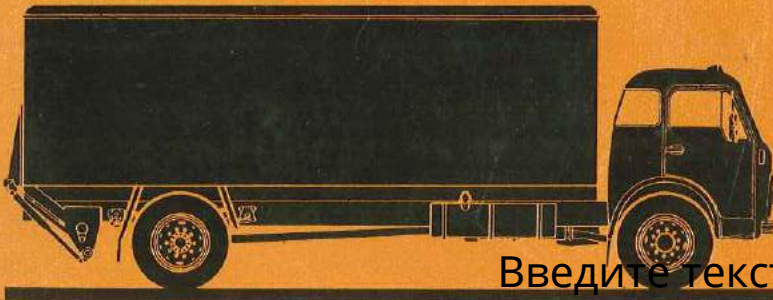
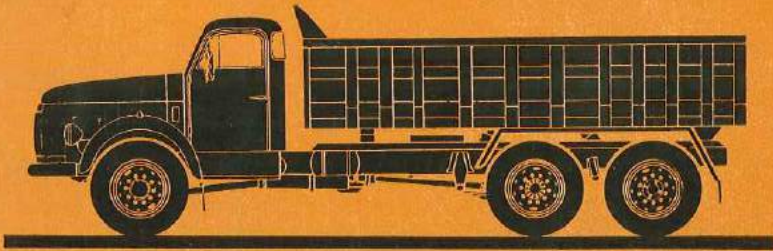


# VOLVO

INSTRUCTION BOOK

# 86-SERIES



Введите текст

POWER TRANSMISSION

Clutch

Technical description

The 86-series trucks are available with three different types of clutches: two single disc clutches and one twin disc clutch.

Single disc clutch

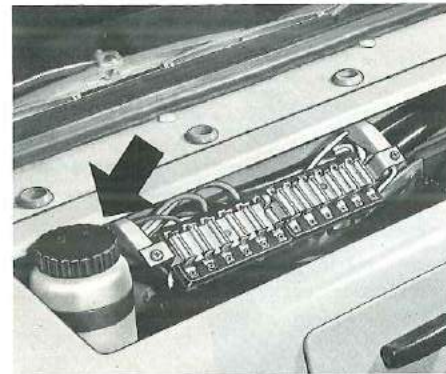
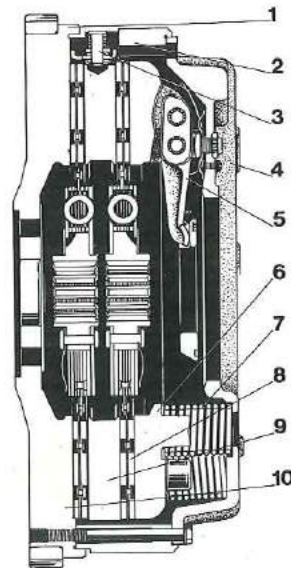
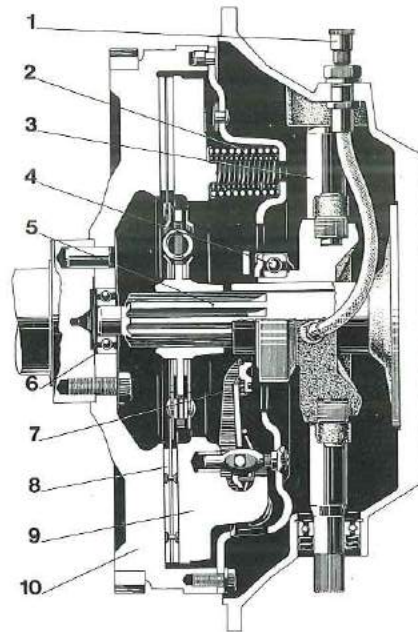
- |                     |                   |
|---------------------|-------------------|
| 1 Lubricator        | 6 Support bearing |
| 2 Clutch spring     | 7 Lever           |
| 3 Throw-out shaft   | 8 Disc            |
| 4 Throw-out bearing | 9 Thrust plate    |
| 5 Input shaft       | 10 Flywheel       |

The attaching plate (4) is bolted to the engine flywheel (10) and functions as a retainer for the other clutch parts. The thrust plate (9) is located between the attaching plate and disc (8) and transfers the thrust from the springs (2) to the disc. When the clutch pedal is depressed, the throw-out shaft (3) turns and the throw-out bearing (4) is moved forwards against the thrust washer. The thrust washer actuates in its turn the clutch levers so that the thrust plate is drawn backwards, thereby releasing the pressure on the clutch disc. With the clutch engaged, the pressure plate is held against the clutch discs by the springs.

Twin-disc clutch

In principle the twin disc clutch functions in the same way as the single dry disc clutches. It differs from these in that it is fitted with two discs and an extra thrust plate between these discs.

- |                       |                               |
|-----------------------|-------------------------------|
| 1 Flywheel            | 6 Pressure plate              |
| 2 Intermediate ring   | 7 Clutch spring               |
| 3 Centering mechanism | 8 Disc                        |
| 4 Casing              | 9 Intermediate pressure plate |
| 5 Lever               | 10 Flywheel                   |



25 Checking fluid level in clutch fluid container F 86, FB 86

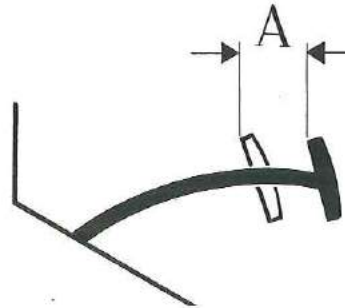
The clutch fluid container is placed under the occasional shelf on the dashboard. The container should be almost filled with brake fluid. When necessary, top up with brake fluid which meets requirements according to SAE 70 R 3.

26 Checking clutch pedal travel

To avoid risk of the clutch slipping or gear-changing problems, check and if necessary adjust the clutch pedal (N 86, NB 86) travel or the clearance on the throw-out bearing (F 86, FB 86). This check should be made regularly.

