



betriebsanleitung

**operating instructions
instruktionsbok
instructions de service
instrucciones de servicio
instruções de serviço
libretto di manutenzione**

INDEX

FOREWORD

This book provides the technical description and the maintenance and operating instruction for the all-wheel-drive light cross-country **STEYR-PUCH „HAFLINGER“**. Please read the book carefully before using the vehicle and ensure your maintenance staff is informed of all instructions on care and maintenance which may be issued from time to time. Unprofessional work on the vehicle must be prevented, so it is important that a reliable garage is used. The vehicle number must be quoted on all enquiries and spare part orders. Direction "right", "left", "front" and "rear" refer to the vehicle as viewed from the direction of travel.

Steyr-Daimler-Puch AG
Graz Factory

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INSERTION SHEETS (loose?)

TECHNICAL DATA LUBRICATION AND MAINTENANCE CHART WIRING DIAGRAM



HAFLINGER

Lubrication and maintenance jobs

RUNNING-IN PERIOD					NORMA L - USE					
Mixed road/ cross-country use	Local authority and agricultural use		Tropical use		Daily (any type of use)	NOTE	Mixed road/ cross-country use	Local authority and agricultural use		Tropical use
	Com- pulsory check	Prior to use	Com- pulsory check	Prior to use				Com- pulsory check	Prior to use	
1250 km							1250 km			1250 km
750 miles							1500 miles			750 miles
2500 km							5000 km			2500 km
1500 miles							1000 km			1500 miles
Prior to use							6000 miles			Every
							100 km / 60 mls			
							200 km / 120 mls			
							400 km / 240 mls			
							800 km / 480 mls			
							1000 km			
							2000 km			
							4000 km			
							8000 km			
							10000 km			
							6000 miles			
							10000 miles			
							15000 miles			
							20000 miles			
							30000 miles			
							40000 miles			
							50000 miles			

30. Check front wheel toe-in and adjust if necessary.
31. Check acid level of battery, add distilled water as necessary.
32. Check acid level and density of battery, clean terminals, check connections, regrease, check charge and recharge if necessary.
33. Check all electrical connectors for contact.
34. Check lights and signalling devices.
35. Check headlight beams.
36. Check tyre pressure, correct as necessary.
37. Check rubber gaiters on semi-axle and universal joints.
38. Check oil level in front axle, add as necessary.
39. Check oil level in gearbox, add as necessary.
40. Check oil level in wheel drives, add as necessary.
41. Change front axle oil, oil warm.
42. Change gearbox oil, oil warm.
43. Change wheel-drive oil, oil warm.
44. Check and tighten all oil-filler and drain screws.
45. Check oil level in steering housing, add as necessary.
46. Front axle journal (4 nipples)
47. Tack line steering arm (1 nipple)
48. Speedometer drive, (1 nipple)
49. Lever for differential lock (3 nipples)
49. Handbrake cable (2 nipples)
48. Clutch cable (1 nipple)
50. Choke cable (1 nipple)
50. Heater cable (1 nipple)
50. Universal joint shaft for auxiliary drive (3 nipples)
50. Bearing for differential lock (1 nipple)
48. Intermediate lever for accelerator pedal (1 nipple)
63. Grease gear lever bearing.
64. Clean and grease steering and universal joints
65. Oil hinges of doors and bonnet.
66. Oil manual accelerator cable and handbrake cable.
67. Oil lever and rods for differential lock, all-wheel and auxiliary drive.
47. Clean and lubricate front wheel drive joints. (every 30,000 km / 30,000 miles)
50. Replace grease in auxiliary drive support.
70. Test drive, tune carburettor.

1) Such jobs can be done by yourself or by petrol station attendants (only if the engine is running). 2) In dusty conditions or tropical countries every 500 km/300 miles; for local authority use, every 40 km/10 hours. 3) Reduce time by half for stationary engines or dusty conditions. The filter insert must be marked "15" (filter grading) for tropical. Local authority or stationary use 4) For agricultural use or in dirty conditions clean cooling fins of cylinder, cylinder head and oil cooler every 2,500 km/1,500 miles or 50 hours to prevent overheating of engine. Lubrication and maintenance of special-purpose attachments such as snow ploughs, winches, sprayers and so forth should be done in accordance with the manufacturer's instructions. Lubricants according to the lubrication chart.



STEYR-PUCH HAFLINGER

Control Maintenance Data

907.1.70.062.1

1. Auflage englisch

TECHNICAL DATA

700 APT / 703 APT / 700 APTL / 703 APTL / 700 APT 3 / 703 APT/3
700 APTL 3 / 703 APTL 3

Engine

Type	4 stroke, flat-twin air cooled engine
Bore	3.15 in (80 mm)
Stroke	2.52 in (64 mm)
Cubic Capacity	39.23 cubic in (643 cc)
Compression Ratio	1 : 7.8
Power Developed	30 bhp SAE (25 bhp DIN) at 4800 rpm
Maximum Torque	32.8 ft/lbs at 3500 rpm (4.5 mkg at 3500 rpm)
Speed Governor	Starting to govern at 4800 rpm Ending to govern at 5200 rpm
Ignition Adjustment	0 ± 0.0787 in (0 ± 2 mm) below T.D.C. gauged on pulley
Valves	Overhead type
Valve gap	Intake 0.0078 in (0,20 mm) Exhaus 0.0078 in (0,20 mm) Both adjusted with cold engine
Lubrication	Circulating pressure system (gear pump, oil cooler, and oil filter built into the main flow)
Engine Breathing	Closed crankcase breathing system
Fuel Feed	Mechanically Powered Fuel pump
Carburettor	Special cross-country down-draught carburettor, Type ZENITH 32 NDIX
Adjustment	Draught 22 main jet 110 air correction jet 240 idling jet 45 idling air jet 80 starter jet 190
Air filter	Cyclon filter, oil bath air cleaner and paper fine filter
Electrical installation (if required interference suppressed)	Battery ignition Dynastart Bosch 12 V/240 W, regulator with starter relay Battery 12 V/55 Ah Ignition coil Bosch Sparking plugs Bosch W 225 T 1 or equivalent Bosch distributor with centrifugal regulator
Installing position of engine	Rear engine mounted on the rear flange of the gear-axle drive unit.

Clutch

Type Single plate clutch, dry type KS 180 of Fichtel & Sachs

Gear-axle drive unit

Gears	5 forward (in all 5 gears synchromesh locking device) 1 reverse
Speedometer drive	By gears from the front wheel drive
Gear shift	Control

Axle drive Through spiral bevel gears to bevel gear differential, wheel driving shafts and spur wheel reduction within the wheel

Constructive design Gears and rear axle drive combined in one box

Gearing

Axle reduction 4.22 (9:38)
 Spur wheel reduction 2.38 (16:38)

Total gear ratios

Gear	Total reduction	Top speed
1st speed 6.83	68.44	Up to 7 km/h
2nd speed 3.73	37.38	Up to 13 km/h
3rd speed 1.84	18.47	Up to 27 km/h
4th speed 1.12	11.23	Up to 44 km/h
5th speed 0.71	7.11	Up to 70 km/h
Reverse 3.55	35.55	
Power take off	Speed reduction 1:1.77	

Front axle drive

Through spiral bevel gears to bevel gear differential, wheel driving shafts and homo-kinetic driving joint to spur wheel reduction in the wheel. The front axle drive is directly driven from the rear axle. The driving shaft is carried within the central tube connecting both axle drive housings. The front wheel drive may be engaged or disengaged with a hand lever while driving.

Differential locks

Located in both axle drives and being applied separately by hand while the vehicle is in motion.

Wheel suspension (independent axles)

Individually suspended wheels, forked independent axles built as a tubular sheet steel body within which the wheel driving shafts are carried.

Springing

Coil springs and additional hollow rubber springs progressively acting both front and rear, spring travel 170 mm.

Shock absorbers

Hydraulic telescopic shocks double acting both front and rear.

Brakes

Foot brake Hydraulic four-wheel brake/double circuit brake system, brake drums well finned, cast iron insert band of 8.5 in (215 mm) diameter. Total lining area 10.2 sq. in (658 cm²).

Hand brake Mechanical operation on the rear wheels, with engaged front axle drive also acting on the front wheels.

Steering

ZF Gemmer, worm and roller steering box, divided tie rods.

Steering wheel revolutions for complete lock 3

Minimum turning radius 1500 mm wheel base 21 ft (6,5 m)
 1800 mm wheel base 26 ft (8 m)

Wheels and tyres

Disc wheels, rim 3.50x12

Tyres	165-12 with special tread Semperit Universal Grip M 157 G 4 P.R.;
Pressure front and rear	22 p.s.i. (1,5 atü)

Chassis

Consists of a central tube frame with attached axle drive housings and 4 independent half-axles. Two sheet steel transverse girds are attached to the axle drive housings for supporting the springs bearing the body.

Body (Standard design)

Table top platform built heavy sheet steel plates with longitudinal and transverse girders and strengthened border. The front panel which is housing the headlamps, dashboard as well as the bearing to the steering column is mounted to the front part of the platform. Both front seats are longitudinally adjustable. Behind the front seats two pans with cover are sunk-in into the platform, each of them housing a folding rear seat. Steering box and pedal bearings are placed in the foot-recess at the front end of the platform. At the rear end of the platform and vertically underneath it, are the engine compartment cover, also the fuel tank, the battery, toolbox and the spare wheel. The table top platform is a most suitable cargo space for goods and passenger transport. The body is rubbermounted on 4 points and securely screwed to the central tube frame.

Main dimensions and weights

Wheel base	59 in (1500 mm)	70,8 in (18.000 mm)
Tread front and rear	44 in (1130 mm)	44 in (1130 mm)
Overall length	112 in (2850 mm)	12,4 in (3150 mm)
Overall width	55 in (1400 mm)	55 in (1400 mm)
Overall width including canvas hood	55 in (1400 mm)	55 in (1400)
Height of platform (without load)	28 in (720 mm)	28 in (720 mm)
Overall height (steering wheel level, without load)	53,5 in (1360 mm)	53,5 in (1360 mm)
Overall height with canvas hood (without load)	69 in (1740 mm)	69 in (1740 mm)
Weight (standard design, ready to start) approx.	1419 lbs (645 kg)	1474 lbs (670 kg)
Total permissible weight	2640 lbs (1200 kg)	2640 lbs (1200 kg)
Permissible axle load front	1364 lbs (620 kg)	1386 lbs (630 kg)
Permissible axle load rear	1540 lbs (700 kg)	1496 lbs (680 kg)
Ground clearance below differential (loaded)	8 in (240 mm)	8 in (240 mm)
Fording ability	13.8 in (350 mm)	13.8 in (350 mm)
Cargo space behind front seats:		
Length	60 in (1540 mm)	71 in (1840 mm)
Width	50 in (1275 mm)	50 in (1275 mm)
Total cargo space	2,27 sq yd (1,90 m ²)	2,75 sq yd (2,30 m ²)

Fuel capacities and viscosity

Fuel tank	6.92 imp. gal. (31,5 l) (Reserve 5 l), engine oil new 2 l, 3 pts (1,75 l) when changing Oil summer SAE 30, beyond 30° C SAE 40, Winter SAE 20, at extremely low temperatures SAE 10 W
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Air cleaner	0,30 l Motor oil
Gearbox and rear axle	5 pts (2,7 l) transmission oil SAE 90 (1,8 to 1,9 l at oil change) (at extremely low temperatures use SAE 80 for easy gearshift)
Front axle	2 pts (1,15 l) transmission oil SAE 90 (0,80 to 0,85 l at oil change)
Wheel drive housing	0.3 pts (0,15 l) each transmission oil SAE 90
Steering	0.3 pts (0,2 l) transmission oil SAE 90
Central tube	0.0 pts (0,5 l) transmission oil SAE 90
Brakes	0.0 pts (0,3 l) brake fluid

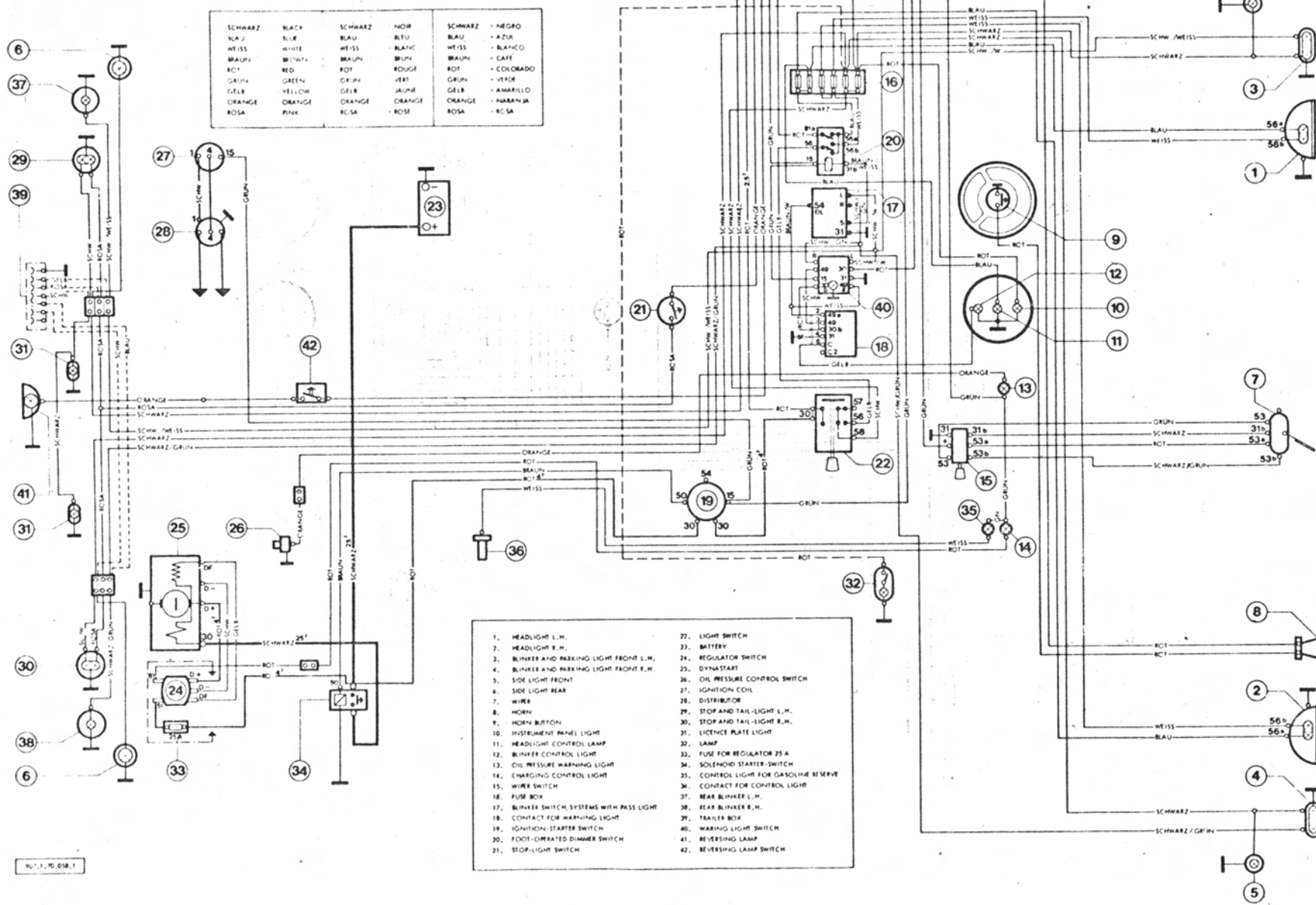
Fuel consumption

On the road	approx. 10,9 l/100 km standard
Cross-country drive	0.7 to 1.1 imp. gal./hour (approx. 3 to 5 l/hour)

Performance

Top speed	48 mph (75 km/h)
Minimum continuous speed	2 mph (3 km/h)
Maximum hill climbing (capacity on dry roads with good grip)	65% = Adhesive limit

WIRING DIAGRAM USA MODEL HAFLINGER 700/APT



SCHWARZ	BLACK	SCHWARZ	NOIR	SCHWARZ	- NEGRO
BLAU	BLUE	BLAU	BLEU	BLAU	- AZUL
WEISS	WHITE	WEISS	BLANC	WEISS	- BLANCO
BRAUN	BROWN	BRAUN	BRUN	BRAUN	- CAFE
ROT	RED	ROT	ROUGE	ROT	- COLORADO
GRÜN	GREEN	GRÜN	VERT	GRÜN	- VERDE
GELB	YELLOW	GELB	JAUNE	GELB	- AMARILLO
ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	- NARANJA
ROSA	PINK	ROSA	ROSE	ROSA	- ROSA

