ANTONIO CARRARO

Tractor people

Rondò
serie 33

K 327
K 333

Manuale di assistenza tecnica

11-2003
Cod. 47310047/01

GENERAL INFORMATION AND SAFETY NOTES 1.1

TECHNICAL INFORMATION 1.2

FAULT FINDING 1.3

IDM-C143800201.fm

1.1

GENERAL INFORMATION AND SAFETY NOTES 1.1

Purpose of the manual

This manual has been put together by the manufacturer to provide essential practical information for technicians and mechanics authorized to carry out major servicing on the machine, including repairs and the replacement of main components.

Besides adopting good working practices to ensure that servicing and repairs are performed correctly and in the shortest time possible, users of the manual must read the directions carefully and apply them to the letter.

A little time spent on preparatory reading will help to avoid costly mistakes and prevent risks to personal health and safety.

To facilitate comprehension, the written information is accompanied by illustrations designed to bring maximum clarity to the descriptions of all the various procedures (e.g. removal and refitment, disassembly and assembly, adjustments, etc.).

The manual comes complete with assembly drawings and diagrams to provide the skilled service technician with an overall view of the assembly and functional aspects of the machine.

The following symbols are used throughout this manual to identify particularly important sections of text or data.

Danger!

This symbol identifies situations of imminent danger which, if ignored, can cause serious risks to personal health and safety.

Caution!

This symbol identifies situations in which care must be taken to avoid risks to personal health and safety and risks of damage to equipment.

Important!

This symbol identifies especially important technical information that must not be ignored.

Identification of the machine and manufacturer

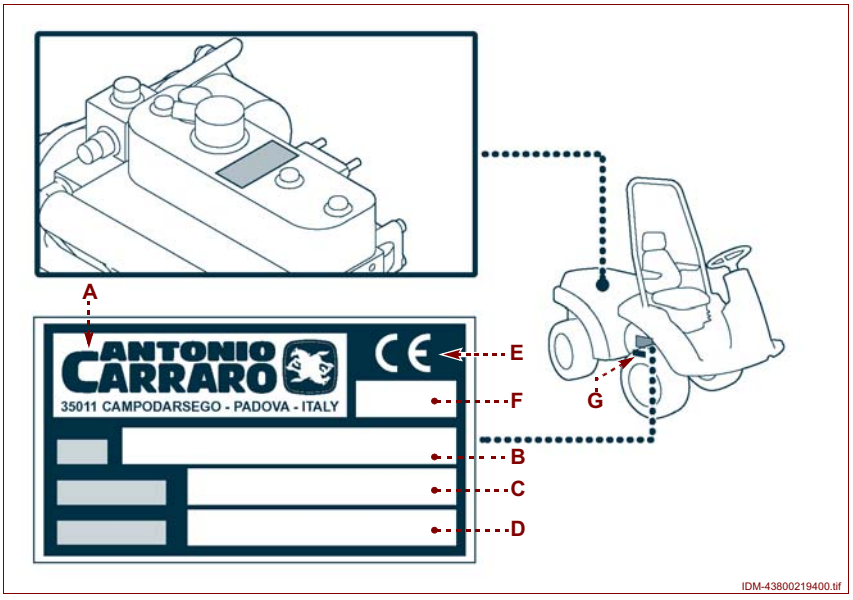
The identification plates illustrated are fixed directly to the machine.

Important!

See the electric motor's own instruction manual for motor identification data.

Manufacturer and machine identification data plate

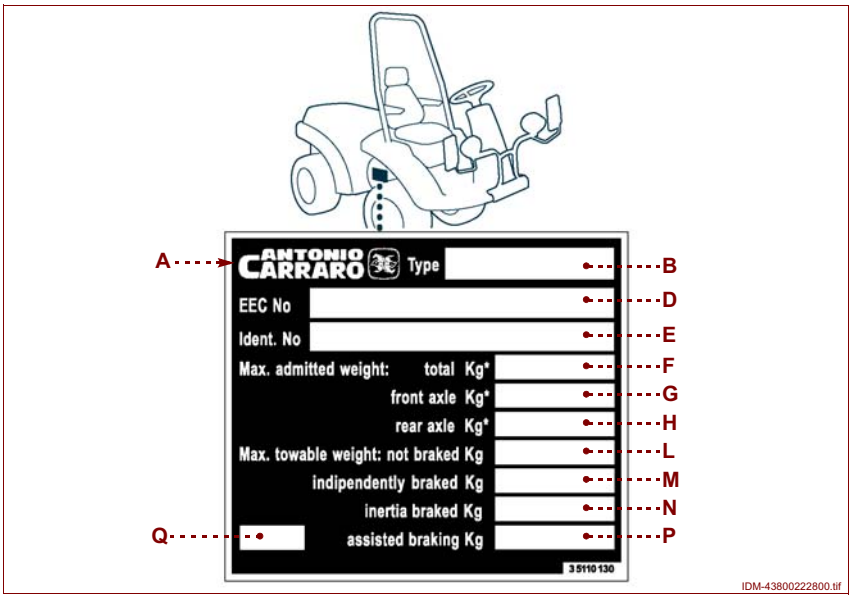
A) Name of manufacturer.
B) Model of machine.
C) Engine power.
D) Total weight (Kg).
E) CE conformity marking.
F) Year of manufacture
G) Serial number



IDM-C143800201.fm

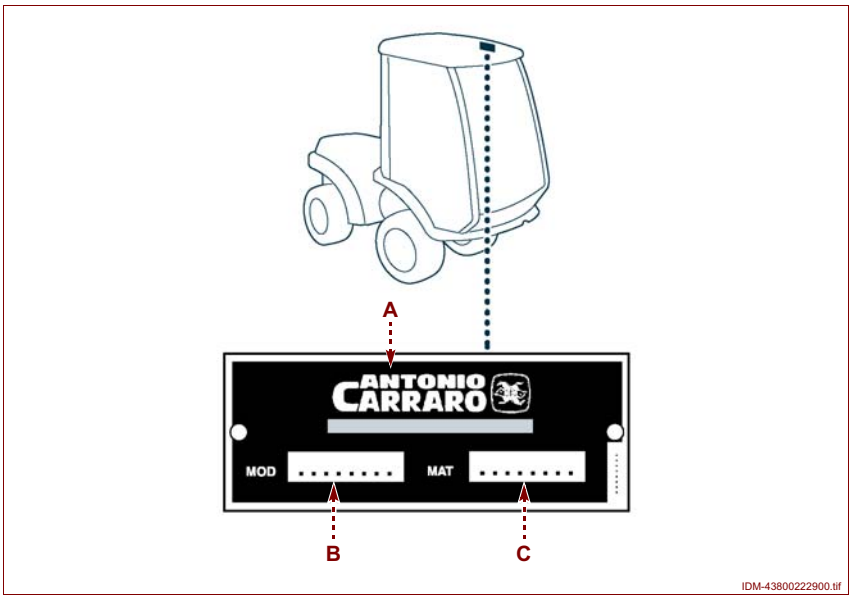
Road use approval plate

A) Name of manufacturer.
B) Model of machine.
C) Industrial type approval number
D) CEE type approval number
E) Serial number
F) Permissible weight: total
G) Permissible weight: front axle
H) Permissible weight: rear axle
L) Permissible trailer weight: no brakes
M) Permissible trailer weight: independent braking
N) Permissible trailer weight: inertia braking
P) Permissible trailer weight: power assisted braking
Q) Year of manufacture



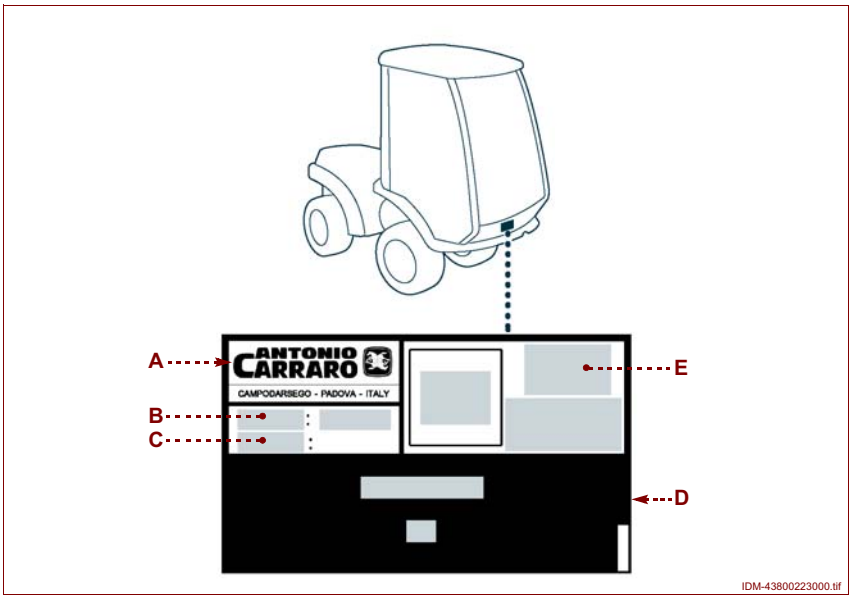
Cab identification data plate

A) Name of manufacturer.
B) Model
C) Serial number



Cab type approval data plate

A) Name of manufacturer.
B) Cab model
C) Serial number
D) Tractor model
E) CEE type approval number



1.1

General safety standards

Hazard situations are liable to arise in any workplace. In certain conditions these can cause individuals to be placed at risk, as well as leading to economic losses.
To prevent problems occurring, abide by the following instructions.

– Be certain to read the instructions given in the manual and those applied directly to the machine, being especially careful to observe safety warnings. Time taken to read directions and warnings can prevent regrettable accidents. It is always too late to remember what should have been done, once an accident has happened.
– The procedures indicated in the manual have been tested and selected by the manufacturer's own technicians, and should therefore be considered as the prescribed operating methods for this machine. Certain procedures are performed with the aid of special tools designed to simplify the tasks and reduce job times.
– Always ensure the machine is kept in good running order by carrying out repairs without delay when faults or malfunctions occur. Continuing to use the machine when less than fully efficient can worsen any damage, and this in turn will steadily jeopardize safety requirements, besides causing more serious economic losses.

Operating procedures: reminders

– Before commencing any kind of work on any assembly of the machine, clean the area thoroughly, removing all encrusted soil, dirt and accumulated grease.
– Whatever the operation, always disconnect the battery before starting.
– Do not use inflammable liquids (petrol, fuel oil, etc) to degrease or wash down components. Use suitable proprietary cleaners.
– Clean all disassembled mechanical components thoroughly, using suitable proprietary compounds. Check the integrity of single parts, inspecting for wear, seizure, cracks and/or defects that could jeopardize smooth operation.
– Check the integrity of moving parts (bearings, gears, shafts, etc.) and replace the associated oil seals whenever overhauls and/or repairs are undertaken.
– Certain components (bevel gear pair) must be replaced as complete assemblies, as indicated in the parts catalogue.
– Replace worn parts with genuine spares only.

Avoid problems by observing the following directions.

Shaft seals

– Clean the shaft thoroughly and make certain it is not damaged, scored or ovalized at the areas in contact with the seals.
– Lubricate the lips of the seals, and make certain they are positioned facing in the right direction. Seals should always be refitted using the appropriate special tool. Avoid striking any seal directly with a hammer.
– Take care not to damage the seals when reassembling the shaft.

O-rings

– Lubricate the O-ring and locate it in its groove. Make certain that the O-ring does not roll when the shaft is reassembled.

Bearings

– Always remove bearings with the proper pulling tool. Inspect bearings carefully, then clean and lubricate before refitting. Avoid striking any bearing directly with a hammer.

Cleaning

– Components such as gears, bearings etc. must be washed down thoroughly, though not with inflammable liquids. Similarly, do not use steam or hot water, as surface moisture is difficult to remove. After cleaning, dry the parts by blasting with air or wiping with non-abrasive cloth to avoid scoring the surface. Smear all surfaces with a thin film of lubricant to prevent rust.

Tightening threaded fasteners

– When assembling or reassembling structural components secured with nuts and bolts, observe the tightening torques indicated in the relative tables.

TECHNICAL INFORMATION 1.2

Description of assemblies

To ensure the user can find and consult the various topics without difficulty, the information in the manual is split up and presented under sections corresponding to the various structural and functional assemblies of the machine. These are listed below together with a short description.

Driving position (section 2)
Describes and illustrates disassembly and assembly operations for the driving position (platform, seat, column, steering, brakes, etc.).

Frame articulation (section 3)
Describes and illustrates disassembly and assembly operations for the central steering joint.

Hydrostatic drive (section 4)
Describes and illustrates removal and refitment operations for the front hydrostatic transmission and the rear axle, and disassembly and assembly of components.

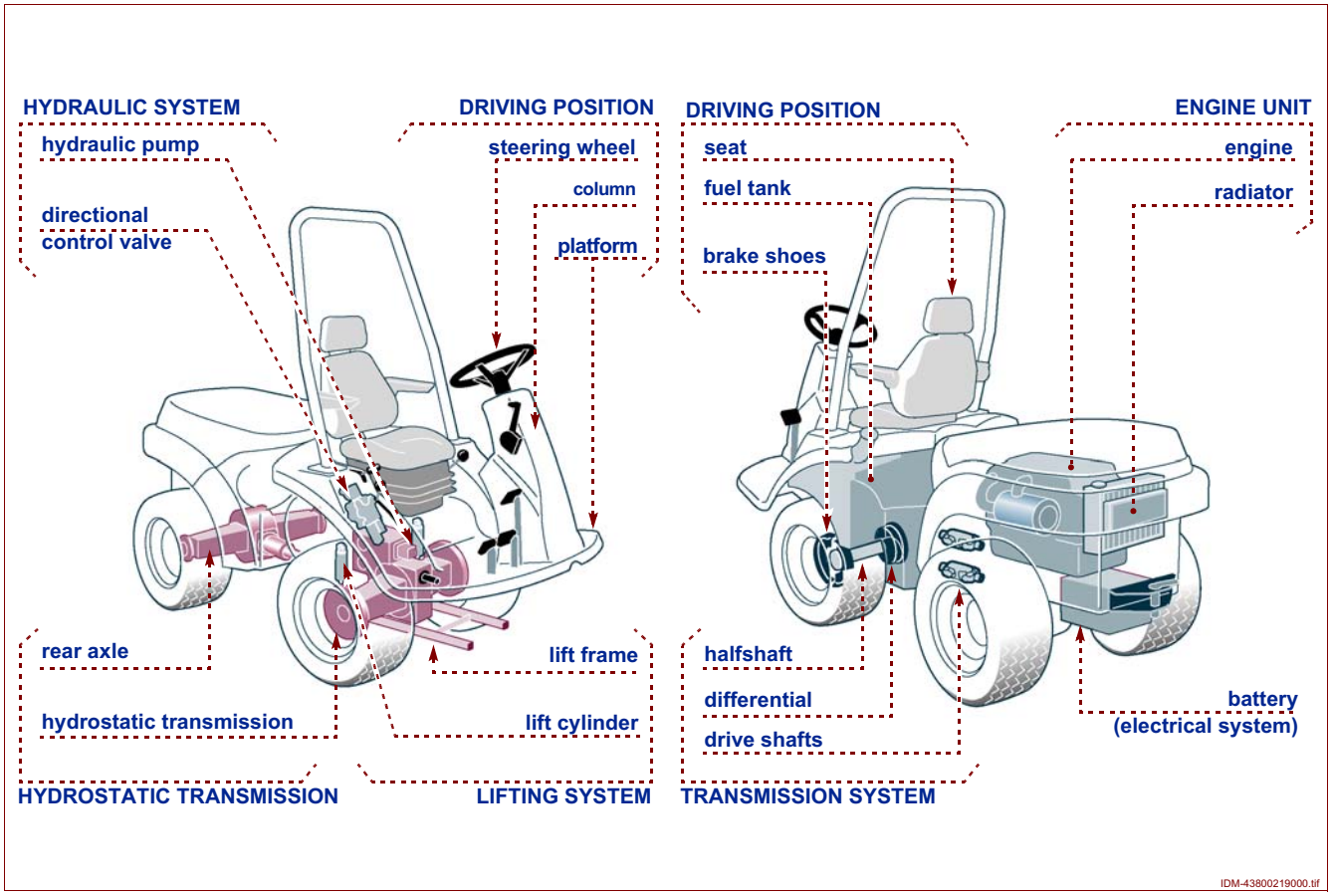
Hydraulic lift (section 5)
Describes and illustrates disassembly and assembly operations for the lift frame and cylinders.

Driveline (section 6)
Describes and illustrates disassembly and assembly operations for the driveline components (halfshafts, differentials, drive shafts).

Engine (section 7)
Describes and illustrates disassembly and assembly operations for the radiator and engine.

Cab (section 8)
Provides information on controls, includes functional diagrams of the cab, and describes the operations of removing and refitting the cab, also disassembly and assembly of the relative components.

Systems (section 9)
Provides information on the vehicle's hydraulic and electrical systems.
Hydraulic system: removal and refitment of pump and directional control valve; pressure testing procedures.
Electrical system: technical data relating to main components (battery, starter motor, alternator, fuses); wiring diagram.

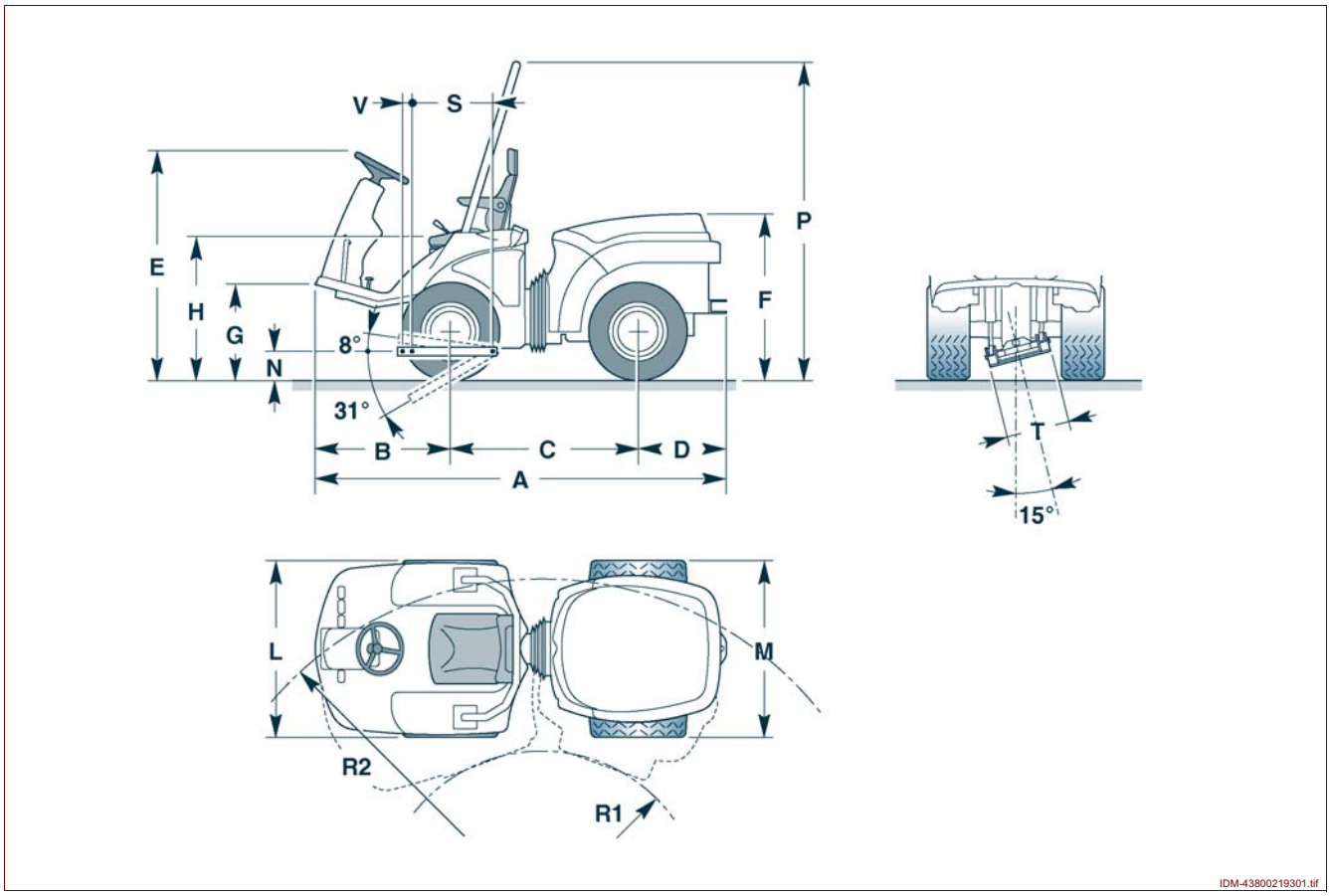


IDM-C143800201.fm

Technical specifications

1.2

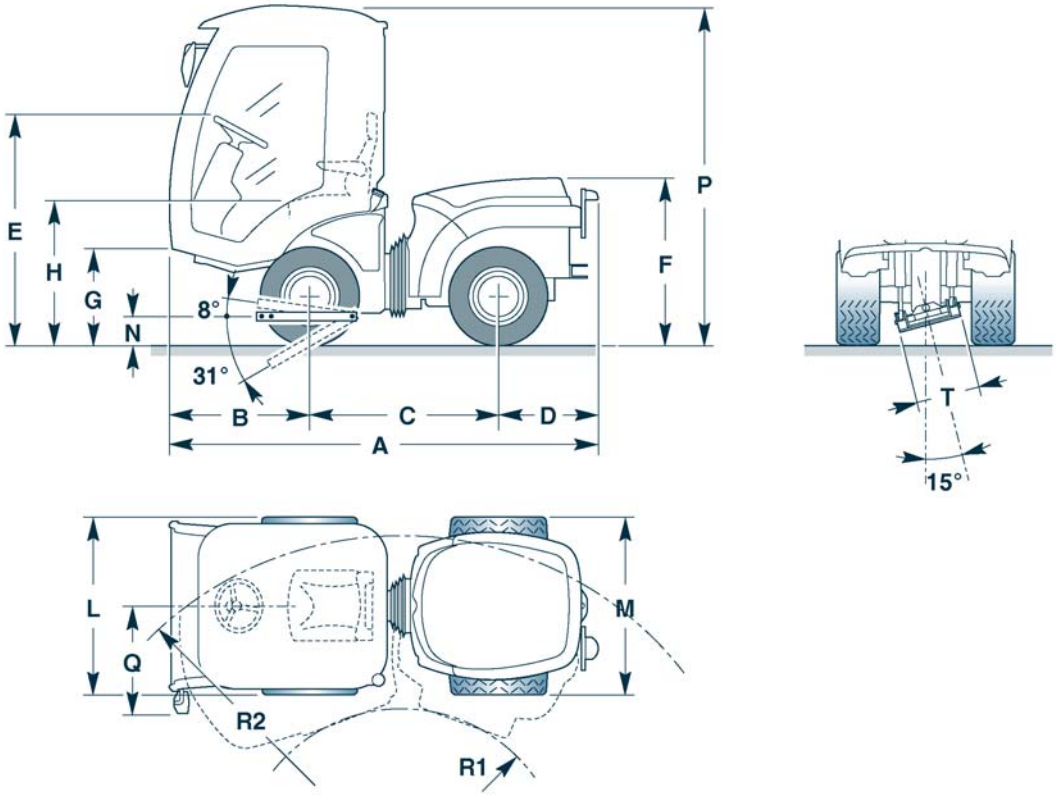
Standard version



Description	*Tyres 23x10.50-12 (TRELLEBORG)*	*Tyres 23x10.50-12 (DURO)*
Dimensions (mm)		
A	2410	2410
B	795	795
C	1100	1100
D	515	515
E	1340	1350
F	975	985
G	563	573
H	850	860
L	1050-1290	1050-1290
M	1040-1280	1040-1280
N	170	180
P	1875	1885
S	488	488
T	310	310
V	50	50

IDM-C143800201.fm

Version with cab



IDM-43800223100.tif

Description	*Tyres 23x10.50-12*	*Tyres 23x10.50-12*
Dimensions (mm)		
A	2500	2500
B	815	815
C	1100	1100
D	585	585
E	1340	1350
F	975	985
G	563	573
H	850	860
L	1050-1290	1050-1290
M	1040-1280	1040-1280
N	170	180
P	1985	1995
Q	650	650
S	488	488
T	310	310
V	50	50

IDM-C143800201.fm

Description	*K327*		*K333*	
Weight	with roll bar	with cab	with roll bar	with cab
Total (Kg)	780	910	800	930
Front axle (Kg)	485	640	485	640
Rear axle (Kg)	295	270	315	290
Permissible weight				
Total (Kg)	1750		1750	
Front axle (Kg)	1000		1000	
Rear axle (Kg)	1000		1000	
Engine				
Type	YANMAR 3TNE 74C-ECR		YANMAR 3TNE 82AC-ECR	
No. cylinders	3		3	
Displacement (cc)	1006		1331	
Power (kW)	717		22	
Max. engine speed (rpm)	3000		3000	
Max torque (Nm)	62		83	
Fuel tank capacity (l)	48		48	
Coolant	Water		Water	
Transmission				
Type	Hydrostatic (four wheel drive with front diff lock)			
Hydraulic gear pump (cm^3/rev)	displacement 7,9			
PTO				
Type	Independent hydraulic control			
Splined shaft	DIN 5482-25x22			
Speed (engine at 2525 rpm) (rpm)	1000			
Maximum torque (Nm)	200			
Direction of rotation	Clockwise			
Front implement lift				
Maximum lifting capacity (with frame horizontal and centre of mass at 1 m from fulcrum) (N)	6100			
Maximum lift angle from horizontal	8°			
Maximum lowering angle from horizontal	31°			
Maximum swing relative to longitudinal axis	15°			
Steering				
Type	Hydrostatic, central joint steering wheel (50°)			
Inside steering radius (mm) R1	665* ÷ 735			
Outside steering radius (mm) R2	1775 ÷ 1845*			
Hydrostatic steering unit	OSPM50 PB (120 bar)			

* *With wheel spacers*

Tyres		
Type	23x10.50-12 (TRELLEBORG) 23x10.50-12 (DURO)	
Width (mm)	245	
Inflation pressure (under normal conditions)	0,1 - 0,12 Mpa (1 - 1,2 bar)	
Inflation pressure (full load)	0,18 - 0,2 Mpa (1,8 - 2 bar)	
Braking system		
Operating brake	mechanical, pedal operated, acting on front wheels only	
Parking brake	mechanical, pedal operated, acting on front wheels only	
Emergency brake	hydrostatic braking action of vehicle	
Electrical system		
Voltage (Volt)	12V	
Alternator (Volt-Ampere)	12V - 40A	
Battery (Volt-Ampere/hour)	12V - 55Ah	
Main fuse (Ampere)	40 A	
Speeds	Tyres 23x10.50-12 (TRELLEBORG)	Tyres 23x10.50-12 (DURO)
Low forward (km/h)	0÷12,68	0÷13,06
Low reverse (km/h)	0÷6,34	0÷6,53
High forward (km/h)	0÷20,29	0÷20,89
High reverse (km/h)	0÷10,14	0÷10,44

Lubricant table

Lubricant type	*Part requiring lubrication*	*Quantity (litres)*
ESSO Unifarm 15W/40	Engine (Rondò K327)	3.5
	Engine (Rondò K333)	2.5
	Integrated hydrostatic transmission	10.5(2)
	Rear axle	1,7
ESSO Unifarm 10W/30(1) ESSO Torque fluid 56(1)	Integrated hydrostatic transmission	10.5(2)
ESSO GP Grease	Grease nipples	-
ESSO Beacon 2	Accelerator cable	-
FIAT ZETA 2	Splines, couplings and halfshafts	-
API PGX 2	Integrated hydrostatic transmission components	-
TECNOLUBE POLIMER 400	Bushes	-
GISTEDA-FLÙ	Coolant circuit (antifreeze)	-

(1) Temperatures below -5 °C.
(2) Complete replacement of oil in hydraulic system

IDM-C143800201.fm

1.2

Coolant composition table

Percentage of antifreeze	*Operating temperature*
18%	down to -8 °C
28%	down to -13 °C
36%	down to -20 °C
40%	down to -24 °C
50%	down to -38 °C

Sealant table

Type of sealant/threadlocker	*Part*
RTV 1473 NERO ANGST-PFISTER	Joints, gaskets, gearbox top cover, front axles, rear axles, sump, pump
LOCTITE 242	Grubscrews and couplings
LOCTITE 243	Brake drum and flange bolts
LOCTITE 270 (high strength)	Studs, nuts and bolts
LOCTITE 510	Mating surfaces, non threaded plugs
LOCTITE 603	PTO brake piston dowel
Better AREXONS	Threaded plugs, thermal probe on radiator, thermal probe on engine
Macroplast - BOSTIK	Platform floor mat

Tightening torques

Indicative maximum tightening torque values Nm - kgm
Assumed at coefficient of friction = 0.14

Description	*Tightening torques*					
	Strength class 8.8		*Strength class 10.9*		*Strength class 12.9*	
Diameter x pitch (mm)	*Nm*	*Kgm*	*Nm*	*Kgm*	*Nm*	*Kgm*
M 4 x 0.7	2,2	0,22	2,75	0.28	3.3	0.33
M 5 x 0.8	5.9	0.6	7.84	0.8	9.39	1.01
M 6 x 1	10.1	1.03	14.3	1.46	17.2	1.75
M 8 x 1	25.5	2.6	36.3	3.7	43.1	4.4
M 8 x 1.25	24.3	2.48	34.2	3.49	41.1	4.19
M 10 x 1.25	50.9	5.2	71.5	7.3	85.3	8.7
M 10 x 1.5	48.7	4.97	68.6	7	82	8.37
M 12 x 1.5	87.2	8.9	122.5	12.5	147	15
M 12 x 1.75	82.9	8.46	116.6	11.9	140.1	14.3
M 14 x 1.5	140.1	14.30	196	20	235.2	24

Description Diameter x pitch (mm)	Tightening torques Strength class 8.8 Nm	Kgm	Strength class 10.9 Nm	Kgm	Strength class 12.9 Nm	Kgm
M 14 x 2	131.9	13.46	195.2	19.92	222.5	22.70
M 16 x 1.5	210.7	21.5	294	30	352.8	36
M 16 x 2	199.9	20.4	282.2	28.80	339.1	34.6
M 18 x 1.5	303.8	31	421.4	43	509.6	52

Special bolts

Description	Diameter x pitch (mm)	Tightening torques Nm	Kgm
Crown wheel/differential housing fixing bolts	M 10 x 1.25	71.5	7.3
Wheel nuts or bolts	M 14 x 1.25	137	14
Hydrostatic transmission inlet valve plug	-	88	9
Hydrostatic transmission housing bolts	M 10 x 1.5	48,7	4,97
Instrument column securing bolts	M 8 x 1.25	24.3	2.48

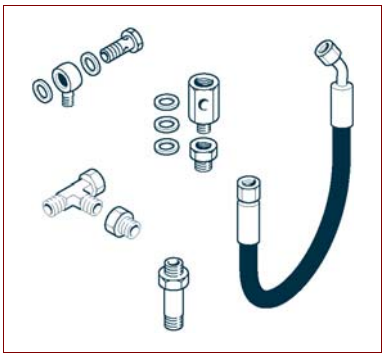
Nipples (with copper washer)

Nominal diameter	Hex wrench	Tightening torques Nm	kgm
M 14 x 1.5	17 - 19	44	4.5
M 16 x 1.5	22 - 24	59	6.0
M 18 x 1.5	24 - 27	59	6.0
M 20 x 1.5	27	59	6.0
GAS 1/4 "	17 - 19	44	4.5
GAS 3/8 "	22 - 24	59	6
GAS 1/2 "	27	59	6

List of special tools

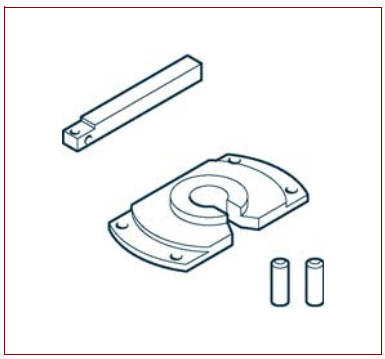
1.2

Pressure testing kit
AT 37981859

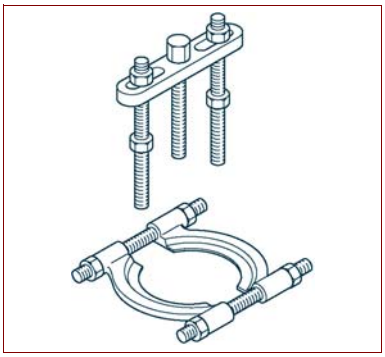


Plate, complete
AT 37981915

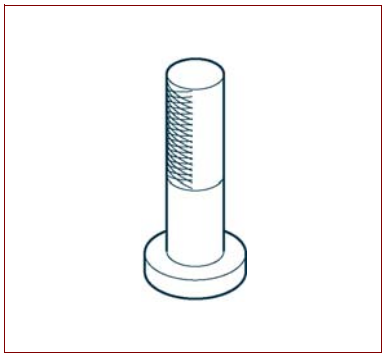
Bracket
AT 27981215



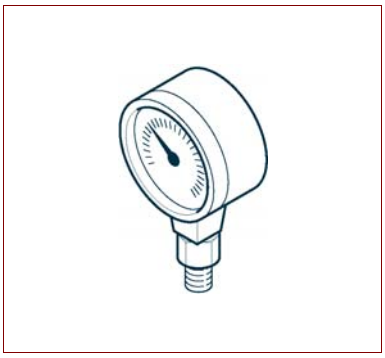
Puller
AT 37981766



Driver
AT 37981276
AT 37981860
AT 37981165

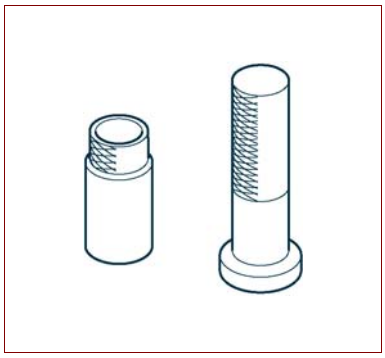


Pressure gauge
AT 37981769
(0÷25 bar)
AT 37981758
(0÷250 bar)
AT 37981330
(0÷600 bar)

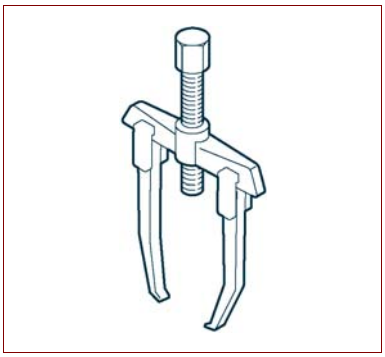


Driver
AT 37981861

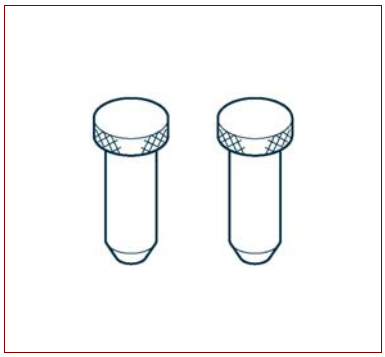
Sleeve
AT 37981862



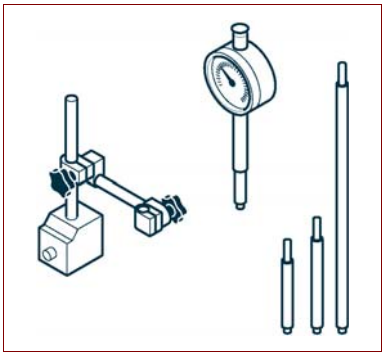
Puller
AT 37981247



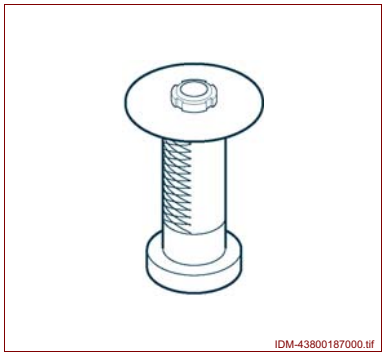
Aligners
AT 37981863



Dial gauge kit
AT 37981837

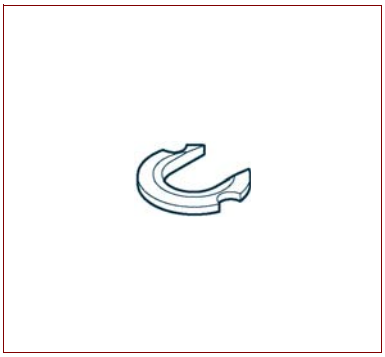


Driver
AT 37981872
AT 37981880

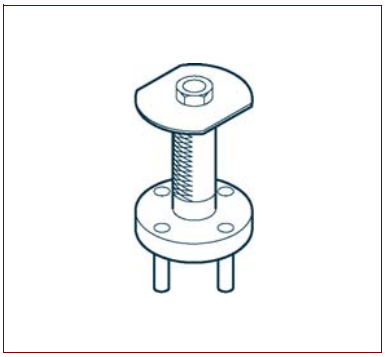


IDM-C143800201.fm

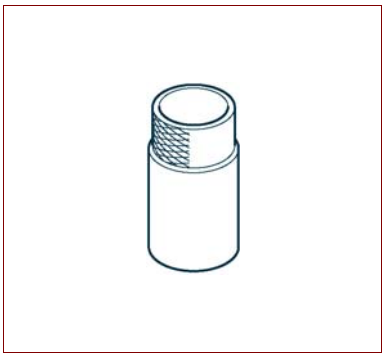
Plate
AT 37981870



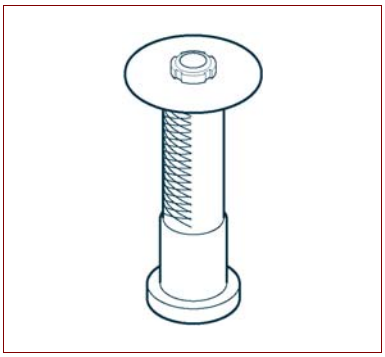
Driver
AT 37981871



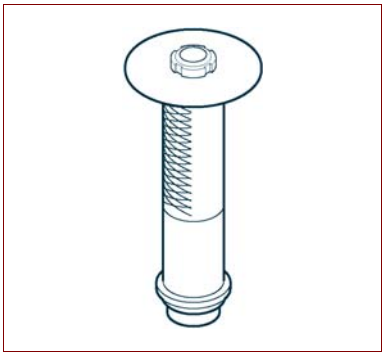
Seal replacer
AT 37981873



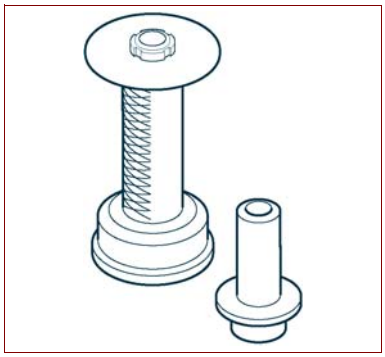
Driver
AT 37981874



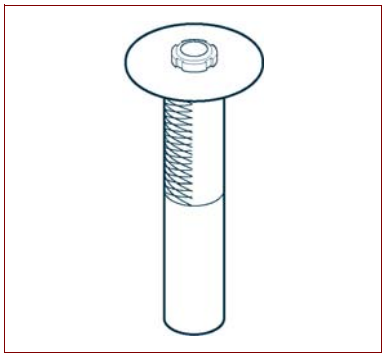
Driver
AT 37981875



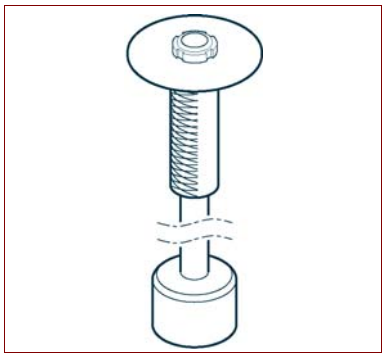
Driver
AT 37981876



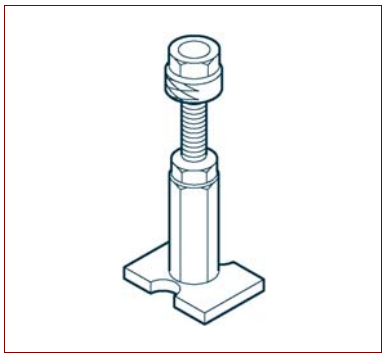
Driver
AT 37981877



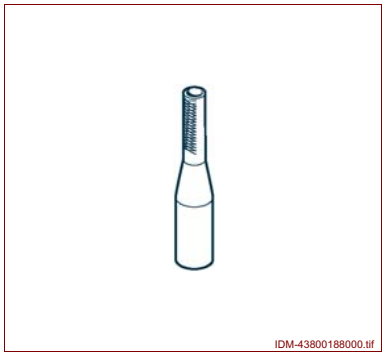
Driver
AT 37981878



Driver
AT 37981879

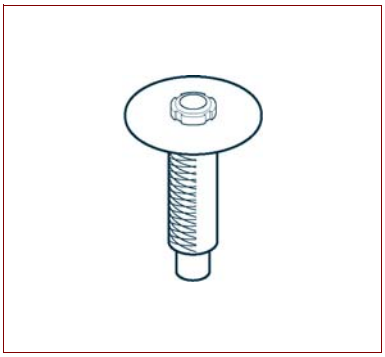


Seal replacer
AT 37981881

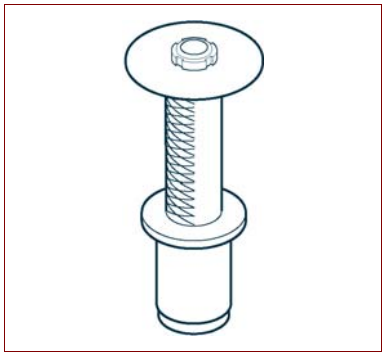


1.2

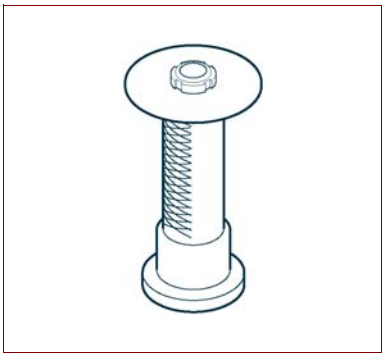
Driver
AT 37981882



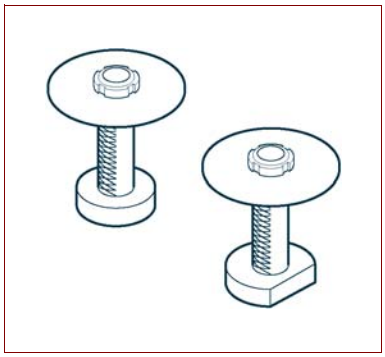
Driver
AT 37981887



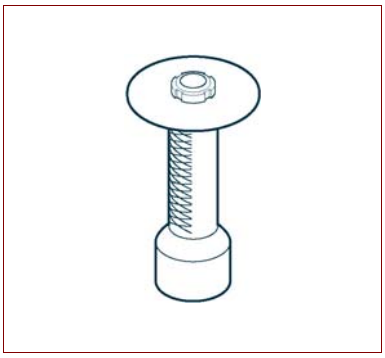
Driver
AT 37981883



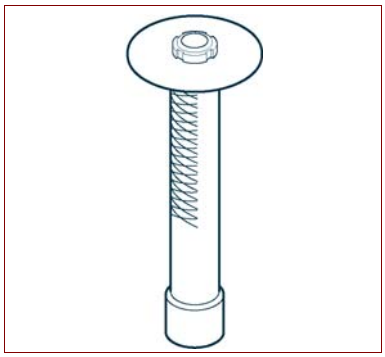
Driver
AT 37981888
AT 37981889



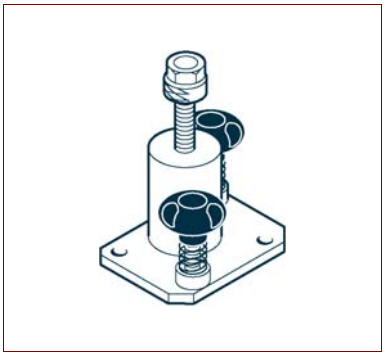
Driver
AT 37981884



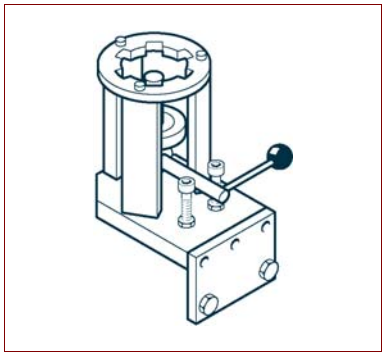
Driver
AT 37981890



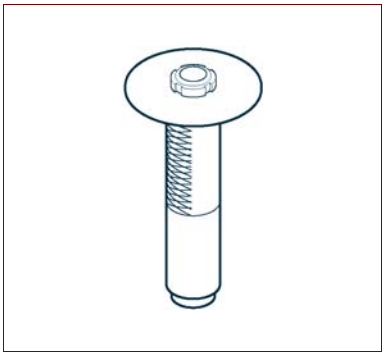
Shaft retainer
AT 37981885



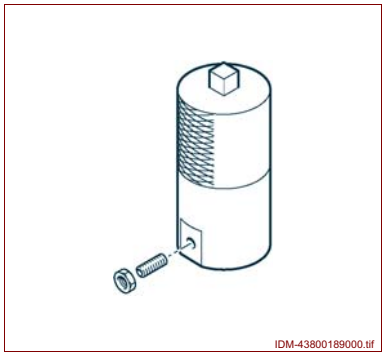
Clutch assembly press
AT 37981891



Driver
AT 37981886

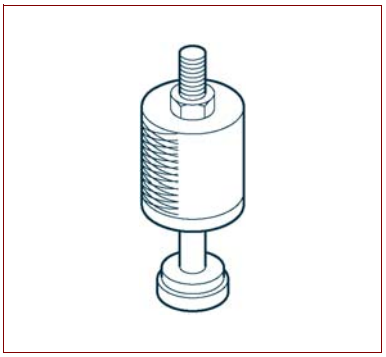


Torque wrench adapter
AT 37981892

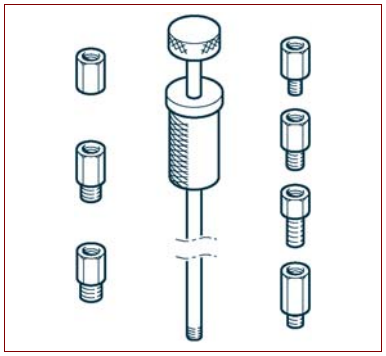


IDM-C143800201.fm

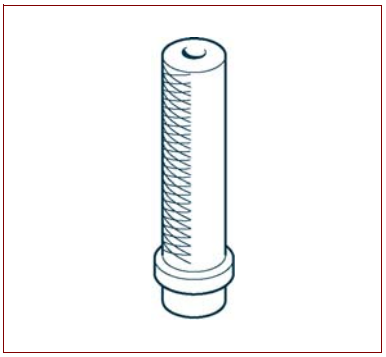
Puller
AT 37981900



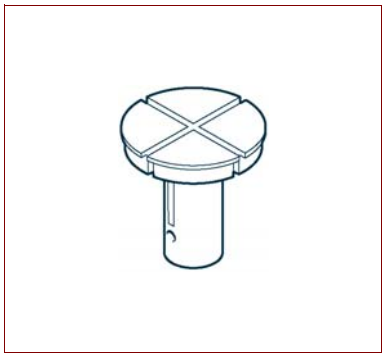
Puller
AT 27981047



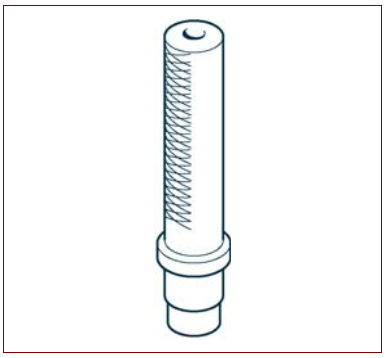
Driver
AT 37981905
AT 37981907



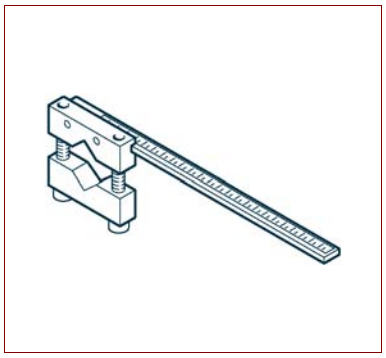
Puller
AT 37981486



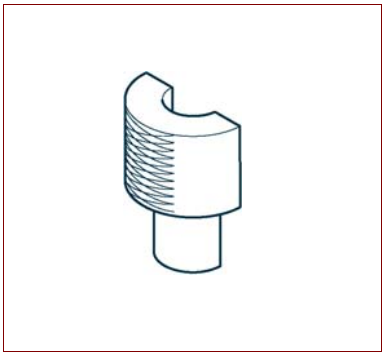
Driver
AT 37981906
AT 37981908



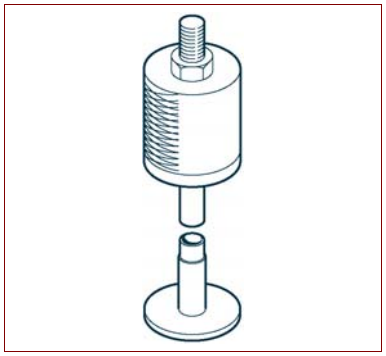
Steel rule
AT 37981912



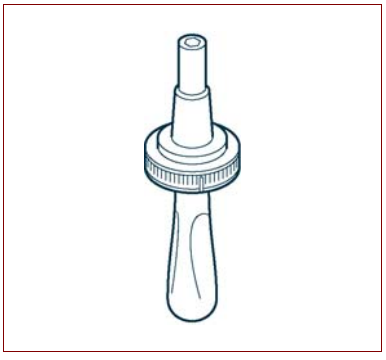
Half driver
AT 37981823



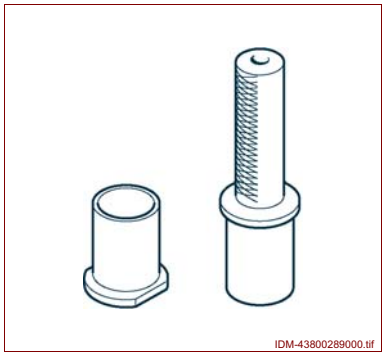
Puller
AT 37981894



Torque gauge
AT 37981196



Driver
AT 37981865
AT 37981914



FAULT FINDING 1.3

The information described below is designed to help identify and correct any faults and malfunctions that may occur during operation.

Important!

For best results when solving problems, these operations should be performed by authorised workshops, where a general check-up can also be performed on the machine.

Braking system

Problem	*Cause*	*Corrective action*
Poor braking	Brakes need adjusting	Carry out the adjustment procedure (see “Adjusting the brakes”)
	Brake shoes worn	Replace the shoes (see “Removing the brake shoes”)
	Brake drum worn	Replace the drum
Uneven braking	Brakes need adjusting	Carry out the adjustment procedure (see “Adjusting the brakes”)
Machine will not move even with the parking brake released	Brake levers or linkages stuck	Check lever and linkage action and repair if necessary
Excessive brake pedal travel	Brakes need adjusting	Carry out the adjustment procedure (see “Adjusting the brakes”)
	Brake shoe linings worn or damaged	Replace the shoes (see “Removing the brake shoes”)

Hydrostatic power steering

Problem	*Cause*	*Corrective action*
Steering wheel offering excessive resistance	Steering pump damaged	Replace the pump (see “Removing and refitting the hydraulic pump”)
	Steering system needs adjusting	Check the setting of the steering circuit relief valve, and if faulty, contact the manufacturer
Hydraulic steering circuit leaks oil	Oil lines not properly connected.	Tighten the hose connections
	Seals are worn	Replace the seals
Machine does not hold direction when steered	Air in the steering circuit	Eliminate air infiltration
	Steering cylinder seals are worn	Replace the seals (see “Replacing the cylinder seals)
	Steering cylinder relief valve or return valve jammed or faulty	Eliminate contaminants and replace the hydraulic system oil filter
Machine does not steer at all	Oil level low in power steering unit	Top up the oil level in the steering unit
	Steering pump damaged	Replace the pump (see “Removing and refitting the hydraulic pump”)

Hydrostatic transmission

Problem	*Cause*	*Corrective action*
Machine moves off even before the drive pedals are pressed	Hydrostatic pump neutral position needs adjusting	Adjust the pump linkage to set the correct neutral position
	Pedal return movement restricted	Lubricate the drive control pedals
Oil temperature in hydrostatic transmission too high	Insufficient oil in hydrostatic transmission circuit	Top up the oil level in the hydrostatic transmission circuit
	Oil cooler clogged	Clean the cooler
	Oil filter clogged	Replace the filter
Machine does not move when drive control pedals are pressed	Insufficient oil in hydrostatic transmission circuit	Top up the oil level in the hydrostatic transmission circuit
	Oil filter clogged	Replace the filter
	Pressure relief valves jammed open	Clean the relief valves
	Inlet pressure too low	Check the pressure (see “Checking the hydrostatic transmission inlet pressure”)
	Excessive wear of hydrostatic transmission components	Check the efficiency of the system and overhaul if necessary
	Hydraulic pump damaged	Replace the pump
	Hydraulic pump/drive shaft coupling failed	Replace the coupling
Movement of machine unpredictable or jerky, or affected by loss of power	Insufficient oil in hydrostatic transmission circuit	Top up the oil level in the hydrostatic transmission circuit
	Oil filter clogged	Replace the filter
	Pressure relief valves jammed open	Clean the relief valves
	Inlet pressure too low	Check the pressure (see “Checking the hydrostatic transmission inlet pressure”)
PTO clutch slipping	Directional control circuit relief valve not correctly set	Adjust the setting of the valve
	Hydrostatic transmission inlet valve jammed	Clean the valve
The ground speed does not correspond to the selected speed and the response of the forward and reverse pedals is inverted	Speed control lever associated with hydraulic motor wrongly assembled	Detach the lever and set the swash plate in the correct position

Hydraulic lift

Problem	*Cause*	*Corrective action*
Implement does not lift, or lift movement is very slow	Hydraulic pump damaged	Replace the pump (see “Removing and refitting the hydraulic pump”)
	Directional control circuit relief valve jammed open	Check the setting of the valve
		Clean the valve, and replace if necessary
		Unscrew the valve, then retighten, torquing to 20Nm
	Power steering circuit relief valve jammed open	Check the setting of the steering circuit relief valve, and if faulty, contact the manufacturer
	Insufficient oil in hydrostatic transmission circuit	Top up the oil level in the hydrostatic transmission circuit
	Oil filter clogged	Replace the filter

STEERING WHEEL AND COLUMN 2.1

SEAT AND PLATFORM 2.2

FUEL TANK 2.3

STEERING 2.4

BRAKES 2.5

IDM-C243800201.fm

STEERING WHEEL AND COLUMN 2.1

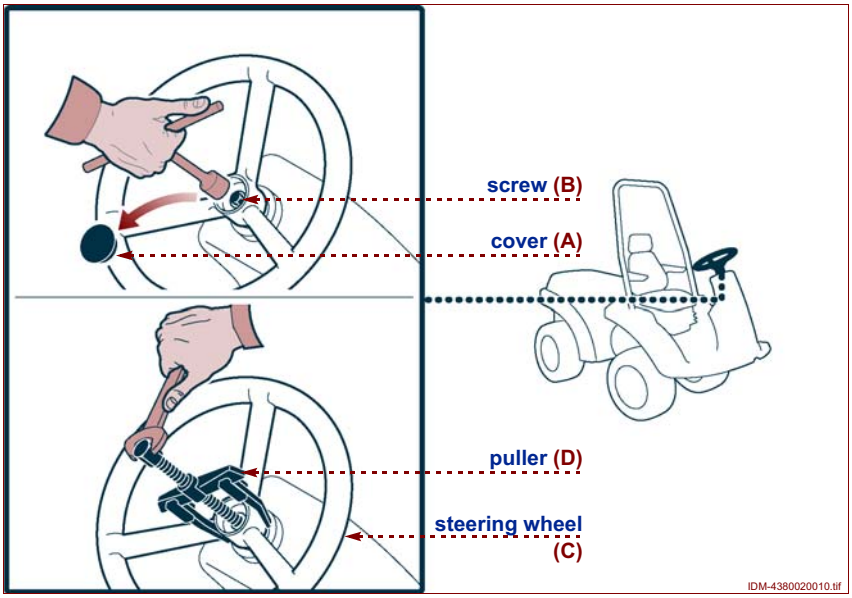
Disassembling the steering wheel and column

Proceed as follows.

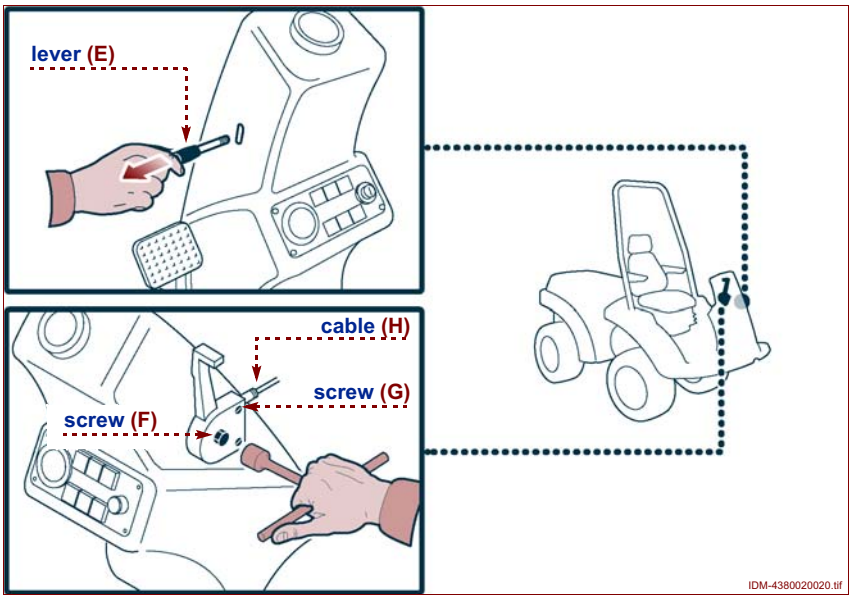
1 - Remove the cap **(A)**.
2 - Undo the bolt **(B)**.
3 - Remove the steering wheel **(C)** with the puller **(D)** (AT 37981247).

Important!

If the machine is equipped with an auxiliary console, this must be detached after removing the steering wheel.



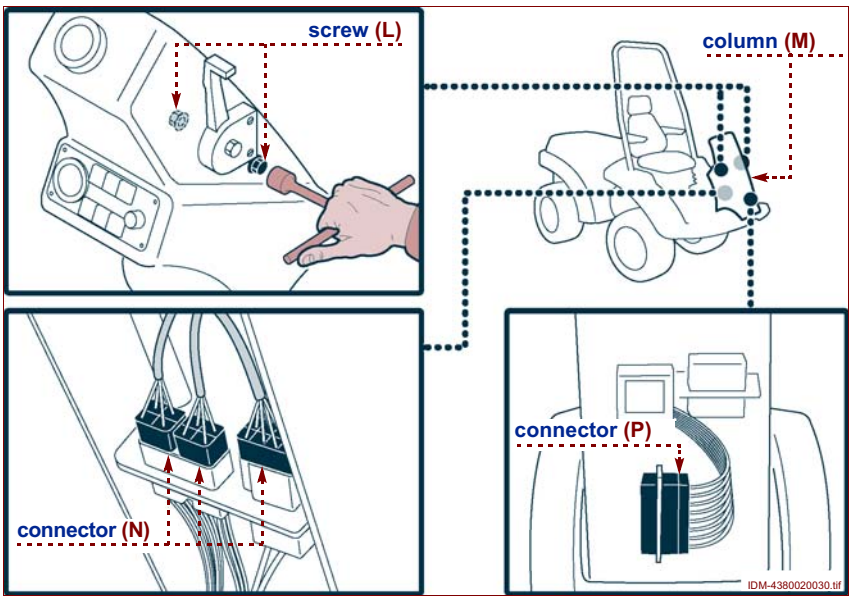
4 - Unscrew the lever **(E)**.
5 - Loosen the bolt **(F)** and the screws **(G)** and pull out the throttle cable **(H)**.



6 - Undo the bolts **(L)** and lift the column **(M)** away to expose the electrical connections.
7 - Separate the connectors **(N - P)**.
8 - Remove the column **(M)** completely.

Important!

If the machine is equipped with a rear power socket, unplug both connector (P) and the connector alongside.



Assembling the steering wheel and column

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

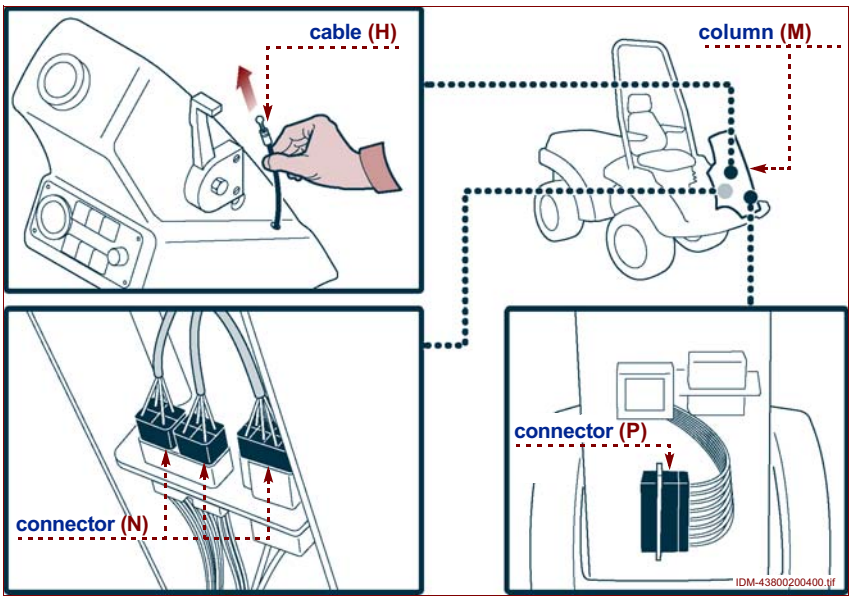
Proceed as follows.

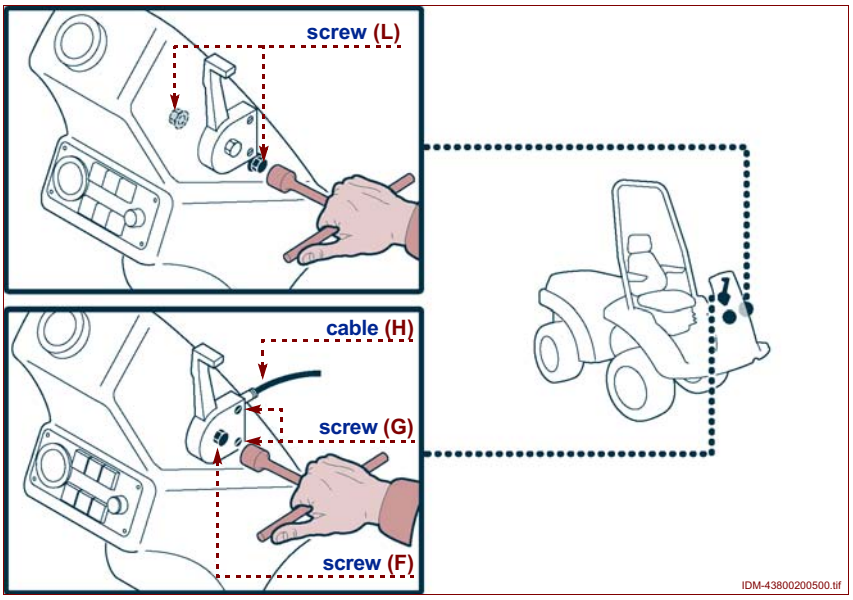
1 - Fit the column **(M)** and route the throttle cable **(H)** through the hole.
2 - Join up the connectors **(N - P)**.

Important!

If the machine is equipped with a rear power socket, reinstate both connector (P) and the connector alongside.

3 - Tighten the bolts **(L)** to secure the column.
4 - Attach the throttle cable **(H)** to the hand control and tighten the screws and bolt **(G - F)**.

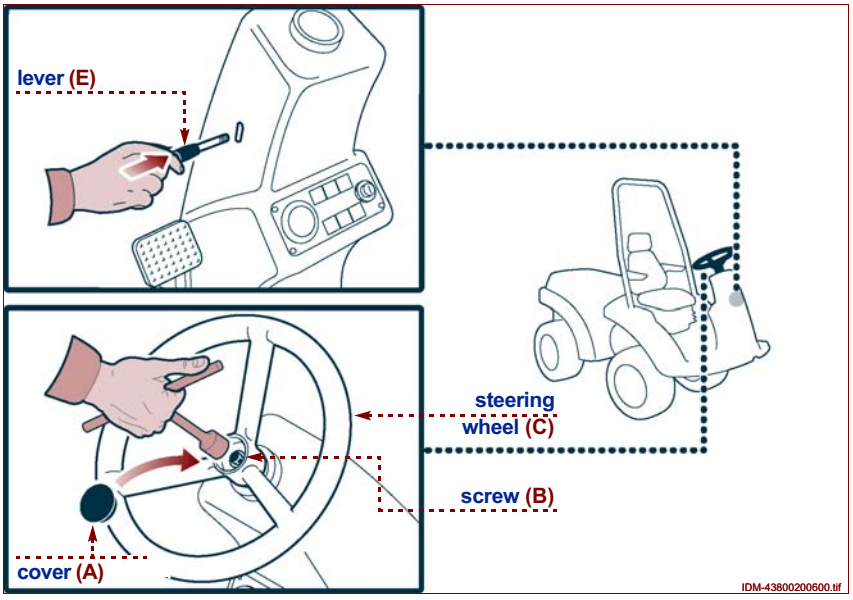




5 - Screw in the lever **(E)**.
6 - Fit the steering wheel **(C)** and clamp in place with the bolt **(B)**.
7 - Fit the cap **(A)**.

Important!

If the machine is equipped with an auxiliary console, this must be reinstated before refitting the steering wheel.



SEAT AND PLATFORM 2.2

Disassembling the seat and platform

For machines with roll bar:

1 - Remove the steering wheel and column (see “Disassembling the steering wheel and column”).

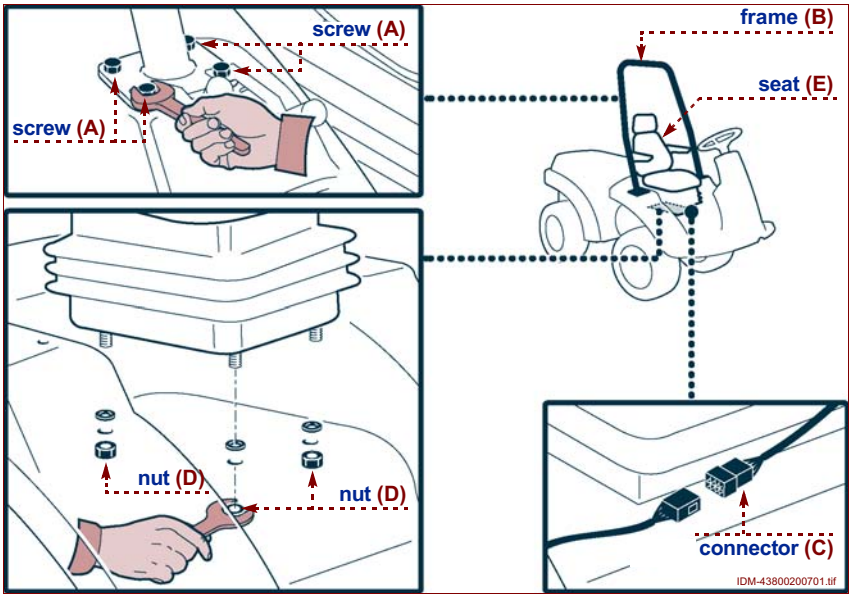
For machines with cab:

1 - Remove the cab (see “Removing the cab”)

For both versions, proceed as follows:

2 - Separate the connector **(C)**.

3 - Undo the nuts **(D)** and remove the seat **(E)**.



4 - Undo the nut **(F)**, take out the bolt **(G)** and remove the pedals **(H)**.

5 - Undo the lock nut and remove the pedal **(L)**.

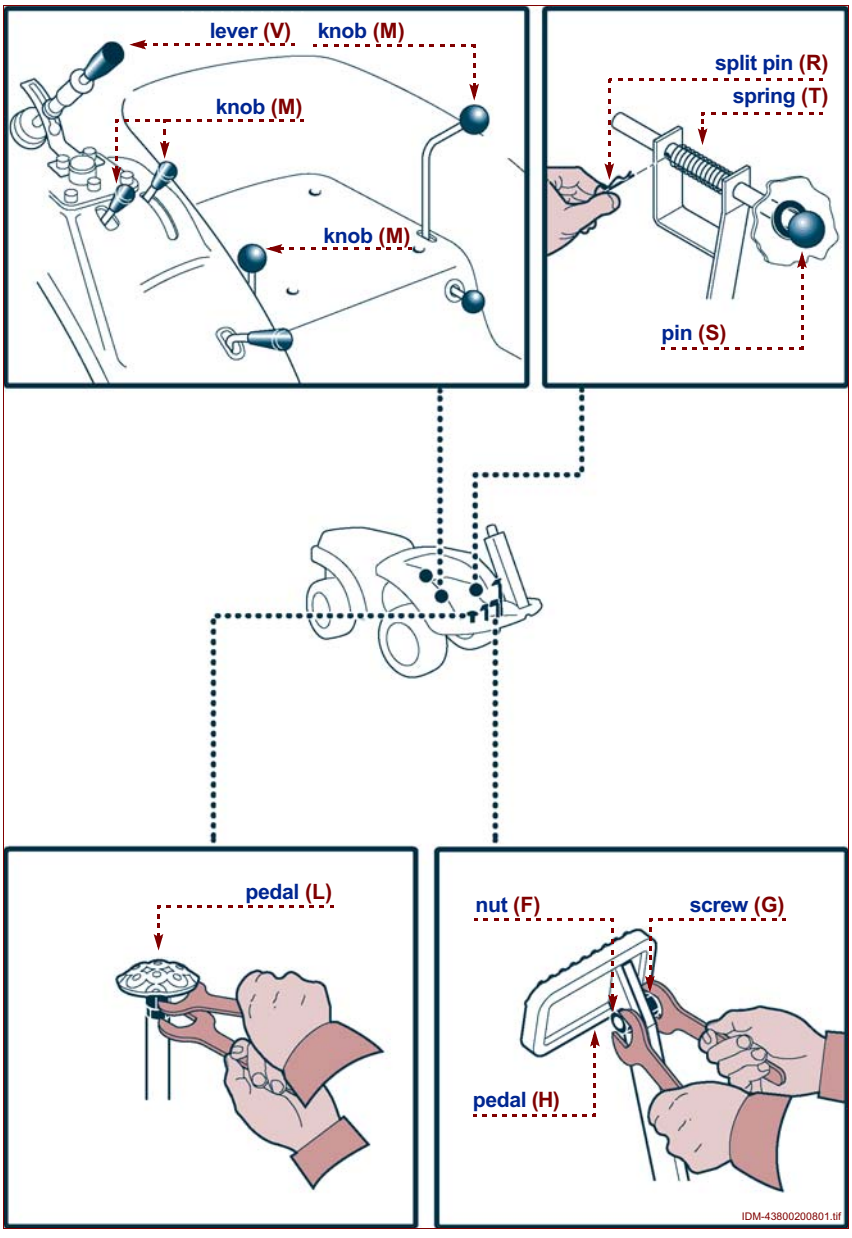
6 - Detach the knobs **(M)** from the respective levers.

7 - Remove the split pin **(R)**, pull out the bolt **(S)** and the spring **(T)**.

8 - Disassemble the lever **(V)**, if installed.

Important!

If the machine is equipped with a pipelines guard, this must be removed.



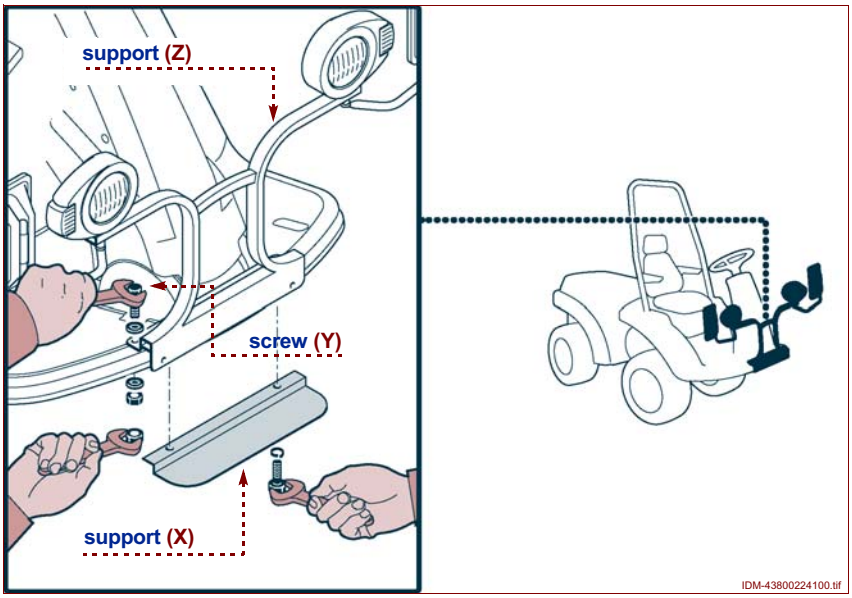
IDM-C243800201.fm

For machines with "road lights kit":

9 - Remove the plate **(X).**

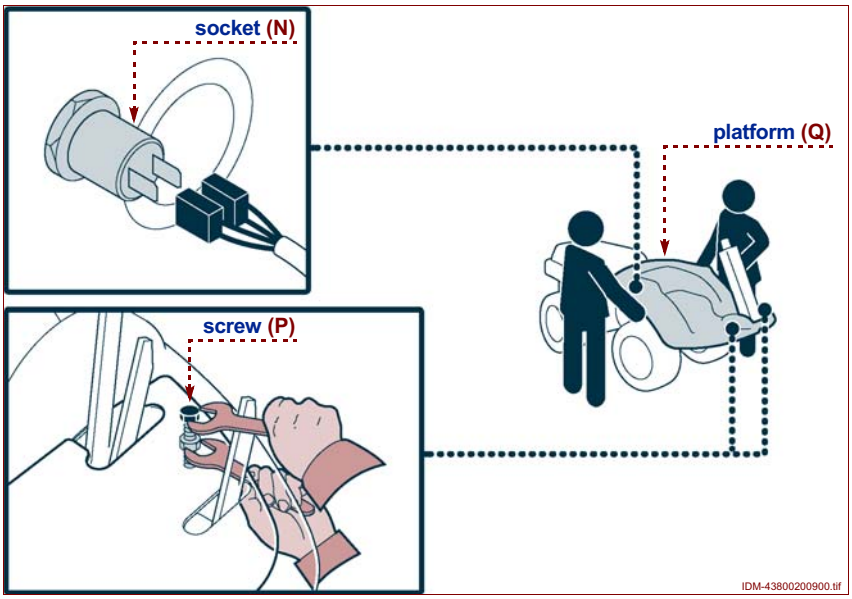
10 - Detach the headlight connectors.

11 - Undo the bolts **(Y)** and remove the bracket **(Z)**.



12 - Disconnect the socket **(N)**.

13 - Undo the bolts **(P)** and remove the platform **(Q)**.



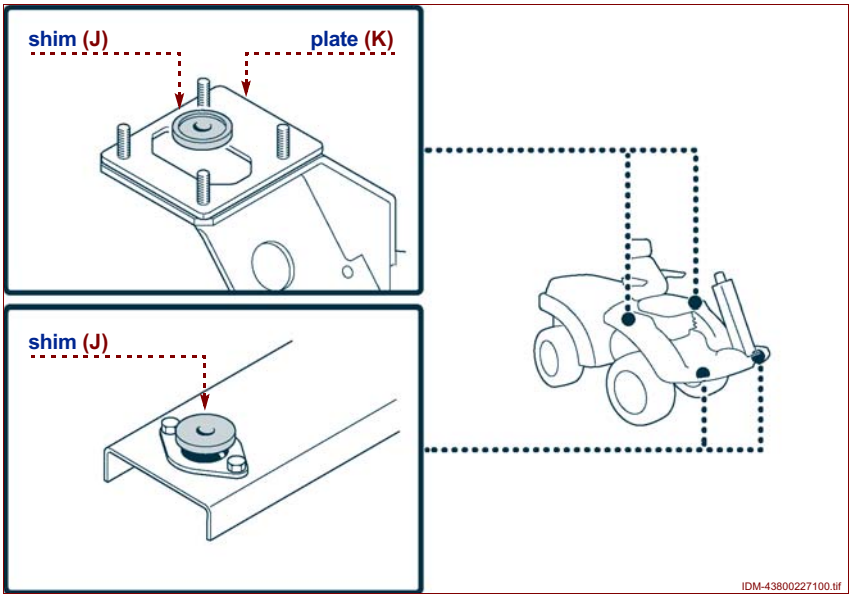
Assembling the seat and platform

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

For machines with cab:

1 - Before refitting the platform, check that the plate **(K)** is located with the wider half innermost and that the shims **(J)** are positioned as illustrated.



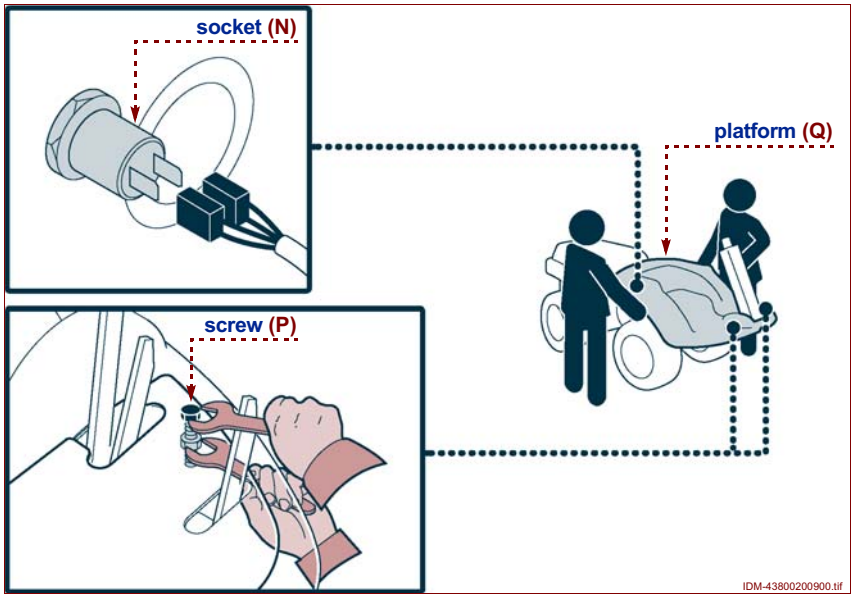
IDM-C243800201.fm

2.2

For both versions, proceed as follows:

2 - Fit the platform **(Q)** to the frame and secure with the bolts **(P)**.

3 - Connect the socket **(N)**.

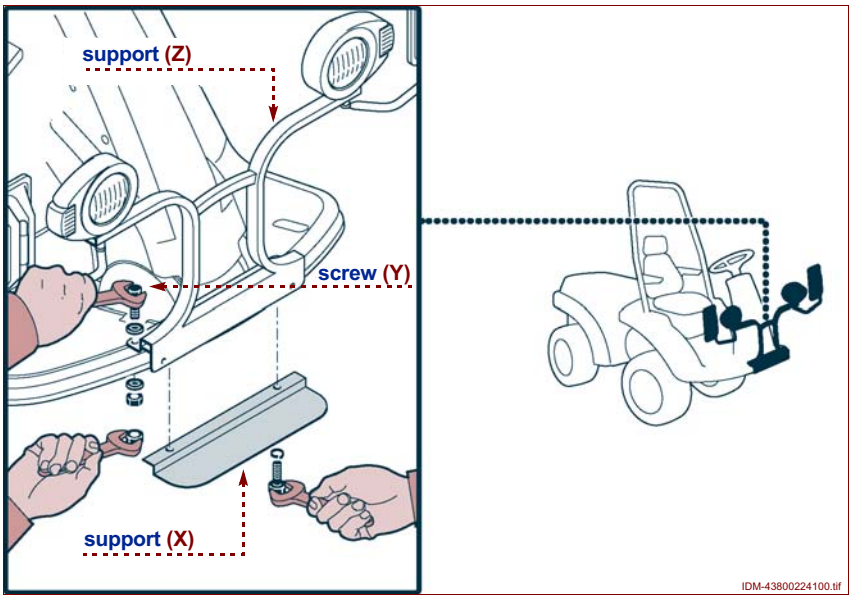


For machines with "road lights kit":

4 - Fit the bracket **(Z)** and secure with the bolts **(Y)**.