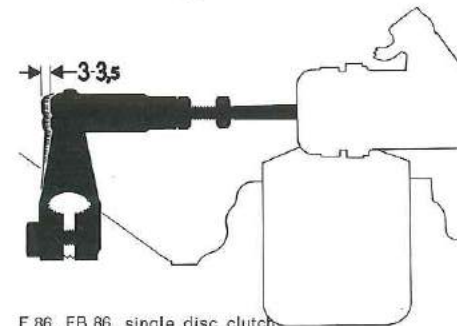
N 86, NB 86

Check first that the pedal stop is properly adjusted. The pedal must not strike against the floorboard and the rubber seal should seal against the other side of the floorboard when the pedal is released. Adjust the length of the pull rod for the throw-out lever so that the pedal travel A is 35—40 mm (1 3/4—1 9/16"), see picture.



F 86, FB 86 single disc clutch

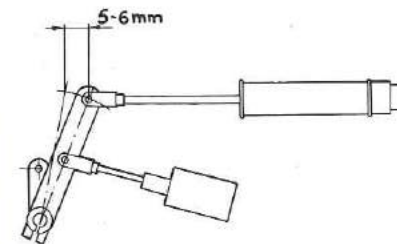
The clearance is measured at the throw-out lever. Adjust the free movement of the lever to 3.0—3.5 mm (0.12—0.14"), see picture.



F 86, FB 86, single disc clutch

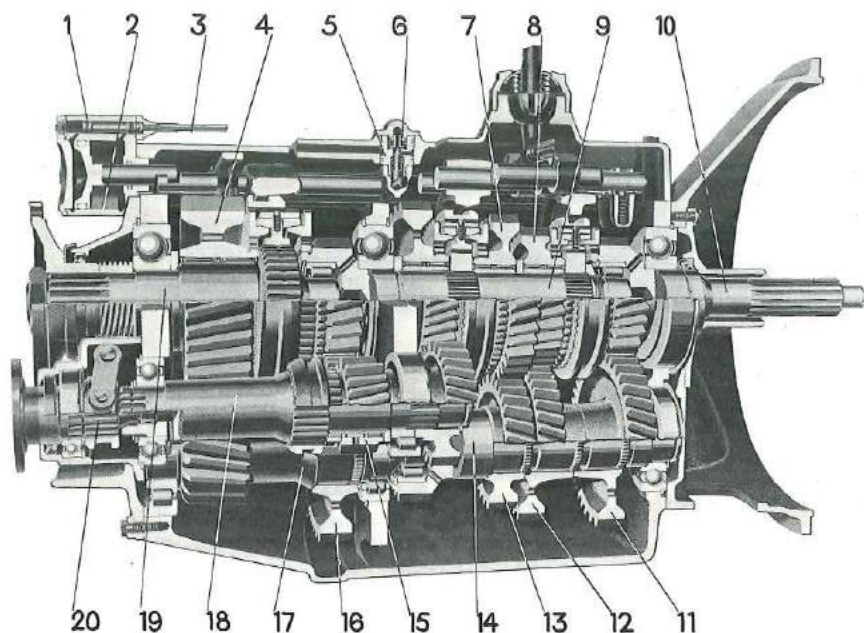
Adjusting twin disc clutch, FB 86

As alternative, the F 86 and FB 86 trucks can be fitted with a twin disc clutch. Clutch operation is altered for a twin disc clutch. In addition, there is also an auxiliary unit to assist with pedal pressure. Clutch travel is checked by releasing the fork on the auxiliary unit from the throw-out lever and then measuring the lever stroke. If the travel is correct, the measurement should be 5—6 mm (0.20—0.24"), see picture. Any adjustment to the clutch travel must also involve adjustment to the auxiliary unit. This is done by releasing the locknut at the fork and turning the impact rod. For this purpose there is a hole in the rod. When properly adjusted, the auxiliary unit should be completely off-load.



FB 86, twin disc clutch

Gearbox



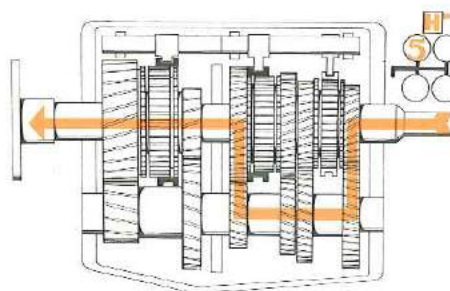
Gearbox R 51

- 1 Valve
- 2 Control cylinder housing
- 3 Control cable
- 4 Gear wheel, low ratio.
- 5 Check valve
- 6 Cover
- 7 Gear wheel, 2nd speed
- 8 Gear wheel, 3rd speed
- 9 Mainshaft
- 10 Input shaft
- 11 Drive gear for countershaft I
- 12 Gear wheel, 3rd speed
- 13 Gear wheel, 2nd speed
- 14 Countershaft I
- 15 Gear wheel
- 16 Drive gear for countershaft II
- 17 Countershaft II
- 18 Reverse shaft
- 19 Output shaft
- 20 Rear power take-off

Technical description

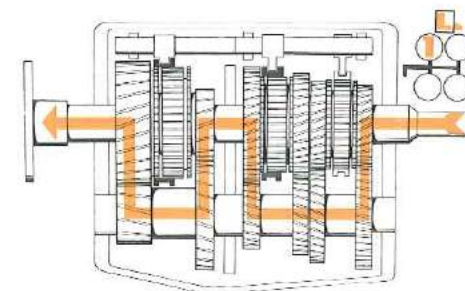
The R 51 gearbox is an 8-speed unit and consists of two sections, a 4-speed basic unit which is operated by means of the gear lever and a 2-speed range unit which is operated pneumatically from a toggle switch on the gear lever.

Combining these two sections gives us 8 forward speeds and 2 reverse speeds. All forward speeds are synchronized but not the reverse speeds. In other words, there must be no gear-changing between LOW and HIGH while reversing.



HIGH

With the range unit engaged in high speed register, gears 5-8 are engaged. Power goes through the basic unit in the same way as low gear register engagement, but then continues directly to the output shaft.



LOW

With the range unit in low gear register, gears 1-4 can be engaged. Power passes through the basic gearbox and then via gears into the range unit.

The compressed-air operated range section is used only once when changing through the gear register (between 4th and 5th).