- | | |
|--|--|
| 1. HEADLIGHT L.H. | 22. LIGHT SWITCH |
| 2. HEADLIGHT R.H. | 23. BATTERY |
| 3. BLINKER AND PARKING LIGHT FRONT L.H. | 24. REGULATOR SWITCH |
| 4. BLINKER AND PARKING LIGHT FRONT R.H. | 25. DYNASTART |
| 5. SIDE LIGHT FRONT | 26. OIL PRESSURE CONTROL SWITCH |
| 6. SIDE LIGHT REAR | 27. IGNITION COIL |
| 7. WIRE | 28. DISTRIBUTOR |
| 8. HORN | 29. STOP AND TAIL-LIGHT L.H. |
| 9. HORN BUTTON | 30. STOP AND TAIL-LIGHT R.H. |
| 10. INSTRUMENT PANEL LIGHT | 31. LICENSE PLATE LIGHT |
| 11. HEADLIGHT CONTROL LAMP | 32. LAMP |
| 12. BLINKER CONTROL LAMP | 33. FUSE FOR REGULATOR 25 A |
| 13. OIL PRESSURE WARNING LIGHT | 34. SOLENOID STARTER SWITCH |
| 14. CHARGING CONTROL LIGHT | 35. CONTROL LIGHT FOR GASOLINE RESERVE |
| 15. WIRE SWITCH | 36. CONTACT FOR CONTROL LIGHT |
| 16. FUSE BOX | 37. REAR BLINKER L.H. |
| 17. BLINKER SWITCH SYSTEMS WITH PASS LIGHT | 38. REAR BLINKER R.H. |
| 18. CONTACT FOR WARNING LIGHT | 39. TRAILER BOX |
| 19. IGNITION-STARTER SWITCH | 40. WARNING LIGHT SWITCH |
| 20. FOOT-OPERATED DIMMER SWITCH | 41. REVERSING LAMP |
| 21. STOP-LIGHT SWITCH | 42. REVERSING LAMP SWITCH |

107-1, 70, 698.1

1. Vehicle types

700 AP	Standard model, wheelbase 1500 mm
703 AP	Standard model, wheelbase 1800 mm
700 APL	Standard model with auxiliary drive, wheelbase 1500 mm
703 APL	Standard model with auxiliary drive, wheelbase 1800 mm
700 APT	Tropical model, wheelbase 1500 mm
703 APT	Tropical model, wheelbase 1800 mm
700 APTL	Tropical model with auxiliary drive, wheelbase 1500 mm
703 APTL	Tropical model with auxiliary drive, wheelbase 1800 mm
700 AP/3	Standard model with glass-fibre cab, wheelbase 1500 mm
703 AP/3	Standard model with glass-fibre cab, wheelbase 1800 mm
700 APL/3	Glass-fibre cab and auxiliary drive, wheelbase 1500 mm
703 APL/3	Glass-fibre cab and auxiliary drive, wheelbase 1800 mm
700 APT/3	Glass-fibre cab, tropical model, wheelbase 1500 mm
703 APT/3	Glass-fibre cab, tropical model, wheelbase 1800 mm
700 APTL/3	Glass-fibre cab, tropical model with auxiliary drive, wheelbase 1500 mm
703 APTL/3	Glass-fibre cab, tropical model with auxiliary drive, wheelbase 1800 mm
Special body (aluminium) from Preininger wheelbase 1800 mm	
All models available for left or right hand drive	

1. Vehicle Bodies

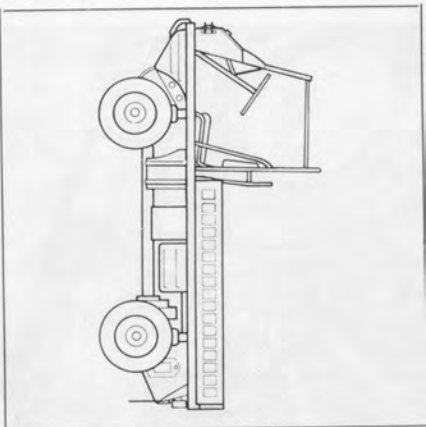


Fig. 1 ▲

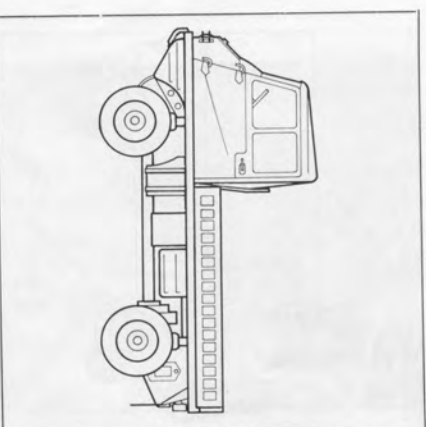


Fig. 2 ▲

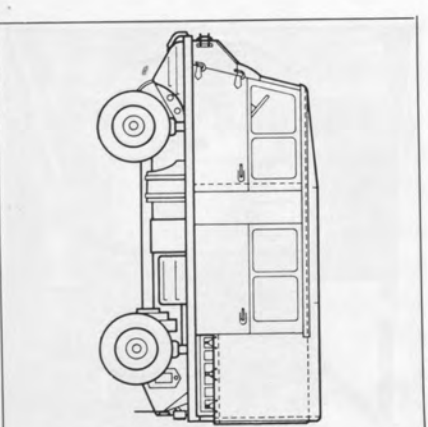


Fig. 3 ▲

Fig. 3: Model with large canvas cab

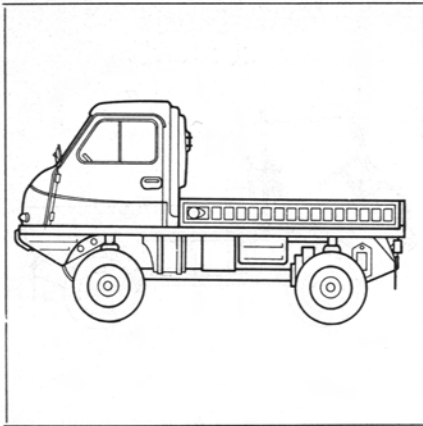


Fig. 4 ▲

Fig. 4: Model with solid glass-fibre cab

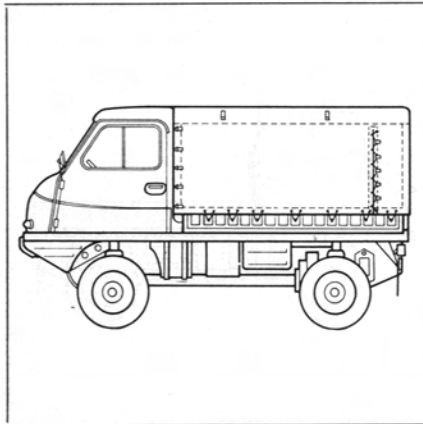
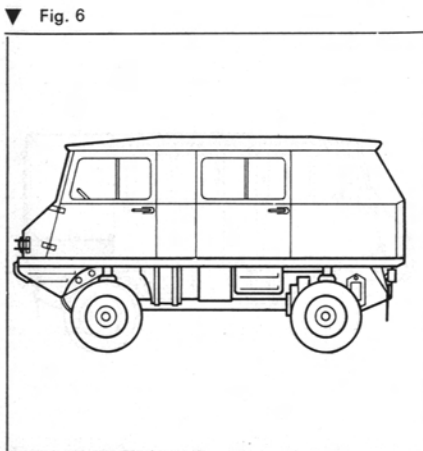


Fig. 5 ▲

Fig. 5: Model with solid glass-fibre cab and large canvas tilt



▼ Fig. 6

Fig. 6: Special bodywork (aluminium) from Preininger

III. Vehicle numbers

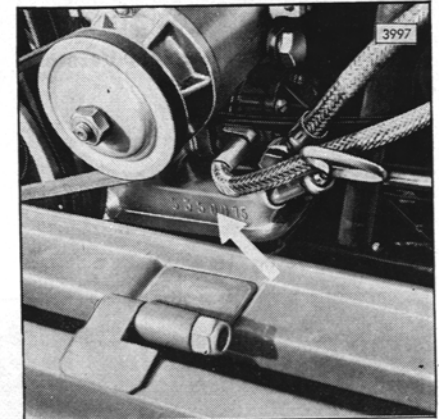


Fig. 7 ▲

The engine number is stamped to the left of the oil dip stick (fig. 7, arrow).

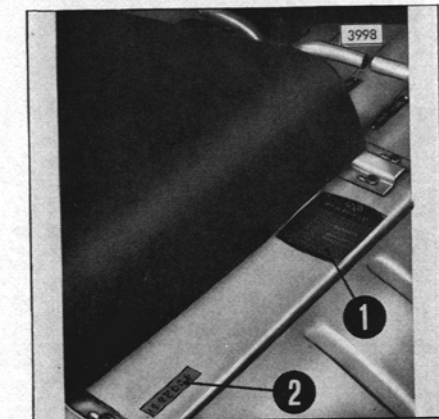


Fig. 8 ▲

The specification plate containing all vehicle numbers is fitted in front of the right hand front seat (fig. 8/1).

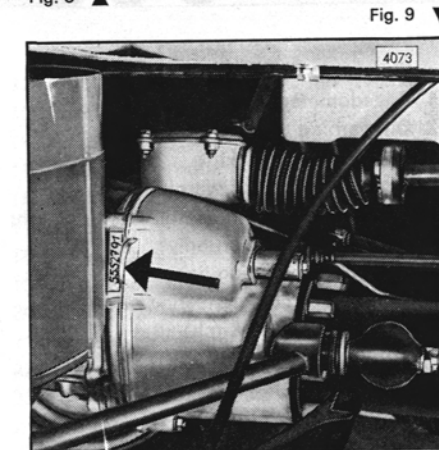


Fig. 9 ▼

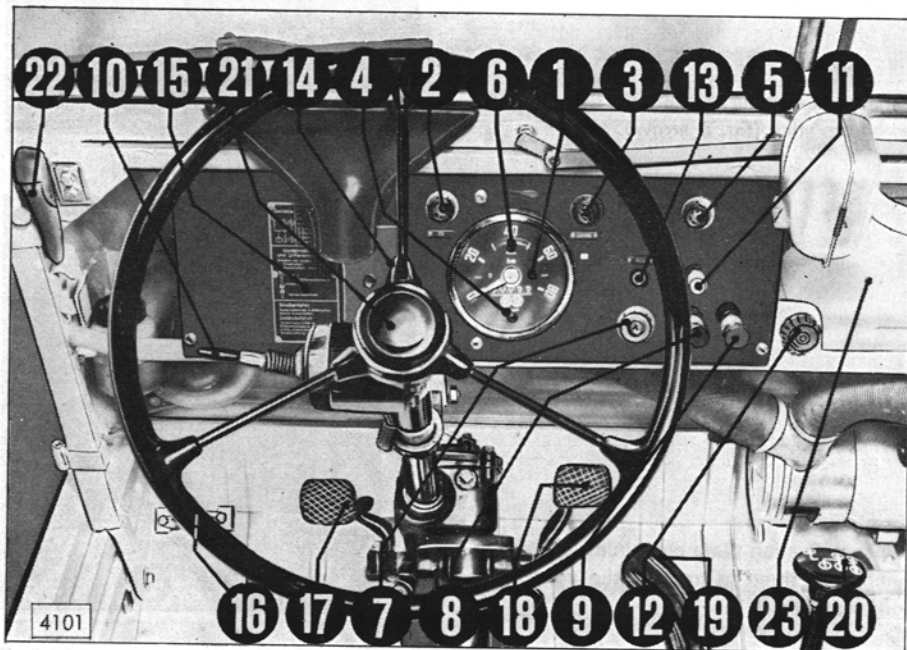
The chassis number is stamped on the right hand side of gearbox flange (fig. 9, arrow).

The chassis number is also stamped in front of the right hand front seat (fig. 8/2).

IV. Vehicle operation

Operation and controls for Version I

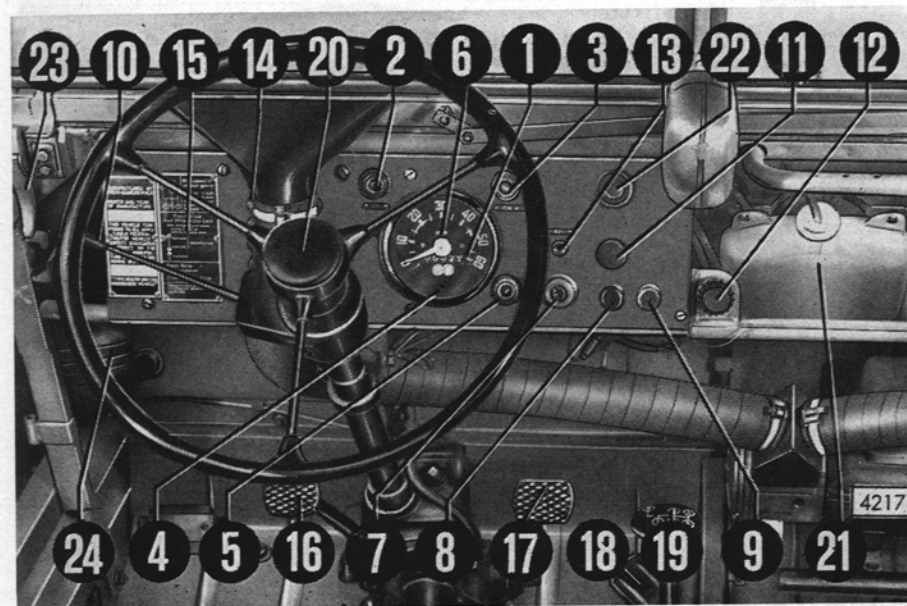
Left-hand drive fig. 10



- | | |
|---|---|
| 1 Speedometer | 11 Push-pull switch for windscreen wipers |
| 2 Oil warning light | 12 Manual pump for windscreen washer |
| 3 Ignition warning light | 13 Fuel warning light (or fuel gauge) |
| 4 Direction indicator warning light | 14 Fuse box |
| 5 Trailer direction indicator warning light
(for trailer operation only) | 15 Gear position diagram |
| 6 Main beam warning light | 16 Dip switch control |
| 7 Ignition switch (or steering wheel
locking ignition switch) | 17 Clutch pedal |
| 8 Lights switch | 18 Brake pedal |
| 9 Push-pull switch for Eberspächer
heater (if fitted) | 19 Throttle pedal |
| 10 Direction indicator switch | 20 Gear lever |
| | 21 Horn push knob |
| | 22 Clamp for wind screen |
| | 23 Windscreen washer reservoir |

Operation and controls for version II

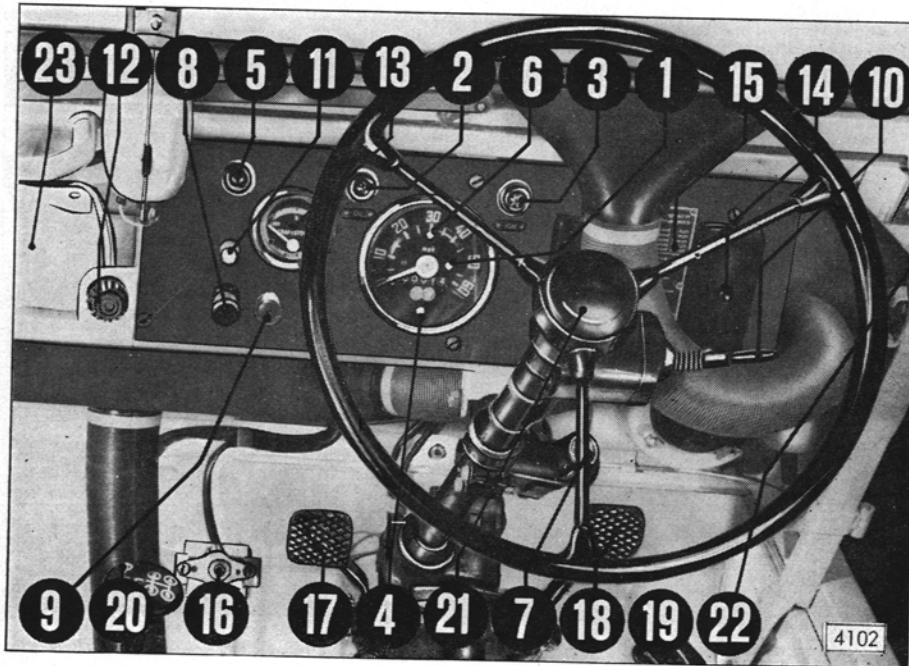
Left-hand drive fig. 11



- | | |
|---|--------------------------------------|
| 1 Speedometer | 12 Manual pump for windscreen washer |
| 2 Oil warning light | 13 Fuel warning light |
| 3 Ignition warning light | 14 Automatic fuse box |
| 4 Direction indicator warning light | 15 Gear position diagram |
| 5 Trailer direction indicator warning light
(for trailer operation only) | 16 Clutch pedal |
| 6 Main beam warning light | 17 Brake pedal |
| 7 Ignition switch (or steering wheel lock
ignition switch) | 18 Throttle pedal |
| 8 Light switch | 19 Gear lever |
| 9 Push-pull switch for Eberspächer heater
(if fitted) | 20 Horn press button |
| 10 Direction indicator switch (dip switch) | 21 Windscreen washer reservoir |
| 11 Switch for 2-speed windscreen wipers | 22 Switch for warning flashing unit |
| | 23 Clamp for windscreen |
| | 24 Windscreen washer reservoir |