5 - Reattach the headlight connectors.

6 - Fit the plate **(X)**.



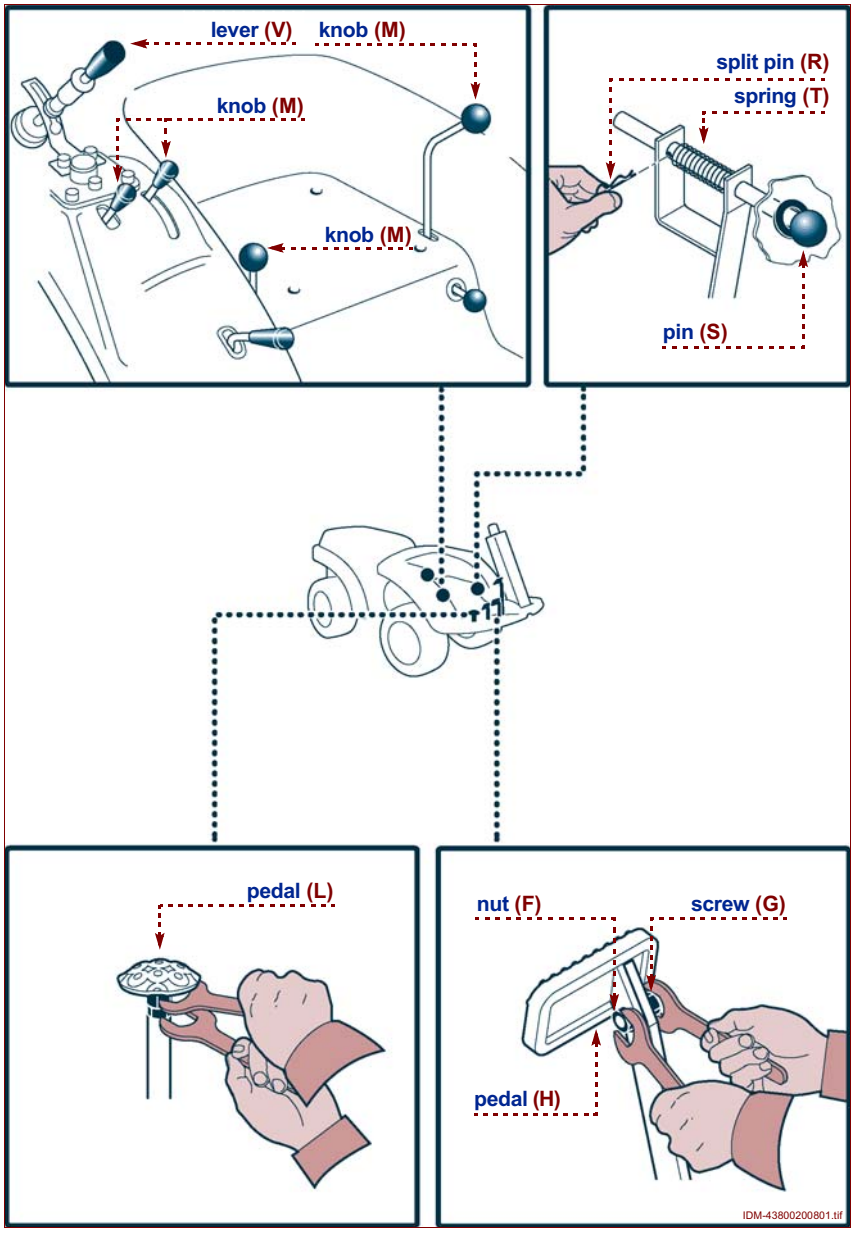
IDM-C243800201.fm

7 - Fit the knobs **(M)** to the respective levers.
8 - Montare la molla **(T)**, inserire il perno **(S)** e bloccarlo mediante la copiglia **(R)**.
9 - Rimontare la leva **(V),** se presente.

Important!

Se la trattrice è dotata di carter di protezione tubi, esso deve essere installato.

10 - Fit the pedal **(L)** and secure with the lock nut.
11 - Fit the pedals **(H)**, securing with the bolts **(G)** and nuts **(F)**.



12 - Position the seat **(E)** and secure with the nuts **(D)**.
13 - Join up the connector **(C)**.

For machines with roll bar:

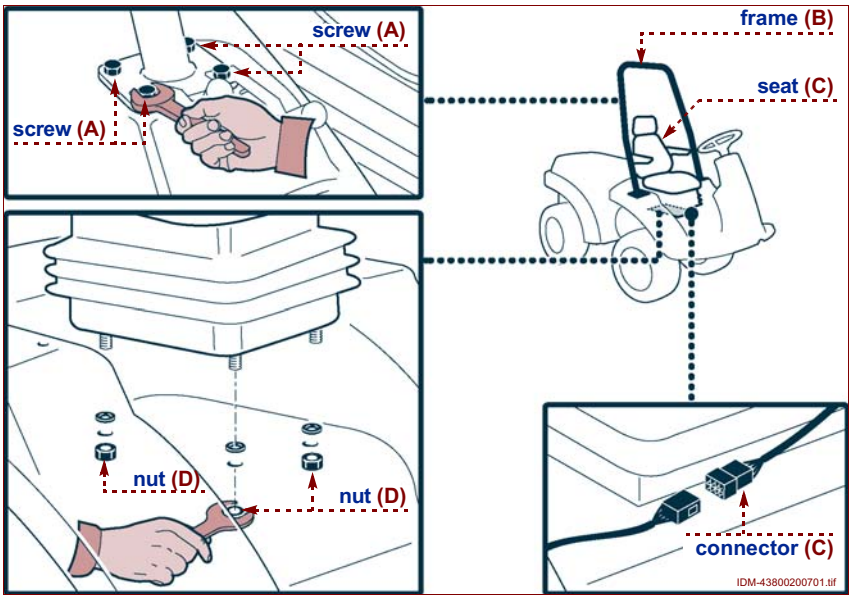
14 - Undo the bolts **(A)** and remove the roll bar **(B)**.

For machines with cab:

15 - Refit the cab (see “Refitting the cab”)

For both versions, proceed as follows:

16 - Fit the column and the steering wheel (see “Assembling the steering wheel and column”).



FUEL TANK 2.3

Removing the fuel tank

Danger!

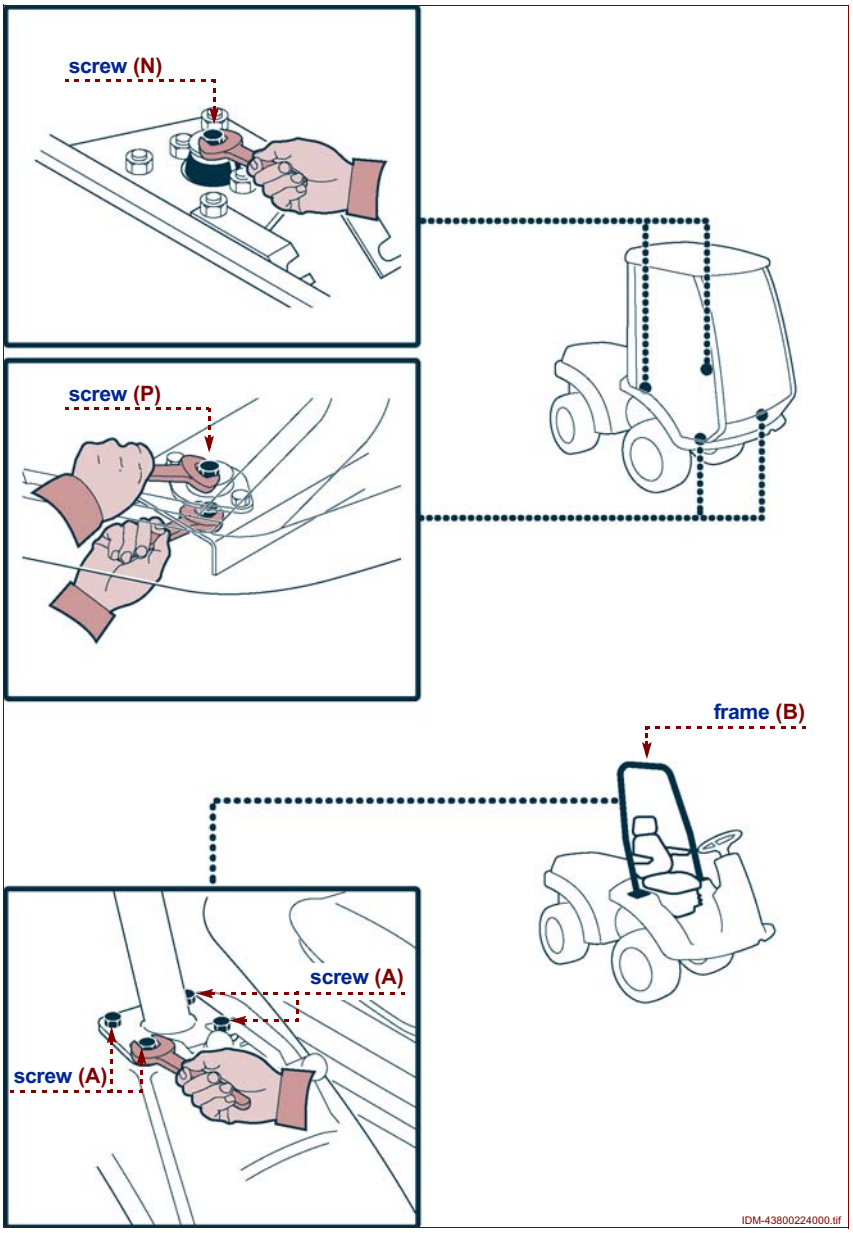
All types of fuel are highly flammable. Do not use naked flames and do not smoke when carrying out these operations.

For machines with cab:

1 - Undo the bolts **(N)** of the rear antivibration mounts completely, and loosen the bolts **(P)** of the front mounts.

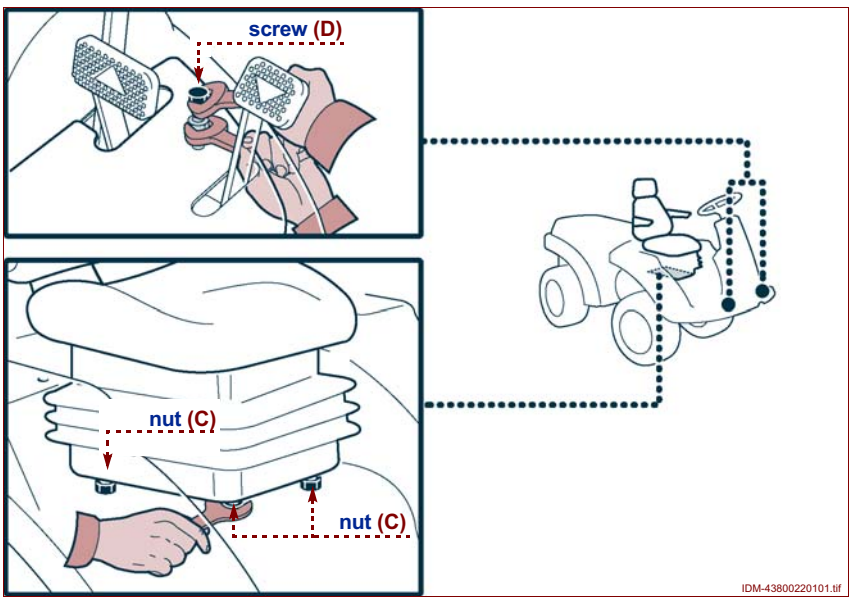
For machines with roll bar:

1 - Undo the bolts **(A)** and remove the roll bar **(B)**.



2 - Loosen the seat retaining nuts **(C)**.

3 - Loosen the bolts **(D)**.

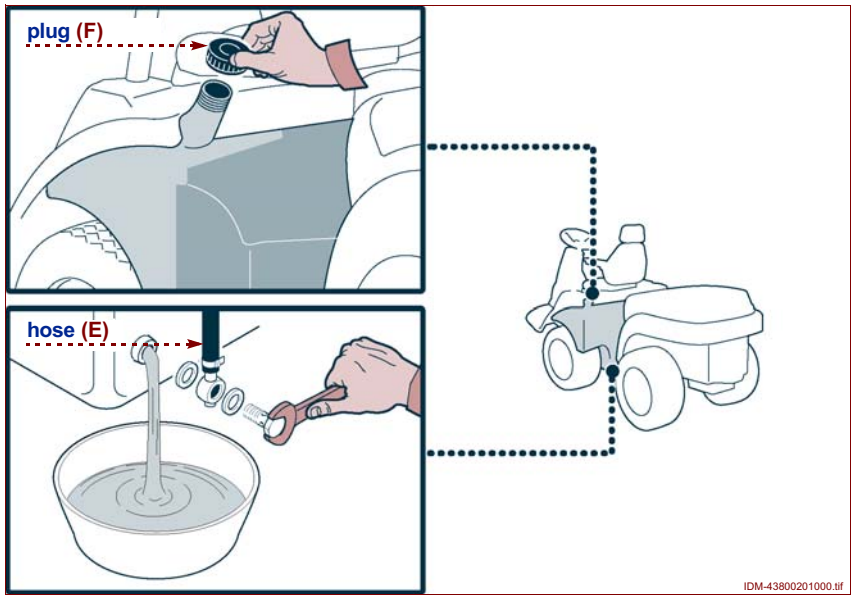


IDM-C243800201.fm

For both versions, proceed as follows:

4 - Position a vessel of suitable capacity under the fuel hose **(E)**.

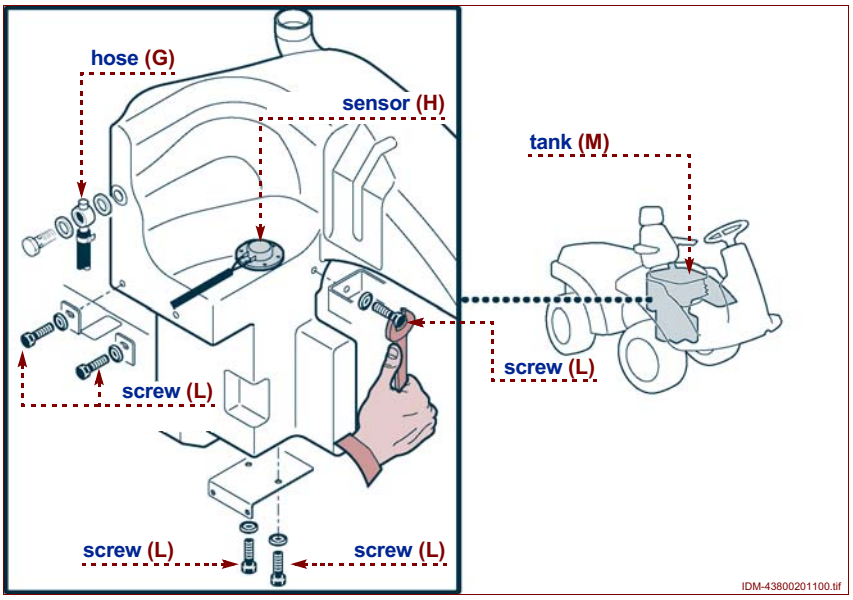
5 - Remove the filler cap **(F)**, then disconnect the hose **(E)** and drain off all the fuel.



6 - Disconnect the hose **(G)**.

7 - Separate the connectors of the fuel level sensor **(H)**.

8 - Undo the bolts **(L)** and remove the tank **(M)**.



Refitting the fuel tank

Important!

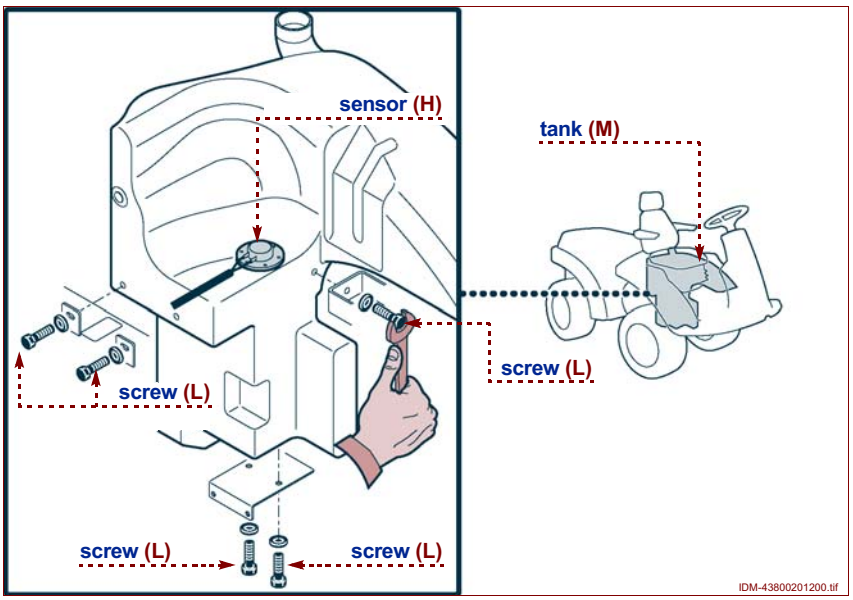
When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.

1 - Position the tank **(M)** on the mountings.

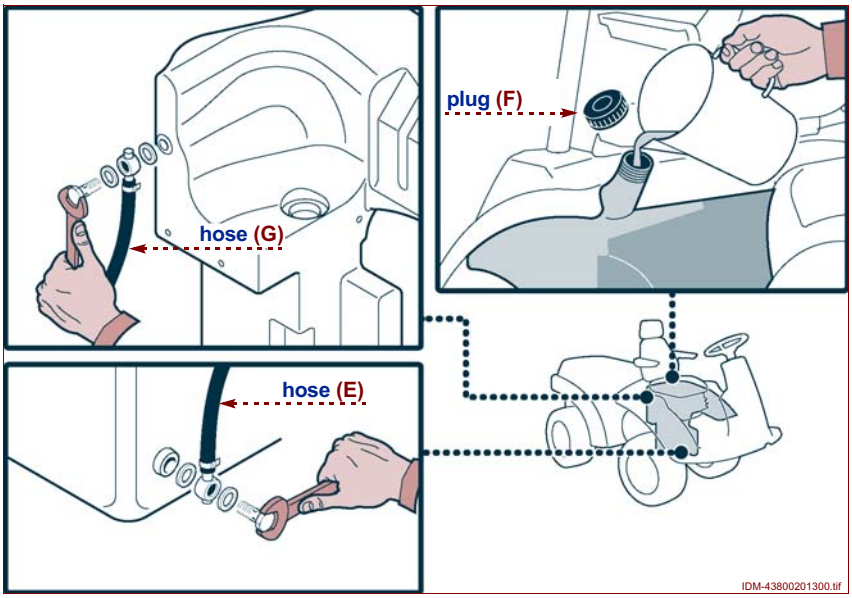
2 - Insert the tank securing bolts **(L)**.

3 - Join up the connectors of the fuel level sensor **(H)**.



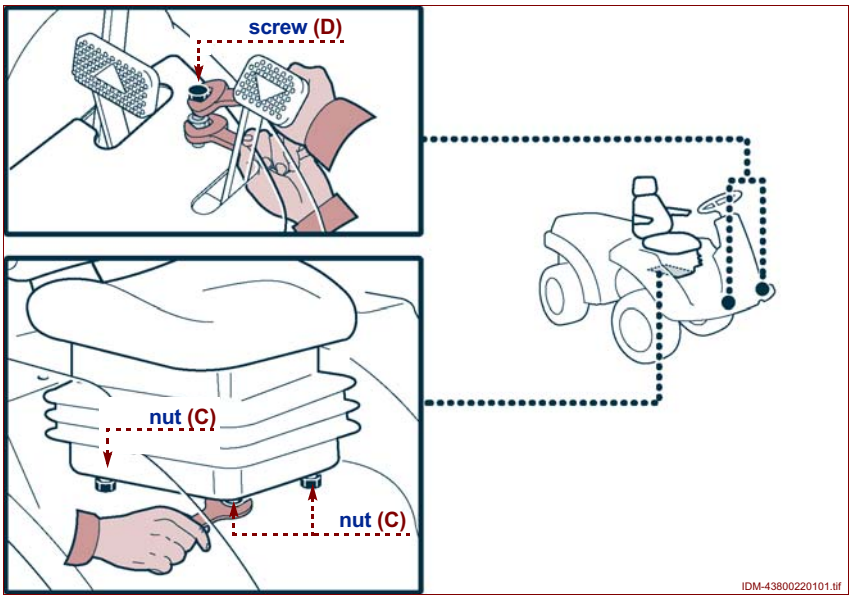
4 - Connect the hoses **(G - E)**.

5 - -Refill the tank with the fuel removed previously and fit the filler cap **(F)**.



For machines with roll bar:

6 - Tighten the nuts and bolts **(C - D)**.

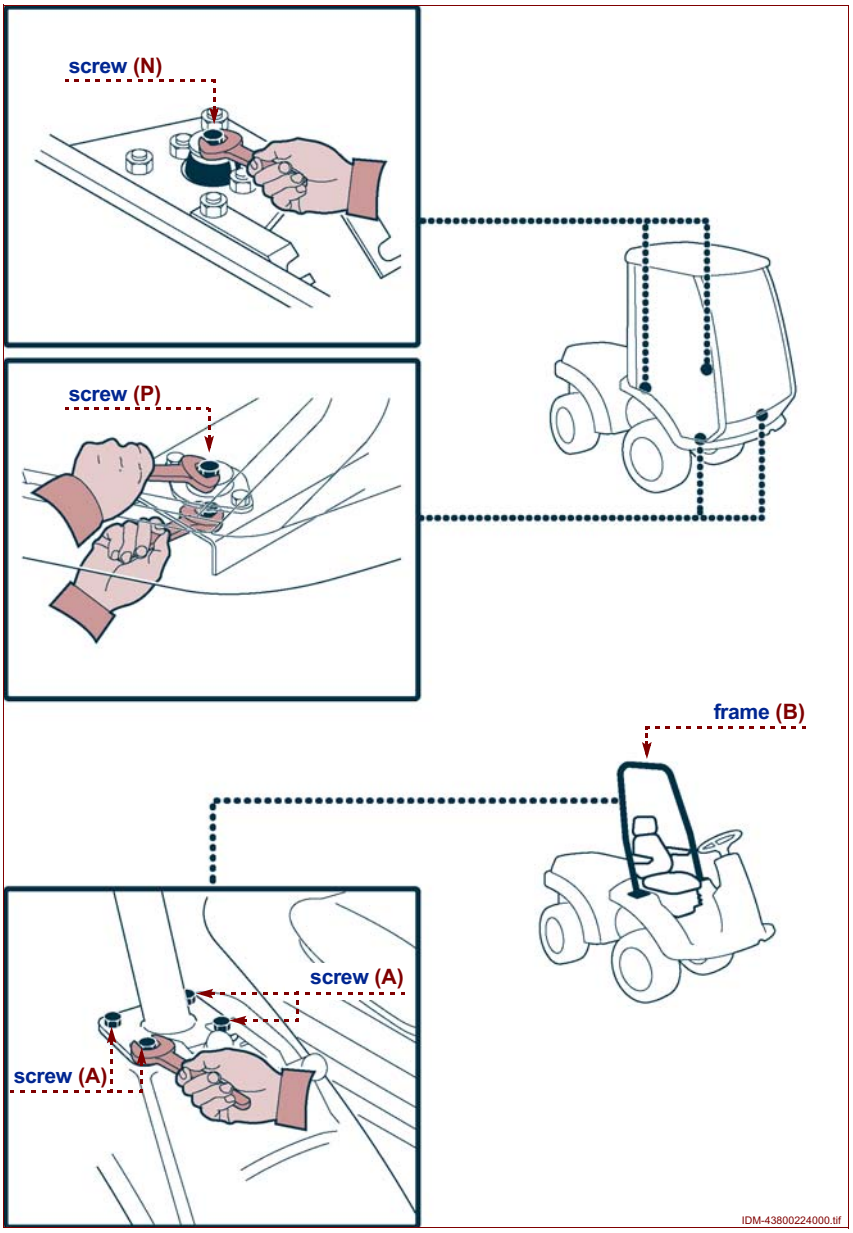


For machines with roll bar:

7 - Fit the roll bar **(B)** and anchor with the bolts **(A)**.

For machines with cab:

7 - Fit and tighten the bolts **(N)** of the rear antivibration mounts and tighten the bolts **(P)** of the front mounts.



STEERING 2.4

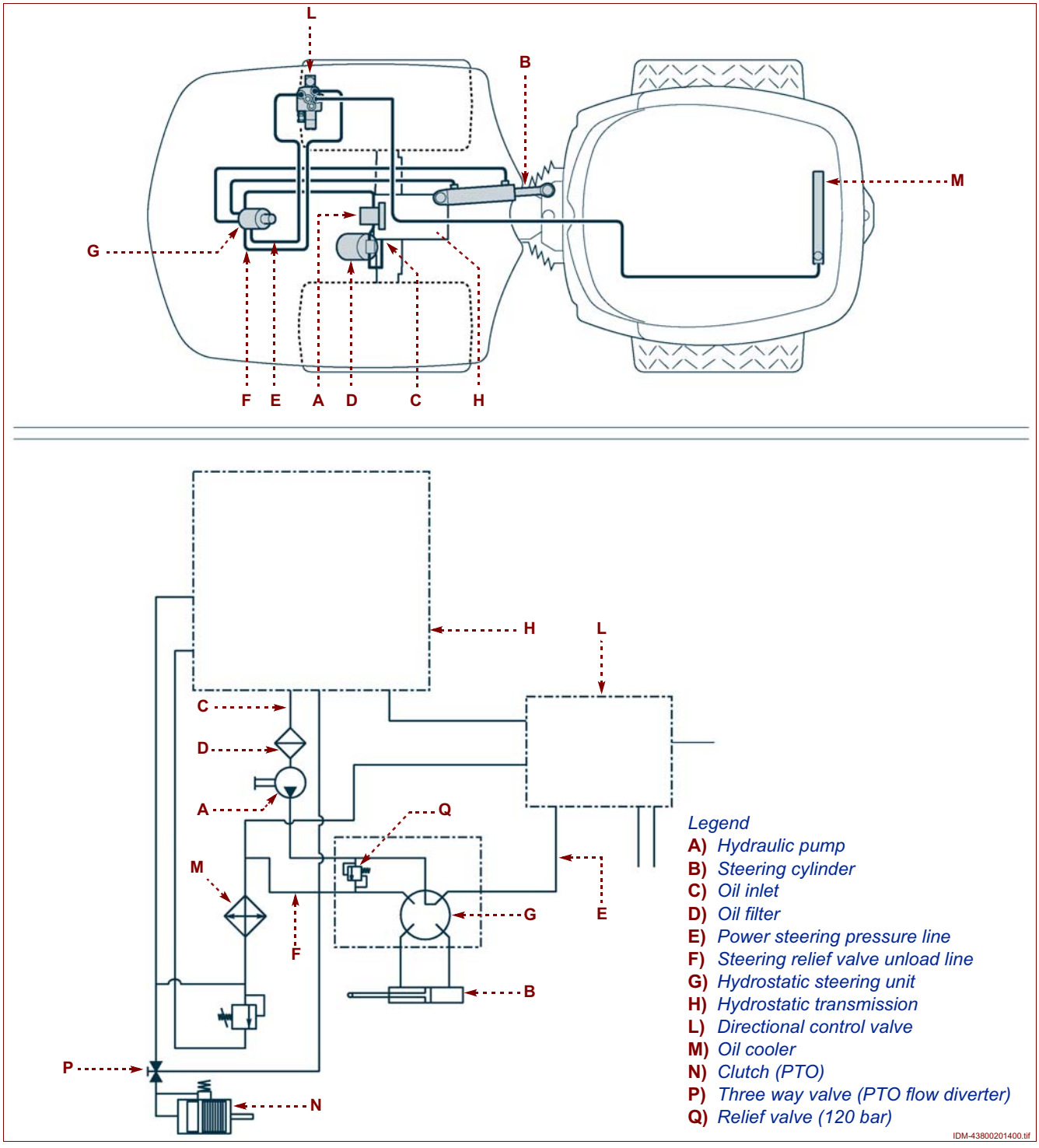
Technical specifications

Type ..... Hydrostatic, with steering wheel and centre-articulated frame (50° angle)
Inner turning radius .....700 mm
Outer turning radius .....1710 mm
Relief valve setting .....12 MPa (120 bar)
Shock valve setting ..... 20MPa (200 bar)
Cylinder diameter ..... ø 40 mm
Rod diameter..... ø 15 mm
Cylinder stroke ..... 151 mm
Turns lock-to-lock..... 3,5

Hydraulic circuit diagram

The machine is equipped with a pressurized hydraulic system of which the power steering and implement lift circuits are protected by relief valves unloading to a part of the circuit at a pressure of 20 bar.

This pressure added to the setting of the relief valve (120 bar) gives a value of 140 bar, the pressure at which the valves come into operation to protect the circuit.



IDM-C243800201.fm

Removing the hydrostatic steering unit

Proceed as follows.

1 - Remove the steering wheel and column (see “Disassembling the steering wheel and column”).
2 - Undo the bolts **(A)** and remove the steering unit **(B)**.

Important!

If the unit is damaged, contact the manufacturer before proceeding with any repair.

3 - Disconnect the oil lines **(C)** and plug temporarily to prevent any leakage of oil.

Important!

Mark the oil lines before disconnecting, so as to facilitate reconnection subsequently.

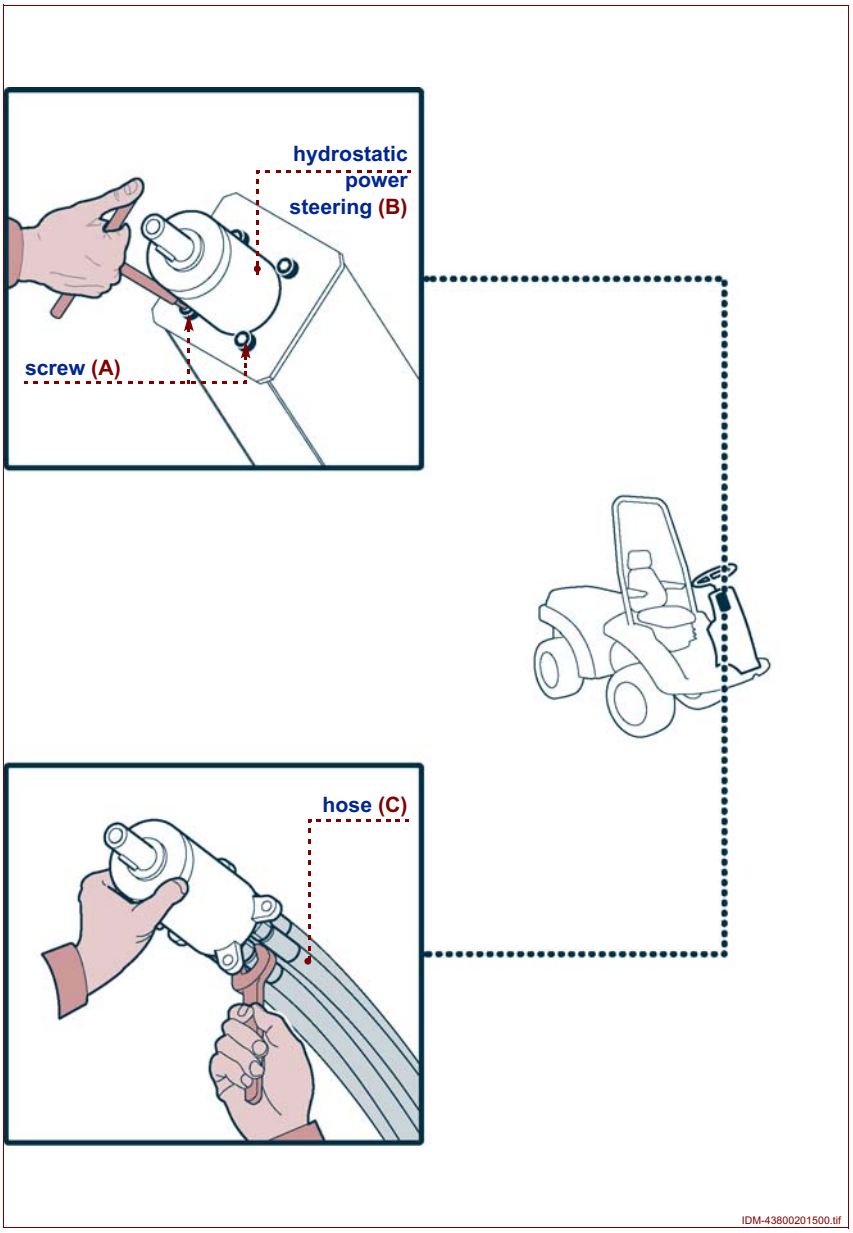
Refitting the hydrostatic steering unit

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.

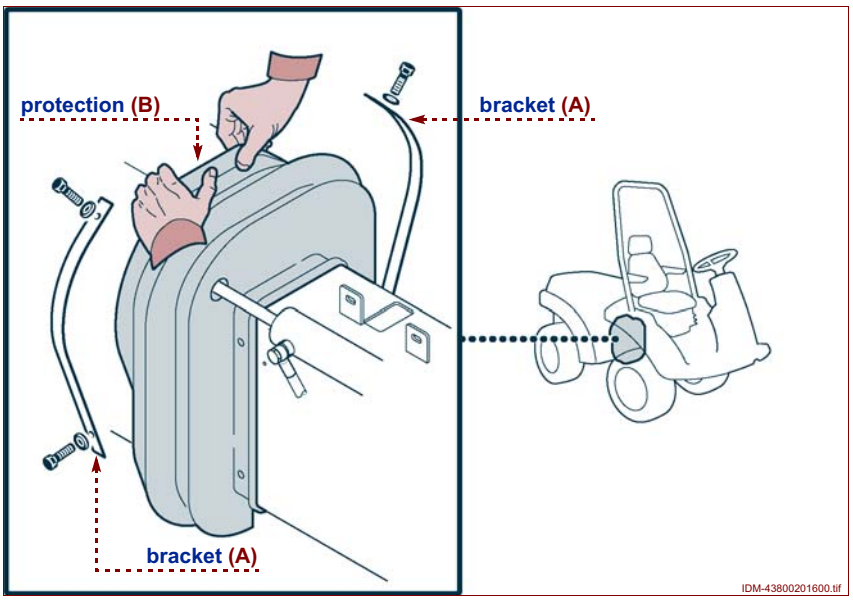
1 - Connect the oil lines **(C)** to the steering unit **(B)**.
2 - Fit the steering unit **(B)** and secure with the bolts **(A)**.
3 - Fit the column and the steering wheel (see “Assembling the steering wheel and column”).



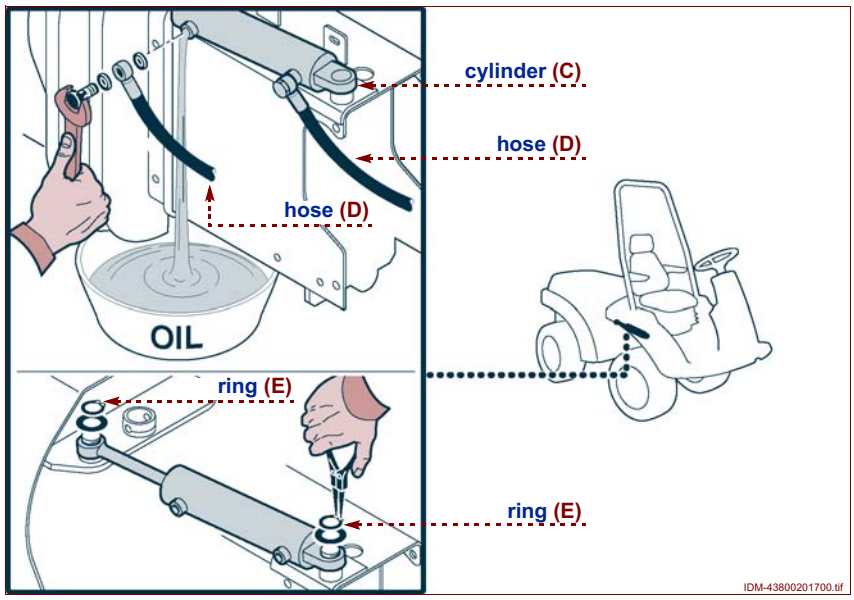
Removing the cylinder

Proceed as follows.

1 - Undo the screws and remove the straps **(A)**.
2 - Remove the boot **(B)**.



3 - Position a vessel of suitable capacity under the cylinder **(C)**.
4 - Disconnect the oil lines **(D)** and plug temporarily to prevent any leakage of oil.
5 - Drain the oil into the vessel.
6 - Unseat the circlips **(E)** and remove the cylinder **(C)**.
7 - Inspect the cylinder to assess its condition and determine whether it should be replaced, or retained and fitted with new seals (see “Replacing the cylinder seals”).

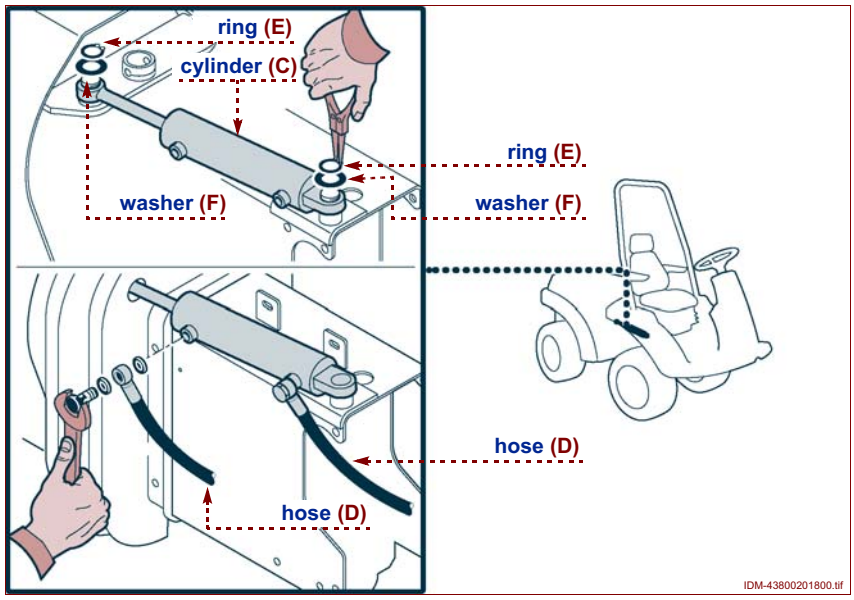


2.4

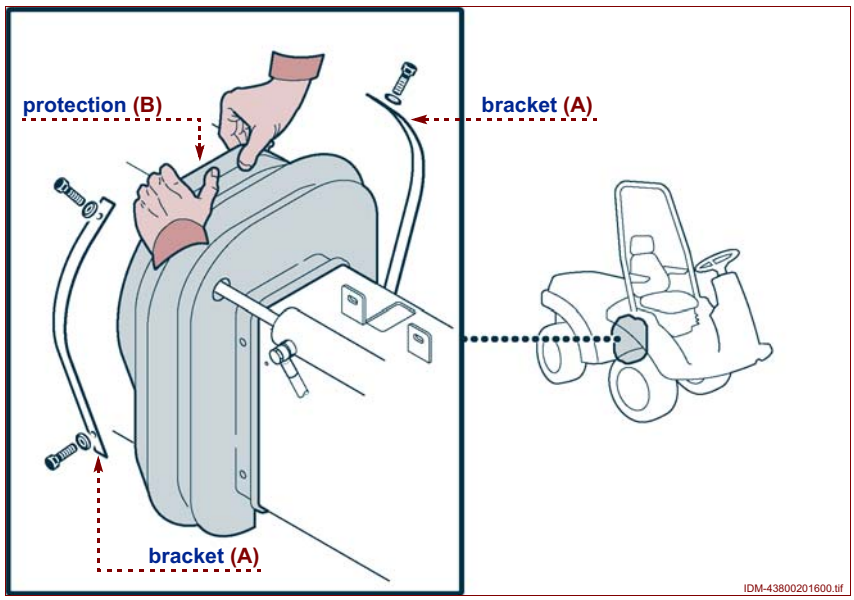
Refitting the cylinder

Proceed as follows.

1 - Insert the cylinder **(C)** through the hole in the boot **(B)**.
2 - Couple the cylinder **(C)** to the mounting points on the frame.
3 - Fit the washers **(F)** and the circlips **(E)**.
4 - Collect the oil lines **(D)**.

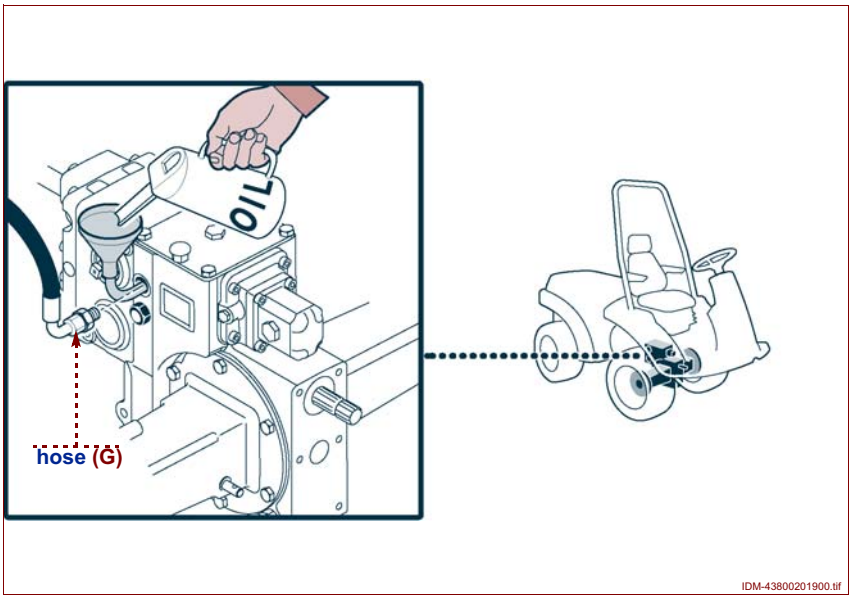


5 - Position the boot **(B)** and secure with the straps **(A)**.



IDM-C243800201.fm

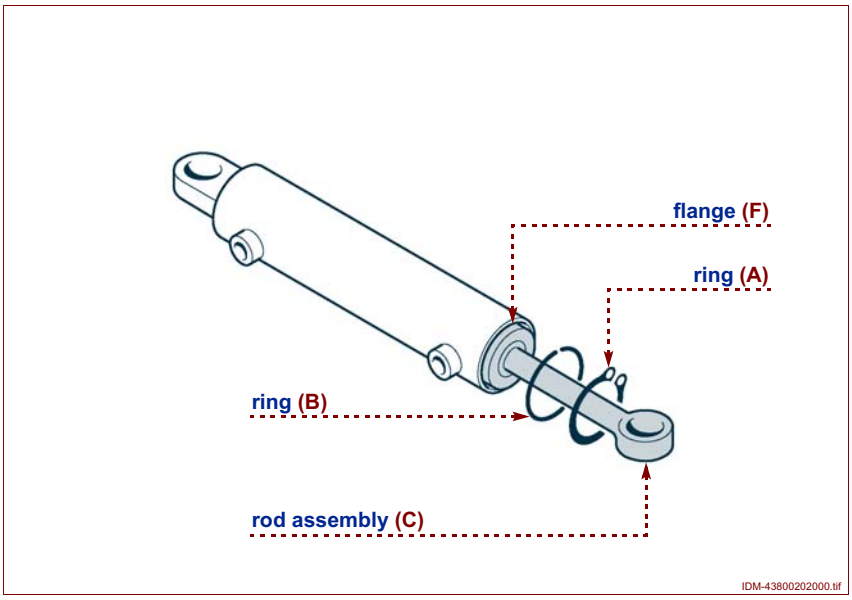
6 - Detach the fitting **(G)** and replace the oil drained previously, filling up to the level on the indicator.
7 - Retighten the fitting **(G)** and check that there are no leaks.



Replacing the cylinder seals

Proceed as follows.

1 - Remove the steering cylinder (see "Removing the cylinder").
2 - Unseat the circlip **(A)**.
3 - Force the gland **(F)** inwards using the special driver (AT 37981823).
4 - Remove the circlip **(B)**.
5 - Draw out the rod assembly **(C)**.

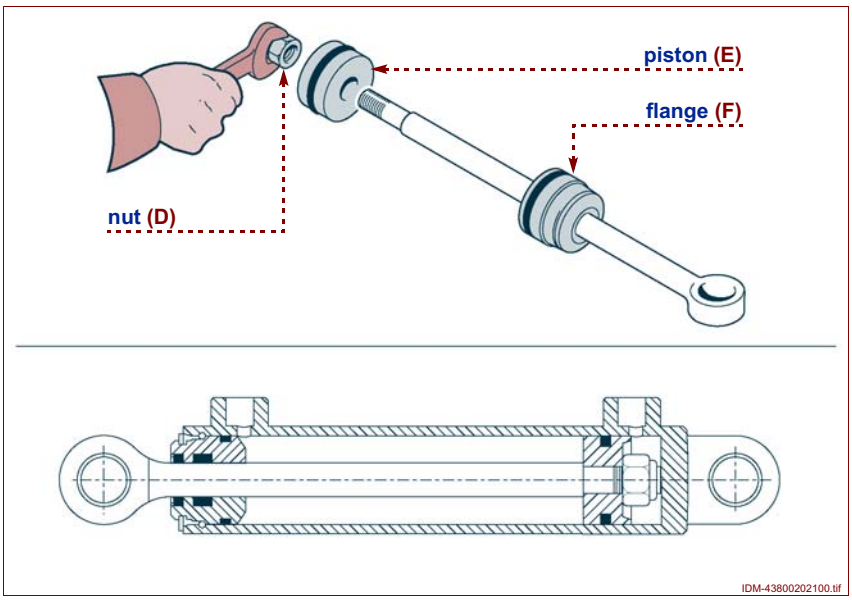


6 - Undo the nut **(D)**, separate the piston **(E)** and remove the gland **(F)**.
7 - Remove all the seals.

Important!

Clean all separated parts, ensuring that none are damaged, scored or ovalized at the areas in contact with the seals. Take care not to damage the seals when replacing.

8 - Fit all the seals.
9 - Refit the gland **(F)** and the piston **(E)**, and lock with the nut **(D)**.
10 - Refit the rod assembly **(C)** and the circlips **(A - B)**.



BRAKES 2.5

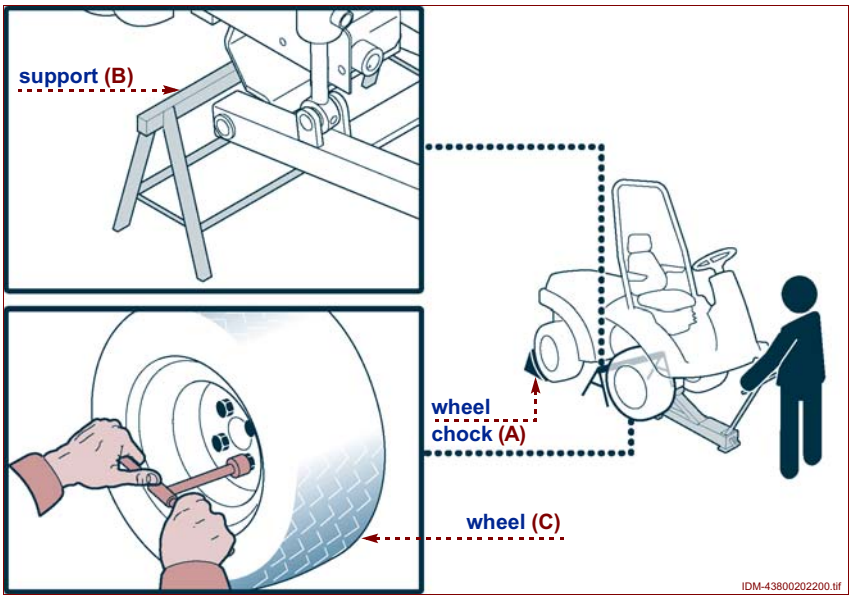
Technical specifications

Braking device	*Description*
Main brake	Drum brake with mechanical linkage, operated by two pedals one on either side of the steering column.
Parking brake	Operates on the shoes of the main drum brake. The parking brake is applied by depressing the main brake pedals and locking them down with a third pedal.
Emergency brake	Applied automatically by the braking action of the hydrostatic transmission when the forward/reverse pedals are released.

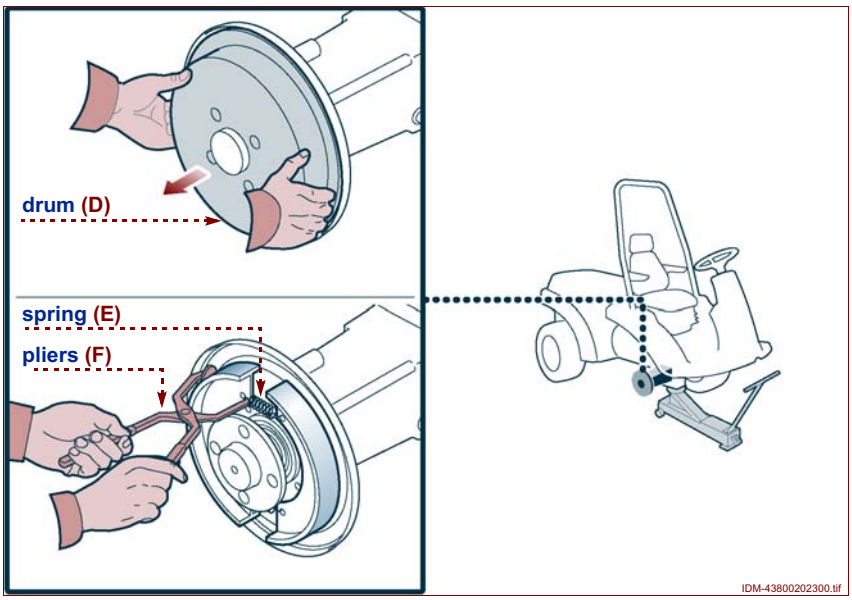
Removing the brake shoes

Proceed as follows.

1 - Position wheel chocks **(A)** to immobilize the machine.
2 - Jack up the front end and position the stand **(B)**.
3 - Loosen the wheel nuts and remove the wheel **(C)**.

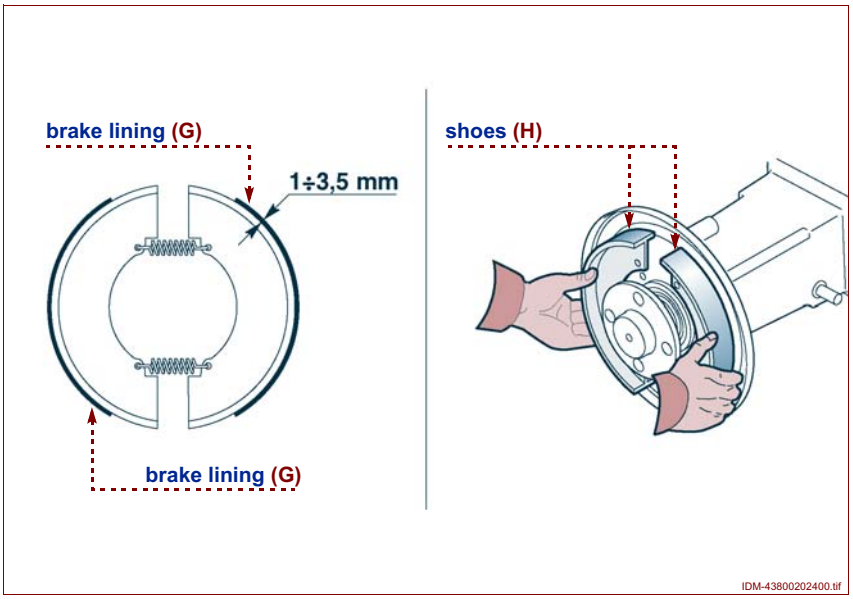


4 - Remove the brake drum **(D)**.
5 - Release the springs **(E)** using the special tool **(F)** (AT 37981260).



IDM-C243800201.fm

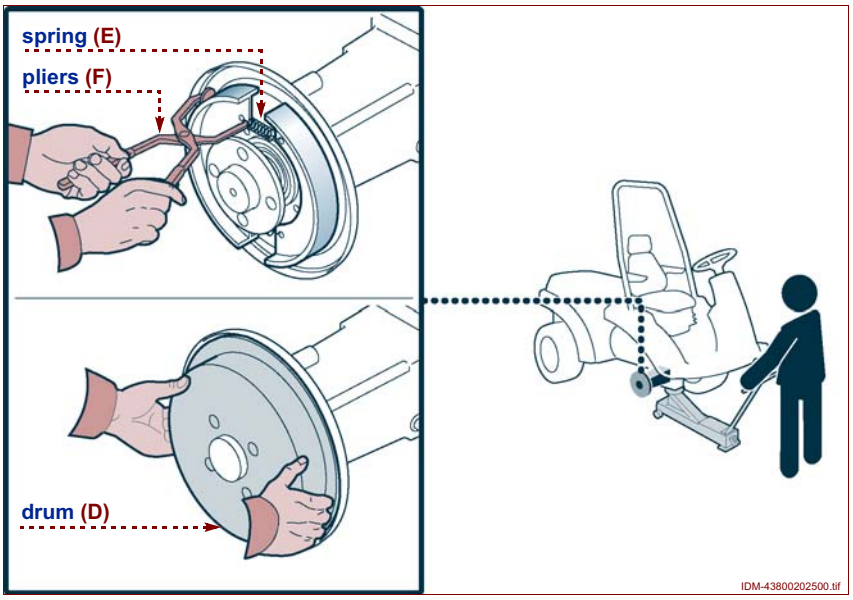
6 - Inspect the brake linings **(G)** for wear (min 1 mm) and scoring.
7 - If necessary, disassemble the shoes **(H)** and replace.
8 - Clean all parts of the brake assembly (shoes, drum, etc).
9 - Inspect the friction surface of the drum to establish whether it should be reground or replaced.



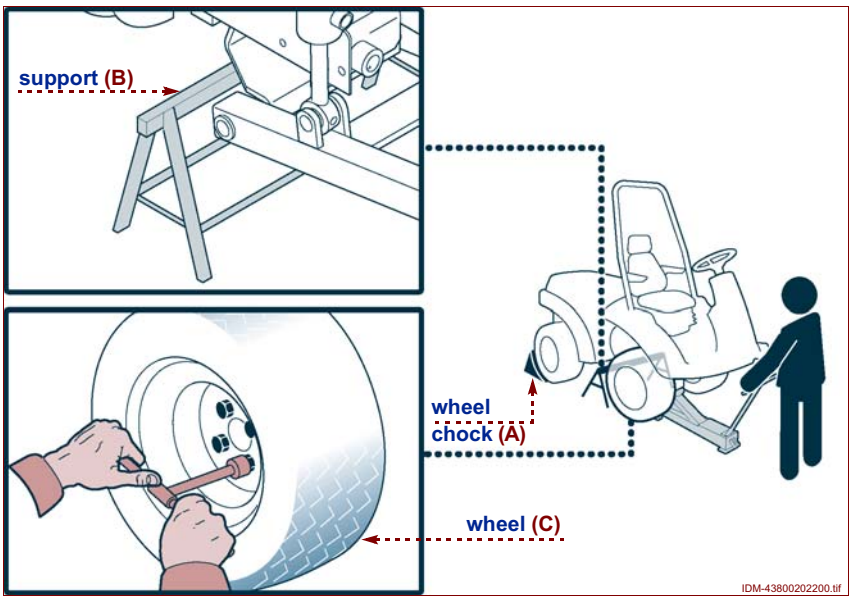
Refitting the brake shoes

Proceed as follows.

1 - Fit the shoes **(G)**.
2 - Locate the springs **(E)** using the special tool **(F)** (AT 37981260).
3 - Refit the drum **(D)**.



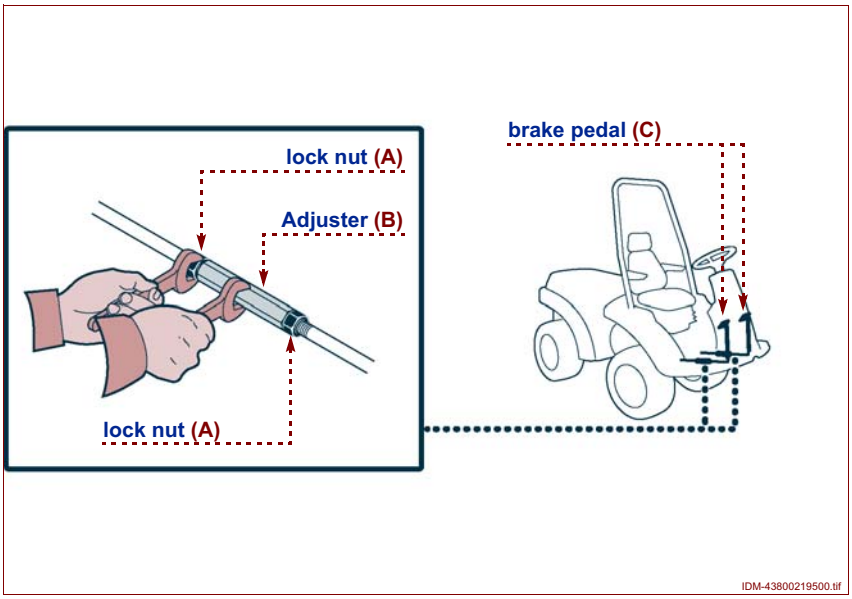
4 - Fit the wheel **(C)** and tighten the nuts.
5 - Jack up the machine, remove the stand **(B)** and lower the wheels to the floor.



Adjusting the brakes

Proceed as follows.

1 - Back off the nuts **(A)** and crank the sleeve **(B)** to bring the shoes into contact with the drum.
2 - Depress the brake pedal **(C)** forcibly, so that the shoes are bedded in.
3 - Crank the sleeve **(B)** further to bring the shoes fully into contact with the drum.
4 - Slacken off the sleeve **(B)** one full turn to give the correct clearance between shoes and drum.



2.5

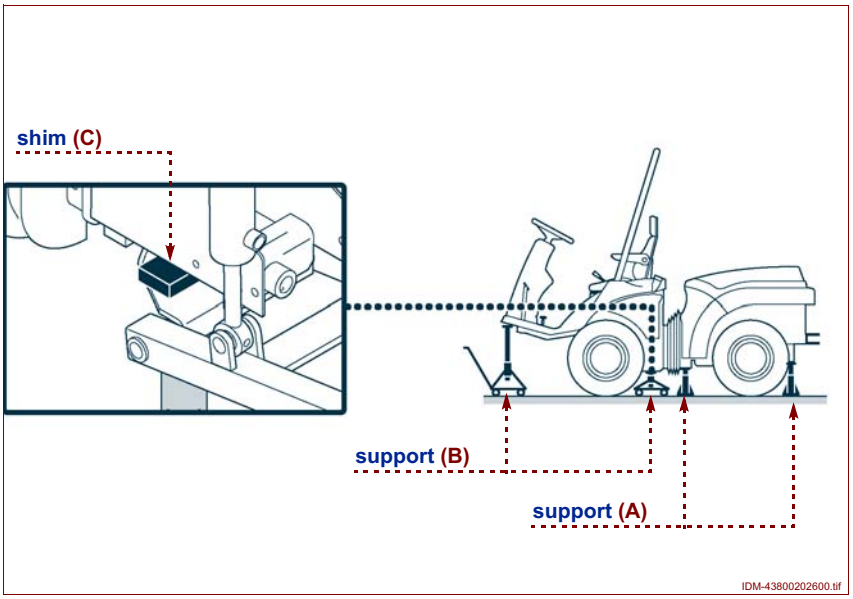
CENTRAL JOINT 3.1

CENTRAL JOINT 3.1

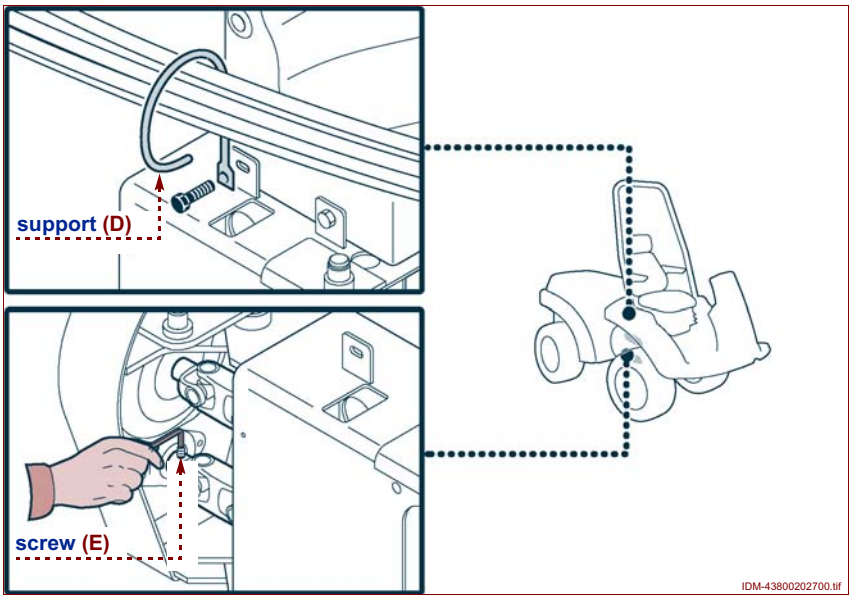
Disassembling the central joint

Proceed as follows.

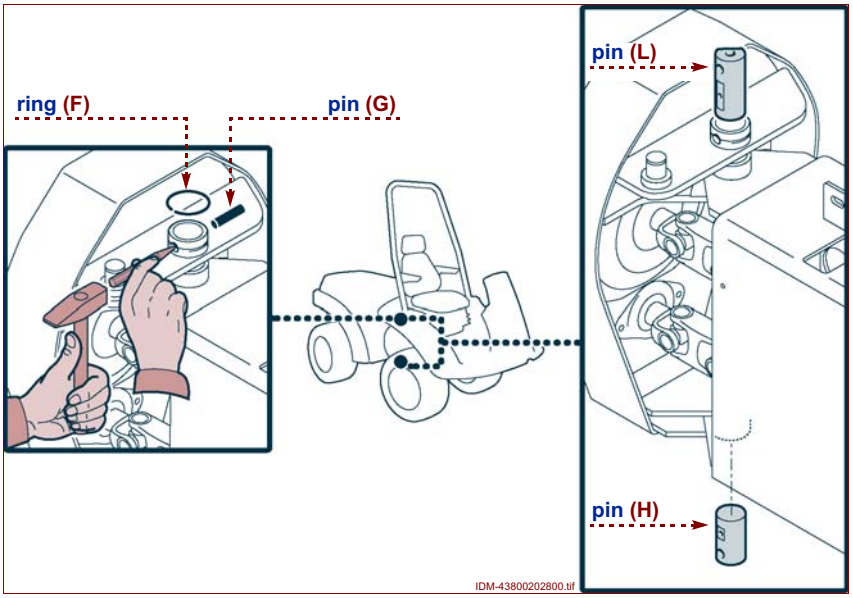
1 - Remove the steering cylinder (see “Removing the cylinder”).
2 - Position stands **(A)** under the rear end of the machine to ensure stability.
3 - Position stands **(B)** under the front end of the machine.
4 - Locate the shim **(C)** to ensure the machine remains stable.



5 - Remove the hose retainer **(D)**.
6 - Remove the hose clips.
7 - Undo the screw **(E)** of the bottom universal joint.



8 - Unseat the circlip **(F)**, remove the pin **(G)** and draw out the pivots **(H - L)**.



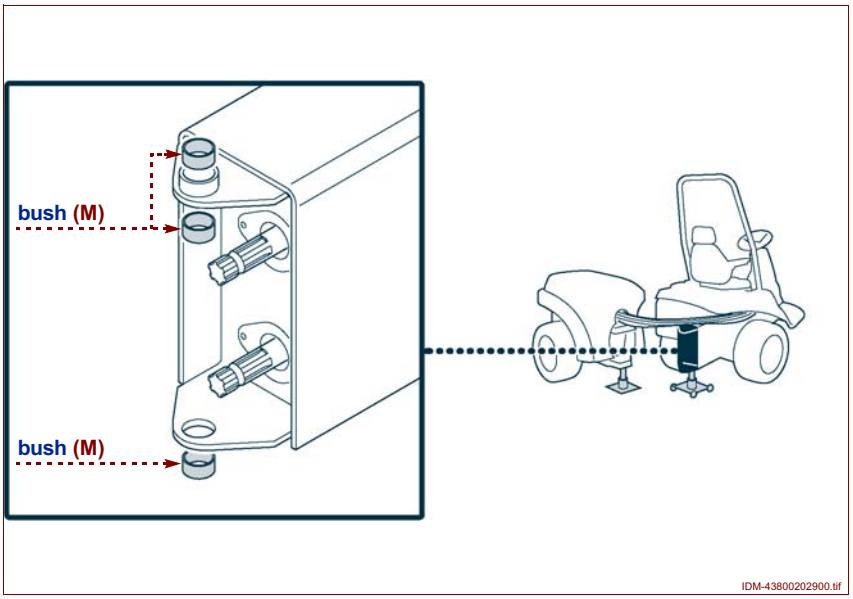
IDM-C343800201.fm

9 - Distance the front end of the machine to allow removal of the universal joints.

Important!

Mark the parts of the universal joint to ensure refitment in the same position; to avoid damage, ensure hydraulic hoses are not pulled taut when separating the two ends.

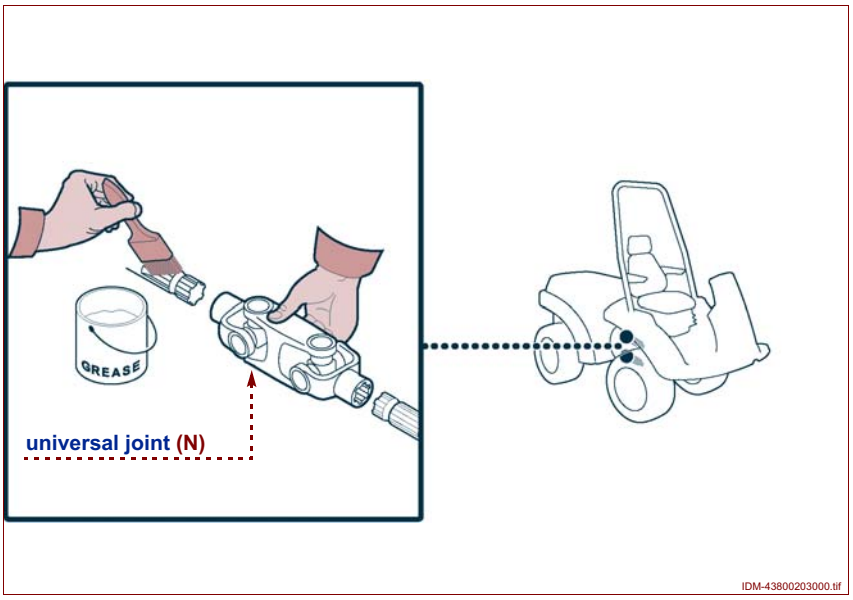
10 - Inspect the bushes **(M)** for wear, and replace if necessary (see “Replacing the bushes”).



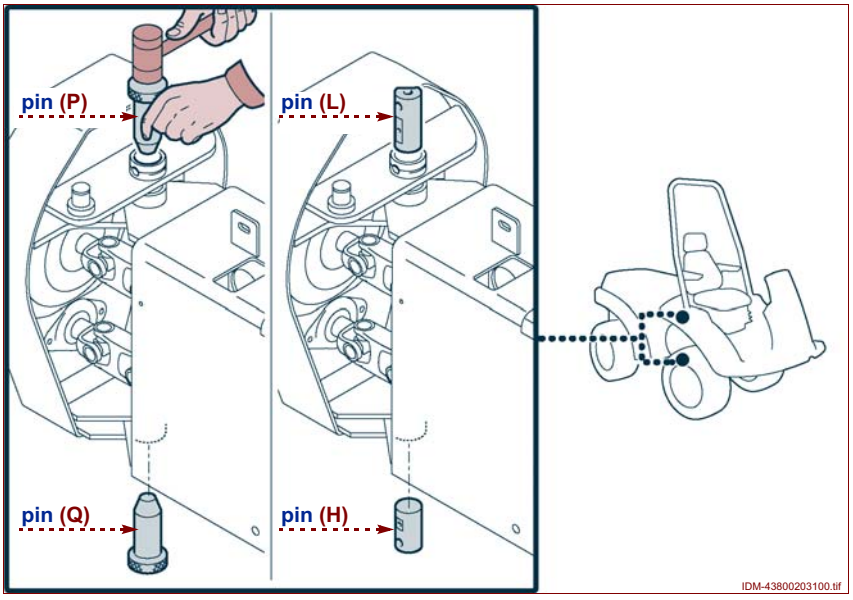
Assembling the central joint

Proceed as follows.

1 - Clean all disassembled parts and ensure they are not damaged. Grease the pivots and their sockets.
2 - Grease the coupling shafts of the universal joint.
3 - Draw the front end of the machine close to the rear end.
4 - Refit the universal joint **(N)** to the respective shafts.



5 - Line up the coupling holes to allow insertion of the aligners **(P - Q)** (AT 37981863).
6 - Remove the aligner **(P)** and insert the pivot **(L)**.
7 - Remove the aligner **(Q)** and insert the pivot **(H)**.

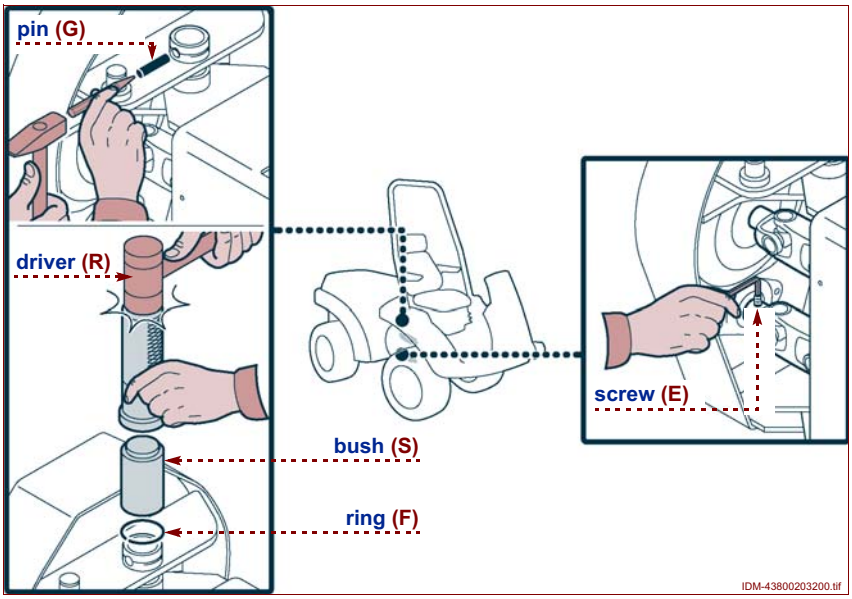


IDM-C343800201.fm

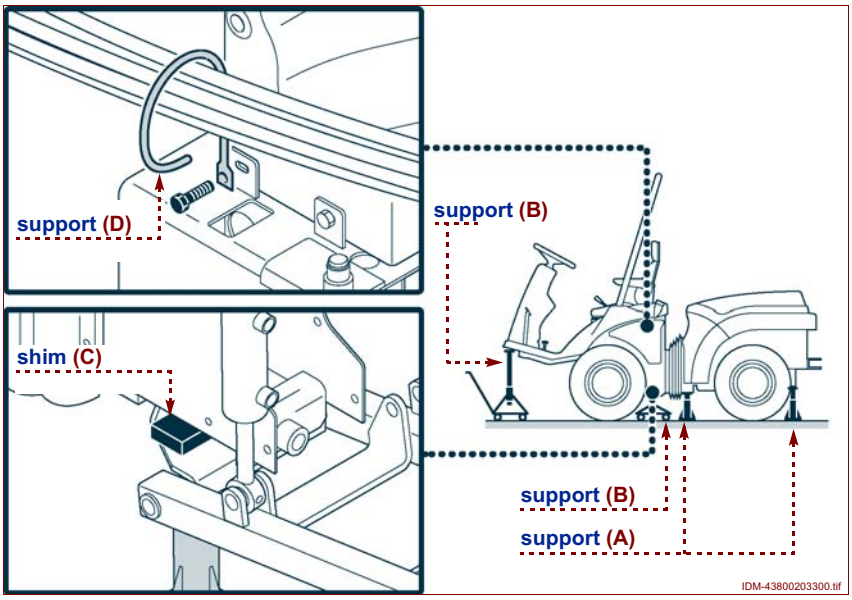
8 - Locate the pins **(G)**.
9 - Fit the circlips **(F)**.
10 - Use the sleeve **(S)** (AT 37981862) and driver **(R)** (AT 37981261) to seat the circlip in its groove.
11 - Tighten the screw **(E)** to lock the lower universal joint.

Important!

The tip of the screw (E) must locate in the groove on the shaft.



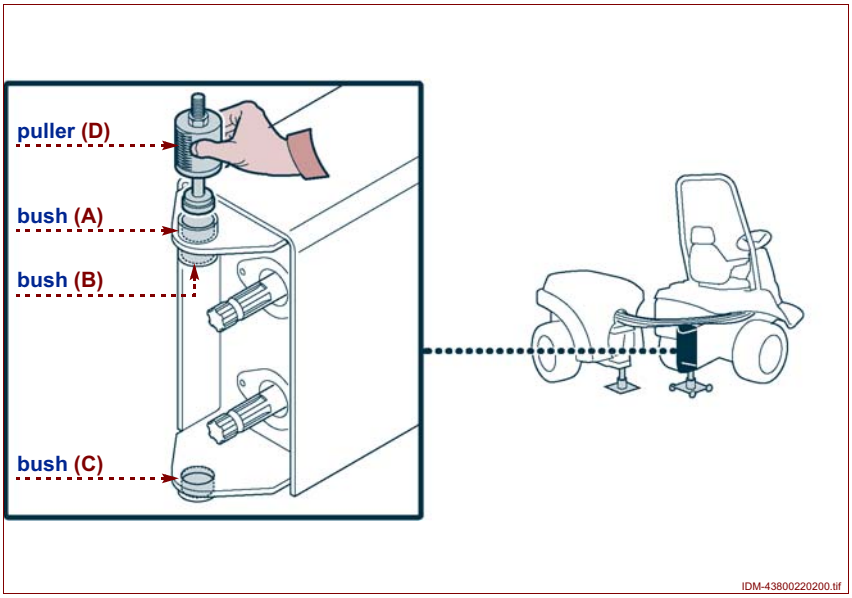
12 - Remove the shim **(C)** and the stands **(A - B)**.
13 - Fit the hose retainer **(D)**.
14 - Fit the hose clips.
15 - Fit the steering cylinder (see “Refitting the cylinder”).



Replacing the bushes

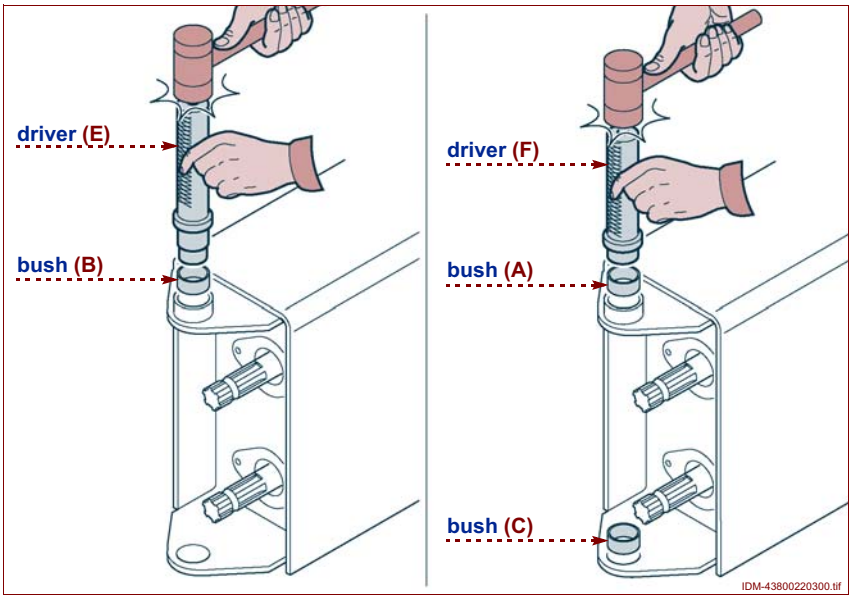
Proceed as indicated

1 - Disassemble the central joint (see “Disassembling the central joint”).
2 - Remove the bushes **(A - B - C)** using the puller **(D)** (AT 37981900).



IDM-C343800201.fm

3 - Replace the bushes with new parts, being certain to grease before fitting.
4 - Locate the first bush **(B)**, using the relative driver **(E)** (AT 37981906).
5 - Locate the remaining bushes **(A - C)**, using the relative driver **(F)** (AT 37981905).
6 - Assemble the central joint (see “Assembling the central joint”).



FRONT END TRANSMISSION 4.1

REAR AXLE 4.2

HYDROSTATIC TRANSMISSION HOUSING 4.3

DISASSEMBLY AND ASSEMBLY OF HYDROSTATIC TRANSMISSION COMPONENTS 4.4

IDM-C443800201.fm

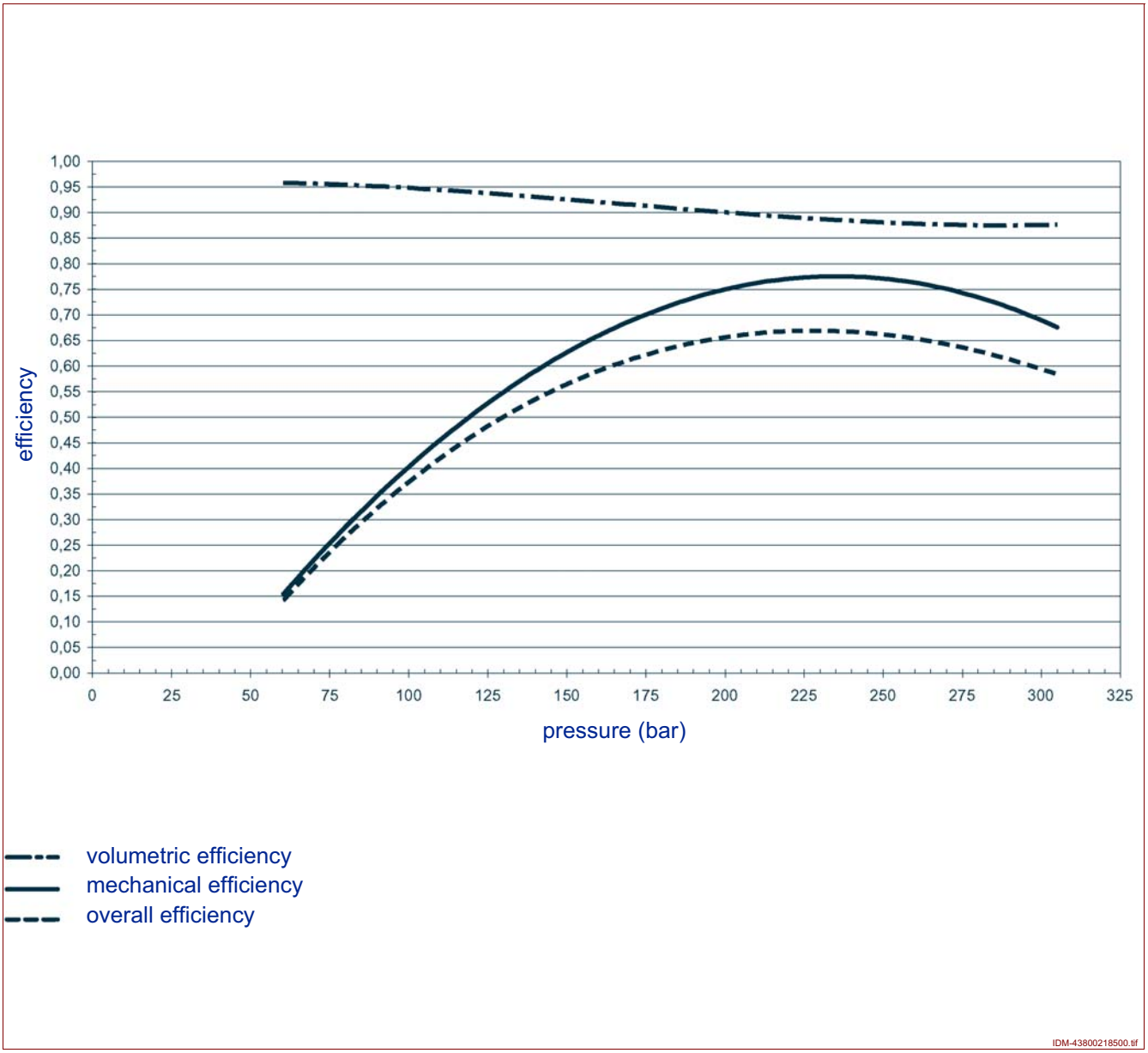
FRONT END TRANSMISSION 4.1

Technical specifications

Transmission ratio between hydraulic motor shaft and wheels 14.9:1
Transmission ratio between hydraulic motor shaft and output to rear power train 3.06:1
Maximum static torque transmissible at PTO ..... 200 Nm
Maximum braking torque at PTO brake ..... 16.8 Nm
Max displacement (pump) ..... 20.8 cm^3/rev
Max displacement (motor) ..... 32 cm^3/rev
Maximum swash angle (pump) ..... ± 17°
Maximum swash angle (motor) ..... 20°
Number of pistons (pump) 9
Number of pistons (motor) 9
Relief valve setting ..... 30 MPa (300 bar)
Charge pressure (engine at 1000 rpm) ..... 1.2 MPa (12 bar)
Charge pressure (engine at 2600 rpm) ..... 1.6 MPa (16 bar)
Charge pump displacement (gear pump) ..... 7.9 cm^3

4.1

Efficiency curves



IDM-C443800201.fm

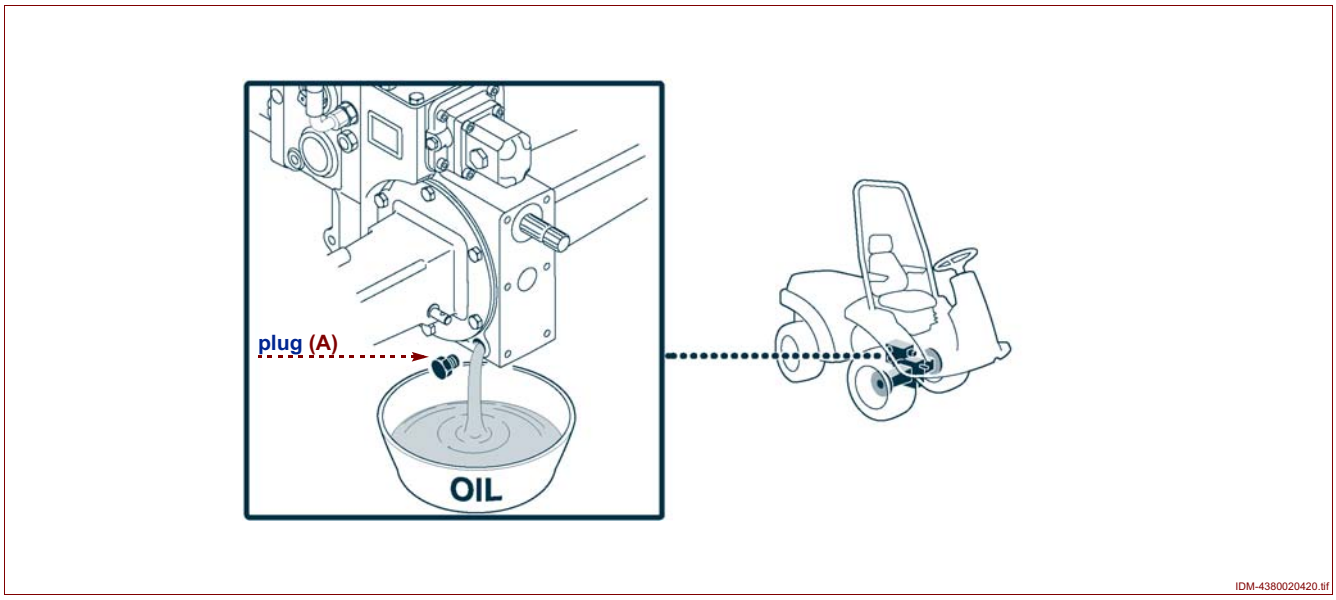
Removing the front end transmission

Important!

