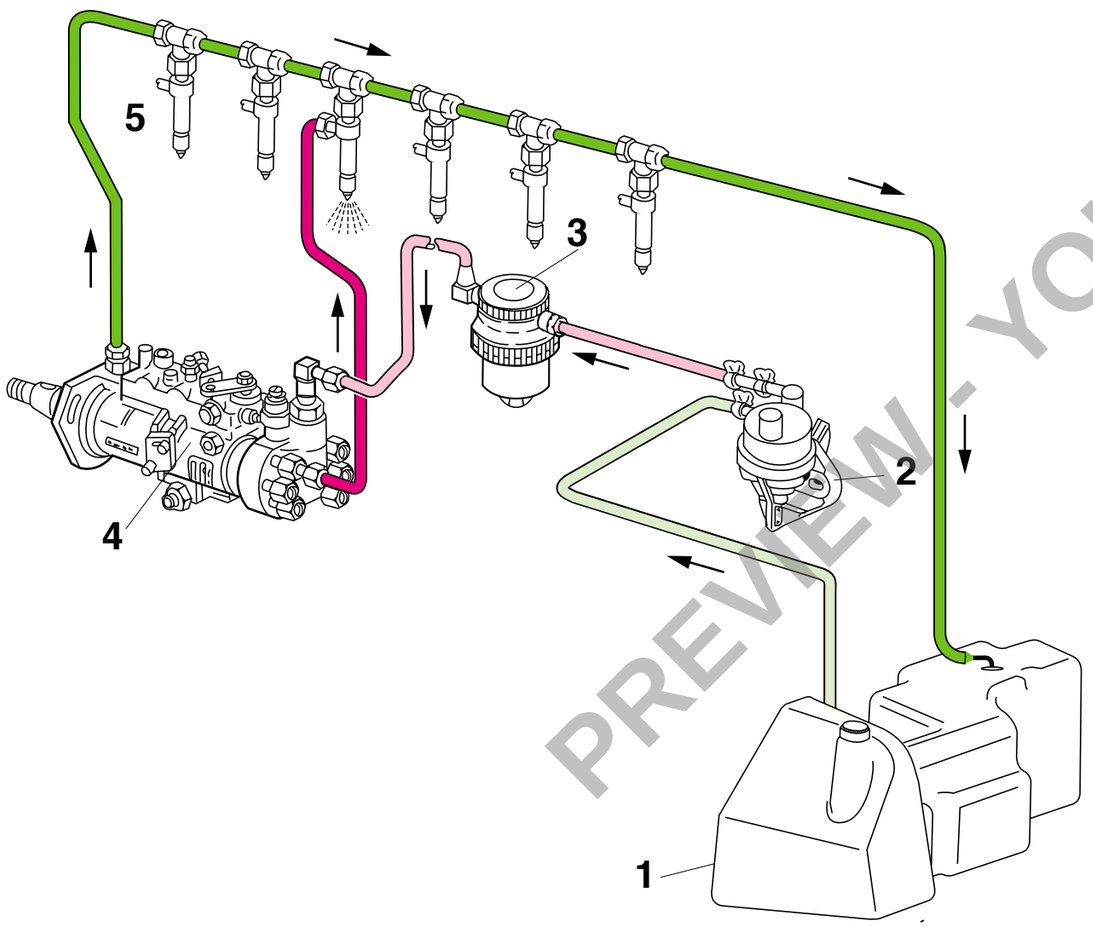
RENAULT Agriculture

H **3922** Renault **TEMIS 610**

INJECTION SHEET

SUPPLY CIRCUIT



supply circuit (suction)
supply circuit (supply pressure pump)
delivery circuit
return circuit

SUPPLY CIRCUIT CHARACTERISTICS

① 160-litre fuel tank (RX)
215-litre fuel tank (RZ)

② Self-regulating membrane supply pump.
Minimum flow rate at maximum no-load speed:
1.6 l/min.
Minimum pressure at tick-over:
0.35 bar

③ BOSCH cartridge fuel filter.

④ BOSCH VE 6/11F1200R860
rotary injection pump.
All-speed mechanical regulator
Automatic advance
NOTE: Injection pump lubrication and cooling are provided by the fuel.

⑤ BOSCH DLLA 132S 1320
type S injectors
5 x 0.23 mm Ø holes
Injector setting pressure:
260 bar ± 12

STATIC SETTING: 9° ± 0.5.

TEST CONDITIONS

– Max. no-load speed: Check with the tachometer before connecting up the test-set.

– Reverser in neutral.

– If the tractor is fitted with B13 mechanical gearbox → doubler in neutral.
If the tractor is fitted with the Tractonic gearbox → tripler in mid-position.

– Hydraulic distributors in neutral.

– Gearbox oil temperature: above 40 °C.

– If the tractor is fitted with air conditioning, do not operate it during the test.

– Take the measurements after operating at nominal speed under full load for one hour.

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CONTENTS (CONT'D)

REMOVAL - INSTALLATION

FUEL FILTER REPLACEMENT A1-2.24
SUPPLY SYSTEM BLEEDING A1-2.24
ROTARY INJECTION PUMP A1-2.25
INJECTOR SEATING A1-2.27

ADJUSTMENT OF CONTROLS

ACCELERATOR CONTROL A1-2.32

TOOLS

INJECTOR TOOLS A1-2.34

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GENERAL SPECIFICATIONS

	TEMIS 550
ENGINE	4045 TRT 52
Make	D.P.S.
Type of injection	Direct
Inlet	Turbocharged
Cooling	Fluid
Number of cylinders	4
Injection sequence	1-3-4-2
Bore (mm)	106.5
Stroke (mm)	127
Capacity (cm^3)	4,525
Compression ratio	17/ 1
Compression pressure (bar)	24
Nominal speed (rpm)	2,350
Tick-over speed (rpm)	850 ± 25
Max. off-load speed (rpm)	2,550 ± 15
Power in kW (ch) ECE R24	75 (102)
Lubrication circuit (L)*	Min.: 10 / Max.: 12.5
Cooling circuit (L)**	18

* Lubricant: ELF TRACTORENAULT SDM in accordance with standards SAE 15W40 - CCMC D4 - API CF4/5F - MIL.L2104E - MIL.L.46152C

** Fluid: RENAULT Agriculture cooling fluid

- Reference GLACEOL RX type D 50/50
- Protection: - 40 ºC

- **Direction of rotation of the crankshaft**

  Clockwise as viewed from the water pump end.

- **Identification of the engine front**

  The water pump is mounted on the front of the engine.

- **Identification of the engine sides**

  The "left hand" and "right hand" sides of the engine are as viewed from the end of the crankshaft (at the rear of the engine).

- **Identification of No. 1 cylinder:**

  The cylinder nearest to the water pump is called No. 1 cylinder.

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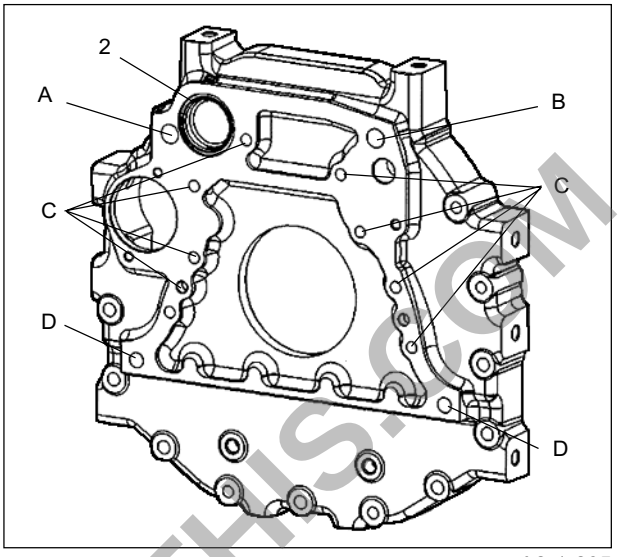
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- **Reinstallation of the engine flywheel casing**

1 - Clean the mating surfaces on the cylinder block and the flywheel casing.

2 - Install the casing seal and seal item 2 on the engine flywheel casing (without sealing compound).