With the R 51 gearbox it is possible to mount a side power take-off and two alternative rear taken-offs. The side power take-off is fitted on the right-hand side of the gearbox and is driven via the reverse leading gear. The rear power take-off is mounted on the rear of the gearbox and is driven via a claw coupling on the rear end of the reverse shaft. The permissible torque for the side power take-off is 35 kpm (253 lb.ft.) and for the rear power take-offs 80 or 30 kpm (578 or 217 lb.ft.), depending upon which type is fitted. The power take-offs are switched on by the switch on the dashboard. This actuates a solenoid valve which regulates air to a control cylinder and this in its turn operates the power take-off.

Lubricants

The following oil should be used for lubrication of the gearbox:

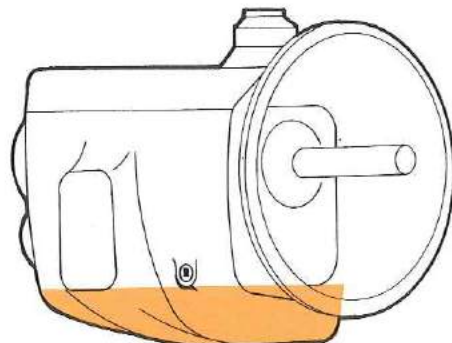
- alt. 1 **Gear oil without film-reinforcing agent.**  
Hypoid oil (HYP or EP) or Multipurpose oil (MP) must not be used since these oils can attack the bronze parts and seals and cause synchronizing difficulties and oil leakage.
- alt. 2 **Engine oil SAE 40.**  
Gear oil and engine oil can be mixed.  
The viscosity should be chosen according to the following table:

Lubricant type	Designation <sup>1)</sup>		
	Below -10° C (14° F)	Between -10° C and +30° C (14° and 86° F)	Above +30° C (86° F)
Gear oil	SAE 80	SAE 90 <sup>2)</sup>	SAE 140
Engine oil	SAE 40 all year round Multigrade oils should not be used		—

<sup>1)</sup> The temperatures refer to unvarying air temperatures.  
<sup>2)</sup> SAE 140 should be used for lengthy driving at heights of 2 000 metres (6 560 ft) above sea-level.

27 Checking oil level in gearbox

To check the oil level, unscrew the level plug on the right-hand side of the gearbox.  
The oil should be level with the hole.  
If necessary, top up with oil of the same type already used in the gearbox.  
The gearbox can be topped-up either through the level hole or through the filler hole on top of the gearbox.



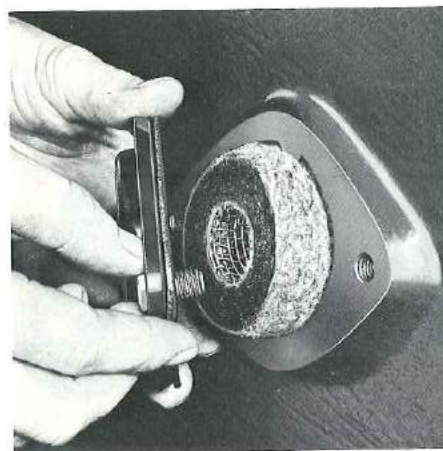
28 Changing oil in gearbox

During running-in the oil should also be changed after the first 5 000 km (3 000 miles) on which occasion the gearbox should also be flushed with the same type of oil to be subsequently used. After the running-in period, oil change should be every 40 000 km (25 000 miles).  
The oil is drained through the drain plug at the rear, left-hand side.  
The new oil is filled through the filler hole.  
Oil capacity: approx 8 litres (1.8 Imp. galls. = 2.1 US galls.)

29 Lubricating range unit's valves and cylinder

The valves and cylinder for the range unit are lubricated with ball bearing grease at least once a year. This is necessary in order to prevent the O-rings from jamming or becoming worn and causing air leakage. Neglected greasing of the range unit may also cause difficulty in changing between LOW and HIGH. The O-rings should be changed when the gearbox is repaired.

**Make sure that all the water is drained from the wet tank in order to prevent condensation water from collecting in the valves and cylinder.**



30 Changing gearbox oil filter

The gearbox oil filter should be replaced at every other oil change.  
However, during running-in, the filter should also be changed after the first 5 000 km (3 000 miles) in connection with the first oil change.

The filter is changed as follows:

- 1 Remove cover
- 2 Take out filter and scrap it. Clean the space in the gearbox with white spirit
- 3 Fit a new oil filter
- 4 Replace cover with new sealing

Propeller shaft

Technical description

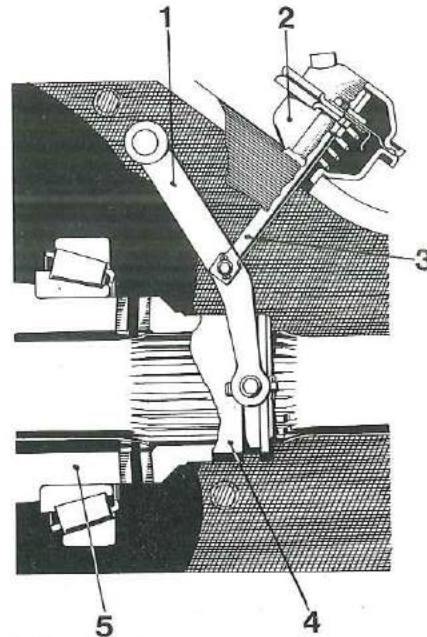
The F 86, FB 86 trucks with 3 000 and 3 400 mm (118 and 134") wheelbases have a one-piece propeller shaft. At one end there is a slip joint which allows for the alternations in length of the propeller shaft caused by the movement of the rear axle.  
The other trucks in the 86-series have a two-piece propeller shaft. The leading section is carried in a support bearing. The rear one is provided with a slip joint.

Differential lock

The differential lock is controlled by means of a switch on the dashboard. This operates a solenoid valve which admits compressed air to a control cylinder on the rear axle casing.

The compressed air actuates the control cylinder (2) so that the selector rod (3) is pressed down. This causes the selector fork (1) to move the carrier (4) against the differential carrier (5). In this way the differential carrier is locked to one of the drive shafts so that power can be transmitted to the wheel which has a grip with the ground.