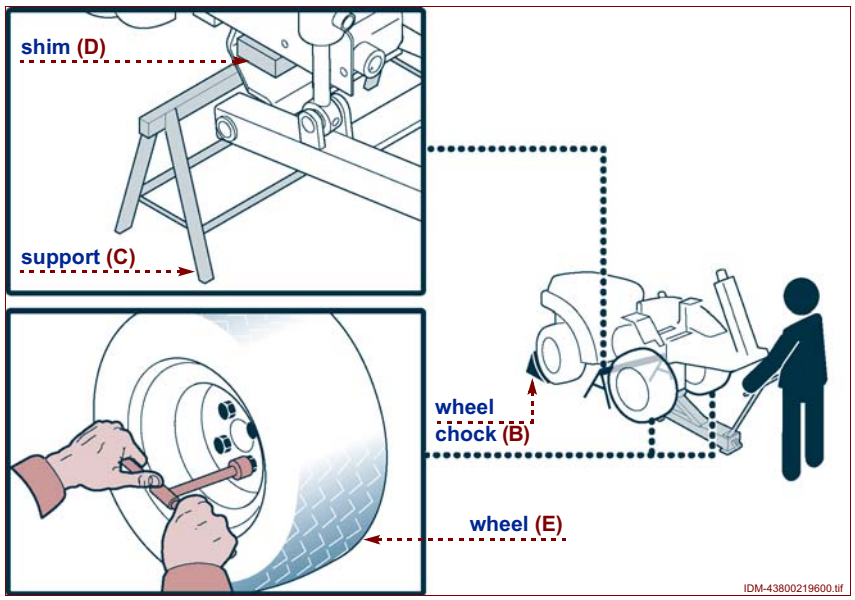
The transmission needs to be removed only if gears or shafts require attention, or in the event of a complete overhaul. To carry out work on the hydrostatic transmission, it will be sufficient to detach the relative housing (see *chap 04 - 16*).

To remove the transmission completely, proceed as follows.

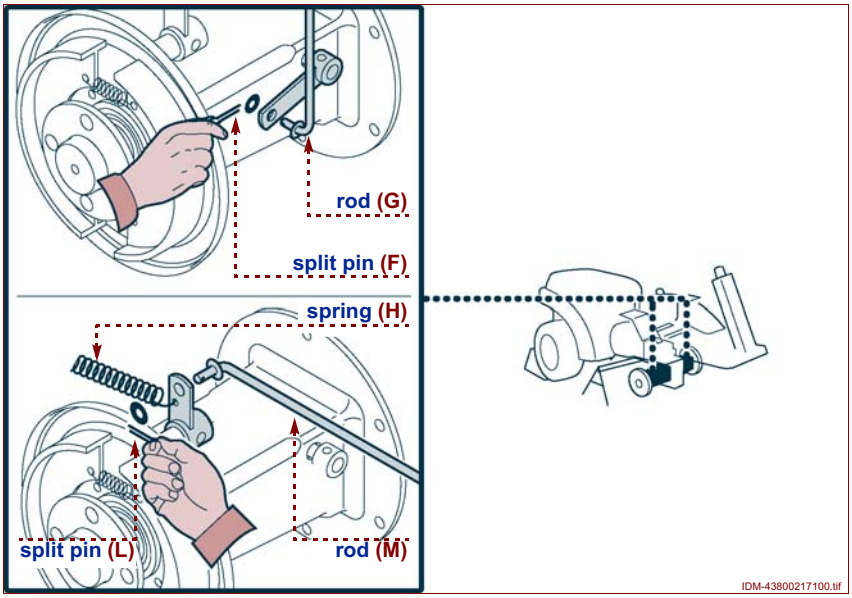
1 - Remove the steering wheel and column (see “Disassembling the steering wheel and column”).
2 - Remove the platform (see “Disassembling the seat and platform”).
3 - Disconnect the steering cylinder (see “Removing the cylinder”).
4 - Remove the hydraulic lift frame (see “Removing the lift frame”).
5 - Remove the fuel tank (see “Removing the fuel tank”).
6 - Position a vessel of suitable capacity under the drain plug **(A)**.
7 - Unscrew the drain plug **(A)** and allow the oil to run off.



8 - Position wheel chocks **(B)** to immobilize the machine.
9 - Jack up the front end and position the stand **(C)**.
10 - Locate the shim **(D)** to ensure the machine remains stable.
11 - Loosen the wheel nuts and remove the wheel **(E)**.



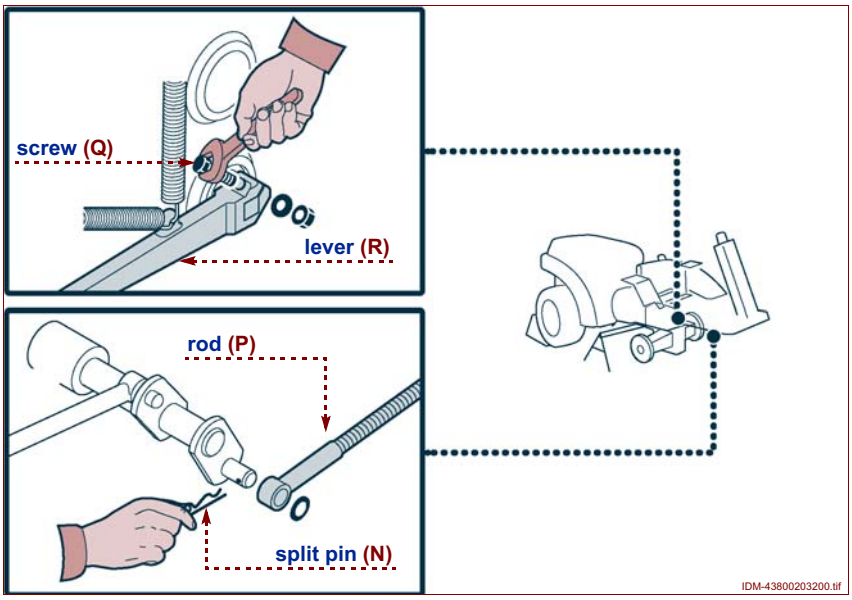
12- Remove the split pin **(F)** and free the differential lock linkage rod **(G)**.
13- Detach the spring **(H)**.
14- Remove the split pin **(L)** and free the brake linkage rod **(M)**.
15- Repeat on the other side.



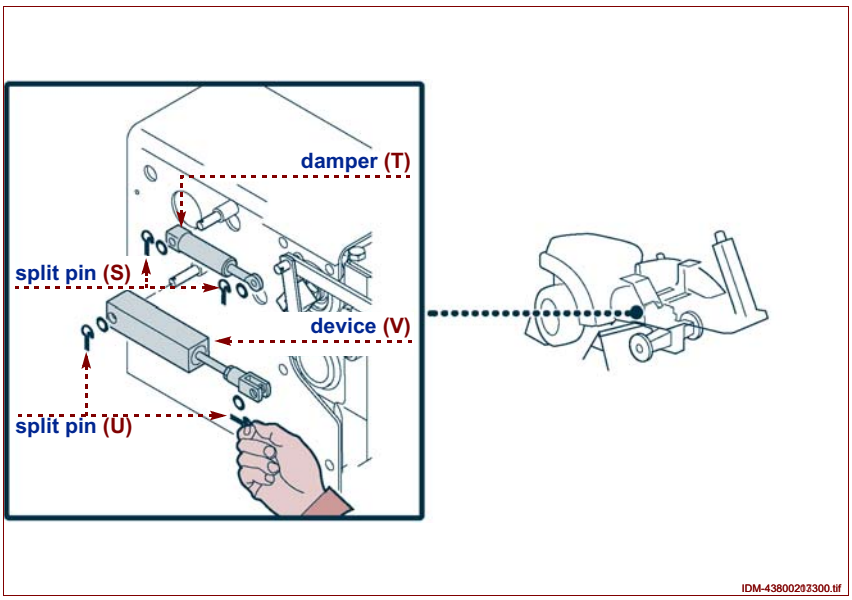
16- Remove the split pin **(N)** and free the drive linkage rod **(P)**.
17- Undo the bolt **(Q)** and free the shift lever **(R)**.

Important!

Before proceeding with this step, mark the coupling position of the splined profile so as to ensure the lever will be refitted in the same position.



18- Remove the split pins **(S)** and free the drive control linkage damper **(T)**.
19- Remove the split pins **(U)** and free the neutral position adjuster **(V)**.



IDM-C443800201.fm

20- Disconnect the oil lines and plug temporarily to prevent any leakage of oil.

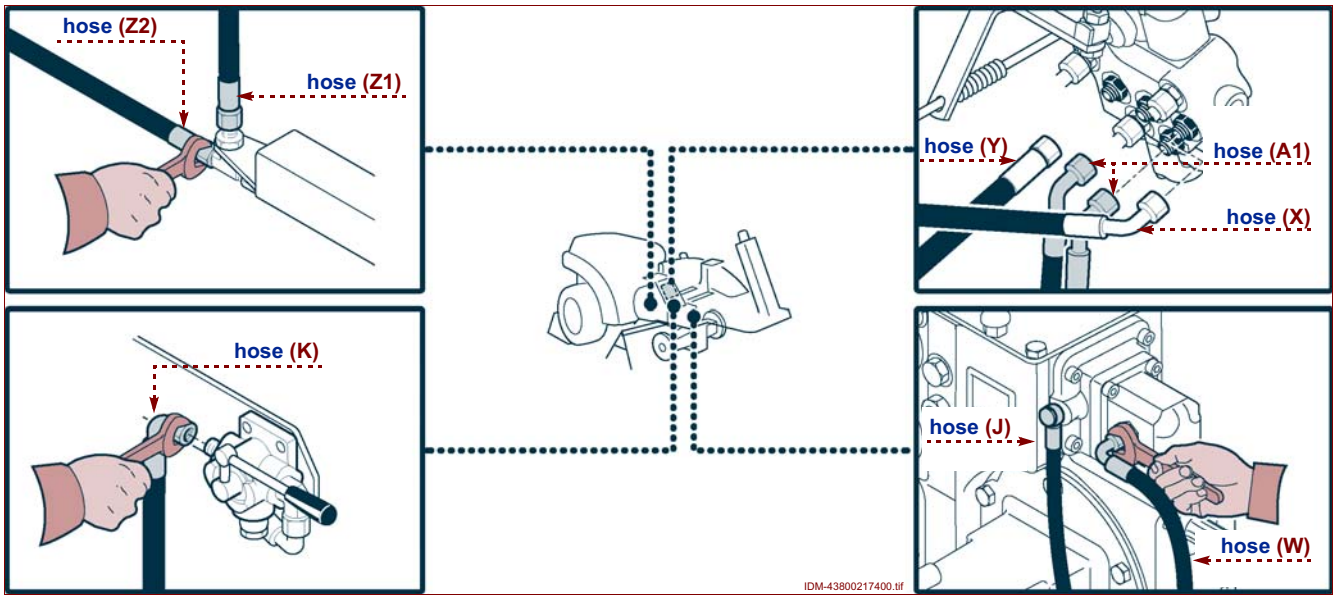
A1) oil lines serving external pressure ports (if installed)
J) PTO clutch inlet line
K) PTO clutch return line
W) hydraulic pump oil line
X) oil cooler pressure line
Y) transmission housing return line
Z1) oil cooler return line
Z2) hydrostatic transmission inlet line

Important!

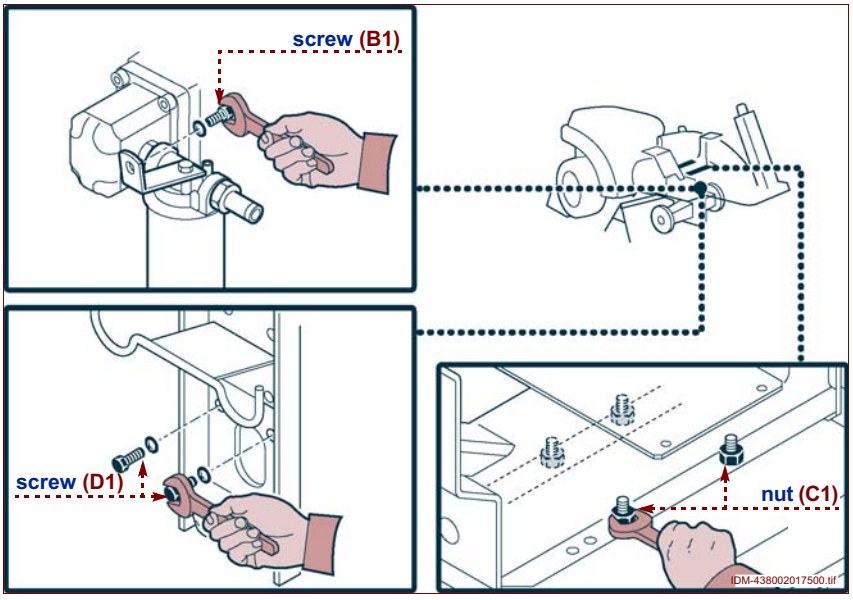
Mark the oil lines before disconnecting, so as to facilitate reconnection subsequently.

If the machine is equipped with front external pressure ports, the connections between the oil lines and spool valves will not be as illustrated.

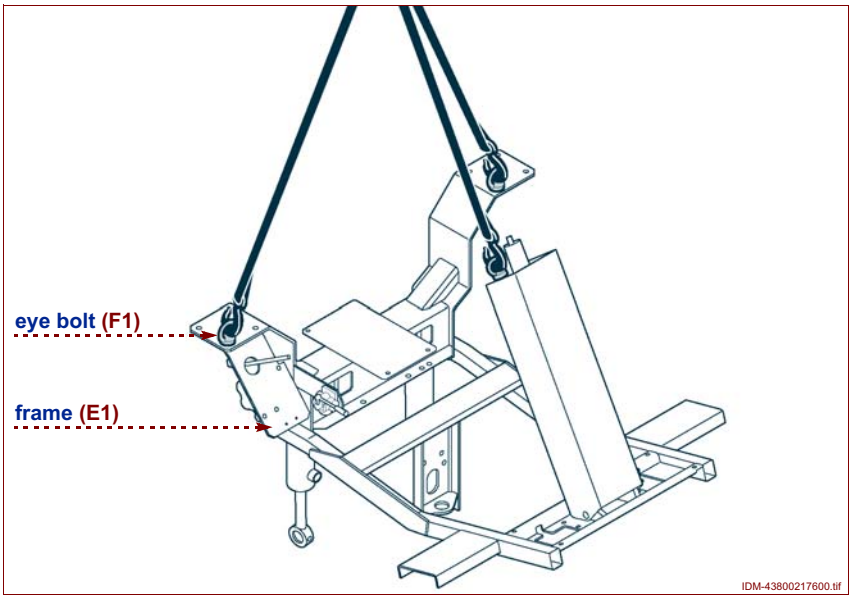
For details, refer to the hydraulic diagram.



21- Undo the filter mounting bolts **(B1)**.
22- Undo the nuts and bolts **(C1 - D1)** and detach the frame.

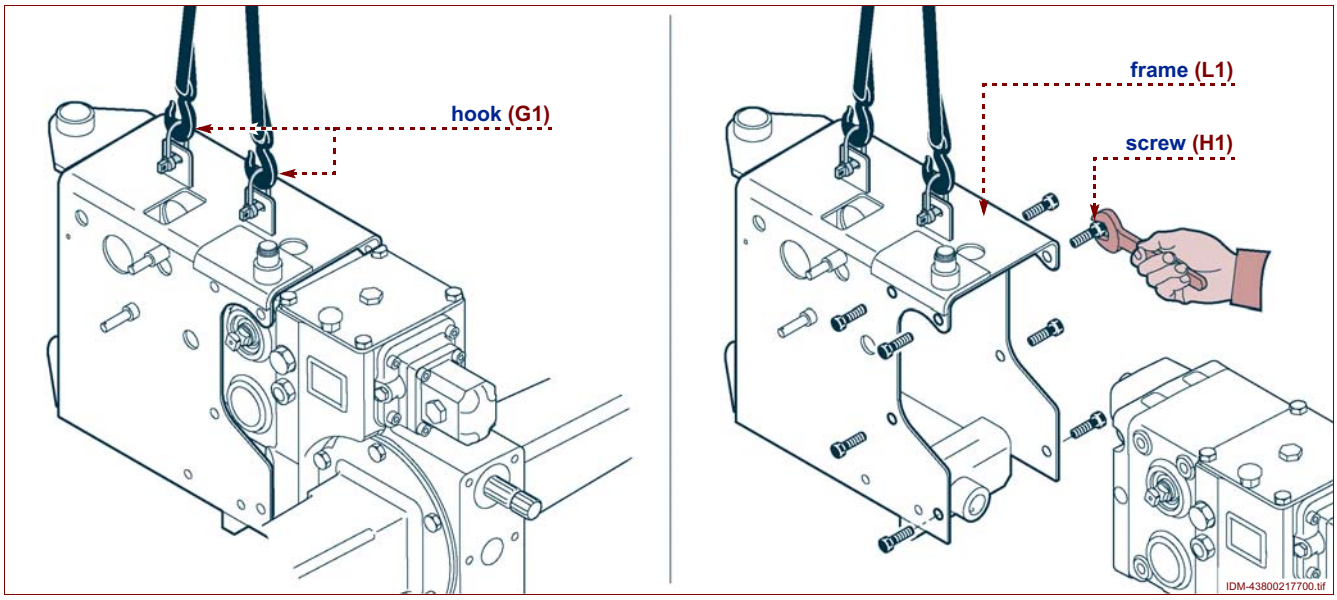


23- Separate the connectors of the engine electrical system.
24- Fit the eye bolts **(F1)** (AT 37981845) and lift the frame **(E1)** clear.
25- Disassemble the central joint (see “Disassembling the central joint”).



26- Insert the sling hooks **(G1)**, then hoist the hydrostatic transmission and position it on the bench.
27- Undo the bolts **(H1)** and separate the frame **(L1)**.

4.1

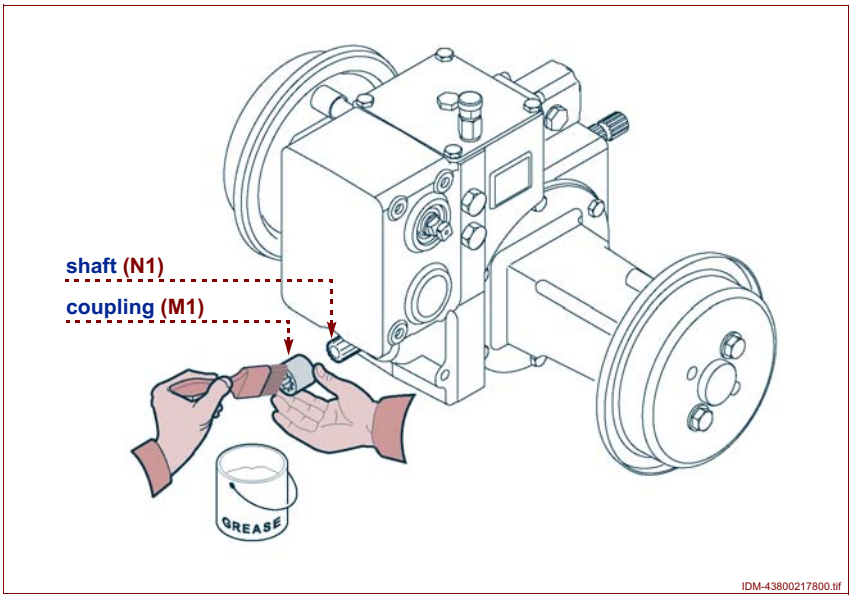


Refitting the front end transmission

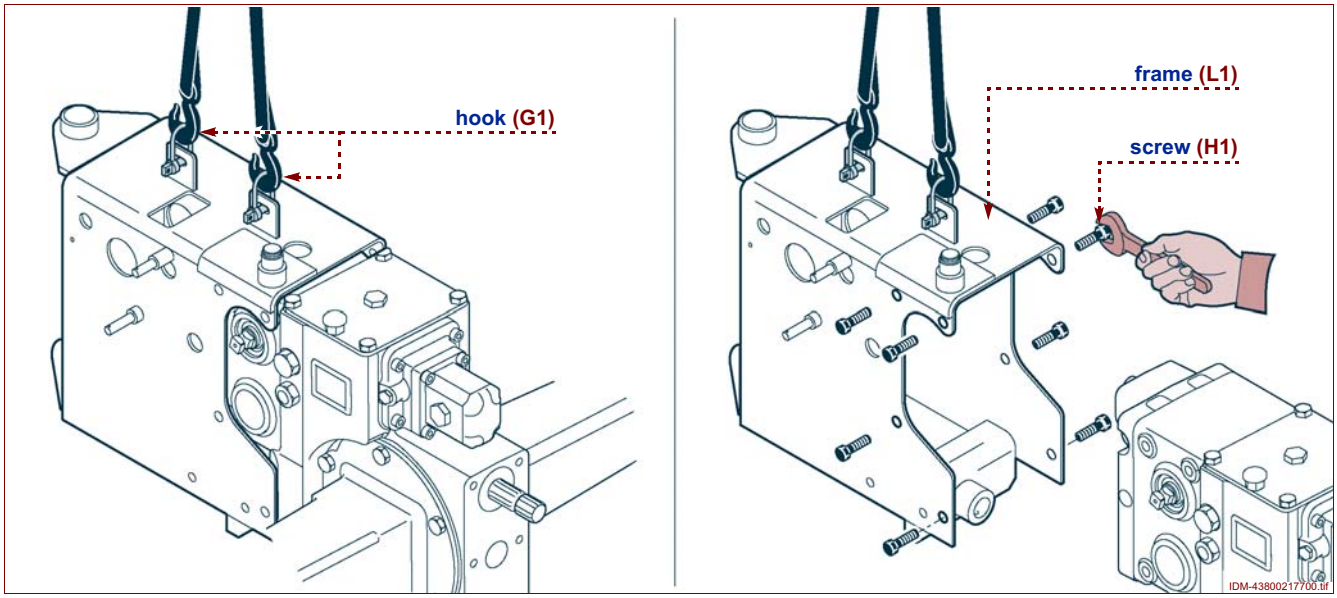
Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.
1 - Clean all disassembled parts and ensure they are not damaged.
2 - Grease the coupling **(M1)** and fit to the bottom shaft **(N1)**.

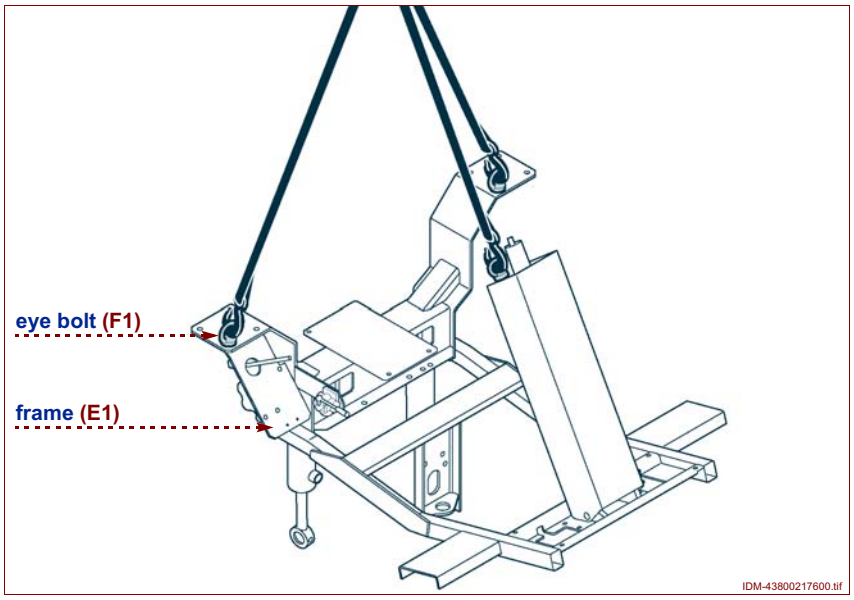


IDM-C443800201.fm

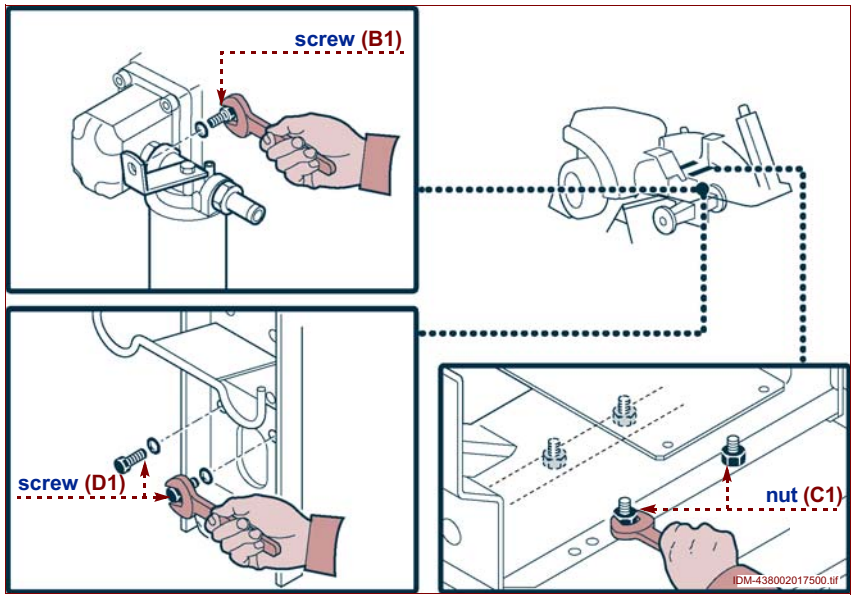


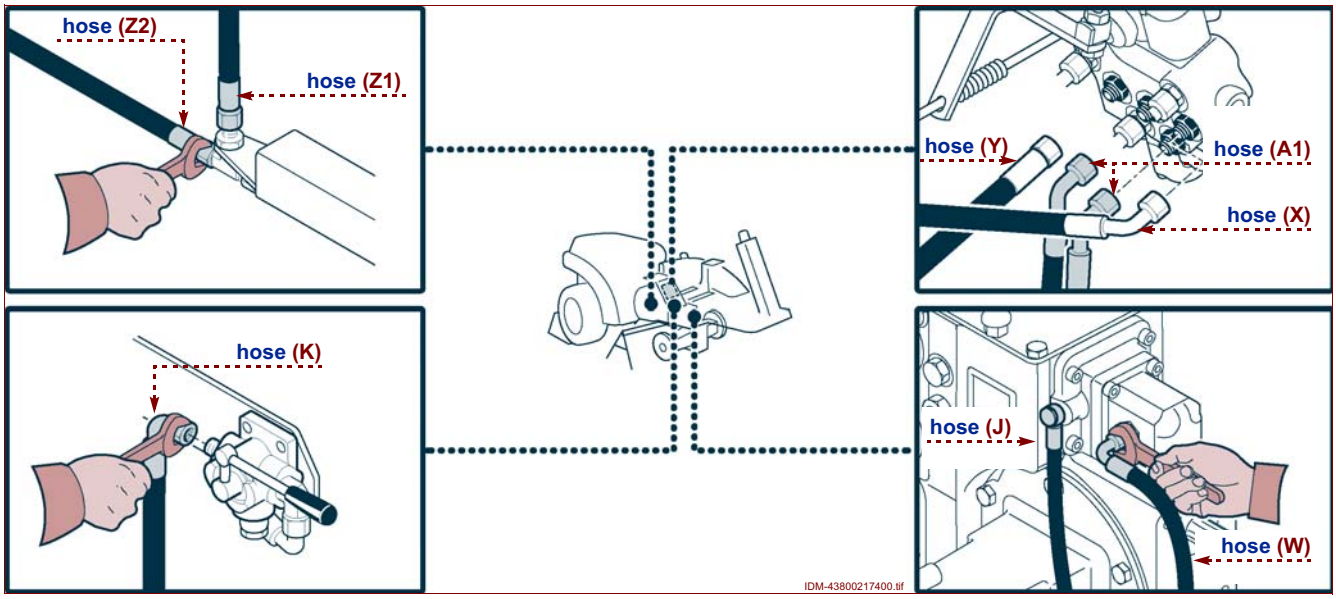
4.1

3 - Fit the frame **(L1)** and ensure the drive shafts are coupled correctly.
4 - Fit the frame clamp bolts **(H1)**.
5 - Hoist the hydrostatic transmission and offer to the mounting points.
6 - Assemble the central joint (see “Assembling the central joint”).
7 - Detach the sling hooks **(G1)**.
8 - Hoist the frame **(E1)** and offer to the mounting points.
9 - Detach the slings and remove the eye bolts **(F1)**.



10 - Fit the nuts and bolts **(C1 - D1)** clamping the frame.
11 - Fit the filter mounting bolt **(B1)**.



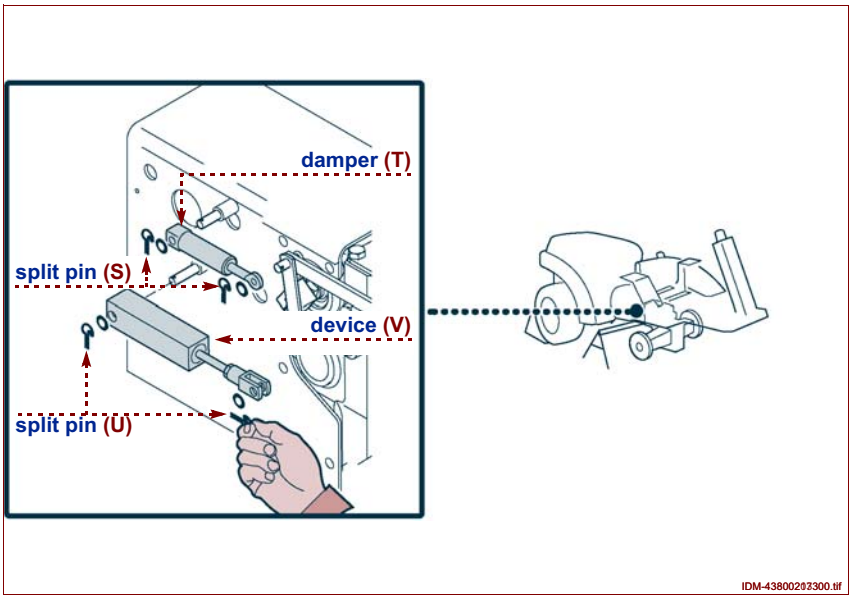


4.1

12- Reinstate the oil lines:
A1) Oil lines serving external pressure ports (if installed)
J) PTO clutch inlet line
K) PTO clutch return line
W) hydraulic pump oil line
X) oil cooler pressure line
Y) transmission housing return line
Z1) oil cooler return line
Z2) hydrostatic transmission inlet line

If the machine is equipped with front external pressure ports, the connections between the oil lines and spool valves will not be as illustrated.
For details, refer to the hydraulic diagram.

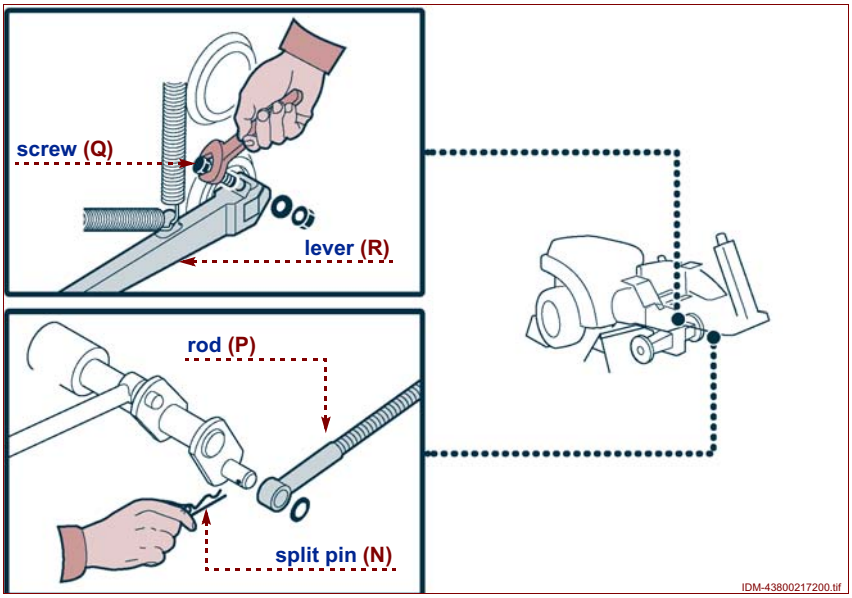
13- Fit the adjuster **(V)**, the washers and the split pins **(U)**.
14- Fit the damper **(T)**, the washers and the split pins **(S)**.
15- Refit the lever **(R)**, being careful to match up the witness marks made on the splines.



Caution!

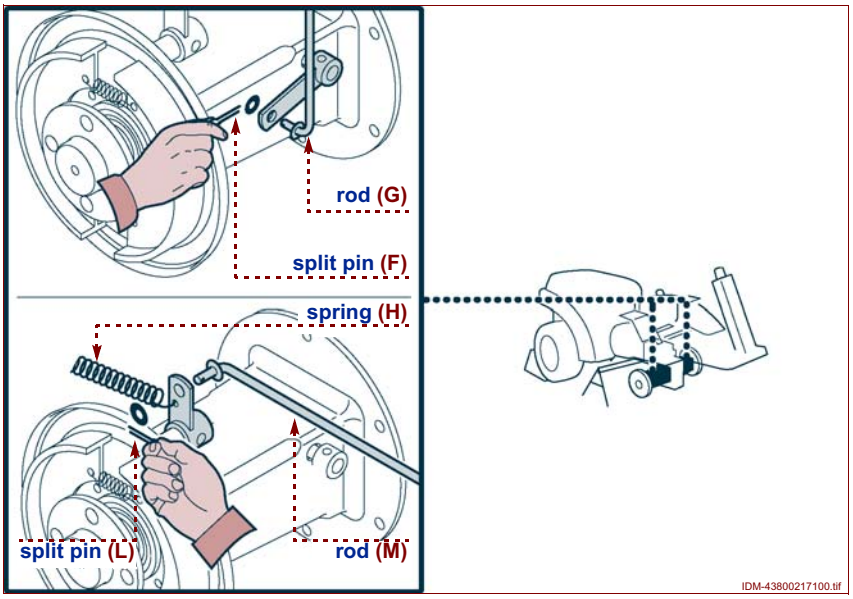
If the lever is not refitted correctly, it will select the wrong speeds, invert the operation of the drive pedals and seriously damage the hydrostatic transmission.

16- Locate the linkage rod **(P)** and secure with the split pin **(N)**.

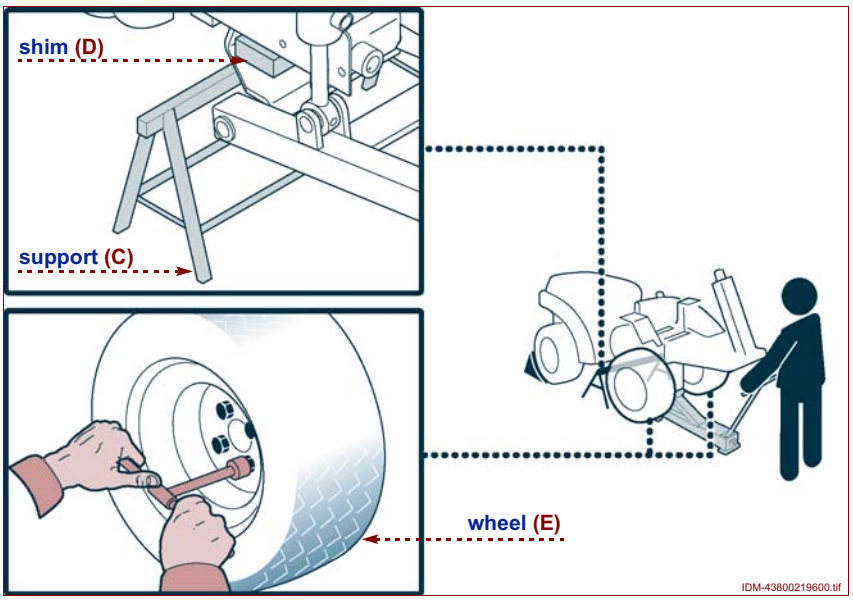


IDM-C443800201.fm

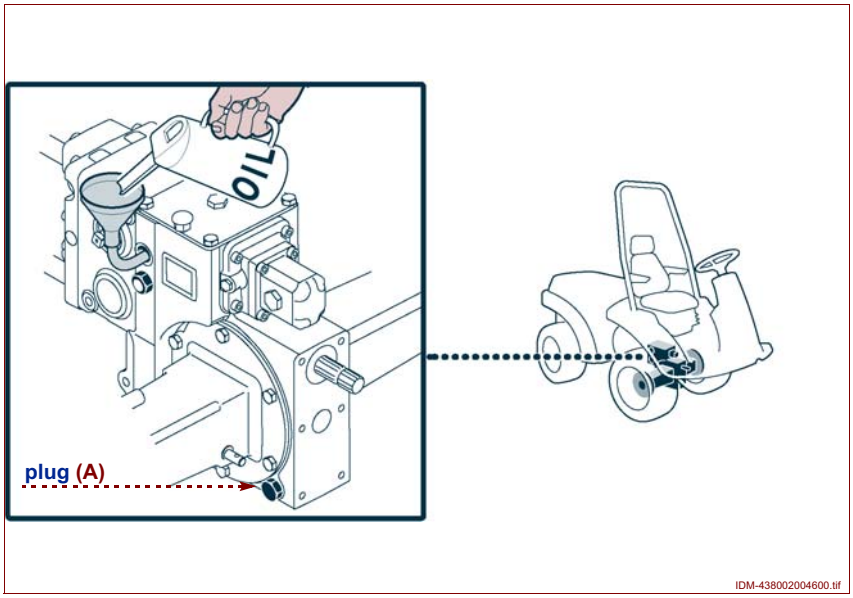
17- Refit the brake linkage rod **(M)**, washer and split pin **(L)**.
18- Repeat on the other side.
19- Attach the spring **(H)**.
20- Refit the differential linkage rod **(G)**, washer and split pin **(F)**.



21- Fit the wheel **(E)** and tighten the wheel nuts.
22- Jack up the machine, remove the stand **(C)** and the shim **(D)**, and lower the wheels to the floor.



23- Screw in the drain plug **(A)** and replace the oil drained previously, filling up to the level on the indicator.
24- Refit the fuel tank (see “Refitting the fuel tank”).
25- Refit the hydraulic lift frame (see “Refitting the lift frame”).
26- Connect the steering cylinder (see “Refitting the cylinder”).
27- Refit the platform (see Assembling the seat and platform”).
28- Refit the steering wheel and column (see “Assembling the steering wheel and column”).

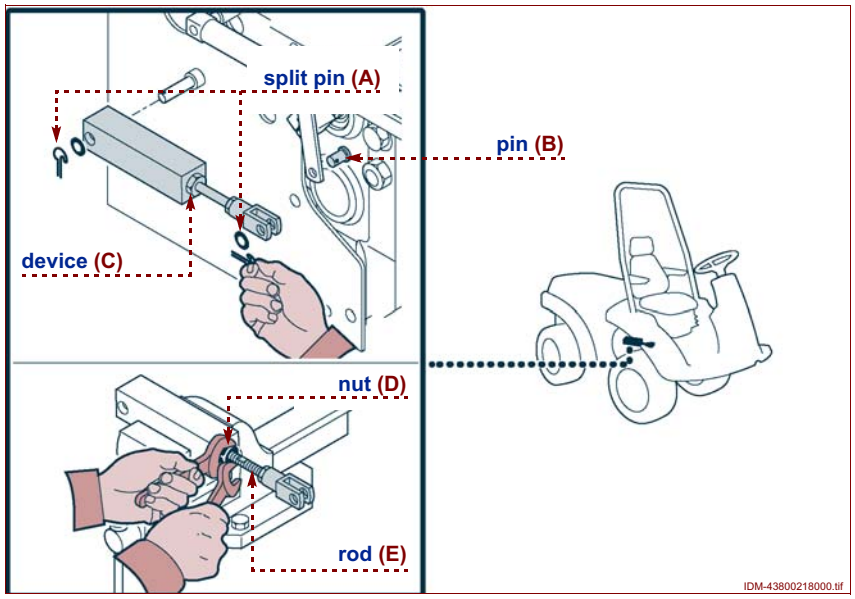


Setting the neutral position adjuster

This adjustment is needed to ensure that the machine does not creep when the engine is running, with no pedals depressed. This condition is obtained when the pump of the hydrostatic transmission is in the neutral position. To make the adjustment, proceed as follows.

Taking up end float

1 - Remove the split pins **(A)** and the pivot **(B)**, and detach the adjuster **(C)**.
2 - Clamp the adjuster **(C)** in a vice.
3 - Lock the rod **(E)** against rotation and turn the nut **(D)** to eliminate end float.



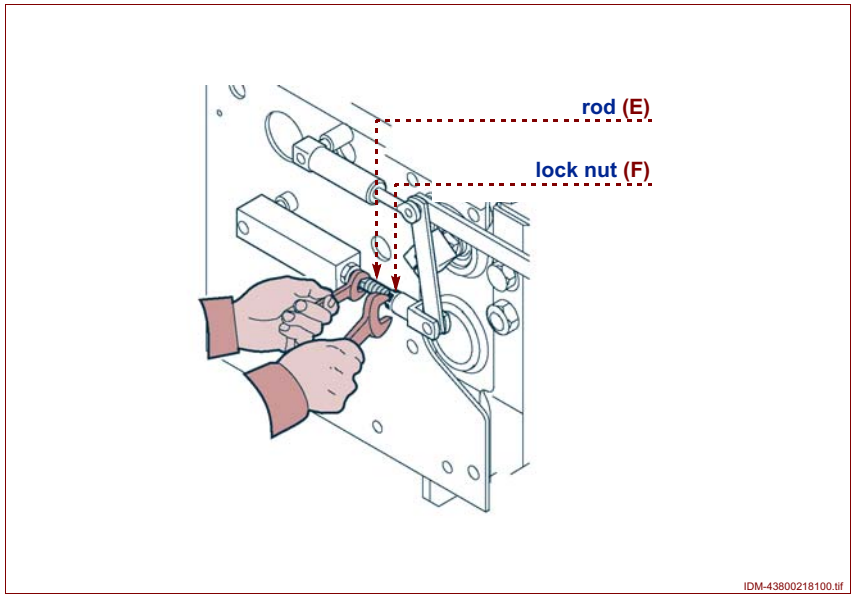
4.1

Important!

End float is eliminated only in a predetermined and exact position; accordingly, if the nut (D) is too tight or too slack, there will be a degree of end float.

Finding the neutral position of the pump

1 - Refit the device **(C)**.
2 - Start up the engine and, without depressing the pedals, check that there is no uncontrolled movement.
3 - If the adjustment is not correct, slacken the lock nut **(F)** and turn the rod **(E)** one way or the other, as appropriate, so as to find the point at which the machine remains stationary.
4 - Retighten the lock nut **(F)** when done.

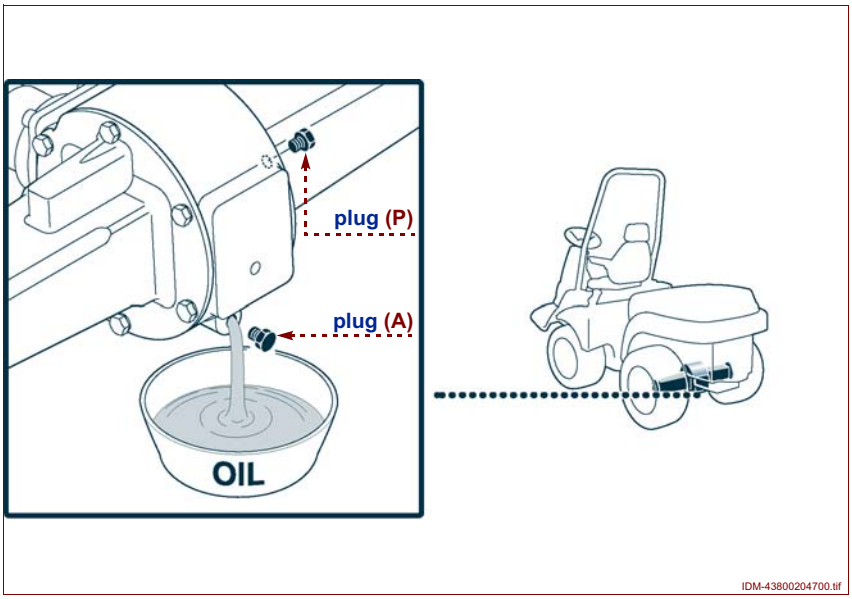


REAR AXLE 4.2

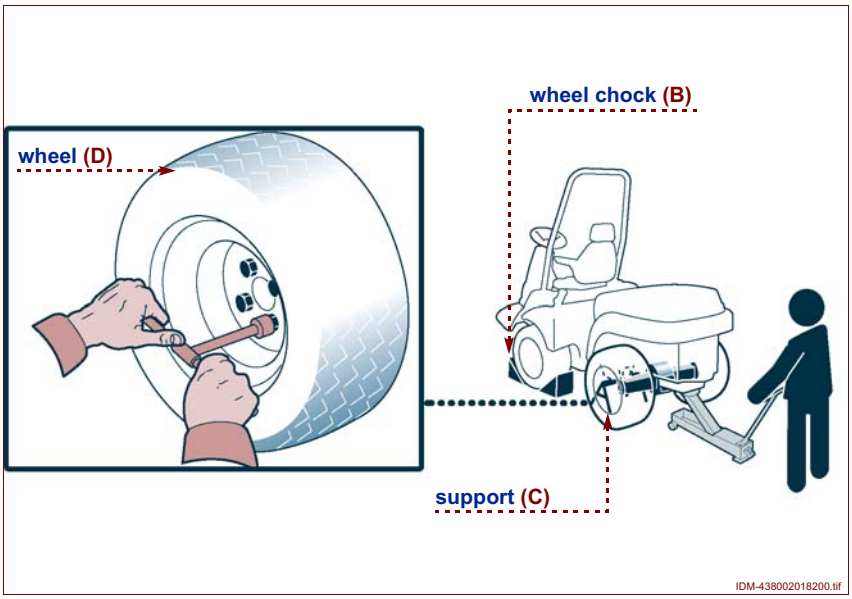
Removing the rear axle

Proceed as follows.

1 - Position a vessel of suitable capacity under the drain plug **(A)**.
2 - Unscrew the filler plug **(P)**, then the drain plug **(A)**, and allow the oil to run off.



3 - Position wheel chocks **(B)** to immobilize the machine.
4 - Jack up the rear end and position the stand **(C)**.
5 - Loosen the wheel nuts and remove the wheels **(D)**.

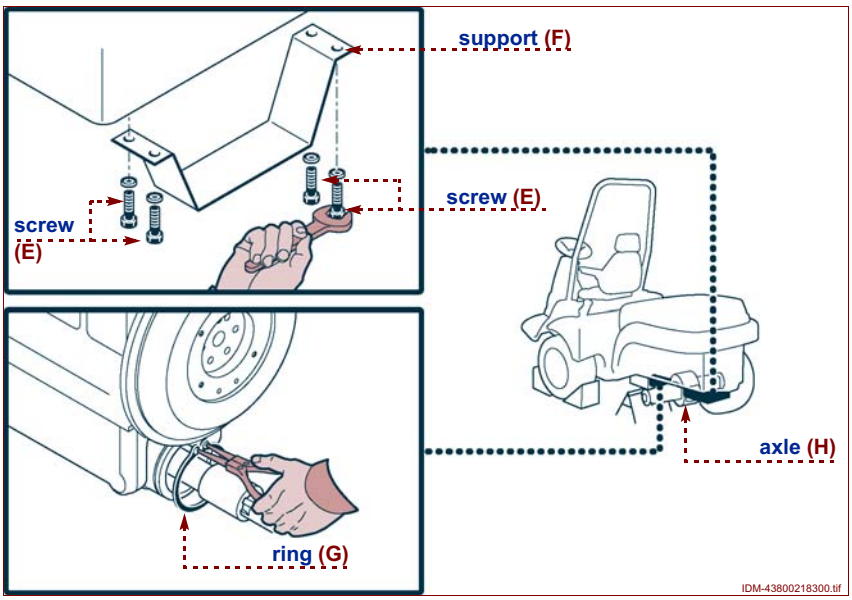


6 - Remove the battery (see “Removing the battery”).
7 - Undo the bolts **(E)** and remove the battery shelf **(F)**.

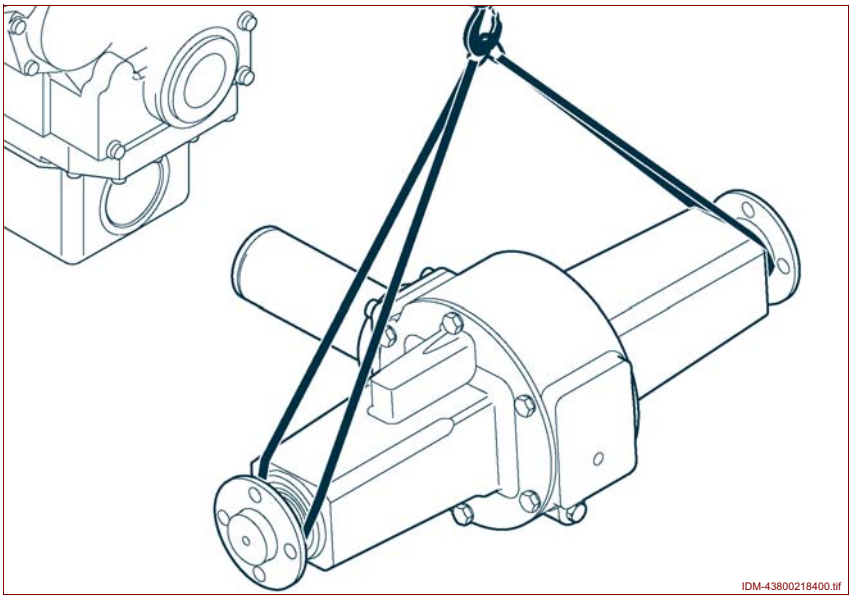
Important!

If the machine is equipped with a rear joint, this must be removed after detaching the battery shelf.

8 - Unseat the circlip **(G)** and disconnect the axle **(H)**.



9 - Sling the rear axle to a hoist so that it can be safely supported during the separation step.



4.2

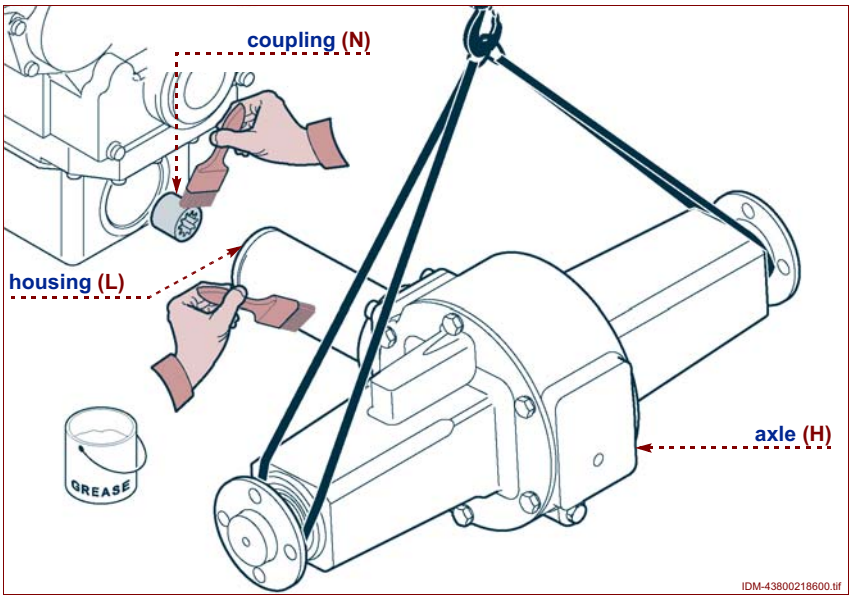
Refitting the rear axle

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

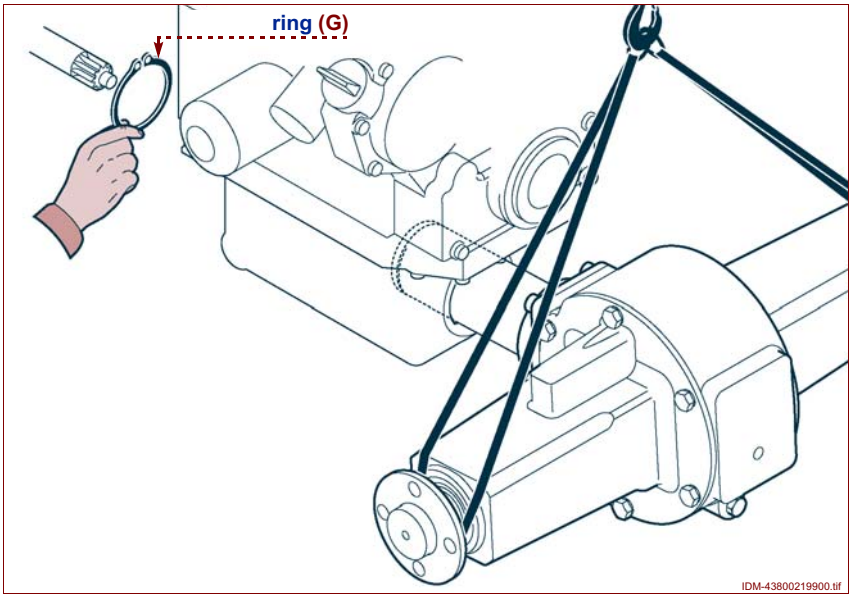
Proceed as follows.

1 - Clean all disassembled parts and ensure they are not damaged.
2 - Grease the extension **(L)** and coupling **(N)** before assembling with the shaft.
3 - Hoist the rear axle **(H)**, connect it to the engine and couple the drive shafts.



Important!

Before coupling the shafts, position the circlip (G).



IDM-C443800201.fm

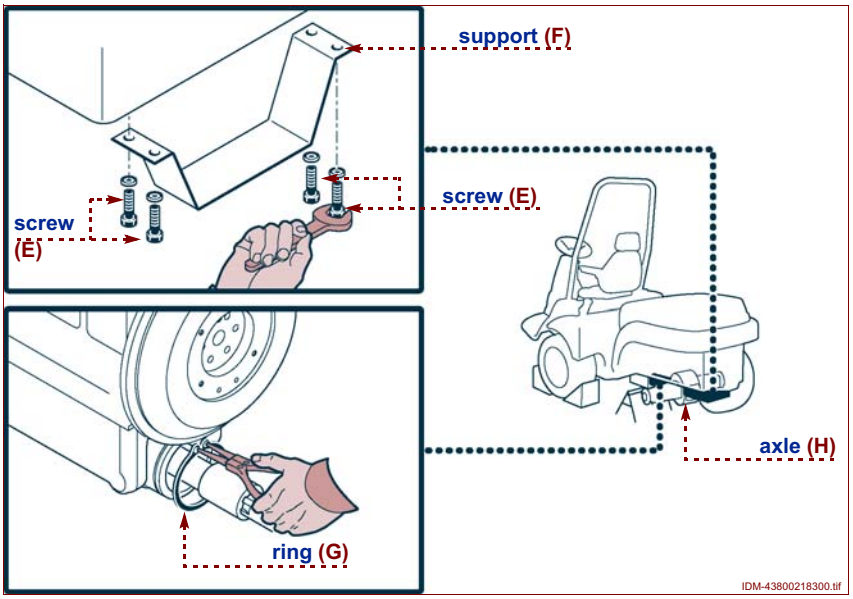
4 - Locate the circlip **(G)** in its seat to lock the axle **(H)**.

Important!

If the machine is equipped with a rear joint, this must be refitted after positioning the circlip.

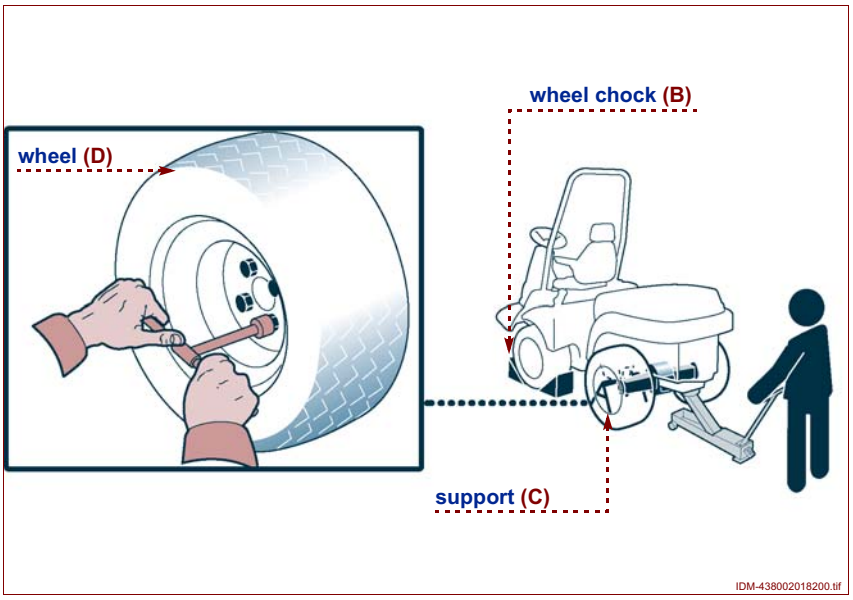
5 - Refit the battery shelf **(F)** and secure with the bolts **(E)**.

6 - Fit the battery (see “Installing the battery”).



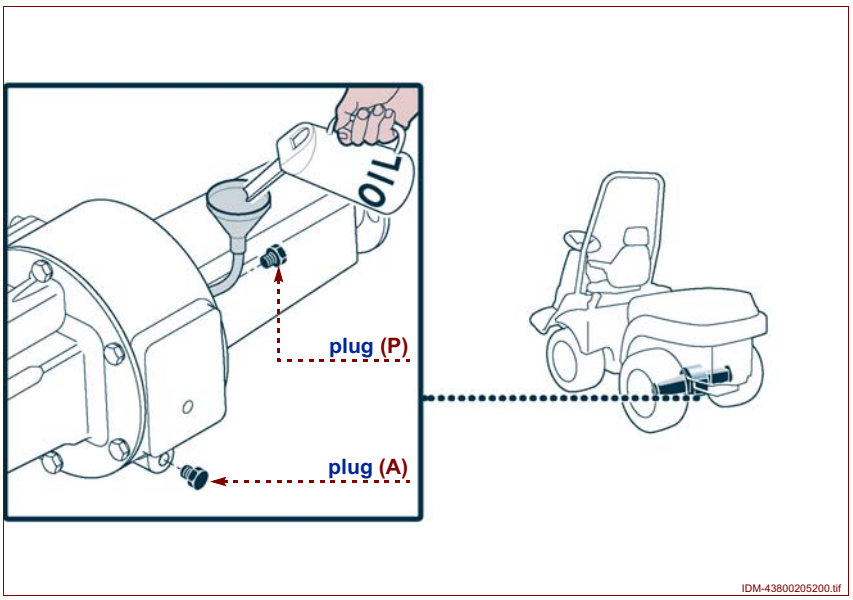
7 - Fit the wheels **(D)** and tighten the wheel nuts.

8 - Jack up the machine, remove the stand **(C)** and lower the wheels to the floor.



9 - Screw in the drain plug **(A)** and replace the oil drained previously, filling up to the level on the indicator.

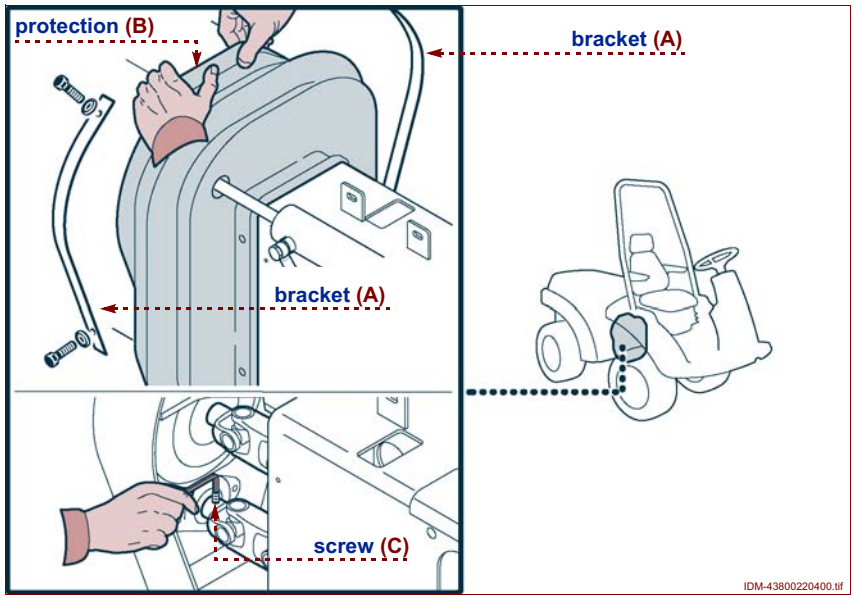
10 - Tighten the filler plug **(P)** and check for leaks.



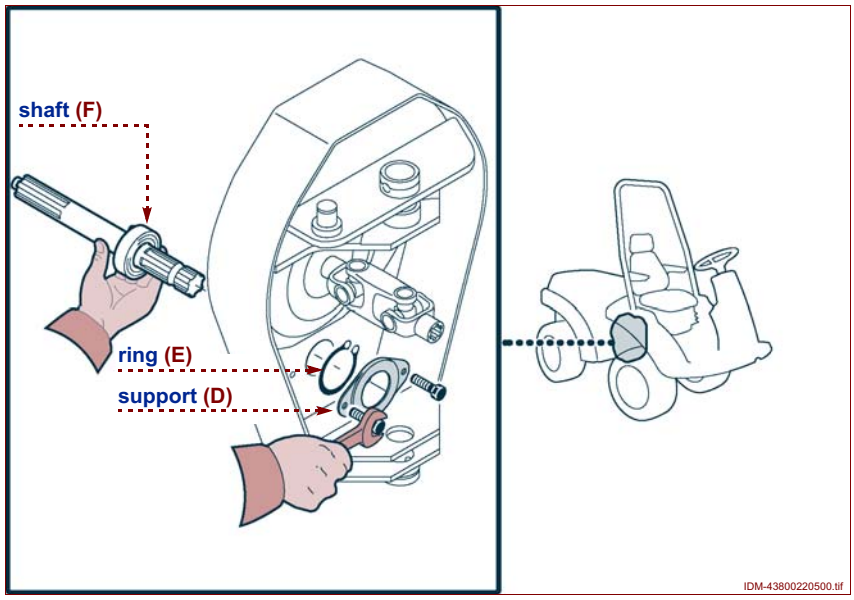
Replacing the bushes

Proceed as follows.

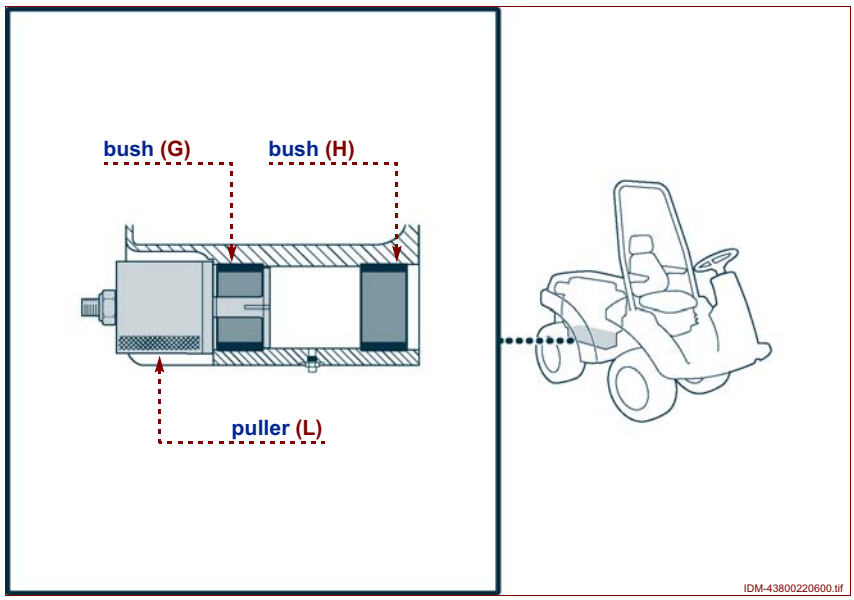
1 - Separate the rear axle (see “Removing the rear axle”).
2 - Undo the screws and remove the straps **(A)**.
3 - Remove the boot **(B)**.
4 - Undo the screw **(C)** of the bottom universal joint.



5 - Unscrew the bolts and remove the flange **(D)**.
6 - Unseat the circlip **(E)**.
7 - Draw out the drive shaft **(F)**.

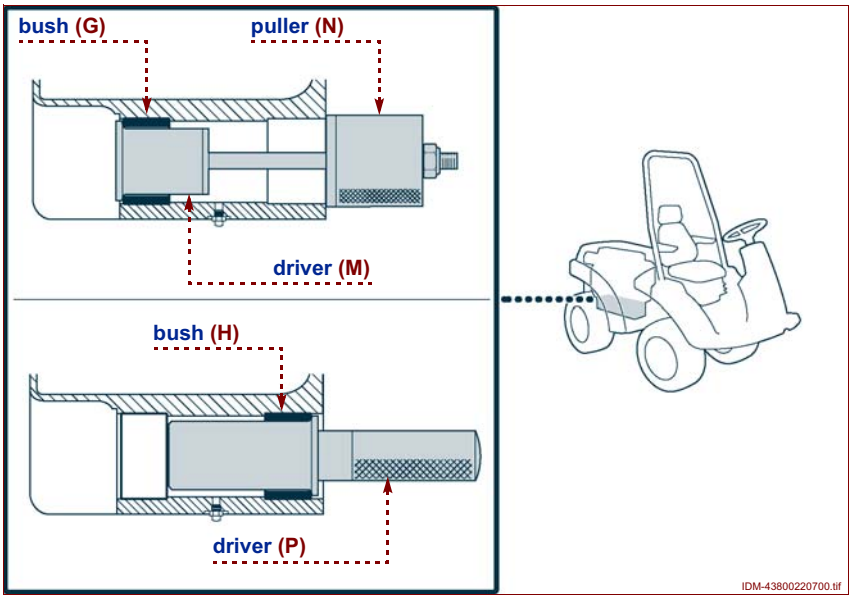


8 - Remove the bushes **(G - H)** using the puller **(L)** (AT 37981894).
9 - Replacing the bushes with new parts, being certain to grease before fitting.



IDM-C443800201.fm

10- Fit the bush **(G)** using the driver **(M)** (AT 37981914) in conjunction with the puller **(N)** (AT 37981894).
11- Fit the bush **(H)** using the driver **(P)** (AT 37981865).

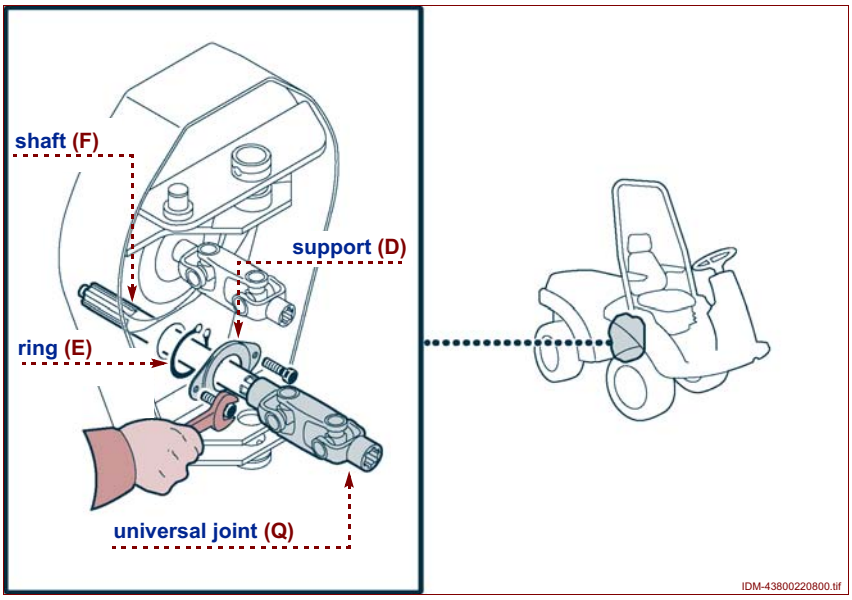


12- Refit the shaft **(F)** and connect to the bottom universal joint **(Q)**.

Important!

Before coupling the shaft to the joint, locate the circlip (E) and the flange (D)

13- Fit the circlip **(E)** and the flange **(D)**.

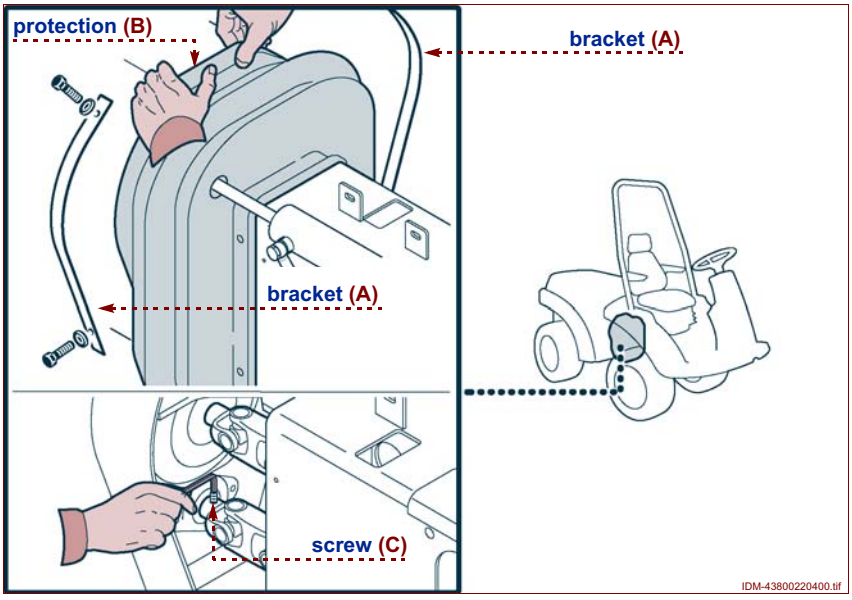


14- Tighten the screw **(C)** of the bottom universal joint.

Important!

The tip of the screw (C) must locate in the groove on the shaft.

15- Position the boot **(B)** and secure with the straps **(A)**.
16- Connect the rear axle (see “Refitting the rear axle”).



HYDROSTATIC TRANSMISSION HOUSING

Removing the housing

When the job in hand does not involve a complete overhaul of the hydrostatic transmission, but simply servicing or replacing components of the hydrostatic drive, there is no need to lift the transmission onto the bench. It will be sufficient to remove the housing. This allows all the components of the hydrostatic section (apart from the pump swash plate) to be inspected or replaced and significantly reduces the job time.

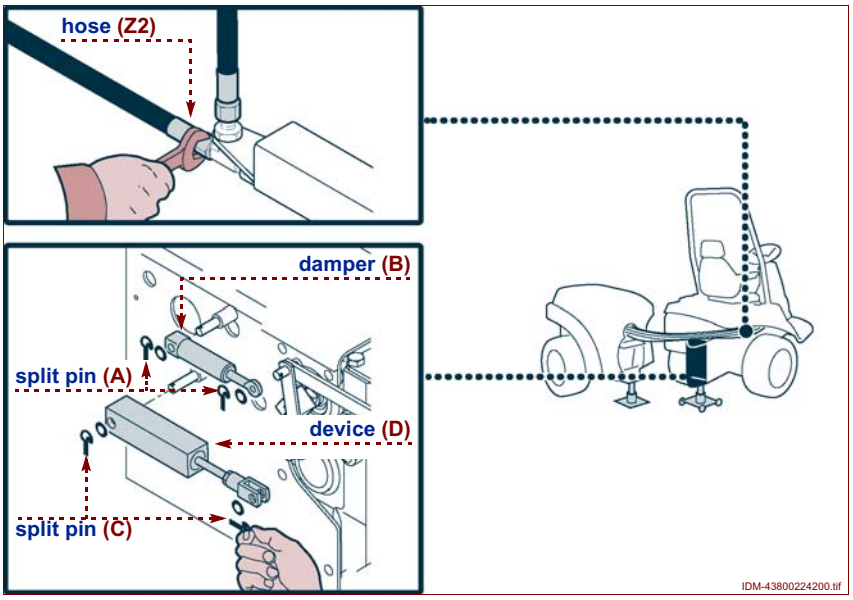
To remove the housing, proceed as follows.

1 - Remove the fuel tank (see “Removing the fuel tank”).
2 - Disassemble the central joint (see “Disassembling the central joint”).

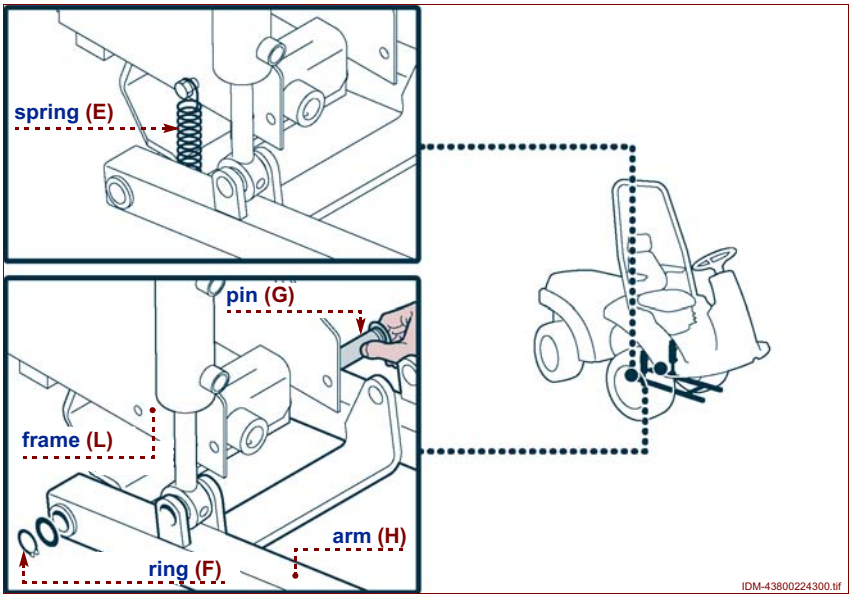
Important!

If the machine is equipped with a cab, attach the hooks of a hoist to the eyebolts so as to take the weight off the front end.

3 - Remove the split pins **(A)** and free the drive control linkage damper **(B)**.
4 - Remove the split pins **(C)** and free the neutral position adjuster **(D)**.
5 - Disconnect the hydrostatic transmission oil inlet line **(Z2)**.



6 - Detach the springs **(E)**.
7 - Unseat the circlip **(F)** and remove the pivot **(G)** to free the arms **(H)** of the lift frame **(L)**.

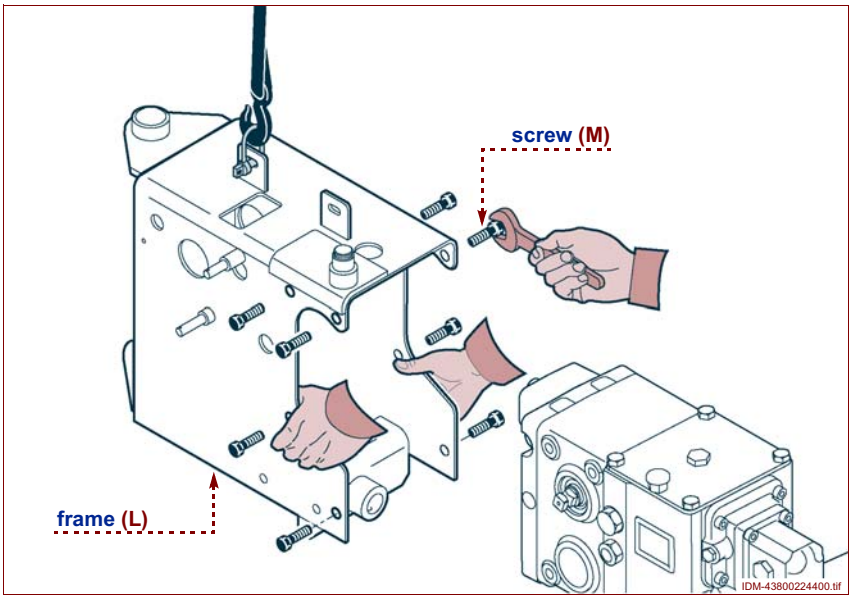


IDM-C443800201.fm

8 - Undo the bolts **(M)** and separate the frame **(L)**.

Important!

At this point, it will be possible to work on the components of the hydrostatic drive (see "Disassembling the cover and cylinder barrels").