3 - Position the flywheel casing on the cylinder block and tighten the attachment bolts to the following torque values:



A2-1-205

Lubricated bolt tightening torques

Item	Bolt	Quantity	TIGHTENING TORQUE
A	M20 X 110	1	53 daN.m or 20 daN.m + 45°
B	M20 X 80	1	53 daN.m or 20 daN.m + 45°
C	M12 X 40	8	11 daN.m
D	M16 X 70	2	27.5 daN.m or 15 daN.m + 30°

- **Flywheel reinstallation**

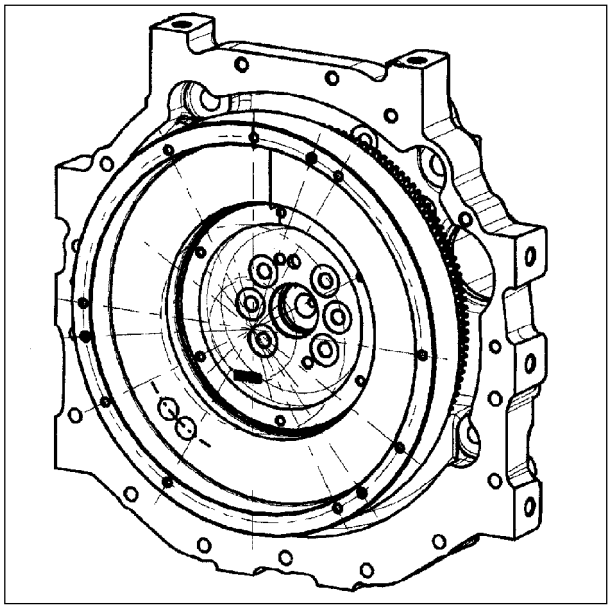
1 - Mount the two studs (item 1) on the crankshaft.

2 - Locate the flywheel on the studs then slide it against the crankshaft.

IMPORTANT: Always change the flywheel bolts when the latter is removed.

3 - Apply LOCTITE 242 (FRENETANCH) to the threads on bolts (B) and start screwing the bolts into the crankshaft. Remove the centring studs (1) then fit the last 2 bolts.

4 - Tighten the bolts (B) to 14 daN.m.



A2-1-060

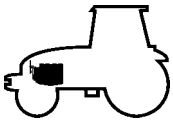
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General specifications

	Temis 610	Temis 630	Temis 650
Cooling	liquid RAg type D - 40°		
Fan	attached to water pump pulley, 7-blade suction type		
Water pump	belt driven centrifugal vane pump		
Ratio between engine speed (rpm) and water pump speed (rpm)	1:1.4		
Temperature regulation	thermostat control, opening begins at 79° ± 2° C 7-mm stroke at 94° C		
Distribution	by camshaft located under the cylinder block operating the valves via push-rods, stems, rocker arms, and driven by helical pinions		
Inlet: - start: before TDC - end: after BDC	 12° 31°		
Exhaust: - start: before TDC - end: after BDC	 50° 15°		
Operating clearance between valves and rocker arms, with engine cold : - inlet - exhaust	 0.30 ± 0.05 mm 0.30 ± 0.05 mm		
Supply			
Air filtration	dual-cartridge dry filter, with clogging indicator, centrifugal pre-filter and automatic dust evacuation		
Supply pump	dual-diaphragm type		
Cam control	operated via engine distributor		
Fuel filtration	sediment. pre-filter, two interchangeable cartridge filters on the injection pump outlet		
Turbocharger: - GARRETT - GARRETT	 O 4B 4E36		

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Cylinder block and liners

Handle all parts with care. Do not insert hands between parts.
Wearing of safety equipment (safety goggles, gloves, shoes, etc...) is mandatory.
The liner inside diameter should never be measured when the liner is removed from the cylinder block, due to its deformability; the inside diameter must be measured with the liner installed.

Checking the liner inside diameter, to determine the degree of ovality, taper and wear, is performed using the gauge **(2)**, equipped with a 1/100th mm dial gauge **(1)**, previously set on zero on the 104-mm diameter calibration ring **(3)** (Fig. 60).

Note: if a 104-mm diameter calibration ring is not available, use a strip-gauge.

Liner diameter checking diagram (Dimensions in mm) (Fig. 61)
The dimension should be checked on each liner and in three different positions per liner and in two mutually perpendicular planes: one parallel to the longitudinal axis **(A)** and the other perpendicular to it **(B)**; the wear is generally more pronounced in this plane **(B)** level with the first dimension.
In the event of ovality or taper, or in any case, in the event of wear, these defects may be eliminated during repair by grinding the liners in the event of light wear or scratching, or by reaming followed by grinding if the scraches or ovality are more severe.

1. 1st measurement.
2. 2nd measurement.
3. 3rd measurement.

In the event of grinding, all the liners must be ground to the same size (0.4 - 0.8 mm).

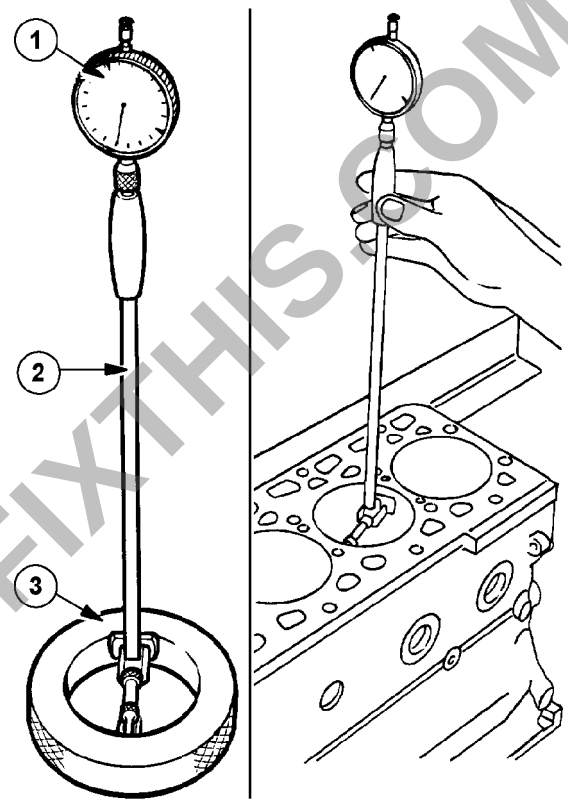


Fig. 60

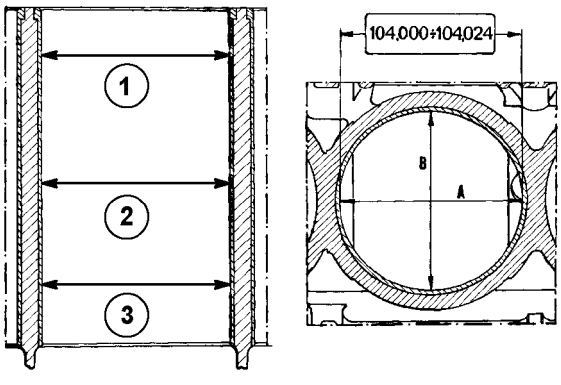


Fig. 61

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Fig. 31

DISPLACEMENT AND POWER TAKE OFF CLUTCHES
DT 310/310 - 330/310 - 355/330

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General specifications

Double-cone synchronisers have an additional bush which doubles the friction contact surface, thus increasing the efficiency of the assembly:
- comfort is increased by the reduced effort required to change gear,
- for the same effort, gear changing is faster.

General description

The transmission system on TEMIS tractors consists of five main items:
- the input housing which also acts as the clutch housing,
- the main gearbox which also includes the power take off train. This also supports the four-wheel drive distribution box,
- the rear axle assembly which includes the differential and the power take off extension shaft,
- the RH and LH flared tubes,
- the lift cover.

Gearbox assembly

Main gearbox
This includes the transmission and power take off gears.

Transmission
The main gearbox includes eight basic gears. It consists of a train of four gears, supplemented by two gears for selecting the normal (field) or high speed (road) ranges.
All the gears are permanently driven and selection is effected by double cone synchronisers on the 3 main gears, and by a single cone synchroniser for the 4th main gear and two sliding gear-hubs for the field or road ranges.
Selection of the eight gears is achieved via two levers.

Power take off
The main gearbox provides three power take off rotational speeds. The three speeds are obtained via three gears which deliver output speeds of 540 rpm, 1,000 rpm or proportional to the ground speed, according to the equipment in use.

All the gears are permanently driven and speed selection is controlled by two sliding gear-hubs.
A lever is provided for selection of the three output speeds.

Input housing assembly
The input housing, mounted at the front of the main gearbox is intended to reverse the transmission and to provide 2 additional speed ranges for the main gearbox. It includes the power take off driver gear.

