by one full turn.
- (b) Place the manual height control lever in the lowest position and ensure that the suspension spheres can be rocked freely by hand.
- (c) Operate the hydraulic brake pedal until the car can be pushed with the brake pedal fully depressed.
- (d) Turn the steering wheel from lock to lock.

After disconnection and/or draining or replacement of the following parts, refill them with hydraulic fluid before reconnection.

- (a) High pressure pump.
- (b) Rubber feed pipe from reservoir to high pressure pump.
- (c) Reservoir filter unit.

When the high pressure pump, rubber feed pipe, reservoir filter unit, pressure regulator or main accumulator have been removed and refitted for any reason it is necessary to bleed the system by running the engine with pressure regulator bleed screw slackened off by one full turn until all traces of air bubbles disappear from the fluid being returned to the reservoir. To check this, remove the filler cap from the reservoir and observe through the aperture the fluid being returned to the reservoir. Tighten pressure regulator bleed screw and allow pressure to build up until pressure regulator cuts out. Release pressure regulator bleed screw and again observe if all traces of air have disappeared from fluid so released. Finally, tighten the pressure regulator bleed screw.

If difficulty is experienced in making high pressure pump function, as indicated by the absence of any flow of fluid into the reservoir, it becomes necessary to prime the high pressure pump. This can be effected by removing the complete filter assembly from the reservoir, inverting it and filling it with hydraulic fluid with the engine running. When the fluid is obviously being drawn into the high pressure pump, top up the inverted filter with fluid and replace it as quickly as possible into the reservoir.

After reconnection of any pipe or unit associated with the brake circuit it is advisable to bleed the brake circuit by means of the bleed screws provided for this purpose.

QUICK CHECK OF HIGH PRESSURE PUMP AND PRESSURE REGULATOR

(This operation can only apply if all possible causes mentioned in incident 1 have been eliminated)

Slacken pressure regulator bleed screw by one full turn; place manual height control in lowest position: (for DS only, place auxiliary clutch control in clutch lock position); start engine, tighten pressure regulator bleed screw and pressure regulator should cut out: -

For cars without power-steering (ID 19) - within 60 seconds -

For cars with power-steering (all models) - within 20 seconds - after screws have been so tightened.

The term "cut-out" means that pressure has been built up and is detected by the falling off of the working noise made by the pump under load; this can also be ascertained by removing the filler cap of the reservoir and observing when the fluid is diverted into the reservoir.

The above "QUICK CHECK" is fairly satisfactory, but not necessarily completely accurate in all instances. If it is considered desirable to make a more definite check, it becomes necessary to make use of a high pressure gauge. This must be connected to the high pressure outlet of the pressure regulator by means of a suitable length of high pressure piping. The high pressure gauge should indicate a rise of pressure from zero:-

In 60 seconds for cars without power-steering (ID 19) to 130-140 kg/cm² (1850-2000 p.s.i.):

In 20 seconds for cars with power-steering (all models) to 150-175 kg/cm² (2133-2490 p.s.i.)

This is after the pressure regulator bleed screw has been tightened and the engine is running at between 550-650 r.p.m.

The engine should then be switched off and a period of ten seconds allowed to elapse for stabilization of high pressure recorded. If no appreciable further loss of pressure is recorded, it can be assumed that the high pressure pump and pressure regulator are functioning satisfactorily. If pressure does drop rapidly, the pressure regulator is faulty and must be changed.

Should it be necessary to increase the speed of the engine to above 1,000 r.p.m. to obtain cut-out, this indicates that the high pressure pump is faulty, providing the pressure regulator itself has no internal leak as previously established.

NOTE: When working on the DS 19, do not forget to release the auxiliary clutch control when the check is finished.

When the above check has been concluded satisfactorily, it is proved that the high pressure has been built up and contained between the high pressure pump and the pressure regulator; therefore any further loss of high pressure that takes place when the whole hydraulic system is reconnected must occur within one or more of the hydraulic circuits. The source of such internal leaks can be pinpointed with the use of the high pressure gauge and isolation of each circuit and hydraulic unit.

This is not difficult, but a good knowledge of the whole of the hydraulic system is necessary to enable the operator to carry out such a hydraulic test, and reference to the appropriate operation in the repair manual will be required to obtain full details of procedure and repair.