**Operating and control elements for
version III**

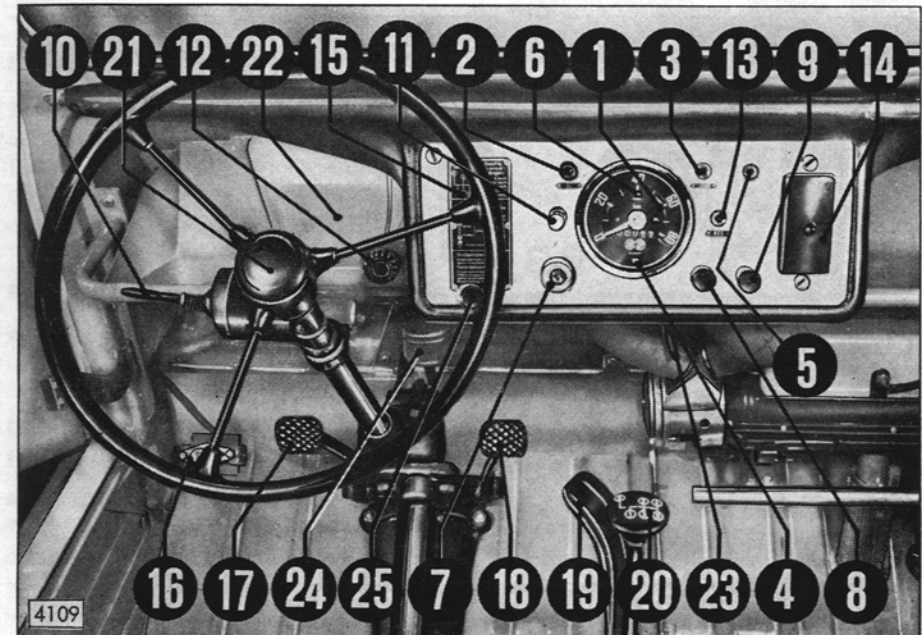
Right-hand drive (fig. 12)



- | | |
|---|---------------------------------------|
| 1 Speedometer | 12 Manual pump for windscreen washer |
| 2 Oil warning light | 13 Fuel warning light (or fuel gauge) |
| 3 Ignition warning light | 14 Fuse box |
| 4 Direction indicator warning light | 15 Gear position diagram |
| 5 Trailer direction indicator warning light
(for trailer operation only) | 16 Dip switch control |
| 6 Main beam warning light | 17 Clutch pedal |
| 7 Ignition switch (or steering wheel
locking ignition switch) | 18 Brake pedal |
| 8 Light switch | 19 Throttle pedal |
| 9 Push-pull switch for Eberspächer heater
(if fitted) | 20 Gear lever |
| 10 Direction indicator switch | 21 Horn push knob |
| 11 Push-pull switch for windscreen wipers | 22 Clamp for windscreen |
| | 23 Windscreen washer reservoir |

**Operation and controls for type
polyester cab, version IV**

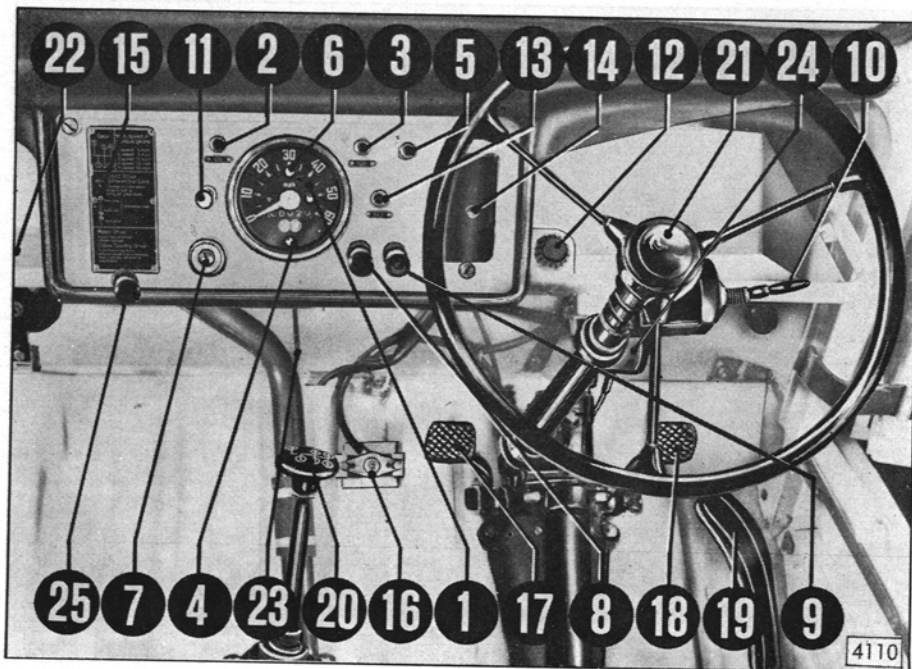
Left-hand drive (fig. 13)



- | | |
|---|---------------------------------------|
| 1 Speedometer | 13 Fuel warning light (or fuel gauge) |
| 2 Oil warning light | 14 Fuse box |
| 3 Ignition warning light | 15 Gear position diagram |
| 4 Direction indicator warning light | 16 Dip switch control |
| 5 Trailer direction indicator warning light
(for trailer operation only) | 17 Clutch pedal |
| 6 Main beam warning light | 18 Brake pedal |
| 7 Ignition switch (or steering wheel
locking ignition switch) | 19 Throttle pedal |
| 8 Lights switch | 20 Gear lever |
| 9 Push-pull switch for Eberspächer
heater (if fitted) | 21 Horn push knob |
| 10 Direction indicator switch | 22 Windscreen washer reservoir |
| 11 Push-pull switch for windscreen wipers | 23 Ventilation lever |
| 12 Manual pump for windscreen washer | 24 Brake fluid reservoir |
| | 25 Control knob for fresh air flap |

Operating and control elements for polyester cab models, version V

Right-hand drive (fig. 14)



- | | |
|---|---------------------------------------|
| 1 Speedometer | 12 Manual pump for windscreen washer |
| 2 Oil warning light | 13 Fuel warning light (or fuel gauge) |
| 3 Ignition warning light | 14 Fuse box |
| 4 Direction indicator warning light | 15 Gear position diagram |
| 5 Trailer direction indicator warning light
(for trailer operation only) | 16 Dip switch control |
| 6 Main beam warning light | 17 Clutch pedal |
| 7 Ignition switch (or steering wheel
locking ignition switch) | 18 Brake pedal |
| 8 Light switch | 19 Throttle pedal |
| 9 Push-pull switch for Eberspächer heater
(if fitted) | 20 Gear lever |
| 10 Direction indicator switch | 21 Horn push knob |
| 11 Push-pull switch for windscreen wipers | 22 Windscreen washer reservoir |
| | 23 Ventilation lever |
| | 24 Brake fluid reservoir |
| | 25 Control knob for fresh air flap |

1. CONTROLS

All vehicle controls are fitted to the dash board within the driver's field of vision. Instruments automatically illuminate if vehicle lighting is switched on. Please refer to the manufacturer's operating instructions for controls operating instructions for auxiliary attachments.

Speedometer (fig. 15)

The speedometer indicates the vehicle speed in km (miles) per hour. The odometer (fig. 15/1) registers continually the driven distance in km (miles).



Fig. 15 ▲

Main beam warning light (fig. 15/2)

A blue light indicates main beam operation.

Direction indicator warning light (fig. 15/3)

A green light flashes with the blinker cycle. The light disappears as soon as the indicators are switched off. Vehicles fitted with towing attachment have a trailer direction indicator warning light to the right of the speedometer (to the left for right-hand drive) (fig. 10/5, fig. 11/5, fig. 12/5, fig. 13/5 and 14/5). The warning light flashes in the same cycle as the vehicle indicator, provided the trailer indicator system is in order. The warning light flashes once only if the vehicle is used without trailer or if the trailer indicator system is faulty.

Fuel warning light

A dashboard mounted red warning light (fig. 10/13, fig. 11/13, fig. 13/13, 14/13) illuminates as soon as the fuel reserve is down to approx. 5 litres. A fuel gauge fig. 12/13 can be fitted on request.

Oil pressure warning light fig. 15/4

Glow as soon as the ignition key is inserted and goes out as soon as the oil pressure is built up sufficiently after starting the engine. If the light comes on when the engine is running, the engine must be stopped and the engine oil level checked. Do not continue driving until the fault causing the light to come on is rectified and the light extinguishes again at normal operating speed.

Short temporary flashing of the light when driving through narrow bends or during heavy vibration on cross-country rides is of no concern.

Ignition warning light (fig. 15/5)

Glow red after inserting the ignition key and by extinguishing indicates that the dynamo is charging the battery after starting the engine. If this light glows during driving, also stop the engine and check for faulty dynamo or faulty dynamo drive. Do not continue driving if fault is caused by dynamo drive because air cooling fan is not operating either. If the dynamo is faulty, short driving is possible but without lights.

Warning light for Eberspächer heater (fig. 10/9, 11/9, 12/9, 13/9 and 14/9)

Glow red if the Eberspächer petrol heater is operating. This heater is not standard equipment. See also page 16.

Warning light for warning flashing unit

(Standard equipment for German models and version II, page 9, fig. 11/22.) The orange light flashes in the cycle of the warning flashing unit.

The warning flashing unit for German models is fitted to the pull switch which is in place of the ignition lock (fig. 10/7).

2. OPERATING ELEMENTS

Ignition lock (fig. 10/7, 11/7, 13/7 and 14/7)

To switch on ignition, insert ignition key and turn clockwise until ignition and oil warning lights glow. The dynamo starter is operated by turning the key further in a clockwise direction.

Ignition lock with steering wheel lock (fig. 16 and 12/7)

Key positions

- a) Key in position "0"
Steering wheel locked
- b) Key in position "I"
Steering wheel unlocked
- c) Key in position "II"
Ignition switched on, ignition and oil warning light on
- d) Key in position "III"
The dynamo starter is operated.

The key can be removed from position "0" and "I".

The steering wheel lock engages in Position "0" if key is removed by light turning of the wheel.

Light switch (fig. 10/8, 11/8, 12/8, 13/8 and 14/8)

The light switch is fitted to the dashboard. Switch knob pushed in is position "0" and all lamps are switched off. Pulling switch to first stage is position "I" and switches on instrument illuminations, side and tail lights. Pulling switch to second stage switches on the headlamps. A foot-operated switch (fig. 10/16, 12/16, 13/16 and 14/16) dips the headlamp beam (headlamp beam dipping on the version II, page 9, also by direction indicator lever fig. 11/10).

Direction indicators switch combined with head lamp flasher (fig. 17)

The switch lever is switched on the steering column. Move lever clockwise to indicate right turns (fig. 17 R) and anti clockwise for left turn (fig. 17 L) (with right hand drive vice versa).

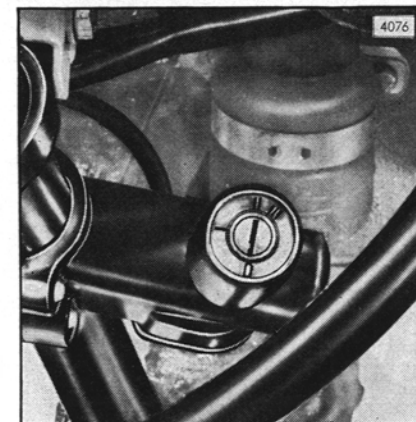
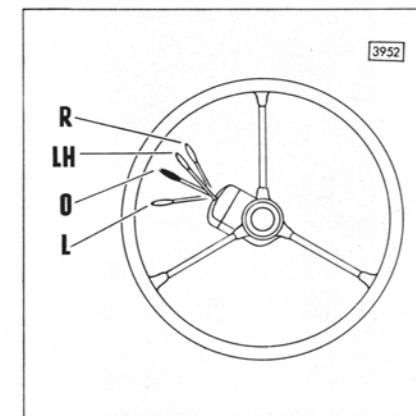


Fig. 16 ▲

Fig. 17 ▼



The indicator lever must be cancelled manually (fig. 17 O). Moving the lever towards the steering wheel flashes the headlamps (fig. 17 LH).

Windscreen wiper switch (fig. 10/11, 11/11, 12/11, 13/11 and 14/11)

This switch is of the push-pull type and is fitted to the dashboard. Pulling the knob activates the two wiper blades. When switching off, the blades return to the parking position. Functions only if ignition is switched on (2-speed wiper fitted to version II, fig. 11/11).

Switch for Eberspächer heater (fig. 10/9, 11/9, 12/9, 13/9 and 14/9)

Pulling this switch operates the Eberspächer type BN 2 heater. The heater continues working for approximately 3 minutes after switching off. The heater must only be switched on again after the warning light extinguishes. The heater can also be operated when the ignition is switched off.

Windscreen washer

The manual pump for the windscreen washer is fitted to the right hand side of the dashboard (fig. 10/12 and 11/12). The pump is fitted to the left hand side on glass-fibre, and right hand drive models (fig. 12/12, 13/12 and fig. 14/12). The washer reservoir is illustrated in fig. 10/23, 11/21, 12/23, 13/22 and 14/22.

Foot-operated dip switch (fig. 10/16, 12/16, 13/16, 14/16)

Full or dipped headlamp beam is selected with the left foot. The version II is fitted with a combined direction indicator/headlamp switch (fig. 11/10).

Gear lever (fig. 19/9)

The gear lever positions (fig. 18) for the 5 forward gears are standard, the reverse gear position is forward to the left. The gear lever must be pushed downwards to engage reverse gear.

Top speeds in the various gears

For models having a top speed of 75 km/h

- 1st gear 8 km/h (4,96 miles)
- 2nd gear 14 km/h (8,68 miles)
- 3rd gear 29 km/h (17,98 miles)
- 4th gear 48 km/h (29,76 miles)
- 5th gear 75 km/h (46,50 miles)

For models having a top speed of 70 km/h

- 1st gear 7 km/h (4,34 miles)
- 2nd gear 13 km/h (8,06 miles)
- 3rd gear 27 km/h (16,74 miles)
- 4th gear 44 km/h (27,28 miles)
- 5th gear 70 km/h (43,40 miles)

Selector lever for differential lock

The two selector levers for the front (fig. 19/1) and rear differential lock (fig. 19/2) are behind each other between the front seats. Differential locks are engaged by pulling levers fully. Vehicle must be "straight" when selecting or disengaging the locks.

Selector lever for front wheel drive

The pull type lever is in the centre of the vehicle (fig. 19/3). Engaging is also by pulling lever fully. Reduce throttle when engaging.

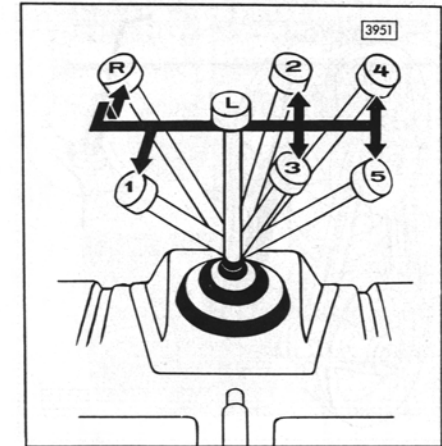
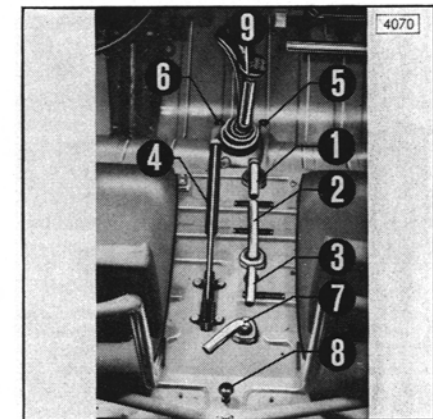


Fig. 18 ▲

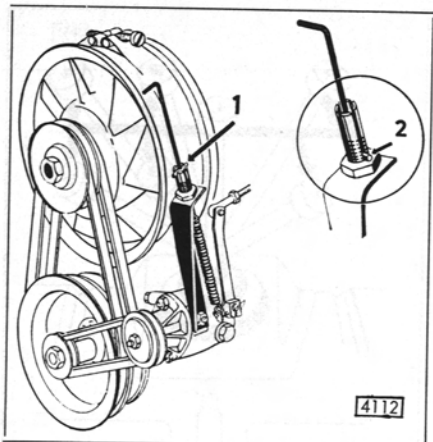
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Fig. 19 ▼



Hand brake (fig. 19/4)

Works on the rear wheels. Hand brake lever is held in braked position by a ratchet. To disengage, depress knob on top of lever.



▲ Fig. 20

Choke control (fig. 19/5)

Pull out knob for starting of cold engine.

Throttle control (fig. 19/6)

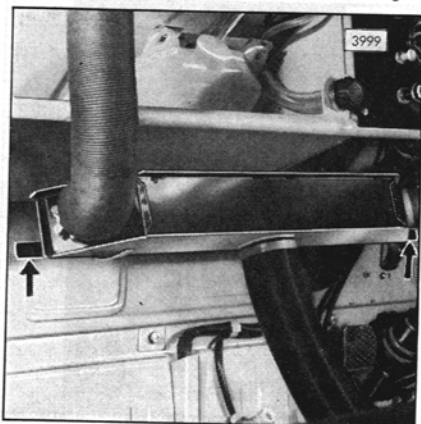
The throttle control permits selecting of any fixed throttle position. To this end pull out control button as required turn to the right thus fixing control cable. Return control for normal throttle pedal operation.

Selector lever for auxiliary drive, if fitted (fig. 19/7)

The cross-handle lever is situated between the front seats. The vehicle must be stationary and the clutch disengaged when selecting. The vehicle can be fitted with a control governor (fig. 20). Maximum two-stage speed is 3000 rpm. Control is by pulling and clockwise rotation of the control lever. The pin must engage in notch of control sleeve (fig. 20/1 stationary use, fig. 20/2 mobile use).

Control knob for vehicle heating (fig. 19/8)

The heating is infinitely variable with the control knob regulating the amount of warm air. Pulling the knob outwards permits warm air entering the vehicle interior. Two flaps to be closed by the driver (fig. 21, arrow) guide the warm air through the de-misting nozzles to the windscreen.