**NOTE.** The differential lock may only be used on slippery surfaces.



Differential lock  
 1 Selector fork  
 2 Control cylinder  
 3 Selector rod  
 4 Carrier  
 5 Differential carrier

Lubricants

The rear axle is filled at the factory with oil according to MIL-L-2105 B.

The oil should be changed for the first time after 5 000 km (3 000 miles). Even the oil used after this in the rear axle should be in accordance with MIL-L-2105 B. In connection with the first oil change, flush the back axle with oil of the same type subsequently to be used.

Lubricant, type	Viscosity <sup>1)</sup>		
	Below -10° C (14° F)	Between -10° C and +30° C (14-86° F)	Above +30° C (86° F)
MIL-L-2105 B	SAE 80	SAE 90 <sup>2)</sup>	SAE 140

<sup>1)</sup> The temperatures refer to unvarying air temperatures.

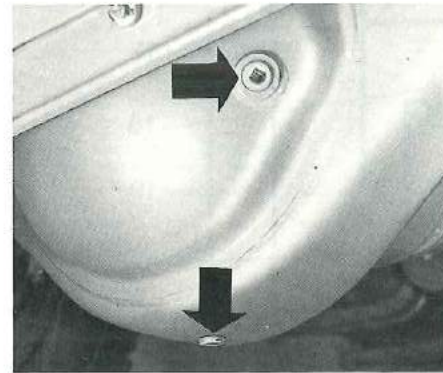
<sup>2)</sup> SAE 140 should be used for long-distance driving at altitudes of 2 000 metres (6 560 ft.) above sea level.

32 Checking oil level in rear axle

To check the oil level in the rear axle, unscrew the combined level and filler plug on the rear axle casing. The oil should be level with the hole.

If necessary, fill with oil of the same type already used in the rear axle. Do not mix different types of oil since this can give rise to frothing and result in damage to the rear axle.

**NOTE.** Check also to make sure that the rear axle air valve is not blocked. This is important to avoid oil leakage due to overpressure in the rear axle.



33 Changing oil in rear axle

During running-in, the oil should also be changed after the first 5 000 km (3 000 miles). On this occasion the rear axle should be flushed with the same type of oil subsequently used in it. After completion of the running-in, the oil should be changed every 40 000 km (25 000 miles).

The oil is drained by removing the bottom plug in the rear axle casing.

Oil capacity:

approx. 9.5 litres (2 Imp. galls. = 2.5 US galls.) for single reduction

approx. 13 litres (2.9 Imp. galls. = 3.4 US galls.) for double reduction

42 Checking brake lines

All brake lines should be checked for leakage and damage.

43 Checking function of brake system

The function of the vehicle brake system should be checked in accordance with the instructions given in the Service Manual once a year.

44 Inspecting the compressor

Every other year, the vehicle should be taken to a workshop for a check on the air compressor.

FRONT END AND STEERING GEAR

Front axle

Technical description

The N 86, NB 86 and F 86, FB 86 have a rigid front axle made in one piece. The front axle member is of drop-forged, high-alloy steel. It is attached to the front springs by means of four U-bolts.

45 Checking front wheel alignment

For proper function of the vehicle steering, it is essential that the front wheel alignment is correct. Faulty front wheel alignment can also cause rapid wear on the front tyres.

If it is suspected that the alignment of the front wheels is not correct, check this immediately.

46 Checking front end for play

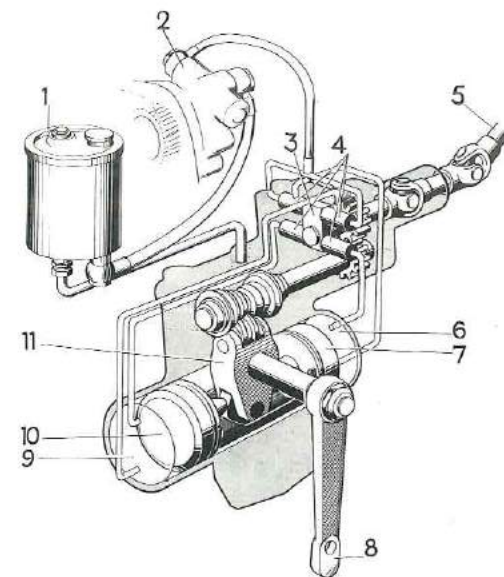
This check should be carried out with the front end jacked up. Check all the parts of the front end for play.

Steering gear

Servo steering N 86, NB 86

Servo steering N 86, NB 86

- 1 Oil container
- 2 Servo pump
- 3 Swing arm
- 4 Steering valves
- 5 Steering column
- 6 Servo cylinder
- 7 Piston
- 8 Pitman arm
- 9 Servo cylinder
- 10 Piston
- 11 Steering shaft



In principle, the servo steering for the N 86, NB 86 consists of a mechanical steering gear, of the cam and roller type, supplemented with an hydraulic servo unit.

The pump is rotor type and gear-driven. It is located on the left-hand side of the engine.

The pump serves as a source of power and supplies the necessary pressure to the servo cylinders. The oil container with filter is mounted so that the oil level is always above the pump level.

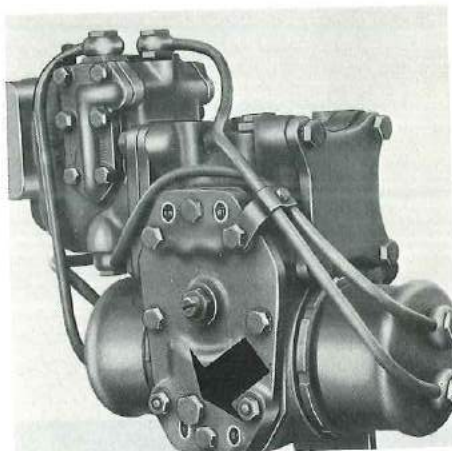
The steering (5) when turned actuates the swing arm (3) which has contact with the four steering valves (4). These valves regulate and distribute oil to the servo cylinders (6 and 9). The pistons (7 and 10) of the servo cylinders actuate the steering shaft (11) and reinforce the power exerted by the steering cam on the steering shaft.

Should the hydraulic function fail, the servo steering will function as an ordinary mechanical steering. No rapid steering wheel movements may, however, be carried out. A certain amount of caution should, therefore, be observed.