Following the stopping of the engine, and after an interval of several hours, some loss of pressure can occur. This is not an unusual feature and can be due to small internal pressure leaks. For example, the brake warning light may come on to indicate a pressure loss, but providing this light is extinguished within a short time after the engine has started, it is not indicative of an hydraulic defect. Similarly, any height loss should also quickly be restored when the engine is again running, indicating that full pressure is resumed.

<u>INCIDENT</u>	<u>POSSIBLE CAUSES</u>	<u>REMEDY</u>
<u>GENERAL SYSTEM</u>		
1) High pressure absent or low	<p>Insufficient fluid in reservoir.</p> <p>Pressure regulator bleed screw loose.</p> <p>Ball behind pressure regulator screw missing.</p> <p>Rubber pipe from reservoir to high pressure pump empty of fluid or obstructed.</p> <p>Filter in hydraulic reservoir dirty or obstructed.</p> <p>High pressure pump belts broken or slipping (DS 19, DW & ID 19 power steering).</p> <p>High pressure pump pulley loose on shaft (key sheared or missing).</p> <p>Pipe between high pressure pump and pressure regulator obstructed.</p> <p>Filter outlet pipe obstructed.</p> <p>Joint between filter outlet pipe and flange unsound</p> <p>Filler cap air vent hole obstructed.</p> <p>High pressure pump faulty (see pressure check page 1).</p> <p>Pressure regulator faulty (see pressure check page 1).</p>	<p>Top up to level.</p> <p>Tighten.</p> <p>Replace.</p> <p>Clear obstruction</p> <p>Thoroughly clean filter</p> <p>Replace and/or adjust tension.</p> <p>Replace key.</p> <p>Clear.</p> <p>Clear.</p> <p>Fit new joint.</p> <p>Clear.</p> <p>Change pump</p> <p>Change pressure regulator.</p>
2) Rapid loss of high pressure and/or height after engine has stopped.	<p>Main accumulator gas pressure at zero.</p> <p>Abnormal internal leak in power steering.</p> <p>Abnormal internal leak in brake control pedal unit.</p> <p>Abnormal leak in height corrector.</p> <p>Leak from suspension cylinder</p>	<p>Change main accumulator.</p> <p>Change gear selector unit.</p> <p>Change brake control pedal unit.</p> <p>Change height corrector.</p> <p>Fit new seals or change suspension unit.</p>
<p>When a car is new some fall in fluid level can occur as the fluid becomes fully distributed throughout the system. Similarly, the level will drop if for any reason the suspension bellows have been changed or drained. Fluid must partially fill these bellows before it can be returned to the reservoir. In these circumstances top up as necessary.</p>		
3) Hydraulic fluid level in reservoir drops with no sign of external loss.	<p>Obstruction or blocking of the return pipe from the suspension bellows to the reservoir can be due to the return pipe being trapped or pinched. This incident is confirmed by the affected bellows swelling to abnormal size.</p> <p>Leak at gearbox cover piston/cylinder ring seals, indicated by a rise in the level of oil in the gearbox.</p> <p>Excessive evaporation of solvent from the hydraulic fluid, due to overheating for prolonged periods.</p>	<p>Trace source of obstruction or trapping and clear, or fit new return pipe.</p> <p>Fit new ring seals. Drain gearbox, refill with Gear oil E.P. 90.</p> <p>Change hydraulic fluid. (See booklet F. 139)</p>