▼ Fig. 21

Control for fresh air flap (glass-fibre cab models)

The fresh air flap control is situated on the dashboard (fig. 13/25, 14/25). The knob is infinitely variable and controls the amount of fresh air. Fresh air enters the cab interior if flap lever (fig. 13/23, 14/23) is pushed upwards. For demisting, the lever is pushed downwards.

Trailer socket (only if towing attachment is fitted)

The trailer socket is fitted to the left-hand side of the rear of the vehicle as illustrated in fig. 22/1.

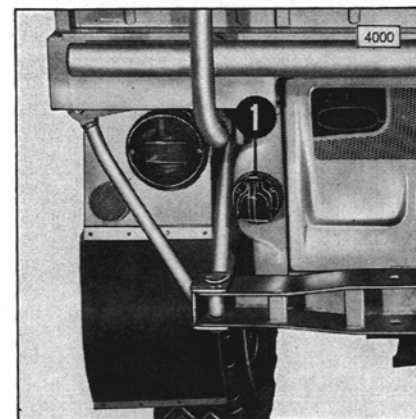


Fig. 22 ▲

Rifle holders (fig. 23)

The Hafflinger can be fitted with two rifle holders near the passenger. Two additional rifle holders can be fitted in front of the rear seats on the middle cross member on 1500 mm wheelbase models of the front tubular support. The holders are opened by swinging out the lock fig. 23/1. The floor is fitted with holders for the rifle butts (fig. 23/2).

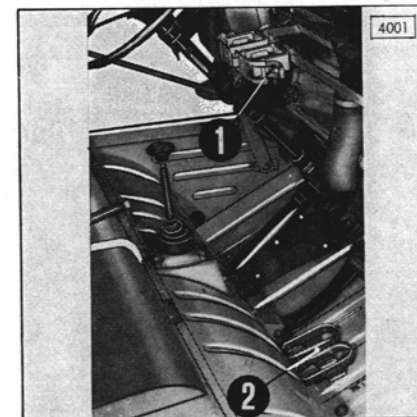
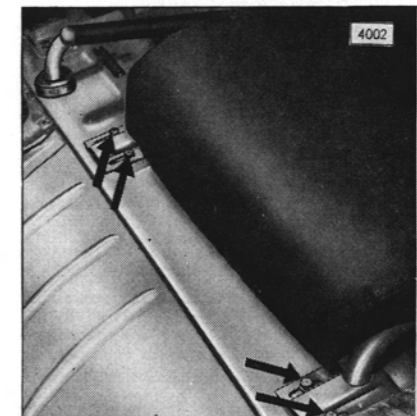


Fig. 23 ▲

Fig. 24 ▼

Adjusting the front seats

The front seats are adjustable or rearward. The seat anchors are slotted and held by four M6 screws (fig. 24, arrow). To adjust, loosen screws, move seat and retighten screws.



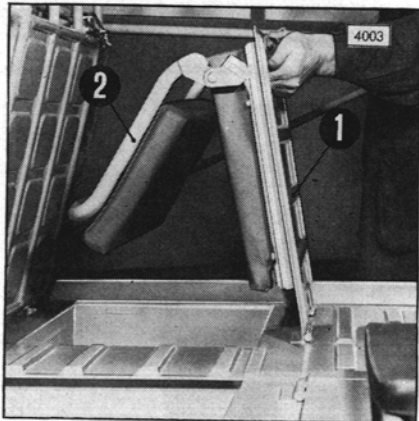


Fig. 25 ▲

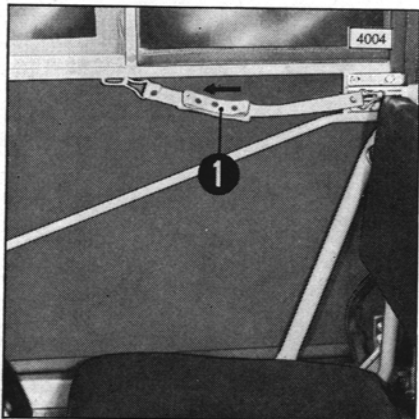
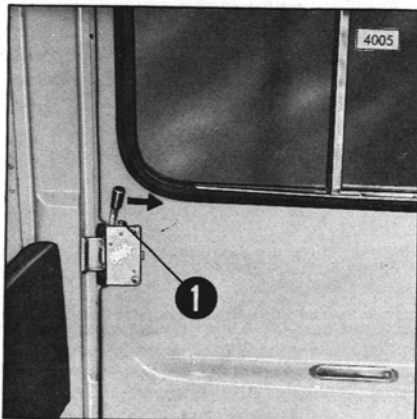


Fig. 26 ▲

Fig. 27 ▼



Setting-up of rear seats

Open cover (fig. 25/1) and swing back completely.
Lift up seat back (fig. 25/2).

Doors and locks

The doors are opened by pulling the door handles. The doors are opened from the inside by pulling out the strap (fig. 26/1). The doors cannot be locked.

Glass-fibre cab

The front left door can be locked from outside. The front right door can be secured from the inside by pushing the doorbolt to the rear (fig. 27/1). The door is opened by pushing outer door handle downwards or pulling inner door handle in direction of arrow (fig. 27).

Side windows

To open the two front door windows remove the two leather straps from the hooks (fig. 28, arrows). The windows are swung backwards and the straps secured on the rear hooks.

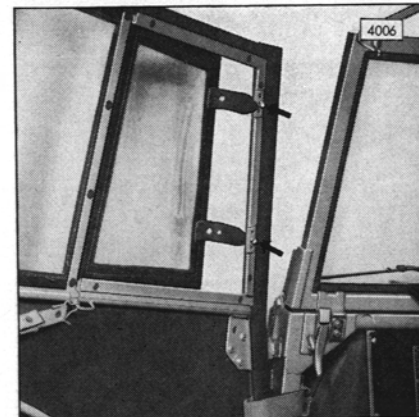


Fig. 28 ▲

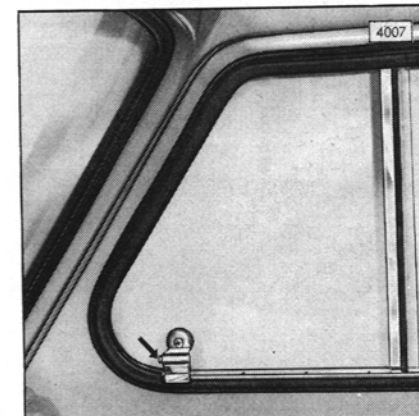
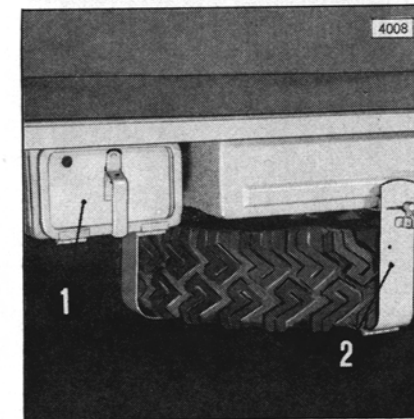


Fig. 29 ▲

Fig. 30 ▼



Glass-fibre cab.

The two front door windows consist of two panes each. The front pane is of the sliding type. To open, depress window knob lock (fig. 29, arrow).

Toolbox and spare wheel holder

The toolbox can be seen on the right-hand side of vehicle (fig. 30/1). Adjoining the toolbox is the spare wheel holder illustrated in fig. 30/2.

Vehicles with installed power take off have the spare wheel screwed down to the upper engine compartment lid.

With 1800 mm wheel base models the two tool boxes are arranged one after an other.

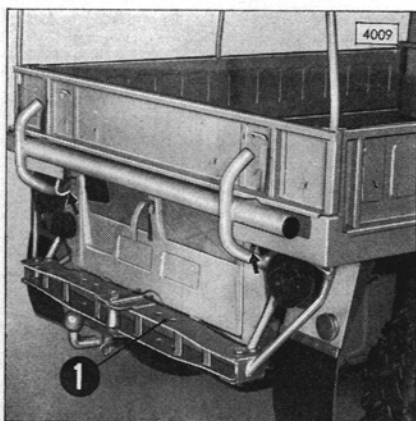
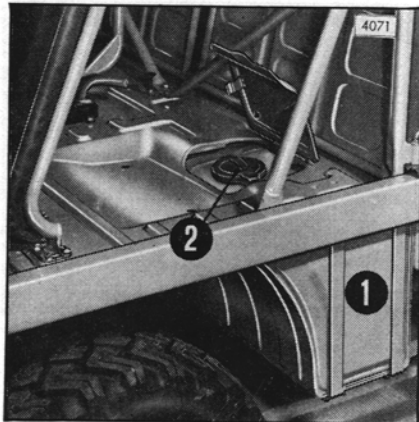


Fig. 31 ▲



Fig. 32 ▲

Fig. 33 ▼



Towing attachment (fig. 31/1)

The towing attachment is fitted to the chassis with struts. Both safety chains must be hooked in after connecting the trailer.

Tow hooks

The front towhook is illustrated in fig. 32/1 and the rear tow hooks in fig. 31 (arrows).

Fuel tank, reserve fuel can and battery box

The fuel tank is on the left-hand side of vehicle illustrated in fig. 33/1. The filler cap (fig. 33/2) is below the driver seat. Fig. 34/1 shows holder for reserve fuel can. There is no holder for fuel can with 1800 mm wheel-base. The battery box is also on the left-hand side and illustrated in fig. 34/2.

Seat belts

Angle brackets (fig. 35/1) are fitted to the floor on either side of the floor and threaded bolts (fig. 35/2) at the side to anchor seat belts.

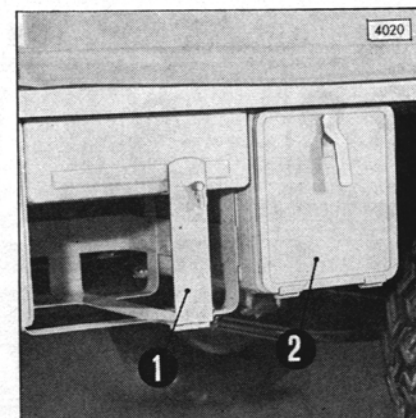


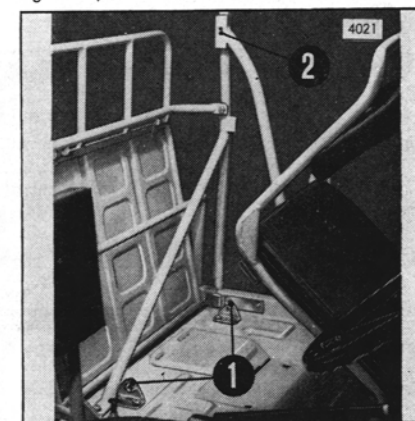
Fig. 34 ▲

HOODS

The large canvas hood

(Model with slot metal front panel)
The large canvas hood (four door) consists of three tubular supports (front, centre and rear), two straps (fig. 36/2) six side connecting tubes (fig. 36/3, 4, 5), the actual canvas hood and the four doors. (1800 mm wheel-base models have four tubular supports. The extra tubular support is screwed to the platform and is fixed on either side by two connecting tubes to the front and the centre tubular support.) The front tubular support is screwed to the platform, center and rear tubular supports are inserted into platform sides. Longitudinal support for the hood is provided by the connecting tubes fixed with screws to tubular supports and to the windshield. After loosening the wing nuts, the front connecting tubes can be swung in line with the front tubular support. The hood is supported in the roof center by two straps. In front the straps are hooked into eyelets (fig. 36/1) with a rubber connector and fixed at the rear by catches (fig. 36/6). The canvas hood is fixed accordingly to (fig. 37) to the

Fig. 35 ▼



wind guard (fig. 37/1), the front tubular support (fig. 37/2), the center tubular support (fig. 37/3) and to the side and rear platform (fig. 37/4) borders. The rear canvas flap can also be rolled up separately and secured with two straps to top of rear tubular support.

The safety chains must be hooked in if the vehicle is used without doors (fig. 36/7).

Swinging down wind guard

Loosen wing nuts on wind guard and swing front connecting tubes in line with front tubular support.

Open the two catches (fig. 36/8) and swing wind guard forwards. Secure wind guard with two rubber straps (fig. 38/1).

The short canvas hood

The short canvas hood (fig. 39) consists of front tubular support, canvas hood and two doors.

The front tubular support is screwed to the platform. Side support for the hood are the connecting tubes secured with wing nuts to the wind guard.

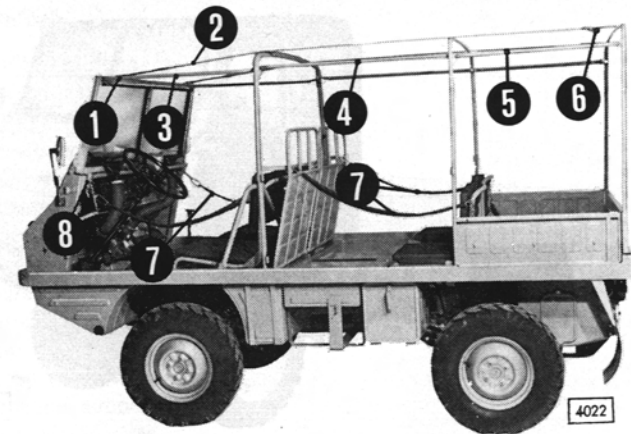


Fig. 36

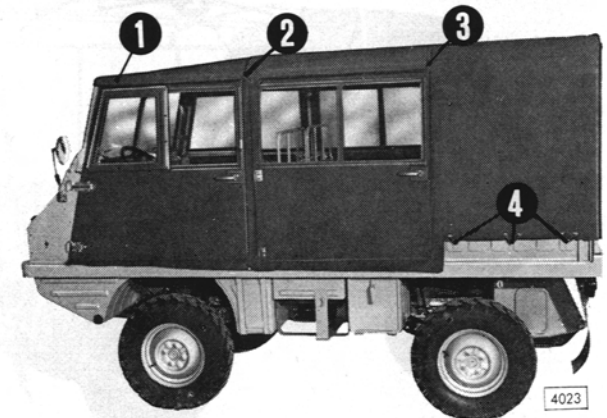


Fig. 37



Fig. 38



Fig. 39

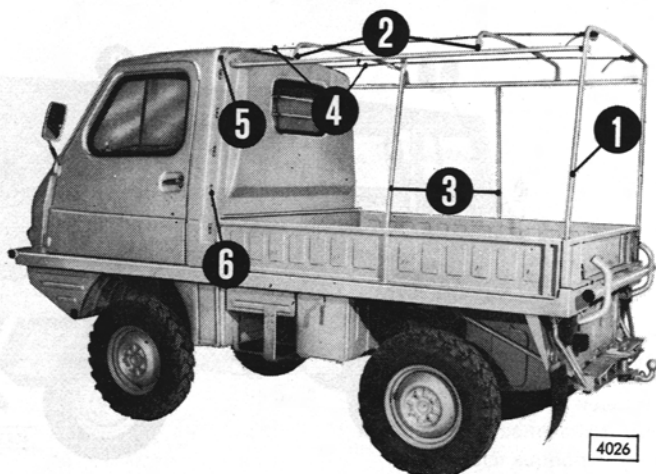


Fig. 40

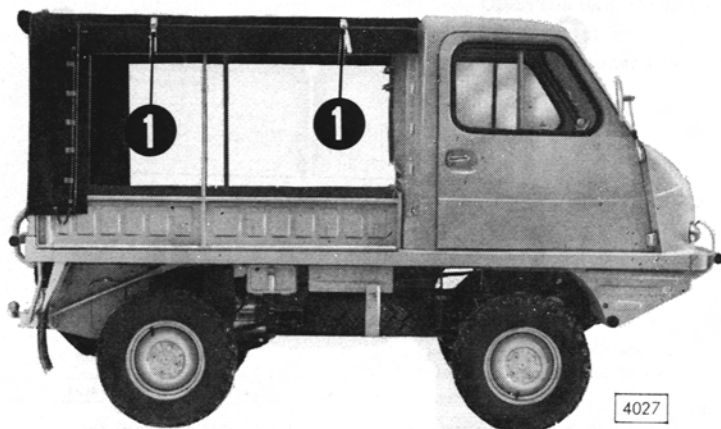


Fig. 41

Canvas hood for glass-fibre cab

The canvas hood for the glass-fibre cab consists of rear tubular support (fig. 40/1), two small tubular supports (fig. 40/2), two side members (fig. 40/3), two connecting tubes, two straps (fig. 40/4) and the canvas hood which can be rolled up on the sides and rear. The rear tubular support and the side members are inserted into the holes provided in the sides. The connecting tubes are screwed to tubular support, members and cab rear wall. The cover is inserted into the sheet-metal holder fitted to the rear roof top (fig. 40/5) and fixed backwards over tubular support with rubber loops. Connect eyelets of canvas sides into hooks on cab (fig. 40/6) and secure with the straps.

If sides and rear of canvas is rolled up (fig. 41), disconnect hooks first. The rolled up flaps are secured to the hood with the straps provided (fig. 41/1).

V. Driving instructions

1. STARTING THE ENGINE

Switch on ignition. Ignition and oil warning lights switch on. Move gear lever to neutral.

Cold engine

Pull choke (fig. 19/5) particularly when the air temperature is low. Do not depress throttle pedal (fig. 10/19). Turn ignition key clockwise to operate dyna starter. If engine does not start, switch off dyna starter after five seconds and wait about the same length of time to rest wise to operate starter. If engine does not start, switch off starter after five seconds and wait about the same length of time to rest the battery before restarting.