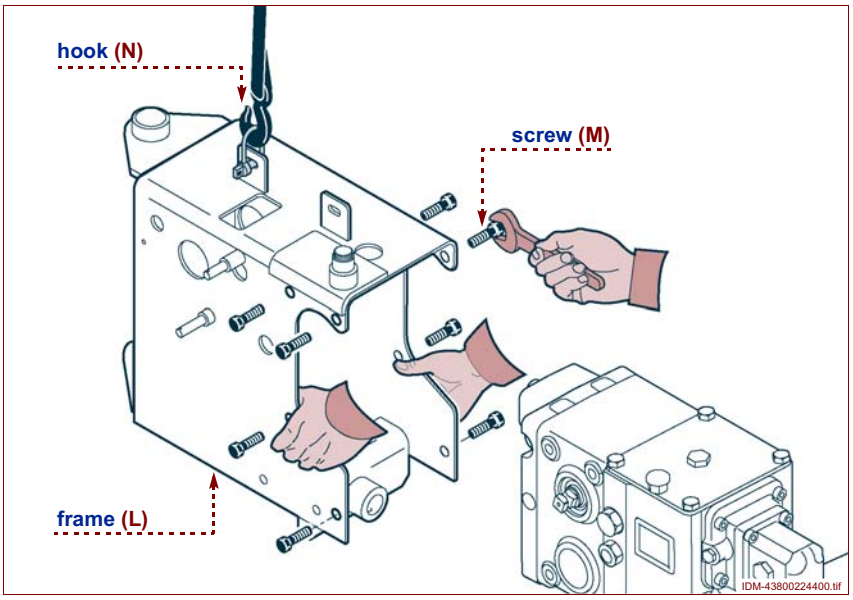


Refitting the housing

Proceed as follows.

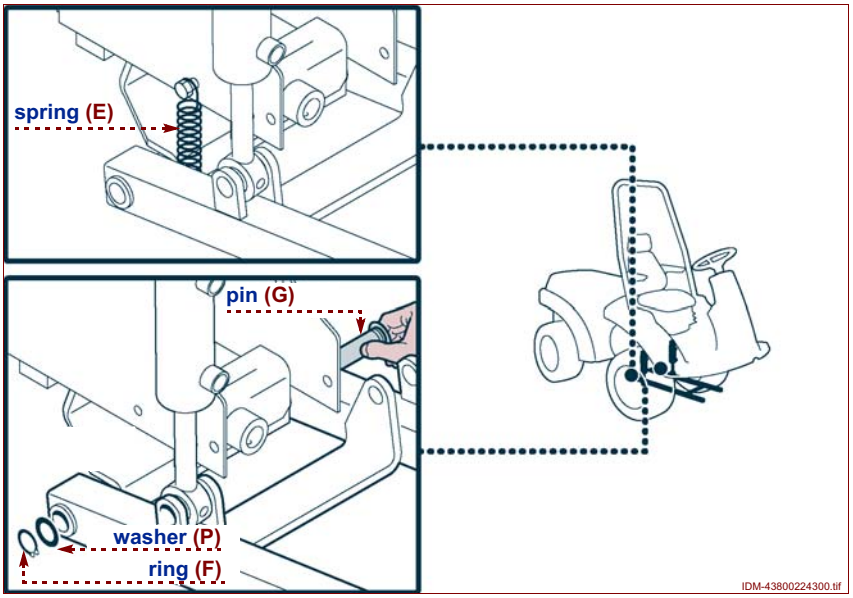
1 - Position the frame **(L)** and secure with the bolts **(M)**.

2 - Detach the lifting hook **(N)**.

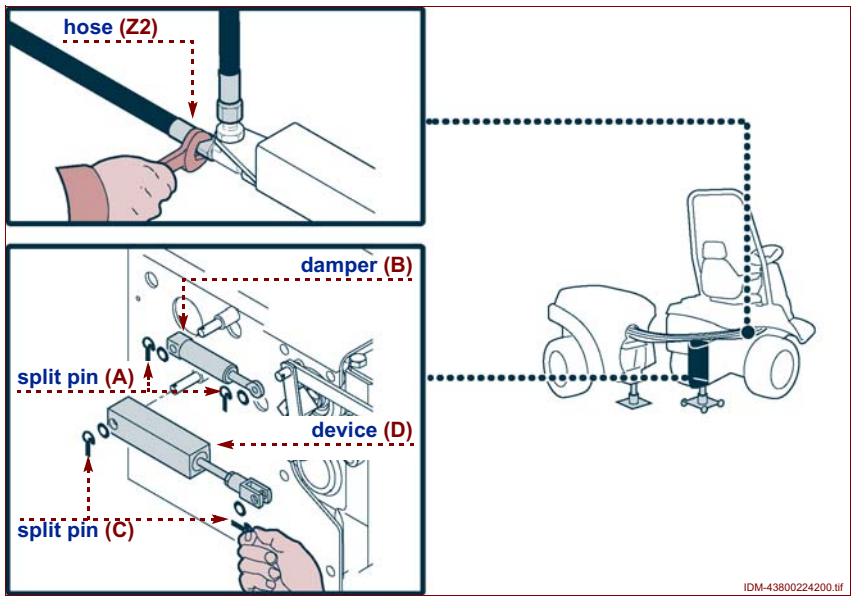


3 - Fit the pivot **(G)**, the washer **(P)** and the circlip **(F)**.

4 - Reattach the spring **(E)**.

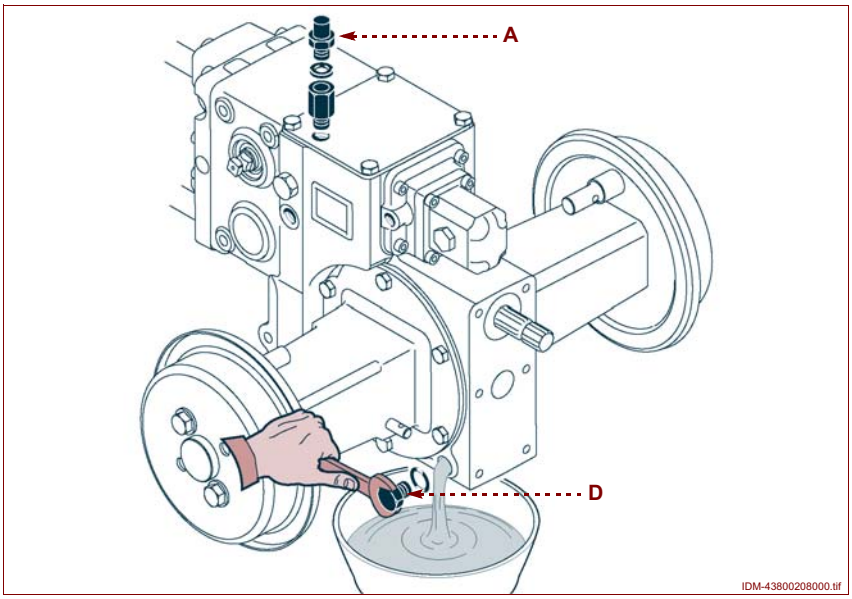


5 - Reconnect the oil line **(Z2)**.
6 - Fit the adjuster **(D)**, the washers and the split pins **(C)**.
7 - Fit the damper **(B)**, the washers and the split pins **(A)**.
8 - Assemble the central joint (see “Assembling the central joint”).
9 - Refit the fuel tank (see “Refitting the fuel tank”).

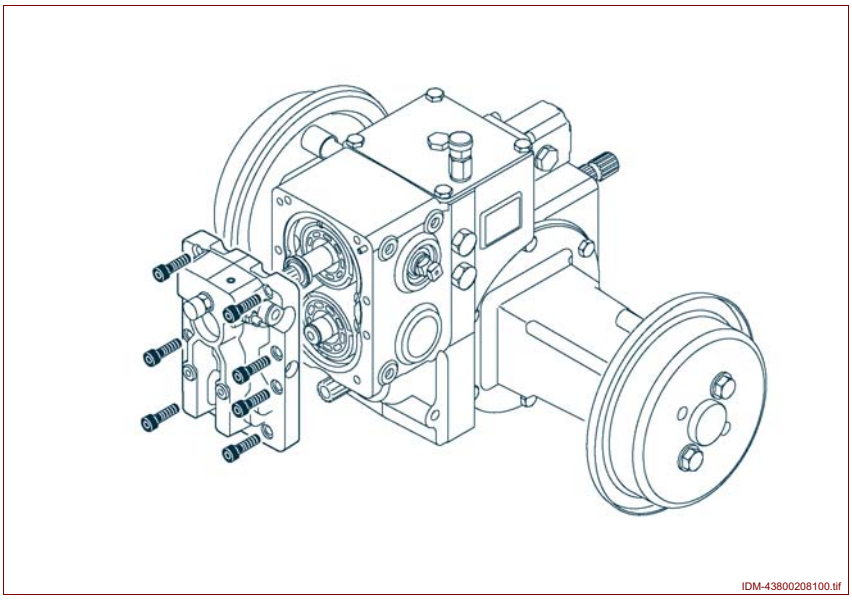


Disassembling the cover and cylinder barrels

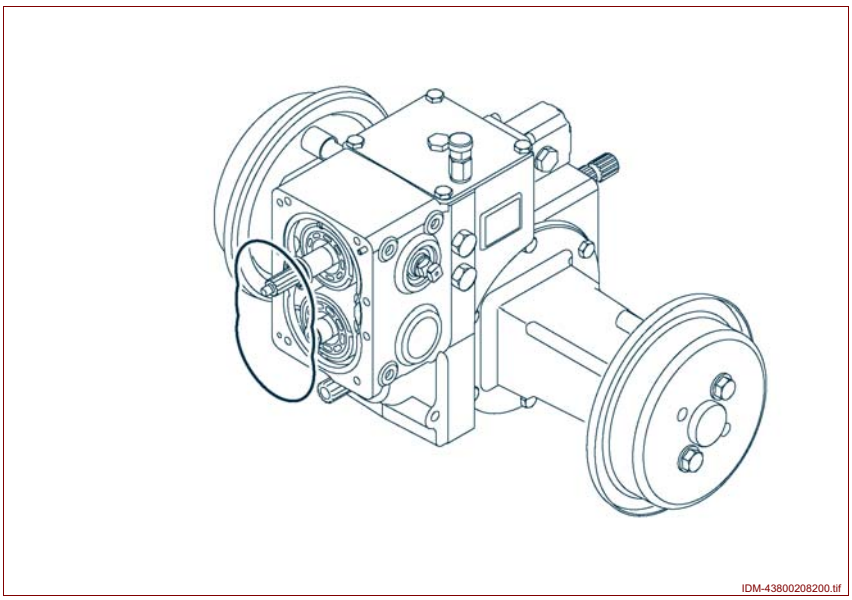
1 - Position a vessel under the drain plug **(D)** to collect the oil.
2 - Remove the drain plug **(D)**.
3 - Remove the filler plug **(A)** and its extension. Removing the washer, the oil will flow more quickly.



4 - Loosen the screws and remove the cover.

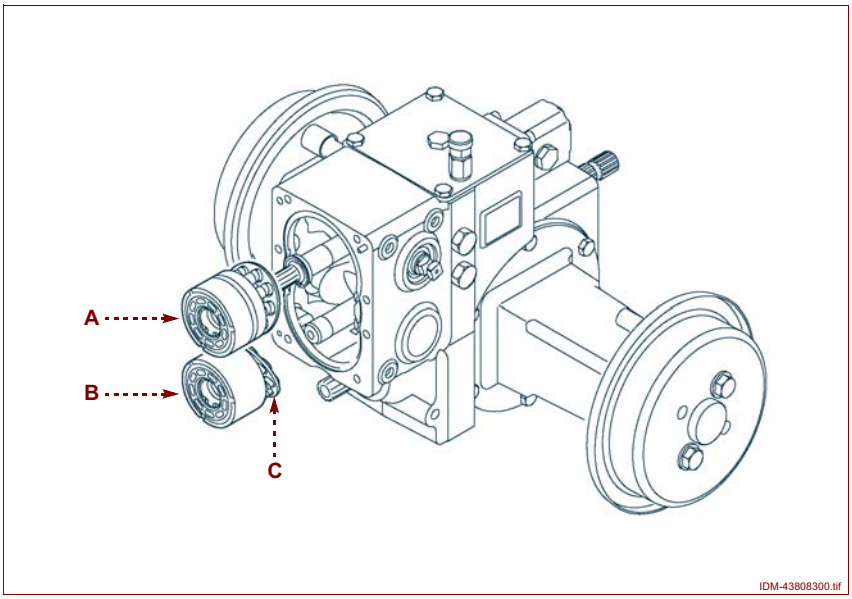


5 - Remove the O-ring from the machined face of the housing. The O-ring must be replaced if damaged.

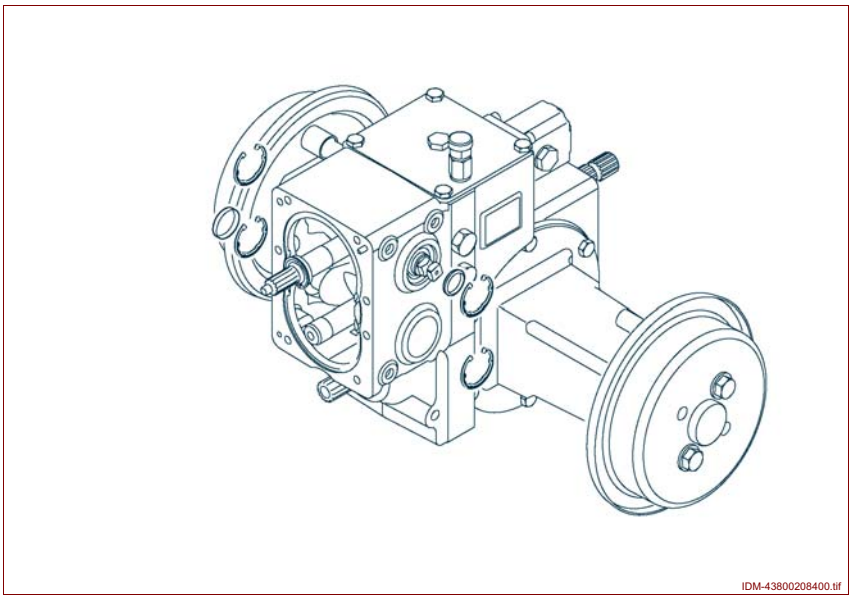


4.4

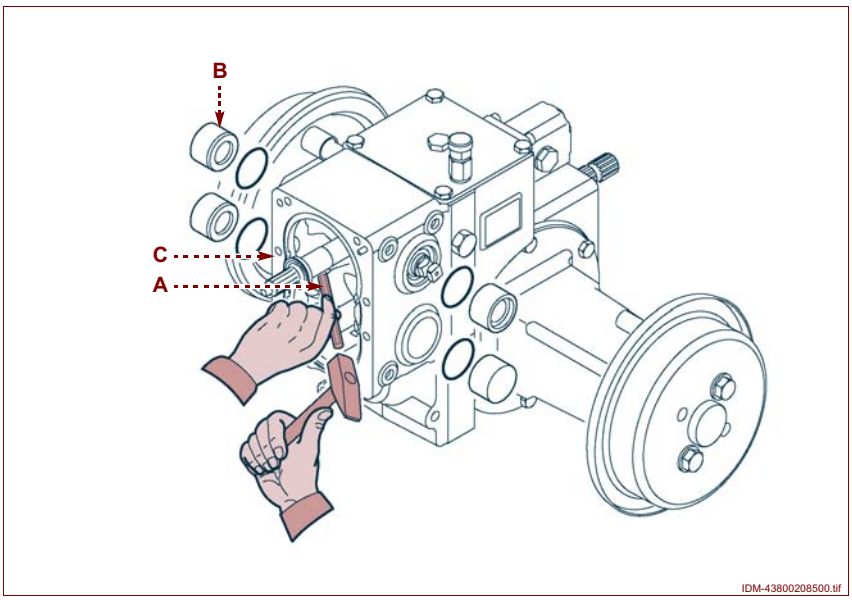
6 - Draw out the pump cylinder barrel **(A)**.
7 - Take out the pistons, which will be left inside the transmission housing.
8 - Draw out the motor cylinder barrel **(B)**, pulling the shoe retainer **(C)** with one hand so as to remove the barrel and all the pistons together.
9 - In the event of the oil creating a “suction cup” effect, the entire barrel assembly must be rotated manually on the shaft before it can be pulled out.



10 - Remove the four circlips and the two oil seals, which must be replaced with new parts.

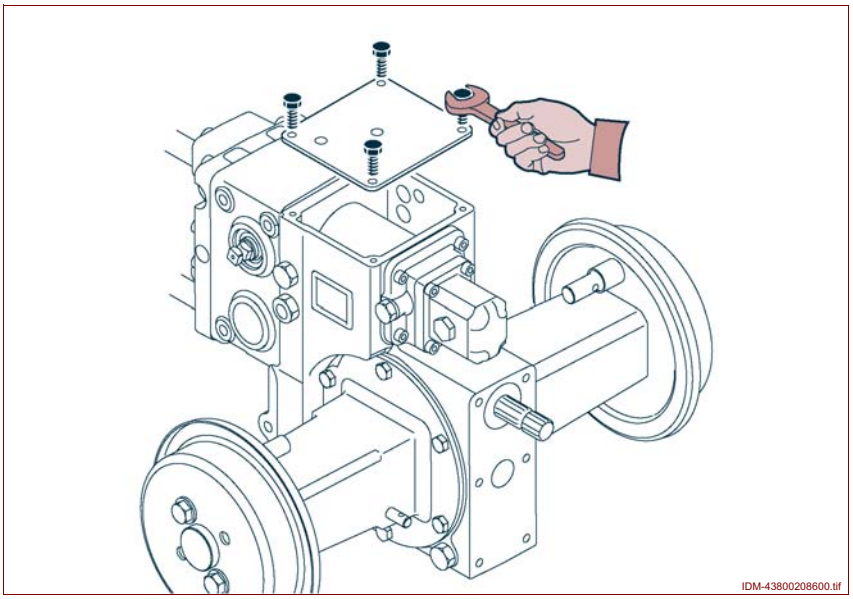


11 - Using a punch **(A)** and a plastic hammer, strike the blind bush **(B)** from inside the housing, being careful not to cause any damage to other components or seats.
12 - Take care not to damage the machined face of the housing **(C)**. Do not lever against the face with any kind of object.
13 - Strike the bush at different points around the circumference so that it is driven out uniformly.
14 - Repeat the operation for all the other bushes.
15 - All the bushes must be replaced with new parts.
16 - Remove the four O-rings, which must be replaced if damaged.

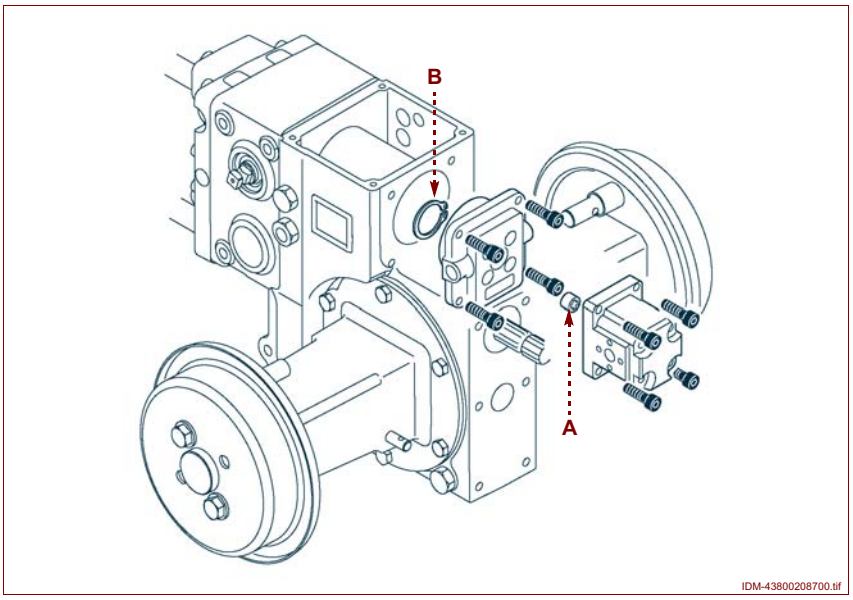


Disassembling the clutch (first version)

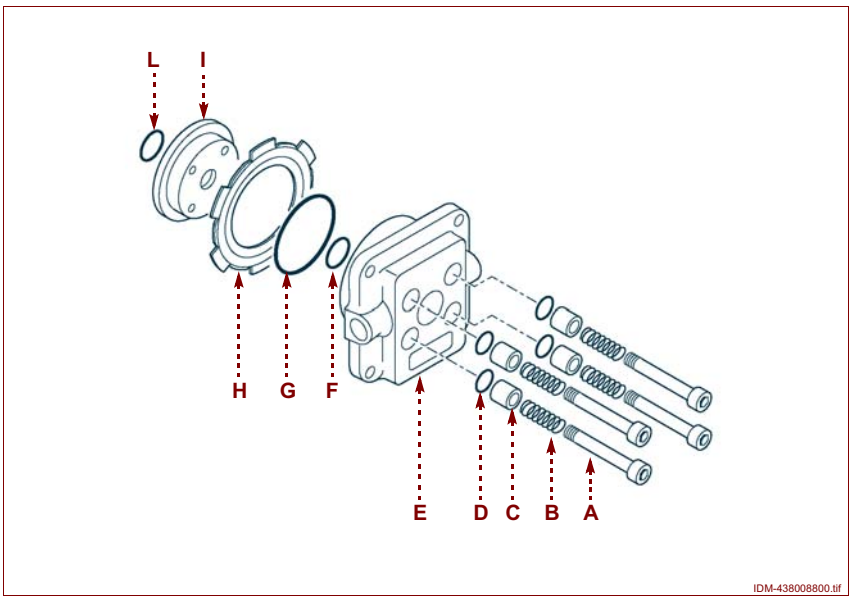
1 - Undo the bolts of the flat cover.
2 - Remove the cover, and clean the silicone sealant from the machined face of the housing.



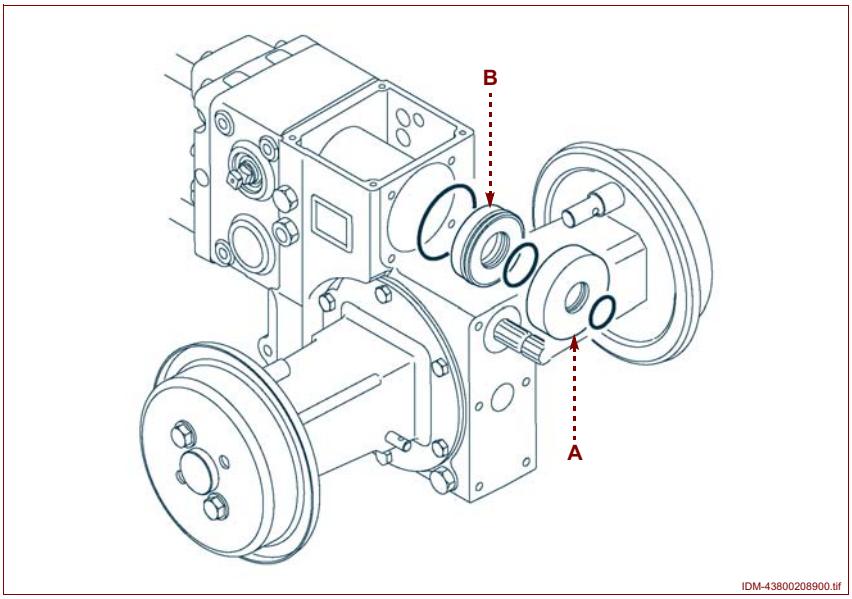
3 - Detach the gear pump.
4 - Remove the coupling **(A)**.
5 - Undo the cover screws.
6 - Remove the cover, and clean the silicone sealant from the machined face of the housing.
7 - Remove the circlip **(B)**.



8 - Remove the following parts, in sequence: screws **(A)**, outer friction disc **(H)**, brake piston **(I)**, springs **(B)** and spacers **(C)**. Separate the O-rings **(D)** and **(G)** from the cover **(E)** using a plastic screwdriver.
9 - Disassemble the slipper rings **(F)**, **(L)** from the cover **(E)** and from the brake piston **(I)**.

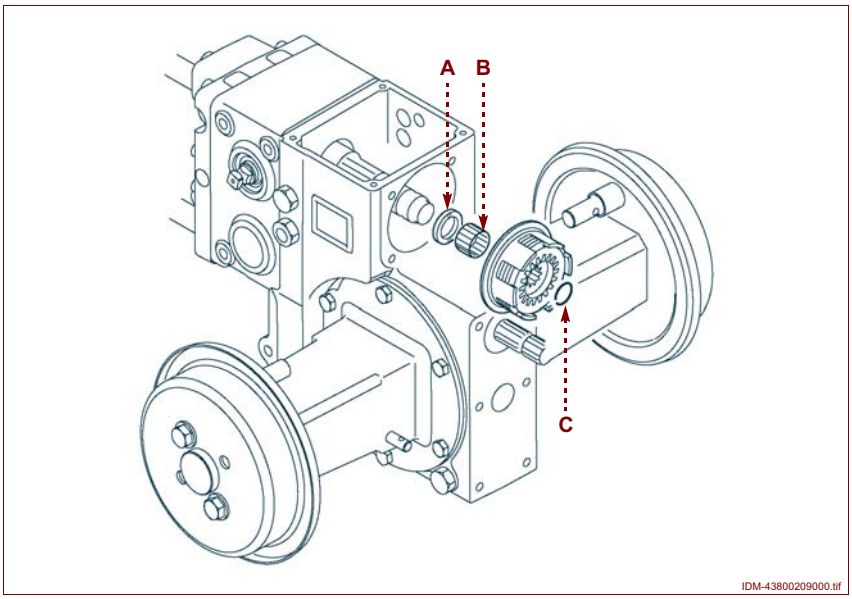


10- Unseat the circlip and remove the cylinder **(A)** and piston **(B)**; if the cylinder **(A)** cannot be removed without assistance, use two M4 jacking screws fitted to the holes provided.
11- If necessary, use a puller to remove the piston **(B)**.
12- Disassemble the one external and the two internal O-rings.

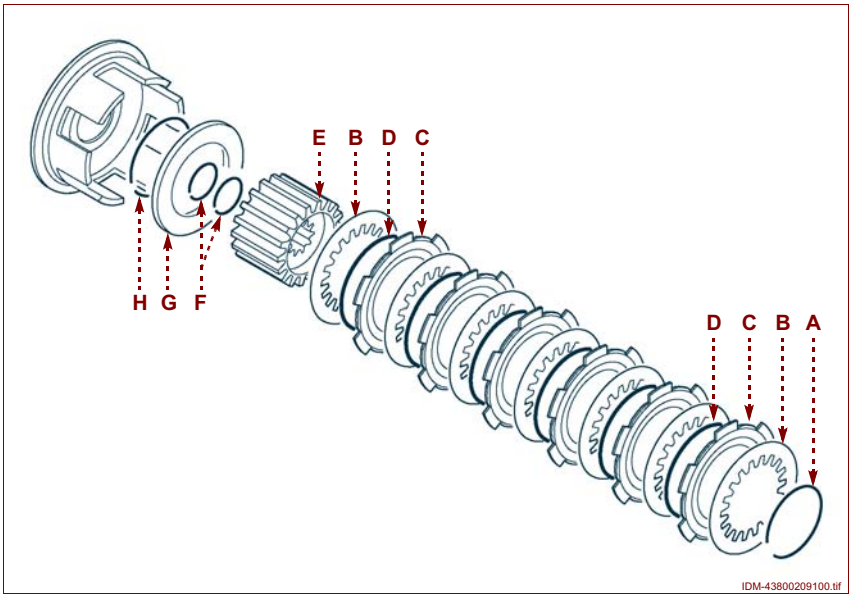


13- Remove the circlip **(C)**.
14- Draw out the clutch assembly.
15- Remove the needle bearing **(B)** and the bronze thrust washer **(A)**, if necessary.

4.4



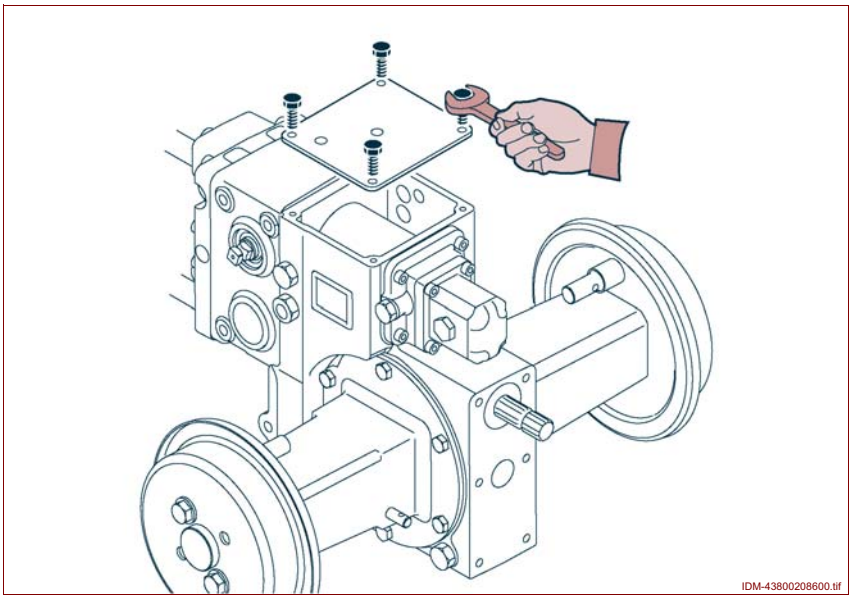
16- Remove the following parts, in sequence: abutment ring **(A)**, inner friction disc **(B)**, outer friction disc **(C)**, belleville disc **(D)**..... sleeve **(E)**, shaft abutment rings **(F)**, reaction disc **(G)**, abutment ring **(H)**.



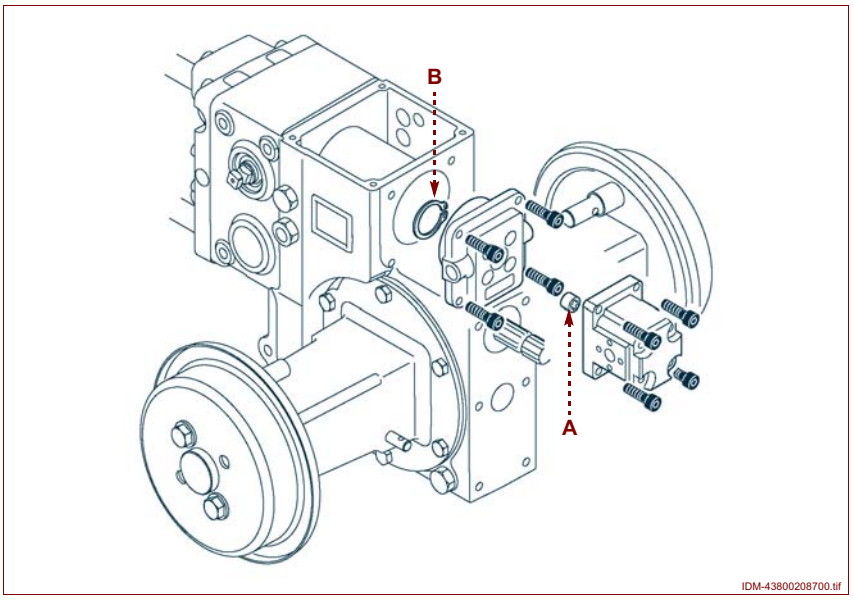
IDM-C443800201.fm

Disassembling the clutch (second version)

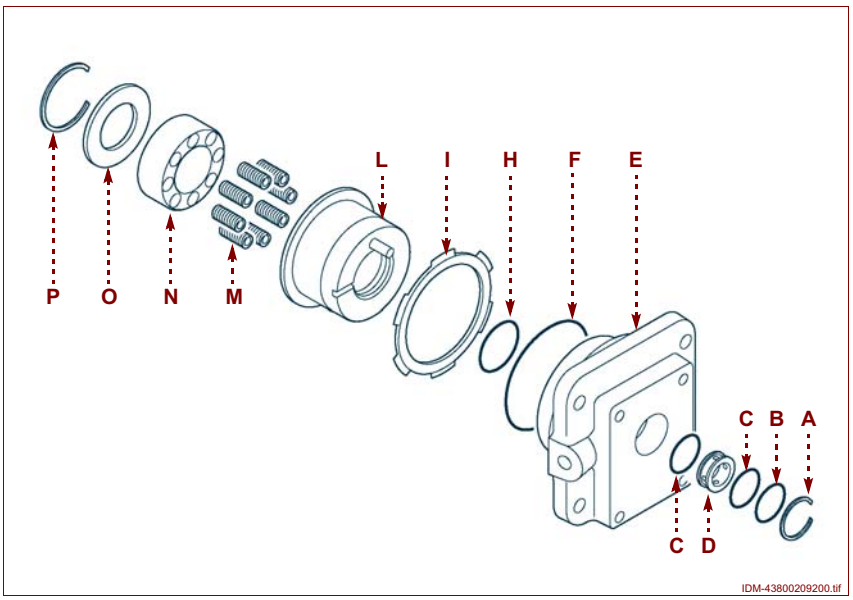
1 - Undo the bolts of the flat cover.
2 - Remove the cover, and clean the silicone sealant from the machined face of the housing.



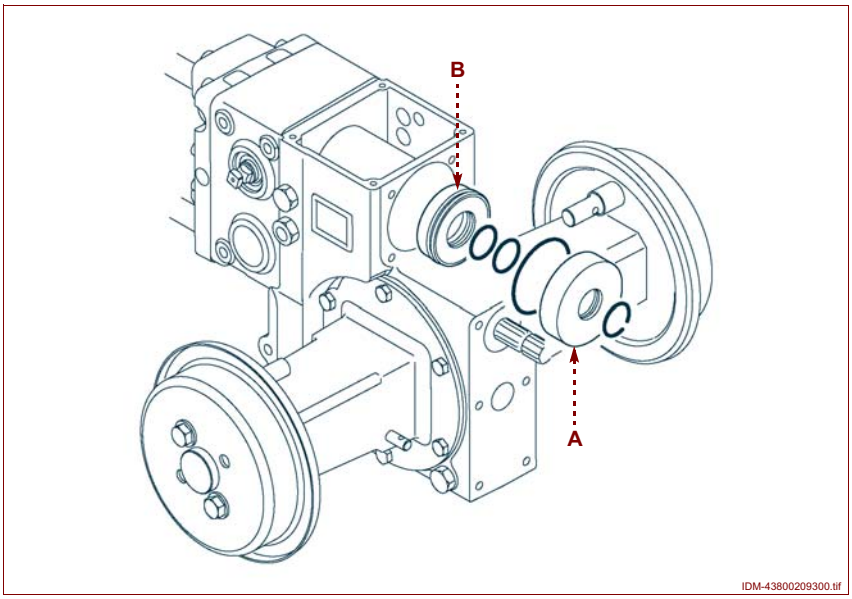
3 - Detach the gear pump.
4 - Remove the coupling **(A)**.
5 - Undo the cover screws.
6 - Remove the cover, and clean the silicone sealant from the machined face of the housing.
7 - Remove the circlip **(B)**.



8 - Remove the following parts, in sequence: abutment ring **(A)**, spacer **(B)**, O-ring **(C)**, spacer **(D)**, O-ring **(C)**, cover **(E)**, O-ring **(F)**, O-ring **(H)**, friction disc **(I)**, brake piston **(L)**, springs **(M)**, divider **(N)**, spring seat washer **(O)** and circlip **(P)**.

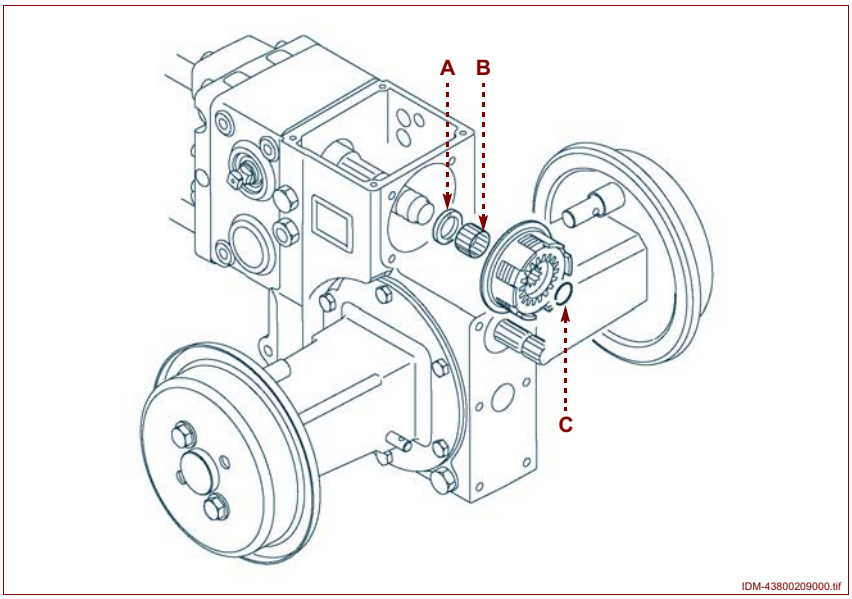


9 - Unseat the circlip and remove the cylinder **(A)** and piston **(B)**; if the cylinder **(A)** cannot be removed without assistance, use two M4 jacking screws fitted to the holes provided.
10 - If necessary, use a puller to remove the piston **(B)**.
11 - Disassemble the one external and the two internal O-rings.

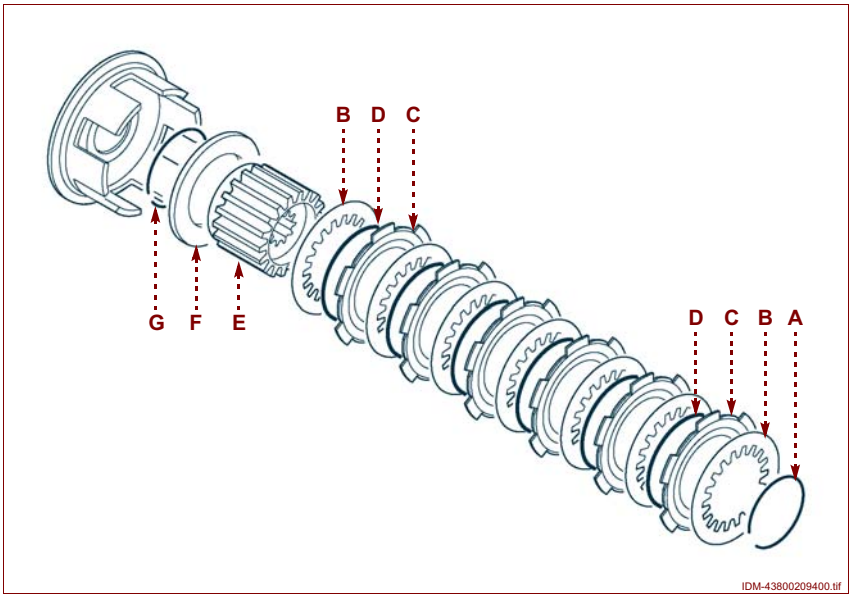


12 - Remove the circlip **(C)**.
13 - Draw out the clutch assembly.
14 - Remove the needle bearing **(B)** and the bronze thrust washer **(A)**, if necessary.

4.4



15 - Remove the following parts, in sequence: abutment ring **(A)**, inner friction disc **(B)**, outer friction disc **(C)**, belleville disc **(D)**..... sleeve **(E)**, reaction disc **(F)**, abutment ring **(G)**.



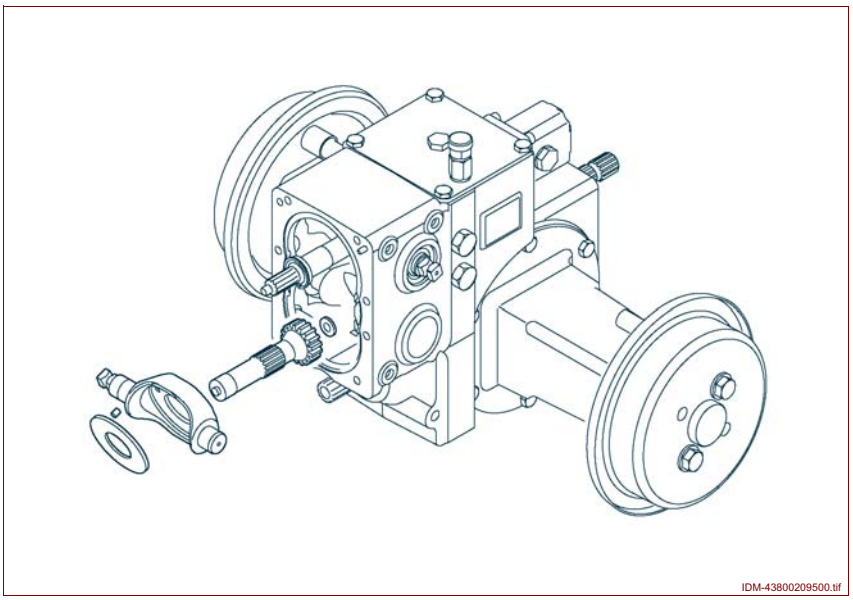
IDM-C443800201.fm

Disassembling the swash plates

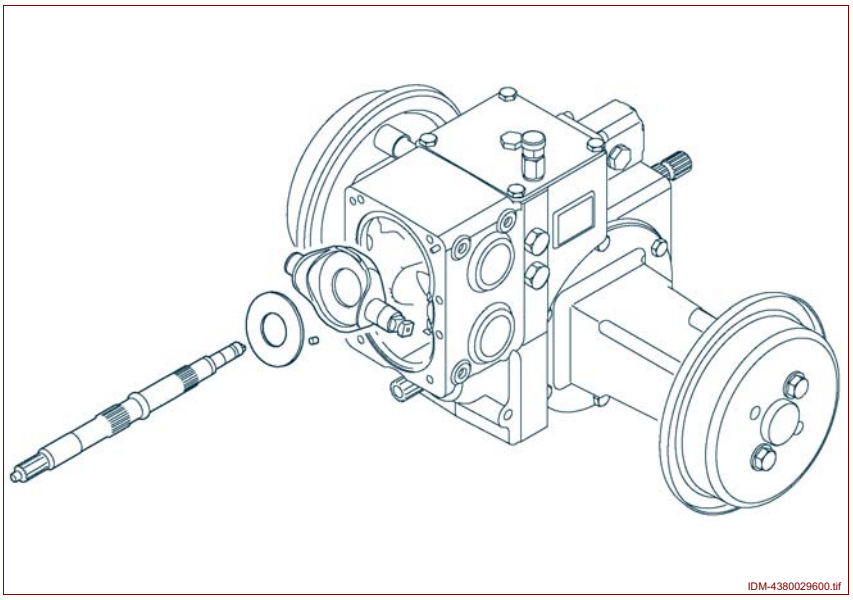
Important!

Before proceeding, mark the angled position of the swash plates to facilitate refitment subsequently.

1 - Draw the motor swash plate and shaft from the housing, being careful not to cause any damage to other components or seats.
2 - Separate the shaft from the swash plate.
3 - Remove the anti-friction washer and dowel if necessary.


IDM-43800209500.tif

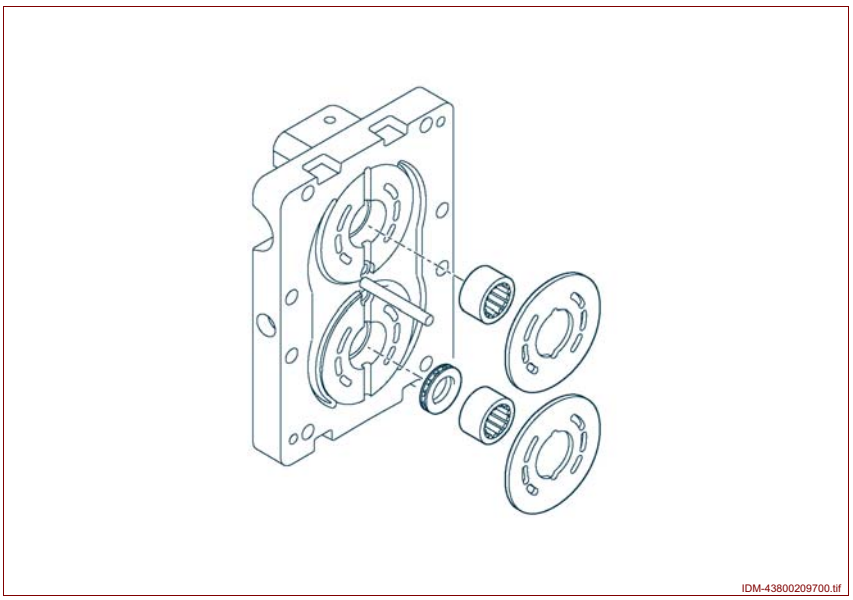
4 - Draw the pump swash plate and shaft from the housing, being careful not to cause any damage to other components or seats.
5 - Separate the shaft from the swash plate.
6 - Remove the anti-friction washer and dowel if necessary.
7 - Reposition the bearing in its seat, if dislodged.
8 - Clean grease and oil from all components.


IDM-4380029600.tif

4.4

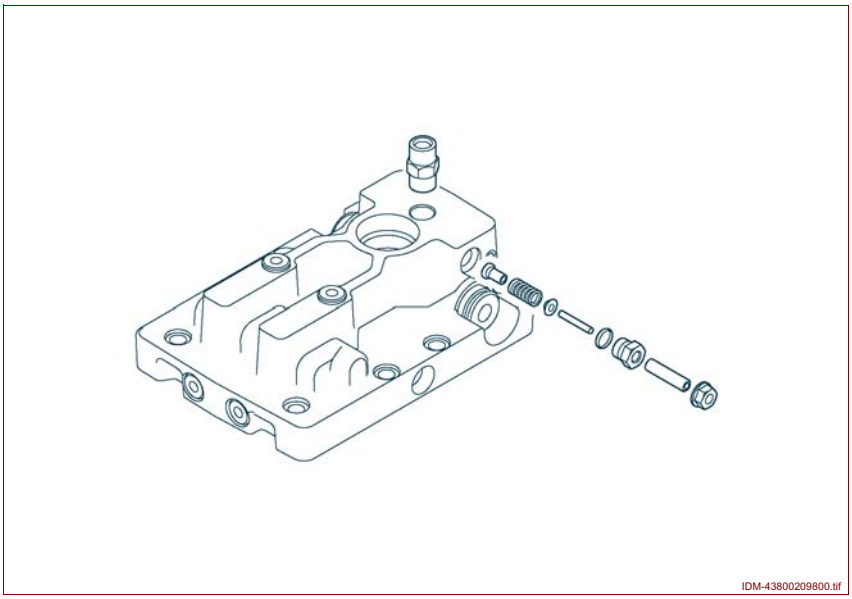
Disassembling the cover

1 - Remove the valve plates, clean off oil and grease.
2 - Remove the two needle bearings from the cover, using a puller only if absolutely necessary.
3 - Discard the needle bearings if damaged.

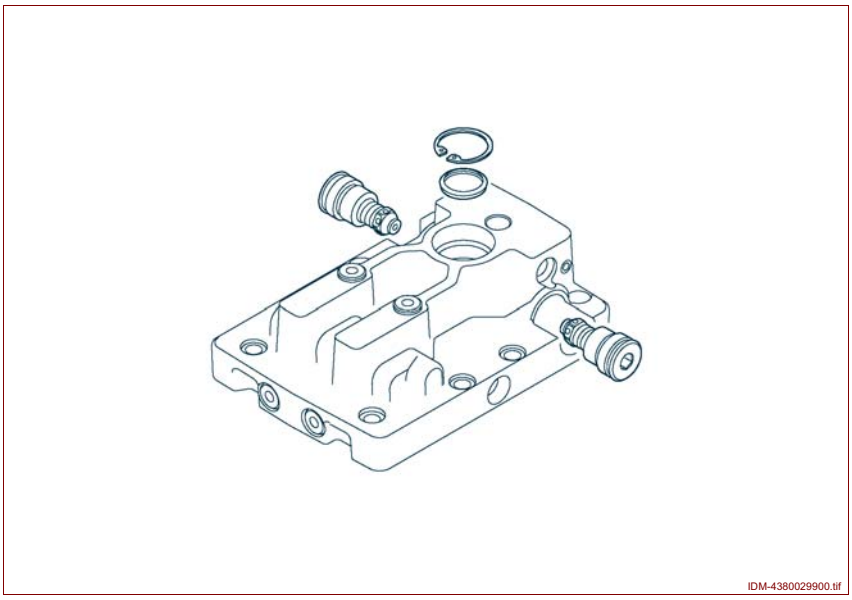

IDM-43800209700.tif

IDM-C443800201.fm

4 - Unscrew the inlet valve and disassemble, being careful to note the sequence of the parts.

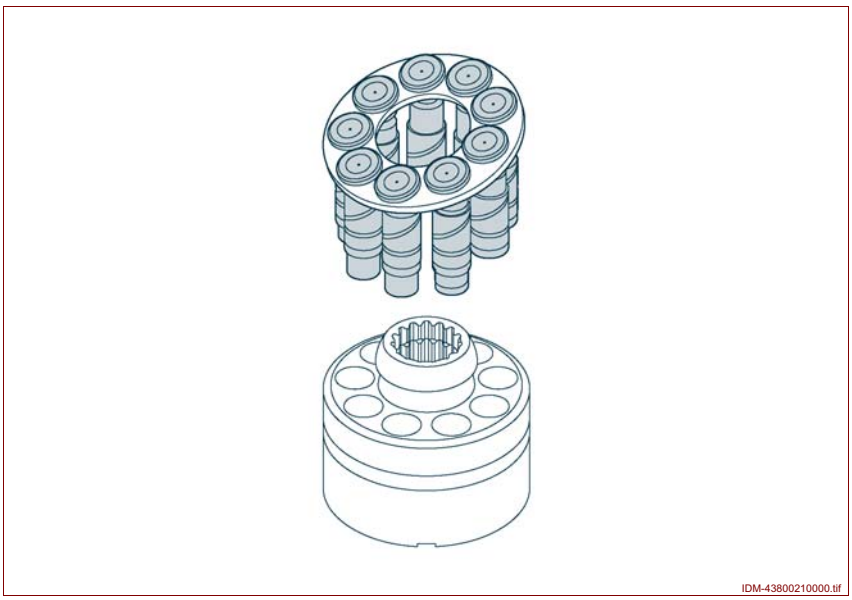


5 - Unscrew the two relief valves.
6 - Discard the valves if damaged.
7 - Unseat the circlip.
8 - Remove the oil seal if damaged.

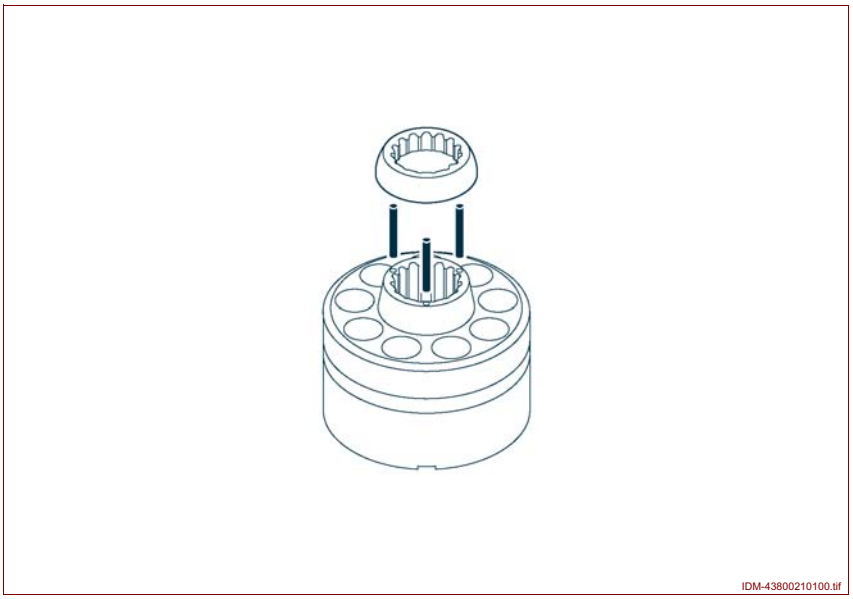


Disassembling the cylinder barrels

1 - Take hold of the shoe retainer and draw the pistons from the barrel.
2 - Separate the pistons from the shoe retainer.

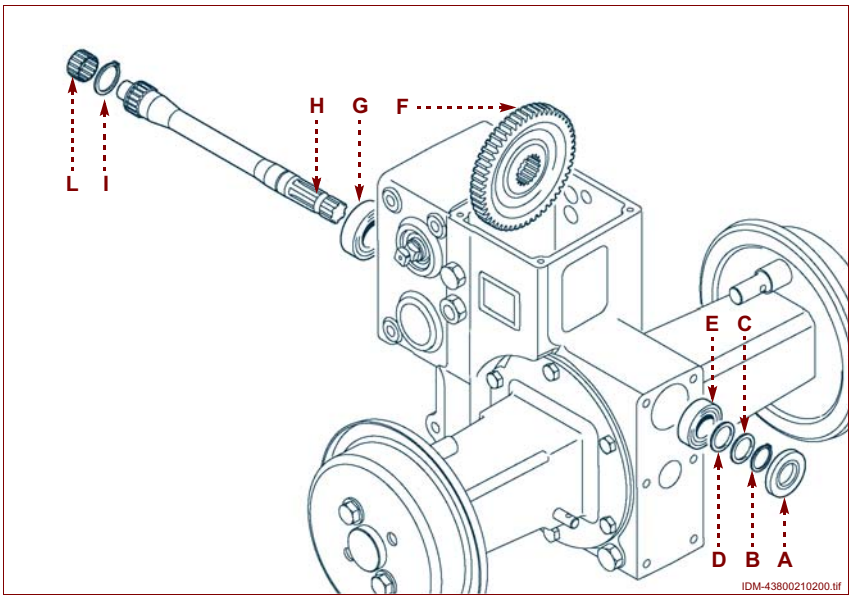


3 - Remove the ballguide and the three pins.
4 - Repeat the operations on the other cylinder barrel.
5 - Clean grease and oil from all components.


IDM-43800210100.tif

Removing the PTO shaft

1 - Disassemble the oil seal **(A)**, circlip **(B)** and shims **(C)**, **(D)**.
2 - Remove the shaft **(H)** from the housing.
3 - Remove the gear **(F)** from the housing.
4 - Remove the bearing **(E)** from the housing.
5 - Separate the needle bearing **(L)** and circlip **(I)** from the shaft.
6 - Remove the bearing **(G)** from the housing.

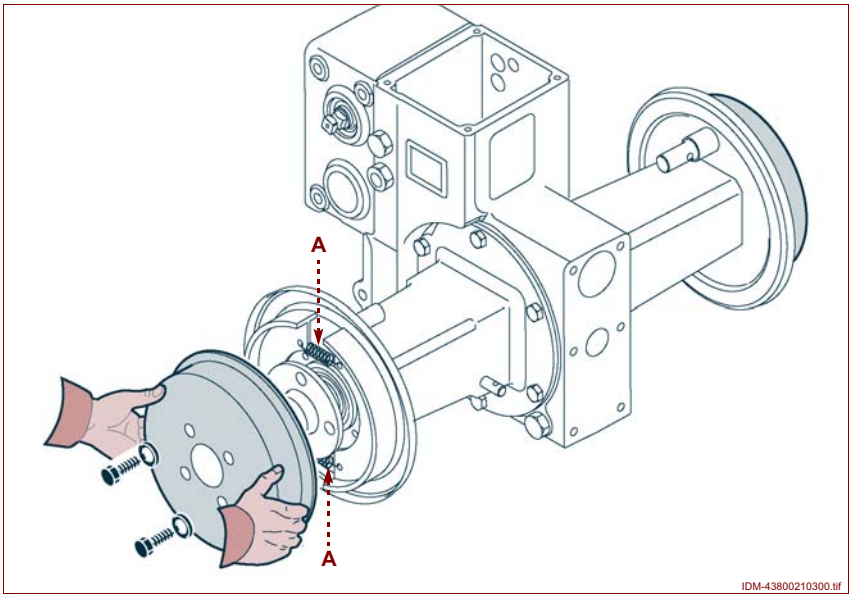


IDM-43800210200.tif

Removing the front axle

Operations on both sides.

7 - Remove the bolts and washers from the wheel hub.
8 - Remove the brake drum.
9 - Remove the brake springs **(A)**.



IDM-43800210300.tif

Operations on both sides.

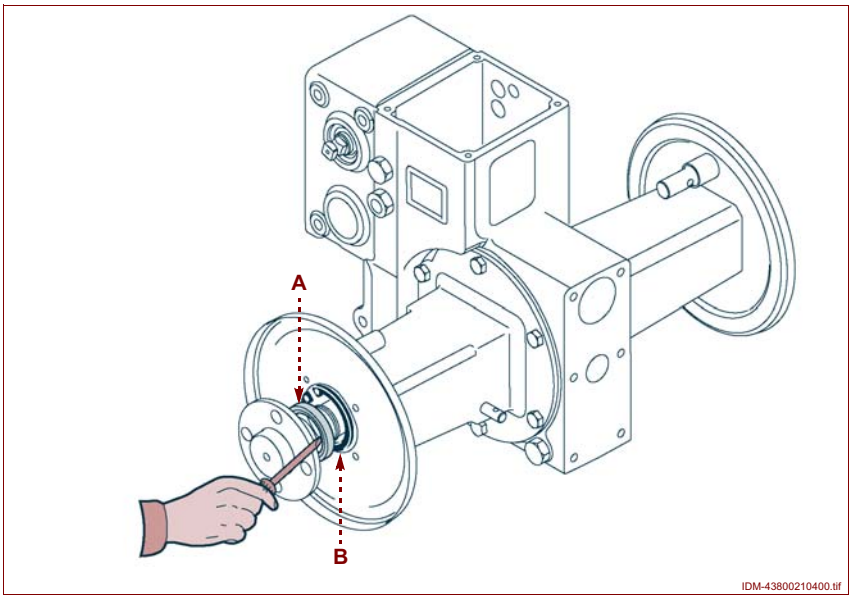
10- Remove the brake shoes.

11- Remove the oil seal **(A)** by breaking off.

12- Unseat the circlip **(B)**.

Important!

Be careful not to score the oil seal seat.

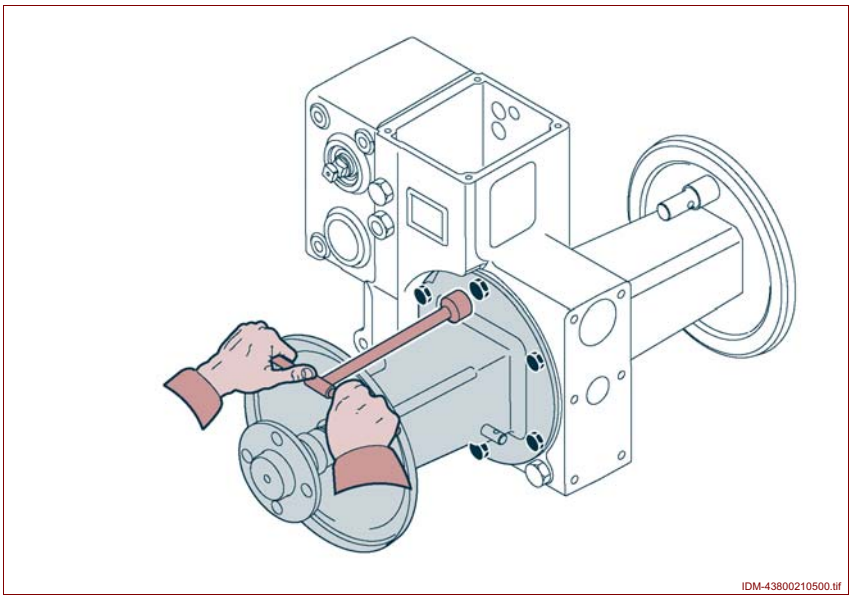


13- Undo the bolts of the trumpet housing.

14- Remove the right hand trumpet housing.

Important!

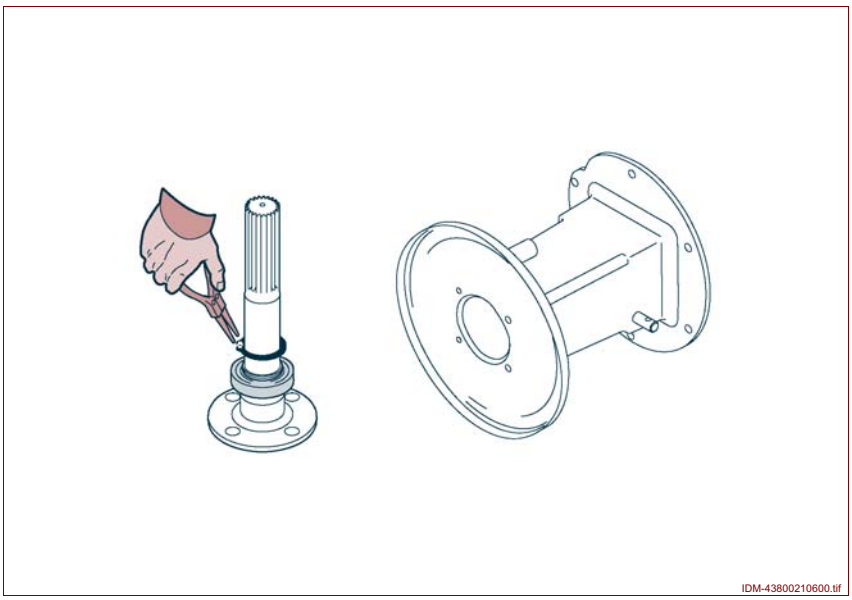
The right hand halfshaft can also be removed without detaching the trumpet housing. In this instance the differential lock must be engaged and the lever then held in the engaged position to ensure the differential lock coupler does not drop, as this would hinder refitment.



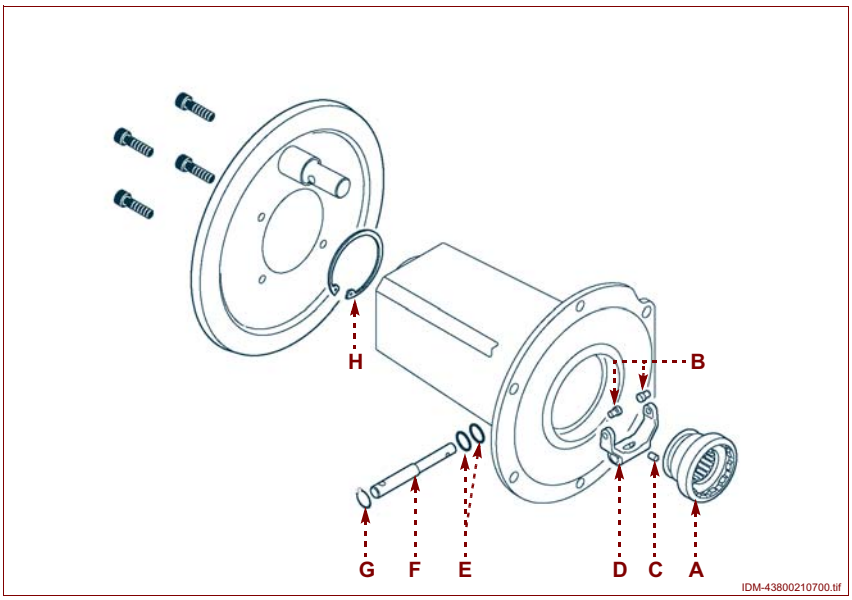
15- Remove the halfshaft from the trumpet housing, striking with a drift and hammer.

16- Remove the circlip.

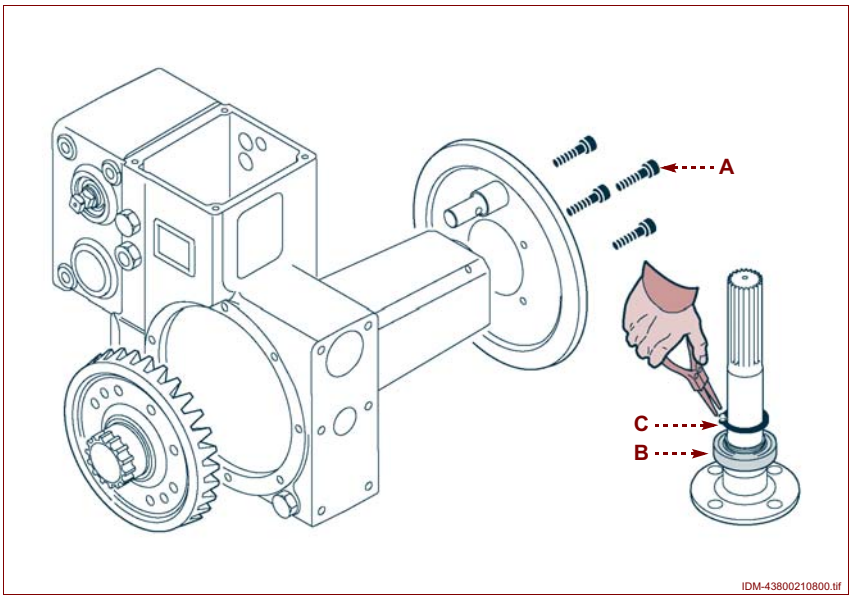
17- Remove the bearing, using a puller (AT 37981766).



18- Undo the bolts and detach the backing plate.
19- Unseat the circlip **(G)** and remove the O-rings **(E)**.
20- 20-Disassemble the coupler **(A)** and buttons **(B)**.
21- Drive out the dowel **(C)** with a drift and hammer.
22- Remove the fork **(D)** and rod **(F)** from the trumpet housing.
23- Remove the circlip **(H)**.

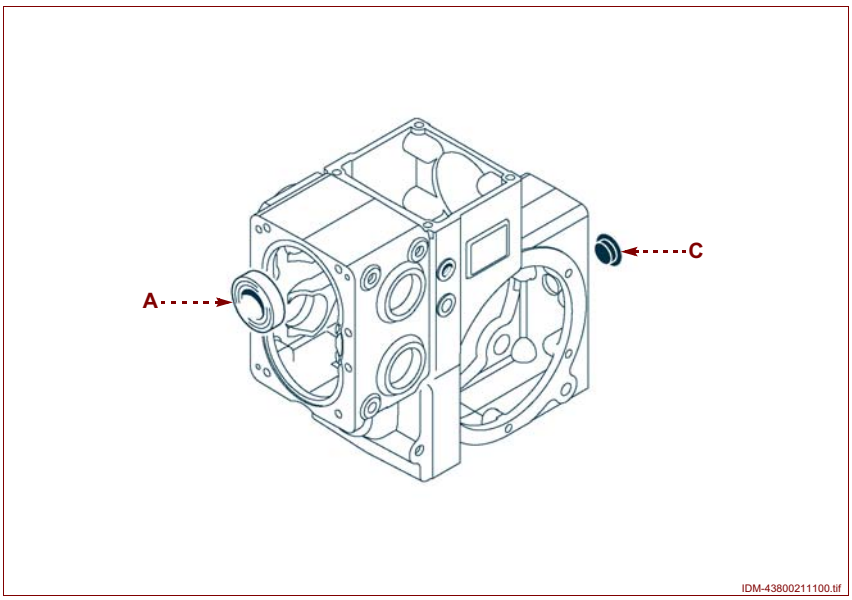


24- Separate the differential from the housing.
25- Disassemble the shaft, striking with a drift and hammer.
26- Unseat the circlip **(C)**.
27- Separate the bearing **(B)** with the aid of a puller (AT 37981766).
28- Remove the bolts **(A)** and detach the backing plate.

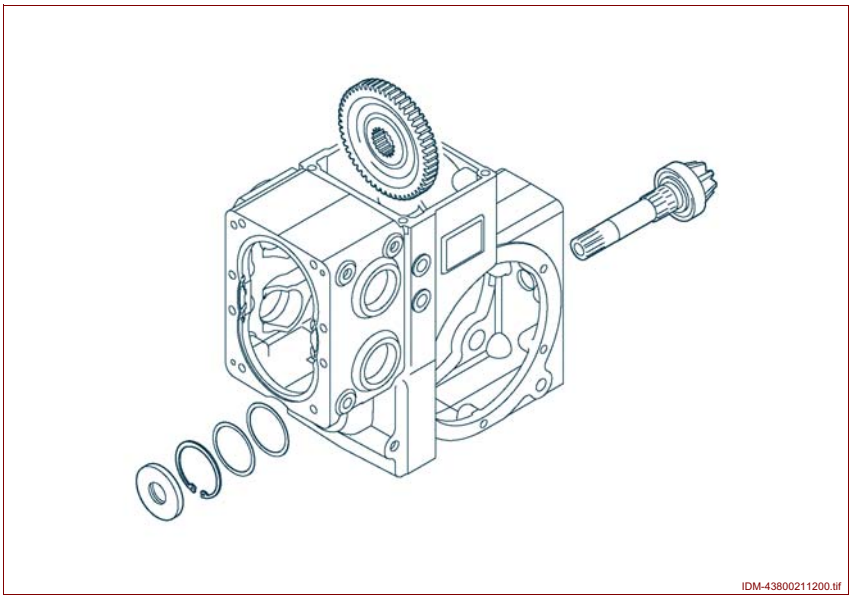


Disassembling the housing components

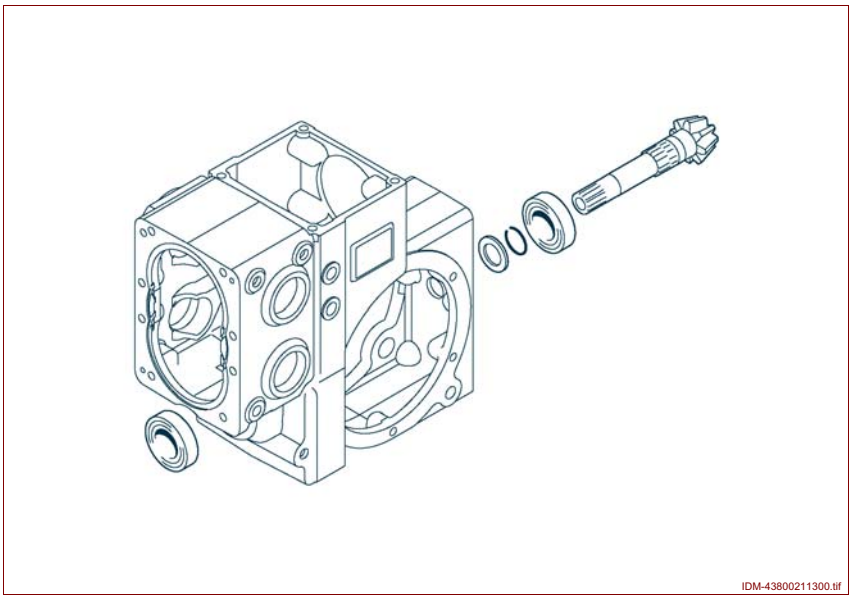
1 - Remove the bearing **(A)** using a drift and hammer.
2 - Remove the expansion plug **(C)**



3 - Disassemble the oil seal, using a drift and hammer.
4 - Unseat the circlip and remove the shims.
5 - Remove the pinionshaft, using a drift and hammer.
6 - Remove the spur gear.

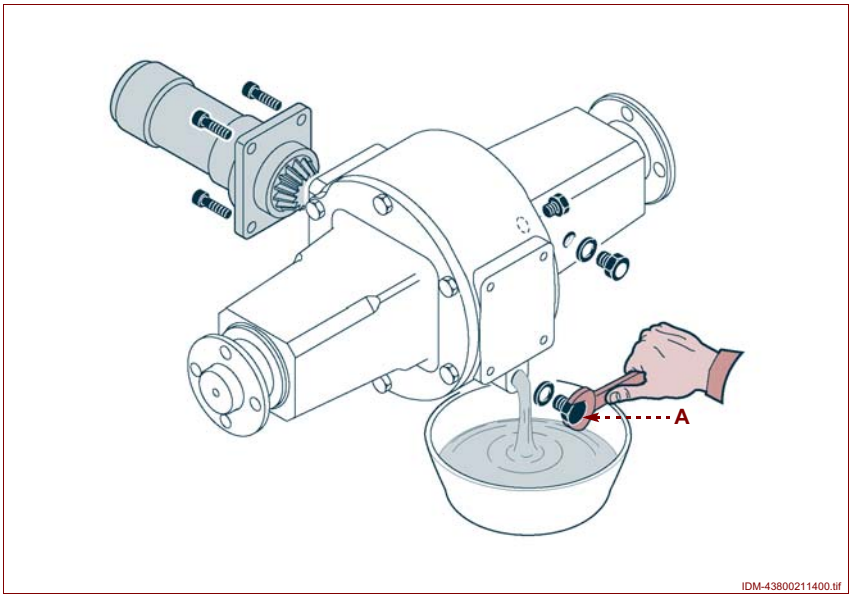

IDM-43800211200.tif

7 - Separate the bearing from the housing, using pullers AT 27981047 and AT 37981486.
8 - Remove the circlips from the shaft.
9 - Separate the bearing, using pullers (AT 37981766).


IDM-43800211300.tif

Disassembling the rear axle

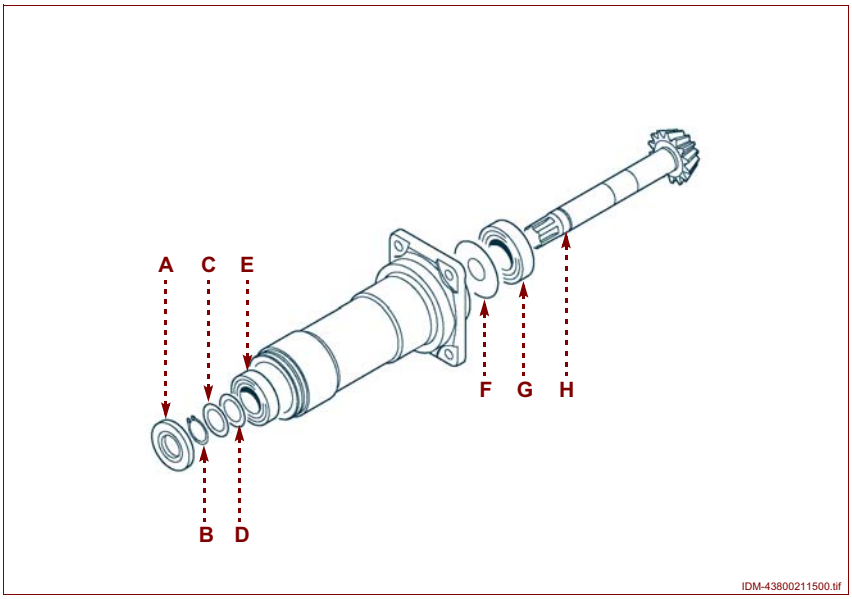
1 - Position a vessel under the drain plug **(A)** to collect the oil.
2 - Remove the plug **(A)** and the washer.
3 - Removing the other two plugs and the relative washers as well, the oil will flow more quickly.
4 - Undo the bolts of the pinionshaft housing, and detach the housing.



IDM-43800211400.tif

IDM-C443800201.fm

5 - Remove the oil seal **(A)** using a drift and hammer.
6 - Remove the circlip **(B)** and shims **(C)**, **(D)**.
7 - Dislodge the pinionshaft **(H)** from the housing, tapping with a drift and hammer.
8 - Separate the bearings **(E)**, **(G)** using the relative pullers (AT 27981047 - AT 37981486).
9 - Recover the shims **(F)** and set aside.

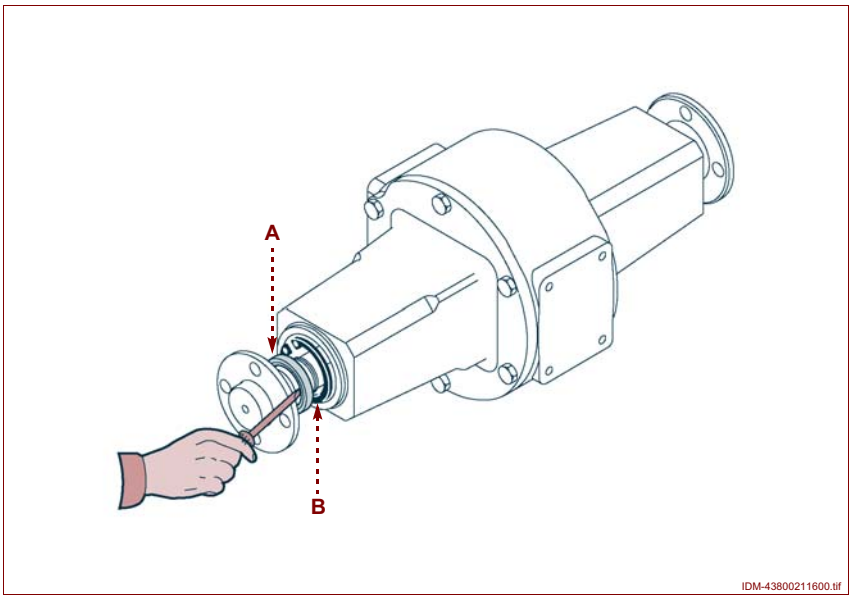


Left hand side

10 - Remove the oil seal **(A)** by breaking off.
11 - Unseat the circlip **(B)**.

Important!

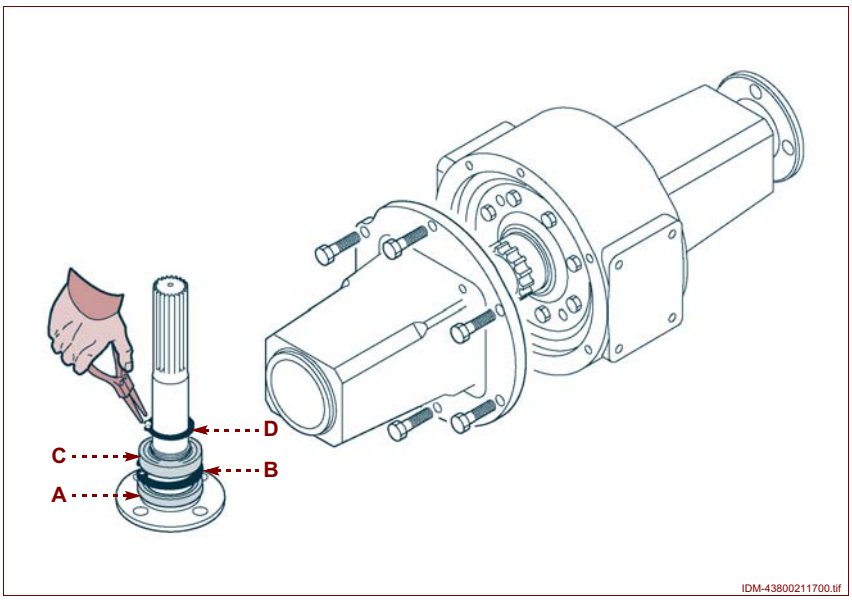
Be careful not to score the oil seal seat.



12 - Undo the bolts of the trumpet housing, and detach the housing.
13 - Dislodge the shaft from the housing, tapping with a drift and hammer.
14 - Unseat the circlip **(D)** and remove the bearing **(C)**, using a drift and hammer or a puller (AT 37981766).
15 - Remove the circlip **(B)** and the oil seal **(A)**.

Important!

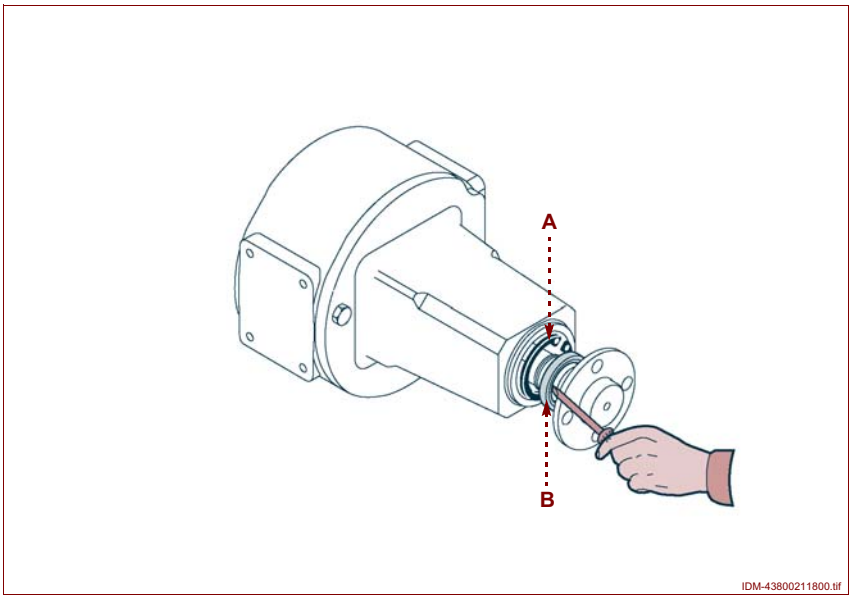
The shaft can also be removed without detaching the trumpet housing.



Right hand side

16- Remove the oil seal **(B)**.

17- Unseat the circlip **(A)**.