<u>INCIDENT</u>	<u>POSSIBLE CAUSES</u>	<u>REMEDY</u>	
4) Suspension hard or too stiff in operation.	Incorrect tyre pressures.	Adjust.	
	Suspension sphere(s) partially or wholly deflated.	Change affected spheres. Drain, flush and refill hydraulic system with fresh fluid. See booklet F. 139.	
	Front and rear spheres interchanged.	Fit spheres in their correct position.	
	<u>Sphere identification</u>		
	Front (all types)	- Stamped "59" on plug of top half, with blue paint around plug.	
	Rear (ID 19, DS 19, DW) (Safari)	- Stamped "26" on plug of top half - Stamped "37" on plug of top half and a ring in green paint around sphere.	
	Shock absorbers interchanged, incorrect type fitted, or faulty.	Fit shock absorbers in their correct Position, change for correct type or recondition. See booklet F. 137.	
	<u>Shock Absorber identification:</u>		
	Front (all types)	- "AV" stamped on nut, or unmarked.	
	Rear (Saloon)	- "AR1" stamped on nut or unmarked where shoulder nut is fitted.	
	Rear (Safari)	- "AR2" stamped on nut.	
	Hydraulic pressure too low or absent.	Trace cause and rectify. See Incident 1.	
	Suspension piston seized or sticking in its cylinder.	Free off or change Piston cylinder assembly.	
	Front anti-roll bar bushes too tight (mal-adjusted).	Adjust	
	Front anti-roll bar linkage rod ball ends overtightened (mal-adjusted).	Adjust.	
Axle arm bearings seized or overtightened.	Free off, or fit new bearings. Re-adjust.		
Front hub upper and/or lower pivot balls too tight.	Adjust.		
Normal height setting too high or too low.	Re-adjust.		
High pressure feed pipe obstructed.	Clear.		
5) Height correction sluggish and heights slow in rising.	Suspension spheres partially deflated	Change suspension spheres.	
	High pressure supply pipes or height corrector passages obstructed.	Clear obstructions.	
	Manual height control linkage not moving freely.	Clean and free off.	
	Height corrector slide valve sticking in its bore.	Clean and free off.	
	Height corrector control rod not functioning correctly	Free off or change rod.	
	Height corrector restrictor and/or pressure return pipe obstructed.	Clear obstruction.	

<u>INCIDENT</u>	<u>POSSIBLE CAUSES</u>	<u>REMEDY</u>
5) cont.	Front anti-roll bar bearings too tight. Front anti-roll bar linkage rod ball ends too tight. Front axle arm bearings and/or front hub pivot balls too tight. Shock absorbers not functioning correctly Hydraulic pressure too low.	Adjust anti-roll bar bearings. Adjust linkage rod ball ends. Adjust bearings and Pivot ball caps. Recondition or change shock absorber. Locate and rectify. See Incident 1.
6) Height correction and over-correction continuing and altering	Air in height corrector and/or suspension system Manual height control linkage mal-adjusted Height corrector control movement restricted. Height corrector restrictor ineffective. Shock absorbers faulty.	Drive car for a few miles until air is dispersed. Re adjust. Free off. Rectify or change height corrector. Change.
7) Knocks or noises in suspension.	Shock absorbers not functioning correctly. Excessive play in front anti-roll bar bearings. Excessive play in ball ends of front anti-roll bar linkage. Rear anti-roll bar clamp(s) loose. Excessive play in front hub pivot balls and cups. Excessive play in upper or lower axle link arm bearings.	Recondition shock absorbers as per instructions in booklet F. 137. Adjust or change bearings. Adjust ball ends. Adjust and tighten. Adjust hub pivot caps. Adjust bearings and grease.
8) Car will not attain normal height with engine running.	Manual height control lever in wrong position. Normal height incorrectly adjusted. Height control rod clamp(s) not securely tightened on anti-roll bar(s) Total or partial loss of hydraulic pressure. Height corrector slide valve seized or sticking in its bore. Height corrector fixing bolts loose.	Check position of manual height control lever Re-adjust to standard specifications. Adjust and tighten clamps. Trace source of trouble and rectify. See Incident 1. Free off slide valve. Tighten bolts.
9) Suspension too soft.	Shock absorbers not functioning correctly Suspension spheres at incorrect gas pressures. Height corrector faulty.	Recondition shock absorbers as per Instructions in booklet F. 137. Change suspension spheres. Change height corrector.