Note for starting at very low temperatures: Disengage clutch at temperatures below zero centigrade and for cold starting with crank. Move choke halfway back as soon as engine has started. Warm up engine for approximately two minutes at slightly increased idling speed (max. 2000 rpm). Use moderate engine speeds to begin with when driving off.

Push back choke as soon as possible.

Warm engine

Do not use choke on a warm engine. If engine does not start after a few attempts, depress throttle pedal completely and release as soon as engine is running.

2. DRIVING OFF AND GEAR

CHANGING

Drive off in 1st gear for hill starts only, otherwise use 2nd gear

Depress clutch pedal completely before selecting 2nd gear. Do not forget to release hand brake. For hill starting, throttle, clutch and hand brake operation should be synchronised.

Gear changing

Select second, third, fourth and fifth gear in the medium speed range. Do not exceed the specified speeds in the various gears. The speed governor must be readjusted if higher speeds are required. The maximum speeds are quoted on page 17. A plate with the maximum speed data is also fitted to the dashboard in full view of the driver (fig. 10/15, 11/15, 12/15, 13/15, 14/15). The engine cannot be over-reved on the flat or uphill because the speed governor limits maximum engine speed to 4800 rpm. Downhill the engine is pushed by the vehicle and speed is no longer controlled by the governor. It is the driver's responsibility to limit the engine speed in the various speeds, if necessary by braking. All five gears are synchronised for smooth gear changing. Throttle before gear changing is not required, but the clutch must be properly disengaged and the lower gear be selected slowly to protect the synchromesh.

3. STOPPING AND PARKING

When driving, from time to time check the ignition and oil warning light. They must not be lit during normal operation. Before the vehicle is at a standstill, disengage clutch and move gear lever to neutral. Switch off engine and remove ignition key. To prevent possible burn-out of the ignition coil, the key must not be left in the ignition position if the engine is switched off. Pull up hand brake before leaving vehicle and switch on parking lights if appropriate.

4. NORMAL DRIVING

Use rear wheel drive only for normal road driving. Ensure front wheel drive and differential locks are disengaged (all three selector levers pressed down).

5. CROSS-COUNTRY DRIVING

Select front wheel drive if the motive power and ground adhesion of the rear wheels is insufficient uphill or in cross-country driving. The differential locks are selected if the wheels are slipping due to insufficient ground adhesion. Steering control is reduced with front axle differential lock and should not be engaged to drive through narrow bends.

Select front wheel drive and differential locks in good time for obstacles. Reduce throttle for selection. If the vehicle comes to a standstill with wheels slipping because selection was not made, reduce throttle, select front wheel drive or differential locks and start off again. Disengage front wheel drive and differential locks at slow speed only.

It is sufficient to press the selector lever down until the four wheel drive coupling dogs disengage. Do not disengage four wheel drive and differential locks of a stationary vehicle because the coupling dogs could, in unfavourable circumstances, jam and cause stress on the operating leverage. To prevent overstressing the differential locks, it is ad-

visable not to use them for driving in narrow bends or on good ground conditions. Chains fitted to all four tyres produce best adhesion in rough country and, therefore, maximum power. Chains must not be too tight to remain flexible and self-cleaning. The chains should be tighter for hard ground than for soft ground. Remove chains for driving on normal roads to reduce wear on chains and tyres.

Select lower gear before driving downhill. Always select the same gear for downhill as would be required to drive uphill. Use four-wheel drive for downhill driving in rough ground conditions to take advantage of the adhesion and brake power of all four wheels.

6. WINTER DRIVING

Change to low viscosity engine oil SAE 10 (see attached technical data) for easier starting in the cold winter months. To prevent cold air entering in winter the right air inlet of the rear engine compartment cover must be closed with the flap provided (except APT versions). This flap is held by a spring in the open position (summer driving). For winter driving, turn spring, swing down flap (fig. 45/4) and locate again in holding bracket in the lower position with the lower spring (vertical position).

Furthermore, the warm air disposal system of the oil cooler is fitted with an adjustable, red flap (fig. 45/5). This flap can be turned after loosening the two screws (fig. 45/6). Turn flap cross-wise and locate. This reduces loss of warm air from the fan hood, the intake air is pre-warmed and the engine more easily remains at the correct operating temperature.

VI. Running In

New vehicles as well as those with re-conditional engines must be driven gently for the first 2000 km. During this time, the engine should be used generally at half throttle and only for short periods at full throttle.

The speed should not exceed 80% of the quoted run-in speeds.

Continuous change of throttle position increases fuel consumption unnecessarily.

VII. Maintenance

The time intervals for the prescribed maintenance work are quoted in the lubrication and maintenance chart.

Opening the top engine compartment cover

The top engine compartment cover (fig. 42/1) can be swung open after pulling the catch (fig. 42/2). The catch is accessible after opening the rear engine compartment cover. The engine must be switched off.

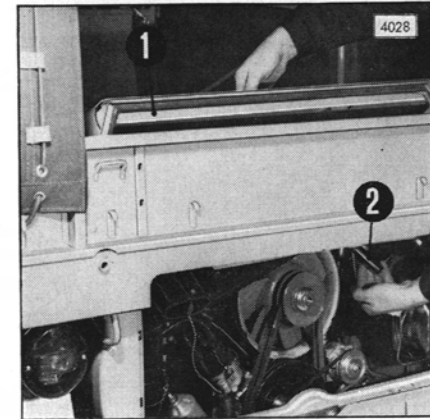


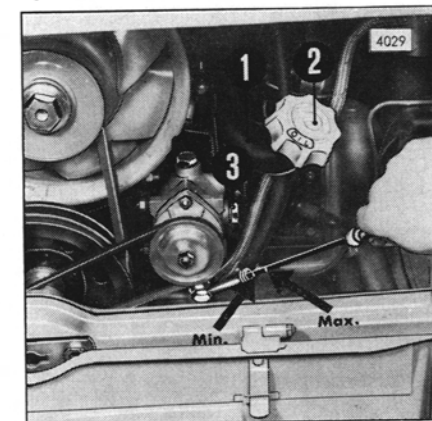
Fig. 42 ▲

Checking the engine oil level (fig. 43)

The oil dipstick is accessible after opening the engine compartment cover. To check oil level, engine must be switched off and standing on a level.

Unscrew dipstick, pull out and clean. Replace stick without screwing in and pull out once again. The oil mark must now be between the minimum and maximum marks of the dipstick. The oil level must not be below minimum nor above maximum. Top up oil with the same brand and type. Replenish oil through oil filter (fig. 43/1) on models with enclosed crankcase ventilation. Unscrew filler cap anti clockwise (fig. 43/2). The filler cap on models without enclosed crankcase ventilation is held by a spring which has to be pushed off to remove cap.

Fig. 43 ▼



Oil level and speed governor

From time to time open the oil filler (fig. 43/2) of the speed governor and top up with engine oil until overflowing.

Tyre air pressure

Tyre life and road safety depends on the correct air pressure. The section on technical data quotes tyre size and air pressure.

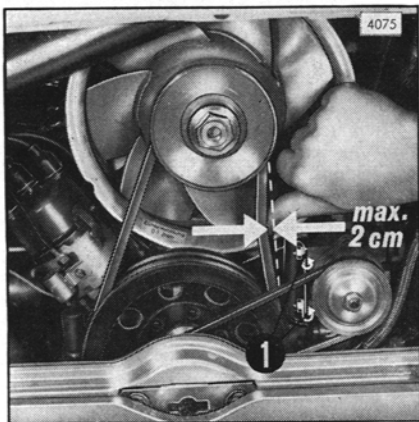


Fig. 44 ▲

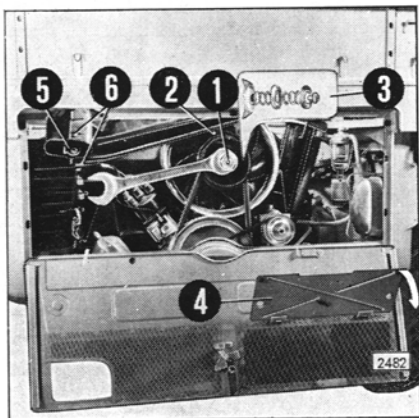


Fig. 45 ▲

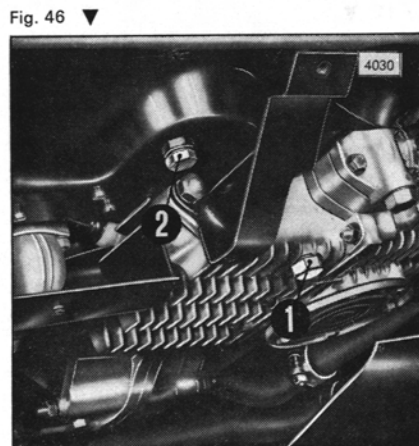


Fig. 46 ▼

Belt tensioning

The two driving belts of the dynastarter drive the crankshaft when starting and the dynamo and the fan when running. The belts must have the correct tension. Check by light thumb pressure. The belt must not depress more than 1 to 2 cm (fig. 44). The narrow belt drives the speed governor. Proper functioning of the governor is necessary for trouble-free running.

Insufficient as well as too much belt tension can cause damage. To adjust remove first the nut (fig. 45/1). Insert a pin into the hole of fan (fig. 45/2) to lock for loosening and tightening the nut. Belt tension is adjusted by adding or removing shim washers between the pulley halves.

These shims (fig. 45/3) are fitted in equal numbers to either side of pulley center piece. Removing shims increases the belt tension, adding reduces the belt tension. Removed shims are placed behind the front nut in order to keep the overall distance. Always replace belts in pairs. The speed governor belt is tensioned by fitting further washers (fig. 44/1) below the governor housing.

Changing the engine oil

Warm up engine before changing the oil. Remove drain screw (fig. 46/1) from crank housing and screw (fig. 46/2) from oil filter housing to let oil drain out completely. Remove any metal deposits from the magnetic drain screws and refit screws. Add 1 3/4 litres

of engine oil through oil filter. Start engine and allow it to idle for a few moments. Switch off engine and check oil level with dipstick. Add oil up to maximum mark. Do not overfill. See technical data for oil viscosity and quantity.

Changing the front axle oil

Change oil only when warm. The drain (fig. 47/1) is situated underneath the drive housing. The screw can be reached through an opening in the ground guard. The filler screw (fig. 48/1) is on the right-hand side housing beside the front wheel drive selector lever. The lower edge of filler hole is the topping up level.

See technical data for oil viscosity and quantity.

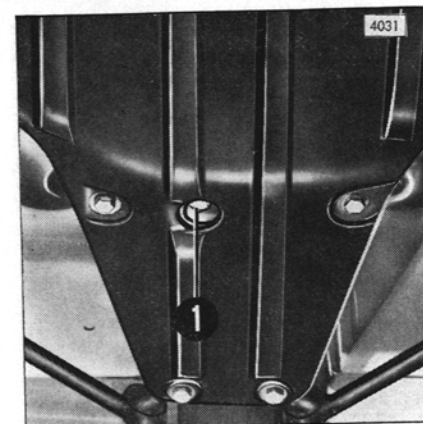


Fig. 47 ▲



Fig. 48 ▲

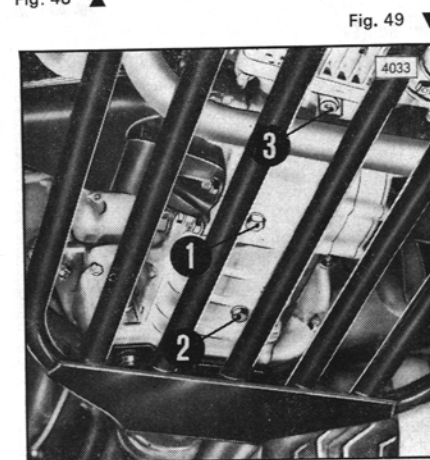


Fig. 49 ▼

Changing the gearbox and rear axle oil

Change oil only when warm. The drain screw (fig. 49/1 and 2) are underneath gearbox and drive housing respectively.

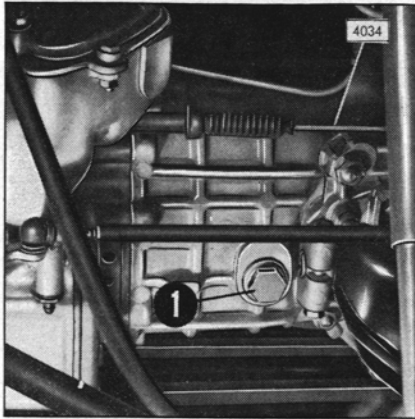


Fig. 50 ▲

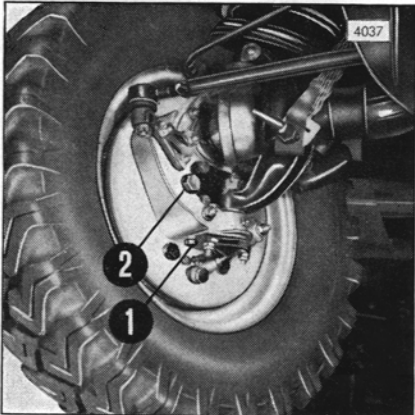
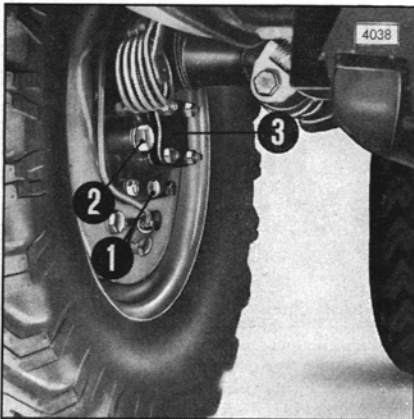


Fig. 51 ▲

Fig. 52 ▼



The filler screw (fig. 50/1) is on the left-hand side of drive housing. The lower edge of the filler hole is the topping up level. The oil drains slowly so do not rush the filling up operation.

See technical data for oil viscosity and quantity.

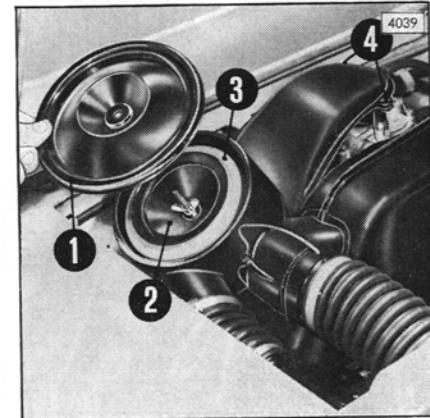
Changing wheel drive oil front and rear

Change oil only when warm. The four drain screws (fig. 51/1 and fig. 52/1) are underneath the rear wheel drive housing and to the side of the front wheel arches, in either case, near the brake bleeding screw. The filler opening (fig. 51/2) on the right-hand vehicle side is on the wheel bearing adjusting cover at the wheel arch and on the left-hand side behind the adjusting cover (fig. 52/2). The lower edge of the filler opening is the topping up level.

See technical data for oil viscosity and quantity.

Cleaning or replacing micronic filter

Remove outer filter cover (fig. 53/1) after loosening wing nut. Unscrew second wing nut and lift out filter cover (fig. 53/2) with air filter (fig. 53/3). Clean micronic filter with compressed air from inside to outside. Excessive air pressure could damage the filter insert. Oiled up or damaged filters must be replaced.



▲ Fig. 53

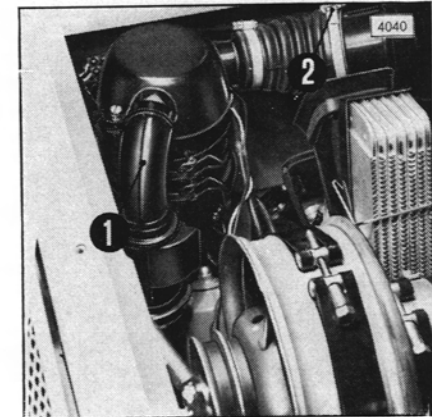
Cleaning and replenishing oil bath filter

Remove fan hood and air intake (Zyclon fig. 54/1) on versions 2 and open catches of oil filter housing (fig. 55/1) and oil reservoir (fig. 55/2).

Press filter housing upwards and remove oil reservoir with filter insert downwards.

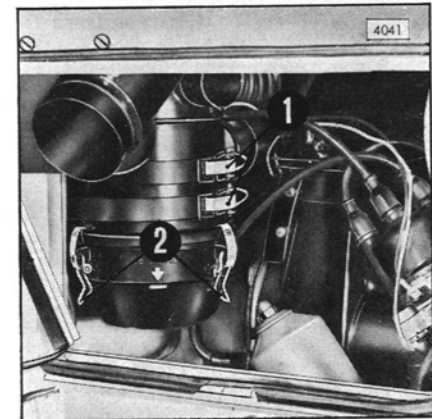
Use petrol to clean oil reservoir and oil filter. Soak filter in new oil, top up oil reservoir with engine oil and refit. Oil level to red mark, see arrow fig. 55.

The Zyclon air filter (fig. 54/1) fitted to the vehicle front of tropical versions is maintenance free.



▲ Fig. 54

Fig. 55 ▼



Cleaning the carburettor

Dismantle fan hood and remove air intake as follows:

Open hose clip (fig. 54/2) and take off vacuum hose (model with closed crankshaft ventilation) from air intake after taking off the two M6 screws (fig. 53/4). Remove M8 screw (fig. 56/1) from intake tube and take off air intake. Disconnect accelerator pump return spring (fig. 57/1). Dismantle accelerator pump linkage (fig. 57/2) by removing split pin. Do not lose washer.