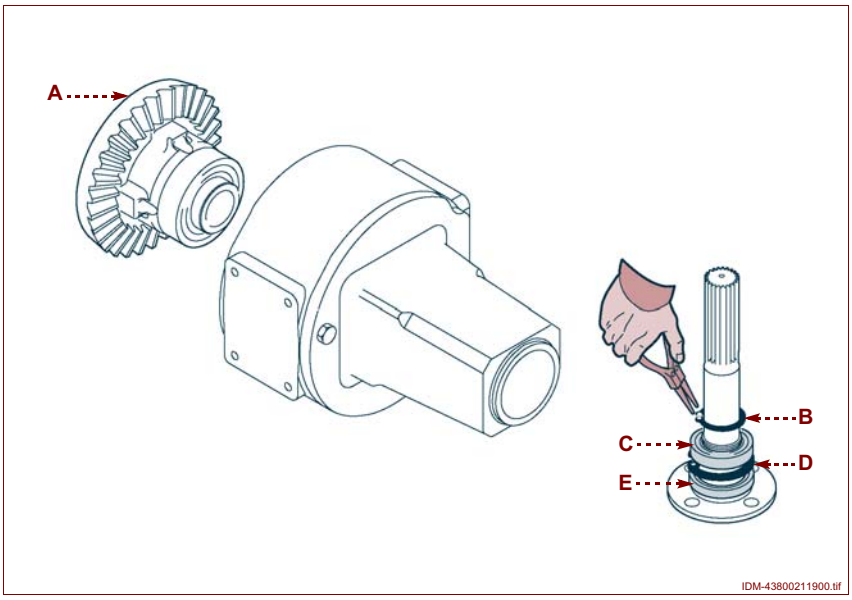


18- Remove the differential **(A)** from the housing.

19- Dislodge the shaft from the housing, tapping with a drift and hammer.

20- Unseat the circlip **(B)** and remove the bearing **(C)**, using a drift and hammer or a puller (AT 37981766).

21- Remove the circlip **(D)** and the oil seal **(E)**.

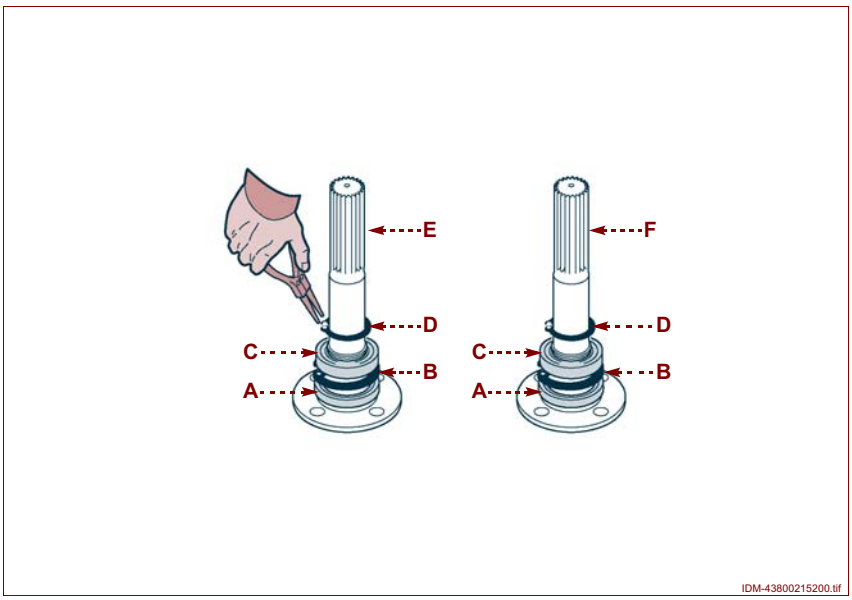


4.4

Preassembling the components

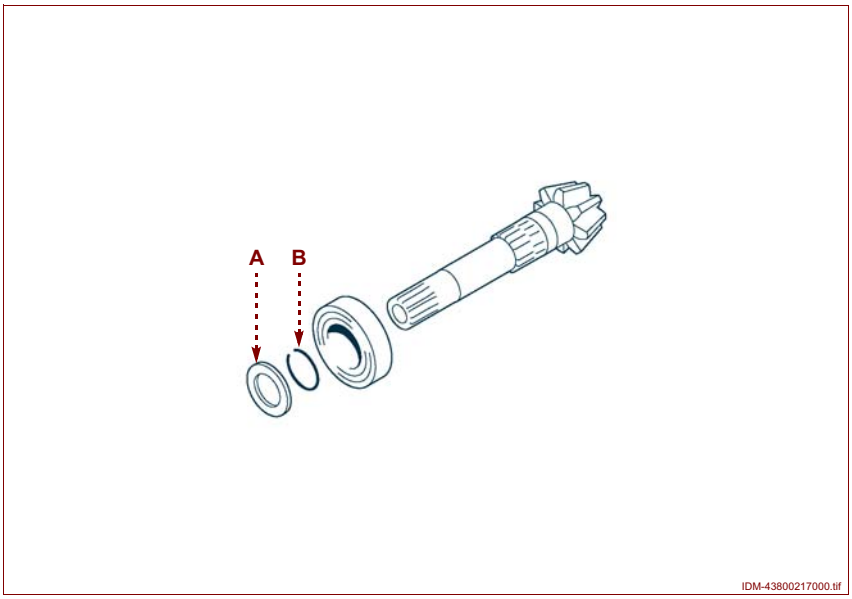
1 - Prepare the first shaft **(E)** by fitting the oil seal **(A)**, using the replacer (AT 37981873), the bearing circlip **(B)**, the bearing **(C)**, using the driver (AT 37981877), and the shaft circlip **(D)**.

2 - Repeat the operations on the other shaft **(F)**.



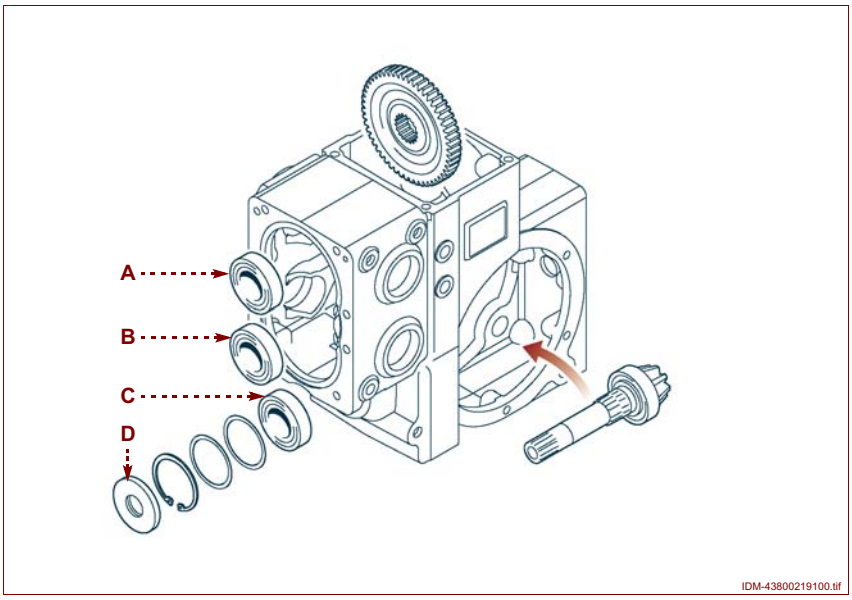
IDM-C443800201.fm

3 - Prepare the pinionshaft by fitting the bearing, circlip **(B)** and oil seal **(A)**, using a driver AT37981874 and hammer.



Assembling the PTO shaft and bevel pinion

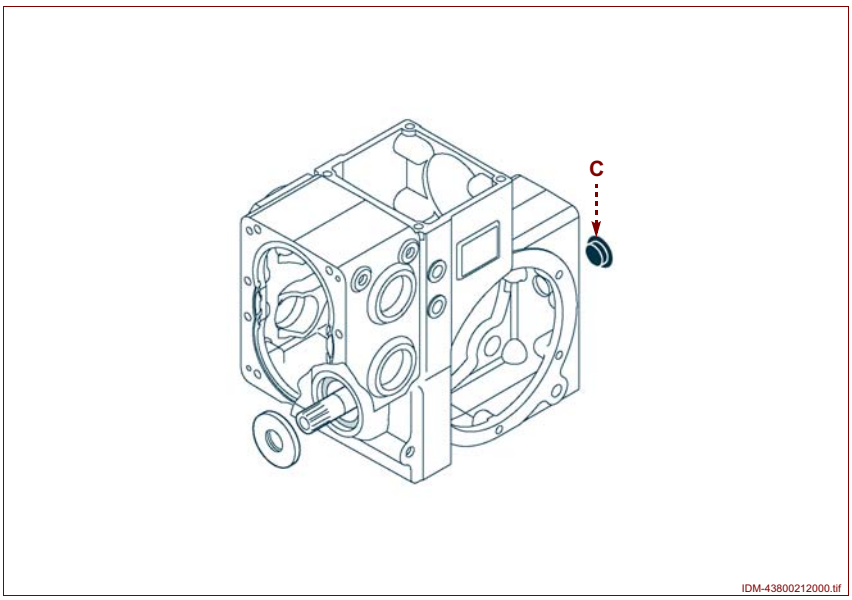
1 - Assemble the bearings **(A)**, **(B)** in the housing, using the driver (AT 37981880) and hammer.
2 - Locate the spur gear in the housing.
3 - Fit the preassembled pinionshaft internally of the housing using the driver (AT 37981878) and hammer, assembling it with the spur gear.
4 - Offer a driver (AT 37981879) and assemble the bearing **(C)**, using a driver (AT 37981878) and a hammer.
5 - Locate the shims, and add the circlip.



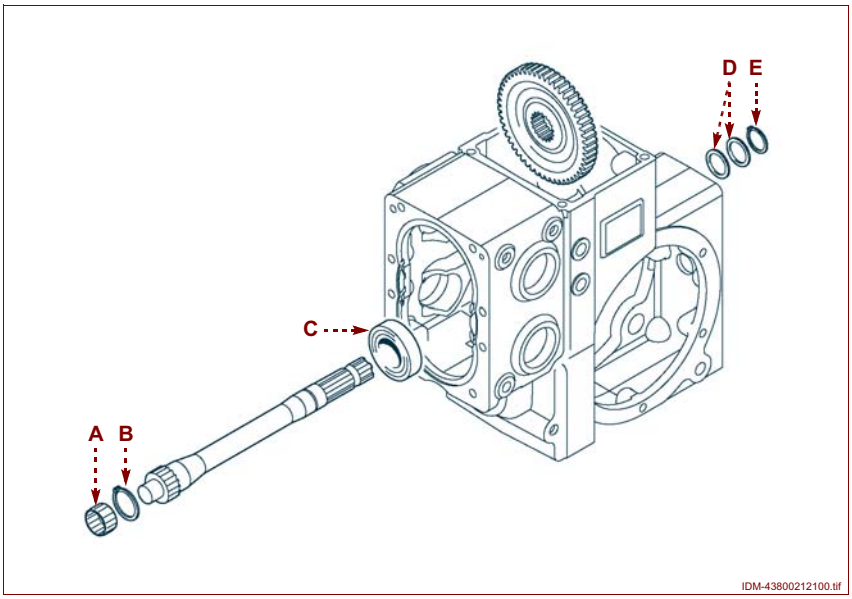
Important!

In the event that the bevel gear pair is replaced, the pinion must be "reset" (see "Setting the front end transmission pinion ").

6 - Fit the oil seal, using a driver (AT 37981889) and hammer.
7 - Before fitting the plug **(C)**, smear the hole with silicone.
8 - Insert the plug **(C)** using a drift and hammer (make certain the plug does not project from the face of the housing).

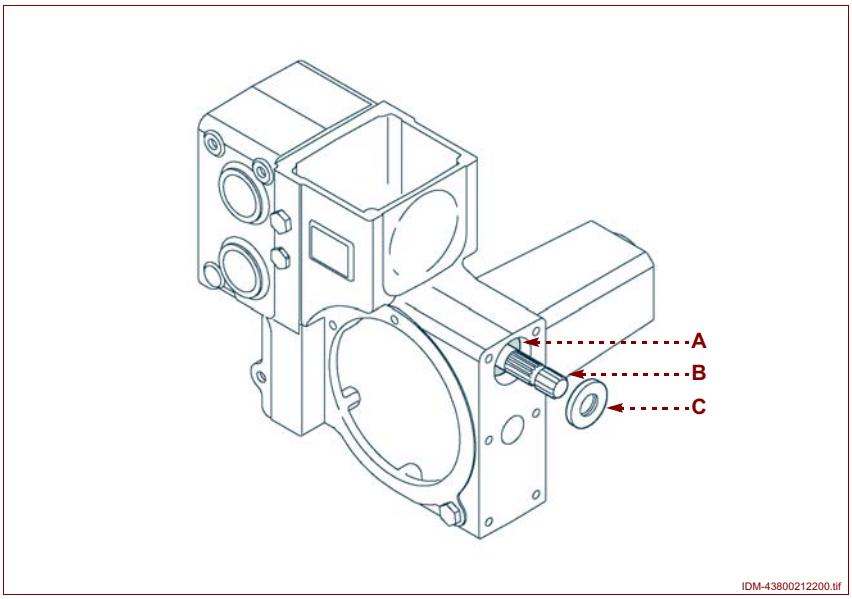


9 - Fit the circlip **(B)** to the PTO shaft.
10 - Position the spur gear in the housing from above.
11 - Locate the PTO shaft in the housing, assembling it with the spur gear, inserting from the rear.
12 - Fit the bearing **(C)** to the shaft, using driver (AT 37981872) and hammer.
13 - Locate the shims **(D)** (1 mm) and fit the circlip **(E)**.
14 - Fit the needle bearing **(A)**.



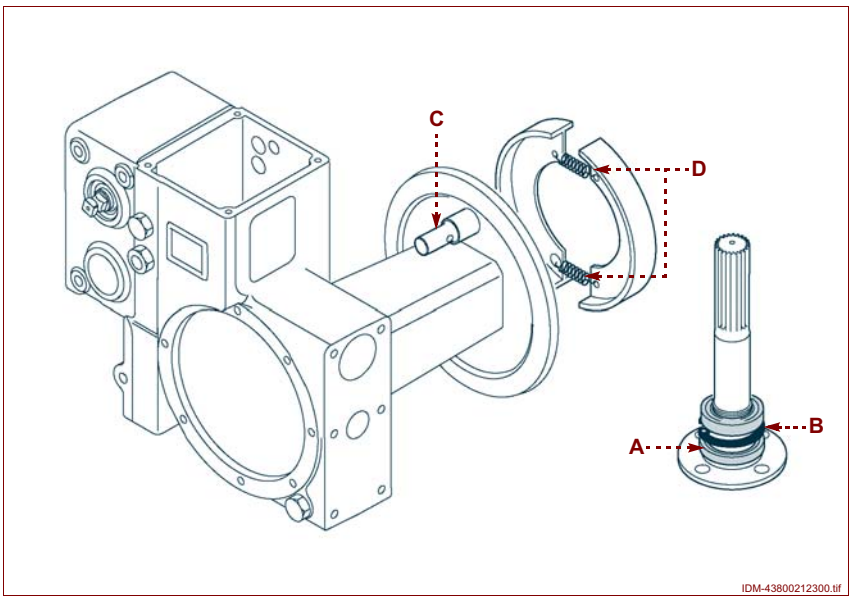
15 - Bed in the shaft **(B)** by tapping in with a rubber hammer.
16 - Check the bearing preload with a torque wrench applied to the adapter (AT 37981892), and if necessary add or remove shims **(A)** to obtain a value of between 0 and 1.5 kgcm.
17 - Fit the oil seal **(C)** using a driver (AT 37981888) and hammer.

4.4



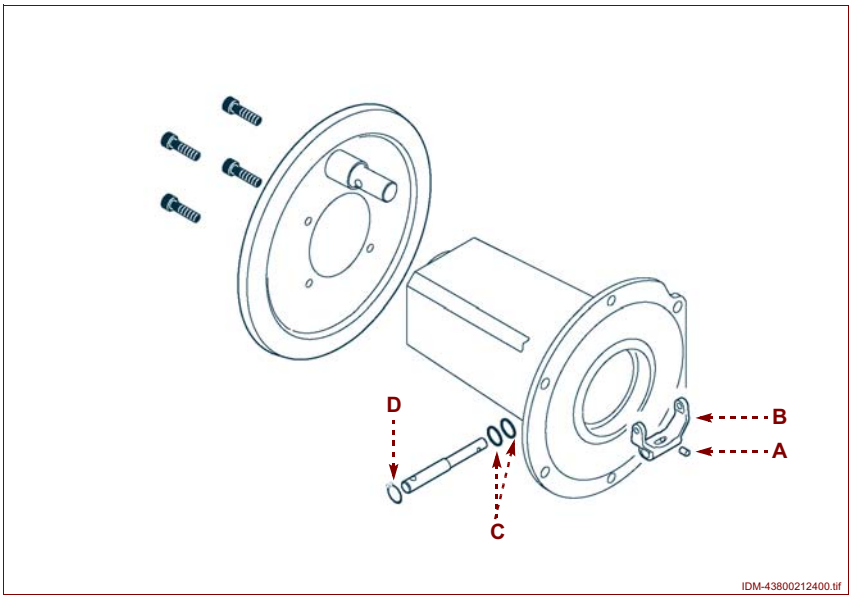
Assembling the front halfshafts

1 - Fit the backing plate, applying Loctite 243 to the bolts and tightening to 2.5 – 3.2 kgm.
2 - Tap the shaft into the housing with a drift and hammer, and fit the circlip **(B)** in its groove.
3 - Seat the oil seal **(A)** using the plate (AT 37981870) and driver (AT 37981871).
4 - Assemble the brake shoes, springs **(D)** and cam **(C)**.
5 - Assemble the differential housing.

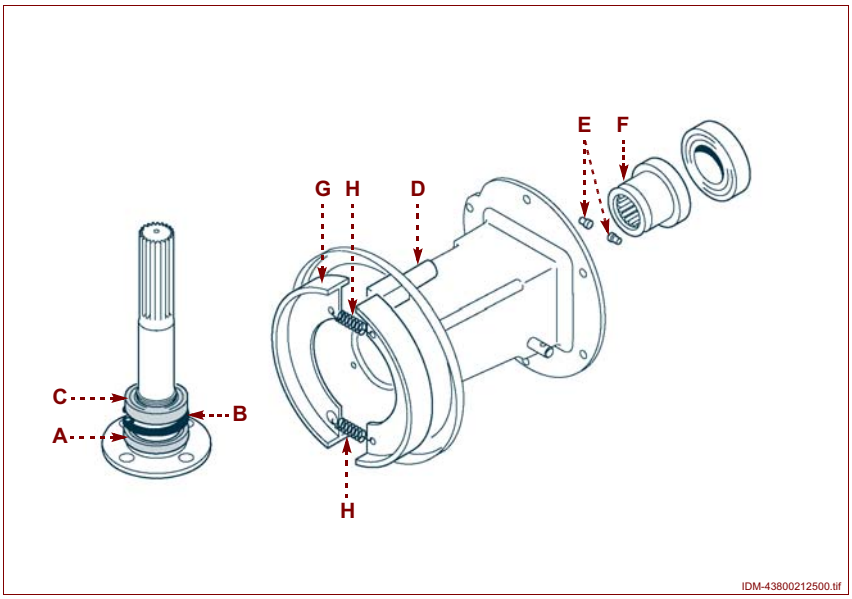


IDM-C443800201.fm

6 - Locate the fork **(B)** in the trumpet housing.
7 - Locate the halfshaft in the hole of the trumpet housing.
8 - Fit the dowel **(A)**, using a drift and hammer.
9 - Fit the O-rings **(C)**, using the seal replacer (AT 37981881).
10 - Fit the circlip **(D)**, using the driver (AT 37981882).
11 - Assemble the backing plate, applying Loctite 243 to the bolts and torquing to 2.5 - 3.2 kgm.



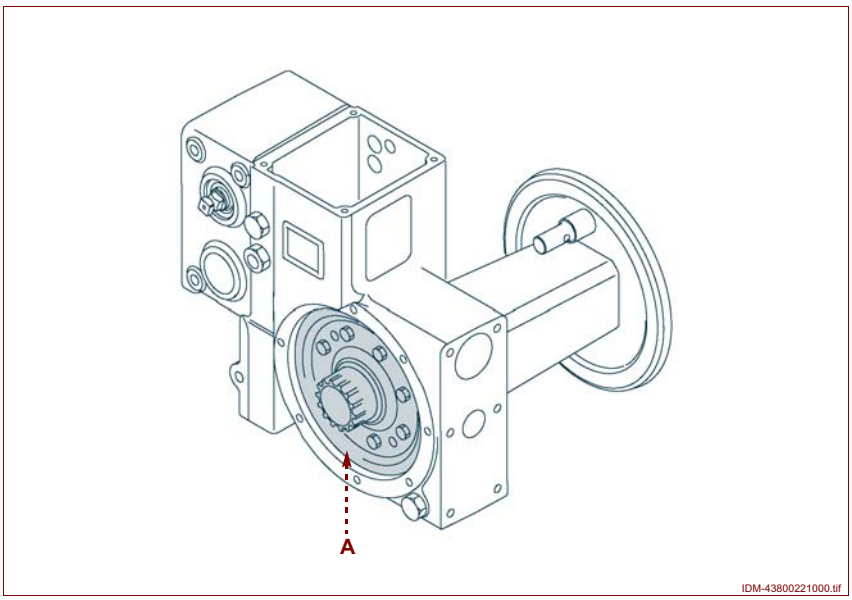
12 - Tap the halfshaft into the trumpet housing with a drift and hammer, until the bearing **(C)** is fully seated.
13 - Fit the circlip **(B)**.
14 - Fit the oil seal **(A)** using the plate (AT 37981870) and driver (AT 37981871).
15 - Assemble the brake shoes **(G)**, springs **(H)** and cam **(D)**.
16 - Grease the buttons **(E)** and assemble.
17 - Locate the sleeve **(F)** and fit the bearing, using the driver (AT 37981883) and hammer.



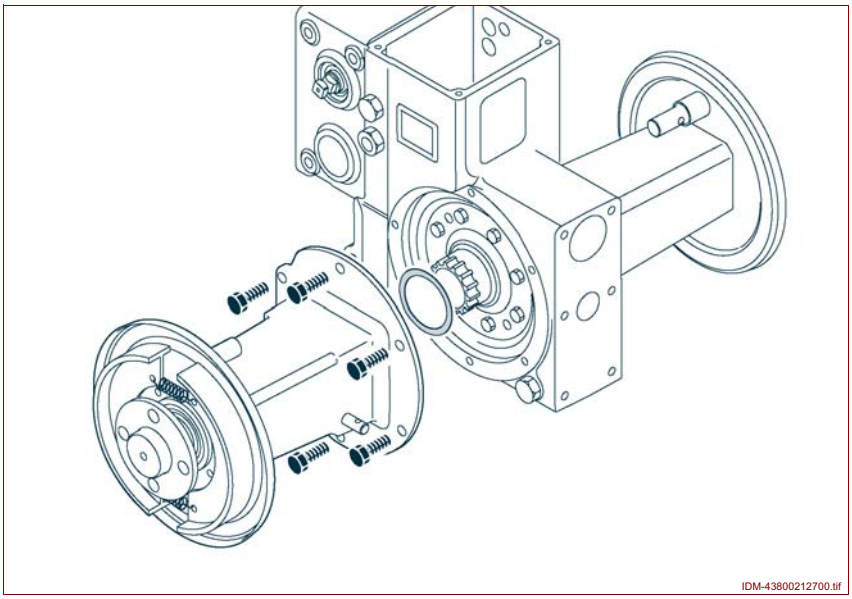
18 - Install the differential **(A)** in the housing, with the aid of a hammer and tube.

Important!

Verify crown wheel / pinion backlash and bearing preload (see *chap 06 - 8*).



19- Apply silicone to the trumpet housing flange.
20- Assemble the trumpet housing, insert the bolts and torque to 5 – 6.5 kgm.

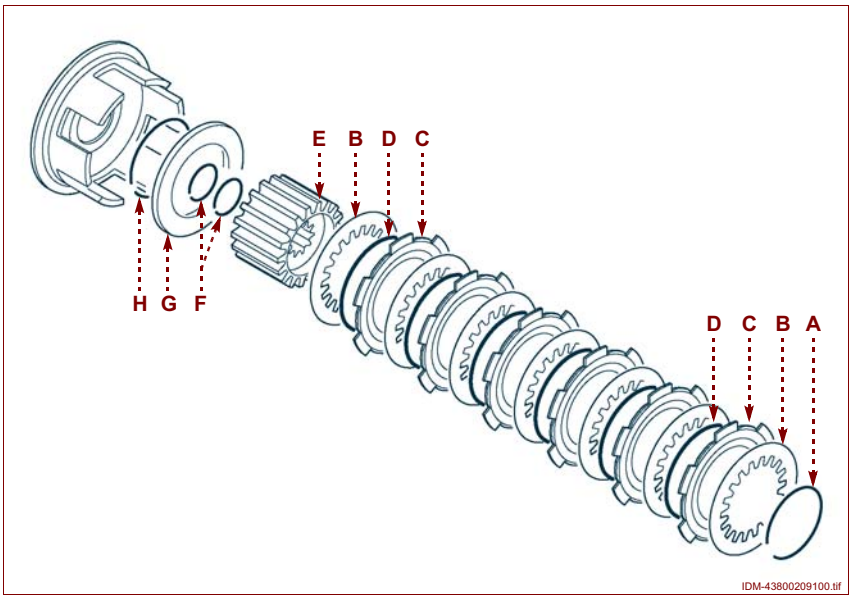


Preassembling the clutch (first version)

1 - Preassemble the following components on the clutch sleeve **(E)**, in sequence: abutment ring **(H)**, reaction disc **(G)**, inner friction disc **(B)**, belleville disc **(D)**, outer friction disc **(C)**.....

2 - Compress all the discs to the point of exposing the groove for the circlip **(A)**, then fit the abutment ring **(A)**, using the special assembly tool (AT 37981891).

3 - Position the assembled discs in the clutch housing.



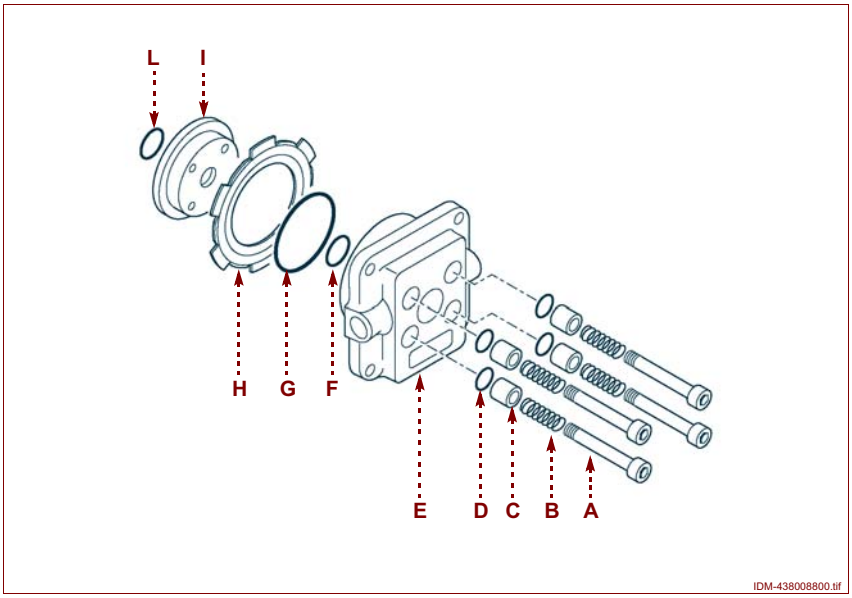
4 - Assemble the slipper rings **(L)**, **(F)** with the brake piston **(I)** and the cover **(E)**.

5 - Fit the O-rings **(G)** and **(D)** to the cover **(E)**.

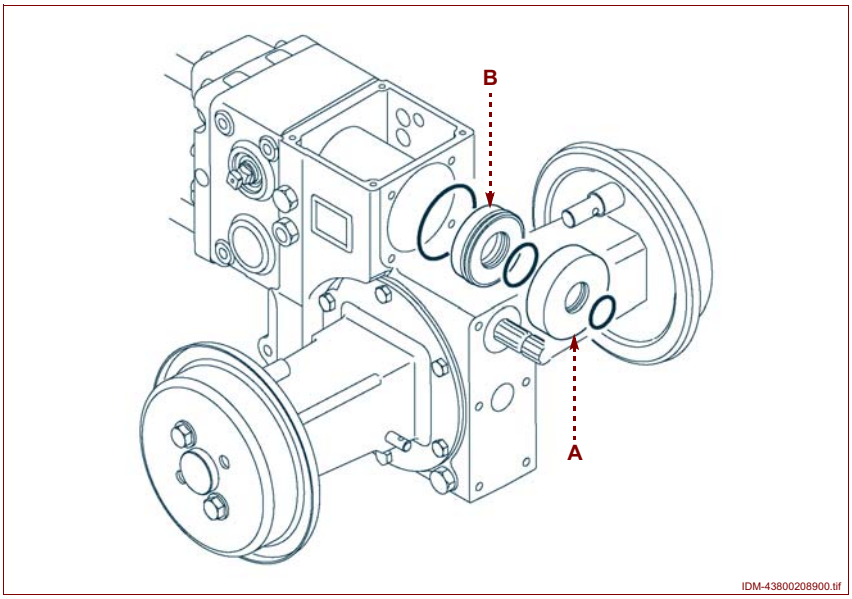
6 - Assemble the spacers **(C)** and the springs **(B)** on the cover **(E)**.

7 - Locate the brake piston **(I)** and the outer friction disc **(H)** in the cover **(E)**.

8 - Insert and tighten (10Nm) the screws **(A)**.

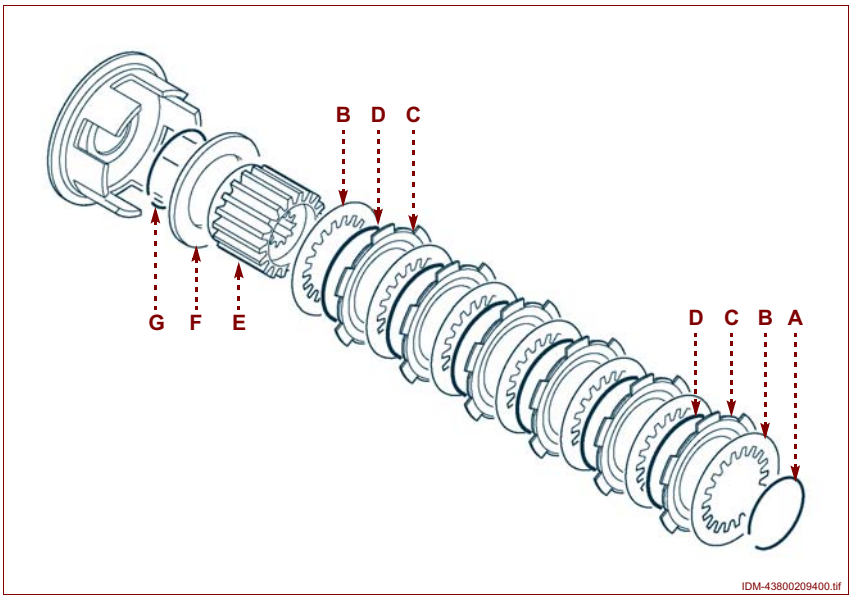


9 - Fit the O-rings to the piston **(B)**.
10 - Locate the O-ring in the cylinder **(A)**.
11 - Fit the outer O-ring.
12 - Drive the piston into the cylinder **(A)** using a plastic hammer and tube, taking care not to damage the O-rings.

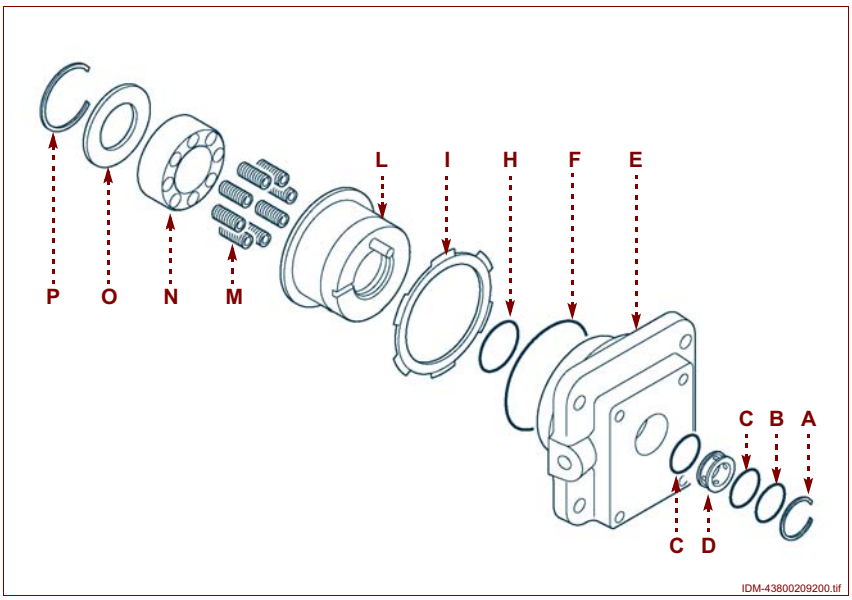


Preassembling the clutch (second version)

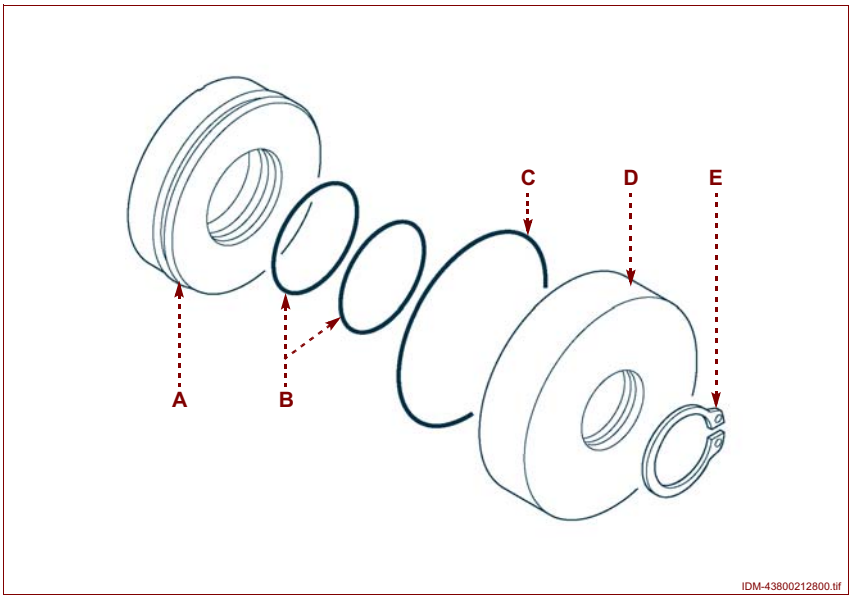
1 - Preassemble the following components on the clutch sleeve **(E)**, in sequence: abutment ring **(G)**, reaction disc **(F)**, inner friction disc **(B)**, belleville disc **(D)**, outer friction disc **(C)**.....
2 - Compress all the discs to the point of exposing the groove for the circlip **(A)**, then fit the abutment ring **(A)**, using the special assembly tool (AT 37981891).
3 - Position the assembled discs in the clutch housing.



4 - Assemble the following parts, in sequence: O-ring **(F)**, O-ring **(H)**, friction disc **(I)**, brake piston **(L)**, divider **(N)**, springs **(M)**, spring seat washer **(O)**, circlip **(P)**, O-ring **(C)**, spacer **(D)**, O-ring **(C)**, shim **(B)**, abutment ring **(A)**.



5 - Fit the O-ring **(C)** to the cylinder **(D)**; fit the O-rings **(B)** one to the cylinder **(D)** and the other to the piston **(A)**.
6 - Grease the cylinder and the piston.
7 - Drive the piston into the cylinder **(A)** using a plastic hammer and tube, taking care not to damage the O-rings.

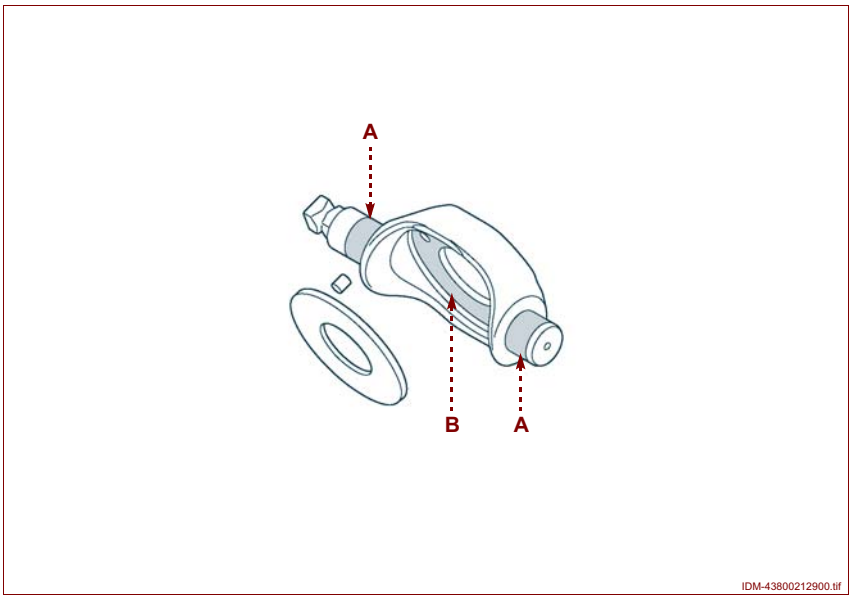


IDM-43800212800.tif

Assembling the swash plates

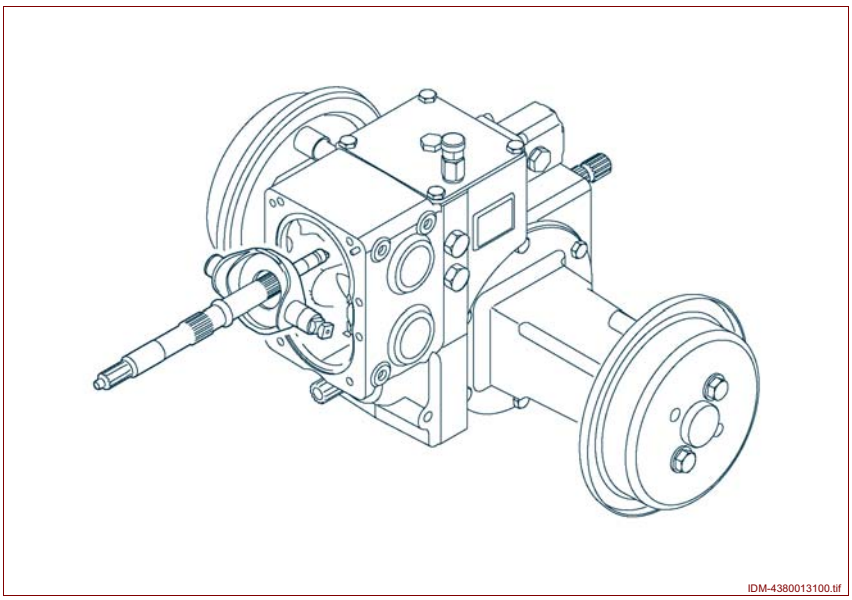
1 - Grease the seat **(B)** of the anti-friction washer.
2 - Fit the 5 mm dowel to the swash plate.
3 - Locate the anti-friction washer, aligning the dowel with the hole.
4 - Grease the two trunnions **(A)**.
5 - Repeat the operation for the other swash plate.

4.4

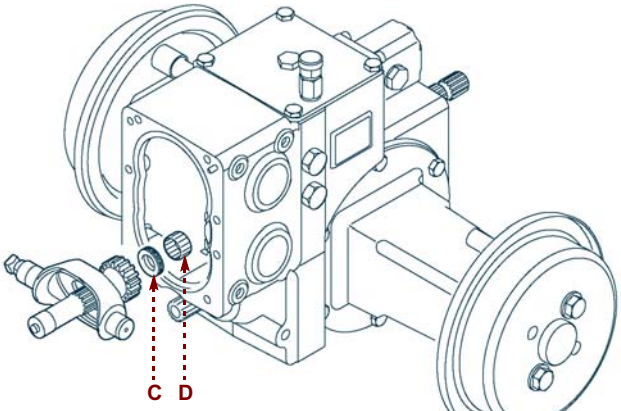


IDM-43800212900.tif

6 - Locate the other swash plate in the housing, taking care not to damage machined surfaces.
7 - Locate the splined shaft in the housing.
8 - Bed in the shaft by tapping with a plastic hammer.


IDM-43800131000.tif

9 - Grease the seat of the thrust bearing lightly, then proceed to locate the thrust bearing **(C)**.
10 - Insert the needle bearing **(D)** in the housing, mounted to the PTO shaft (if removed previously)
11 - Assemble the swash plate with the splined shaft, then locate the assembly in the housing with the plate at the angle marked previously, being certain to align the needle bearing **(D)** correctly and to avoid damaging machined surfaces.

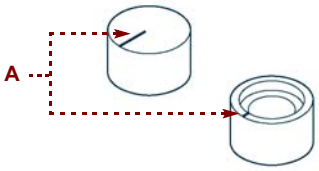


IDM-43800213000.tif

Important!

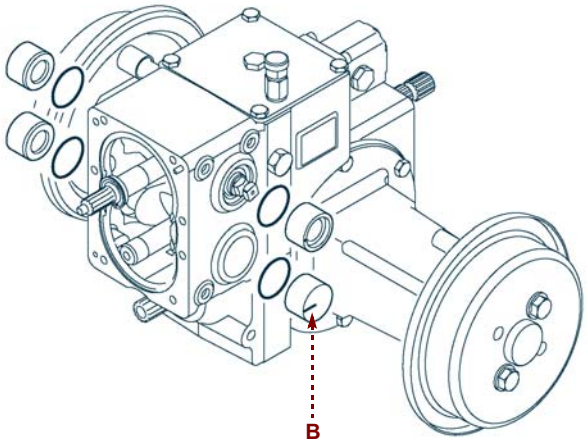
If the swash plates are not refitted correctly, the wrong speeds will be selected, the operation of the drive pedals inverted, and the hydrostatic transmission seriously damaged.

12 - To ensure the bushes are assembled correctly, apply a witness mark **(A)** to coincide with the notch on the bush.
13 - The bushes must be positioned with the mark directed toward the machined face of the cover.



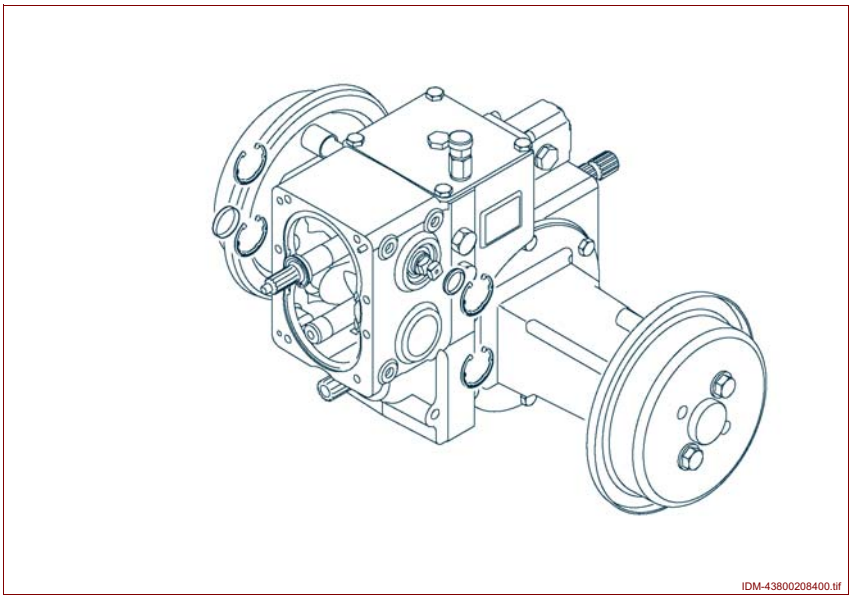
IDM-43800213200.tif

14 - Locate the four O-rings in their seats.
15 - Insert the blind bush **(B)**, being careful to align the witness mark correctly.
16 - Tap the bush into the seat using the driver (AT 37981884) and hammer, holding the opposite trunnion of the swash plate perfectly firm.
17 - Fit the open bush over the opposite trunnion, positioning it with the larger machined diameter outermost to allow fitment of the oil seal.
18 - Repeat the same sequence of operations for the other swash plate.

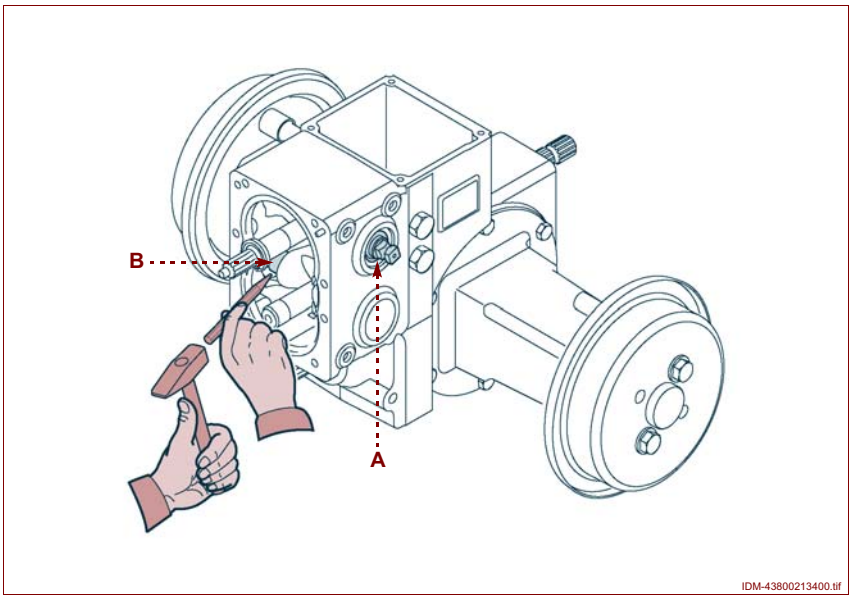


IDM-43800213300.tif

19- Locate the two oil seals and force into the seats using the driver (AT 37981886) and a plastic hammer, being careful not to damage the lip.
20- Fit the four circlips, making certain that each one snaps securely into the relative groove.
21- Tap the projecting end of each swash plate with a plastic hammer to bed in the assembled components.


IDM-43800208400.tif

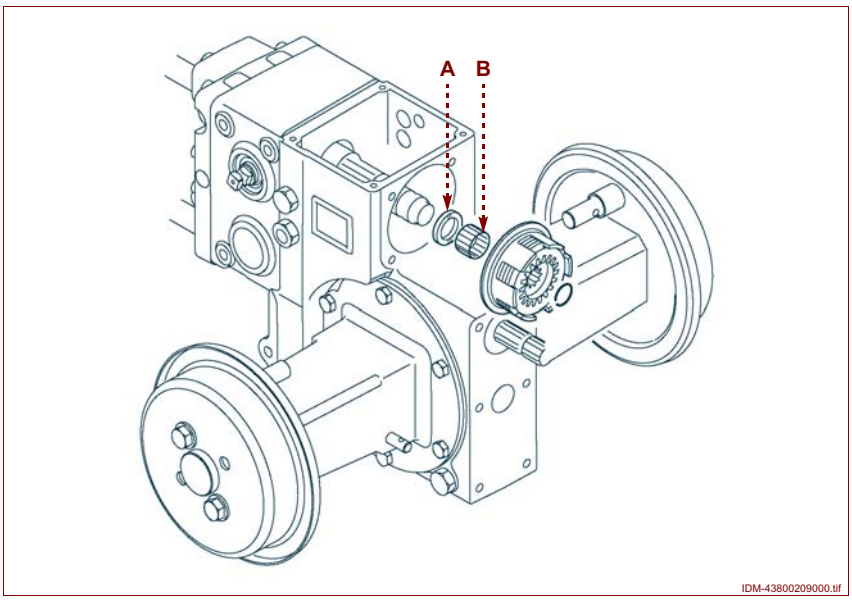
22- Check that the trunnions of the pump swash plate **(A)** rotate freely in the bushes.
23- Measure the torque registering at the projecting trunnion of the pump swash plate. The recommended value is <1.5 Nm.
24- If the value is too high, repeat the step of tapping the projecting end with a plastic hammer to bed in the components.
25- In the even that the bush rotates as one with the trunnion, stake the bush by striking with a punch on the mating circumferences of the bush and the relative hole, at the area denoted **(B)**.



IDM-43800213400.tif

Assembling the hydraulic pump clutch

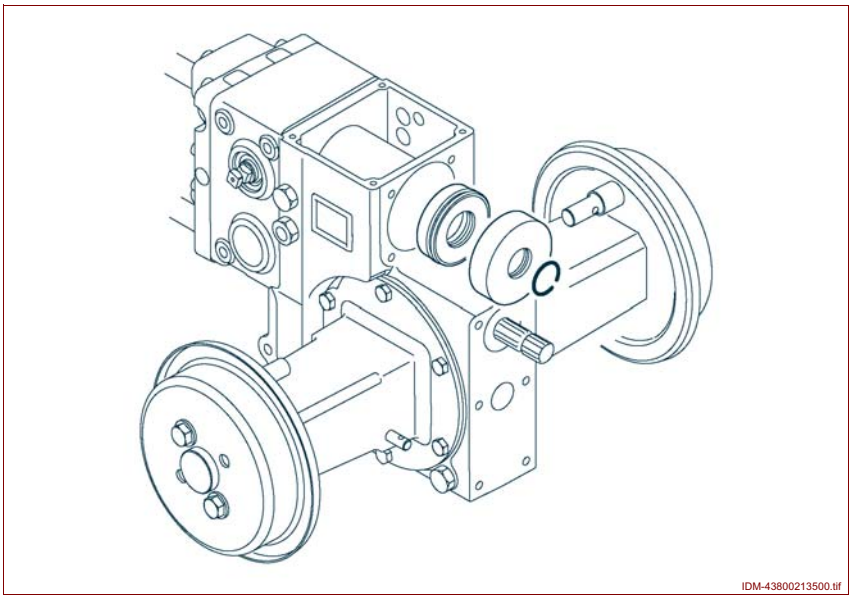
1 - Fit a special tool AT 37981885 to the input shaft so that it will not slip out when assembling the clutch components.
2 - Locate the thrust bearing **(A)** with the grooves directed toward the clutch.
3 - Locate the needle bearing **(B)** in the clutch housing.
4 - Fit the clutch assembly, making certain that all the friction discs are located in their slots.
5 - Fit the circlip, making certain it snaps securely into the groove.



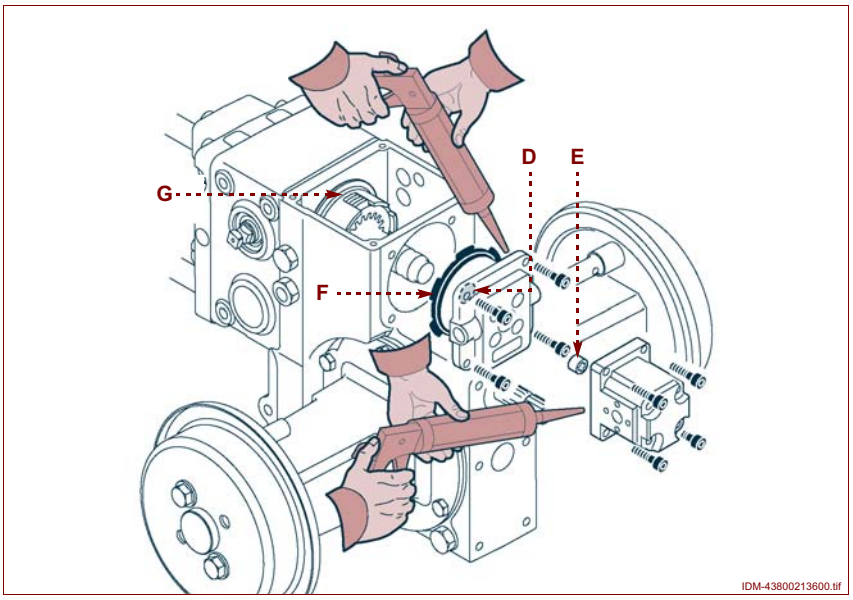
IDM-43800209000.tif

IDM-C443800201.fm

6 - Locate the preassembled cylinder in the clutch housing, taking care not to damage the internal O-rings.
7 - Fit the circlip onto the shaft, making certain it snaps securely into the groove.

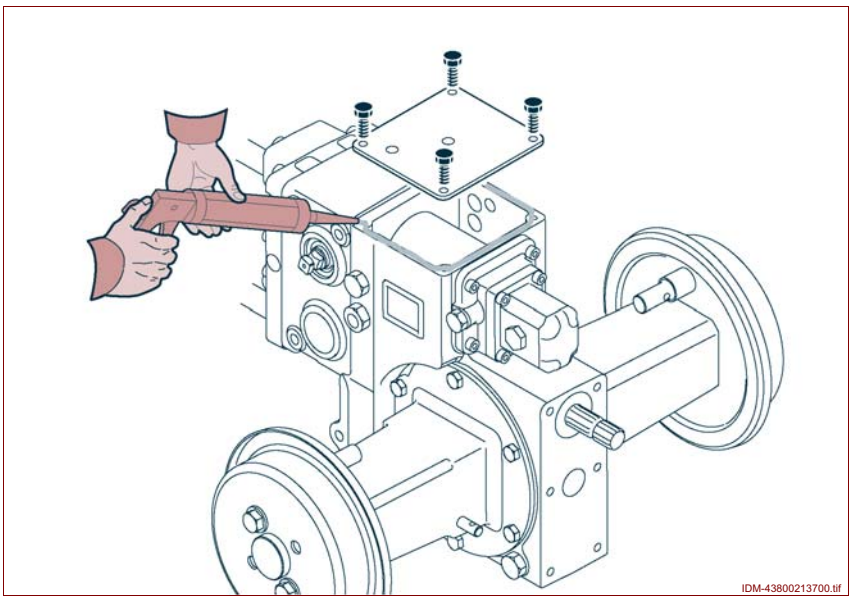

IDM-43800213500.tif

8 - Oil the hole **(D)** in the cover.
9 - Smear the mating surfaces of the cover and the gear pump flange with silicone.
10 - Assemble the cover, applying pressure and making certain to align the lugs of the friction disc **(F)** with the relative slots in the clutch housing **(G)**.
11 - Insert the bolts and torque to 2.5 - 3.2 kgm.
12 - Locate the coupling **(E)**, bearing in mind that the tongue ends of the piston pump and gear pump shafts must be rotated 90° one relative to the other.
13 - Fit the gear pump and insert the bolts, torquing to 1 - 1.3 kgm.



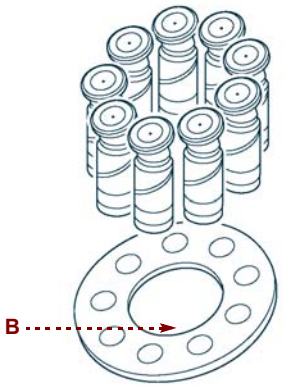
IDM-43800213600.tif

14 - Apply a thin film of silicone around the periphery of the cover.
15 - Assemble the cover and insert the bolts, torquing to 5 - 6.5 kgm.


IDM-43800213700.tif

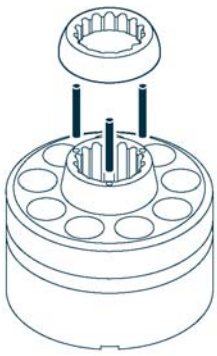
Preassembling the cylinder barrels

1 - Oil the bores of the cylinder barrels.
2 - Before inserting the pistons, make certain the shoe retainer is the right way around. The taper must be coupled with the ballguide **(B)**.
3 - Locate the pistons in the shoe retainer.



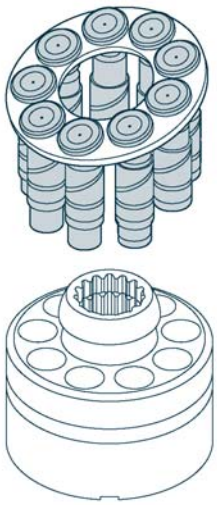
IDM-43800213800.tif

4 - Insert the three pins in the cylinder barrel.
5 - Position the ballguide on the pins.



IDM-43800210100.tif

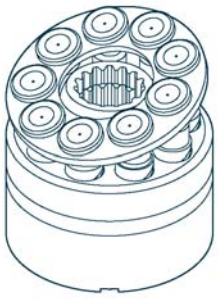
6 - Oil the pistons before assembly.
7 - Assemble the shoe retainer with the cylinder barrel, locating the nine pistons in the bores.



IDM-43800210000.tif

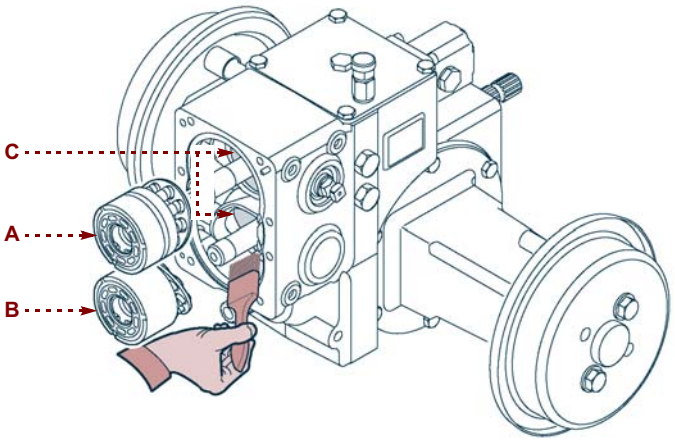
Assembling the cylinder barrels

1 - Check that all the pistons are properly seated in the bores.
2 - Check the rotation of the valve plate.
3 - Test the internal spring by pressing on all the pistons together uniformly.



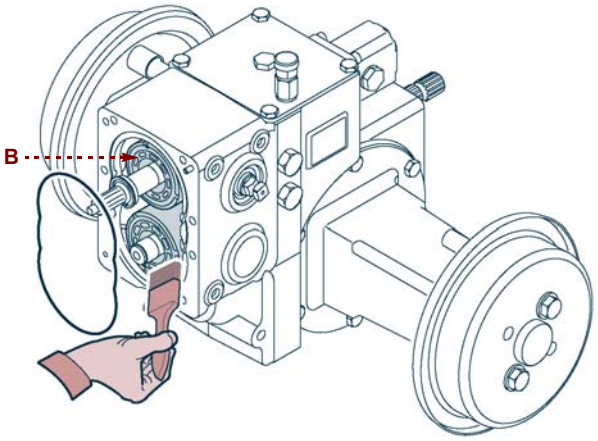
IDM-43800213900.tif

4 - Oil the anti-friction washers **(C)**.
5 - Oil all the piston shoes.
6 - Locate the motor cylinder barrel **(B)** in the housing, engaging the splines of the shaft.
7 - Repeat the same sequence of operations for the pump cylinder barrel **(A)**, which has grooves on the outer surface.
8 - Check that the two cylinder barrels are fully recessed from the machined face of the cover.
9 - Having assembled the two cylinder barrels, rotate them manually to spread the oil applied previously.



IDM-43800214000.tif

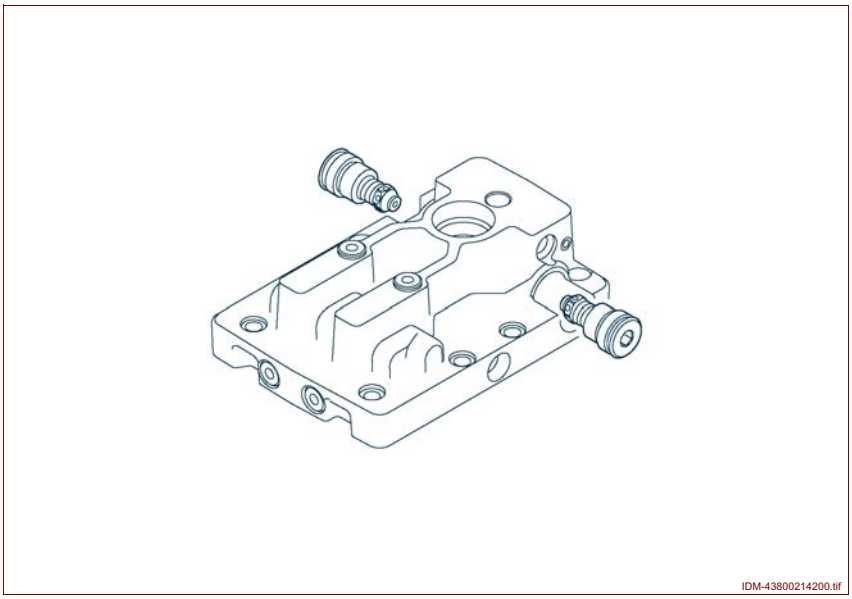
10 - Oil the outermost circumferential edges **(B)** of the two cylinder barrels.
11 - Smear the O-ring seat lightly with grease.
12 - Locate the O-ring in its seat.



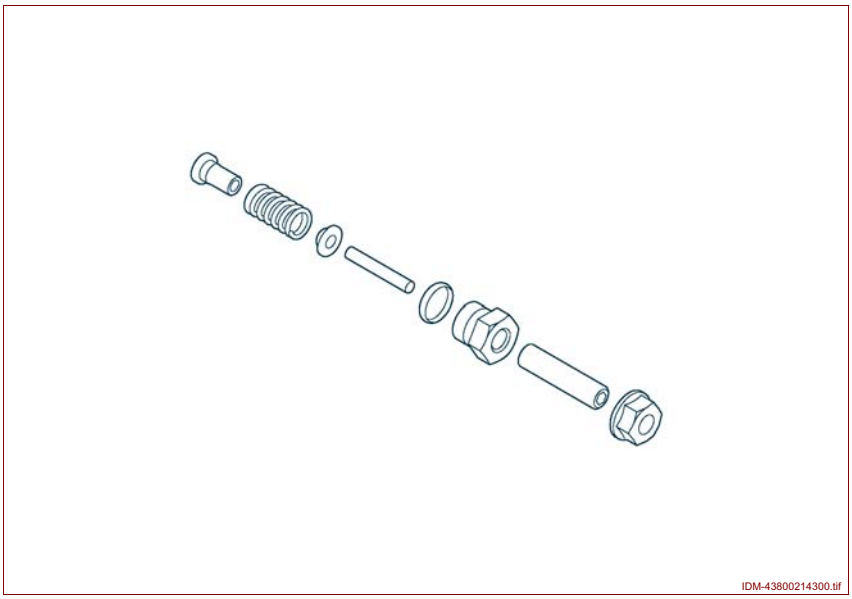
IDM-43800214100.tif

Preassembling the cover

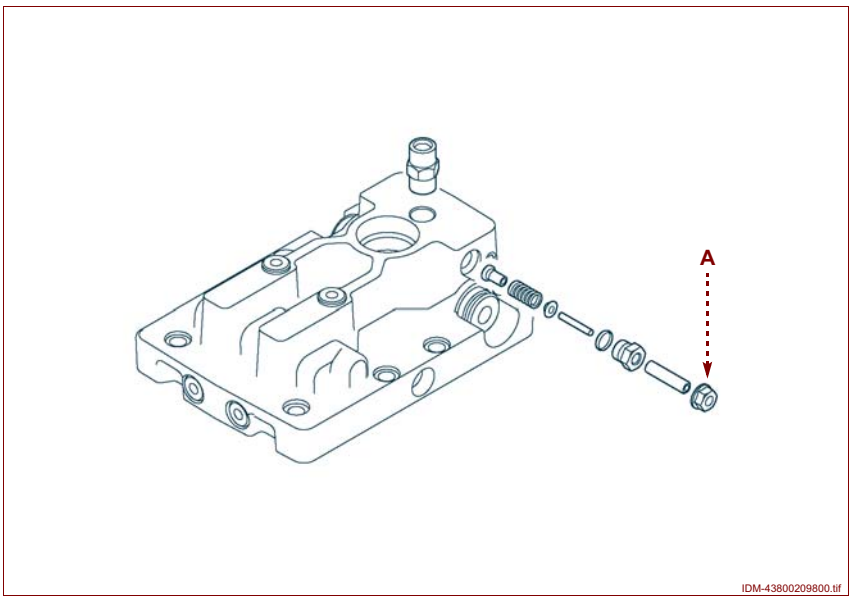
1 - In the event that the relief valves are damaged, these must be replaced with new components.
2 - The pressure setting of the relief valves is fixed.
3 - Screw the two relief valves into the cover and torque to 38 Nm.


IDM-43800214200.tif

4 - Maintain the correct assembly sequence for the components of the inlet valve.


IDM-43800214300.tif

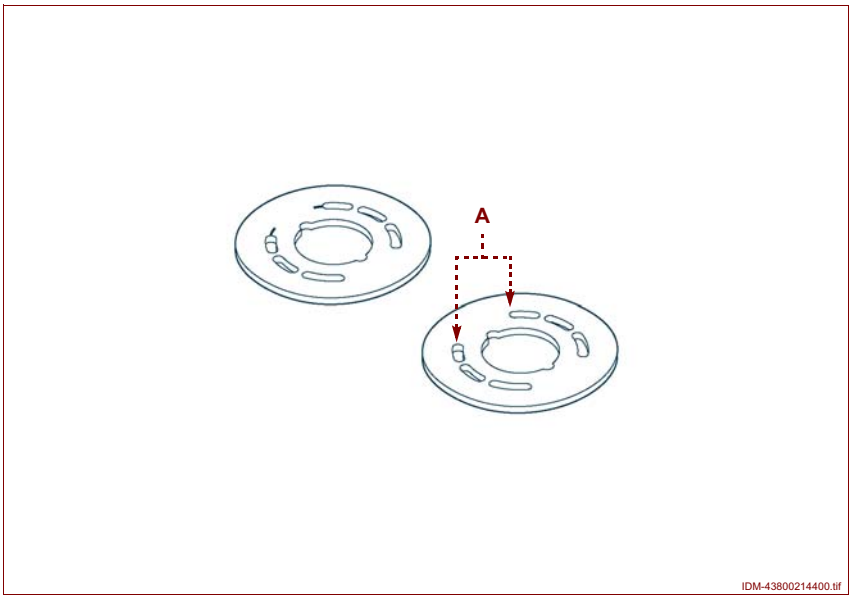
5 - Screw the inlet valve into the cover and leave the nut **(A)** finger tight.



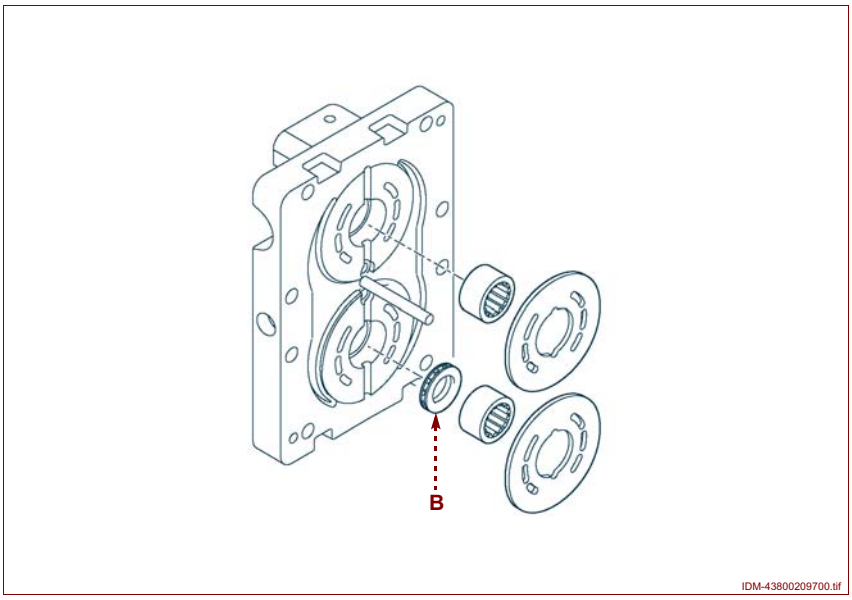
IDM-43800209800.tif

IDM-C443800201.fm

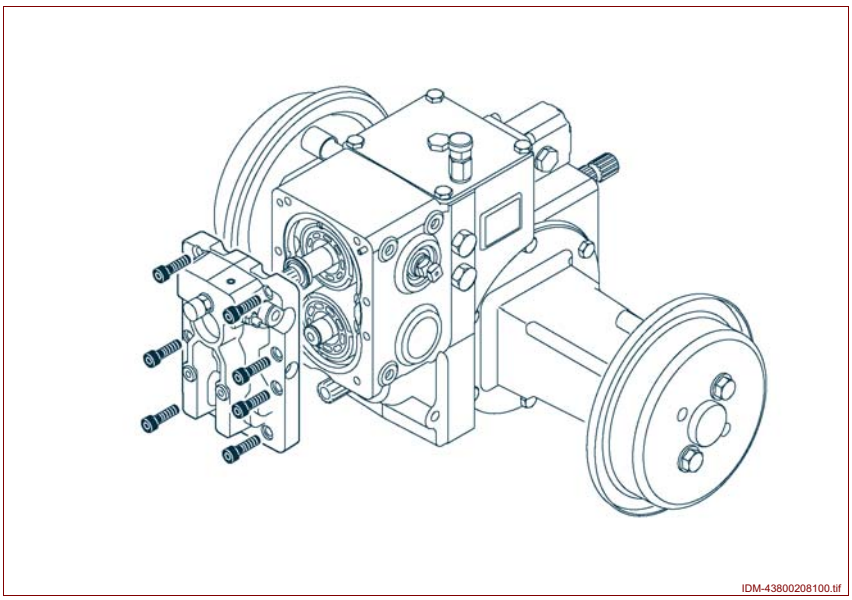
6 - Be careful when assembling the two valve plates: the valve plate of the hydraulic motor has two “whiskers” on the outside of the slots **(A)**.



7 - Locate the motor thrust bearing **(B)** in the cover.
8 - Plant the two needle bearings in the cover using a tube and a plastic hammer.
9 - Important: the two needle bearings must project 3.5 mm from the machined face.
10 - Smear the two machined surfaces with a thin film of grease, then fit the two valve plates, aligning the two notches in the plates with the dowels.

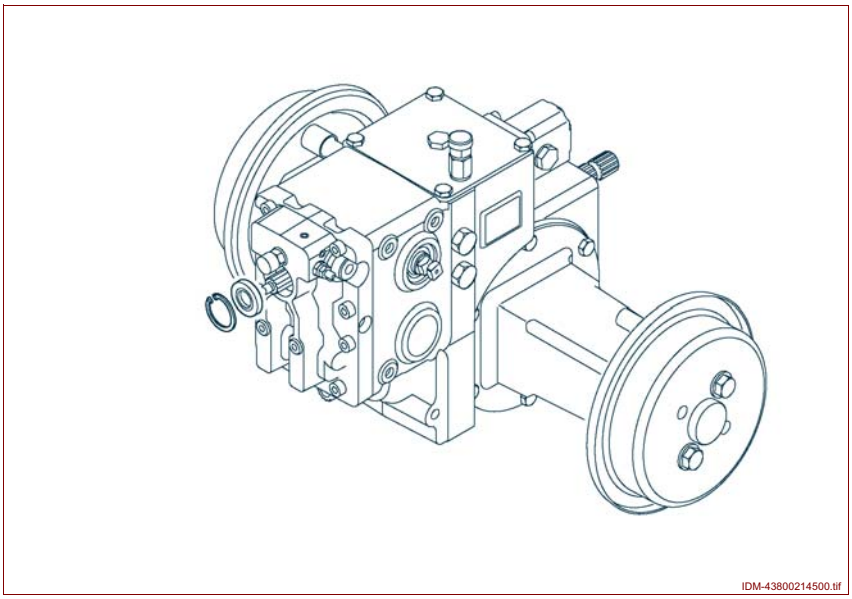


11 - Insert and tighten two diagonally opposed screws at first, so that the cover remains parallel with the machined face during the assembly step.
12 - Tighten all the other screws, torquing to 5 – 6.5 kgm.



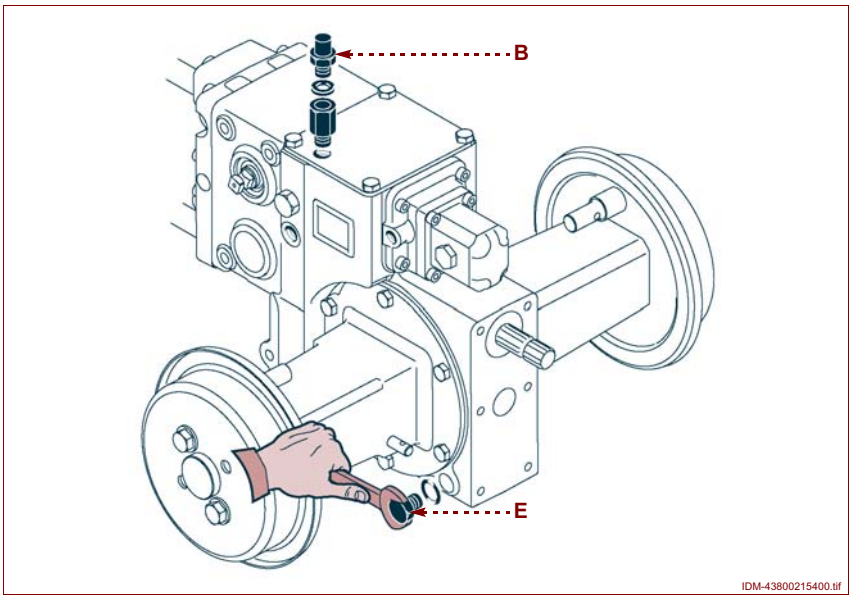
Completing assembly of the cover

1 - Grease the oil seal, then position it in the seat and force home with driver (AT 37981886) and plastic hammer.
2 - Fit the circlip, making certain it snaps securely into the groove.


IDM-43800214500.tif

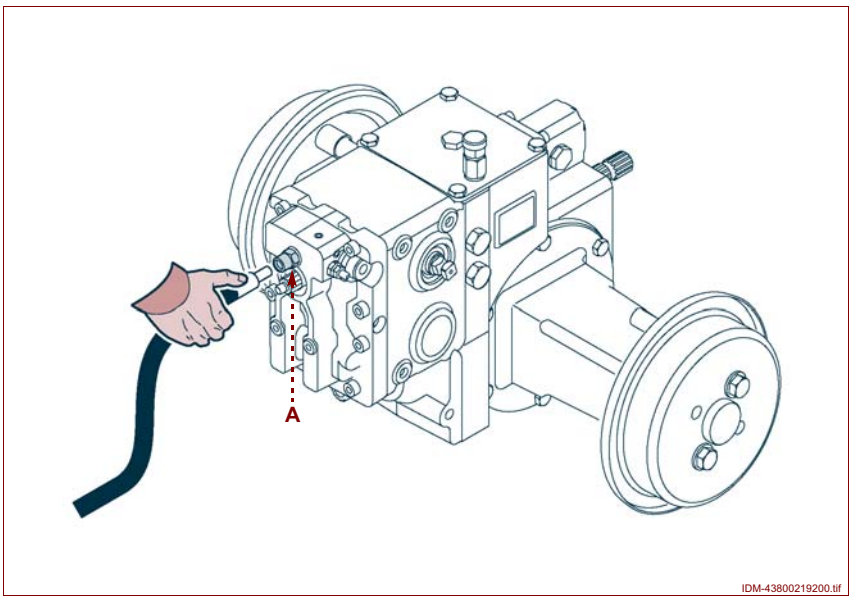
Check for oil-tightness

1 - Fit the plugs **(B)** and **(E)** and washers, torquing to 3 kgm.



IDM-43800215400.tif

2 - To test the oil-tightness of the assembled unit, blank off the nipples on the cover of the hydrostatic transmission with plugs.
3 - Test for leaks by blowing in air through the plug **(A)** at a pressure of 0.35 bar, immersing the unit in a tank, or measure any drop in pressure by connecting a gauge with full scale 0.6 bar (approx) for a duration of 10 minutes.
4 - Blast the unit dry with compressed air.
5 - Fill the housing with oil (ESSO UNIFARM 15W-40).

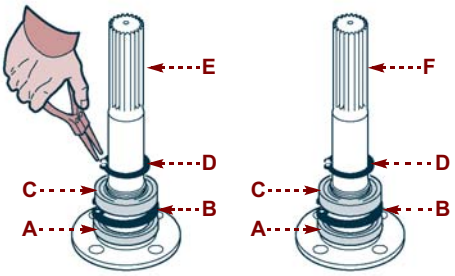


IDM-43800219200.tif

IDM-C443800201.fm

Assembling the rear axle

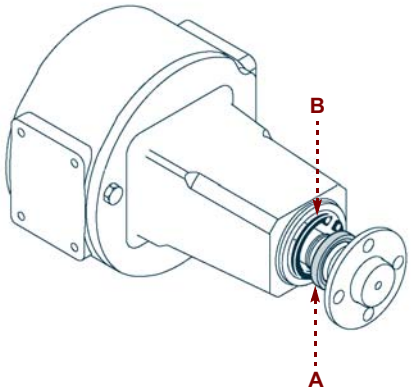
1 - Preassemble the following parts on one halfshaft **(E)**: oil seal **(A)**, using the replacer (AT 37981873), circlip **(B)**, bearing **(C)**, using the driver (AT 37981890), and circlip **(D)**.
2 - Repeat the operation on the other halfshaft **(F)**.



IDM-43800215200.tif

Right hand side

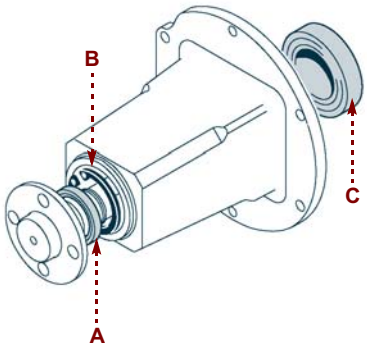
3 - Fit the preassembled shaft in the trumpet housing, using a drift and hammer.
4 - Seat the circlip **(B)** in the relative groove.
5 - Fit the oil seal **(A)**, using the plate (AT 37981870) and driver (AT 37981871).



IDM-43800214600.tif

Left hand side

6 - Fit the preassembled shaft in the trumpet housing, using a drift and hammer.
7 - Seat the circlip **(B)** in the relative groove.
8 - Fit the oil seal **(A)**, using the plate (AT 37981870) and driver (AT 37981871).
9 - Fit the bearing **(C)**, using driver (AT 37981883) and hammer.



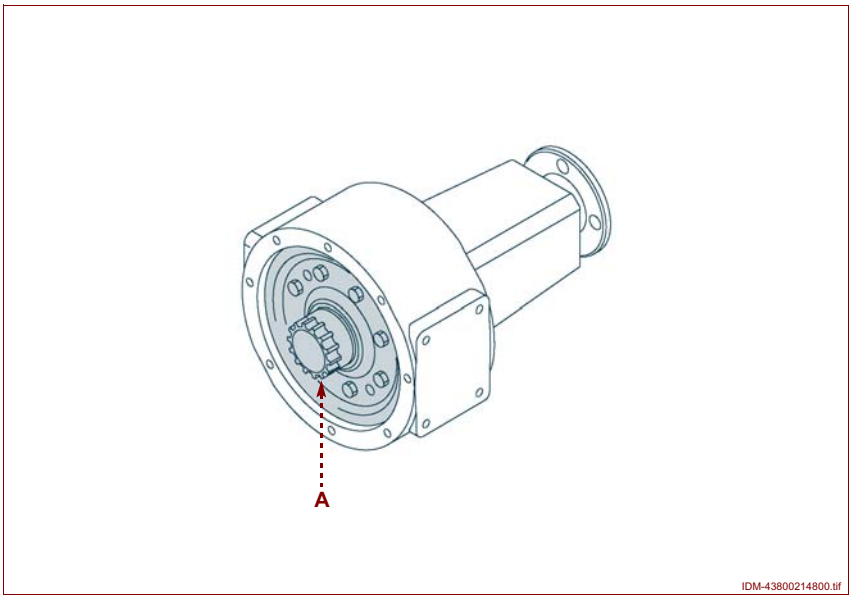
IDM-43800214700.tif

IDM-C443800201.fm

Important!

Make certain that the slot in each tension pin is oriented in the direction of the stress component.

10- Install the differential **(A)** in the housing, with the aid of a tube and hammer.

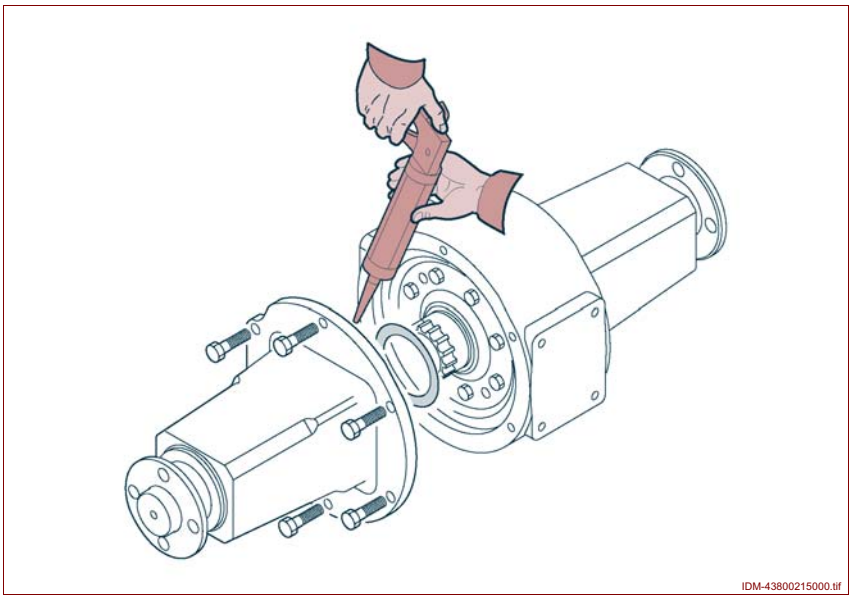


Important!