<u>INCIDENT</u>	<u>POSSIBLE CAUSES</u>	<u>REMEDY</u>
10) Excessive variation between L.H. and R.H. side heights (difference should not exceed 3 mm).	Front anti-roll bar linkage mal-adjusted.	Re-adjust.
	Front anti-roll bar bearings too tight.	Re-adjust.
	Incorrect tyre pressures.	Correct.
	Axle arm distorted	Change
	Body twisted	Repair as necessary.
	Suspension piston sticking in its cylinder.	Free off or change.
	Front hub swivel balls too tight.	Re-adjust.
<u>POWER BRAKES</u>		
11) Poor or ineffective braking	Hydraulic fluid pressure too low.	Trace cause and rectify. See Incident 1.
	Pressure supply pipe(s) obstructed.	Clear obstruction.
	Brake control unit passages obstructed.	Clear obstruction.
	Brake linings contaminated or worn.	Clean or change linings and/or brake pads.
	Slide valve(s) sticking in brake control unit	Free off.
	Stop light switch incorrectly adjusted or faulty.	Re-adjust or change.
12) Harsh or fierce braking	Automatic wear take-up mechanism not functioning.	Check for cause and rectify.
	Rear brake shoes clearance to drum excessive.	Adjust clearance.
	Front brake units fitted incorrectly.	Align brake pads with brake discs.
	Rear fixing bolts of front brake unit loose.	Tighten fixing bolts.
	Front anchorage nuts of front brake unit loose.	Tighten nuts.
	Front brake unit silent bloc bushes worn.	Change silent bloc bushes.
	Excessive end play in front brake moving carrier.	Adjust by re-shimming.
	Rear engine mounting securing nuts loose.	Tighten engine mounting nuts.
	Pistons sticking in front brake moving carriers.	Free off pistons.
	13) Brake squeal	Dust in rear brake drums and/or bearings.
Leading edges of brake linings not square.		Square off.
Brake drum scored.		Skim or change.

INCIDENTPOSSIBLE CAUSESREMEDYSTEERING

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| 14) High pressure low or absent. | General system pressure too low or absent.
Internal pressure leaks in power steering.
Excessive internal leaks in other circuits of hydraulic system.
External leaks | Trace cause and rectify. See Incident 1.

Change steering.
Refer to Incident 1 and subsequent Pressure check details.
Rectify. |
| 15) Steering wheel oscillates | Control valves mal-adjusted.

Steering column and rack mal-aligned.
Excessive tightening of rack pressure pad plug. | Adjust as per instructions in workshop manual.

Align.
Adjust. |
| <u>N.B.</u> Should it be necessary to hold the Steering Wheel hard on extreme lock, and perhaps leave it in that position as for instance when parking, some "kick" or oscillation can occur. | | |
| 16) Steering pulls to left or right. | Front tyres worn at outside tread.

Incorrect tyre pressures
Wheel alignment incorrect.
Front axle castor angle incorrect.
Front axle camber incorrect.
Variations in front to rear axle centres (axle arm distorted).
Centring cam on steering column incorrectly positioned. | Fit new tyres or change road wheels around with rears.
Adjust pressures.
Adjust track.
Re-adjust.
Re-adjust.
Correct or change damaged arm.

Re-position. |

CLUTCH – DS 19

Before attempting any adjustment, make sure that the engagement speeds are correct. The engagement should be set to give: -

Idling speed at	550 r.p.m.
Clutch Drag at	725 r.p.m. ± 25.
Accelerated Idling at	900 r.p.m. ± 25.

For further details of clutch engagement see Booklet F. 141.

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| 17) Clutch engages too fiercely at small throttle openings, or when changing gear. | Incorrect setting of initial clutch clearance.

Clutch re-engagement control spring incorrectly adjusted.

Foreign matter under the large ball valve in clutch re-engagement control.
Clutch re-engagement control faulty.
Centrifugal regulator (later cars) faulty.
Clutch control piston (early cars) sticking in its bore in hydraulic gear selector.
Clutch thrust race sticking on its guide.
De-clutching piston sticking in its bore. | Adjust to 1 mm.

Increase tension of spring.

Clean.