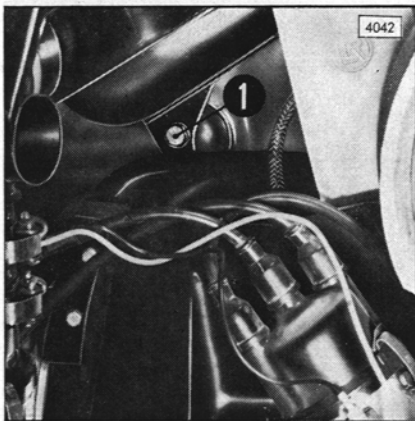


Fig. 56 ▲

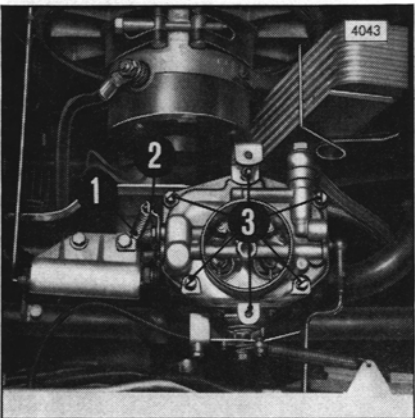
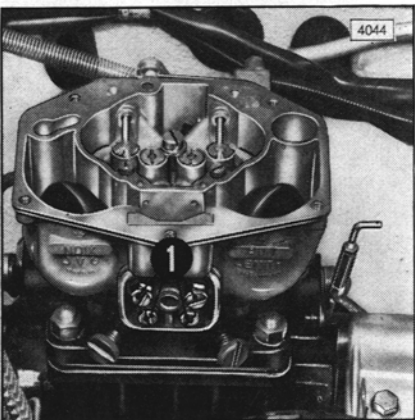


Fig. 57 ▲

▼ Fig. 58



Close carburettor fuel pipe. Remove the six carburettor fixing screws (fig. 57/3) and lift off cover. Take out float. Unscrew nozzle holder cover (fig. 60/1) and unscrew jets (fig. 58/1). Clean jets with compressed air only—needles or wire could damage the fine bores. Use compressed air to blow out all float chamber and carburettor bores. For reassembling note the following points:

Tighten jets, fit jet holder cover side marked "oben" facing upwards. Check carburettor gasket. Replace damaged seal (fig. 59/1) of air intake. The air intake and seal must enclose the carburettor connection completely and must be changed with the two M6 screws (fig. 53/4).

To clean jets, remove jet holder cover and unscrew jets (fig. 58/1).

Carburettor slow running adjustment

Slow running adjustment is called for after dismantling and cleaning of carburettor, after valve adjustment or after dismantling or adjusting of carburettor linkage.

For slow running adjustment proceed as follows:

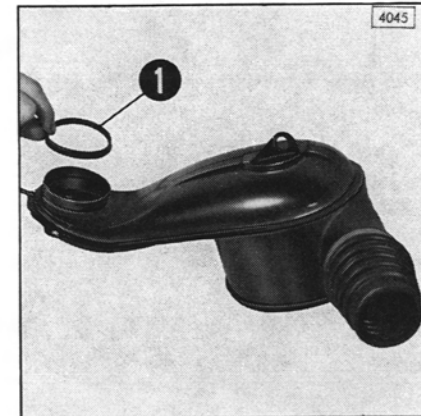
- Warm up engine and switch off.
- Close mixture control screw (fig. 60/2) and open $\frac{1}{2}$ turn. It is important to have the same setting for both mixture control screws.
- Start engine.
- Adjust throttle stop screw (fig. 60/3) until engine runs just above idling speed.

- Turn both mixture control screws either way to find position giving highest engine speed (turn both screws the same amount).
- Turn back throttle stop screw until correct engine idling speed is achieved (approximately 700 rpm).

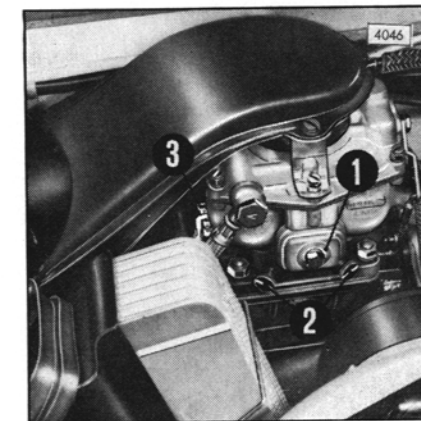
Cleaning the fuel filter

The fuel filter is situated on the right-hand side of engine compartment (fig. 61).

For cleaning, loosen wing nut (fig. 61/1) below glass container, push off holder (fig. 61/2) and empty and clean glass container (fig. 61/3). Replace clogged filter inserts. Cartridge type filters are to be replaced completely.

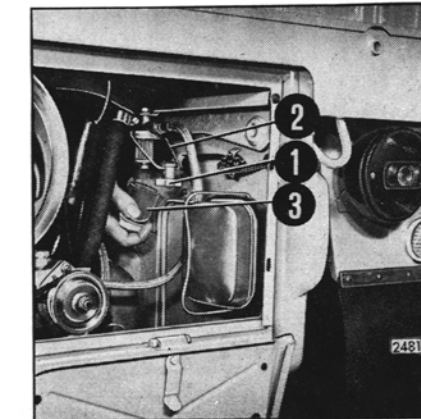


▲ Fig. 59



▲ Fig. 60

▼ Fig. 61



Changing oil filter

To change the oil filter, dismantle complete oil bath air filter with air intake (with Zyclon on version II).

Remove domed nut (fig. 62/1) with ring spanner and dismantle filter housing. Remove spring and rubber guide and lift out oil filter insert. The rubber seal (fig. 62/2) and copper washer under the domed nut must be replaced when fitting new filter insert. Start engine and check oil filter for leaks.

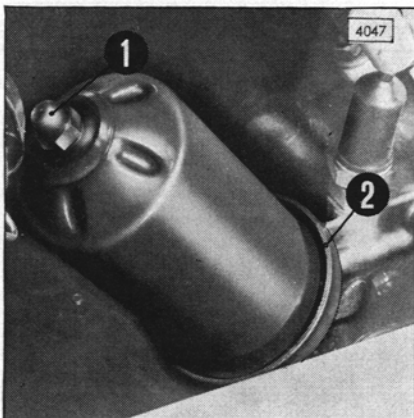


Fig. 62 ▲

Cleaning the fuel tank

The fuel tank can be drained if contaminated by water or dirt. Remove drain screw from underneath of tank. Flush fuel tank with clean petrol before replacing drain screw.

Adjusting valve clearances

First remove domed nut from cylinder head cover using cranked ring spanner and take off cover. If cover is sticking, use rubber hammer to tap wood dowel applied to cover spouts. The valve clearance is adjusted with the cold engine and is 0.20 mm for both inlet and exhaust valves.

Observe one of the two cylinders for adjusting. Use crank to turn crankshaft clockwise until both valves of this cylinder are closed and the pulley mark is matching the fan mark. Loosen counternuts (fig. 63/1) of adjusting screws (fig. 63/2) on rocker arms using a ring spanner and adjust valve clearance on adjusting screw with a feeler gauge (fig. 63/3). Retighten counternuts and recheck clearance of second cylinder. To adjust valve clearance on the other cylinder rotate crankshaft by 360 degrees.

Retightening the cylinder head

A torque wrench must be used to retighten the cylinder head. Proceed in a cross-wise fashion. Tightening torque 2.5 mkp.

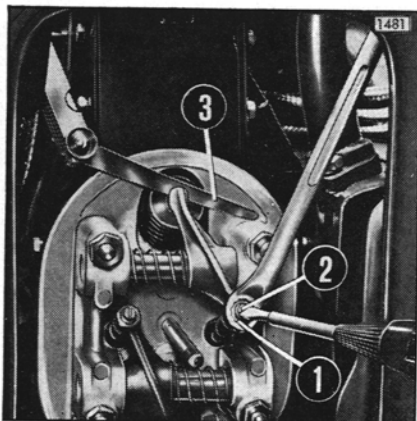
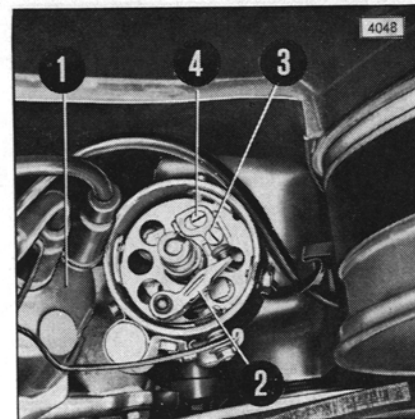


Fig. 63 ▼

Adjusting the contact breaker points

Contact breaker gap and condition of contacts must be checked prior to timing. Remove distributor head (fig. 64/1) after pushing off the two holding springs and take off rotor (fig. 65/1). Turn crankshaft until cam opens moving contact (fig. 64/2) fully. Slacken fixing screw (fig. 64/3) of fixed contact and adjust contact gap to 0.4 mm by turning the excentric screw (fig. 64/4). Retighten fixing screw. Use special contact file and clean pitted or blackened contacts or replace if necessary. Wipe dry distributor head (fig. 64/1). Apply a little grease to cam and to felt below rotor.

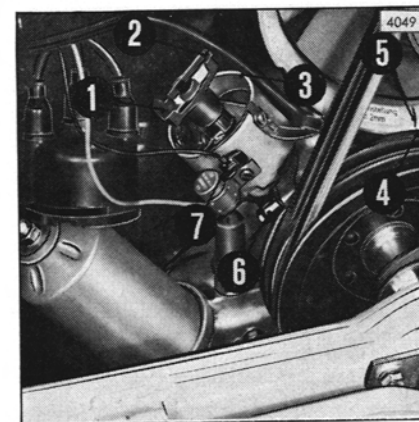


▲ Fig. 64

Ignition timing

Refit rotor (fig. 65/1). Remove sparking plug from left cylinder and earth it, while leaving H.T. lead fitted. Switch on ignition. Turn crankshaft clockwise slowly until a spark on the sparking plug can be seen and heard. The contacts are just opening at this position. Provided the contact gap is adjusted correctly the rotor marking (fig. 65/2) must now match the distributor housing marking (fig. 65/3) and the pulley marking (fig. 65/4) must be 0-2 mm before the fan marking (fig. 65/5). If not, turn the distributor housing after slackening the fixing clamp (fig. 65/6) to correct timing. Turning against operating direction advances, turning in operating direction retards the timing. Retighten clamp, check again and switch off ignition. Refit distributor head. A more accurate way of timing is by using a test lamp. Connect lamp between terminal (fig. 65/7) (capacitor connection) and earth. The lamp lights if the contacts open (ignition must be switched on).

▼ Fig. 65



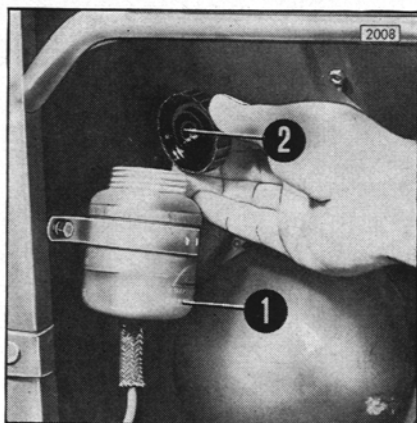


Fig. 66 ▲

Cleaning and testing the sparking plug

The average plug life is 10.000 km. The gap of the sparking plug electrodes should be checked from time to time. Remove sparking plug, check gap (0.6–0.7 mm) and adjust if necessary by bending the earth electrode. If engine and sparking plug are working properly, the plug insulator is coloured medium grey to brown. A light grey to white insulator indicates weak carburettor mixture, a wet or black insulator indicates mixture too rich or intermittent firing of the sparking plug. Clean sparking plug with wire brush or piece of wood and blow out with compressed air.

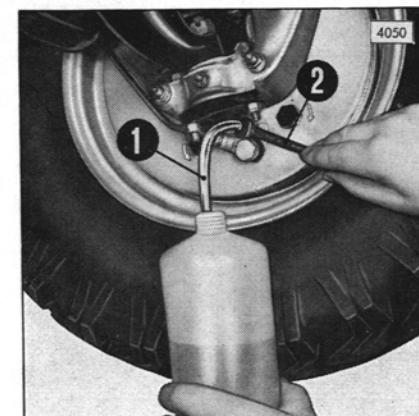
Brake fluid reservoir

The brake fluid reservoir (fig. 66/1) is to the front, on the left beside the dashboard (R.H. drive models to the right of dashboard). Glass-fibre cab models have the reservoir on the front panel near the steering housing (fig. 13/24 and 14/24).

The brake fluid level should be 1 cm below the top edge of reservoir. Never use oil but only genuine brake fluid. Ensure the ventilating bore (fig. 66/2) in the reservoir thread is free.

Bleeding the brakes

If the brake pedal can be depressed too far and feels spongy, air has entered the brake system and must be removed. Commence with the bleeding valve further removed from the main brake cylinder (i. e. rear right). Remove rubber shroud from bleeding tube (fig. 67/1). Insert free tube end into clear container filled with brake fluid. Position container as high as possible. Open bleeding valve $\frac{1}{2}$ turn using a spanner (fig. 67/2). Actuate brake pedal a few times slowly for brake fluid to flow into the container. The enclosed air comes to the surface. Stop actuating pedal as soon as bubbling stops and only fluid is pumped. Ensure sufficient brake fluid is in the reservoir to prevent more air from entering. Hold pedal in lowest position after finishing actuating until bleeding valve is closed. Remove bleeding tube and replace rubber shroud. Repeat on the other three wheel brake cylinders. Brake fluid from the bleeding tube should not be re-used.

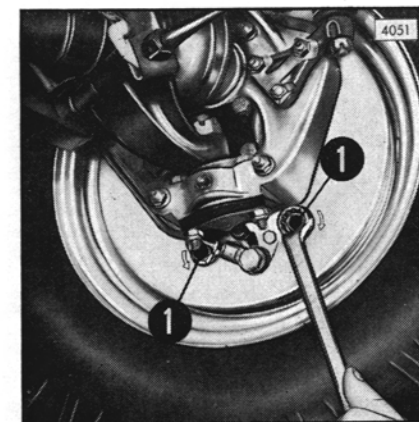


▲ Fig. 67

Brake adjustment

The brake shoes must be adjusted if the pedal has to travel near to the floor before braking action is felt. Jack up vehicle until the relevant wheel moves freely. Turn the two adjusters (fig. 68/1) in the direction indicated by the arrow until each brake shoe blocks the drum. Now turn adjuster back until drum is freed and wheel moves freely. Repeat with second adjuster and on remaining wheels. Brake linings oiled or worn to half thickness must be replaced.

▼ Fig. 68



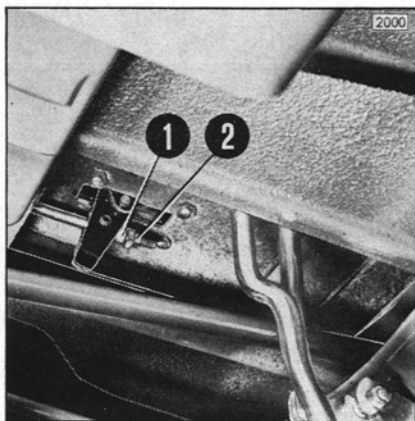


Fig. 69 ▲

Hand brake adjustment

The hand brake Bowden cable is adjusted with the nut (fig. 69/1) situated between the two chassis members in the vehicle centre below the platform. Slacken counternut (fig. 69/2) and turn nut (fig. 69/1) clockwise until correctly adjusted. The brake shoes must be free if the handbrake is released. Retighten counternut.

Changing the brake fluid

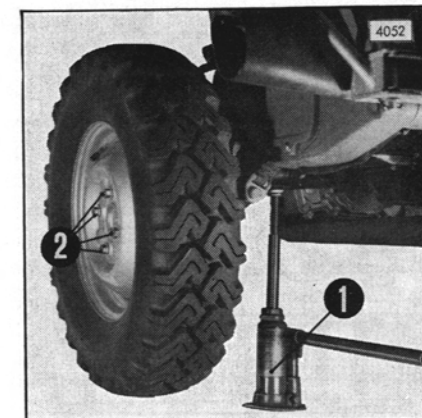
Before refilling flush the brake system with spirit or brake fluid. Do not use petrol, paraffin, phenyl hydride, mineral lubricants, trichloroethylene or other thinners for flushing because even traces would cause swelling of the rubber components. Dismantle main and slave cylinders according to repair instructions. Clean brake cylinders but do not damage bores and seatings by using unsuitable implements (scraper or screwdriver). Blow through all brake tubes and pipes with water-free, filtered compressed air. Refit and fill brake system as quickly as possible to prevent corrosion in cylinder bores and brake pipes. Finally bleed brake system.