Verify crown wheel / pinion backlash and bearing preload (see *chap 06 - 8*).

11- Apply silicone to the trumpet housing flange.

12- Assemble the trumpet housing, insert the bolts and torque to 5 - 6.5 kgm.



13- Preassemble the pinionshaft **(H)** and bearing **(G)** with the driver (AT 37981163).

14- Locate the shims **(F)** in the housing, then tap home the assembled pinionshaft with a hammer.

Important!

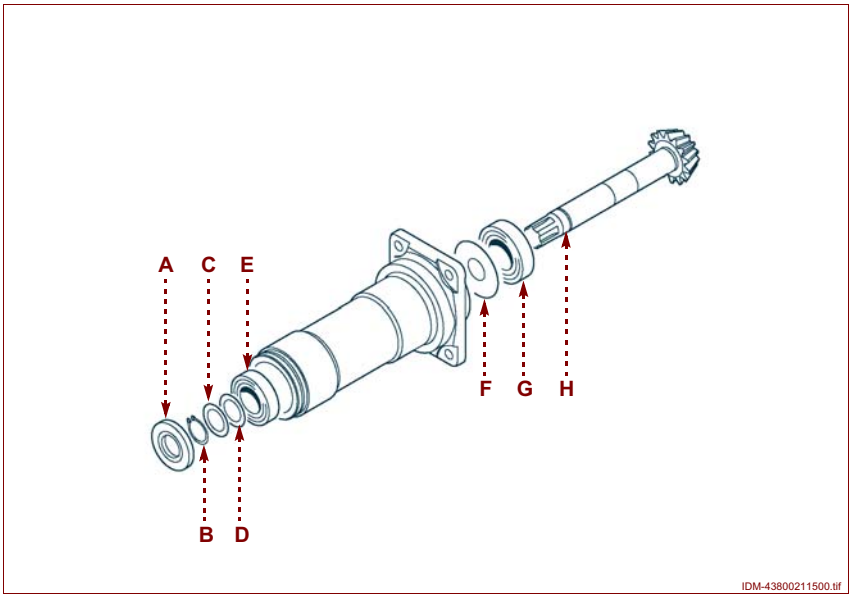
In the event that the bevel gear pair is replaced, the pinion must be "reset" (see "Setting the rear end transmission pinion ").

15- Assemble the bearing **(E)** using the driver (AT 37981860), add the shims **(D)** and **(C)** (nominal thickness 2.9 mm) and fit the circlip **(B)**.

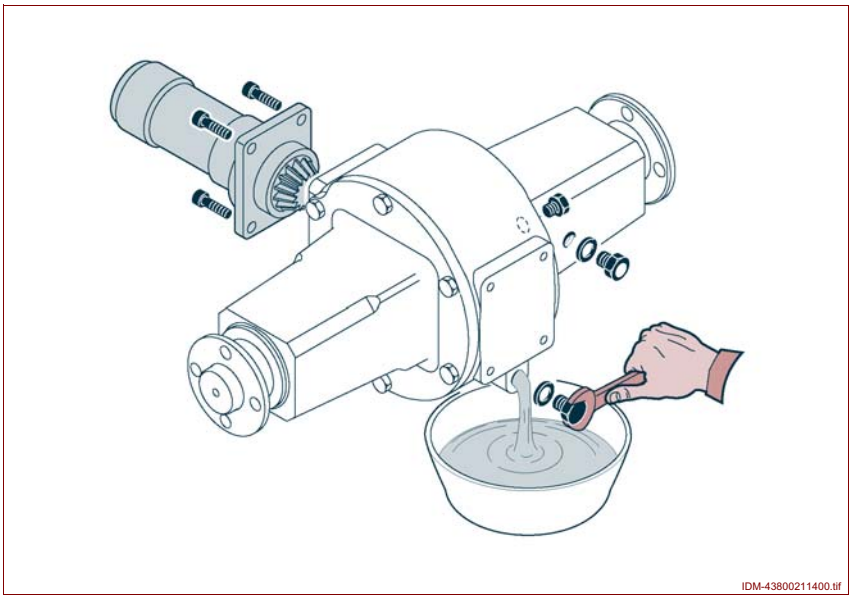
16- Bed in the pinionshaft by tapping with a plastic hammer.

17- Check the bearing preload with the torque gauge, and if necessary, add or remove shims **(D)** to obtain a value of 0 – 3 kgcm.

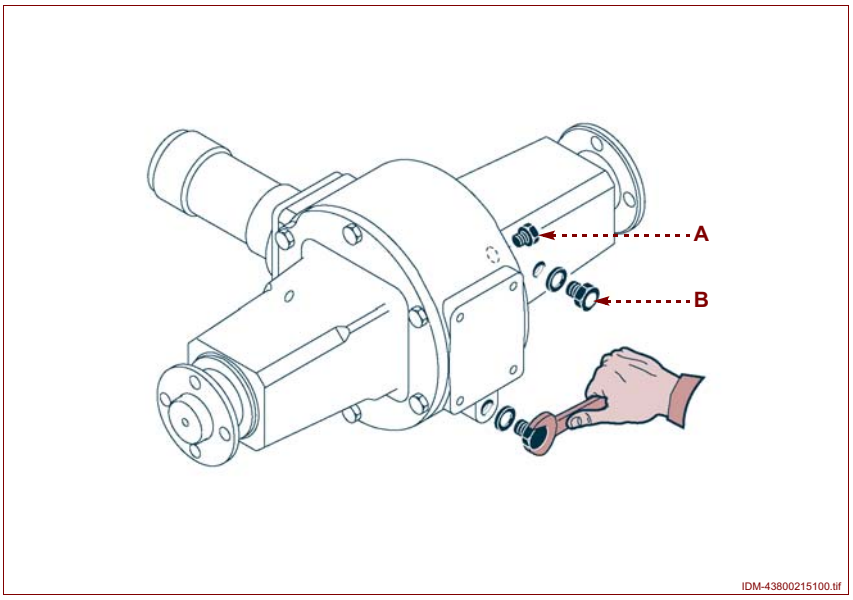
18- Fit the oil seal **(A)**, using a driver (AT 37981887) and hammer.



19- Apply silicone to the pinionshaft housing flange, offer the flange to the differential housing and torque the bolts to 8.5 – 10.9 kgm.



20- Fit the plug **(B)**, torquing to 1 kgm.
21- Fit the two remaining plugs, torquing to 3 kgm.
22- Check rotation and backlash, turning the pinionshaft by hand.
23- To verify the oil-tightness of the assembled unit, test by blowing in air through the plug **(A)** at a pressure of 0.35 bar, immersing the unit in a tank, or measure any drop in pressure by connecting a gauge with full scale 0.6 bar (approx) for a duration of 10 minutes.
24- Blast the unit dry with compressed air.
25- Fill the housing with oil (ESSO UNIFARM 15W-40).
26- Refit the plug **(A)**.



LIFT FRAME 5.1

LIFT CYLINDERS 5.2

LIFT FRAME 5.1

Technical specifications

Maximum lifting capacity .....6100 N (620 kgm)
(with frame horizontal and centre of mass of load at 1 m from lift hinge pivot)
Maximum lift angle from horizontal ..... 8°
Maximum lowering angle from horizontal .....31°
Maximum rotation about longitudinal axis .....15°
Diameter of hydraulic cylinders ..... 22 mm / 50 mm
Stroke of cylinders..... 117 mm

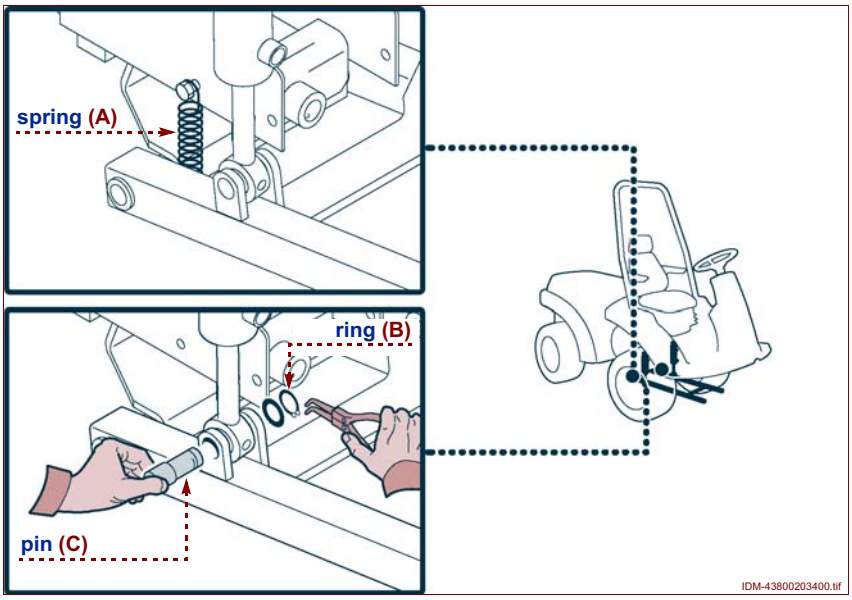
Removing the lift frame

Proceed as follows.

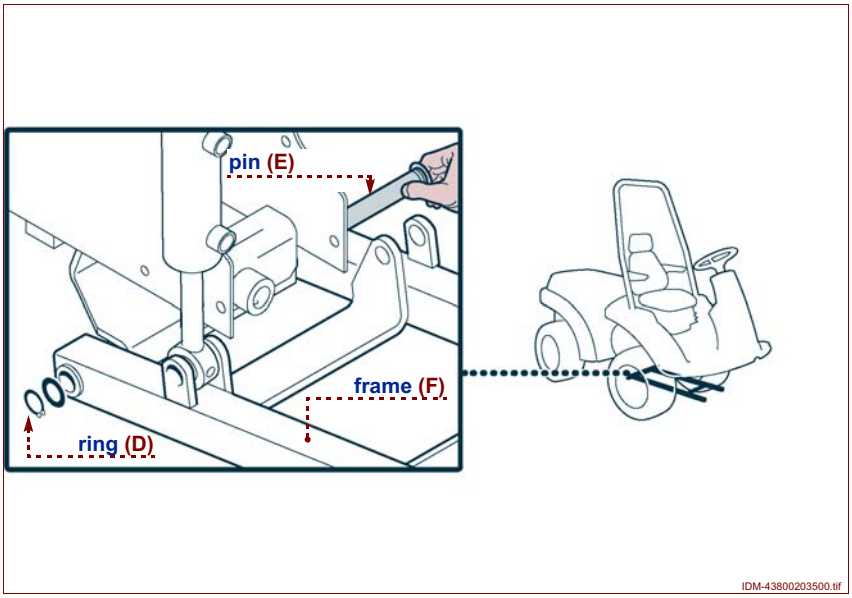
1 - Detach the springs **(A)**.
2 - Remove the circlip **(B)** and extract the rod end pivot **(C)**.

Important!

Repeat the same operations on the other cylinder.



3 - Remove the circlip **(D)**, extract the hinge pivot **(E)** and detach the frame **(F)**.

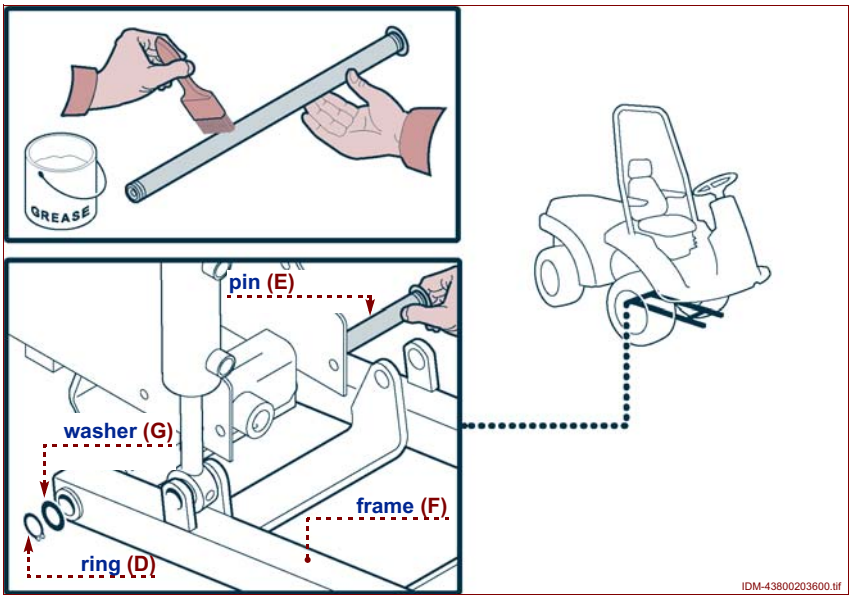


IDM-C543800201.fm

Refitting the lift frame

Proceed as follows.

1 - Clean all separated parts, ensuring that none are damaged. Lubricate the pivot and the relative sockets with grease.
2 - Offer the frame **(F)** to the mounting and locate the hinge pivot **(E)**.
3 - Fit the washer **(G)** and the circlip **(D)**.

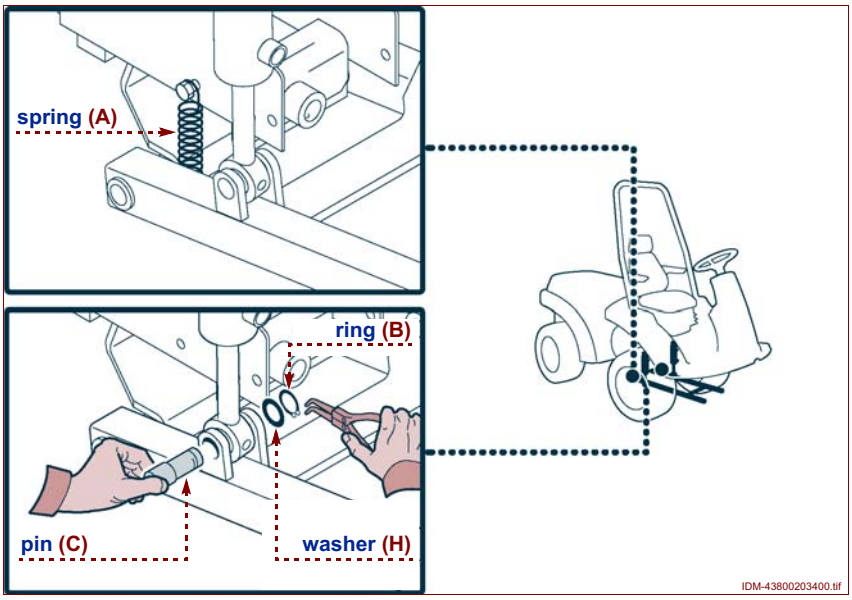


4 - Fit the rod end pivot **(C)**, the washer **(H)** and the circlip **(B)**.

Important!

Repeat the same operations on the other cylinder.

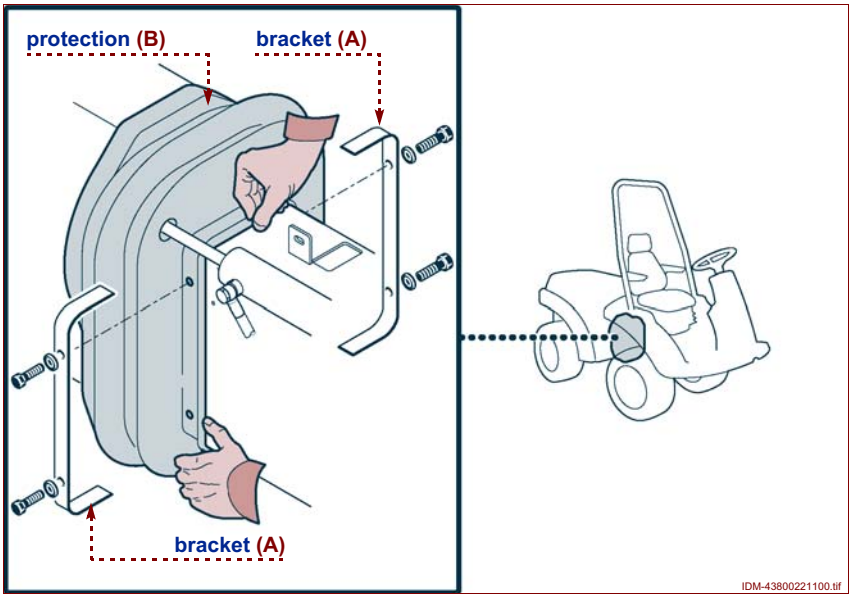
5 - Reattach the spring **(A)**.



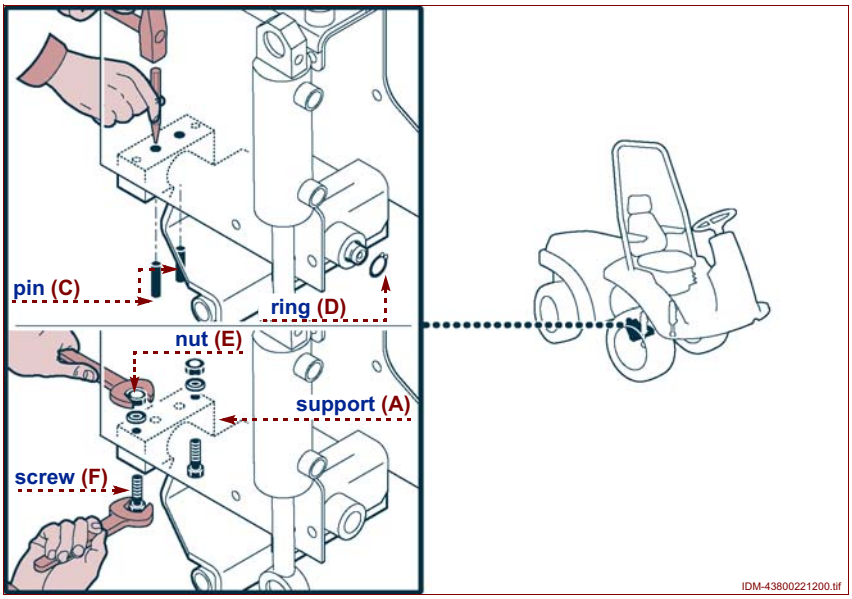
Replacing the bushes

Proceed as follows.

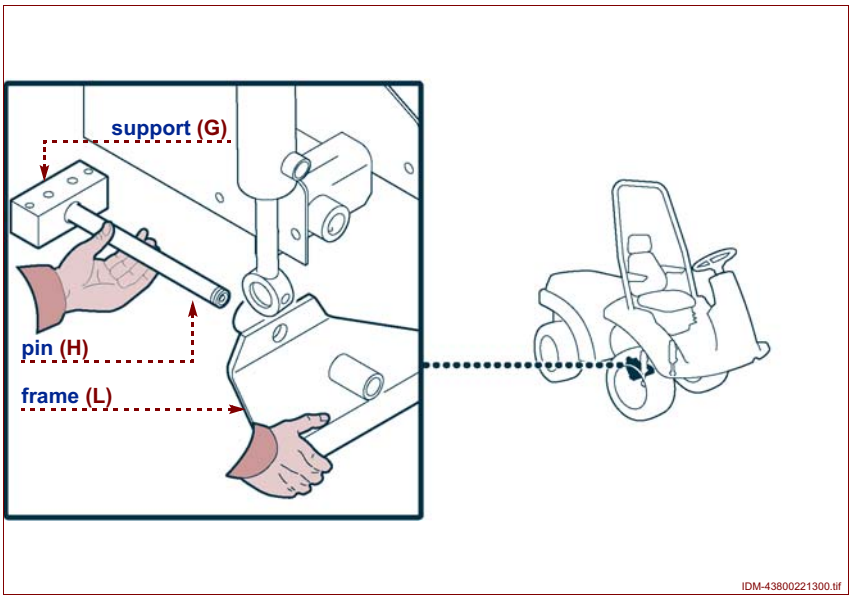
1 - Detach the hydraulic lift frame (see “Removing the lift frame”).
2 - Undo the screws and remove the straps **(A)**.
3 - Remove the boot **(B)**, distancing it toward the rear of the machine.



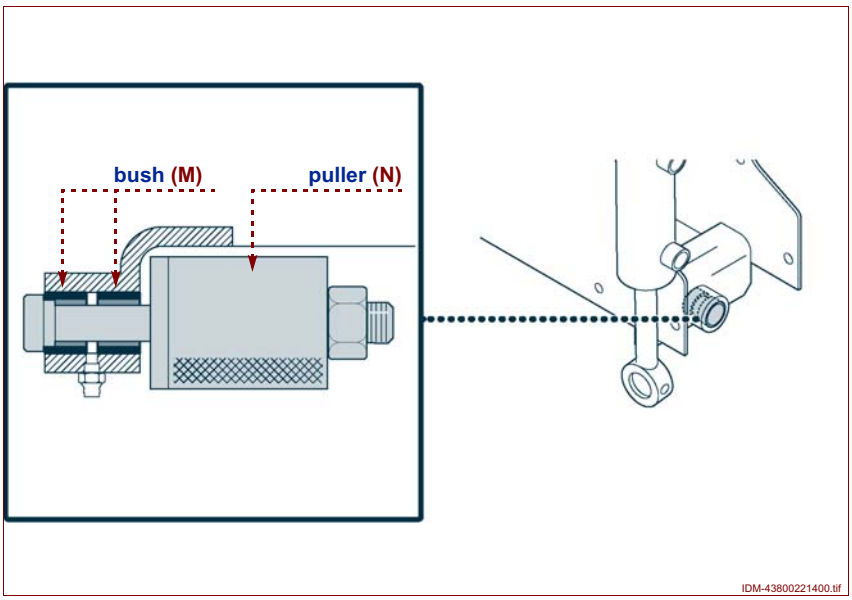
4 - Remove the pins **(C)** and the circlip **(D)**.
5 - Undo the nuts **(E)**, remove the bolts **(F)** and detach the mounting **(G)**.



6 - Separate the pivot **(H)** together with the mounting **(G)** and disassemble the central joint frame **(L)**.



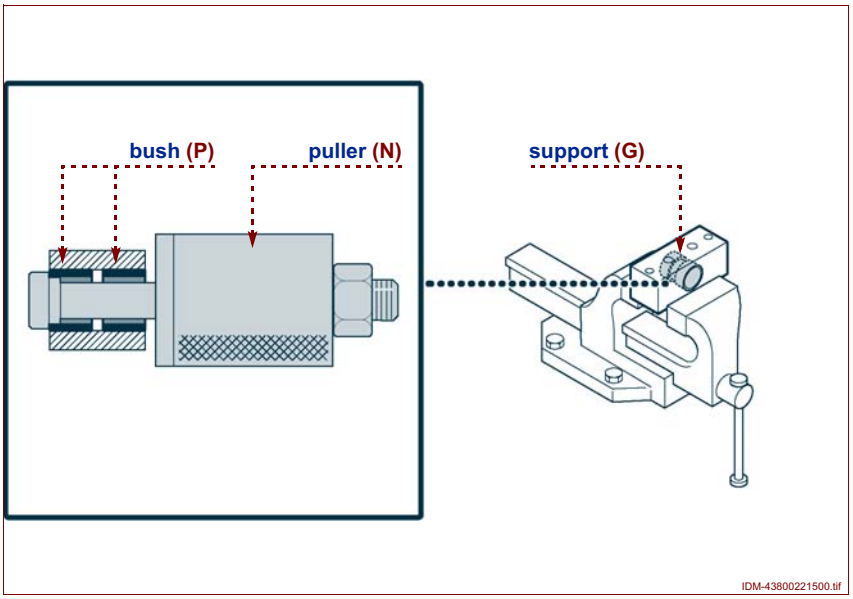
7 - Remove the bushes **(M)** using the puller **(N)** (AT 37981900).



5.1

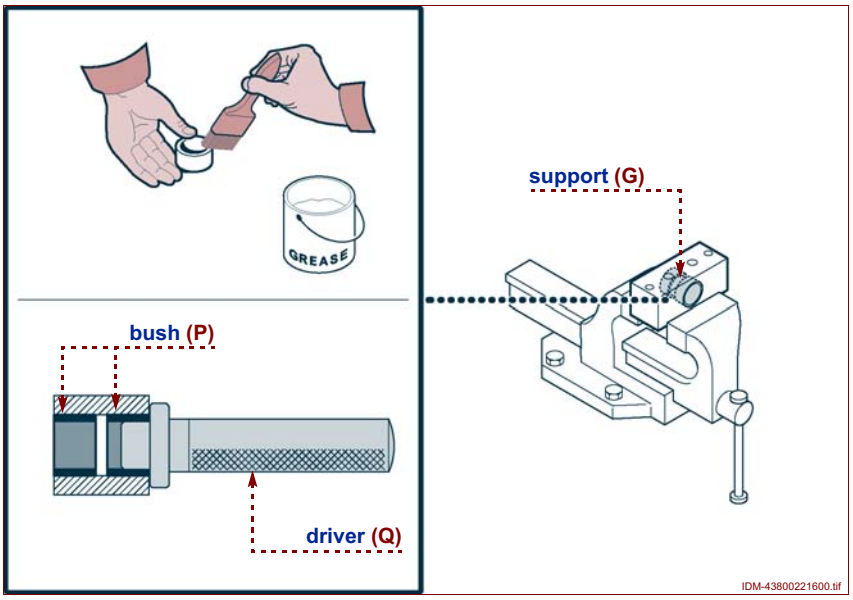
IDM-C543800201.fm

8 - Clamp the mounting **(G)** in a vice and remove the bushes **(P)** using the puller **(N)** (AT 37981900).



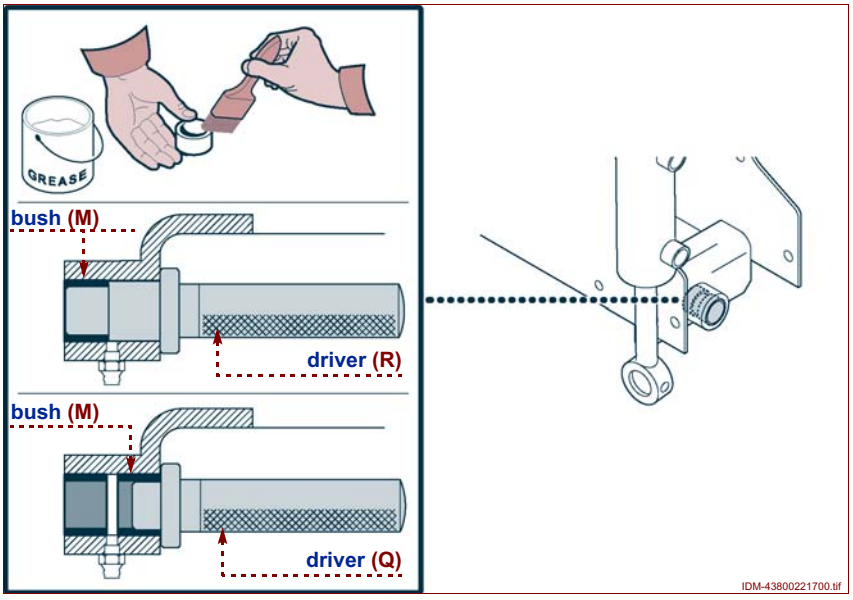
9 - Discard the old bushes, and grease the new bushes **(P)** before reassembling.

10 - Locate the bushes **(P)** in the mounting **(G)** using the driver **(Q)** (AT 37981907).



11 - Discard the old bushes, and grease the new bushes **(M)** before reassembling.

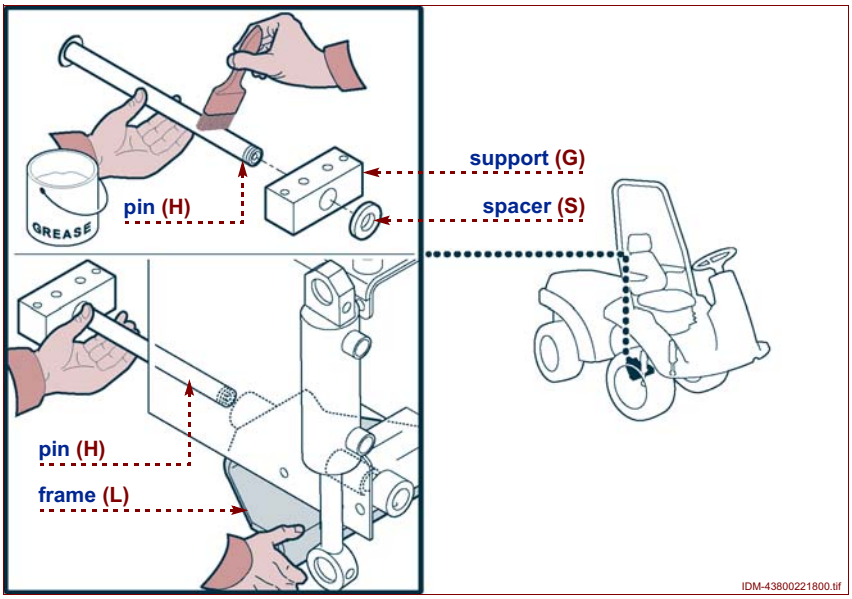
12 - Locate the bushes **(M)** using drivers **(Q)** (AT 37981907) and **(R)** (AT 37981908).



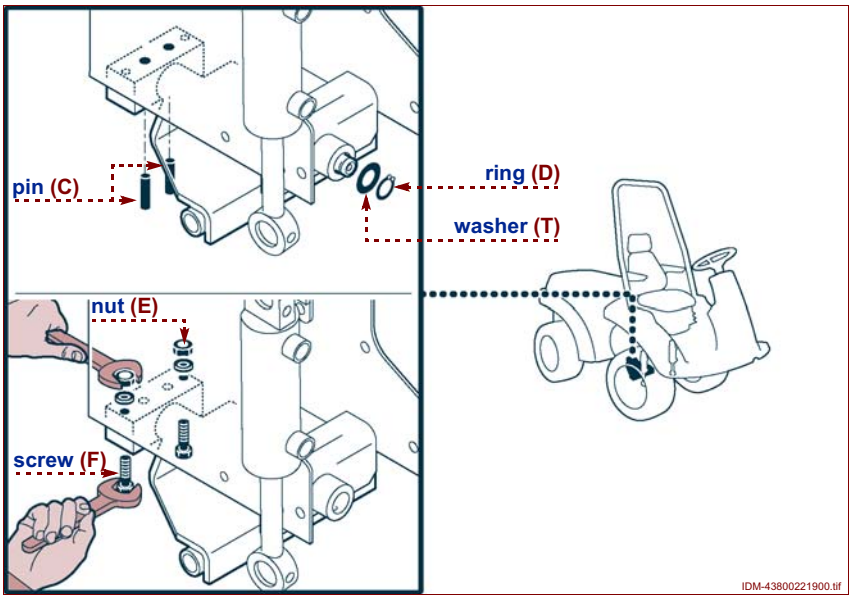
5.1

IDM-C543800201.fm

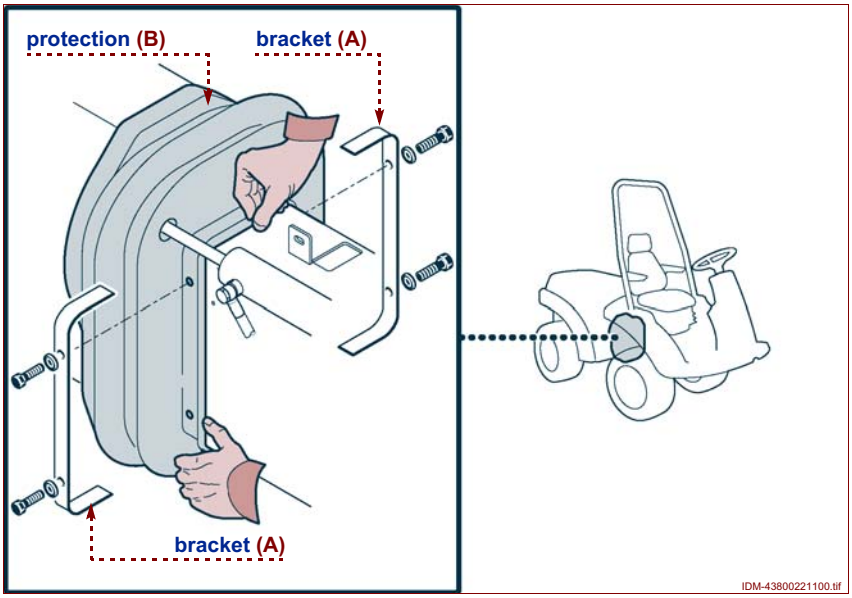
13- Grease the pivot **(H)** and locate in the mounting **(G)**.
14- Fit the spacer **(S)**.
15- Position the central joint frame **(L)** and assemble the pivot **(H)** together with the mounting **(G)**.



16- Insert the bolts **(F)** and lock with the nuts **(E)**.
17- Insert the pins **(C)**.
18- Locate the washer **(T)** and fit the circlip **(D)**.



19- Refit the boot **(B)** and secure with the straps **(A)**.
20- Connect the lift frame (see “Refitting the lift frame”).



5.1

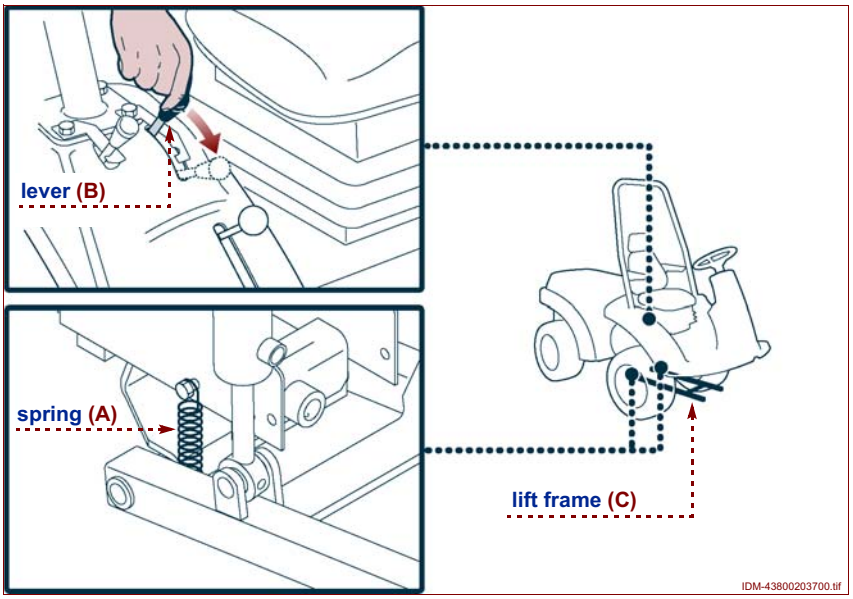
IDM-C543800201.fm

LIFT CYLINDERS 5.2

Removing the cylinders

Proceed as follows.

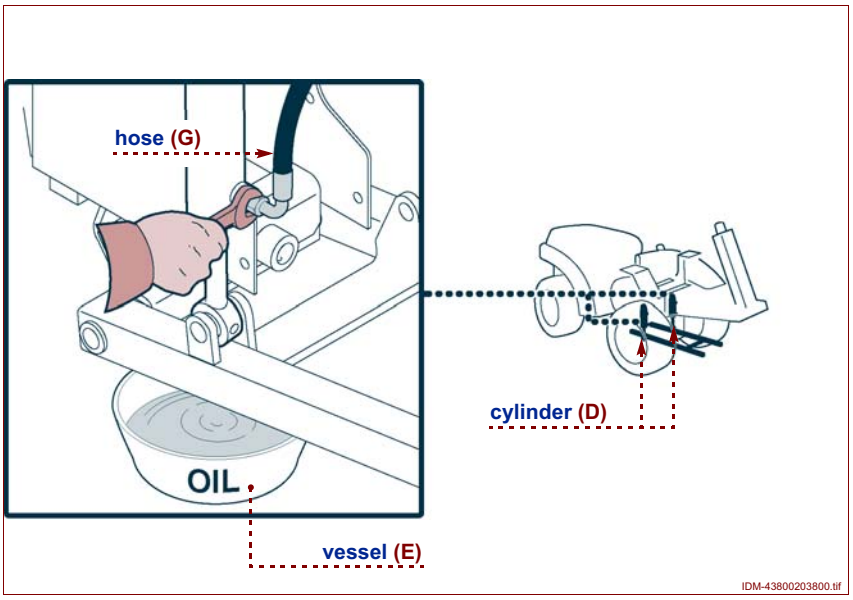
1 - Remove the steering wheel and column (see “Disassembling the steering wheel and column”).
2 - Remove the platform (see “Disassembling the seat and platform”).
3 - Detach the springs **(A)**.
4 - Lower the lift control lever **(B)** completely.
5 - Lower the lift frame **(C)**.



6 - Position a vessel **(E)** of suitable capacity under the cylinder **(D)**.
7 - Disconnect the oil line **(G)** and plug temporarily to prevent any leakage of oil.
8 - Allow the oil to run off.

Important!

Repeat the same operations on the other cylinder.

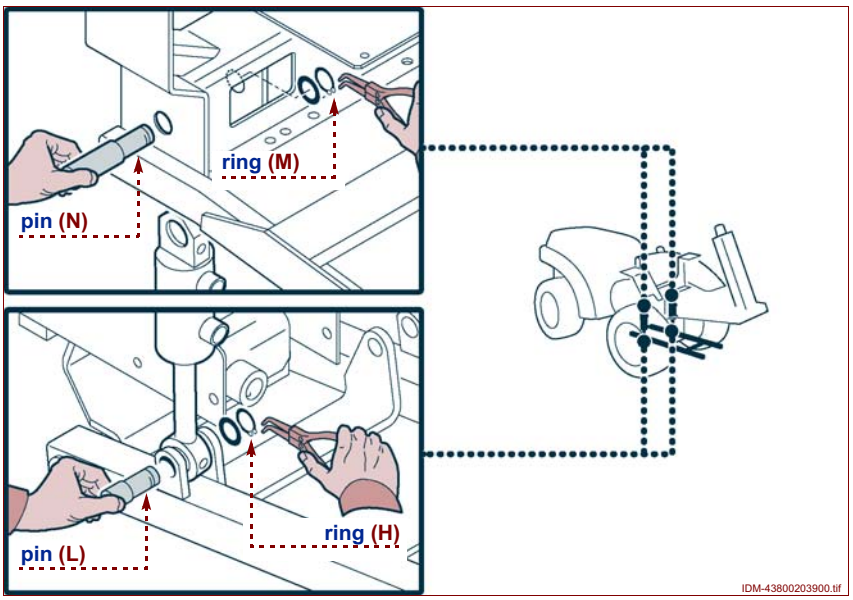


9 - Remove the circlip **(H)** and extract the rod end pivot **(L)**.
10 - Remove the circlip **(M)**, extract the top pivot **(N)** and lift out the cylinder.

Important!

Repeat the same operations on the other cylinder.

11 - Inspect the cylinder to assess its condition and determine whether it should be replaced, or retained and fitted with new seals (see “Replacing the cylinder seals”).



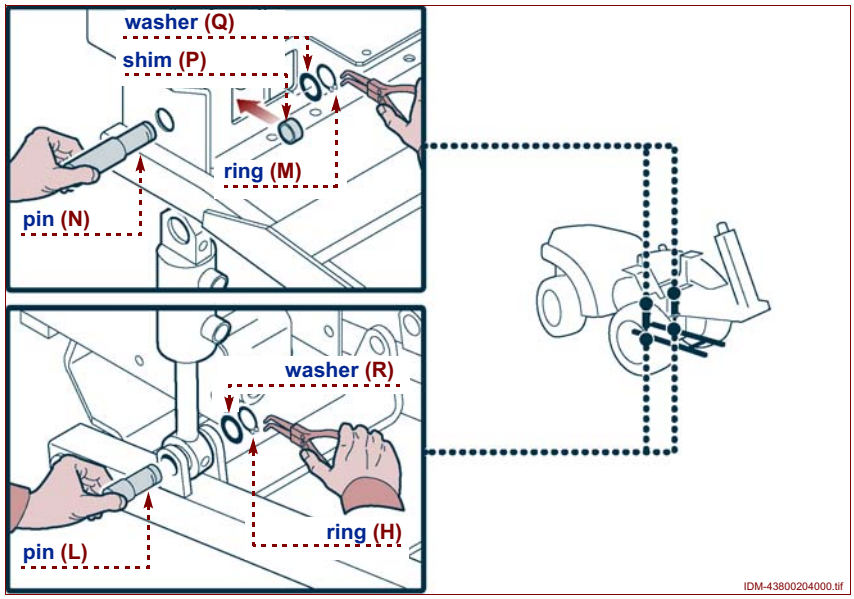
Refitting the cylinders

Proceed as follows.

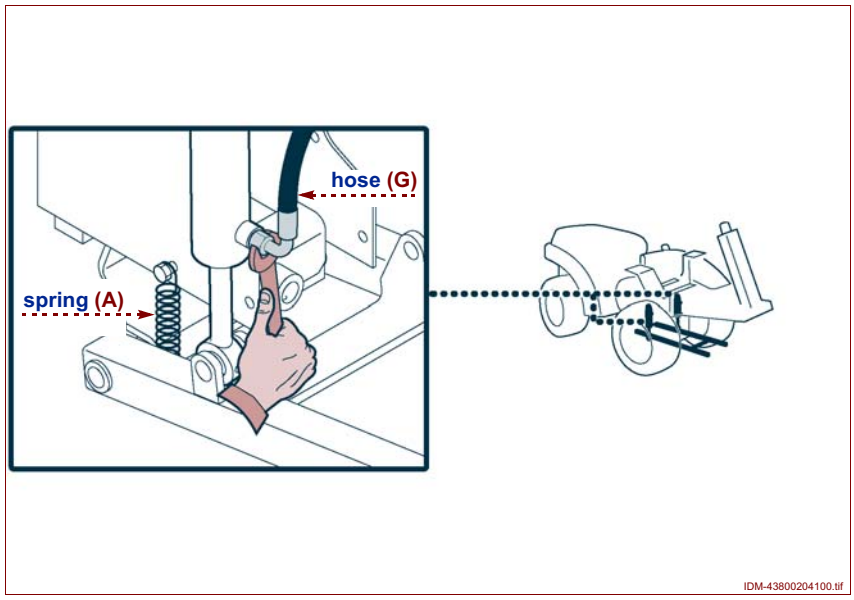
1 - Offer the cylinder to the mounting, then locate the pivot **(N)**, shim **(P)**, washer **(Q)** and circlip **(M)**.
2 - Insert the rod end pivot **(L)** to connect the cylinder to the frame.
3 - Locate the washer **(R)** and fit the circlip **(H)**.

Important!

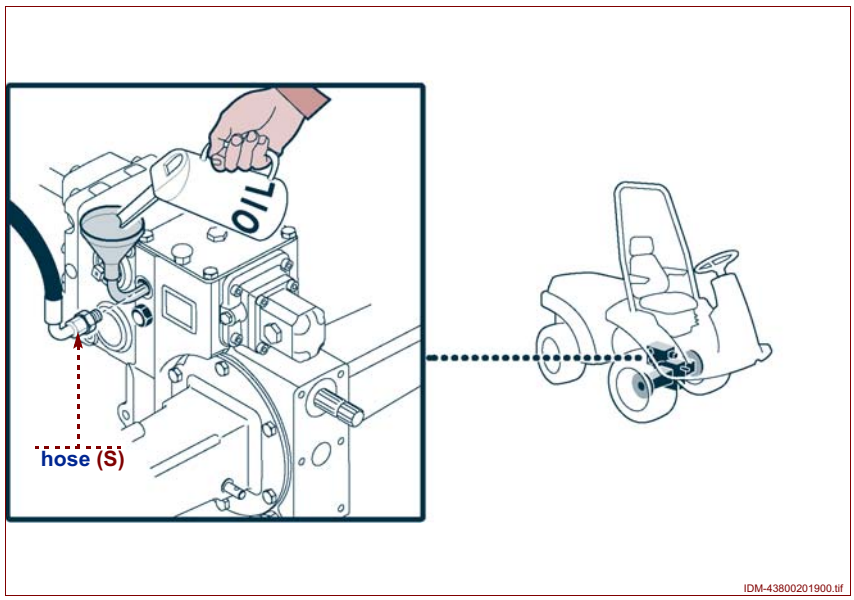
Repeat the same operations on the other cylinder.



4 - Connect the oil line **(G)** to each cylinder.
5 - Attach the springs **(A)**.



6 - Detach the fitting **(S)** and replace the oil drained previously, filling up to the level on the indicator.
7 - Retighten the fitting **(S)** and check that there are no leaks.
8 - Refit the steering wheel and column (see “Assembling the steering wheel and column”).
9 - Refit the platform (see “Assembling the seat and platform”).



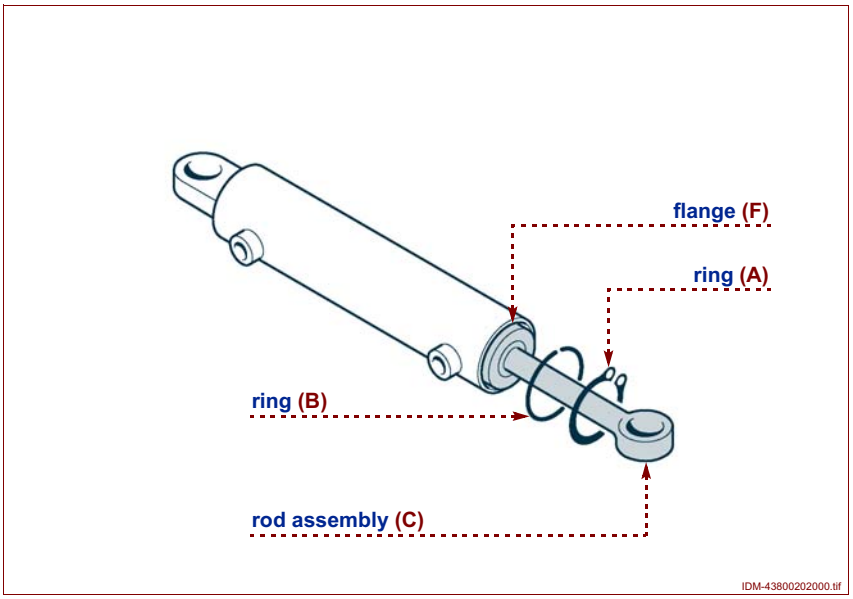
Replacing the cylinder seals

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.

1 - Remove the steering cylinder (see "Removing the cylinder").
2 - Unseat the circlip **(A)**.
3 - Force the gland **(F)** inwards using the special driver (AT 37981823).
4 - Remove the circlip **(B)**.
5 - Draw out the rod assembly **(C)**.

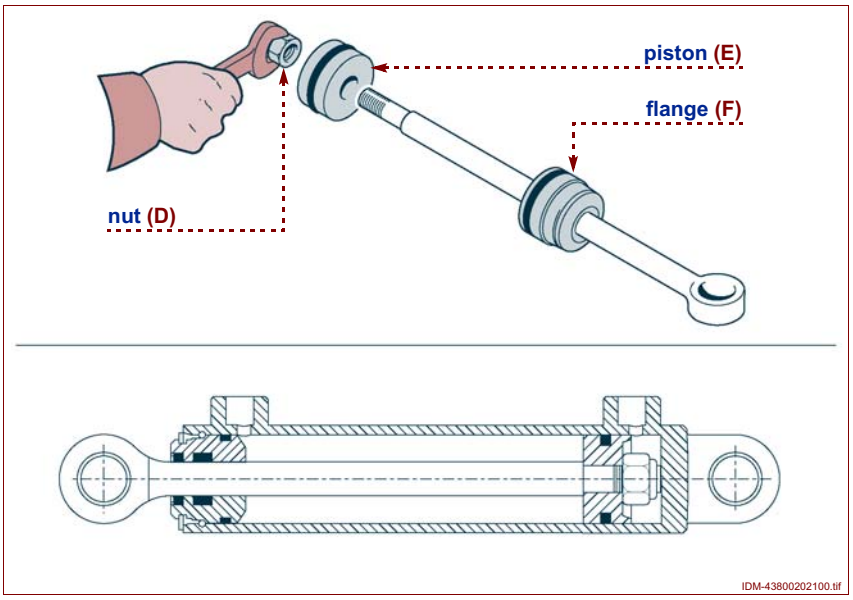


6 - Undo the nut **(D)**, separate the piston **(E)** and remove the gland **(F)**.
7 - Remove all the seals.

Important!

Clean all separated parts, ensuring that none are damaged, scored or ovalized at the areas in contact with the seals. Take care not to damage the seals when replacing.

8 - Fit all the seals.
9 - Refit the gland **(F)** and the piston **(E)**, and lock with the nut **(D)**.
10 - Refit the rod assembly **(C)** and the circlips **(A - B)**.



5.2

DIFFERENTIALS 6.1

HALFSHAFTS 6.2

DRIVE SHAFTS 6.3

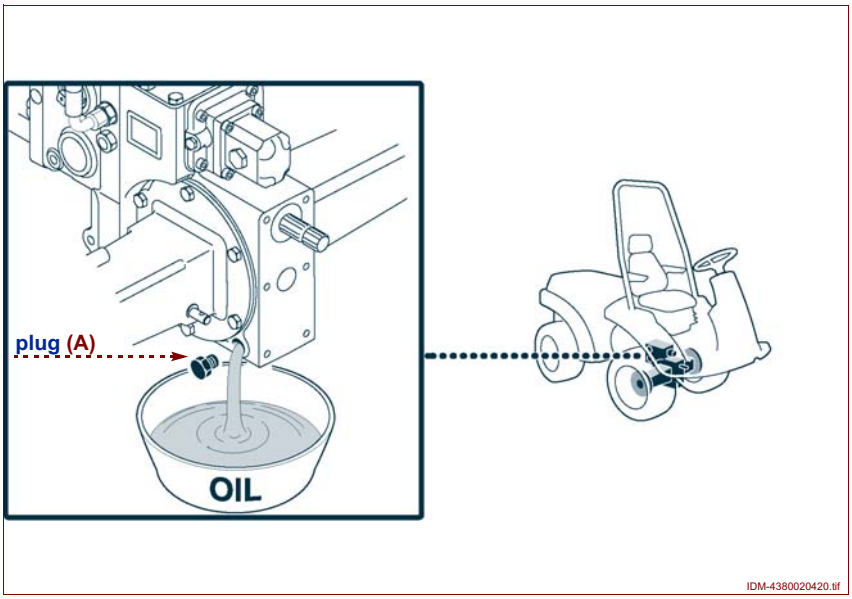
IDM-C643800201.fm

DIFFERENTIALS 6.1

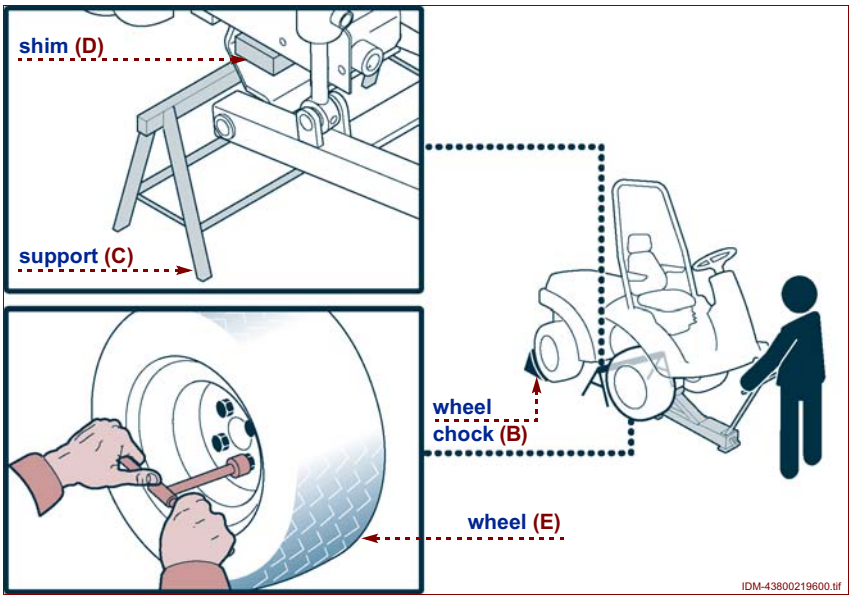
Removing the front differential

Proceed as follows.

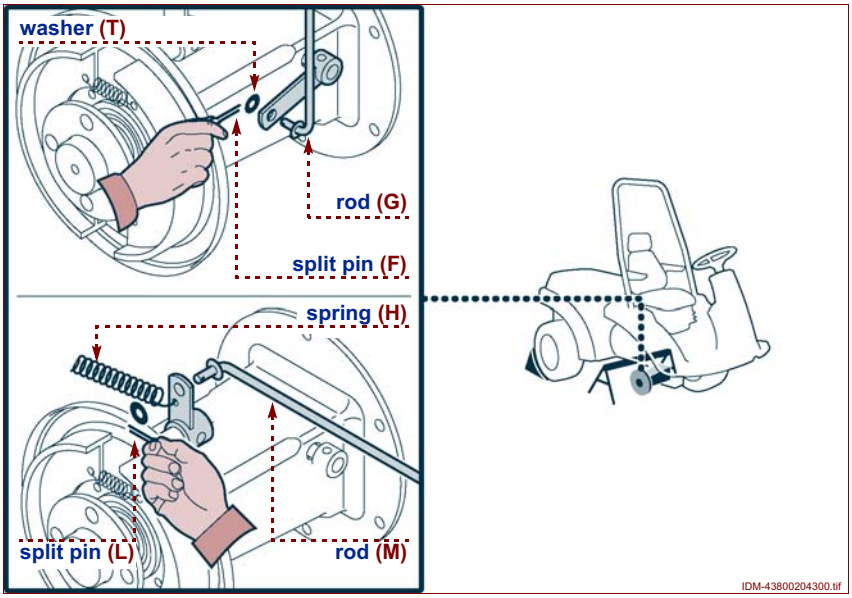
1 - Position a vessel of suitable capacity under the drain plug **(A)**.
2 - Unscrew the drain plug **(A)** and allow the oil to run off.



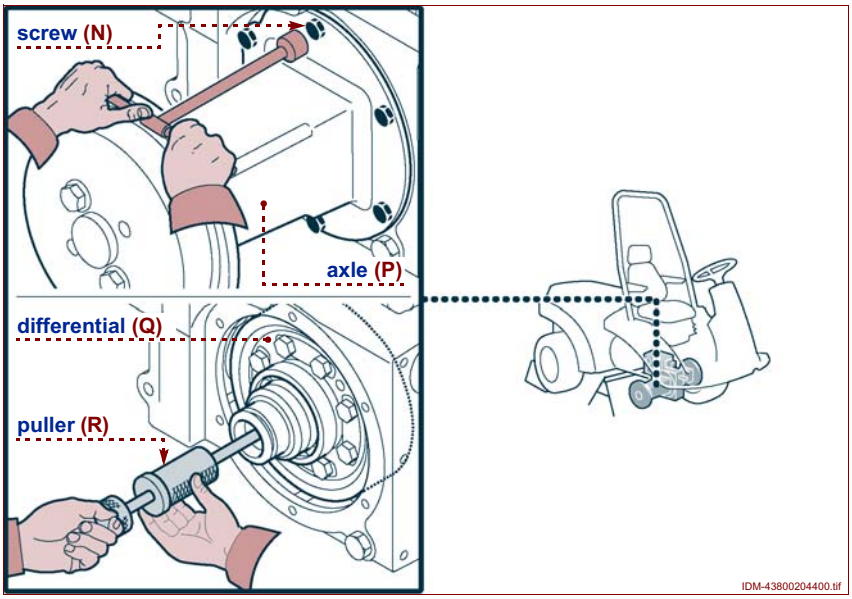
3 - Position wheel chocks **(B)** to immobilize the machine.
4 - Jack up the front end and position the stand **(C)**.
5 - Locate the shim **(D)** to ensure the machine remains stable.
6 - Loosen the wheel nuts and remove the wheel **(E)**.



7 - Remove the split pin **(F)** and free the differential lock linkage rod **(G)**.
8 - Detach the spring **(H)**.
9 - Remove the split pin **(L)** and free the brake linkage rod **(M)**.



10- Undo the bolts **(N)** and detach the axle assembly **(P)**.
11- Remove the differential **(Q)** using the puller **(R)** (AT 27981047 - AT 37981486).

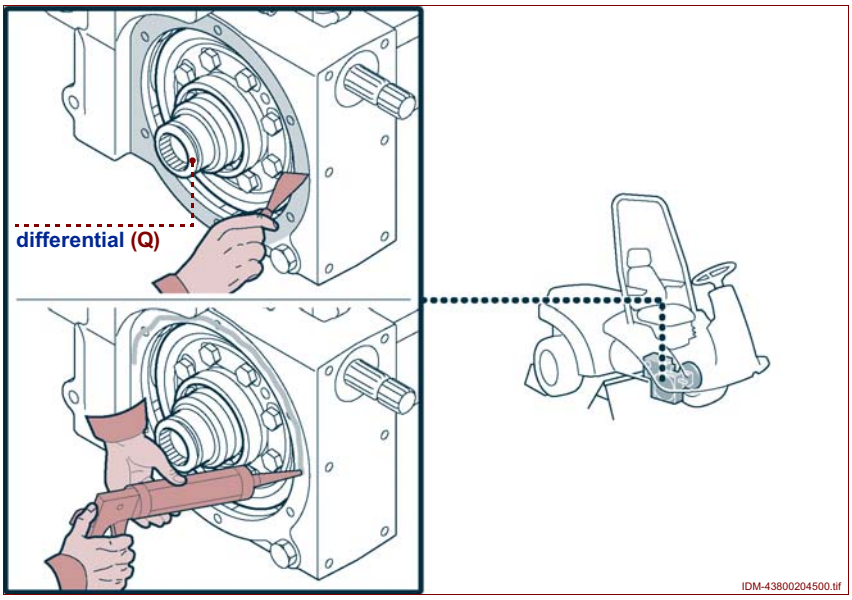


Refitting the front differential

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

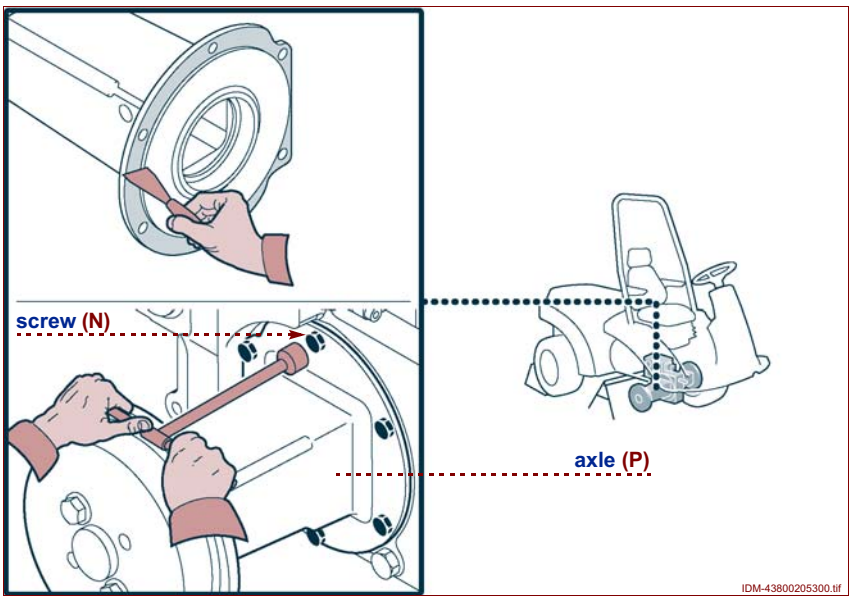
Proceed as follows.
1 - Clean all disassembled parts and ensure they are not damaged. Make certain the two mating surfaces are suitably clean.
2 - Fit the differential **(Q)**.



Important!

Verify crown wheel / pinion backlash and bearing preload (see *chap 06 - 8*).

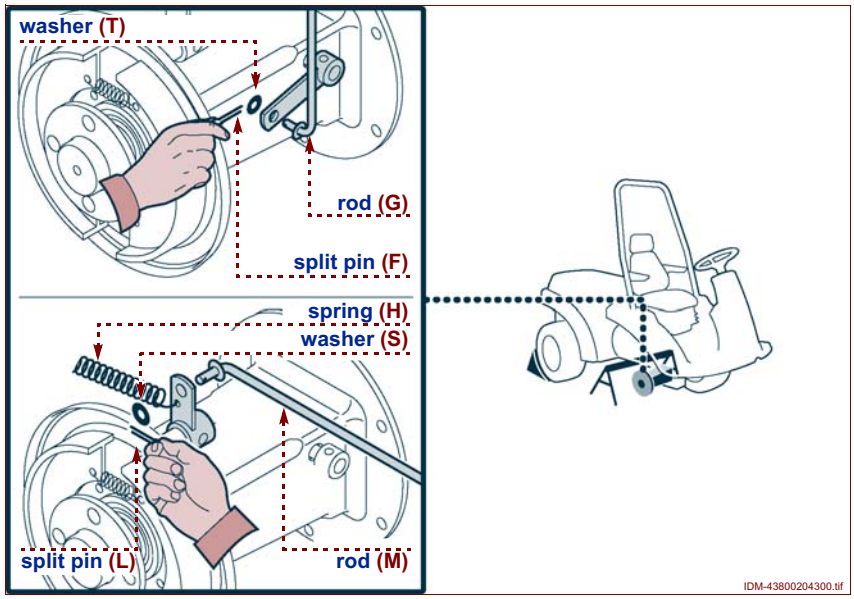
3 - Apply silicone to the mating surface.
4 - Fit the axle assembly **(P)** and secure with the bolts **(N)**.



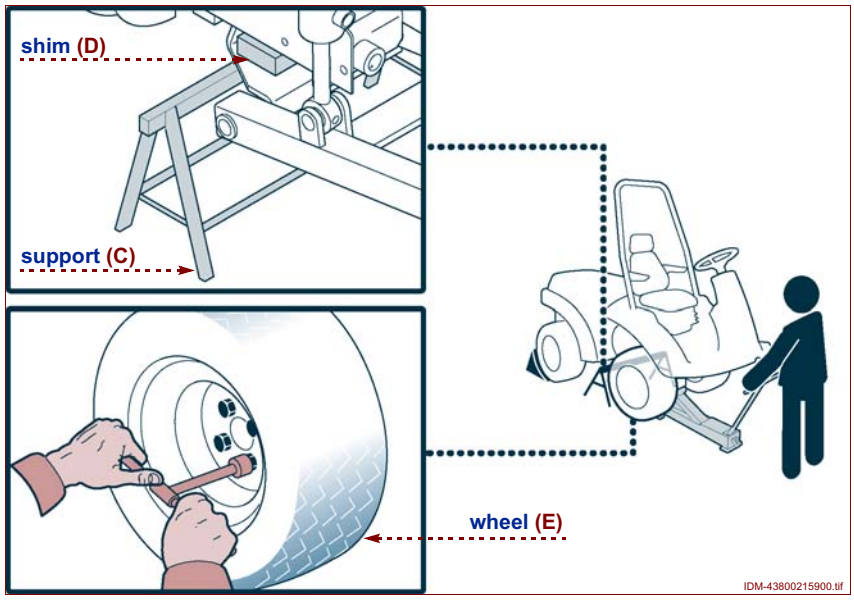
6.1

IDM-C643800201.fm

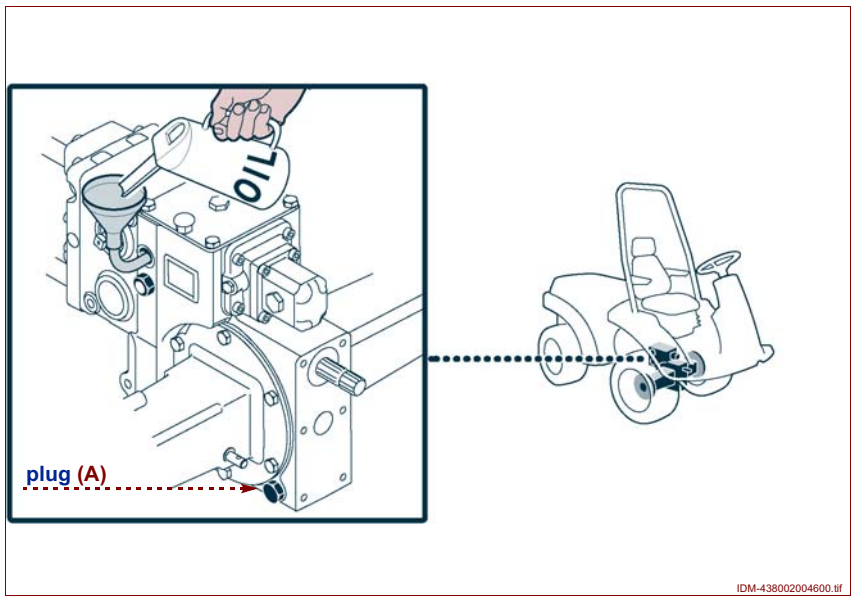
5 - Fit the rod **(M)**, washer **(S)** and split pin **(L)**.
6 - Attach the spring **(H)**.
7 - Fit the rod **(G)**, washer **(T)** and split pin **(F)**.



8 - Fit the wheel **(E)** and tighten the nuts.
9 - Jack up the machine, remove the shim **(D)** and the stand **(C)**, and lower the wheels to the floor.



10 - Fit the drain plug **(A)** and replace the oil drained previously, filling up to the level on the indicator.



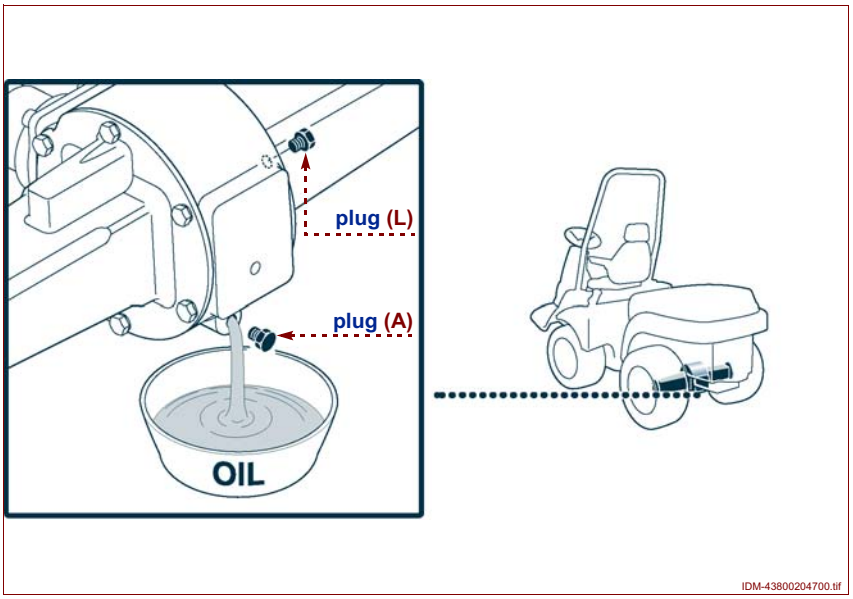
6.1

IDM-C643800201.fm

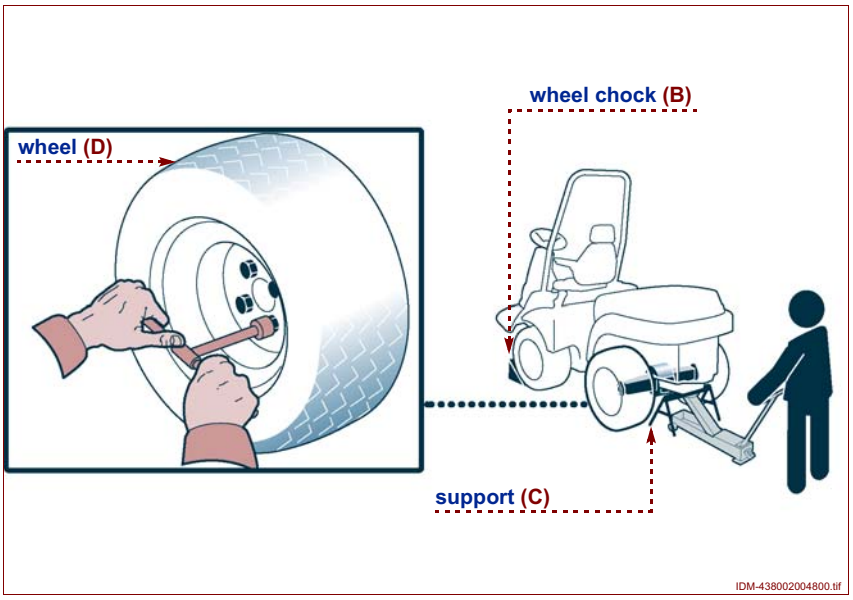
Removing the rear differential

Proceed as follows.

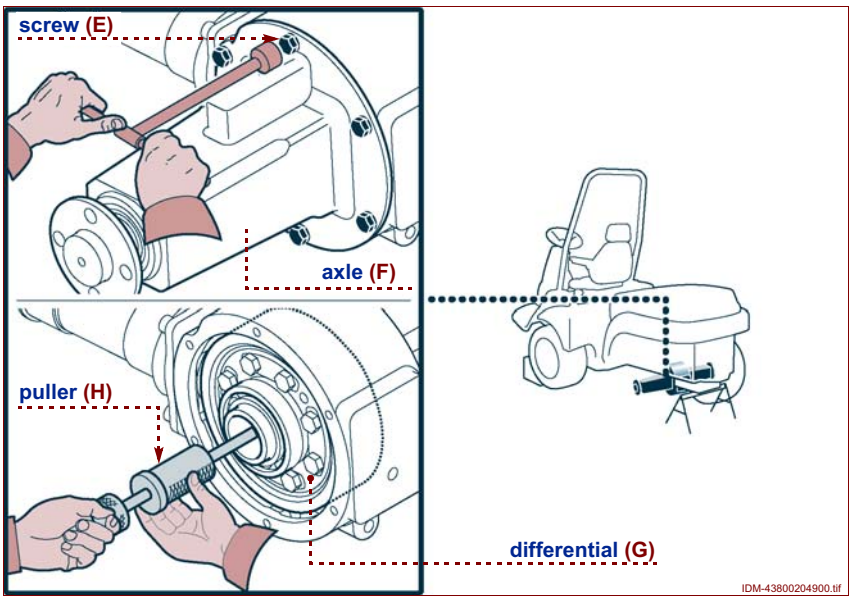
1 - Position a vessel of suitable capacity under the drain plug **(A)**.
2 - Unscrew the filler plug **(L)**, then the drain plug **(A)**, and allow the oil to run off.



3 - Position wheel chocks **(B)** to immobilize the machine.
4 - Jack up the rear end and position the stand **(C)**.
5 - Loosen the wheel nuts and remove the wheel **(D)**.



6 - Undo the bolts **(E)** and detach the axle assembly **(F)**.
7 - Remove the differential **(G)** using the puller **(H)** (AT 27981047 - AT 37981486).



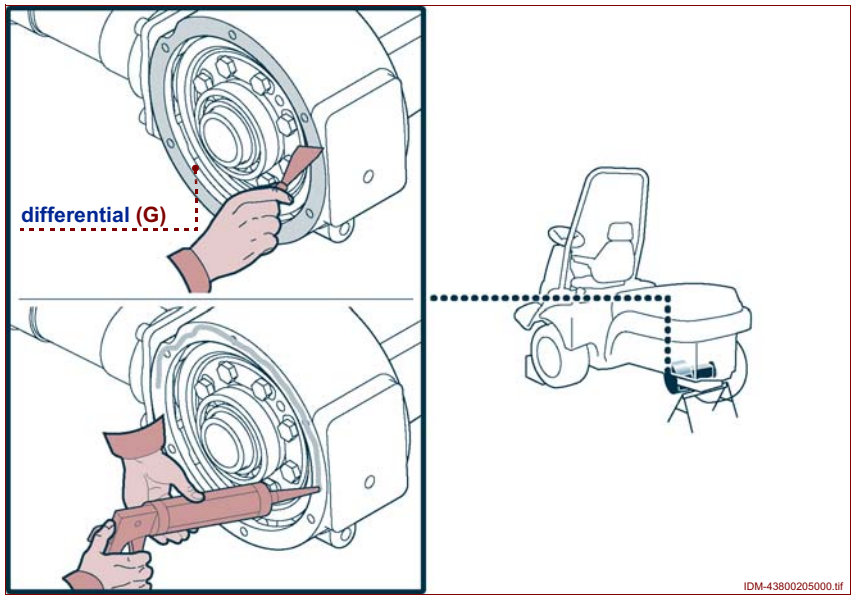
Refitting the rear differential

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.

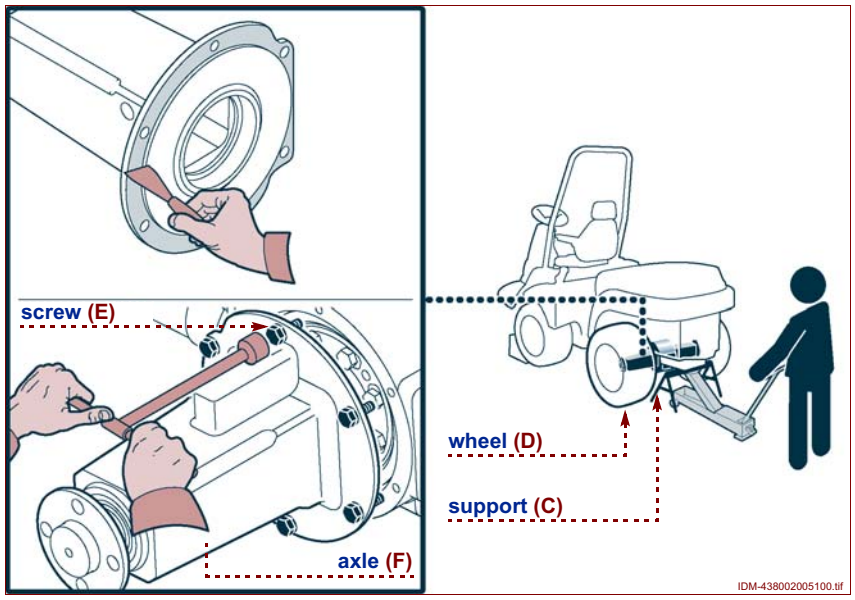
1 - Clean all disassembled parts and ensure they are not damaged. Make certain the two mating surfaces are suitably clean.
2 - Fit the differential **(G)**.



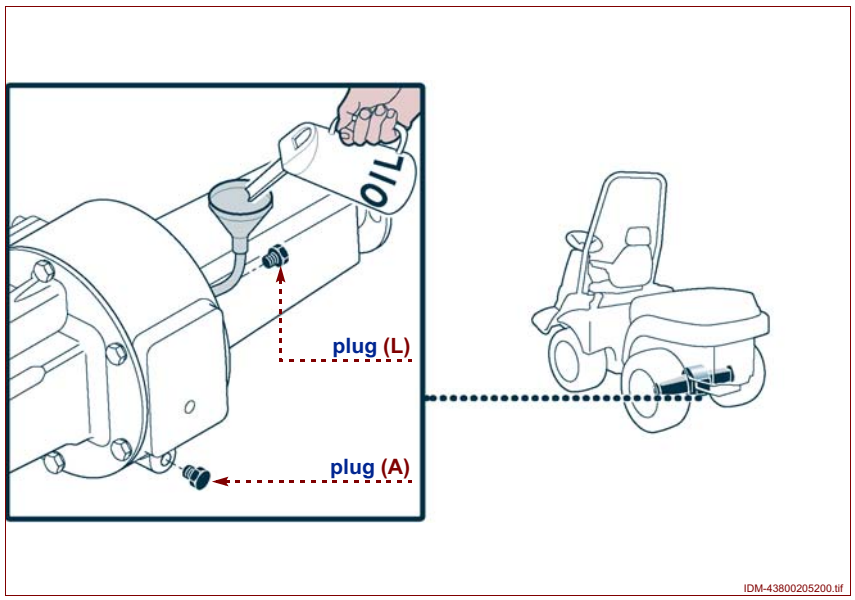
Important!

Verify crown wheel / pinion backlash and bearing preload (see *chap 06 - 8*).

3 - Apply silicone to the mating surface.
4 - Fit the axle assembly **(F)** and secure with the bolts **(E)**.
5 - Fit the wheel **(D)** and tighten the nuts.
6 - Jack up the machine, remove the stand **(C)** and lower the wheels to the floor.



7 - Fit the drain plug **(A)** and replace the oil drained previously, filling up to the level on the indicator.
8 - Retighten the filler plug **(L)** and ensure there are no leaks.



Disassembling the differential

Proceed as follows.

1 - Remove the bearing **(A)** and shim **(B)**, using the puller (AT 37981247) and adapter (AT 37981214).
2 - Remove the bearing **(C)**.
3 - Remove bolts and dowels, and disassemble the crown wheel **(D)**, thrust washer **(E)** and gear **(F)**.
4 - Drive out the pin **(G)**, remove the cross pin **(H)**, thrust plates **(L)** and gears **(M)**.
5 - Remove the thrust washer **(P)** and gear **(N)**.

Assembling the differential

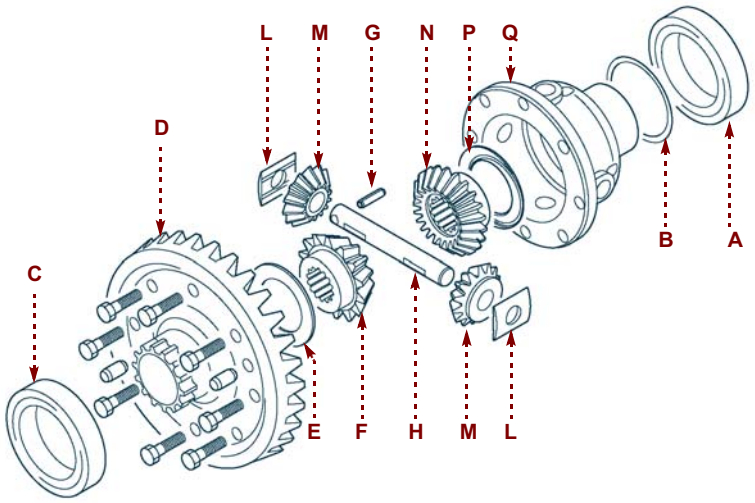
Proceed as indicated

1 - Assemble the thrust washer **(P)** and gear **(N)** with the housing **(Q)**, using the driver (AT 37981875).
2 - Fit the cross pin **(H)**, gears **(M)** and thrust plates **(L)** and insert the pin **(G)**.
3 - Assemble the thrust washer **(E)** and gear **(F)** with the crown wheel **(D)**, using the driver (AT 37981875).
4 - Fit the crown wheel **(D)** to the housing and secure with the bolts and dowels.

Important!

Torque the bolts to 5÷6.5 kgm

5 - Assemble the shim **(B)** and bearing **(A)**, using the driver (AT 37981876).
6 - Assemble the bearing **(C)**, using the driver (AT 37981876).

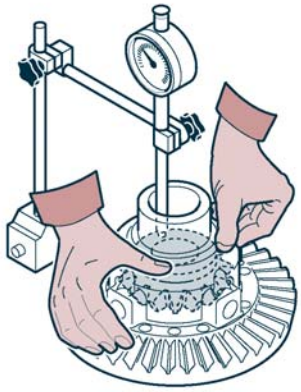


IDM-43800210900.tif

Verifying sun gear end float

Proceed as follows.

1 - Offer the probe of the dial gauge (AT 37981837) to the sun gear.
2 - Shift the sun gear fully into contact with the planet pinion, then into contact with the differential housing, and measure the resulting end float on the dial gauge.
3 - The movement should be between 0.15 and 0.30 mm.