- **Gearbox B13.29**
  A set of 3 permanently driven gears, provides transmission reversal through a double cone synchroniser, and two additional speed ranges through a single cone synchroniser. These are controlled via two levers.

- **Gearbox B13.25**
  A train of 2 permanently driven gears provides transmission reversal through a single cone synchroniser. Two additional gear trains provide the low speed and crawler ranges. The gears are permanently driven and range selection is by sliding gears. Control is provided by two levers.

- **Gearbox B13.35 (Tractonic)**
  The Tractonic gearbox is an electro-hydraulic device providing 3 input speeds to the main gearbox and inversion of the transmission drive. The reverser and tripler gears are controlled by two double cone synchronisers. The number of speeds thus obtained is 24. The system consists of two hydraulic clutches and a reverser/tripler system which can be selected whilst transmitting torque.
  Control is by a lever, located at the top LH side of the steering wheel and an electric switch on the main gear lever.

Lubrication
Lubrication is provided by a hydraulic distributor. The oil circulates through the reverser, the doubler, through the various shafts, and lubricates the gears, bushes and bearings.
The oil also flows through the power take off shafts (input, front and rear) lubricating the gears, bushes and bearings.

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Selecter rails and forks

B13.25 gearbox

Removal/installation of the selecter rails and forks for the road/field range

- Position the range lever in the 'field' position.
- Remove the main gearbox top cover attachment bolts.
- Lift the complete cover and remove it from the housing (Fig. 5).
- Mark the position of the selector **(20)** (Fig. 10a).
- Loosen the bolt **(21)** on the selector **(20)** (Fig. 4).
- Loosen the bolts **(22)** on the forks **(17)** and **(18)** (Fig. 10a).
- Slide the selecter rail **(19)** to the back of the housing and recover the fork **(17)** (Fig. 11a).

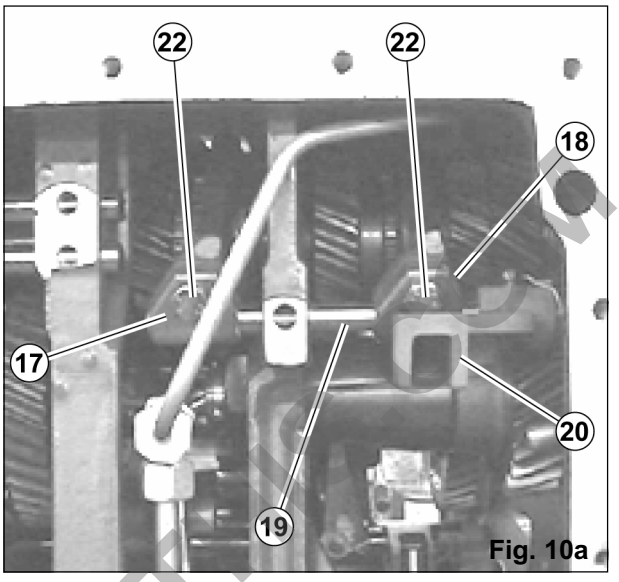


Fig. 10a

During extraction, the locking ball (25) will be ejected by the spring (24) (Fig. 12a). Keep a hand over the hole in order to catch it.

- Completely remove the selecter rail **(19)** recovering the fork **(18)** and the selector **(20)** (Fig. 11a).
- Extract the spring **(24)** (Fig. 12a).

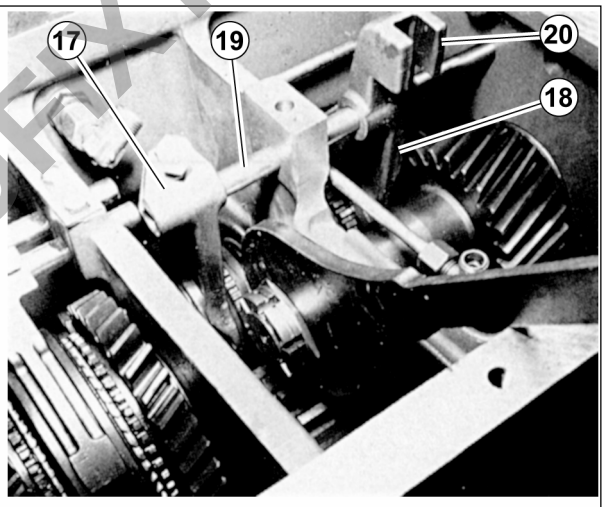


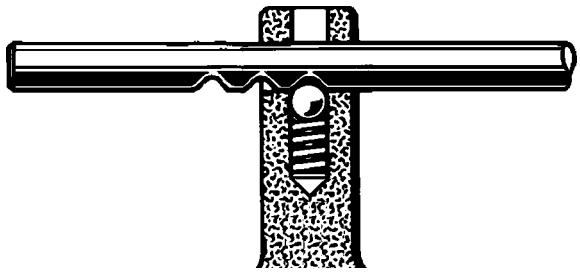
Fig. 11a

Installation

- Lightly oil the selecter rail.
- Install the selecter rail **(19)** in the corresponding bore in the housing, successively inserting the fork **(18)** and the selector **(20)**.
- Install the spring **(24)** and the ball **(25)** in the bottom of the hole, then complete sliding of the selecter rail to position the ball beneath the rod and insert the fork **(17)** on the rod.

Adjustment

- Position the sliding gears in the 'field' position.
- Position the selecter rail **(19)** in the corresponding locked position.
- Position the forks **(17)** and **(18)** so the tip of each bolt falls in each of the cup holes in the guide rod, then tighten and lock the bolts.
  Note: The lateral clearance should be the same on each side of the bolt.
- Position the selector **(20)** in the position marked prior to removal **(21)** and lock it. The bolt should fall in the cup hole machined in the guide rod.


Fig. 12a

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B13.35 TRACTONIC
INPUT HOUSING

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Primary shaft B13.25 - B13.29 - B13.35

Preliminary steps

Note: For the following operations, refer to the corresponding chapters.

- Disconnect the gearbox from the crank case.
- Remove the clutch controls and stops.
- Remove the input housing.
- Remove the selecter rails and forks from the input housing.
- Remove the top cover from the main gearbox.

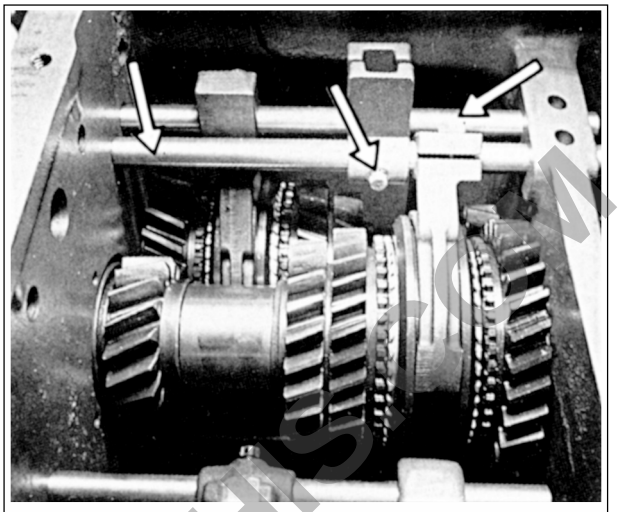


Fig. 3

Primary shaft removal

- Loosen the switch **(46)** for the locking system, remove the selecter rails, the forks and the 3rd/4th gear selectors (Figs. 3 and 4). Refer to the corresponding chapters.

B13.25 gearbox

- Extract the low speed range gear **(318)** (Fig. 1).
- Remove the plate **(504)** by removing the attachment bolts **(504a)** (Fig. 1).
- Extract the spacer **(505)** and adjustment shims **(506)** (Fig. 1).
- Remove the retaining ring **(523)** (Figs. 1 and 5).
- Extract the shims **(522)** (Fig. 1).
- Using a drift, drive out the primary shaft assembly complete (Figs. 1 and 6).