Wheel changing

For wheel changing pull handbrake or block wheels on opposite side to prevent rolling off. Lift appropriate vehicle side at axle tube with jack (fig. 70/1). The four wheel nuts (fig. 70/2) must be slackened before the vehicle is jacked up. Lift up with jack, remove wheelnuts and take off wheel. Fit spare wheel, add nuts and tighten in a crosswise fashion. Check nut tightness again after removing jack. (7 mkp)

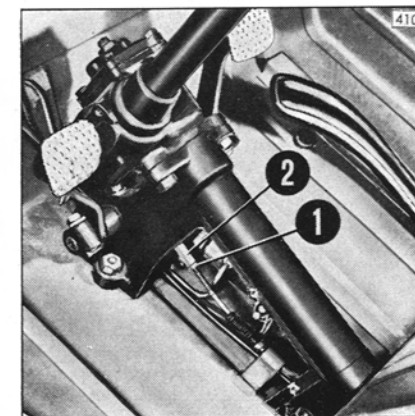
Wheel bearing adjustment

All four wheel hubs are fitted with two adjustable bevel roller bearings. Remove adjusting cover (fig. 52/3) from inside of wheel drive housing and adjust by using shims of different thickness. The bearings must be pre-tensioned (torque on wheel flange 0.07–0.09 mkg) and must only be adjusted by an approved service station.



▲ Fig. 70

▼ Fig. 71



Clutch adjustment

Check clutch pedal to ensure outer extremity has a free travel of approximately 20 mm. Adjustment is required if the free travel distance is reduced or non-existent due to wear of clutch lining (clutch slipping). Remove left cover from steering block, slacken counternut (fig. 71/1) on clutch cable and adjust required clearance with adjuster (fig. 71/2). Retighten counternut.

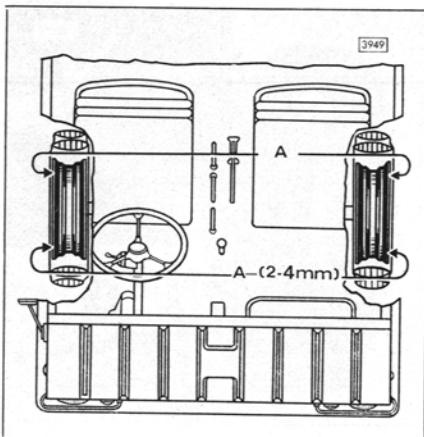


Fig. 72 ▼

Draining oil from clutch housing

The drain screw is illustrated in fig. 49/3. Slacken screw a few turns and wait to see if any liquid drains out. Retighten drain screw.

Toe in adjustment

The toe in is 2–4 mm, vehicle loaded with two men and housing correct tyre pressure. The toe-in is measured between equal positions of wheel rims whereby the front wheels must be positioned straight ahead.

Measure distance "A" (fig. 72) on rear of rims, push vehicle forwards until the same data points are in front. The distance in front must be 2–4 mm less than the distance "A". To adjust the toe-in, screw toe rod ends in or out as required after slackening the clamps. The steering track lever on the front axle drive must be in the centre.

Taking up steering play

The steering must be adjusted if the steering wheel has too much play. Adjust with steering in straight ahead position by slackening the counternut and turning in the adjusting screw (fig. 73/1) with a screwdriver until steering play is normal. Hold adjusting screw in this position and retighten counternut. Then check steering for jamming.

Topping up oil level in steering gear

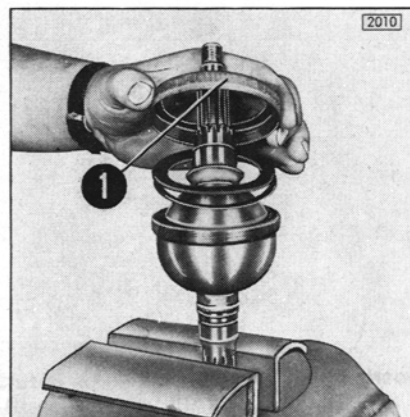
To top up steering gear oil level, remove screw (fig. 73/2) and add gear oil SAE 90 until overflowing.

Checking toe rod rubber shrouds

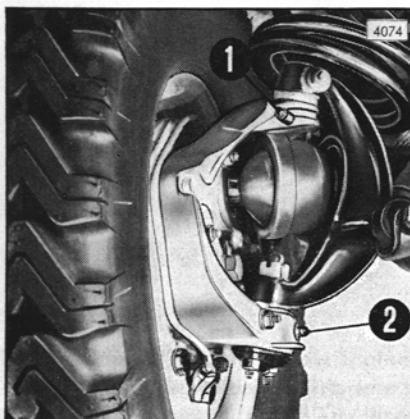
Damaged rubber shrouds must be replaced. Add molykote grease "longterm" before fitting.



▲ Fig. 74



▲ Fig. 75



▼ Fig. 76

Cleaning and lubricating front wheel drive joints

Remove the four wheel nuts and take off wheel complete with brake drum. Disconnect spring from half axle and remove toe rod (fig. 74/1) after unscrewing crown nut from stub axle. Disconnect brake pipe from brake tube and remove complete stub axle after removing the king pins. The lower king pin is removed as follows:

1. Unscrew crown nut (fig. 74/2) and lower cover (fig. 74/3).
 2. Take out ball, ball socket and adjusting screw.
 3. Tap down bolt or extract with M10 screw.
- The upper king pin is removed as follows:

1. Remove key nut (fig. 74/4) and tap out key.
2. This king pin has a M7 internal thread and can be lifted out upwards with an M7 screw.

The complete stub axle can now be removed by pulling out the joint shaft. Clamp wheel screws in vice, joint standing upright. Open thread (fig. 75/1), clean joint carefully with petrol and dry. Lubricate all components lightly and assemble. Fill joint with liquid lubricant containing molybdenumsulphide and screw tight. Lock thread with 6–8 mkg. Refit stub axle.

Check steering stop left and right for proper position as per workshop manual.

Lubrication

The vehicle has 20 lubricating nipples
Front wheel stub axles (fig. 76/1 and 2)
 four lubricating nipples

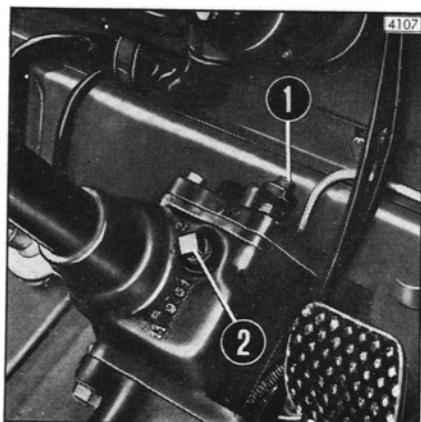


Fig. 73 ▼

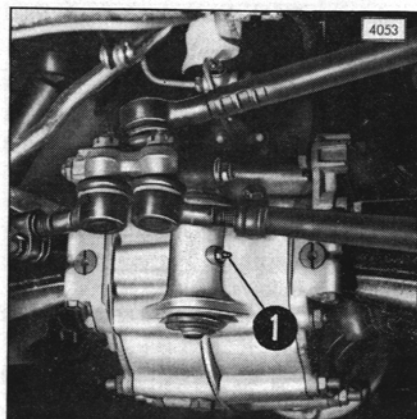


Fig. 77 ▲

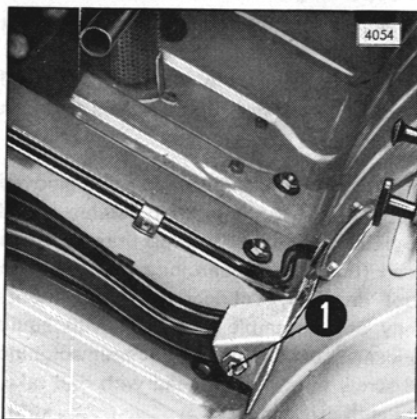
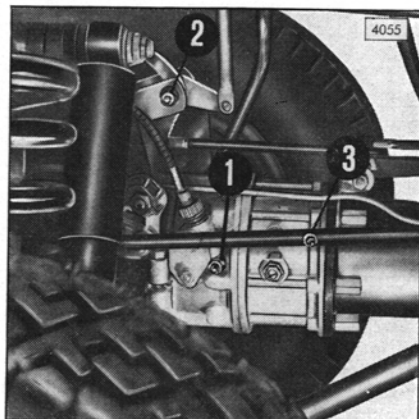


Fig. 78 ▲

Fig. 79 ▼

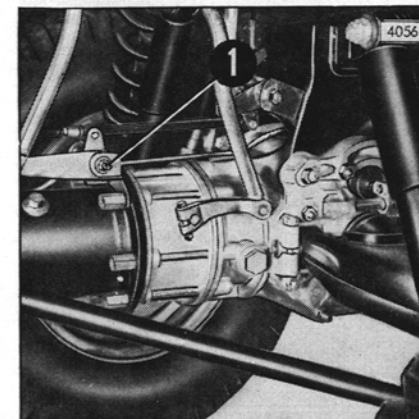


Speedo drive housing, differential linkage and clutch cable guide:
Speedo: one lubricating nipple (fig. 79/1)

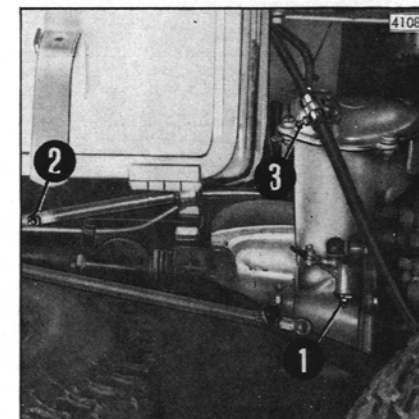
Steering track lever (fig. 77/1)
one lubricating nipple

Throttle pedal bearing (fig. 78/1)
one lubricating nipple (APL and version II)

Differential linkage:
three lubricating nipples (fig. 79/2, 80/1, 81/1)

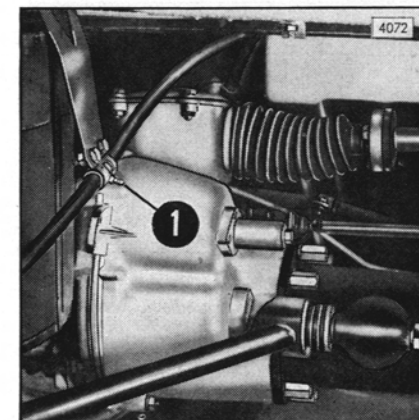


▲ Fig. 80



▲ Fig. 81

Fig. 82 ▼



Clutch cable guide:
two lubricating nipples (fig. 79/3, 81/2)

Hand brake cable
Two lubricating nipples (fig. 82/1 and fig. 81/3)

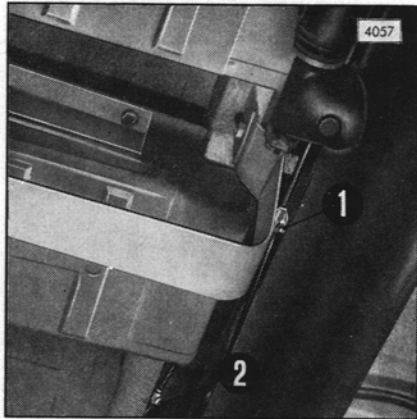


Fig. 83 ▲

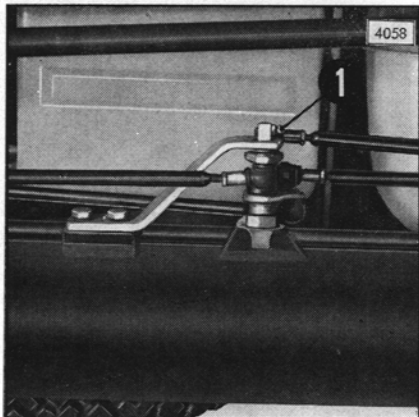
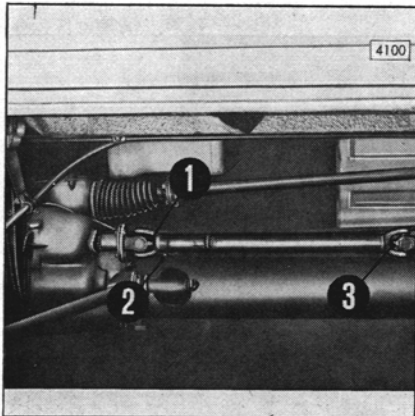


Fig. 84 ▲

Fig. 85 ▼



Choke and heater cable:

Choke: one lubricating nipple (fig. 83/1)
 Heater: one lubricating nipple (fig. 83/2)

Bearing for differential locks

one lubricating nipple (fig. 84/1)

Auxiliary drive shaft:

one lubricating nipple, three lubricating nipples (fig. 85/1, 2, 3)

Grease bearing of gear lever. Push rubber shroud upwards and top up bearing with grease.

Refill grease to bearing for auxiliary drive. Unscrew both covers of the bearings and grease.

Checking the dynastarter (fig. 86)

Unlock and open fan hood. Remove dynastarter brush cover (fig. 86/1). Check wear of brushes (fig. 86/2) and replace if necessary. The dynastarter must be removed to replace the brushes by taking off the drive belts and opening fan cover strap (fig. 86/3). If necessary, regrease bearings at the same time and remove any carbon deposits.

Battery maintenance (fig. 87)

The battery is situated in the centre section of the platform. Check acid level in each cell (fig. 87/1) and top up with distilled water until plates are covered by 5 mm. Clean terminals and cable connections (fig. 87/2), check for secure clamping and protect with battery grease. Check proper contact of earth connection.

Replacing fuses (fig. 88)

The fuse box is fitted to the dashboard. Remove fusebox cover (fig. 88/1) and replace fuse. It is advisable to carry a few spare fuses (8/15 amp) because repairs with wire can cause great damage. It is not sufficient just to replace a fuse but the cause for blowing must be located first.

Automatic cutout (used with version II, page 9)

The automatic cutouts are located at the dashboard. A snapping back knob of the automatic cutout indicates overcharge in the electric system. Contact is made again by pressing down the knob. If the knob springs back repeatedly in short intervals rectify source of trouble, e.g. short circuit before knob pressing down again.

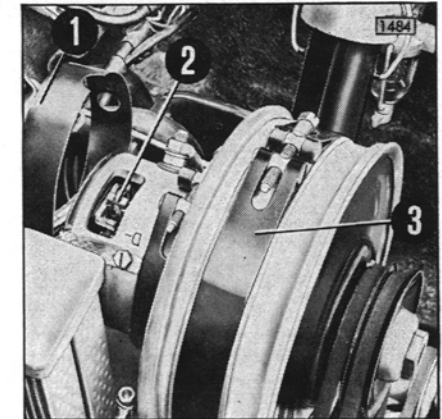


Fig. 86 ▲

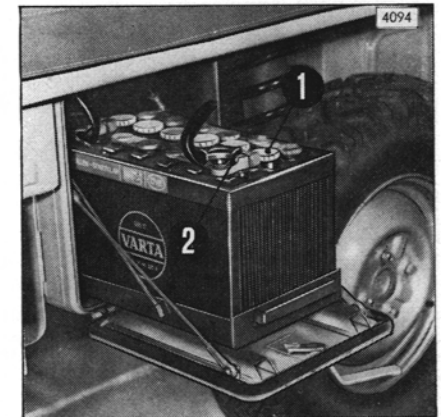


Fig. 87 ▲

Fig. 88 ▼



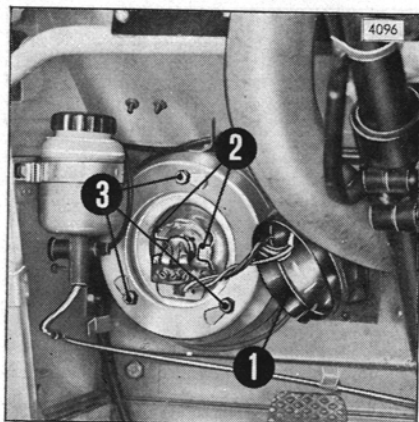


Fig. 89 ▲

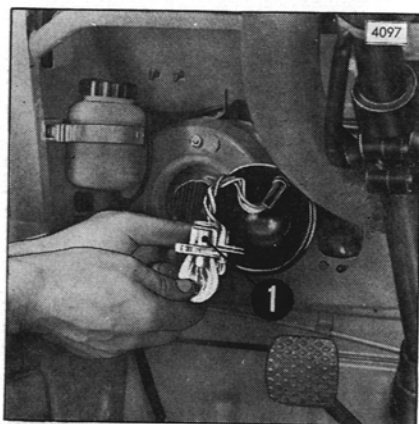


Fig. 90 ▲

Fig. 91 ▼



Changing bulbs

Replacing headlamp parts (fig. 89) (Wachter type)

Bulbs are replaced from the rear, i. e. from the driving compartment. Use screwdriver to lift off cover (fig. 89/1), push aside clips (fig. 89/2) and pull out bulb holder (fig. 90/1). The headlamp assembly is removed from the front to replace rim, lens or reflector. Remove guard, unscrew the three fixing nuts (fig. 89/3) from driving compartment and take out lamp assembly from the front. It is necessary to readjust the headlamps after refitting.

Indicator lamp front and side

To change bulb, remove guard, unscrew both screws from lens and take off lens (fig. 91/1 or fig. 92/1 for models having circular indicator lamps). Press down old bulb (fig. 91/2) and remove.

Assemble in reversed procedure.

To change bulb of side indicator lamps (fig. 92/3), push back rubber sleeve from interior wall and pull out bulb holder. Press old bulb inwards, turn anticlockwise and pull out.

Combined brake, indicator and tail lamp (fig. 93)

Remove the two screws from lamp housing and take off lens.

Brake light bulb (fig. 93/1)

Indicator bulb (fig. 93/2)

Tail light bulb (fig. 93/3)

To change, push bulb sideways and pull out.

Number plate lamp

Remove the two screws and take out insert (fig. 94/1) complete with lens.

Push bulb to the right and pull out.

Assemble in reversed procedure.