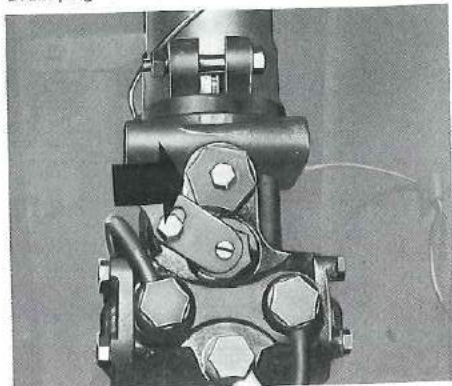
On certain markets, the N/NB 86 can be obtained with mechanical steering (without servo).

Changing oil and filter, N 86, NB 86

- 1 Jack up the vehicle.
- 2 Remove the plug at the bottom right-hand side of the steering gear and drain off the oil. Start the engine and allow it run max. 10 seconds so that the container and pump are emptied of oil. Stop the engine and turn the steering wheel from full lock to full lock several times in order to make the draining go quicker. Re-fit the plug after the system has been emptied.
- 3 Clean the outside of the oil container. Remove the screw for the cover and take off the cover. Pull up the filter and place a finger under the hole in the centre to prevent as little impurities as possible from dropping down into the container. Oil the filter container and sealing ring, fit the new filter with the sealing ring facing downwards and re-fit the cover.
- 4 Remove the filler cover on the oil container. Fill with oil to the edge of the container.
- 5 Turn over the engine several revs with the starter motor (stop control pulled out). The oil level should drop, so that more oil must be added. Turn the steering wheel from full lock to full lock and continue topping-up until the oil level no longer drops under the upper mark on the dipstick.
- 6 Start the engine. Turn the steering wheel from full lock to full lock until no more air bubbles rise to the surface in the oil. Top up with oil.
- 7 Fit a bleed hose on the service steering's bleed screw and insert the other end of the hose in a glass containing a little oil.
- 8 Open the bleed screw 2—3 threads with the engine running. When the oil flowing out into the glass container is free from air bubbles, close the bleed screw, remove the hose and replace the rubber cap on the bleed screw. Top up with oil to the Max mark with the engine running. If the above instructions are followed, the oil level should only rise slightly above the Max mark on the dipstick after the engine has been stopped.



Drain plug

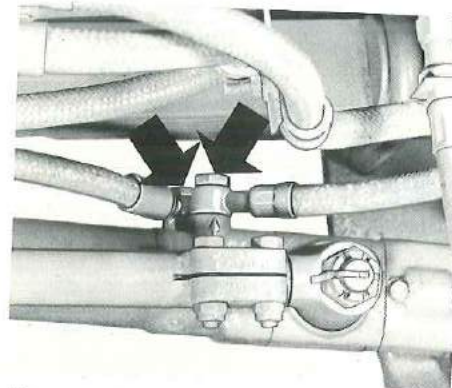


Bleed screw

Changing oil and filter, F 86, FB 86

- 1 Jack up the front end.
- 2 Disconnect the hose connections at the servo cylinder. Start the engine and run the oil out of the container. The engine may not run longer than about 10 seconds, otherwise the pump can be damaged due to shortage of oil. When the engine has stopped, turn the steering wheel from lock to lock, to enable the oil to be pumped out fully from the operating cylinder.
- 3 Re-fit the hose connections at the servo cylinder.
- 4 Clean the oil container on the outside. Remove the screw for the cover and take off the cover. Pull up the filter and place a finger under the centre hole to prevent impurities coming into the container. Oil the filter container and sealing ring. Re-fit the filter with sealing ring facing downwards. Re-fit the cover.
- 5 Remove the oil container filler cover and fill with oil up to the edge of the container.
- 6 Then turn over the engine briefly with the help of the starter motor (stop control pulled out). The oil should drop, but the container should be filled at the same time with oil to prevent it from being sucked empty.
- 7 When the oil container is filled to the upper mark on the dipstick, stop the engine. Turn the steering wheel from full lock to full lock several times and continue filling with oil until the level does not go below the upper mark on the dipstick. This is done in order to fill the operating cylinder and to evacuate through the oil container any air which may remain in the system.
- 8 Start the engine and turn the steering wheel from lock to lock and fill with oil as the level drops. Continue filling until the level remains steady at the upper mark on the dipstick and there are no more air bubbles in the container when turning the steering wheel. If this is carried out properly, the oil level should not rise more than about 3/8" when the engine stops.

**NOTE:** No impurities must come into the container when filling with oil, since this oil passes through the hydraulic pump and steering gear once before being filtered.



Hose connections



Removing oil filter

SPECIFICATIONS

SPECIFICATIONS

General data

Length measurements, N 86 mm (in.)	N 86-38	N 86-44	N 86-48	N 86-52	N 86-56
Wheelbase	3 800 (149.6)	4 400 (173.2)	4 800 (189.0)	5 200 (204.7)	5 600 (220.5)
Front axle centre— cowl rear edge	550 (21.7)	550 (21.7)	550 (21.7)	550 (21.7)	550 (21.7)
Cab depth (standard)	1 100 (43.3)	1 100 (43.3)	1 100 (43.3)	1 100 (43.3)	1 100 (43.3)
Overall chassis length	6 156 (242.4)	7 416 (292.0)	7 936 (312.4)	8 556 (336.8)	9 236 (363.6)
Front overhang	1 255 (49.4)	1 255 (49.4)	1 255 (49.4)	1 255 (49.4)	1 255 (49.4)
Rear overhang	1 100 (43.3)	1 760 (63.9)	1 880 (74.0)	2 100 (82.7)	2 380 (93.7)
Turning circle diameter, m (ft.)	14.4 (47.2)	16.4 (53.7)	17.6 (57.7)	19.0 (62.3)	20.4 (67.0)