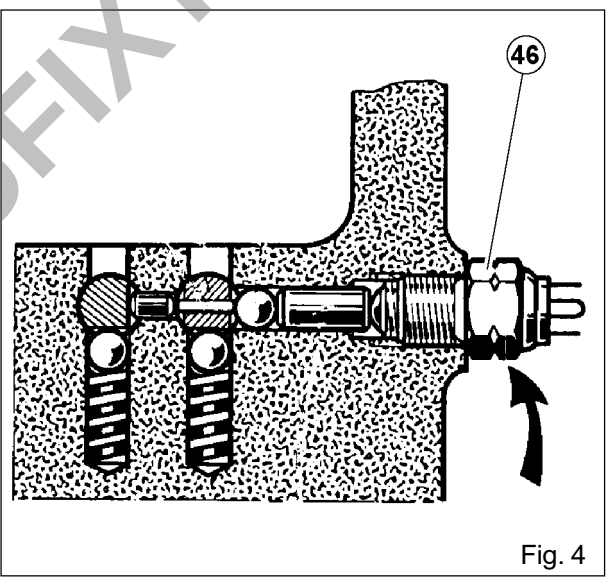


Fig. 4

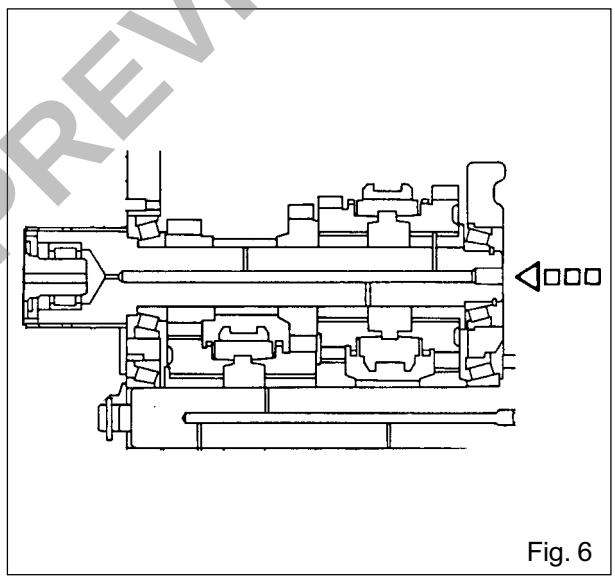


Fig. 6

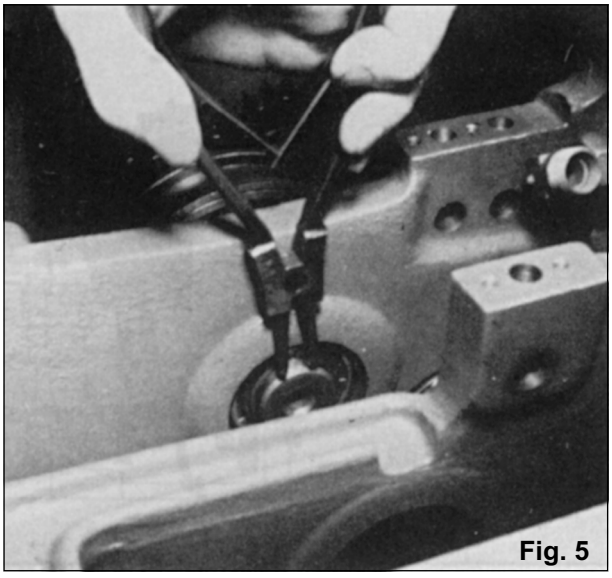


Fig. 5

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Gearbox tools

Notes:

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POWER TAKE OFF SHAFT

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Specifications

Service and handbrake

	HRE 4 224	HRE 5 224
Type	Oil immersed disk brakes	
No. of discs per wheel	4	5
Disc outside dia. (friction)	224 mm	
Disc thickness (friction)	4.2 mm	
Type of slave	Cylinder & piston	
Service brake control	Hydrostatic	
Handbrake control	Mechanical	
Brake fluid type	FRELUD HDS or equivalent to SAE J 1703F, DOT 3, 4 or 5	
Position of the reservoir	Engine compartment	
Circuit capacity	1 l.	
Capacity between max. and min. levels	300 cm^3	
Level detection	with indicator in the cab.	
Brake fluid drain	At least once per year	
Lubrication	ELF TRACTORENAULT THFI oil	

H = Oil-bath brakes
RE = Hydrostatic control with external slave
4 = Number of discs
224 = Diameter of discs

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4WD unit

- Tap the back end of the bell **(16)** to properly seat the shims **(14)** (Fig. 37).

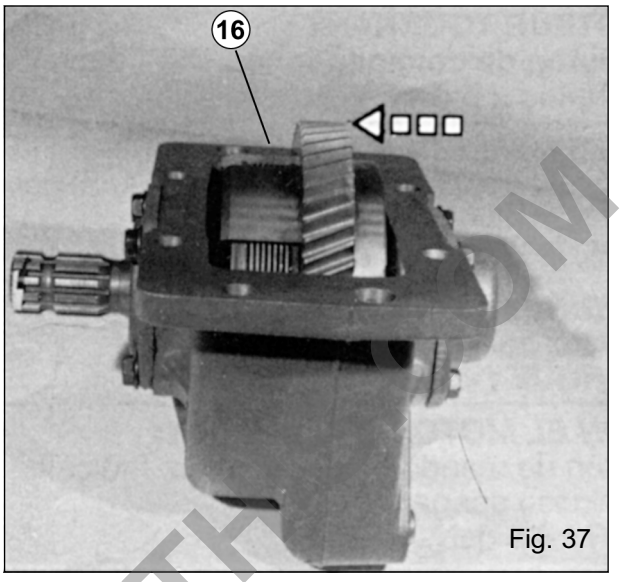
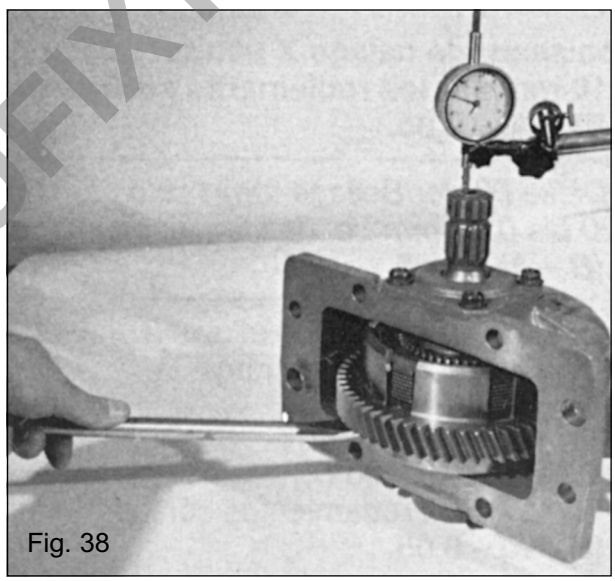


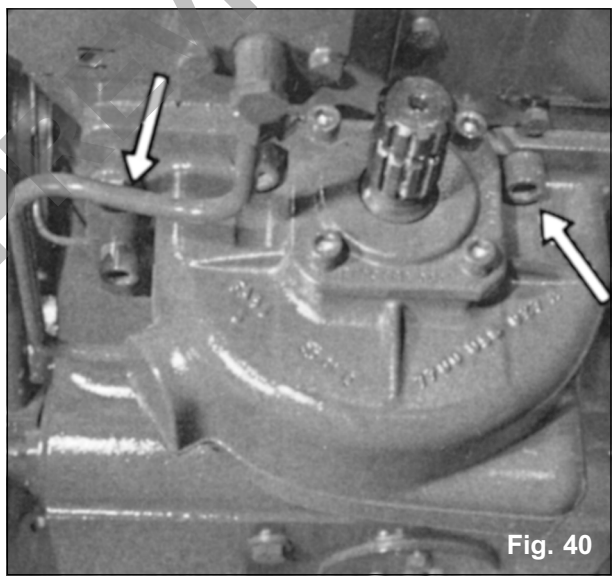
Fig. 37

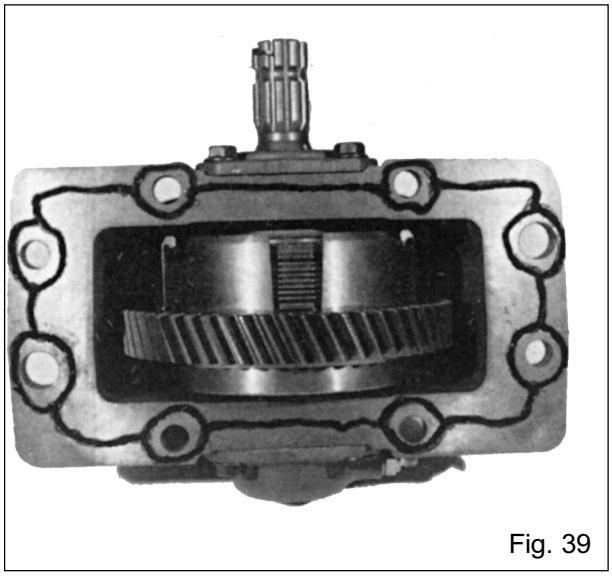
- Using the dial gauge 8029 and its support 8027, check and adjust the axial play to between 0.02 and 0.10 mm (Fig. 38)