IDM-43800211000.tif

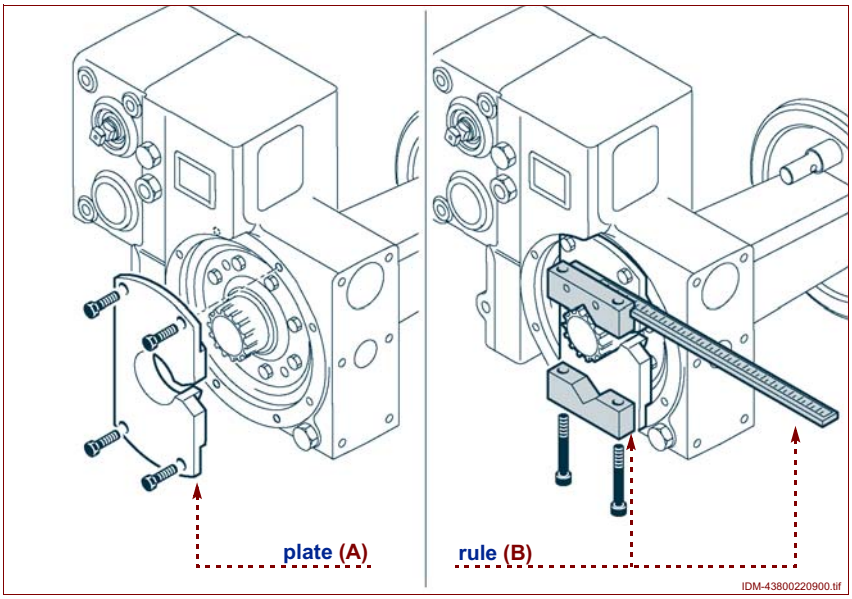
6.1

IDM-C643800201.fm

Verifying crown wheel and pinion backlash

Proceed as follows.

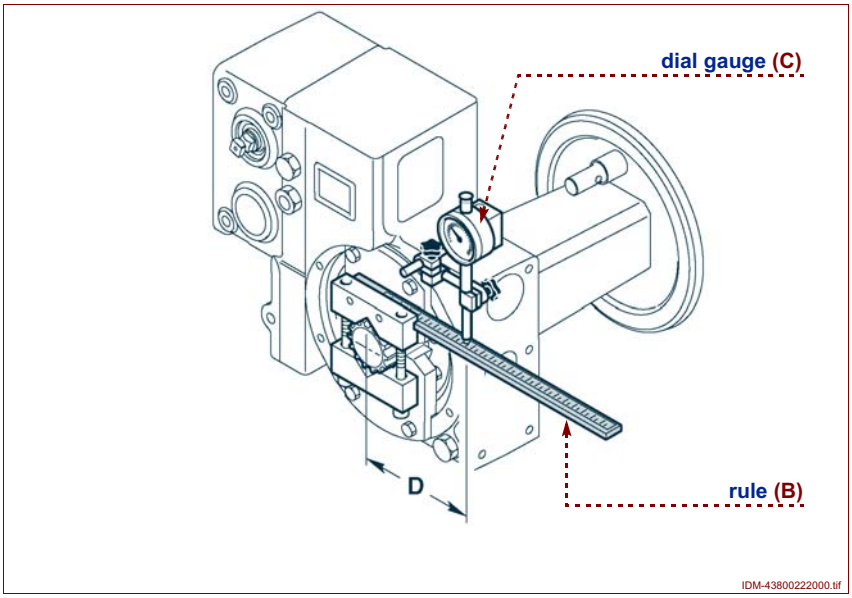
1 - Position the differential in the transmission housing.
2 - Fit the plate **(A)** (AT 27981318), used to align the differential with the housing.
3 - Fit the rule **(B)** (AT 37981912) to the differential.



4 - Offer the probe of the dial gauge **(C)** (AT 37981837) to the rule **(B)** at a distance **(D)** of 93 mm from the differential axis.
5 - Check that the clearance between the crown wheel and pinion teeth, measured with the dial gauge, is between 0.15 and 0.38 mm.

Important!

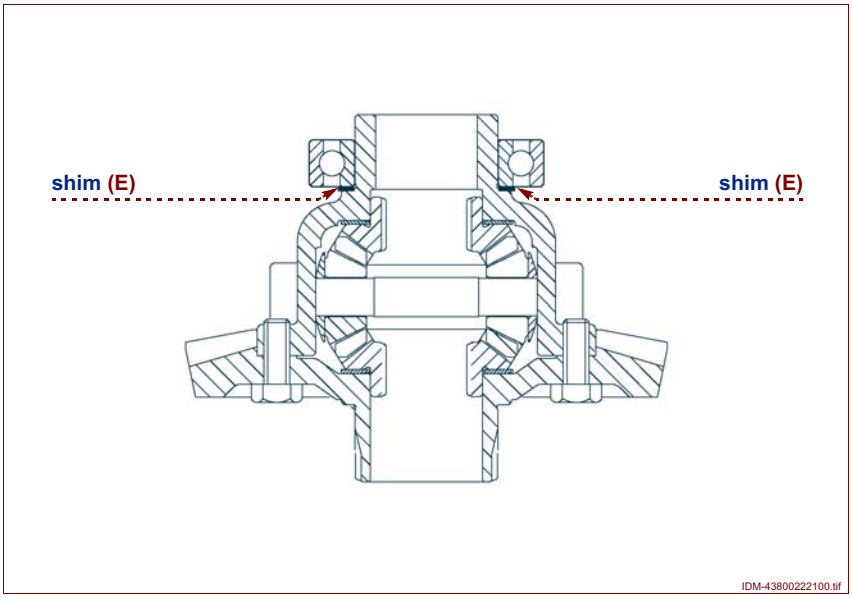
Check the backlash measurements with the rule (B) in three different positions, 120° apart.



6 - If the measurement is not within the prescribed values, the nominal thickness of the shim **(E)** must be increased or reduced.

Important!

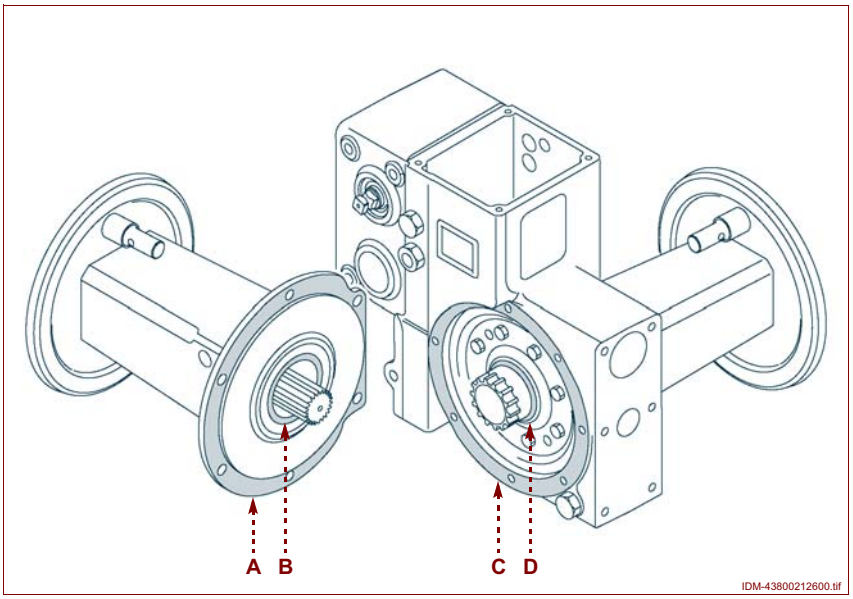
A variation of 0.1mm in thickness of the shim (E) corresponds to a variation of 0.07mm between the teeth of the crown wheel and the pinion.



Differential housing bearings preload

Proceed as follows.

1 - Position the differential in the transmission housing.
2 - Check the distances between the faces **(A)** and **(B)** of the trumpet housing, using the dial gauge (AT 37981224), the bracket (AT 27981215) and the differential alignment tool (AT 27981318).
3 - Check the distance between the faces **(C)** and **(D)** of the housing and the differential.
4 - The difference between the two measurements indicates the shims needed to reduce the clearance to zero.
5 - Assemble shims of thickness equal to the difference between the measured values, minus 0.1÷0.2 mm.



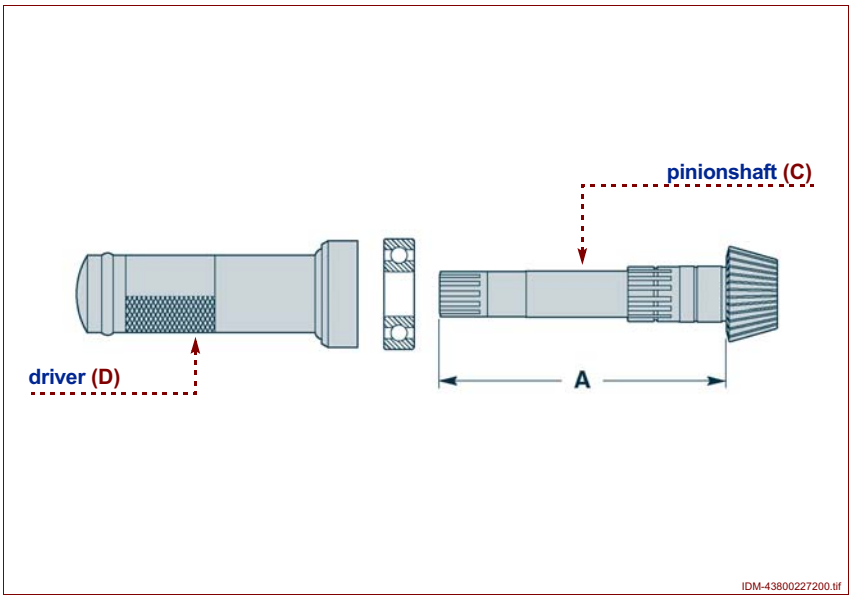
Setting the front end transmission pinion

Important!

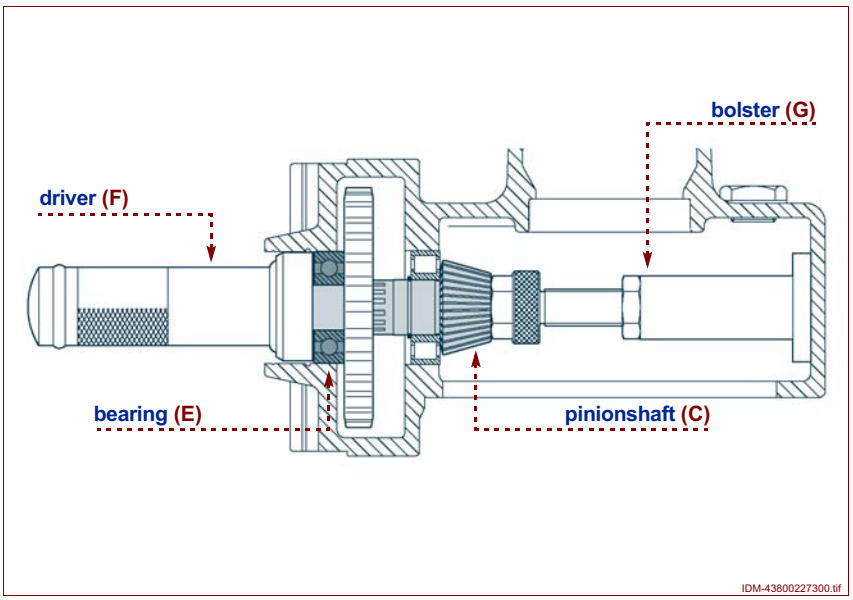
Perform this operation when assembling the pinionshaft, only in the event of the front end transmission bevel gear pair being replaced (see "Disassembling the housing components").

Proceed as follows.

1 - Measure the length **(A)** with a gauge.
2 - Preassemble the pinionshaft **(C)** and bearing using the driver (AT 37981874) (see "Assembling the PTO shaft and bevel pinion").

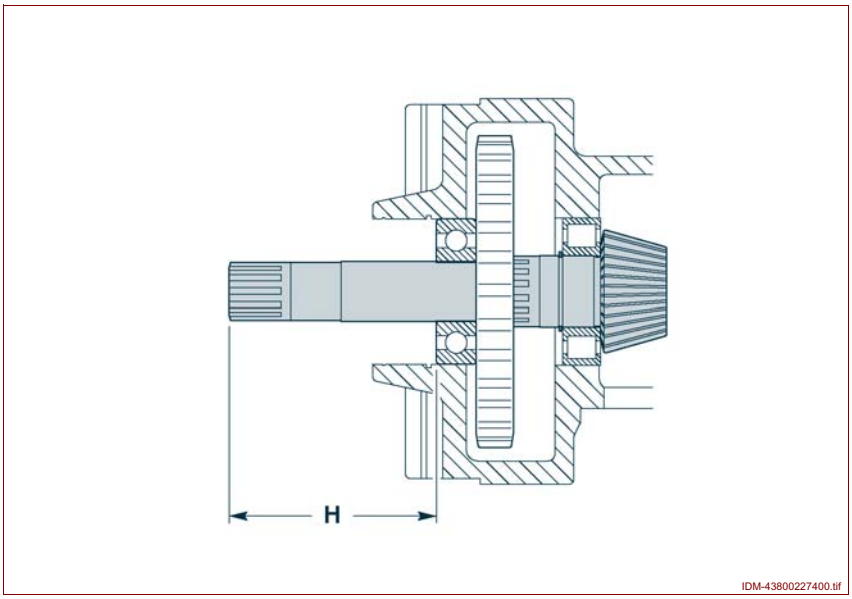


3 - Locate the pinionshaft **(C)** in the transmission housing.
4 - Fit the bearing **(E)**, striking with the driver **(F)** (AT 37981878) against a bolster **(G)** (AT 37981879).



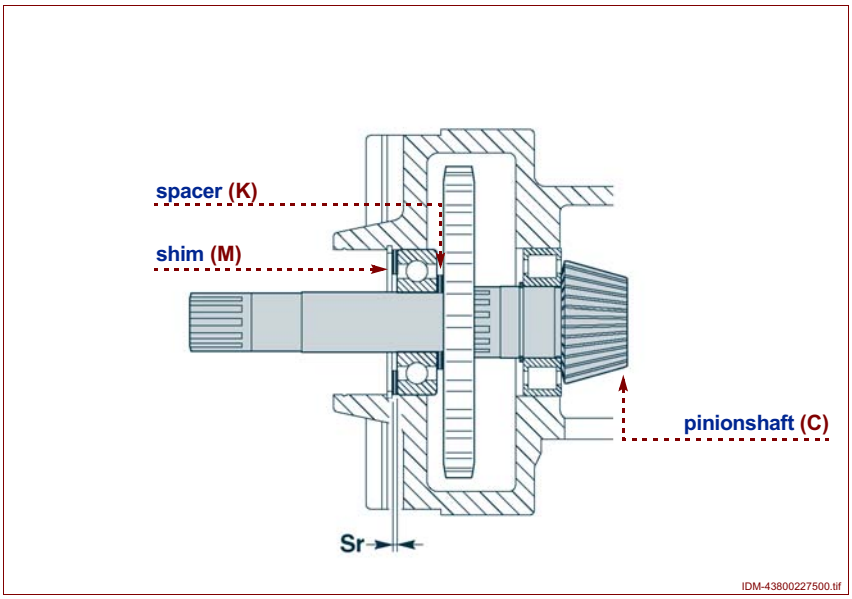
6.1

5 - Measure the length **(H)**, offering the gauge to the outer face of the bearing.



6 - Proceed to calculate the nominal shim thickness **(St)** from the two length measurements **(A - H)**.

St = Y - A + H
Y = 73 mm (without spacers K)
Y = 77 mm (with spacers K)



Important!

The nominal shim thickness (St) needs to be calculated only for first version machines. For second version machines, the nominal shim thickness (St) is always 1.8 mm.

6.1

7 - Once the nominal shim thickness (St) is known, the actual thickness (Sr) of shims to be fitted is obtained by adding or subtracting the value **(L)** stamped on the head of the pinionshaft **(C)** to or from the nominal value **(St)**.

If the value **(L)** is positive, refer to Example 1; if negative, refer to Example 2.

Example 1
St = 1,6 mm
L = + 0,2 mm
Sr = St - L = 1,6 - 0,2 = 1,4 mm

Example 2
St = 1,6 mm
L = - 0,2 mm
Sr = St + ILI = 1,6 + 0,2 = 1,8 mm

Important!

Adjust the value, when necessary, by rounding up to within 0.05 mm.

8 - Align the pinionshaft **(C)** by locating a number of shims **(M)** sufficient to make up the actual thickness **(Sr)**.
9 - Complete the assembly procedure for the pinionshaft **(C)** (see “Assembling the PTO shaft and bevel pinion”).

IDM-C643800201.fm

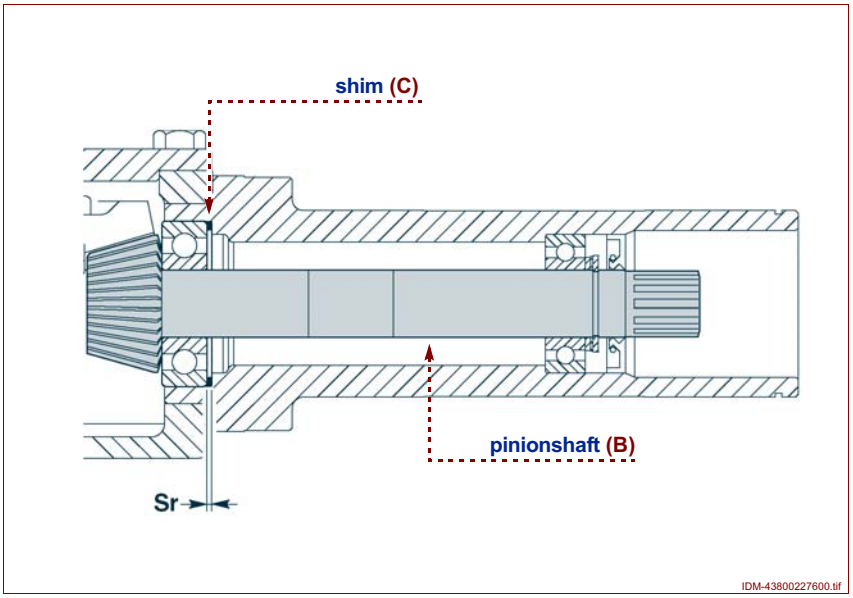
Setting the rear end transmission pinion

Important!

Perform this operation when assembling the pinionshaft, only in the event of the rear end transmission bevel gear pair being replaced (see "Disassembling the rear axle").

Proceed as follows.

1 - 1-Add or subtract the value **(A)** stamped on the pinionshaft **(B)** to or from the nominal shim thickness **(St)** to give the actual shim thickness **(Sr)**.



Important!

The nominal shim thickness (St) is 0.9 mm.

If the value **(A)** is positive, refer to Example 1; if negative, refer to Example 2.

Example 1
St = 0,9 mm
L = + 0,2 mm
Sr = St - L = 0,9- 0,2 = 0,7 mm

Example 2
St = 0,9 mm
L = - 0,2 mm
Sr = St + ILI = 0,9 + 0,2 = 1,1 mm

Important!

Adjust the value, when necessary, by rounding up to within 0.05 mm.

2 - Locate a number of shims **(C)** sufficient to make up the actual thickness **(Sr)**.

3 - Refit the pinionshaft **(B)** (se "Assembling the rear axle").

6.1

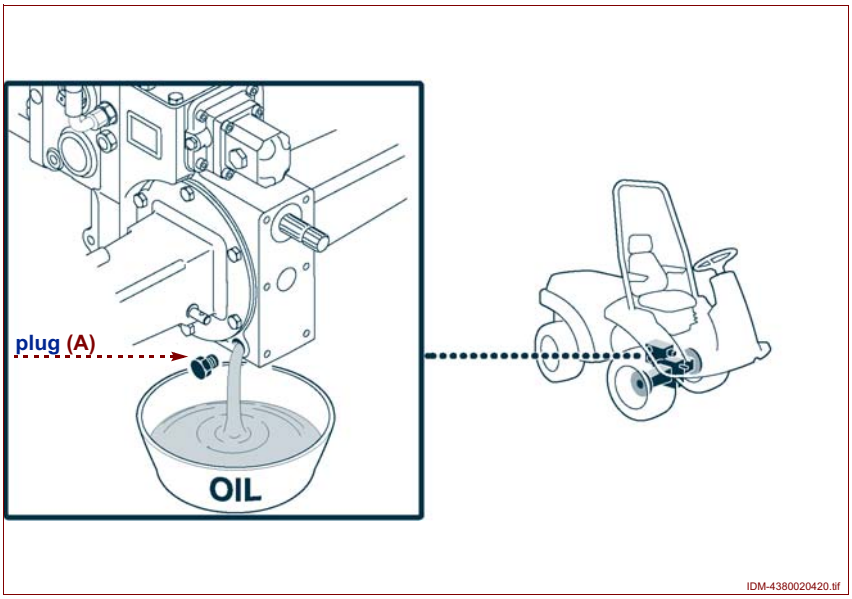
IDM-C643800201.fm

HALFSHAFTS 6.2

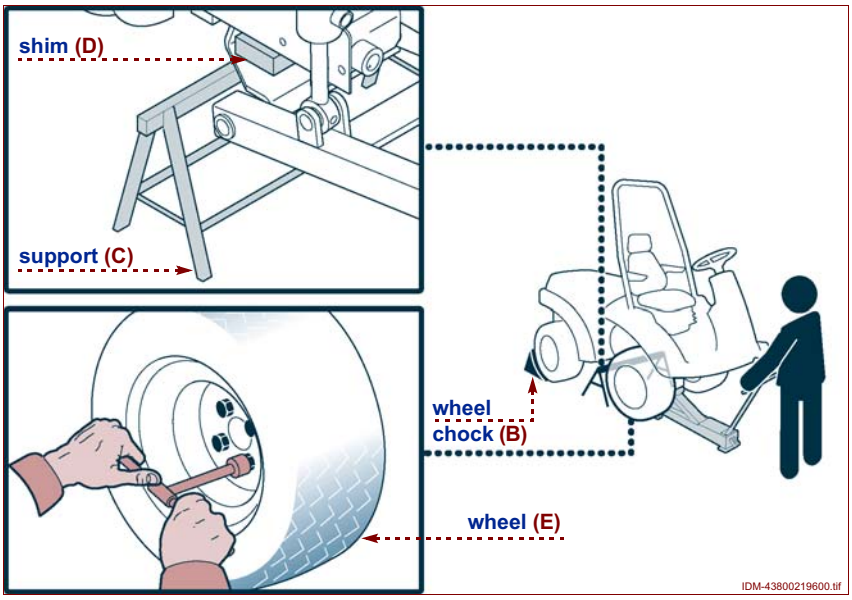
Disassembling the front halfshaft

Proceed as follows.

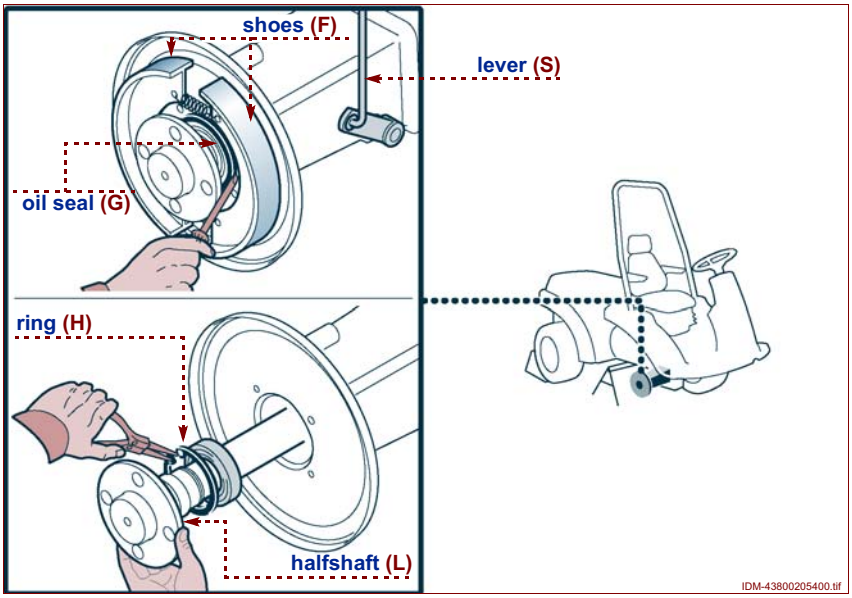
1 - Position a vessel of suitable capacity under the drain plug **(A)**.
2 - Unscrew the drain plug **(A)** and allow the oil to run off.



3 - Position wheel chocks **(B)** to immobilize the machine.
4 - Jack up the front end and position the stand **(C)**.
5 - Locate the shim **(D)** to ensure the machine remains stable.
6 - Loosen the wheel nuts and remove the wheel **(E)**.

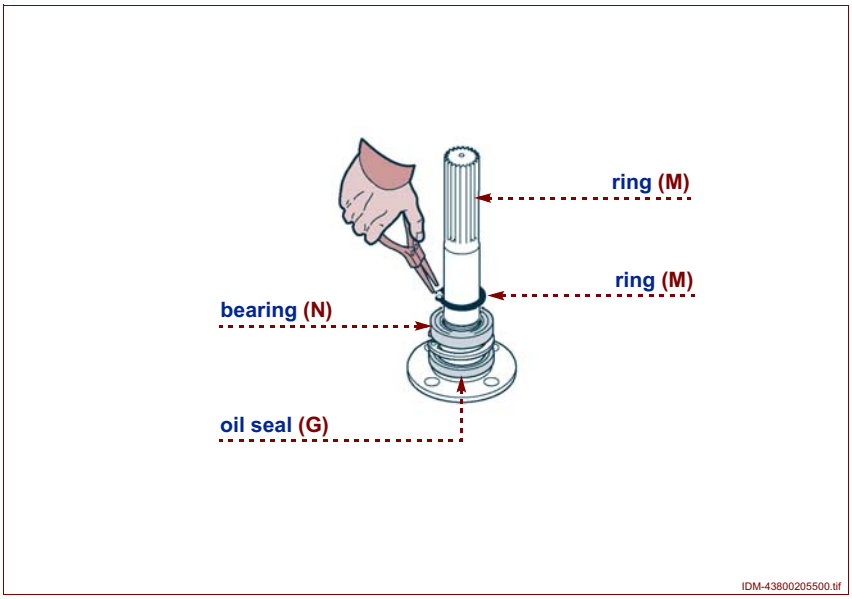


7 - To disassemble the right hand halfshaft, secure the differential lock lever **(S)** in the engaged position.
8 - Remove the brake shoes **(F)** (see “Removing the brake shoes”).
9 - Unseat the oil seal **(G)** and the circlip **(H)**, and pull out the halfshaft **(L)**.

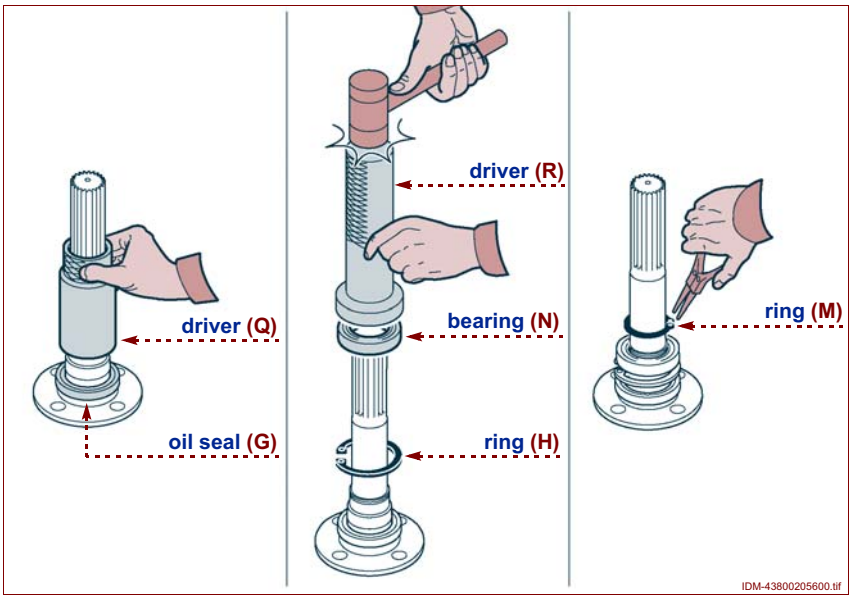


IDM-C643800201.fm

10- Remove the circlip **(M)**.
11- Remove the bearing **(N)**, using the puller (AT 37981766).
12- Remove the oil seal **(G)**.
13- Clean all disassembled parts and ensure they are not damaged. Inspect the bearing for wear.



14- Fit a new oil seal **(G)**, using the replacer **(Q)** (AT 37981873).
15- Fit the circlip **(H)**.
16- Refit the bearing **(N)**, using the driver **(R)** (AT37981890).
17- Refit the circlip **(M)**.
18- If the other halfshaft is being serviced, repeat the same sequence of operations.



6.2

Assembling the front halfshaft

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

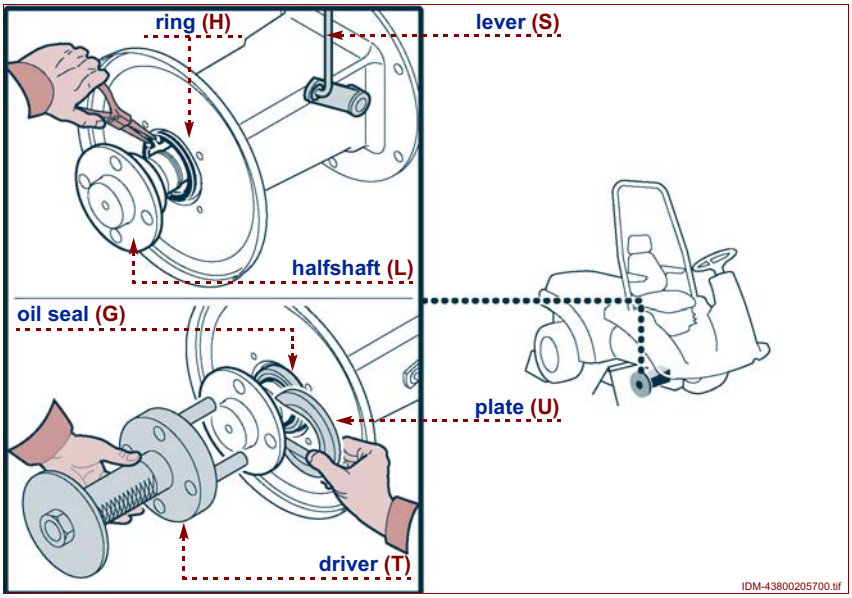
Proceed as follows.

1 - Locate the halfshaft **(L)** in the trumpet housing.

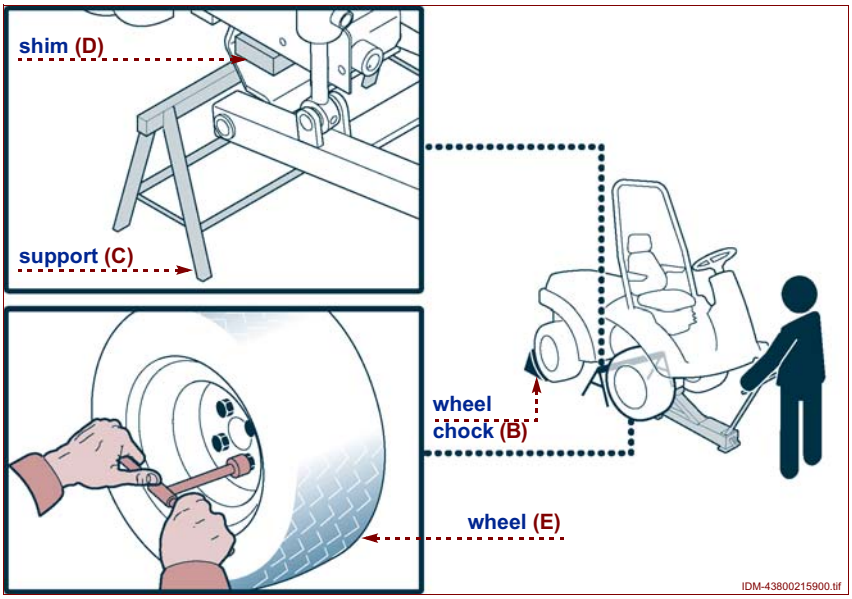
Important!

When assembling the right hand halfshaft, the differential lock lever (S) must have been secured in the engaged position when the halfshaft was removed.

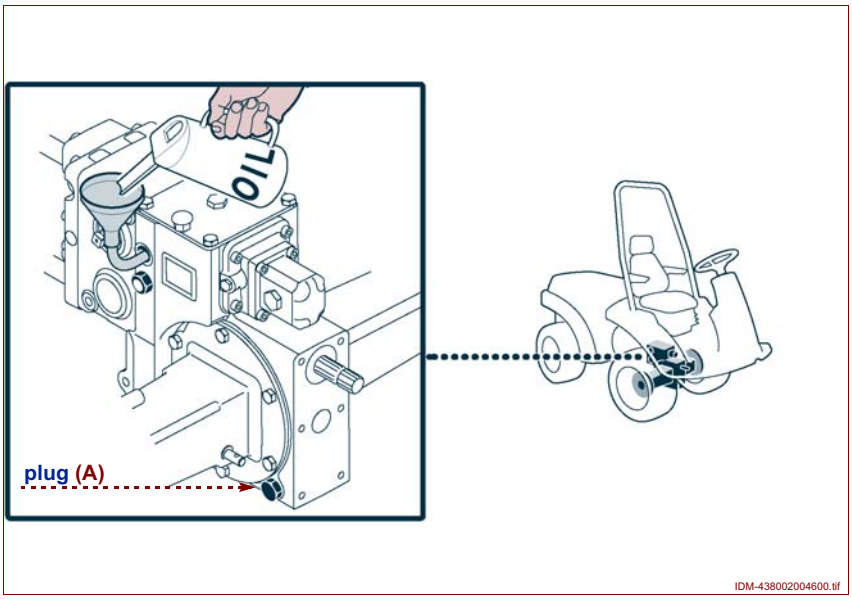
2 - Fit the circlip **(H)**.
3 - Fit the oil seal **(G)**, using the driver **(T)** (AT 37981871) and the plate **(U)** (AT 37981870).



4 - Refit the brake shoes (see “Refitting the brake shoes”).
5 - Fit the wheel **(E)** and tighten the nuts.
6 - Jack up the machine, remove the shim **(D)** and the stand **(C)**, and lower the wheels to the floor.



7 - Fit the drain plug **(A)** and replace the oil drained previously, filling up to the level on the indicator.
8 - If the other halfshaft is being serviced, repeat the same sequence of operations.

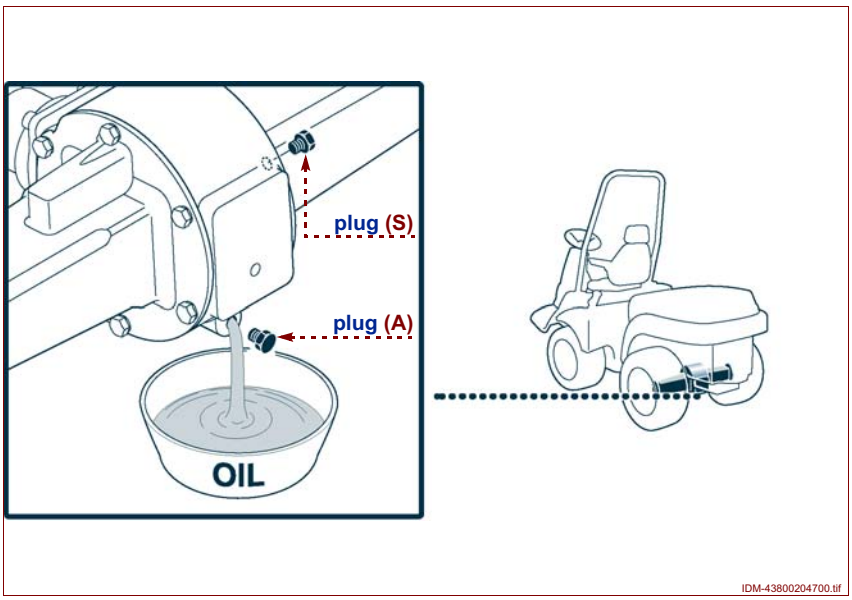


6.2

Disassembling the rear halfshaft

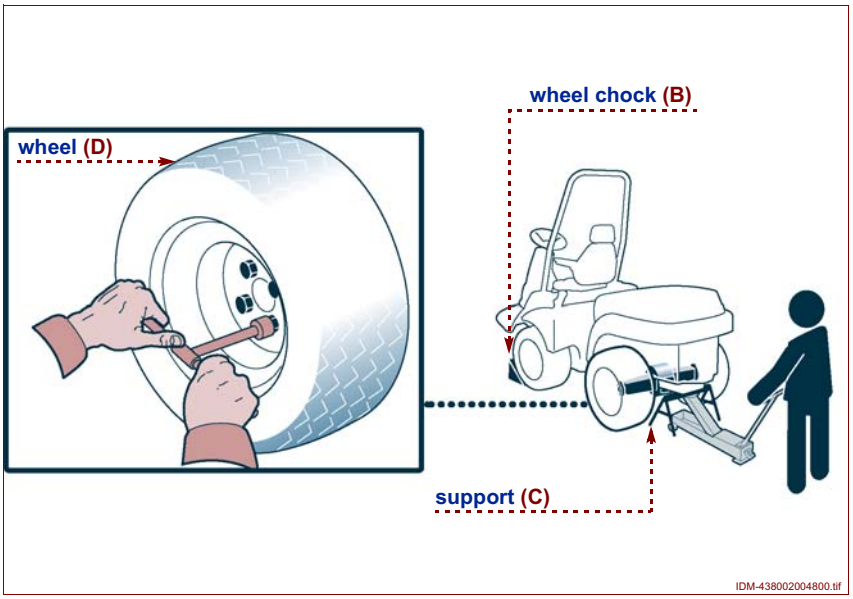
Proceed as follows.

1 - Position a vessel of suitable capacity under the drain plug **(A)**.
2 - Unscrew the filler plug **(S)**, then the drain plug **(A)**, and allow the oil to run off.

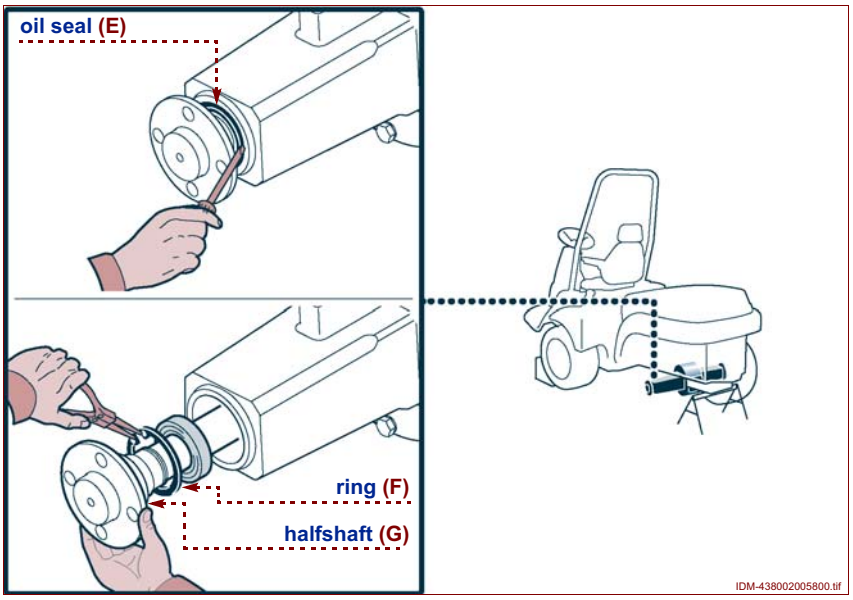


IDM-C643800201.fm

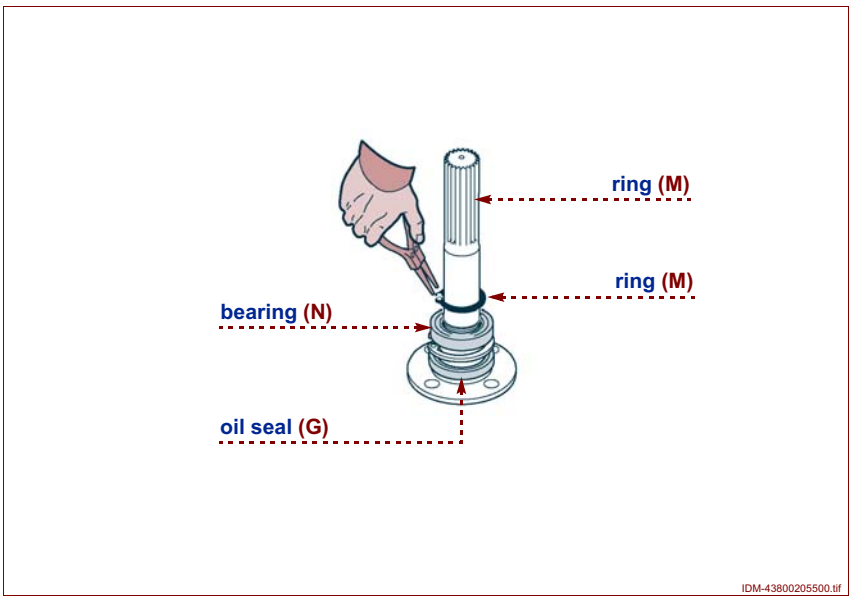
3 - Position wheel chocks **(B)** to immobilize the machine.
4 - Jack up the rear end and position the stand **(C)**.
5 - Loosen the wheel nuts and remove the wheel **(D)**.



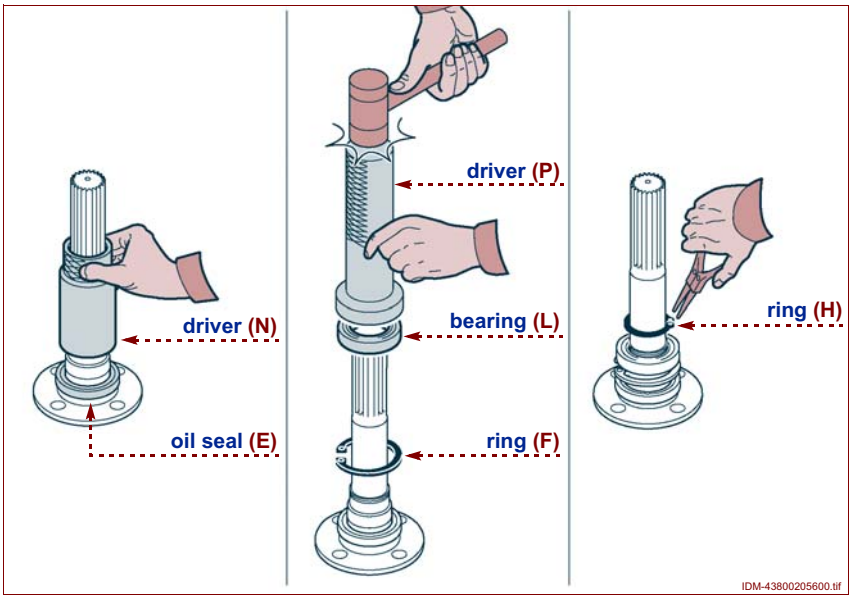
6 - Unseat the oil seal **(E)** and the circlip **(F)**, and pull out the halfshaft **(G)**.



7 - Remove the circlip **(H)**.
8 - Remove the bearing **(L)**, using the puller **(M)** (AT 37981766).
9 - Remove the oil seal **(E)**.
10 - Clean all disassembled parts and ensure they are not damaged. Inspect the bearing for wear.



11- Fit a new oil seal **(E)**, using the replacer **(N)** (AT 37981873).
12- Fit the circlip **(F)**.
13- Refit the bearing **(L)**, using the driver **(P)** (AT37981890).
14- Refit the circlip **(H)**.
15- If the other halfshaft is being serviced, repeat the same sequence of operations.

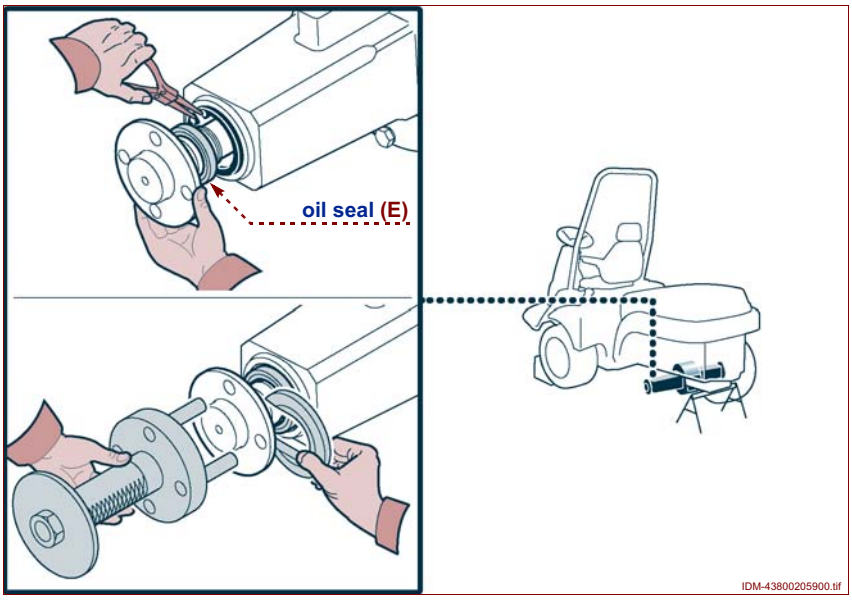


Assembling the rear halfshaft

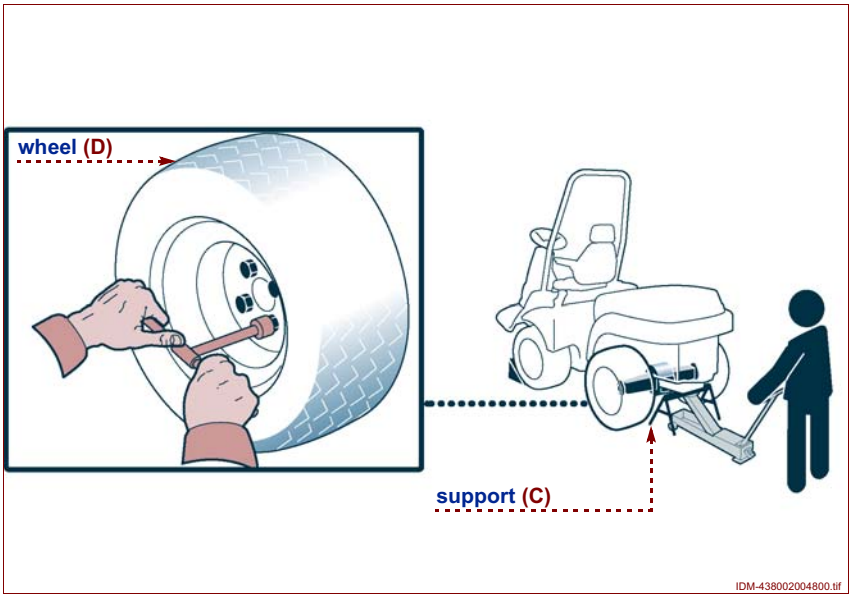
Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.
1 - Clean the seat of the housing and lubricate.
2 - Insert the halfshaft **(G)** and the circlip **(F)**.
3 - Fit the oil seal **(E)**, using the driver **(Q)** (AT 37981871) and the plate **(R)** (AT 37981870).



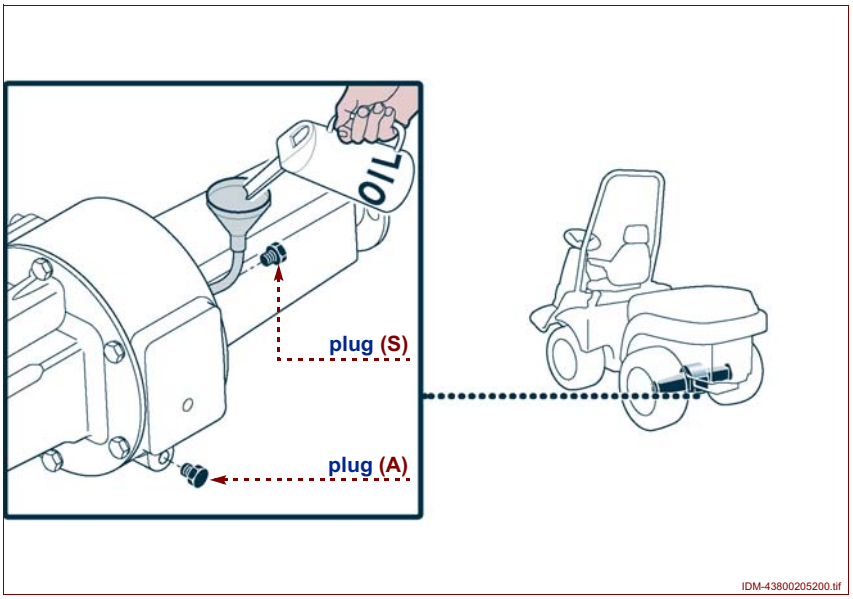
4 - Fit the wheel **(D)** and tighten the nuts.
5 - If the other halfshaft is being serviced, repeat the same sequence of operations.
6 - Jack up the machine, remove the stand **(C)** and lower the wheels to the floor.



6.2

IDM-C643800201.fm

7 - Fit the drain plug **(A)** and replace the oil drained previously, filling up to the level on the indicator.
8 - Retighten the filler plug **(S)** and ensure there are no leaks.

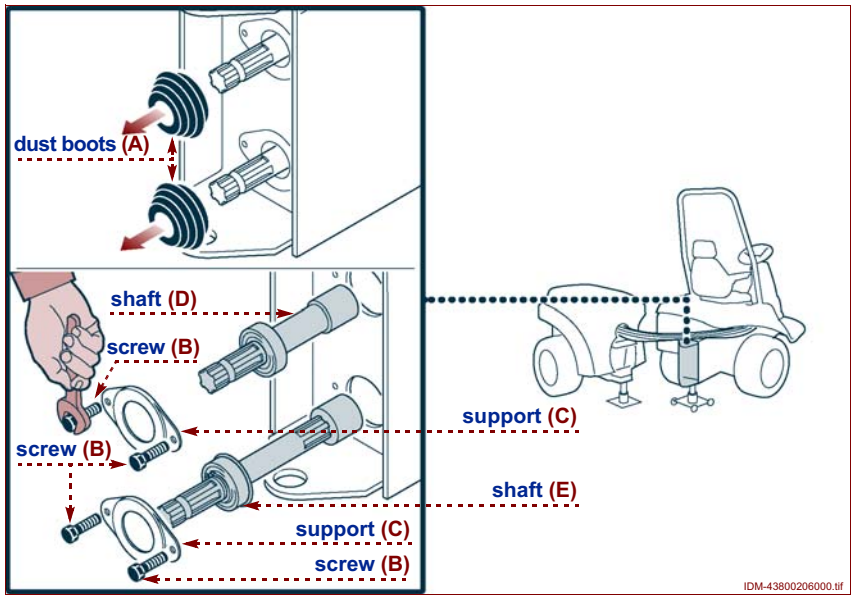


DRIVE SHAFTS 6.3

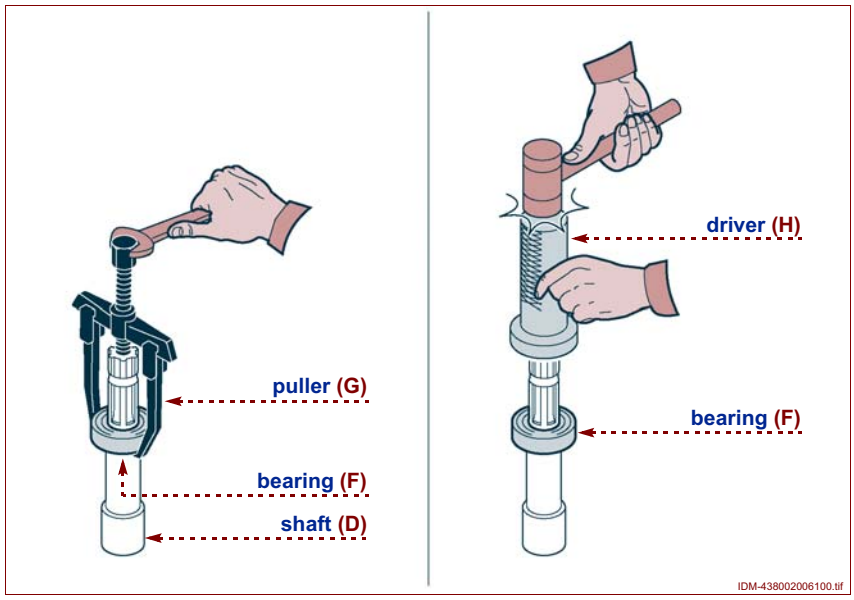
Disassembling the drive shafts

Proceed as follows.

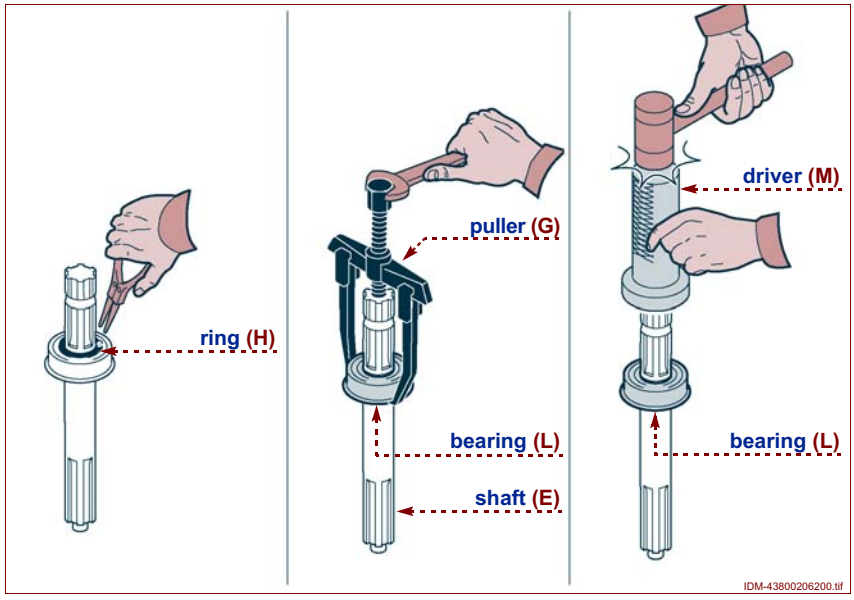
1 - Separate the frames of the central joint (see “Disassembling the central joint”).
2 - Remove the dust boots **(A)**, undo the bolts **(B)** and remove the bearing flanges **(C)**.
3 - Pull out the shafts **(D - E)**.
4 - Clean all disassembled parts and ensure they are not damaged. Inspect the bearings for wear, and replace if necessary.



5 - Remove the bearing **(F)** from the shaft **(D)**, using the puller **(G)** (AT 37981247).
6 - Fit a new bearing **(F)**, using the driver **(H)** (AT 37981276).



7 - Remove the circlip **(H)**.
8 - Remove the bearing **(L)** from the shaft **(E)**, using the puller **(G)** (AT 37981247).
9 - Fit a new bearing **(L)**, using the driver **(M)** (AT 37981860).
10 - Fit the circlip **(H)**.



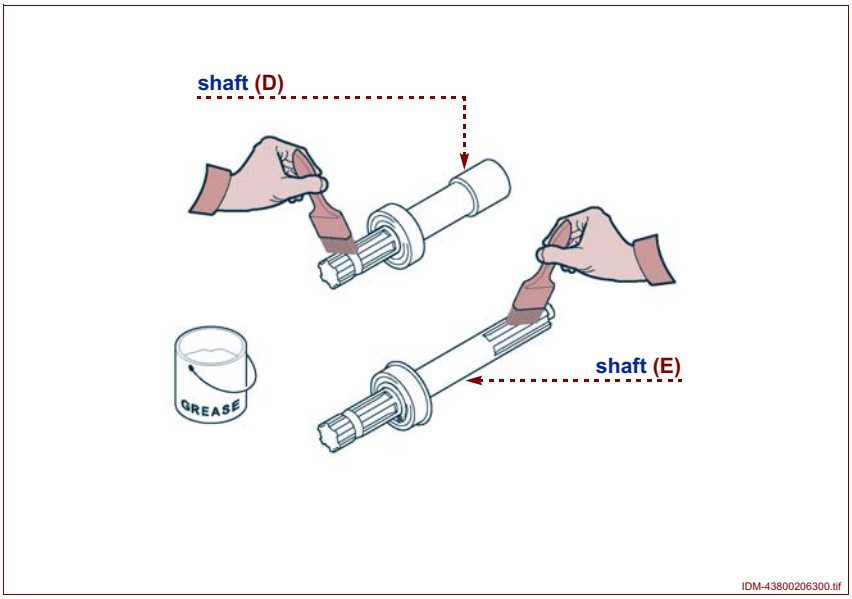
Assembling the drive shafts

Important!

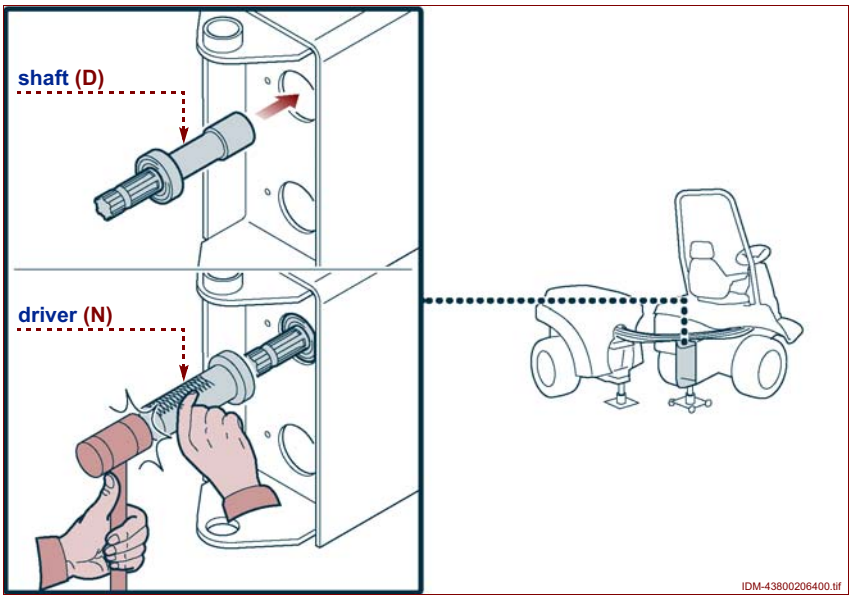
When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.

1 - Grease the coupling splines of the shafts (**D** - **E**).

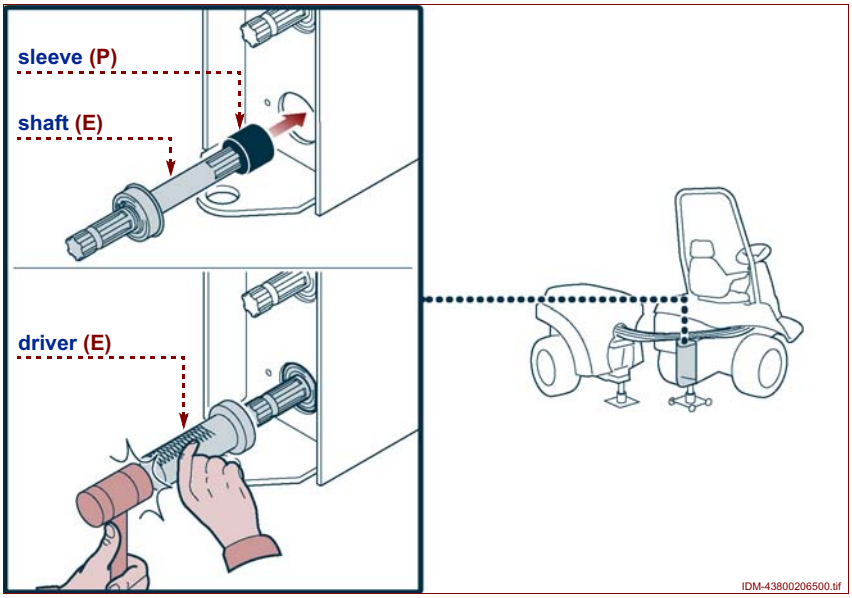


2 - Position the shaft **(D)** in the housing, rotating so that the splines locate, then tap home with the driver **(N)** (AT 37981276).



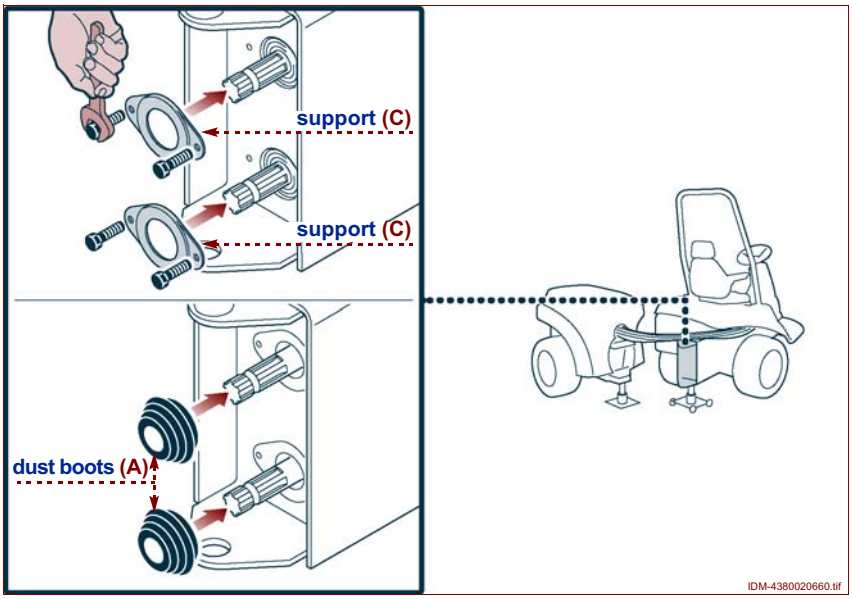
3 - Fit the sleeve **(P)** to the shaft **(E)**.

4 - Position the shaft **(E)** in the housing, rotating so that the splines locate, then tap home with the driver **(Q)** (AT 37981860).



IDM-C643800201.fm

5 - Refit the bearing flanges **(C)**.
6 - Refit the dust boots **(A)**.
7 - Reassemble the central joint (see "Assembling the central joint").



ENGINE 7.1

RADIATOR 7.2

IDM-C743800201.fm

ENGINE 7.1

Important!

For any servicing operation or technical information on the engine not covered in this chapter, contact the engine manufacturer's service department.

Technical specifications

Rondò K327

Engine	YANMAR 3TNE 74C-ECR
No. cylinders	3
Displacement (cc)	1006
Power (kW)	17
Max. engine speed (rpm)	3000
Max torque (Nm)	62
Coolant	Water
Fuel tank capacity (l.)	48
Engine oil	Esso-Unifarm 15W-40
Quantity (dm^3)	3.5
Oil change interval	200 h(1)
Oil filter	10µm
Filter change interval	200 h(1)
Air filter element	5" (122.5mm)

(1) First change at 50 h.

Rondò K333

Engine	YANMAR 3TNE 82 AC-ECR
No. cylinders	3
Displacement (cc)	1331
Power (kW)	22
Max. engine speed (rpm)	3000
Max torque (Nm)	83
Coolant	Water
Fuel tank capacity (l.)	48
Engine oil	Esso-Unifarm 15W-40
Quantity (dm^3)	2.5
Oil change interval	200 h(1)
Oil filter	10µm
Filter change interval	200 h(1)
Air filter element	5" (122.5mm)

Removing the engine hood

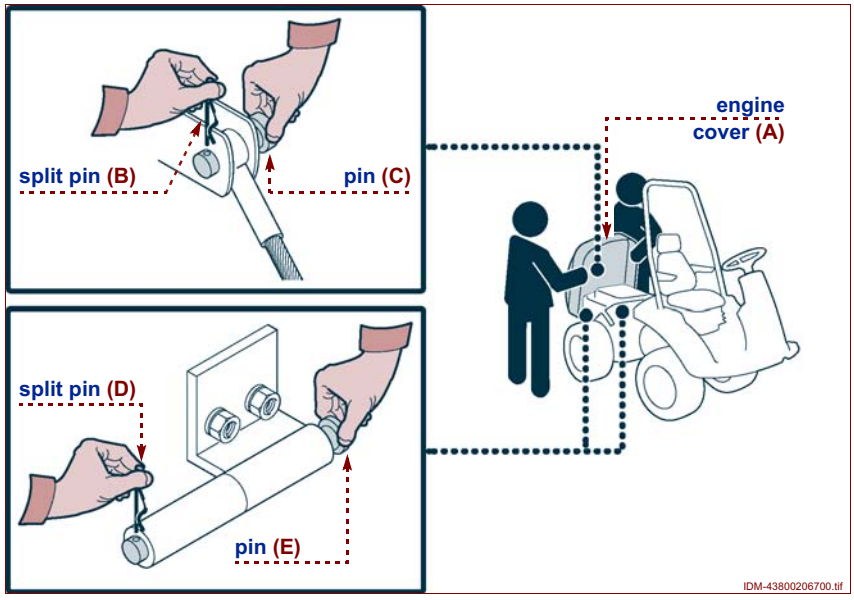
Proceed as follows.

1 - Raise the hood **(A)**, remove the linch pin **(B)**, extract the pivot **(C)** and detach the cable.
2 - Remove the linch pins **(D)**, extract the pivots **(E)** and lift the hood **(A)** clear.

Refitting the engine hood

Proceed as follows.

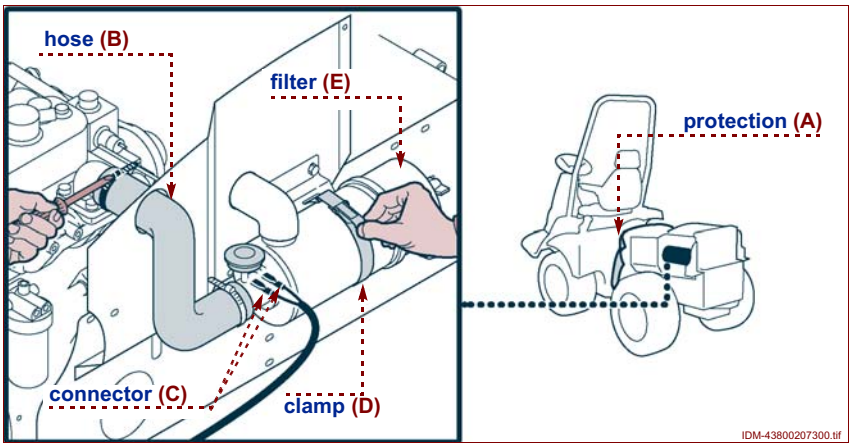
1 - Offer the engine hood **(A)** to the anchorages.
2 - Insert the pivots **(E)** and fit the linch pins **(D)**.
3 - Insert the pivot, fit the linch pin, attach the cable and lower the hood **(A)**.



Removing the engine

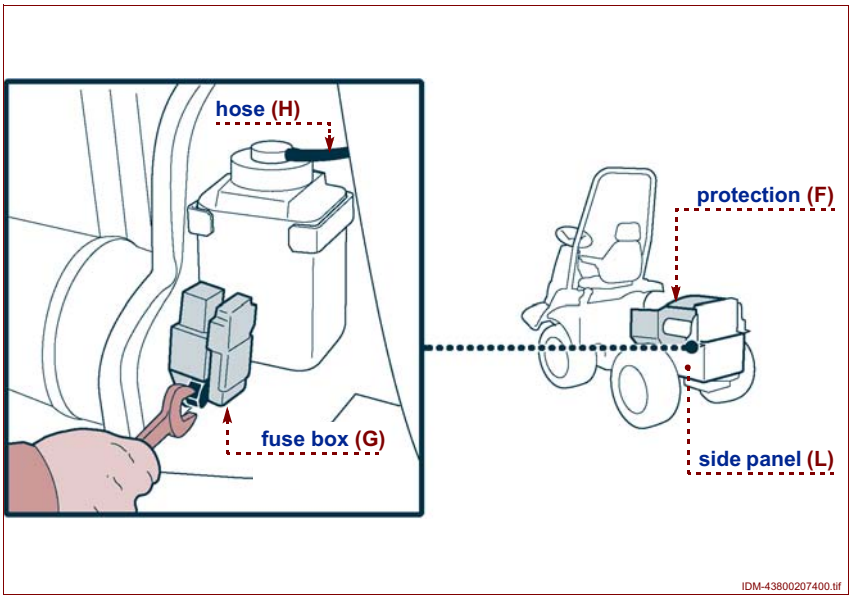
Proceed as follows.

1 - Remove the engine hood (see "Removing the engine hood").
2 - Undo the bolts and remove the guard **(A)**.
3 - Loosen the clip and detach the hose **(B)**.
4 - Separate the connectors **(C)** of the filter clogging sensor.
5 - Undo the clip **(D)** and remove the filter **(E)**.

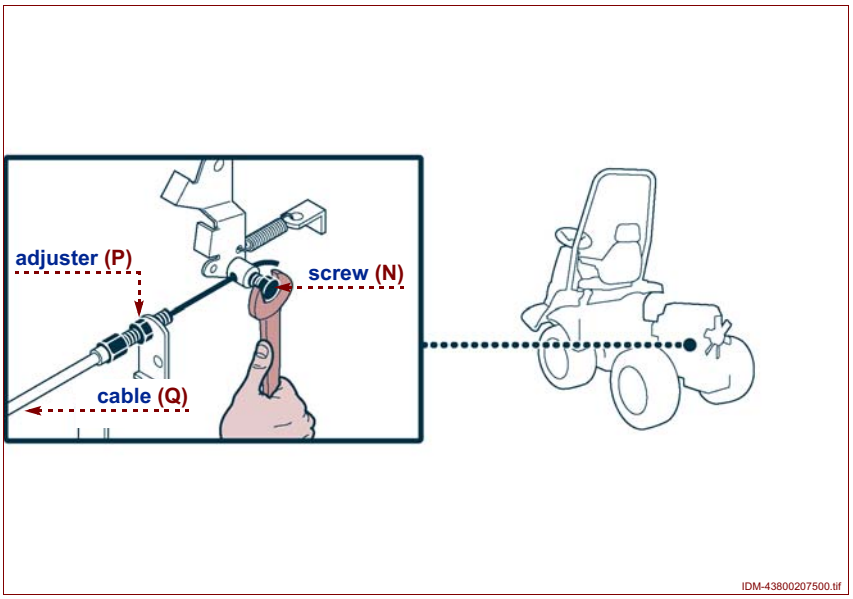


IDM-C743800201.fm

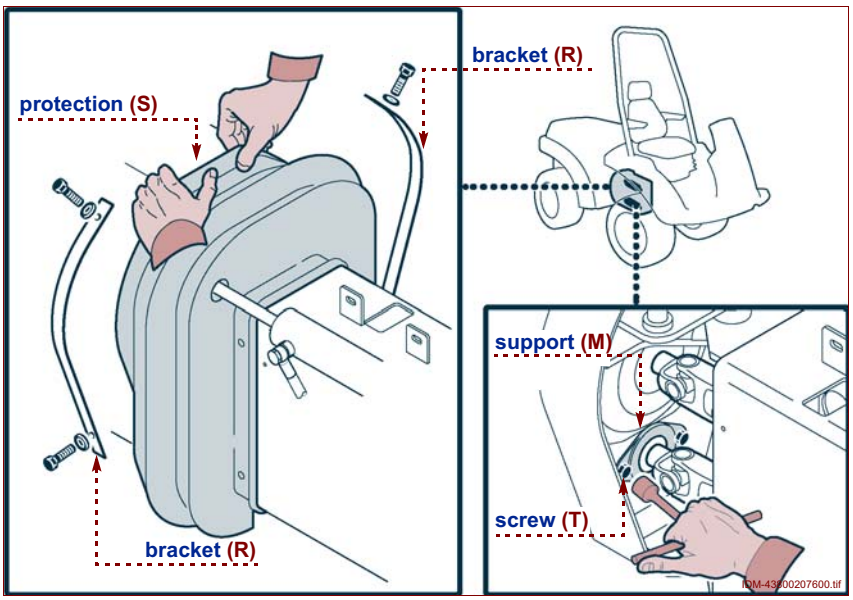
6 - Undo the bolts and remove the guards **(F)**.
7 - Undo the bolts and remove the fuse box **(G)**.
8 - Detach the tube **(H)** from the bottle.
9 - Undo the bolts and remove the side panel **(L)**.
10 - Remove the radiator (see “Removing the radiator“).



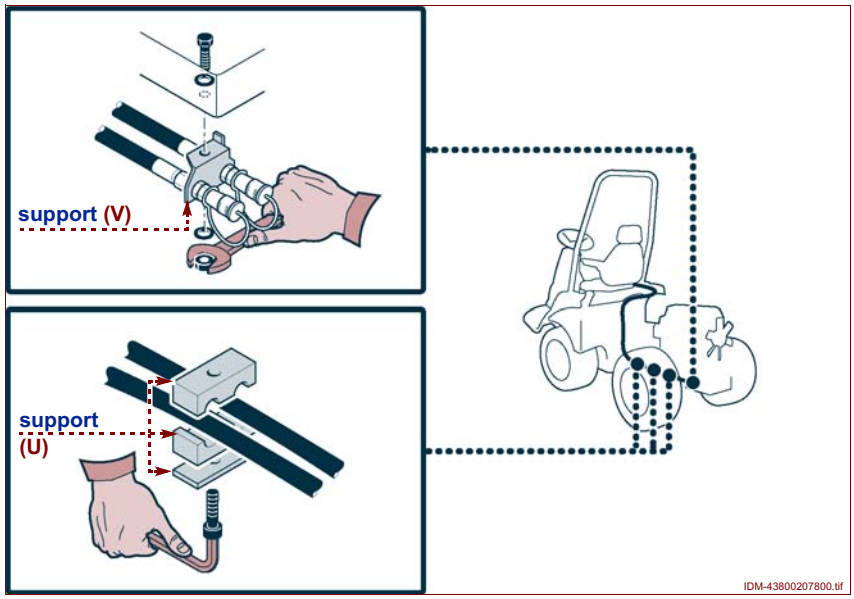
11 - Separate the connectors of the engine electrical system.
12 - Disconnect the fuel lines.
13 - Loosen the clamp screw **(N)**, unscrew the adjuster **(P)** and remove the accelerator cable **(Q)**.



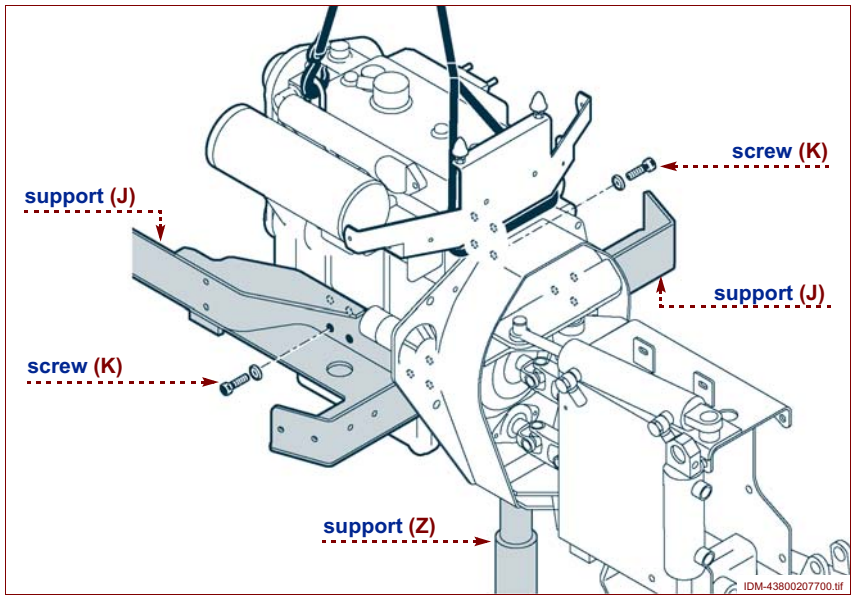
14 - Undo the screws and remove the straps **(R)**.
15 - Remove the boot **(S)**.
16 - Undo the bolts **(T)** and remove the flange **(M)**.



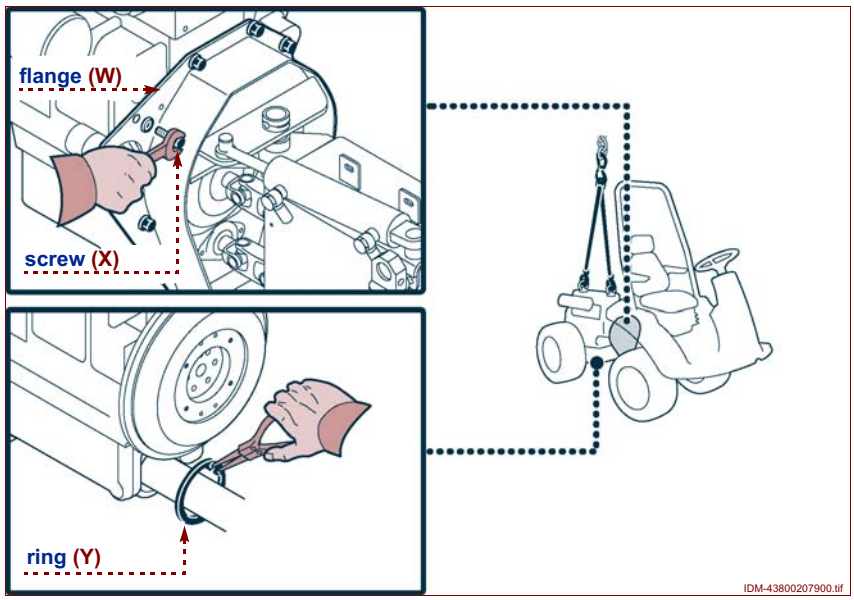
17- Remove the hose clamp brackets **(U)** and the quick coupler bracket **(V)**, if the machine is equipped with an auxiliary hydraulics kit.



18- Position the stand **(Z)**.
19- Sling the engine to a hoist from the lifting points provided.
20- Undo the bolts **(K)** and disconnect the side panel brackets **(J)** from the engine.



21- Undo the bolts **(X)** and separate the engine from the flange **(W)**.
22- Unseat the circlip **(Y)** and disconnect the rear axle from the engine.



7.1

IDM-C743800201.fm

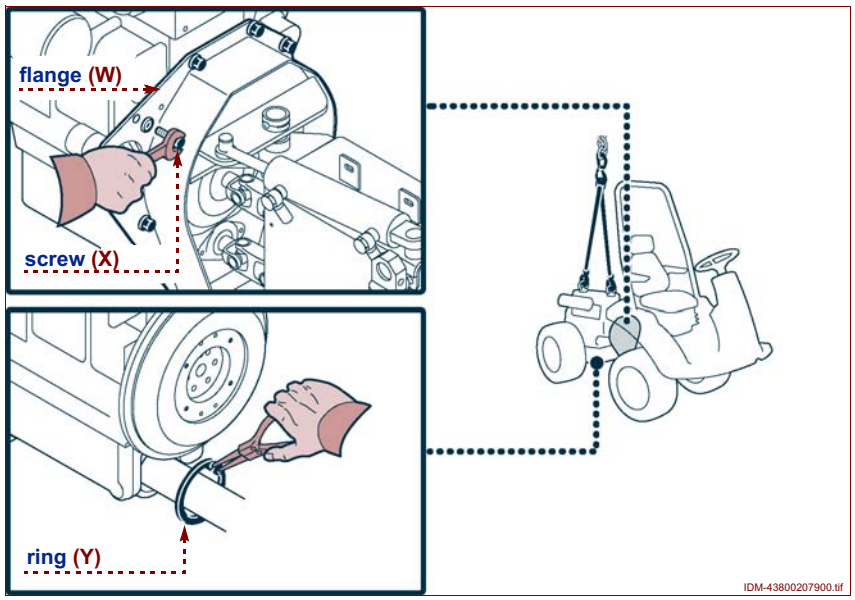
Refitting the engine

Important!

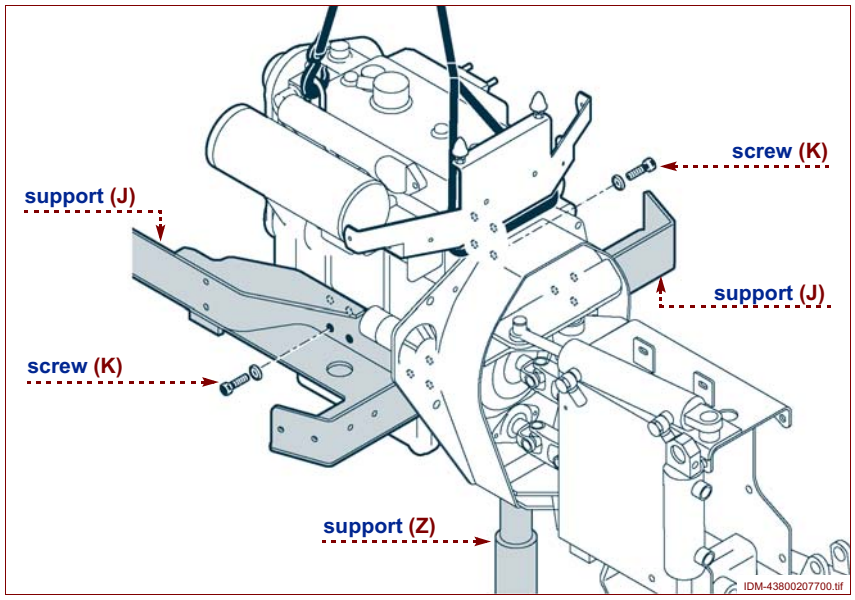
When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.