Length measurements, NB 86 mm (in.)	NB 86-38	NB 86-44	NB 86-52
Wheelbase	3 800 (149.6)	4 400 (173.2)	5 200 (204.7)
Theoretical wheelbase	4 420 (174.0)	5 020 (197.6)	5 820 (229.0)
Bogie distance	1 320 (52.0)	1 320 (52.0)	1 320 (52.0)
Front axle centre—cowl rear edge	550 (21.7)	550 (21.7)	550 (21.7)
Cab depth (standard)	1 100 (43.3)	1 100 (43.3)	1 100 (43.3)
Overall chassis length	7 455 (293.5)	8 305 (327.0)	9 805 (386.0)
Front overhang	1 255 (49.4)	1 255 (49.4)	1 255 (49.4)
Rear overhang	1 080 (42.5)	1 330 (52.4)	2 030 (80.0)
Turning circle diameter, m (ft.)	16.4 (53.7)	18.4 (60.4)	21.0 (68.9)

Length measurements, F 86 mm (in.)	F 86-30	F 86-34	F 86-38	F 86-42	F 86-49
Wheelbase	3 000 (118.0)	3 400 (134.0)	3 800 (149.6)	4 200 (165.4)	4 900 (193.0)
Front axle centre— rear edge of cab	665 (26.2)	665 (26.2)	665 (26.2)	665 (26.2)	665 (26.2)
Overall chassis length	5 345 (210.4)	5 995 (236.0)	6 545 (257.7)	7 455 (293.5)	8 850 (348.4)
Front overhang	1 245 (49.0)	1 245 (49.0)	1 245 (49.0)	1 245 (49.0)	1 245 (49.0)
Rear overhang	1 100 (43.3)	1 350 (53.0)	1 500 (53.0)	2 010 (79.0)	2 705 (106.5)
Turning circle diameter, m (ft.)	12.4 (40.7)	13.2 (43.3)	14.4 (47.2)	15.8 (51.8)	18.2 (59.7)

Length measurements, FB 86 mm (in.)	FB 86-34	FB 86-38	FB 86-42	FB 86-49
Wheelbase	3 400 (133.9)	3 800 (149.6)	4 200 (165.4)	4 900 (193.0)
Theoretical wheelbase	4 020 (158.3)	4 420 (174.0)	4 820 (190.0)	5 520 (217.3)
Bogie distance	1 320 (52.0)	1 320 (52.0)	1 320 (52.0)	1 320 (52.0)
Front axle centre—rear edge of cab	665 (26.2)	665 (26.2)	665 (26.2)	665 (26.2)
Overall chassis length	7 455 (293.5)	8 160 (321.3)	8 850 (384.4)	10 110 (398.0)
Front overhang	1 245 (49.0)	1 245 (49.0)	1 245 (49.0)	1 245 (49.0)
Rear overhang	1 490 (58.7)	1 795 (70.7)	2 085 (82.0)	2 645 (104.0)
Turning circle diameter, m (ft.)	15.4 (50.5)	16.8 (55.1)	18.2 (59.7)	20.6 (67.5)

Width measurements, N 86, NB 86, mm (in.)	wheels tyres	7.5×20" 11.00—20"
Overall width, front		2 347 (92.4)
Overall width, rear		2 350 (92.5)
Track, front		1 918 (75.5)
Track, rear		1 740 (68.5)

Width measurements, F 86, FB 86, mm (in.)	wheels tyres	7.5×20" 11.00—20"
Overall width, front		2 347 (92.4)
Overall width, rear		2 350 (92.5)
Track, front		1 918 (75.5)
Track, rear		1 740 (68.5)

Height measurements, N 86, mm (in.)	tyres	11.00—20"
Cab-ground (unloaded)		2 460 (96.9)
Frame-ground* (loaded)		980 (38.6)

Height measurements, NB 86, mm (in.)	tyres	11.00—20"
Cab-ground (unloaded)		2 450 (96.5)
Frame-ground* (loaded)		945 (37.2)

Height measurements, F 86, FB 86, mm (in.)	tyres	11.00—20"
Cab-ground (unloaded)		2 540 (100.0)
Frame-ground* (loaded)		965 (38.0)

\* Measurements apply over rear axle

Weights, kg (lb.)	N 86	NB 86	F 86	FB 86
Max. front axle pressure	5 350 (11 770)	5 350 (11 770)	6 000 (13 200)	6 000 (13 200)
Max. rear axle pressure	11 000 (24 200)	—	11 000 (24 200)	—
Max. bogie pressure	—	16 500 (36 300)	—	16 200 (35 640)
Max. gross laden weight	16 000 (35 200)	21 500 (47 300)	17 000 (37 500)	22 000 (48 800)

MAINT

Electri

During sidera since are us city al Check freeze charg

Comp

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Fuel

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Win

In c free with driv up que



## Engine

## Electric General data

During sideral since are us city al Check freeze charge

Type designation  
Output (SMMT)  
Max. torque S(MMT)

Number of cylinders  
Bore  
Stroke  
Displacement  
Compression ratio  
Compression pressure

High idle  
Low idle  
Weight with flywheel, flywheel housing and starter motor  
Valve system  
Valve clearance, cold engine inlet exhaust

	D 70 B	TD 70 B
Type designation	D 70 B	TD 70 B
Output (SMMT)	150 h.p. at 2 500 r.p.m.	192 h.p. at 2 400 r.p.m.
Max. torque S(MMT)	48 kpm (347 lb.ft.) at 1 400 r.p.m.	63 kpm (455 lb.ft.) at 1 400 r.p.m.
Number of cylinders	6	6
Bore	104.77 mm (4.125")	104.77 mm (4.125")
Stroke	130 mm (5.188")	130 mm (5.188")
Displacement	6.7 litres (409 cu.in.)	6.7 litres (409 cu.in.)
Compression ratio	17:1	16:1
Compression pressure	28 kp/cm <sup>2</sup> (398 p.s.i.) at 180 r.p.m.	26 kp/cm <sup>2</sup> (370 p.s.i.) at 180 r.p.m.
High idle	2 700 ± 50 r.p.m.	2 700 ± 50 r.p.m.
Low idle	450—500 r.p.m.	450—500 r.p.m.
Weight with flywheel, flywheel housing and starter motor	640 kg (1 408 lb.)	650 kg (1 430 lb.)
Valve system	Overhead	Overhead
Valve clearance, cold engine inlet	0.40 mm (0.016")	0.40 mm (0.016")
exhaust	0.45 mm (0.018")	0.55 mm (0.022")

## Lubricating system

Lubricating oil filters  
Oil pressure, operating speed idling

Libricant, type  
Viscosity, below -10° C (14° F) or when cold-starting difficulties can be expected between -10 and +20° C (14 and 68° F) above +20° C (68° F)

Oil capacity, excl. lubricating oil filter incl. lubricating oil filter

	Service DM or DS	Service DS
Paper filter of throw-away type	3—5 kp/cm <sup>2</sup> (43—71 p.s.i.)	min. 0.5 kp/cm <sup>2</sup> (7 p.s.i.)
SAE 10 W or SAE 10 W 20 (See also page 45.)		
SAE 20/20 W or SAE 20 W 30 SAE 30 or SAE 20 W 30		
13 litres (2.9 Imp. galls. = 3.4 US galls.)		
14 litres (3.1 Imp. galls. = 3.7 US galls.)		