Housing installation

- Apply Loctite 518 to the housing thrust face, in accordance with the geometry shown in Fig. 39.
- Install the housing under the gearbox housing (Fig. 40) and torque tighten the attachment bolts as follows:
- HM 14 bolts: 20 daNm
- CHC M14 bolts: 12 daNm


Fig. 38


Fig. 40

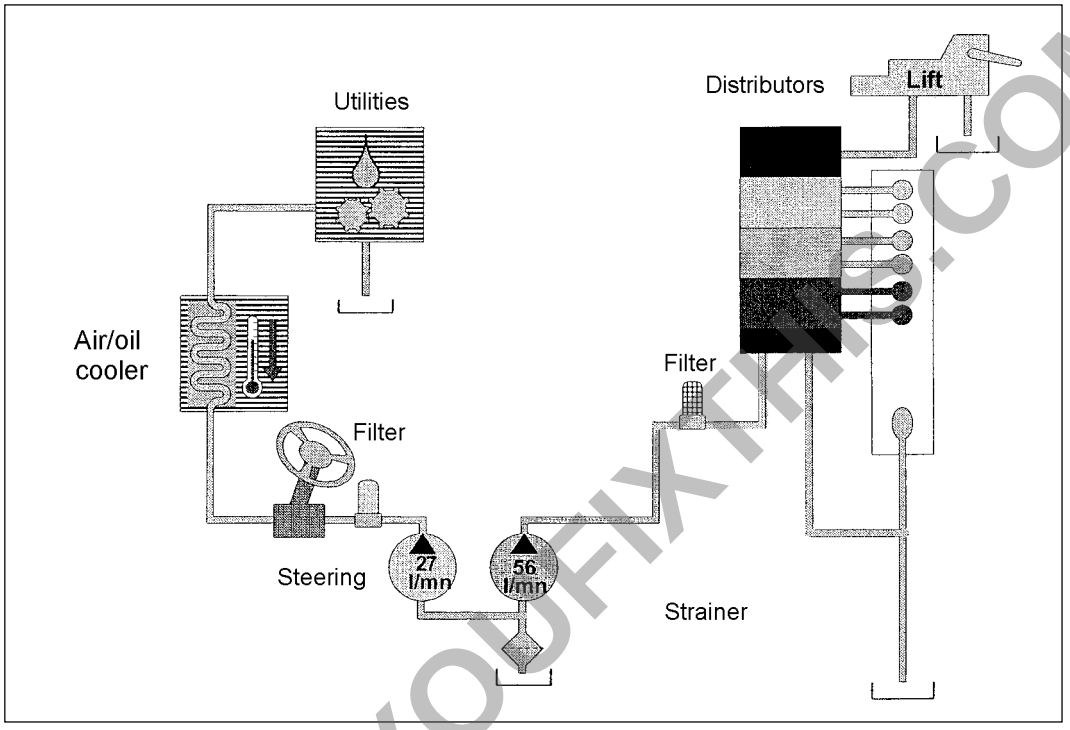

Fig. 39

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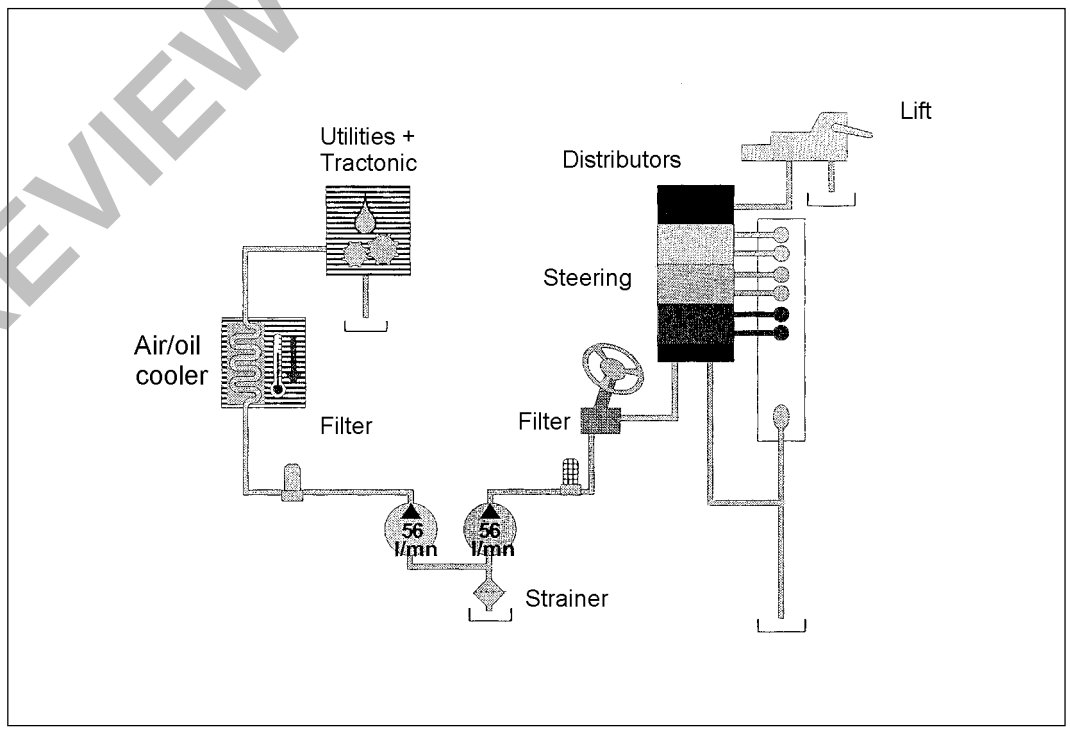
PRESENTATION OF THE VARIOUS CIRCUITS

Circuit for TEMIS 550 fitted with a mechanical gearbox



E-001

Circuit for TEMIS 550 fitted with a Tractonic gearbox



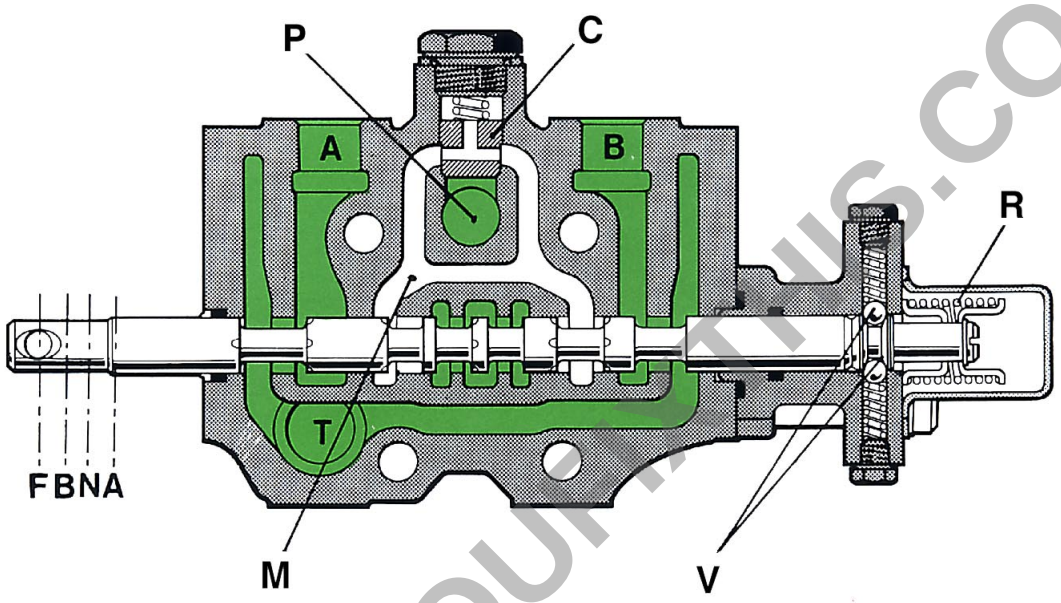
E-002

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AUXILIARY DISTRIBUTOR (cont'd.)

Position F: floating



E-060

- The distributor spool is in position **(F)**: known as the floating position.