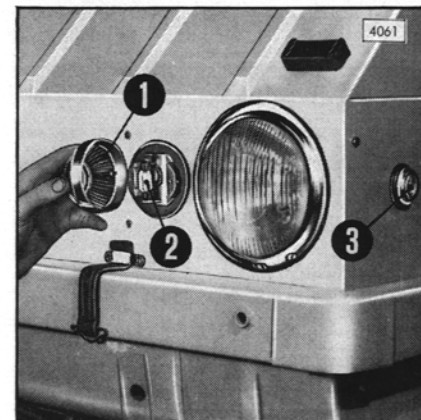


Fig. 92 ▲

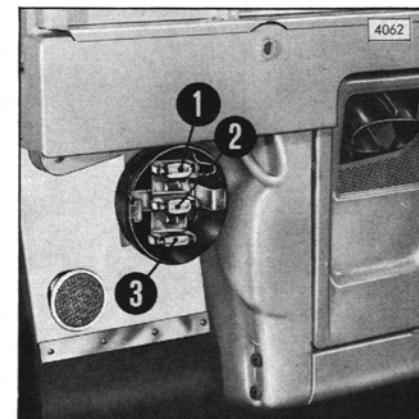
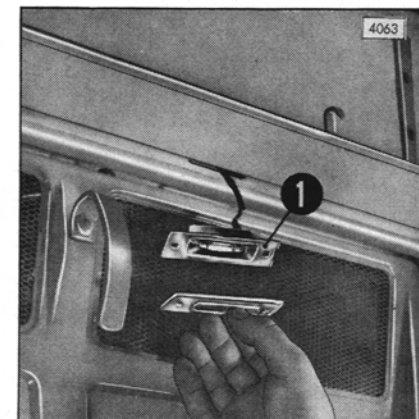


Fig. 93 ▲

Fig. 94 ▼



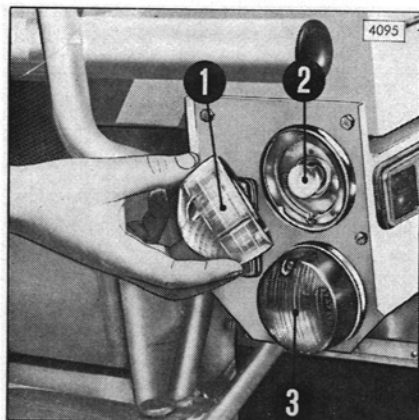


Fig. 95 ▲

Indicator-Brake and Rear light lamp model version II

Unscrew the two screws from housing, remove housing (fig. 95/1, fig. 95/3). Indicator bulb (fig. 95/2). Stop and rear light (fig. 95/3). For replacing push bulb inward, turn anticlockwise and pull out.

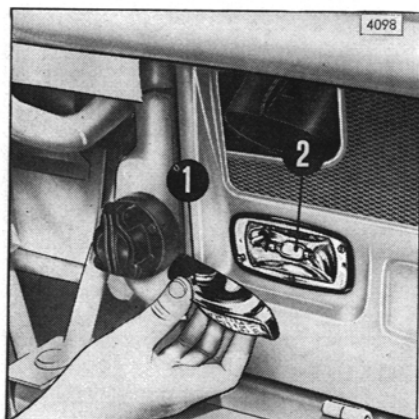
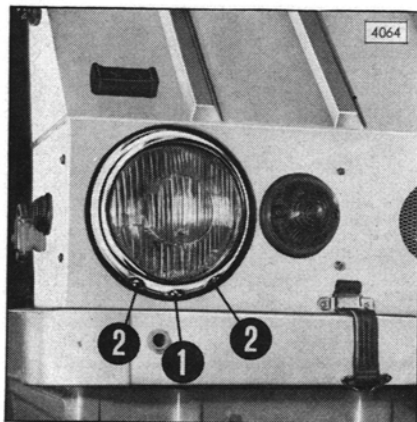


Fig. 96 ▲

Rear headlight

For replacing the bulb, unscrew the two screws from headlamp rim (fig. 96/1). Turn bulb (fig. 96/2) clockwise and pull out.

Fig. 97 ▼



Changing bulbs (Bosch type)

Unscrew centre screw (fig. 97/1) from headlamp rim and remove complete lamp assembly.

Disconnect dip (fig. 98/1) and take out bulb holder with bulb. Push old bulb inward, turn anticlockwise and pull out.



Fig. 98 ▲

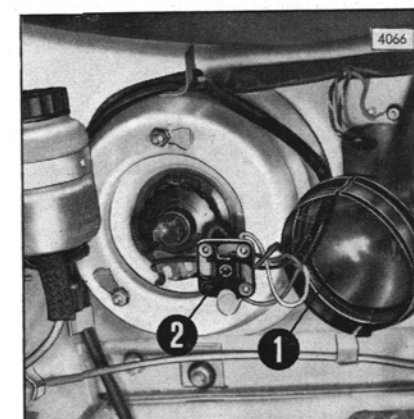


Fig. 99 ▲

Changing bulbs (Hella type)

Use screwdriver to separate rim from front panel (fig. 99/1). Pull off connector with cable (fig. 99/2), turn bulb holder (fig. 100/2) with spring anticlockwise and take out bulb (fig. 100/1). Ensure proper seating of bulb holder and rim when refitting.

Fig. 100 ▼



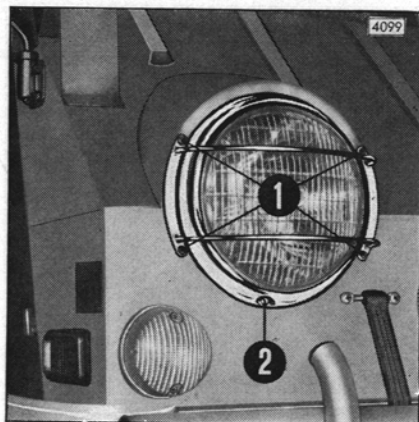


Fig. 101 ▲

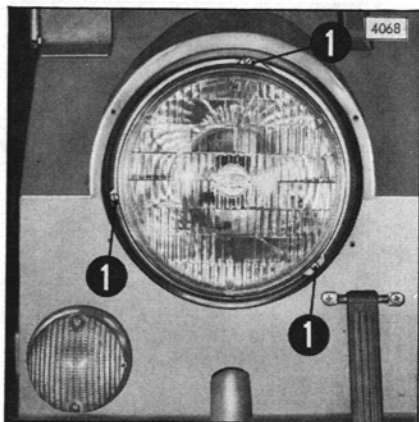
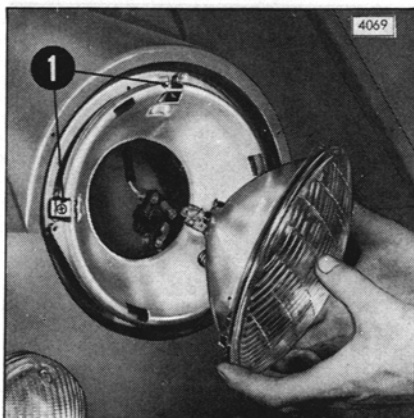


Fig. 102 ▲

Fig. 103 ▼



Changing sealed beam unit (Lucas type)

Dismantle guard by removing the four screws (fig. 101/1). Take off lamp ring by unscrewing screw (fig. 101/2). Remove complete sealed beam unit by unscrewing three screws (fig. 102/1). Disconnect cable connector. The two adjusting screws (fig. 103/1) must not be moved or realignment of headlight beam is necessary.

Faulty bulbs cannot be changed but the complete sealed beam unit is replaced.

Headlight beam alignment

The vehicle is fitted with asymmetrical headlights. The lamps can be adjusted against a wall or with a commercial beam setter. The three screws illustrated in fig. 89/3 are used for horizontal and vertical adjustments (Wacher and Hella headlamps only).

Bosch headlamps are adjusted by the two slotted screws (fig. 97/2). The left-hand screw (viewed from the front) is for horizontal, the right-hand screw for vertical adjustment.

Sealed beam units are adjusted by the two Phillips screws (fig. 103/1) after removing guard and ring. The left-hand Phillips screw (viewed from the front) is for horizontal, the right-hand Phillips screw for vertical adjustment.

Eperspächer heater

Annually prior to winter:

Check glow plug (fig. 104/1)

Clean fuel jet (fig. 104/2)

Check cable terminals for contact

When required: check for passage of intake and exhaust pipe in dirty or snowy conditions.

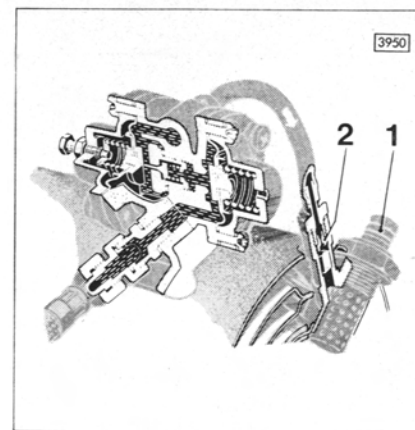
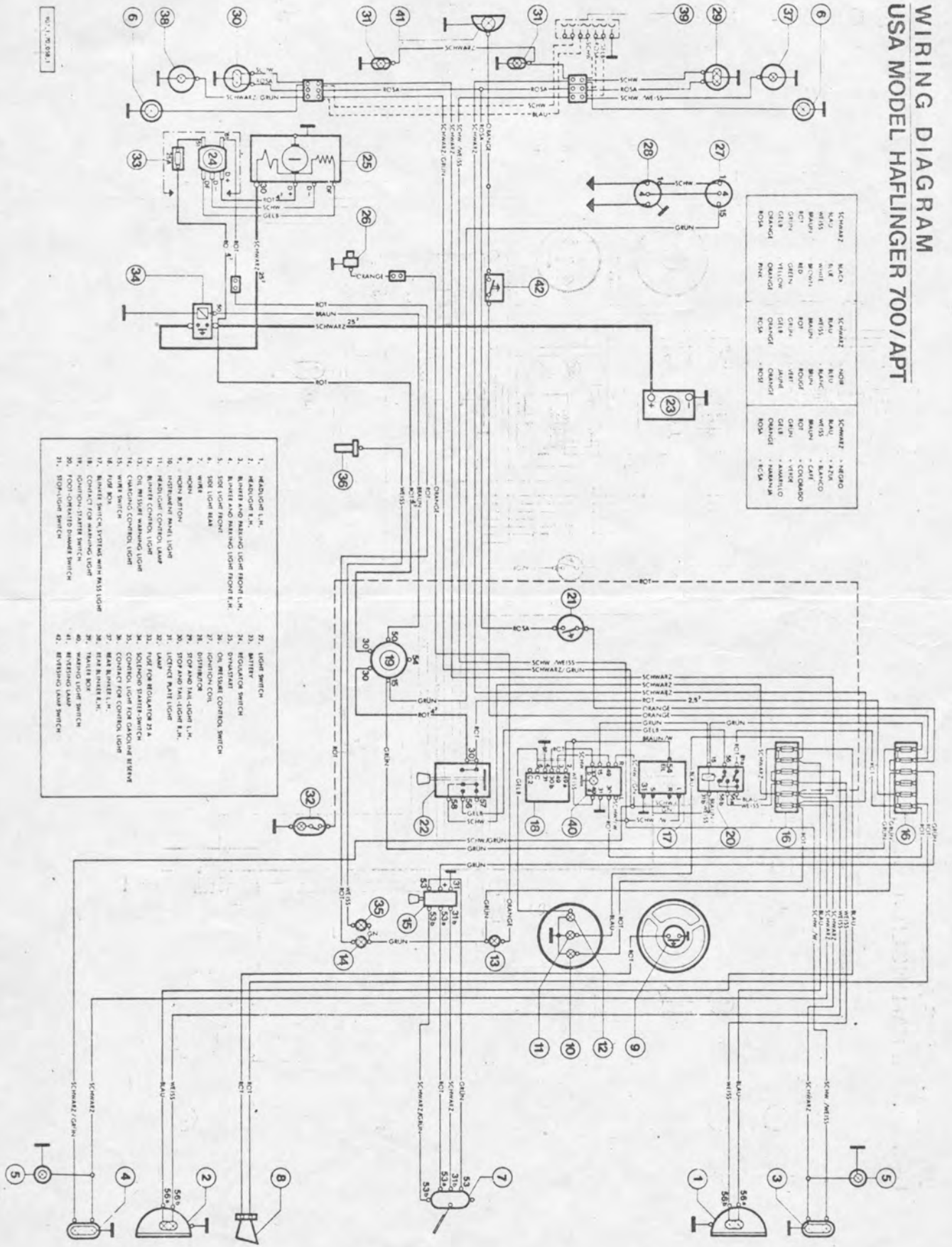


Fig. 104 ▲

WIRING DIAGRAM USA MODEL HAFLINGER 700/APT

SCHWARZ	BLACK	SCHWARZ	BLACK	SCHWARZ	BLACK	SCHWARZ	BLACK
BLAU	BLUE	BLAU	BLUE	BLAU	BLUE	BLAU	BLUE
WEISS	WHITE	WEISS	WHITE	WEISS	WHITE	WEISS	WHITE
GRÜN	GREEN	GRÜN	GREEN	GRÜN	GREEN	GRÜN	GREEN
GELB	YELLOW	GELB	YELLOW	GELB	YELLOW	GELB	YELLOW
ROT	RED	ROT	RED	ROT	RED	ROT	RED
SCHWARZ/GRÜN	BLACK/GREEN	SCHWARZ/GRÜN	BLACK/GREEN	SCHWARZ/GRÜN	BLACK/GREEN	SCHWARZ/GRÜN	BLACK/GREEN
ROT/WEISS	RED/WHITE	ROT/WEISS	RED/WHITE	ROT/WEISS	RED/WHITE	ROT/WEISS	RED/WHITE
GRÜN/WEISS	GREEN/WHITE	GRÜN/WEISS	GREEN/WHITE	GRÜN/WEISS	GREEN/WHITE	GRÜN/WEISS	GREEN/WHITE
GRÜN/ROT	GREEN/RED	GRÜN/ROT	GREEN/RED	GRÜN/ROT	GREEN/RED	GRÜN/ROT	GREEN/RED
GRÜN/BLAU	GREEN/BLUE	GRÜN/BLAU	GREEN/BLUE	GRÜN/BLAU	GREEN/BLUE	GRÜN/BLAU	GREEN/BLUE
GRÜN/GELB	GREEN/YELLOW	GRÜN/GELB	GREEN/YELLOW	GRÜN/GELB	GREEN/YELLOW	GRÜN/GELB	GREEN/YELLOW
GRÜN/ROT/WEISS	GREEN/RED/WHITE	GRÜN/ROT/WEISS	GREEN/RED/WHITE	GRÜN/ROT/WEISS	GREEN/RED/WHITE	GRÜN/ROT/WEISS	GREEN/RED/WHITE
GRÜN/ROT/BLAU	GREEN/RED/BLUE	GRÜN/ROT/BLAU	GREEN/RED/BLUE	GRÜN/ROT/BLAU	GREEN/RED/BLUE	GRÜN/ROT/BLAU	GREEN/RED/BLUE
GRÜN/ROT/GELB	GREEN/RED/YELLOW	GRÜN/ROT/GELB	GREEN/RED/YELLOW	GRÜN/ROT/GELB	GREEN/RED/YELLOW	GRÜN/ROT/GELB	GREEN/RED/YELLOW
GRÜN/ROT/BLAU/GELB	GREEN/RED/BLUE/YELLOW	GRÜN/ROT/BLAU/GELB	GREEN/RED/BLUE/YELLOW	GRÜN/ROT/BLAU/GELB	GREEN/RED/BLUE/YELLOW	GRÜN/ROT/BLAU/GELB	GREEN/RED/BLUE/YELLOW



- 1. HEADLIGHT L.H.
- 2. HEADLIGHT R.H.
- 3. HORN
- 4. STOP AND START MOTOR
- 5. ENGINE
- 6. DISTRIBUTOR
- 7. GENERATOR
- 8. STOP AND TAIL LIGHT L.H.
- 9. STOP AND TAIL LIGHT R.H.
- 10. LICENSE PLATE LIGHT
- 11. HEADLIGHT CONTROL LAMP
- 12. HORN CONTROL LIGHT
- 13. ON WASHING LIGHT
- 14. WASHING LIGHT
- 15. STOP LIGHT
- 16. LIGHT SWITCH
- 17. HORN SWITCH
- 18. CONTACT FOR WASHING LIGHT
- 19. CONTACT FOR STOP LIGHT
- 20. CONTACT FOR LICENSE PLATE LIGHT
- 21. STOP-START SWITCH
- 22. REVERSE SWITCH
- 23. LIGHT SWITCH
- 24. BATTERY
- 25. STOP-START SWITCH
- 26. ON WASHING CONTROL SWITCH
- 27. STOP-START MOTOR
- 28. STOP AND TAIL LIGHT L.H.
- 29. STOP AND TAIL LIGHT R.H.
- 30. LICENSE PLATE LIGHT
- 31. HEADLIGHT CONTROL LAMP
- 32. HORN CONTROL LIGHT
- 33. ON WASHING LIGHT
- 34. WASHING LIGHT
- 35. STOP LIGHT
- 36. LIGHT SWITCH
- 37. HORN SWITCH
- 38. CONTACT FOR WASHING LIGHT
- 39. CONTACT FOR STOP LIGHT
- 40. CONTACT FOR LICENSE PLATE LIGHT
- 41. STOP-START SWITCH
- 42. REVERSE SWITCH

NO. 1.76.038.1