## Turbo-compressor

Make  
Max. speed  
Boost pressure at 2 000 r.p.m. full load

Lubricating system

Eberspächer  
80 000 r.p.m.

0.8—0.9 kp/cm<sup>2</sup>  
(11.3—12.8 p.s.i.)  
Pressure lubrication from engine

## Fuel system

Fuel injection pump	CAV>NNL 6 H 80/404	Bosch PE 6 P 100/320 RS 169 Z
Fuel injection pump's direction of rotation viewed from its coupling side	Clockwise	Clockwise
Injection order	1-5-3-6-2-4	1-5-3-6-2-4
Setting	22° B.T.D.C.	20° B.T.D.C.
Pre-filter		
Feed pump	CAV DFP 3E/64	Bosch FP/K 22 P9
Feed pressure	0.6—1.0 kp/cm <sup>2</sup> (8.5—14.2 p.s.i.)	0.6—1.0 kp/cm <sup>2</sup> (8.5—14.2 p.s.i.)
Governor	CAV GRVWEB 16 (226—1 250)	Bosch RQV 200—1 200 PA 122/2R
Fine filter	CAV 2FS 5845 230	Bosch FJ/DB IW 6×2/102
Injectors, holder jet	CAV BKBL 100S 5318B CAV BDBL 150S 6563	Bosch KBAL 100S 24/4 Bosch DLLA 150S 138
opening pressure	155 kp/cm <sup>2</sup> (2 204 p.s.i.)	175 kp/cm <sup>2</sup> (2 489 p.s.i.)
Fuel tank capacity, litres (Imp. galls. = US galls.)	175 or 125 (38.5 = 46.2 or 27.5 = 33), N 86, NB 86	175 or 300 (38.5 = 46.2 or 66 = 79.2), F 86, FB 86
On certain vehicles: Fuel injection pump	CAV DPA 3268 F 620 with centrifugal governor	
Setting	10° B.T.D.C.	
Opening pressure	200 kp/cm <sup>2</sup> (2 844 p.s.i.)	
Injectors, jet	CAV BDLL 150S 6438	

## Cooling system

Type	Overpressure
Pressure valve opens at	0.28 kp/cm <sup>2</sup> (4 p.s.i.)
Thermostat, type	Wax
marked	170
begins opening at	74—78° C (165—172° F)
fully open at	89° C (192° F)
Number	
Cooling system capacity, N 86, NB 86 F 86, FB 86	30.5 litres (6.7 Imp. galls. = 8.1 US galls.) 30 litres (6.6 Imp. galls. = 7.9 US galls.)

## Table showing glycol/water mixture

Capacity of cooling system	Glycol required for frost protection down to, litres (Imp. galls. = US galls.):			
	-25° C (-13° F)	-30° C (-22° F)	-40° C (-40° F)	-56° C* (-68° F)
N 86, NB 86: 30.5 litres (6.7 Imp. galls. = 8 US galls.)	approx. 12	approx. 13.5	approx. 16	approx. 18.5
F 86, FB 86: 30 litres (6.6 Imp. galls. = 7.9 US galls.)	(2.6 = 3.2)	(3 = 3.6)	(3.5 = 4.2)	(4 = 4.9)

\* The glycol content given here will protect against freezing down to maximum -56° C (-68° F). It is, therefore, pointless to increase the glycol proportion beyond this amount.

	Electrical system	Number	Output	Socket
Electri	Bulbs	2	55/50 W	P 45 t
	Headlights	2	4 W	Ba 9 S
Durin sider since are u city a Chec freez charg	Parking lights	2	5 W	Ba 15 S
	Rear lights	2	20 W	Ba 15 S
	Brake lights	2	20 W	Ba 15 S
	Turn indicators, front	2	20 W	Ba 15 S
	rear	2	2 W	Ba 9 S
	Combined instrument	1	2 W	Ba 9 S
	Speedometer	3	2 W	Ba 9 S
	Tachometer	1	3 W	Ba 7 S
	Rev counter	1	2 W	Ba 9 S
	Warning lamps: fullbeam headlights	1	2 W	Ba 9 S
Com	battery charging	2	2 W	Ba 9 S
	air pressure	1	2 W	Ba 9 S
	oil pressure	1	2 W	Ba 9 S
	diff. lock	2	2 W	Ba 9 S
	turn indicators	2	2 W	Ba 9 S
	power take-off	1	2 W	Ba 9 S
	parking brake	2	5 W	Ba 15 S
	Position lights	2	10 W	S 8.5
	Roof lights	2	10 W	S 8.5
	Lighting for fusebox (N 86, NB 86)	1	4 W	Ba 9 S

Fue	Voltage	24 Volts
	Battery, voltage	12 Volts
	number	2
	capacity	114 Ah
	electrolyte specific gravity	1.28
	recharged with specific gravity	1.21
	Generator, type	Motorola A 28/35-712 40002
	output (max.)	980 Watts
	Starter motor, type	Bosch KG (R) 24 V 4 PS
	output	4 h.p.
Fuses		8 amps — 11
		25 amps — 1

	Clutch	Single disc	Twin disc*
Type		15"	14"
Size		3—3.5 mm	5—6 mm
Clutch lever free travel, F 86		35—40 m	—
Clutch pedal play (N 86)			

\* Only on F/FB 86 with TD 70 B engine and final drive 181.