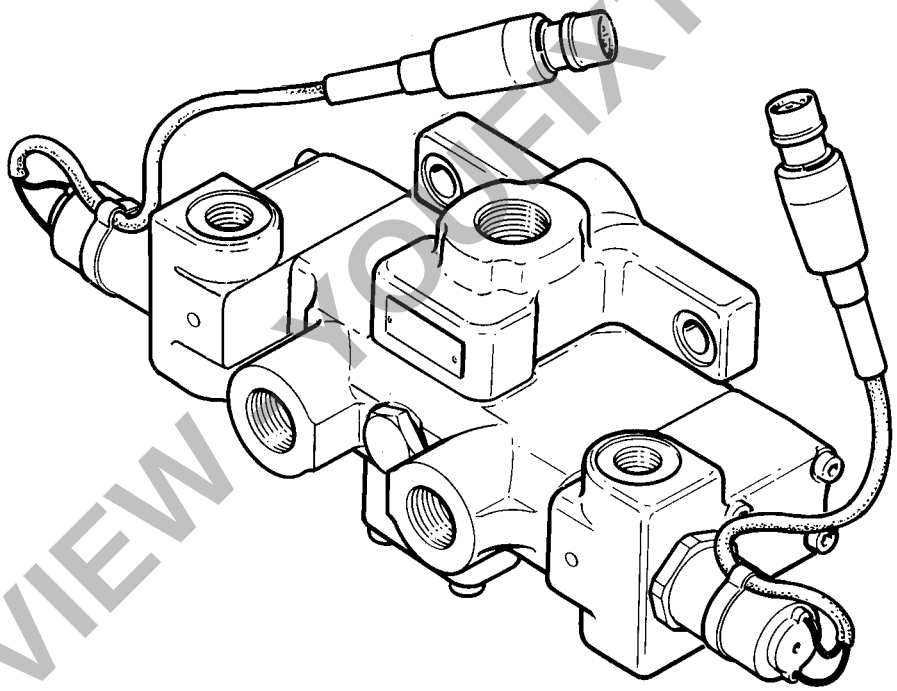
  It is maintained in this position by two locking balls **(V)**.
- **(A)** is on reservoir return **(T)**. The entry into passage **(T)**, of oil from **(A)**, occurs via the spool.
- **(B)** is on reservoir return **(T)**. The entry into passage **(T)**, of oil from **(A)**, occurs via the spool.
- The double acting cylinder is free to move.
- The pressure line is open (supply of other devices).

- In this position, if the pressure rises in the circuit at **(P)** the valve **(C)** rises and the oil is directed to the spool via the passage **(M)**. There is no change at **(A)** or **(B)**, the oil is stopped by the ditributor spool.
- In order to return the spool to its neutral position **(N)** simply manually actuate the distributor spool in order to overcome the lock **(V)**, the spring **(R)** then returns the spool to its neutral position.

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MAIN DISTRIBUTOR
(REXROTH SIGMA)



E-151

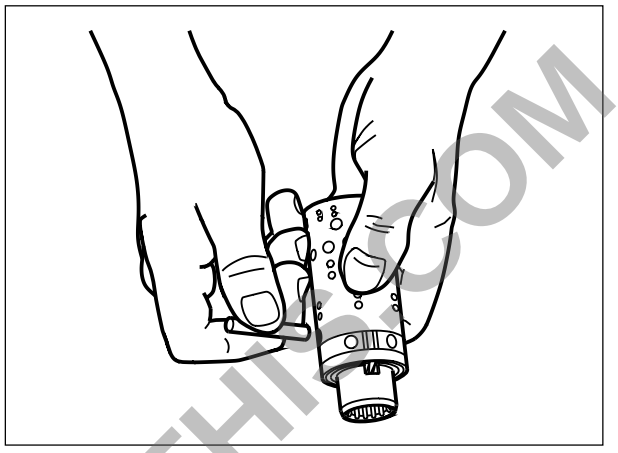
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STEERING UNIT (cont'd.)

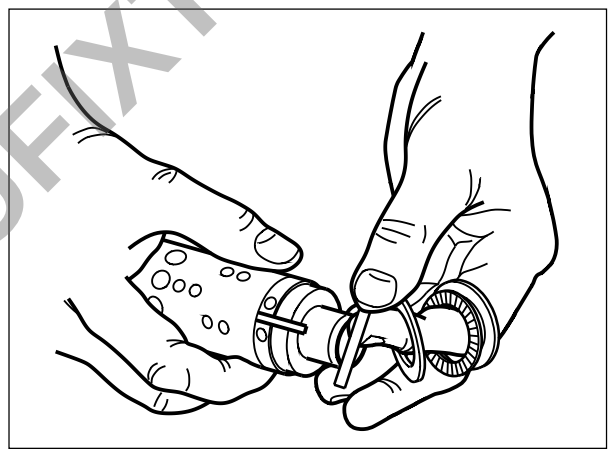
Reassembly (cont'd.)

- Install the locking pin in the drum/sleeve.



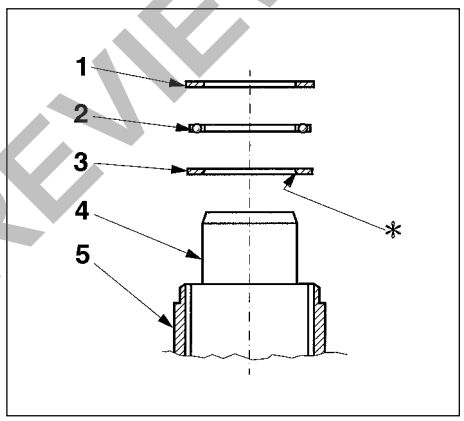
E-235

- Install the thrust washers and the needle roller bearing as shown in the figure below.



E-207

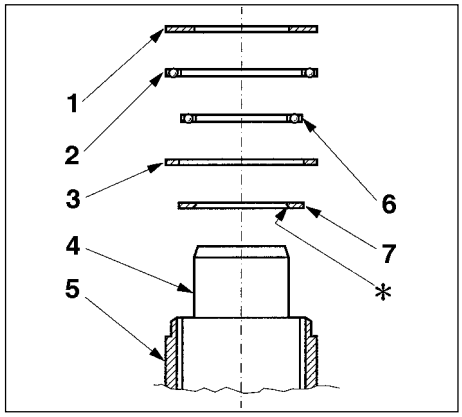
Installation of the standard thrust assembly



E-237

1 - Outer thrust washer
2 - Needle roller bearing
3 - Inner thrust washer
4 - Selection drum
5 - Inlet sleeve