Change clutch re-engagement control.
Change.
Free off or change hydraulic gear selector
Free off.
Free off. |
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<u>INCIDENT</u>	<u>POSSIBLE CAUSES</u>	<u>REMEDY</u>
18) Clutch engages too slowly at small throttle openings, or when changing gear.	Clutch re-engagement control spring incorrectly adjusted.	Reduce tension of spring.
	Centrifugal regulator faulty.	Change.
	De-clutching piston sticking in its bore (all models).	Free off.
19) Clutch will not disengage at all.	Clutch disc stuck.	Free off.
	Incorrect setting of clutch free play.	Adjust.
	Clutch disc linings broken.	Fit new clutch disc.
	Clutch toggles incorrectly adjusted or broken.	Adjust or replace.
	Clutch thrust race damaged or sticking.	Replace.
	Clutch lock lever in "locked" position.	Release.
	De-clutching piston stuck in its cylinder.	Free off.
	Feed pipe to de-clutching cylinder obstructed.	Clear.
	Clutch re-engagement control obstructed.	Clear.
	Centrifugal regulator faulty.	Change.
	Clutch operating mechanical linkage broken or bent.	Fit new parts.
20) Clutch drags with engine idling in first gear.	Incorrect adjustment on hydraulic gear selector, or on centrifugal regulator, or idling speed too high.	Adjust to specified speeds.
	Throttle sticking.	Free off.
	Clutch thrust race sticking or damaged.	Free off or change.
	Low pressure pump output too high.	Change low pressure pump.
	Hydraulic gear selector faulty.	Change.
	Centrifugal regulator faulty.	Change.
21) Clutch fails to engage at 700 – 750 r.p.m.	Excessive initial clutch clearance, or incorrect adjustment on hydraulic gear selector or on centrifugal regulator.	Adjust.
	Inadequate output from low pressure pump (early cars).	Change low pressure pump.
	Non-return valve defective.	Change.
	Clutch thrust race sticking.	Free.
	Hydraulic gear selector faulty.	Change.
	Centrifugal regulator faulty.	Change.
22) Clutch slipping.	Clutch disc linings worn.	Fit new clutch disc.
	Incorrect setting of clutch free play.	Adjust
	Clutch pressure plate springs weak.	Replace.
	De-clutching piston sticking in its bore.	Free off.
	Low pressure pump output inadequate.	Change low pressure pump.
	Air in low pressure pump circuit.	Bleed.
	Centrifugal regulator faulty.	Change.
	Hydraulic gear selector faulty.	Change.

<u>INCIDENT</u>	<u>POSSIBLE CAUSES</u>	<u>REMEDY</u>
23) Clutch judder.	Clutch drag (engagement) speed and/or idling speed, and/or accelerated idling speed set incorrectly.	Adjust to specified speeds.
	Engine mountings loose or damaged.	Tighten or change.
	Clutch disc linings contaminated.	Fit new clutch disc.
	Grease or oil on clutch pressure plate and/or flywheel.	Clean off.
	Pressure plate distorted.	True up or replace.
	Clutch toggles set incorrectly.	Re-adjust.
	Hydraulic gear selector faulty.	Change.
	Centrifugal regulator faulty.	Change.
<u>GEAR CHANGE – DS 19</u>		
24) Inability to engage any gear.	Clutch lock lever in “Locked” position.	Release.
	Absence of or insufficient high pressure.	Check as for Incident 1.
	Mal-alignment of hydraulic selector with mechanical gate.	Align, using special pin.
	Mechanical friction in gearbox cover preventing interlock mechanism from freeing.	Correct.
	Gear change speed regulator obstructed.	Change.
	Internal air lock in hydraulic gear selector.	Operate gear lever in all gears, and clutch lock lever, until air lock is dispersed.
	Internal pressure leak in hydraulic gear selector.	Change hydraulic gear selector.
	Mechanical selector sticking or jamming.	Correct.
	Obstruction in high pressure pipe.	Clear.
	Gearbox cover piston sticking in its bore.	Free off.
	Selector fork or shaft distorted.	Change.
	Hydraulic gear selector faulty.	Change.
	25) Crashing gears.	Gear change speed regulator mal-adjusted.
Synchromesh gears faulty.		Change.
Hydraulic gear selector faulty.		Change.
26) Stiff gear changing.	Mechanical selector stiff.	Free.
	Mechanical selector and hydraulic gear selector mal-aligned.	Re-align.
27) Delay between gears when changing.	Hydraulic gear selector faulty.	Replace.
	Excessive initial clutch free play clearance.	Re-adjust.
	Clutch drag speed set incorrectly.	Re-adjust.
	Clutch re-engagement speed set incorrectly.	Re-adjust.
	Accelerated idling speed set incorrectly	Re-adjust.
	Mechanical resistance in clutch mechanism.	Rectify.
	Hydraulic gear selector faulty.	Change.
	Centrifugal regulator faulty.	Change.