## Gearbox

Type	R 51
Ratios:	
1st	10.18:1
2nd	7.02:1
3rd	5.03:1
4th	3.78:1
5th	2.69:1
6th	1.86:1
7th	1.33:1
8th	1:1
Reverse	10.01:1 (high 2.40:1)
Lubricant	Gear oil (Note: Not hypoid or multipurpose)
Viscosity, below $-10^{\circ}\text{C}$ ( $14^{\circ}\text{F}$ )	SAE 80
between $-10^{\circ}\text{C}$ and $+30^{\circ}\text{C}$ ( $14^{\circ}\text{F}$ and $68^{\circ}\text{F}$ )	SAE 90*
above $+30^{\circ}\text{C}$ ( $86^{\circ}\text{F}$ )	SAE 140
Alt. engine oil	SAE 40 all year round
Oil capacity	approx. 8 litres (1.8 Imp. galls. = 2.1 US galls.)

\* SAE 140 with lengthy driving at heights of 2 000 metres (6 560 ft.) above sea level.

## Power take-off

Located on gearbox	Output shaft speed	Direction of rotation in relation to engine's	Permissible load, torque, kpm (lb.ft.)	
			Short driving time (max. 15 min.)	Long driving time (above 15 min.)
Rear	0.48 × engine speed	Opposite	80 (578)	50 (362)
Rear	0.85 × engine speed	Same	30 (217)	25 (180)
Side	0.63 × engine speed	Same	35 (253)	35 (253)

## Final drive

Type	Single reduction	Double reduction
Designation	1840	181
Reduction ratios	4.87:1 or 5.43:1 or 6.14:1*	5.43:1 or 6.12:1
Lubricant	MIL-L-2105 B	
Viscosity, below $-10^{\circ}\text{C}$ ( $14^{\circ}\text{F}$ )	SAE 80	
between $-10^{\circ}\text{C}$ and $+30^{\circ}\text{C}$ ( $14^{\circ}\text{F}$ and $68^{\circ}\text{F}$ )	SAE 90**	
above $+30^{\circ}\text{C}$ ( $86^{\circ}\text{F}$ )	SAE 140	
Oil capacity	9.5 litres (2 Imp. galls. = 2.5 US galls.)	13 litres (2.9 Imp. galls. = 3.4 US galls.)

\* Only with D 70 B engine.

\*\* SAE 140 for lengthy driving at altitudes of 2 000 metres (6 560 ft.) above sea level.

## Brake system

Brake drum, diameter, front wheels, rear wheels	16 1/4" 15 1/2"
Compressor, make	Westinghouse
designations	TU-FLO 500
Safety valve, opening pressure	9.2—9.9 kp/cm <sup>2</sup> (130—140 p.s.i.)
Brake cylinder, max. permissible stroke, front wheels	44 mm (1.73")
trailing wheels	44 mm (1.73")
drive wheels	51 mm (2")
Pressure regulator, cut-out pressure	7.9—8.5 kp/cm <sup>2</sup> (112—120 p.s.i.)
cut-in pressure	6.7—7.0 kp/cm <sup>2</sup> (95—100 p.s.i.)
Pressure safety valve (safety valve for tractor unit) opening pressure	4.3—4.7 kp/cm <sup>2</sup> (61—67 p.s.i.)
Low-pressure indicator, parking brake footbrake circuit	5.8—6.6 kp/cm <sup>2</sup> (82—94 p.s.i.) 3.8—4.6 kp/cm <sup>2</sup> (54—65 p.s.i.)

## Front wheel alignment

Nominal values with unladen weight and normal body:

Vehicle	Wheelbase mm (in.)	Caster in relation to ground surface	Camber	King pin inclination	Toe-in measured on tyre wear treads mm (in.)
N 86, NB 86	3800—4400 (150—173)	1 3/4° ± 1/2°	1°	5,5°	0—3 mm (0—0.12)
N 86	4800 (189)	2° ± 1/2°	1°	5,5°	0—3 mm (0—0.12)
N 86, NB 86	5200—5600 (205—220)	2° ± 1/2°	1°	5,5°	0—3 mm (0—0.12)
F 86 FT5/FT6	3000 (118)	1 1/2° ± 1/2°	1/1 1/2°	5,5/5°	0—3 mm (0—0.12)
F 86, FB 86	3400 (134)	3/4° ± 1/2°	1/1 1/2°	5,5/5°	0—3 mm (0—0.12)
F 86, FB 86	3800 (150)	1° ± 1/2°	1/1 1/2°	5,5/5°	0—3 mm (0—0.12)
F 86, FB 86	4200 (165)	1 1/4° ± 1/2°	1/1 1/2°	5,5/5°	0—3 mm (0—0.12)
F 86, FB 86	4900 (193)	1 1/2° ± 1/2°	1/1 1/2°	5,5/5°	0—3 mm (0—0.12)

## Servo steering

N 86, NB 86\*

F 86, FB 86

Type	Cam and roller with built-in servo	Cam and roller with auxiliary cylinder
Number of steering wheel turns from lock to lock	3.7	5.8
Lubricant	ATF Type A or Dexron	ATF Type A or Dexron for servo
Oil capacity	approx. 4.5 litres (7.92 Imp. pints = 9.50 US pints)	Hypoid oil for steering box (See also page 89.) approx. 2.7 litres (4.75 Imp. pints = 5.70 US pints) for servo
		approx. 1.0 litre (1.76 Imp. pints = 2.11 US pints)

\* Some N/NB 86 trucks can be delivered with mechanical steering. For this type of steering the following data applies:

Type	Worm and roller
Number of steering wheel turns from lock to lock	6.5
Lubricant	Hypoid oil SAE 80 (at temp. above —10° C = 14° F) SAE 90 (below —10° C = 14° F)
Oil capacity	1.6 litres (2.8 Imp. pints = 3.4 US pints)

## Wheels

Disc wheels, or spoke wheels	7.0×20", 7.5×20" or 8.0×20"
Tyres	7.5×20", 8.0×20" 10.00—20" 11.00—20"

## Tightening torques

	kpm	lb.ft.
Engine, rocker arm cover	1	7
injectors, nut	2	14
plug, oil sump	8	58
Wheel studs, disc wheels	35—44	253—318
spoke wheels	30—40	217—289