Installation of the double thrust assembly



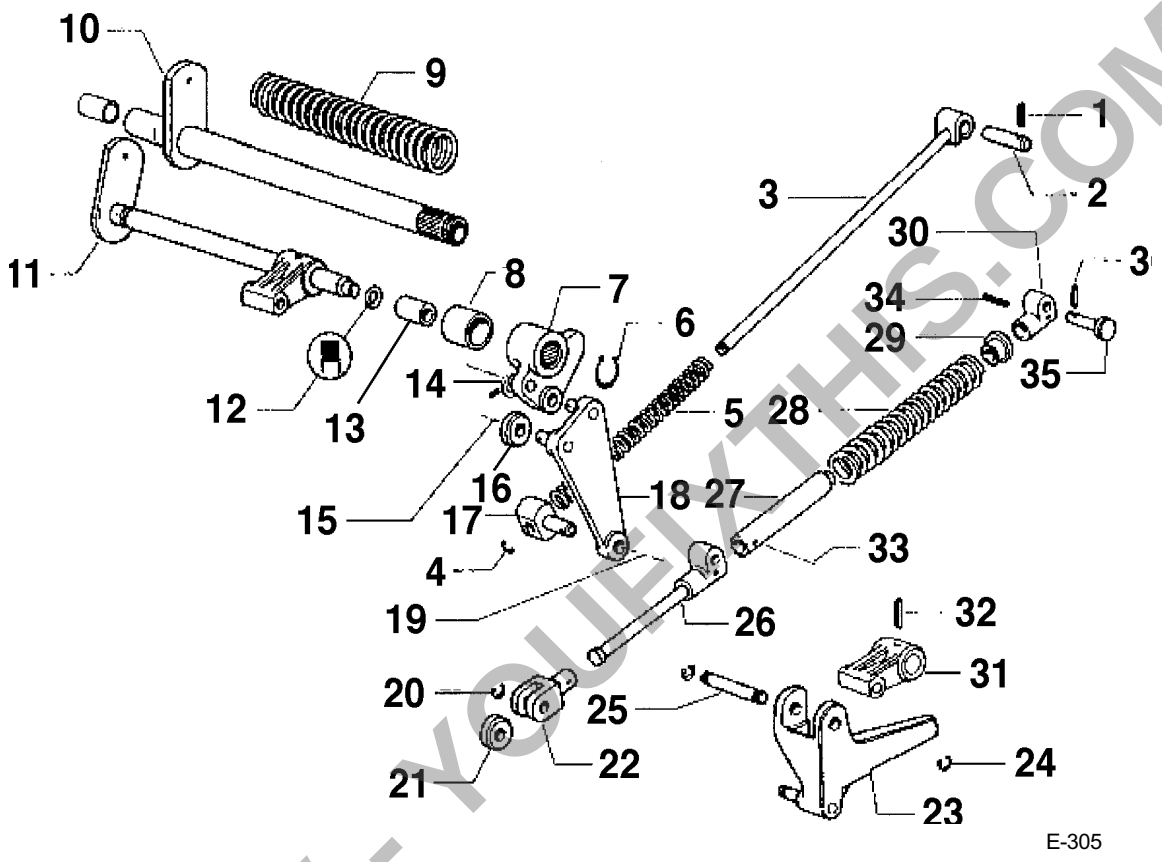
E-238

1 - Thrust washer
2 - Outer needle roller bearing
3 - Outer thrust washer
4 - Selection drum
5 - Inlet sleeve
6 - Inner needle roller bearing

*** The internal chamfer on the thrust washer should face towards the selection drum.**

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LIFT (cont'd.)



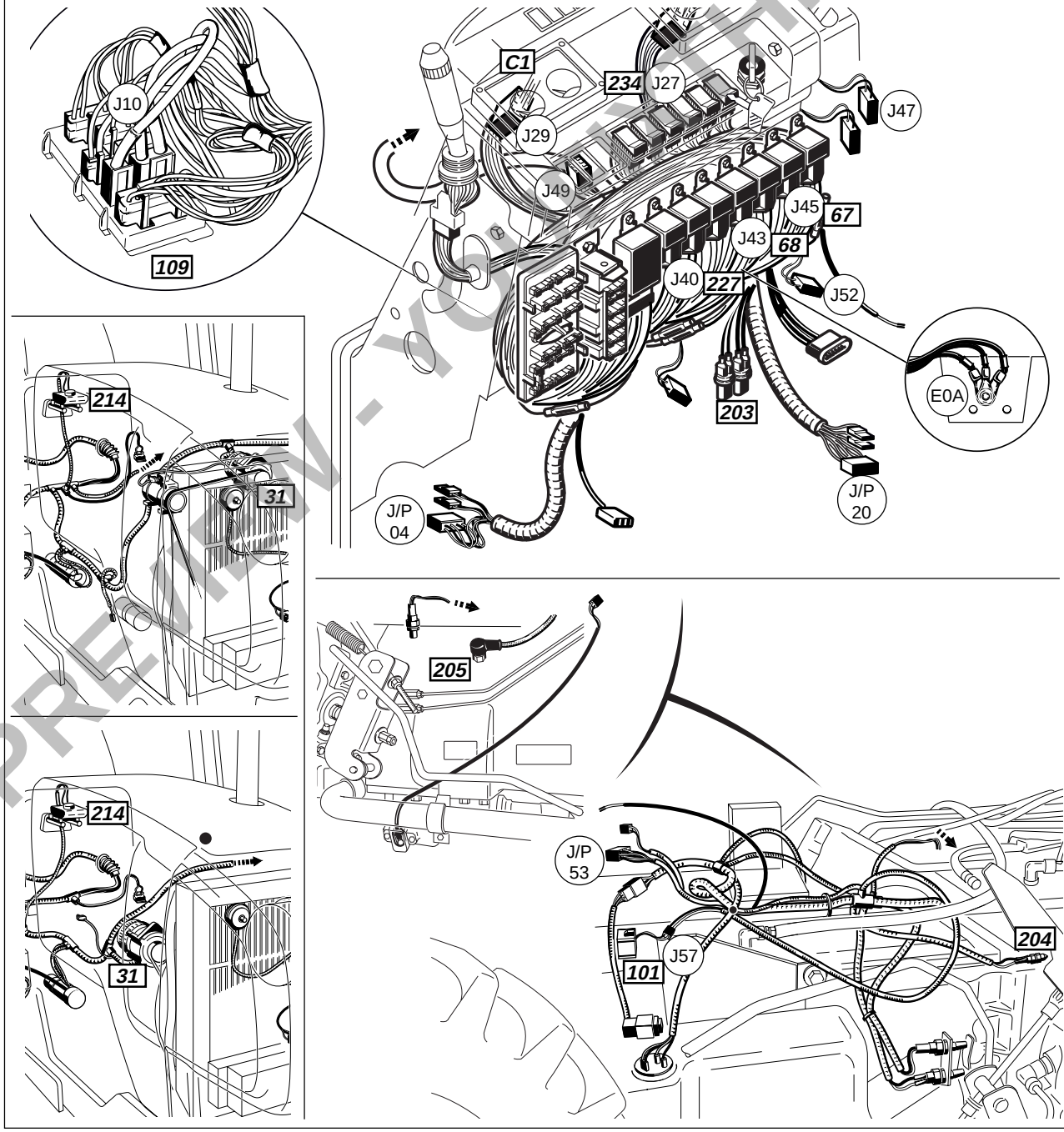
1 - Pin
2 - Axle
3 - Guide rod
4 - Circlip
5 - Spring
6 - Circlip
7 - Lever
8 - Spacer
9 - Spring
10 - "Position control" tube
11 - "Draft control" shaft
12 - Sealing bush
13 - Bush
14 - Split pin and washer
15 - Split pin and washer
16 - Bush
17 - Pin
18 - Intermediate lever
19 - Split pin and washer
20 - Circlip
21 - Bush
22 - Yoke
23 - Rocker
24 - Circlip
25 - Pin
26 - Rod
27 - Guide tube
28 - Spring
29 - Guide stop
30 - Support
31 - Lever
32 - Pin
33 - Pin
34 - Pin
35 - Pin
36 - Pin

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ENGAGED DIRECTION CONTACT - HANDBRAKE
BRAKE FLUID LEVEL

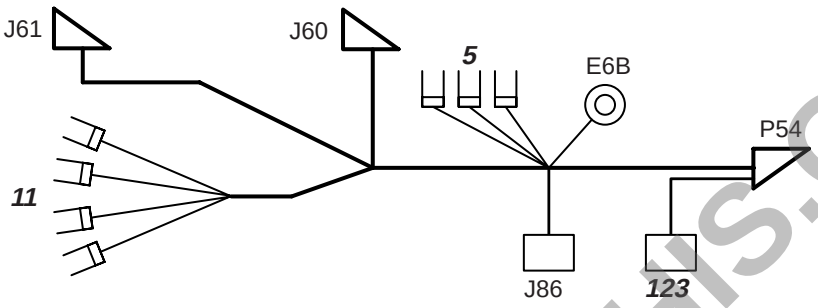
Item No.	DESCRIPTION	Connector No.	Connection between looms
C1	Warning lights and instrument panel	J04/P04	Front harness / Insttrument panel
31	Alternator	J10	13-fuse box
67	Handbrake relay	J20/P20	Underfloor / Instrument panel
68	Brake lights relay	J27	Front axle switch
101	4WD solenoid valve	J29	Warning lights and instrument panel
109	13-fuse box	J40	Starter rlay
203	Brake lights switch	J43	Brake lights relay
204	Handbrake	J45	Handbrake relay
205	Gearbox switch	J47	Instrument panel white socket
214	Brake fluid level	J49	Instrument panel black socket
227	Starter relay	J52	Instrument panel brown socket
234	Front axle switch	J53/P53	Underfloor / B13 mechanical gearbox
E0A	Cab earth	J57	4WD solenoid valve



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3a - LH MUDGUARD HARNESS

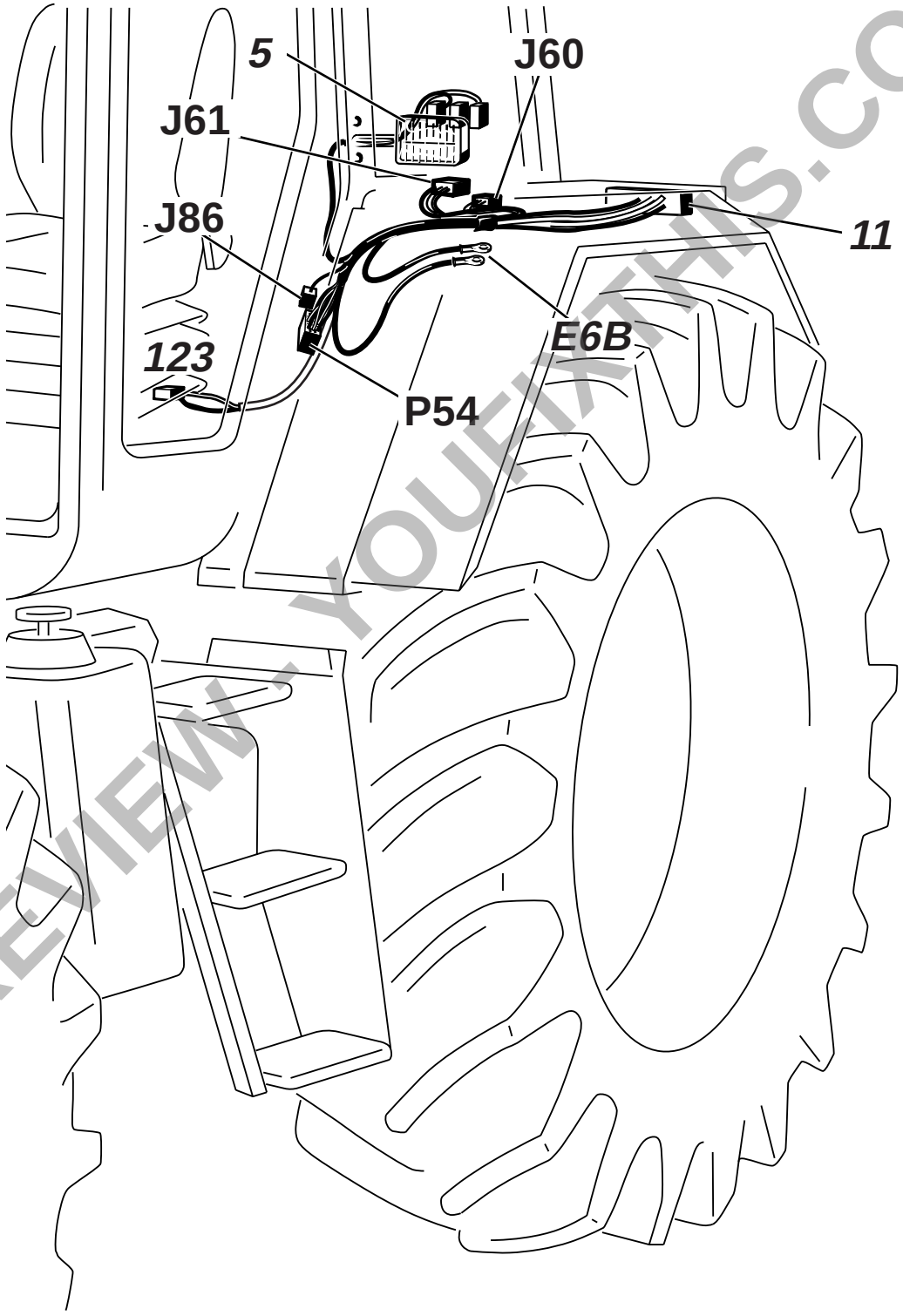


ITEM	DESCRIPTION	CONNECTOR
5	Front LH light	–
11	Rear light	–
—	Link to cab underfloor harness	P54
—	Link to number plate lighting harness	J60
—	Link to trailer power socket harness	J61
—	White shunt socket	J86

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3a - LH MUDGUARD HARNESS

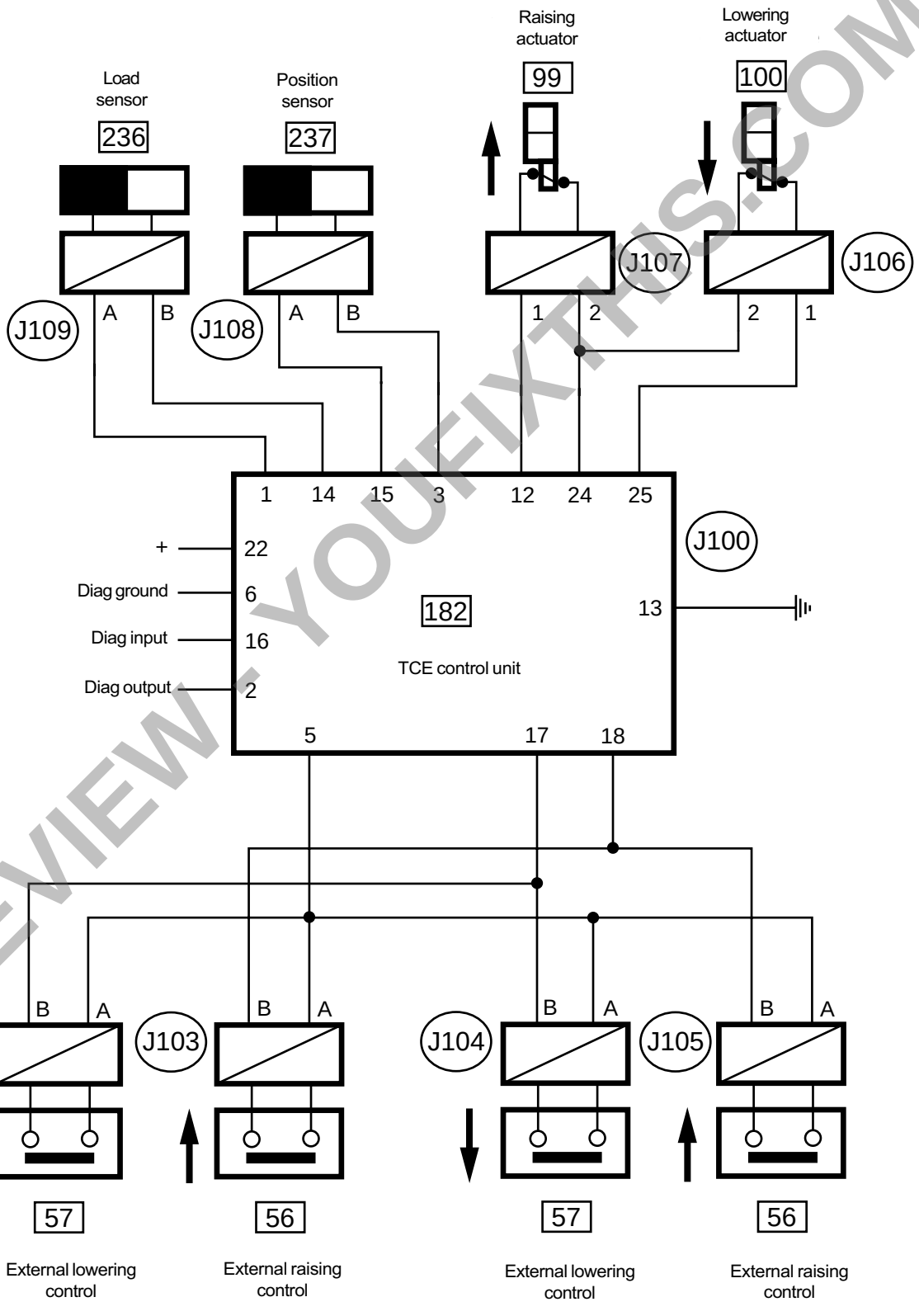


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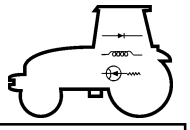
ELECTRONIC TRACTO CONTROL UNIT (cont'd.)

TCE4 LIFT UNIT



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Functions

Monitoring indicator lights

The driver is provided with indicator lights which show the status of the system, its operating mode and any faults.

	Control pressure		Oil temperature	
Indicator status	Extinguished	Permanently lit	Extinguished	Permanently lit
Cause	Supply pressure > 14 bar	Supply pressure < 14 bar	Oil temperature < 105 °C	Oil temperature > 105 °C
Consequences	Normal Tractonic operation	Tractor free-wheeling	Normal operation	Tractor free-wheeling
Action	None	Stop and investigate the fault	None	Stop and investigate the reason for overheating

	ECU supply voltage	
Indicator status	Extinguished	Permanently lit
Cause	ECU voltage > 10.5 V	ECU voltage < 10.5 V
Consequences	Normal Tractonic operation	Audio alarm, tractor free-wheels
Action	None	Stop and investigate the fault

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