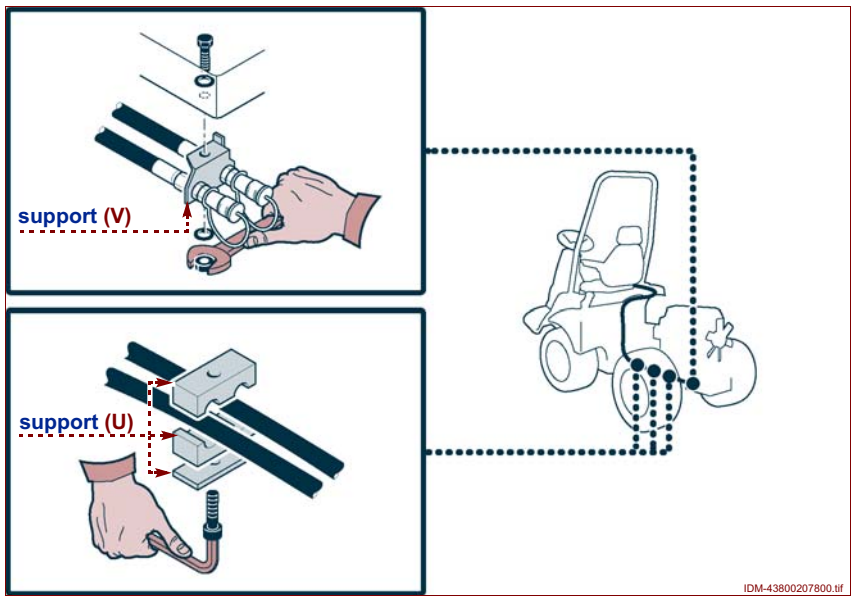
1 - Clean all disassembled parts and ensure they are not damaged. Lubricate the couplings.
2 - Connect the engine to the rear axle and secure with the circlip **(Y)**.
3 - Offer the engine and axle to the flange **(W)**, and couple the drive shafts.
4 - Insert the bolts **(X)** securing the engine to the flange **(W)**.



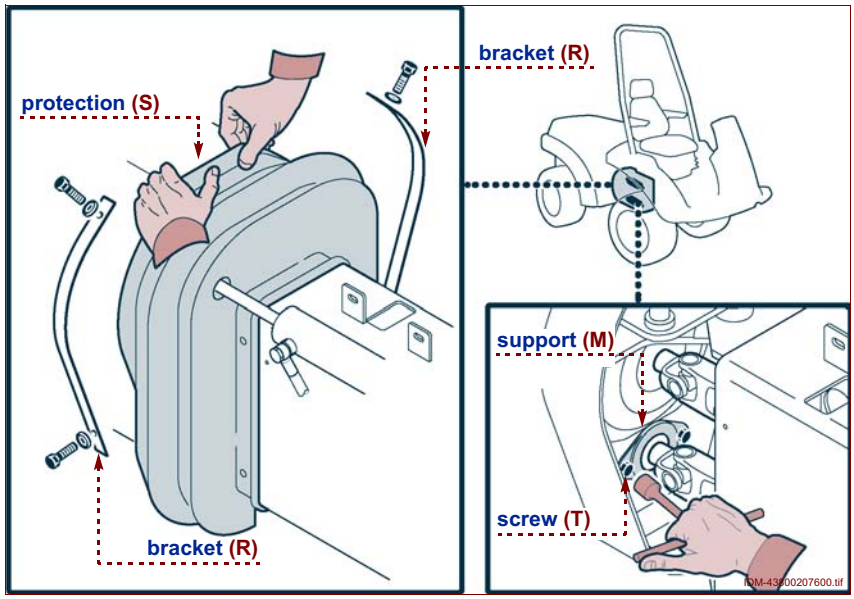
5 - Fit the side panel brackets **(J)** and secure with the bolts **(K)**.
6 - Detach the slings.
7 - Remove the stand **(Z)**.



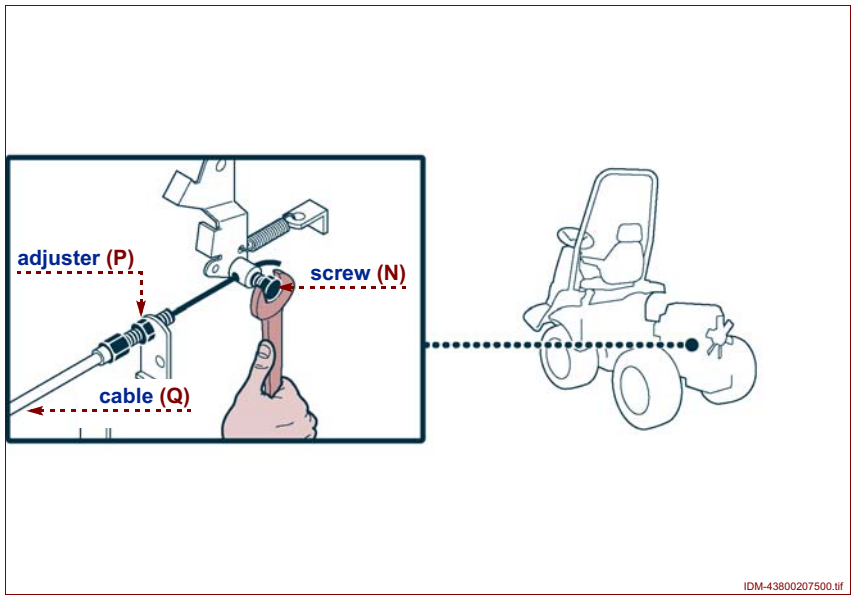
8 - Fit the hose clamp brackets **(U)** and the quick couplers bracket **(V)**, if the machine is equipped with auxiliary hydraulics.



9 - Fit the flange **(M)** and secure with the bolts **(T)**.
10 - Fit the boot **(S)** and secure with the straps **(R)**.

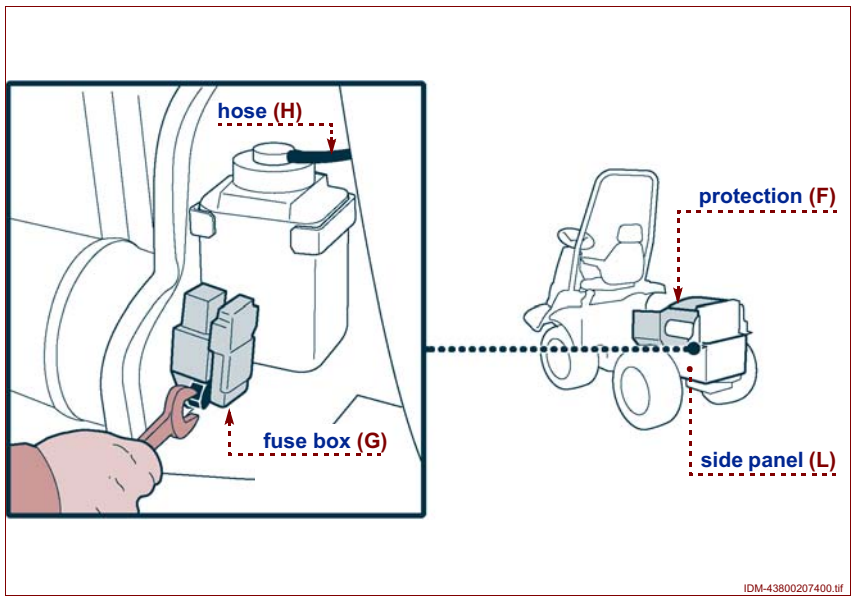


11 - Screw on the adjuster **(P)**, locate the accelerator cable **(Q)** and tighten the clamp screw **(N)**.
12 - Connect the fuel lines.
13 - Join the connectors of the engine electrical system (see electrical diagram).
14 - Fit the radiator (see “Refitting the radiator“).



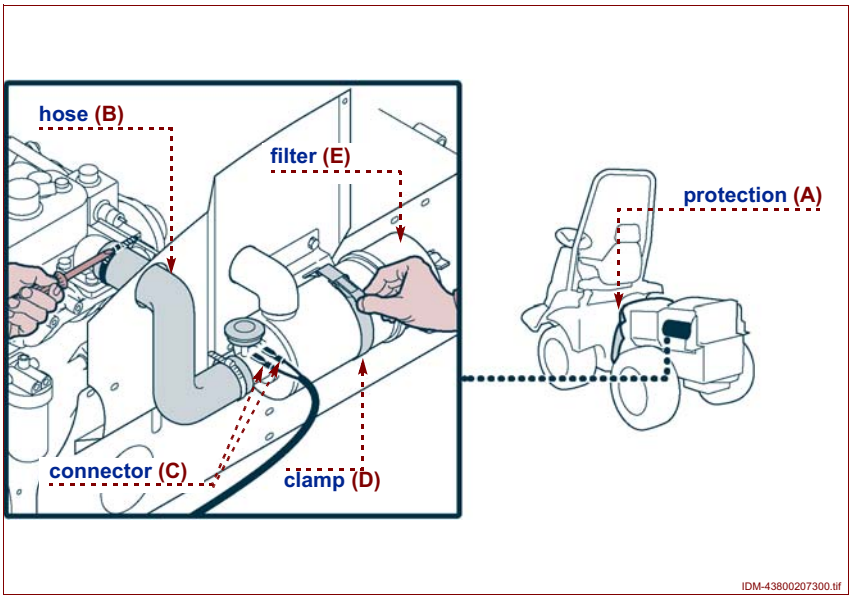
7.1

15 - Fit the side panel **(L)** and secure with the bolts.
16 - Reconnect the tube **(H)** to the bottle.
17 - Position the fuse box **(G)** and secure it with the bolt.
18 - Fit the guards **(F)** and secure with the bolts.



IDM-C743800201.fm

19- Position the filter **(E)** and secure with the clip **(D)**.
20- Attach the connectors **(C)**.
21- Connect the hose **(B)** and clamp with the clip.
22- Fit the guard **(A)** and secure with the bolts.
23- Fit the hood (see “Refitting the engine hood”).

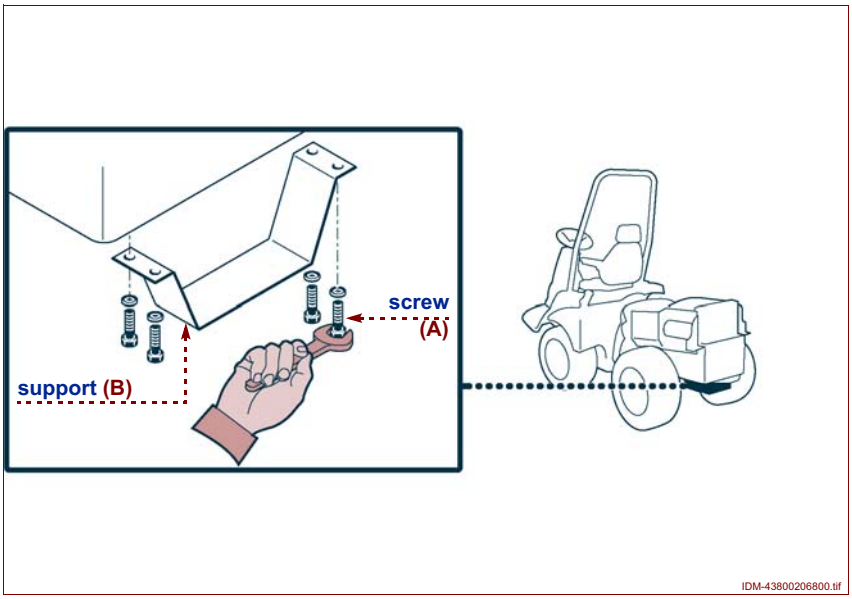


RADIATOR 7.2

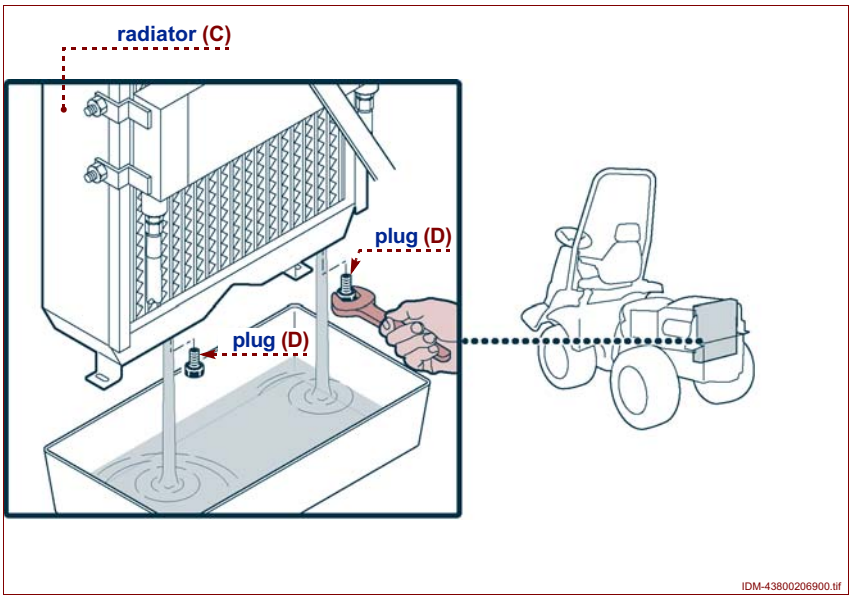
Removing the radiator

Proceed as follows.

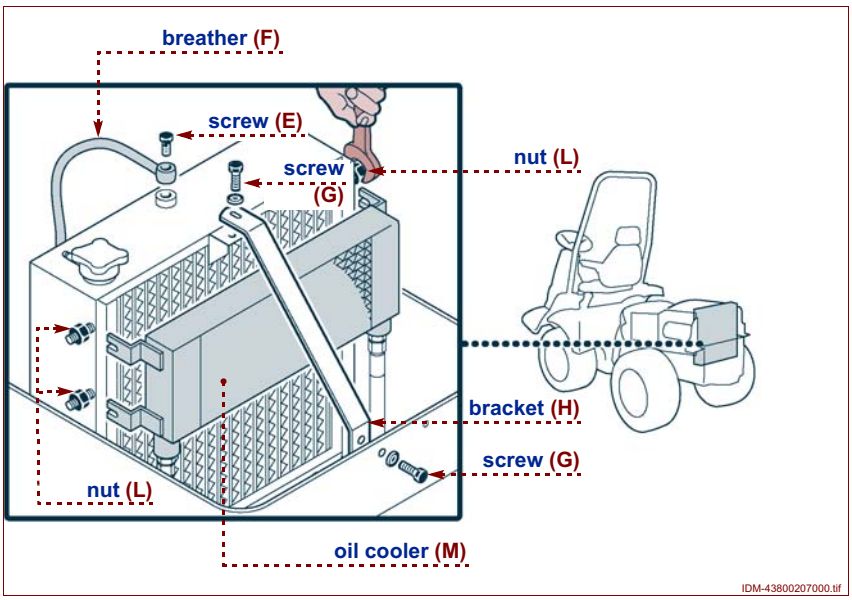
1 - Remove the engine hood (see “Removing the engine hood”).
2 - Remove the battery (see “Removing the battery”).
3 - Undo the bolts **(A)** and remove the battery shelf **(B)**.



4 - Position a vessel of suitable capacity under the drain plugs **(D)** of the radiator **(C)**.
5 - Remove the filler cap, unscrew the drain plugs **(D)** and allow the coolant to run off into the vessel.

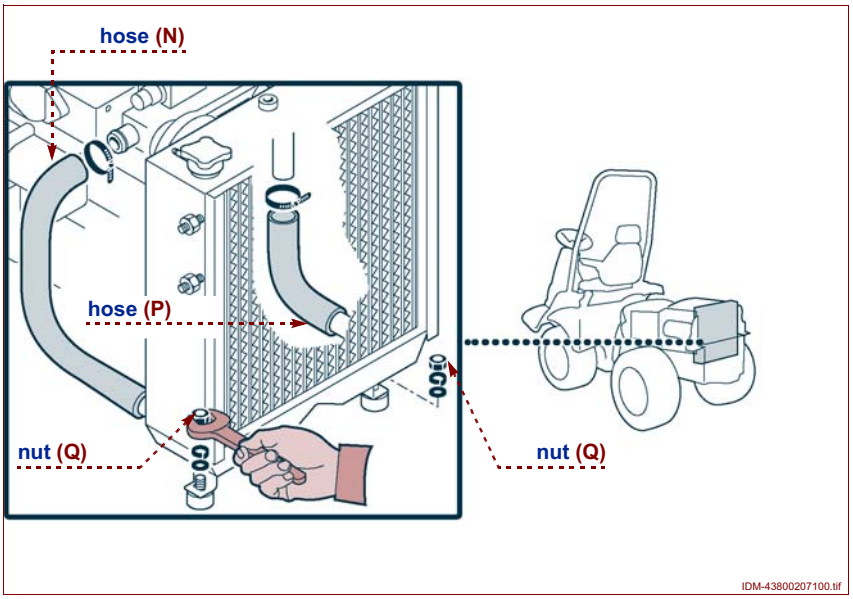


6 - Undo the bolt **(E)** and disconnect the breather **(F)**.
7 - Undo the bolts **(G)** and remove the bracing strut **(H)**.
8 - Loosen the nuts **(L)** and detach the oil cooler **(M)**.



IDM-C743800201.fm

9 - Loosen the clips and disconnect the hoses **(N - P)**.
10 - Undo the nuts **(Q)** and remove the radiator.



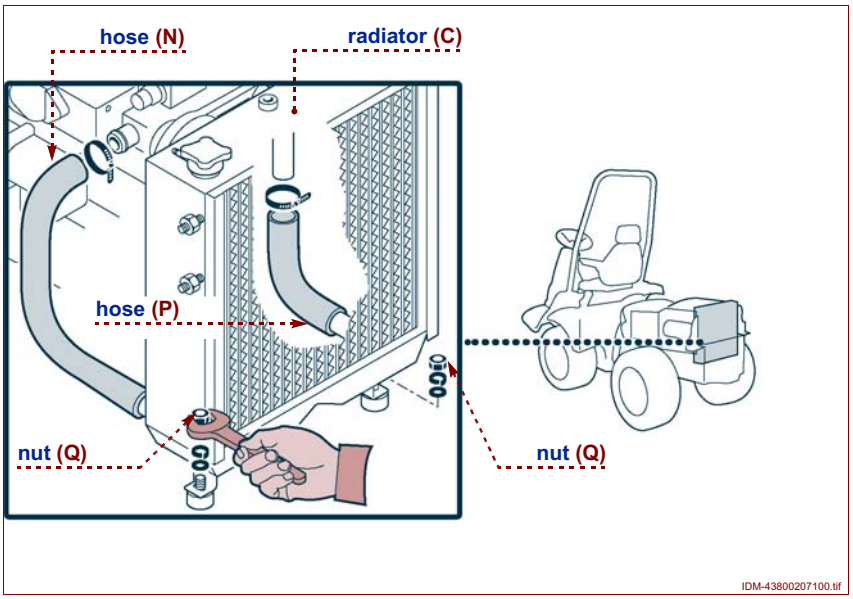
Refitting the radiator

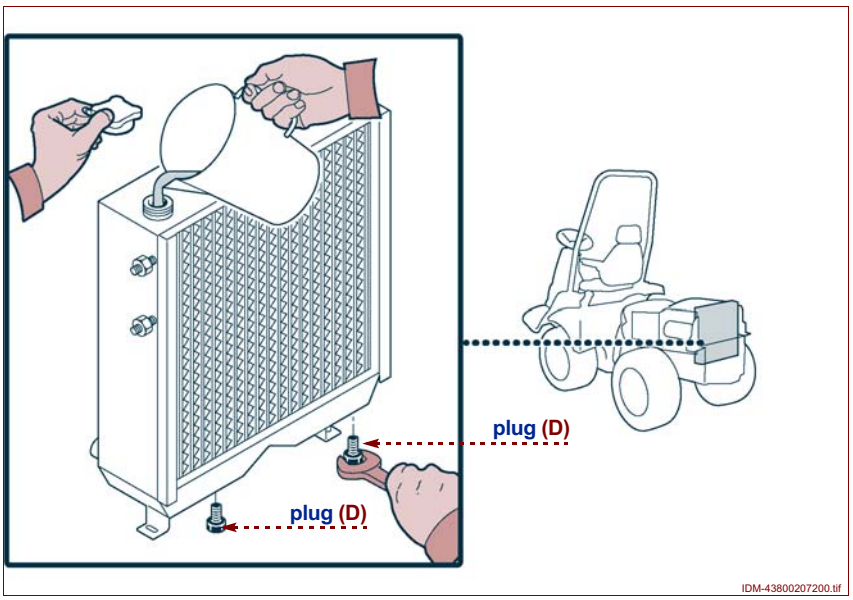
Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.

1 - Clean all disassembled parts and ensure they are not damaged.
2 - Smear the drain plugs **(D)** with sealant (Better Arexons) and fit them to the radiator.
3 - Offer the radiator **(C)** to the mountings on the machine.
4 - Secure the nuts **(Q)**.
5 - Connect the hoses **(N - P)** and secure with the clips.
6 - Fill the radiator with coolant up to the prescribed level, and replace the cap.

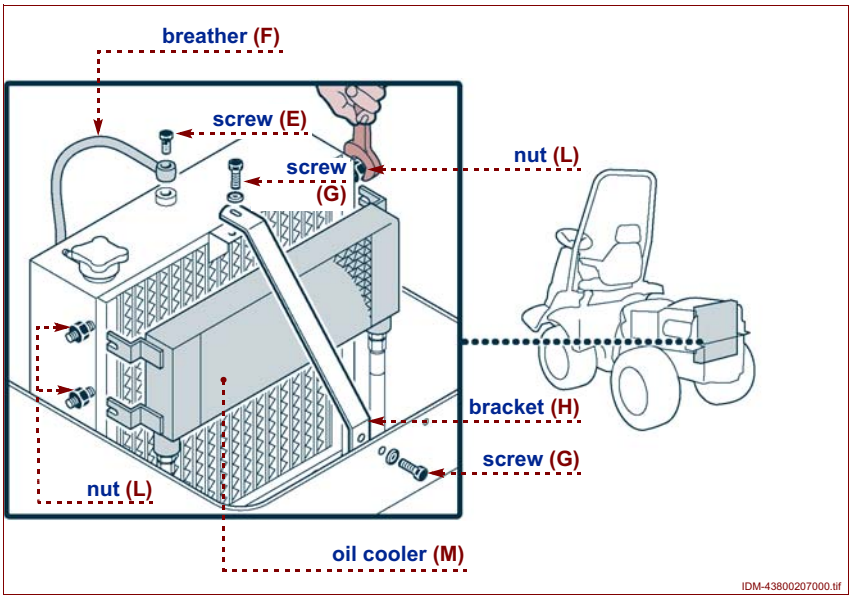




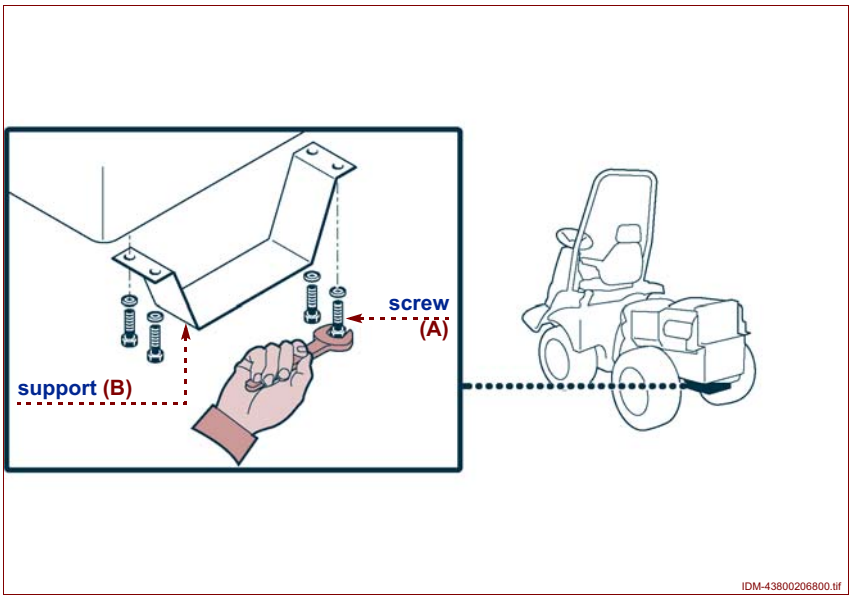
7.2

IDM-C743800201.fm

7 - Fit the oil cooler **(M)** and secure with the nuts **(L)**.
8 - Fit the strut **(H)** and secure with the bolts **(G)**.
9 - Fit the breather **(F)** and secure with the bolt **(E)**.



10 - Fit the battery shelf **(B)** and secure with the bolts **(A)**.
11 - Fit the battery (see “Installing the battery”).
12 - Fit the hood (see “Refitting the engine hood”).



CAB ELECTRICAL SYSTEM 8.1

CAB FRAME 8.2

ROAD LIGHTS AND HORN 8.3

WINDSCREEN WIPER SYSTEM 8.4

HEATING/VENTILATION SYSTEM 8.5

CAB ELECTRICAL SYSTEM 8.1

Cab controls

A) Interior light fitting. Illuminates the driving position.
Operate the switch to turn the interior lighting on and off.

B) Heater control knob. Controls the temperature of the air inside the cab.
Turn right or left to increase or reduce.

C) Fuse box: houses the fuses protecting the electrical system.

D) Fuse (7,5 A): protection of flasher circuit.

E) Fuse (10 A): protection of work lights circuit.

F) Fuse (20 A): protection of fan circuit.

G) Fuse (10 A): protection of windscreen wiper circuit.

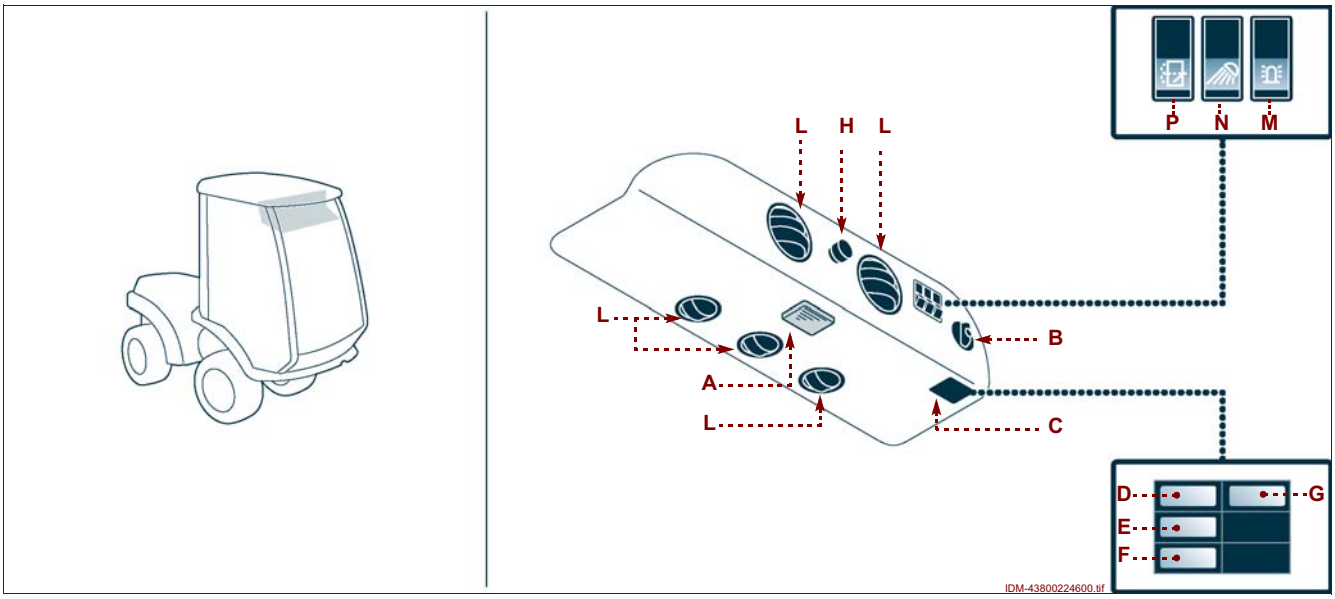
H) Fan switch. Operates the fan.
Turn right or left to switch on or off

L) Adjustable vents. Positionable vents directing air into the cab

M) Beacon switch. Controls the flashing beacon circuit.
Operate the switch to turn the beacon on and off.

N) Work lights switch. Controls the work lights circuit.
Operate the switch to turn the work lights on and off

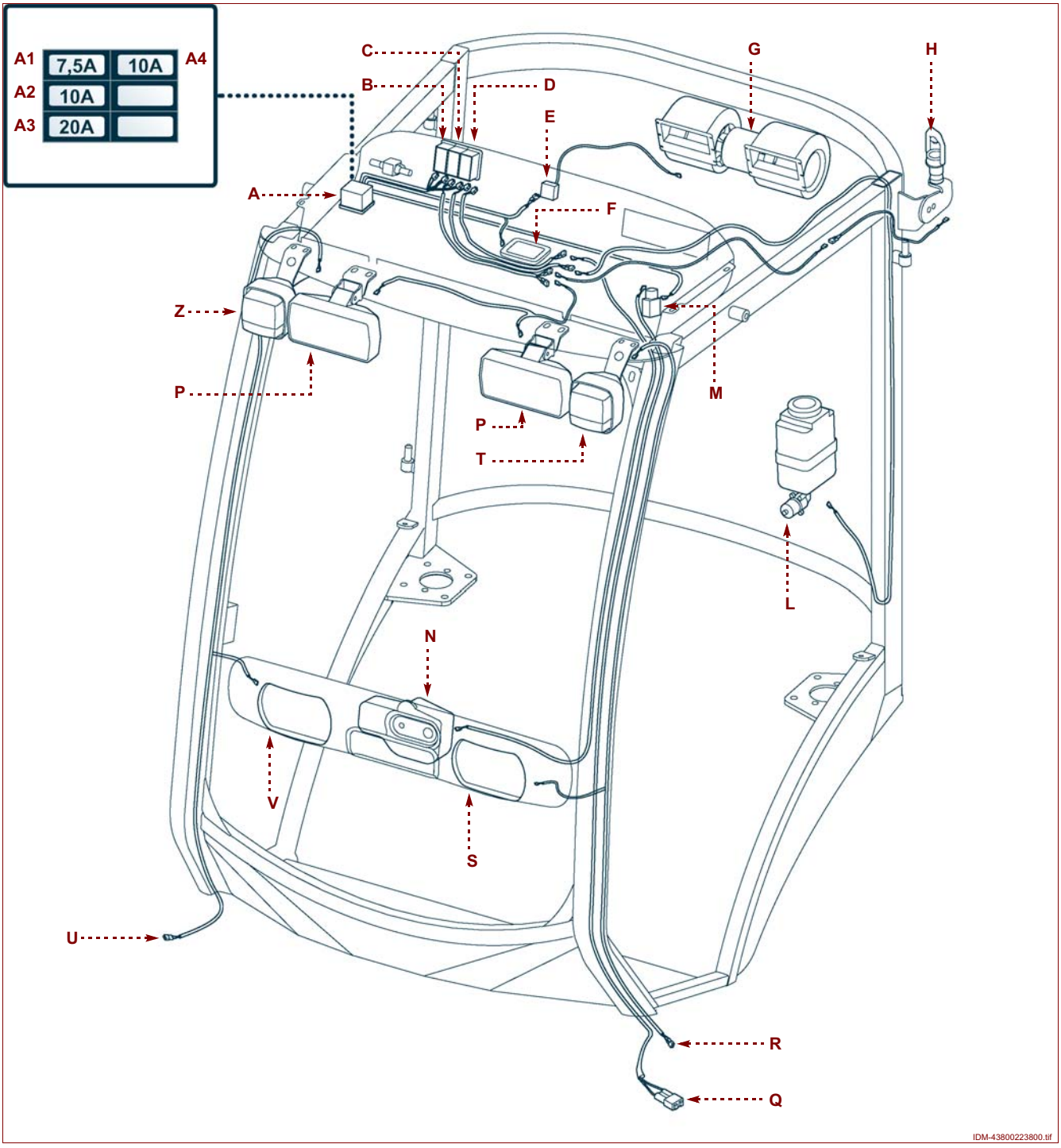
P) Windscreen wiper. Controls the wiper motor circuit.
Operate the switch to turn the wiper on and off
To operate the screen wash, press the switch a second time with the wiper in operation.



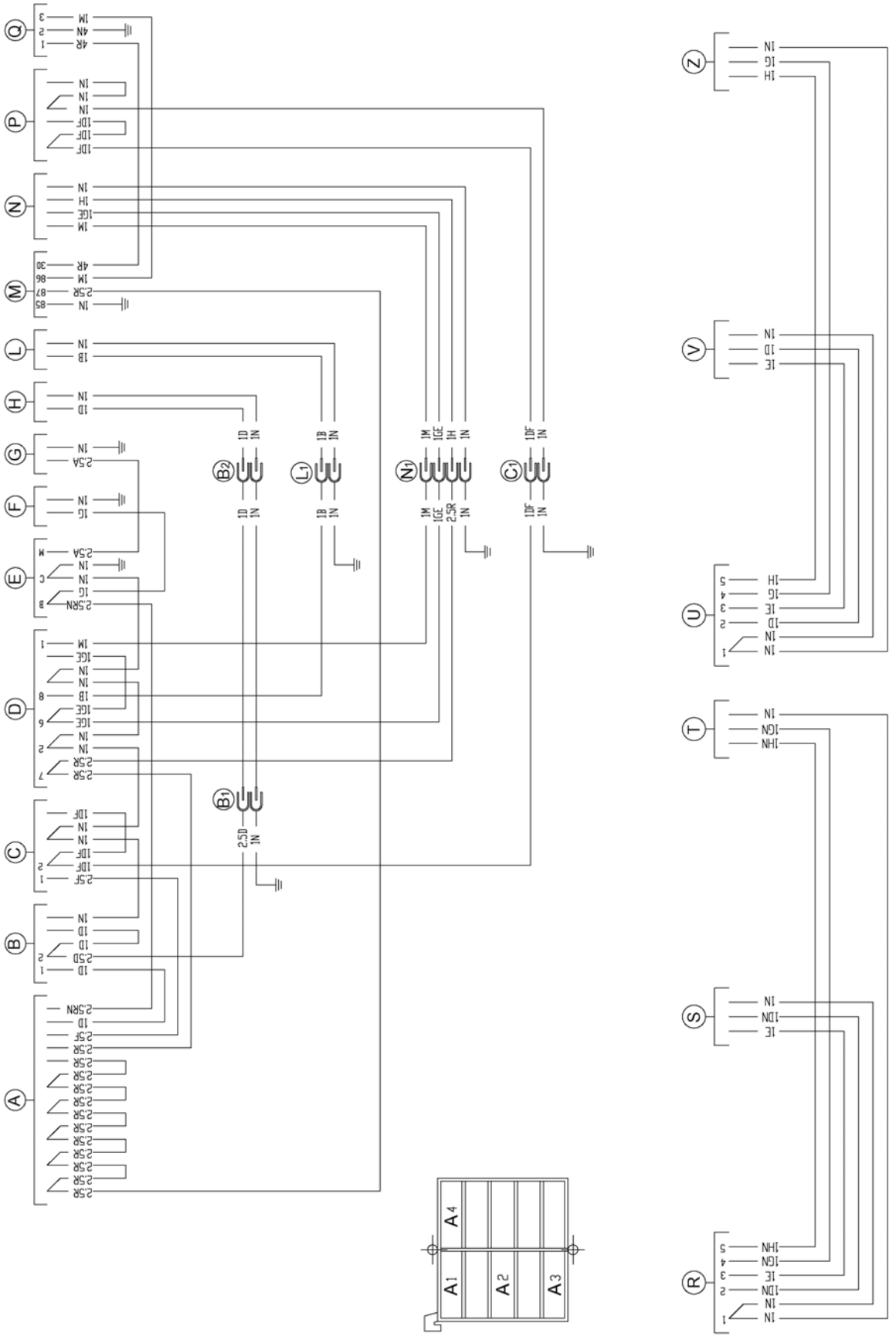
8.1

IDM-C843800201.fm

Cab wiring diagram



Electrical system diagram - cab



IDM-C843800201.fm

Electrical system parts - cab

Name	Description
A	FUSE BOX
A1	7,5 A FUSE, BEACON
A2	10 A FUSE, WORK LIGHTS
A3	20 A FUSE, CAB VENTILATION FAN
A4	10 A FUSE, WINDSCREEN WIPER
B	BEACON SWITCH
B1	CONNECTOR, BEACON
B2	CONNECTOR, BEACON BRACKET
C	WORK LIGHTS SWITCH
C1	CONNECTOR, WORK LIGHTS
D	WINDSCREEN WIPER AND WASH SWITCH
E	FAN SWITCH
F	INTERIOR LIGHT
G	VENTILATION FAN MOTOR
H	BEACON
L	SCREEN WASH PUMP
L1	CONNECTOR, SCREEN WASH PUMP
M	RELAY
N	WINDSCREEN WIPER MOTOR
N1	CONNECTOR, WINDSCREEN WIPER MOTOR
P	WORK LIGHTS
Q	POWER CONNECTOR
R	CONNECTOR, LX ROAD LIGHTS
S	LX DIPPED BEAM/MAIN BEAM

Name	Description
T	LX SIDELIGHTS/DIRECTION INDICATORS
U	CONNECTOR, RX ROAD LIGHTS
V	RX DIPPED BEAM/MAIN BEAM
Z	RX SIDELIGHTS/DIRECTION INDICATORS

Wire colours	
A	ORANGE
B	WHITE
C	PINK
D	GREY
E	GREEN
F	DARK BLUE
G	YELLOW
H	LIGHT BLUE
M	BROWN
N	BLACK
R	RED
V	PURPLE

Note: The same colour codes are used to identify two-colour wires in the following way:
G/V = YELLOW/GREEN (cross stripes)
G-V = YELLOW-GREEN (lengthwise stripes)

8.1

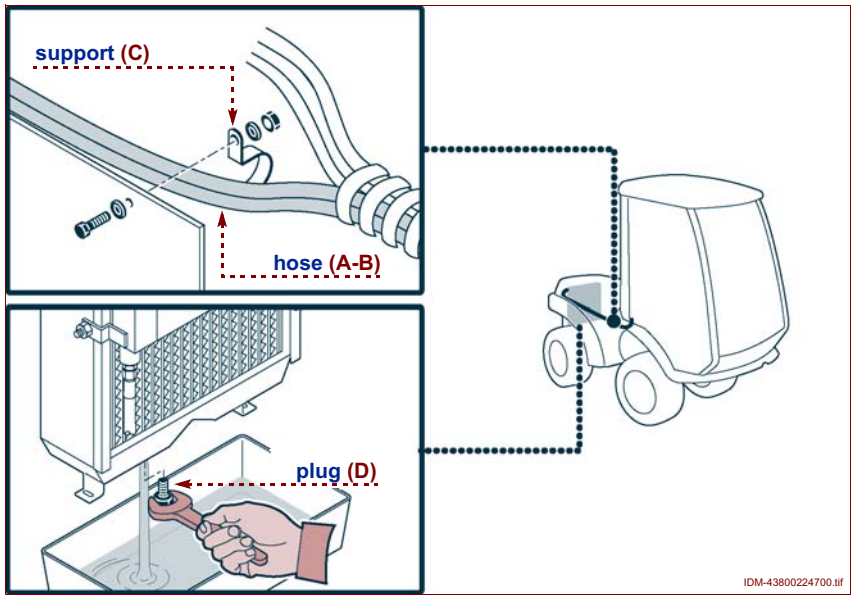
IDM-C843800201.fm

CAB FRAME 8.2

Removing the cab

Proceed as follows.

1 - Position a vessel of suitable capacity under the drain plug **(D)**.
2 - Unscrew the drain plug **(D)** and allow the coolant to run off.
3 - Remove the bracket **(C)** from the engine compartment.

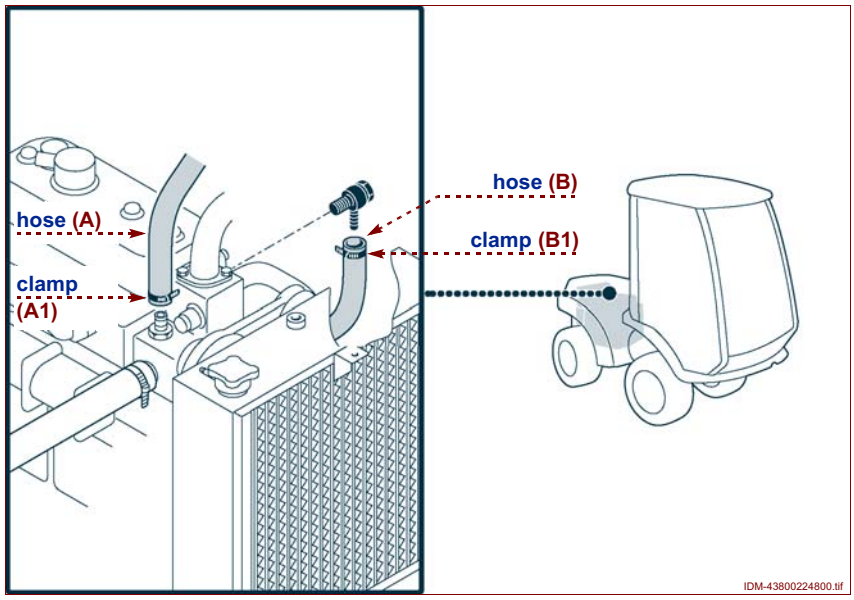


4 - Loosen the clips **(A1-B1)** and disconnect the hoses **(A-B)**.

Important!

Plug the ends of the hoses (A - B) to prevent the spillage of coolant.

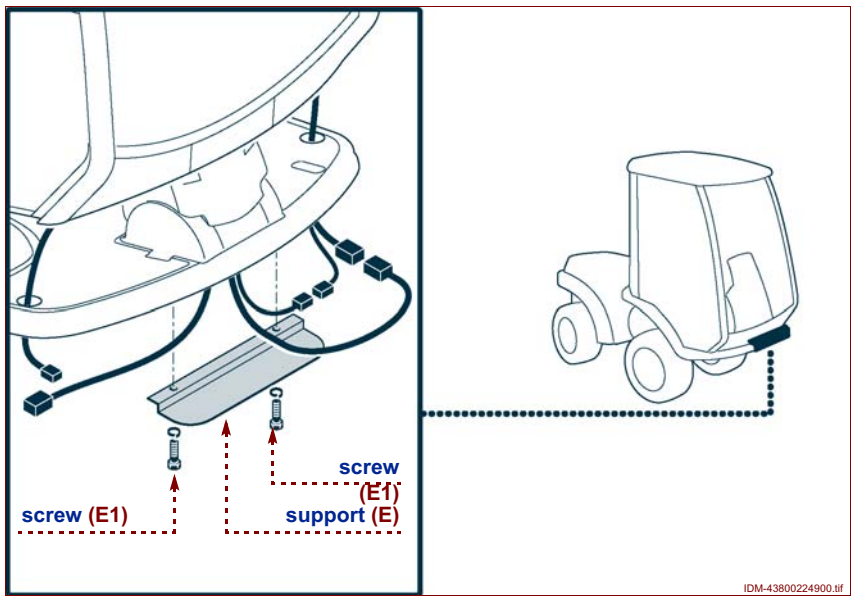
5 - Free the hoses **(A - B)** from the engine compartment and coil them neatly.



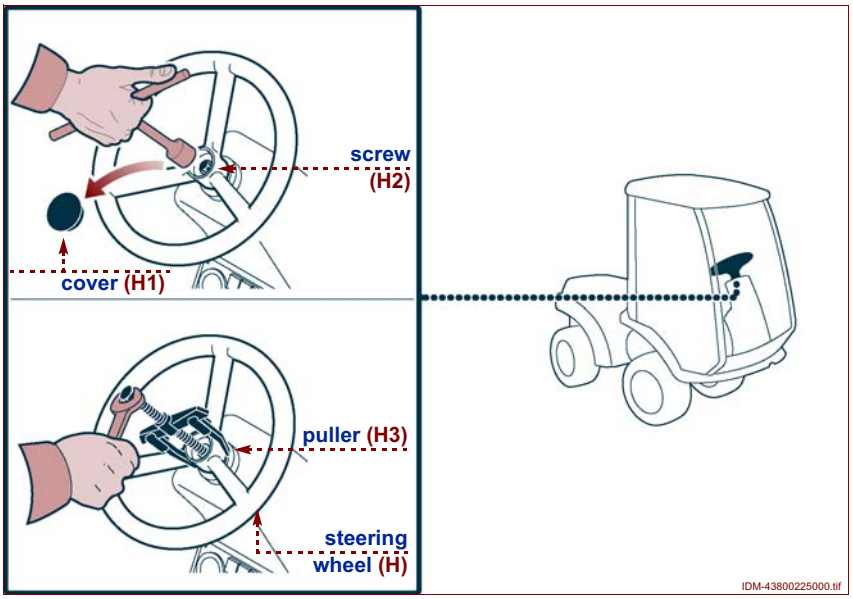
6 - Undo the screws **(E1)** and remove the plate **(E)**.
7 - Separate the cab connectors.

Important!

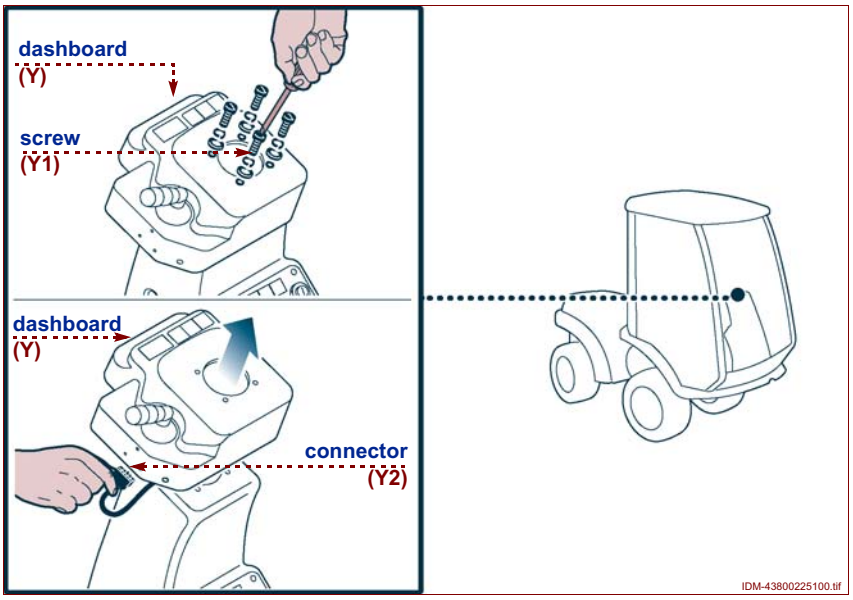
For more details, see the wiring diagram.



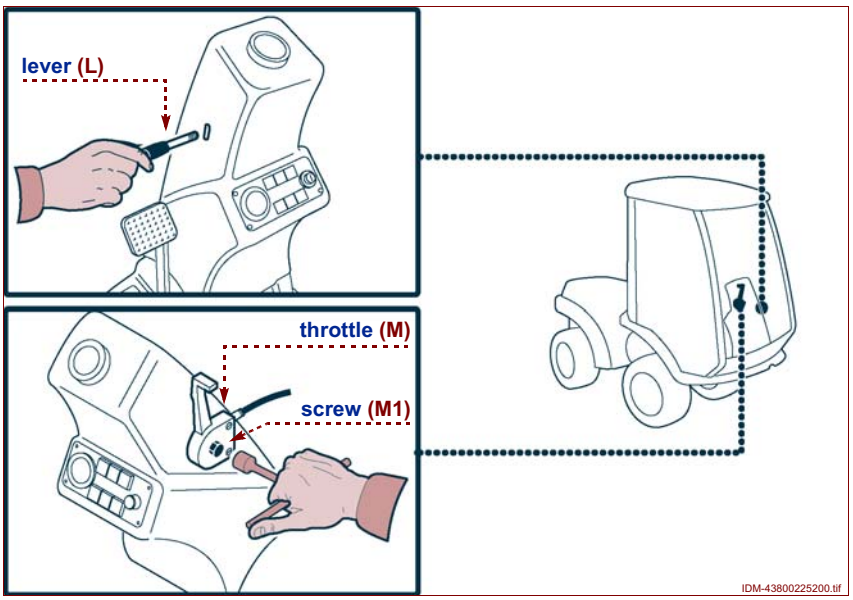
8 - Remove the cap **(H1)**.
9 - Undo the bolt **(H2)**.
10 - Remove the steering wheel **(H)** with the puller **(H3)** (AT 37981247).



11 - Undo the screws **(Y1)** to free the console.
12 - Unplug the connector **(Y2)** and remove the console **(Y)**.



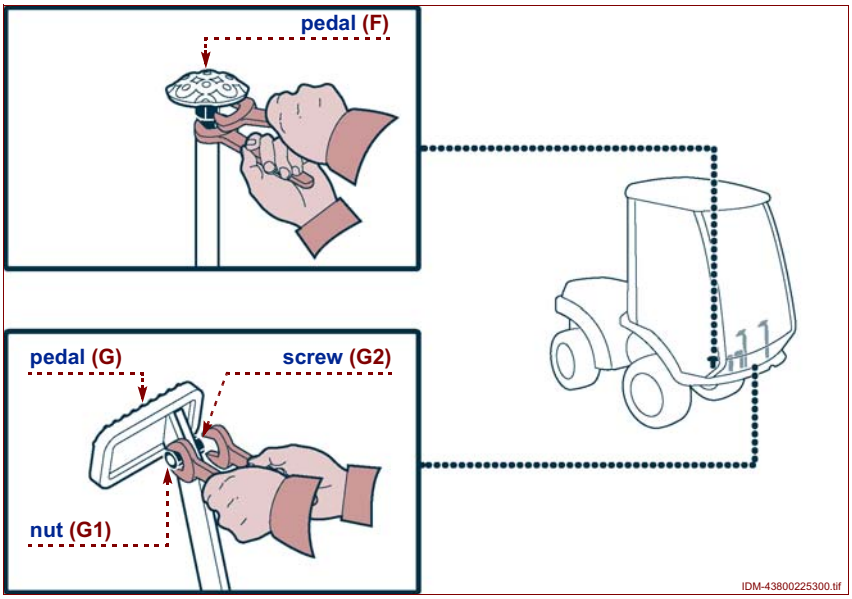
13 - Unscrew the lever **(L)**.
14 - Loosen the bolt **(M1)** and detach the throttle control **(M)**.



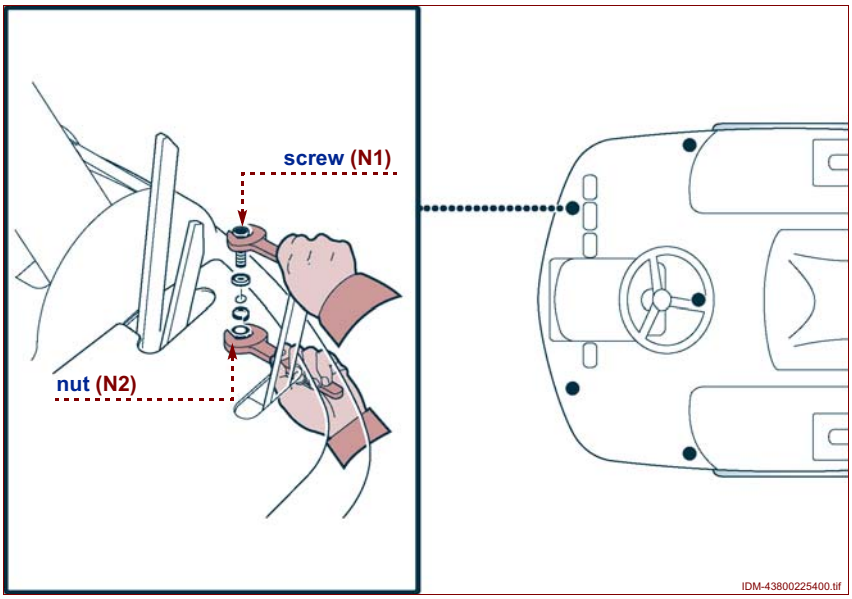
8.2

IDM-C843800201.fm

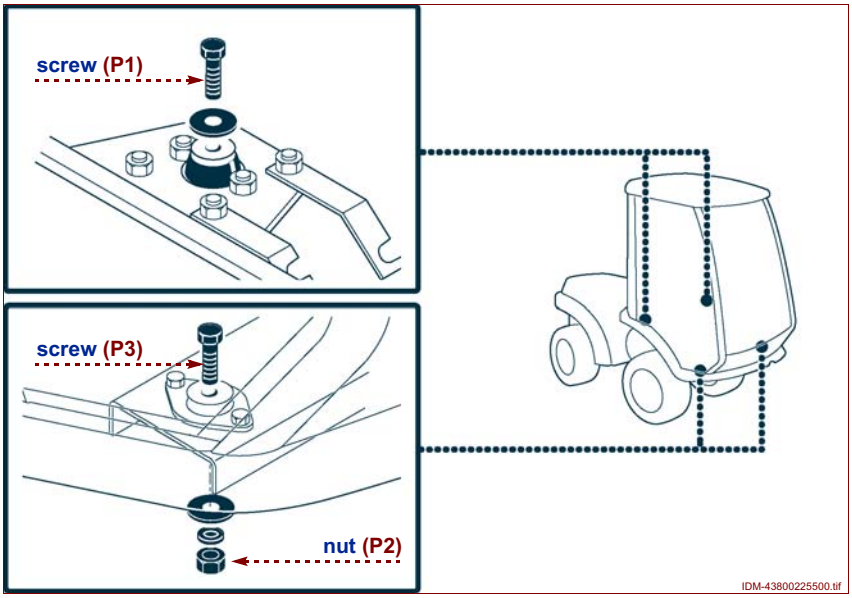
15- Undo the lock nut and remove the pedal **(F)**.
16- Undo the nut **(G1)**, take out the bolt **(G2)** and remove the pedals **(G)**.



17- Undo the nuts **(N2)** and remove the bolts **(N1)**.



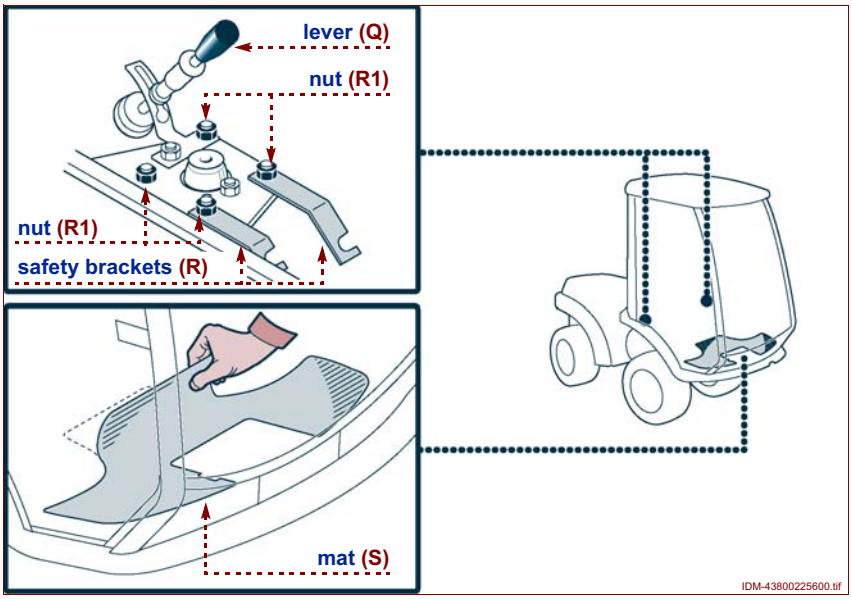
18- Undo the bolts **(P1)** of the rear antivibration mounts
19- Undo the nuts **(P2)** and remove the bolts **(P3)** of the front antivibration mounts.



8.2

IDM-C843800201.fm

20- Undo the nuts **(R1)** and remove the safety brackets **(R)**.
21- Remove the lever **(Q)**.
22- Lift the mat **(S)** from the platform.

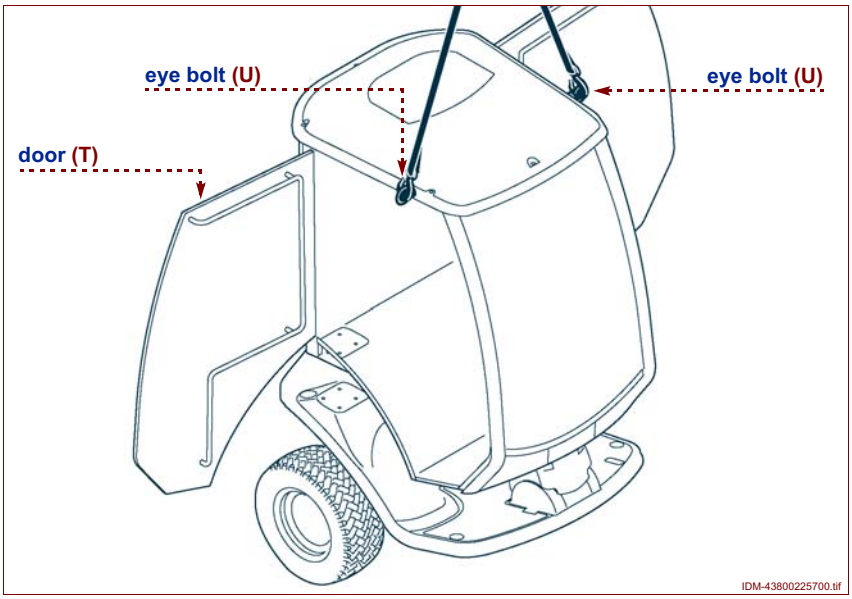


23- Open the door **(T)** of the cab.
24- Fit the eye bolts **(U)** and lift the cab with a hoist and slings.

Caution!

Lift slowly and manoeuvre with maximum care to avoid damaging components of the machine, and of the cab itself.

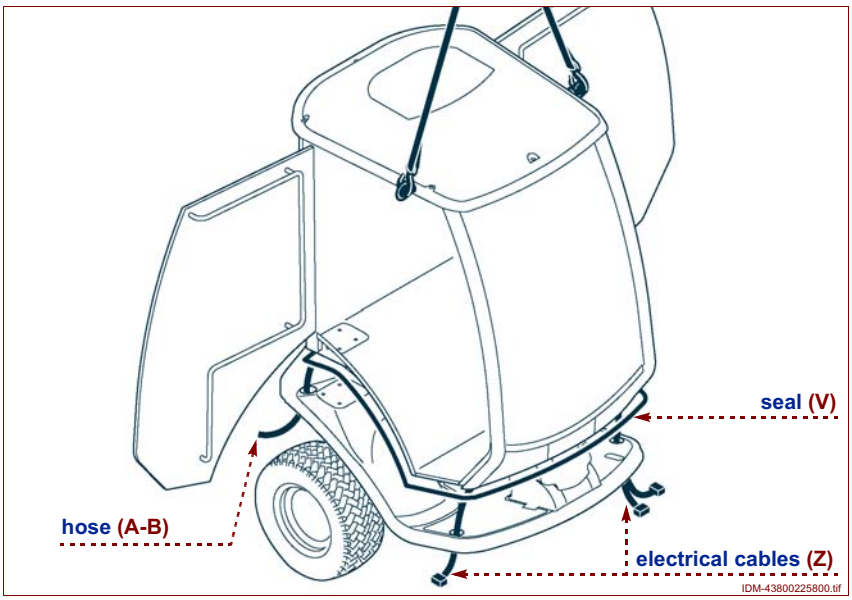
25- Set the cab down on the floor, positioning it stably and in a suitable place.



Refitting the cab

Proceed as follows.

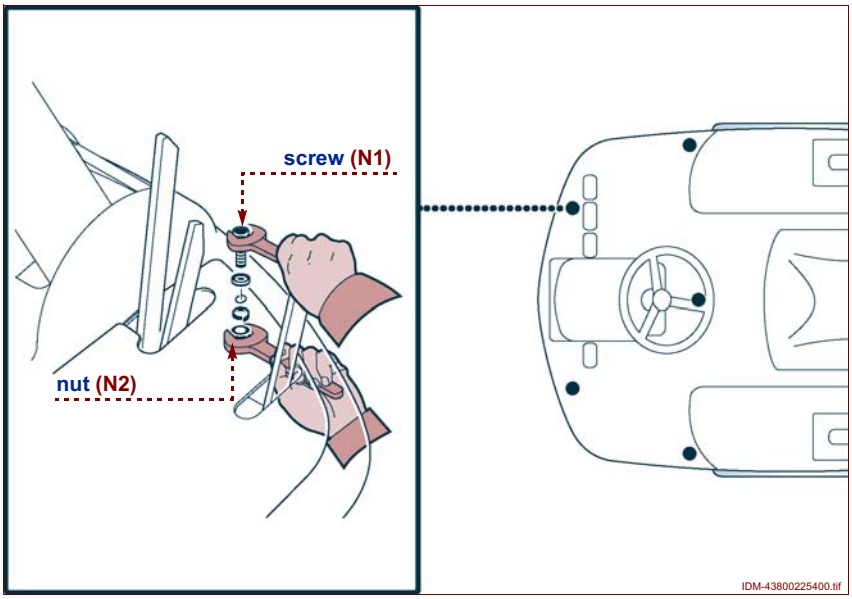
1 - Inspect the seal **(V)** around the skirt of the cab, and renew if necessary.
2 - Attach hooks and slings, hoist the cab and position it on the machine.
3 - Route the heater hoses **(A-B)** and electrical cables **(Z)** through the holes provided in the platform.



8.2

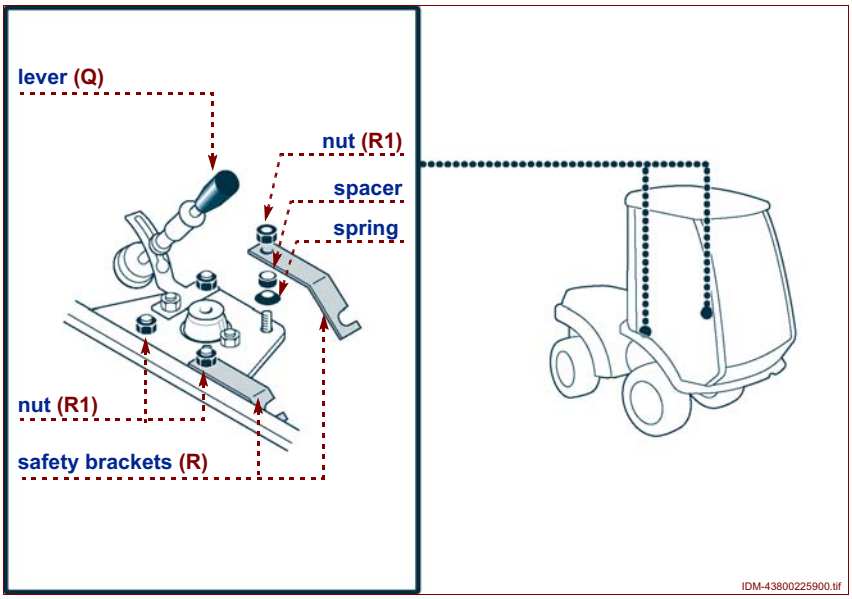
IDM-C843800201.fm

4 - Complete the refitment of the cab with the relative bolts, nuts **(N1-N2)** and washers (see illustration).



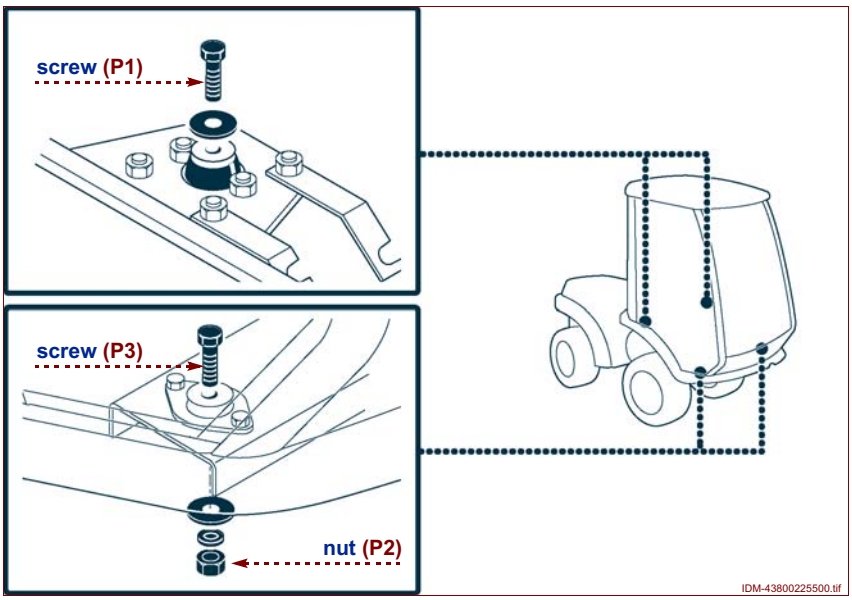
5 - Fit the lever **(Q)**.

6 - Fit the safety brackets **(R)** with spacer and belleville disc (see illustration) and secure with the nuts **(R1)**.



7 - Secure the rear antivibration mounts with bolts **(P1)** and washers.

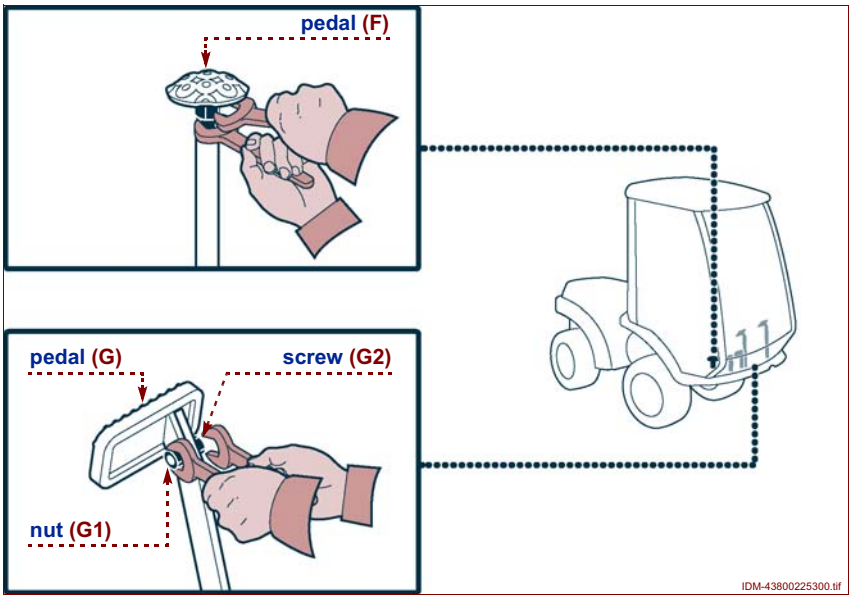
8 - Secure the front antivibration mounts with bolts, nuts **(P2-P3)** and washers.



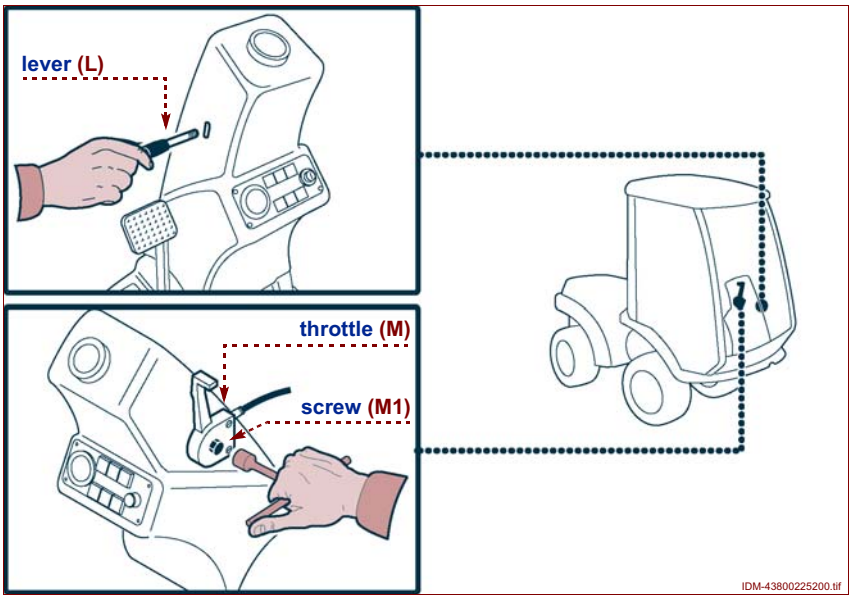
8.2

IDM-C843800201.fm

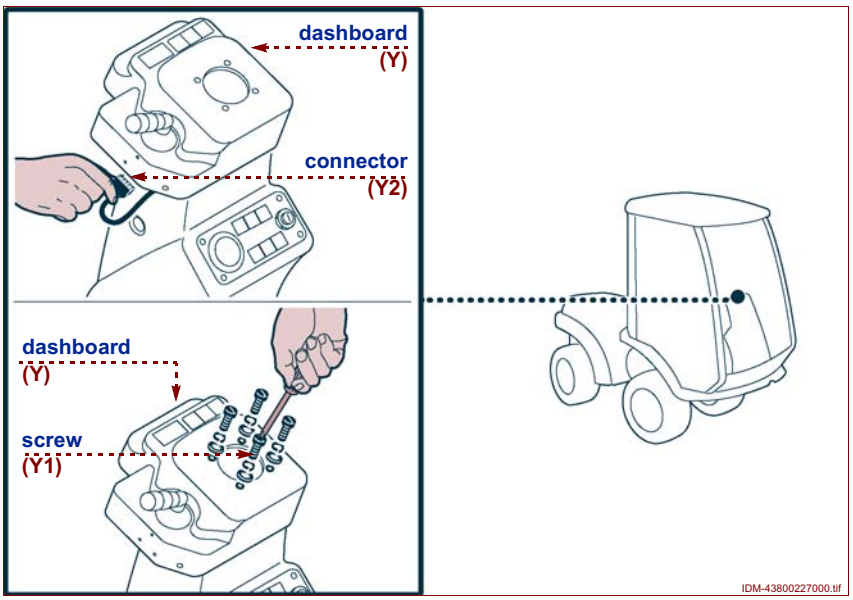
9 - Fit the pedal **(F)** and secure with the lock nut.
10 - Fit the pedals **(G)** and secure with bolt and nut **(G1-G2)**.



11 - Fit the throttle control **(M)** and secure with the bolt **(M1)**.
12 - Screw in the lever **(L)**.



13 - Fit the console **(Y)** and plug in the connector **(Y2)**.
14 - Secure the console **(Y)** with the screws **(Y1)**.

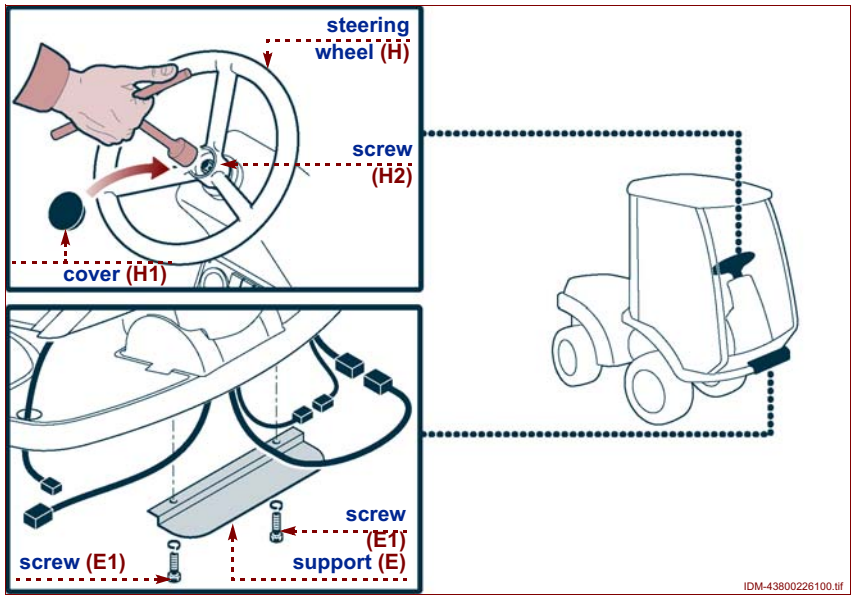


15- Fit the steering wheel **(H)** and clamp in place with the bolt **(H2)**.
16- Fit the cap **(H1)**.
17- Join up the cab connectors.

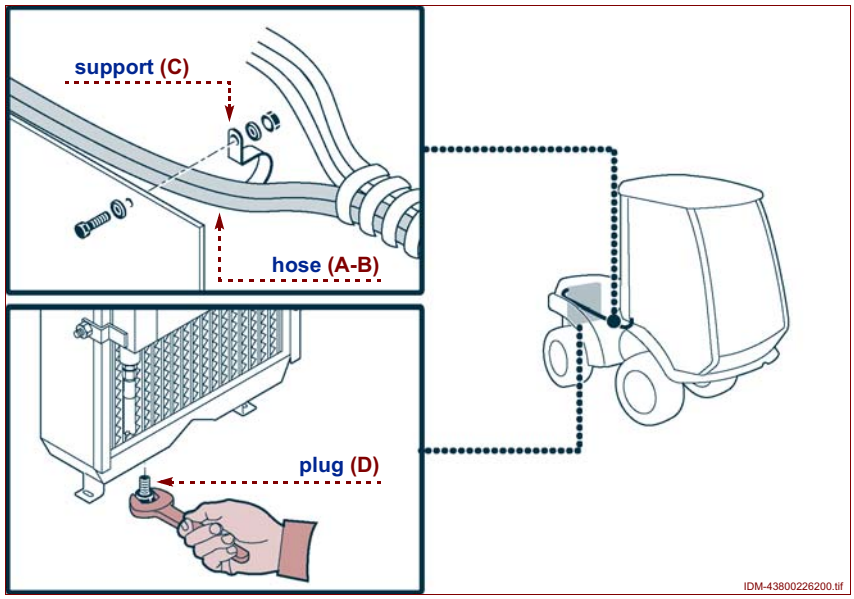
Important!

For more details, see the wiring diagram.

18- Fix the plate **(E)** with the screws **(E1)**.



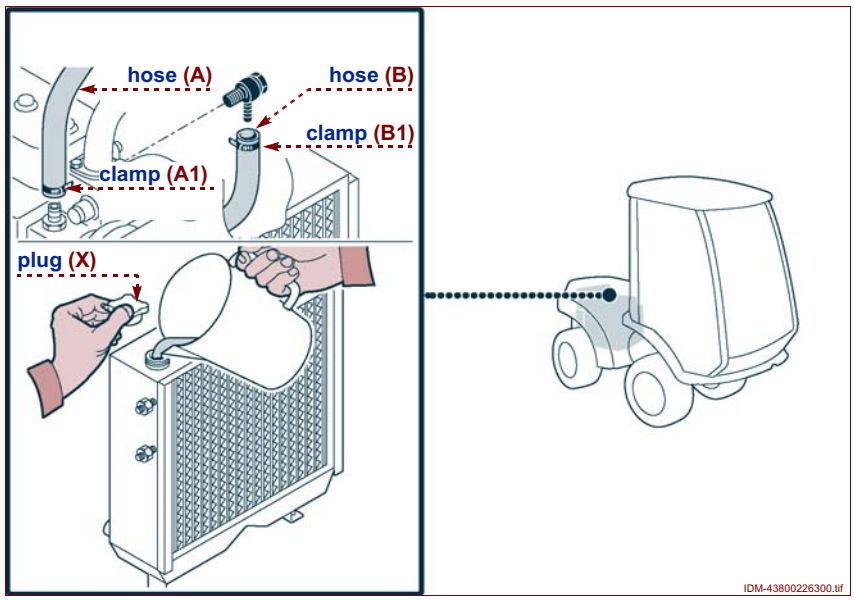
19- Position the hoses **(A - B)** in the engine compartment and anchor to the right hand side with the bracket **(C)**.
20- Smear the drain plug **(D)** with sealant (Better Arexons) and screw into the radiator outlet.



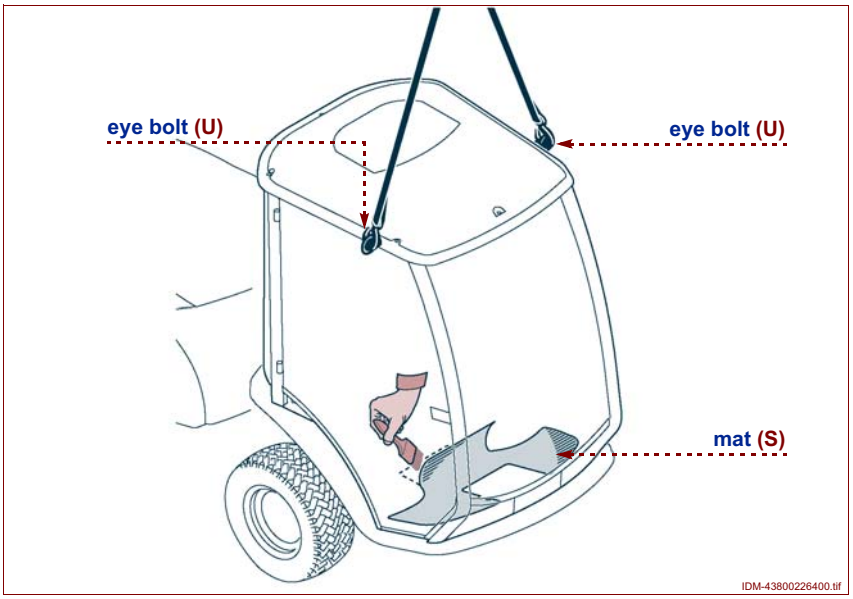
21- Connect the long hose **(A)** of the cab heater and secure with the clip **(A1)**.
22- Connect the short hose **(B)** of the cab heater and secure with the clip **(B1)**.
23- Remove the filler cap **(X)** and fill the radiator with coolant.

Caution!

Open up the heater valve in the cab Start the engine and throttle to 2500 rev/min for about 2-3 minutes so that the heater and the relative hoses will fill with coolant. Thereafter, check the level of liquid in the radiator and top up if necessary.



24- Detach the hoist slings and remove the eye bolts **(U)**.
25- Fix the floor mat **(S)** to the platform with adhesive (Bostik - Macroplast).



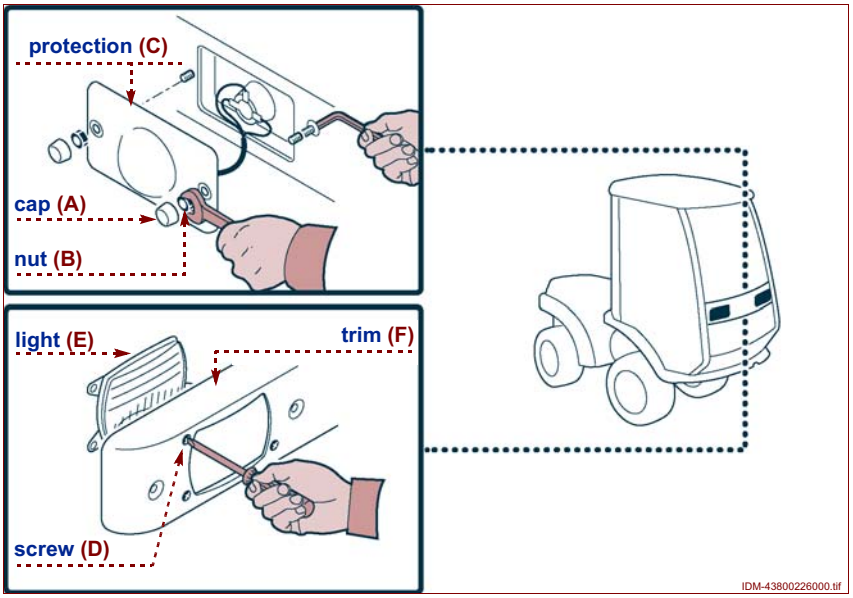
IDM-C843800201.fm

ROAD LIGHTS AND HORN 8.3

Removing the lights

Proceed as follows.

1 - Remove the windscreen wiper (see “Removing the windscreen wiper motor”).
2 - Remove the caps **(A)**, undo the nuts **(B)** and remove the protective plate **(C)**.
3 - Unplug the headlamp connectors.
4 - Remove the headlamp **(E)** from the trim.



Refitting the lights

Proceed as follows.

1 - Fit the headlamp **(E)** and secure to the trim with screws **(D)**.
2 - Fit the trim **(F)** to the cab frame.
3 - Join up the headlamp connectors.
4 - Reposition the plate **(C)**, tighten the nuts **(B)** and refit the caps **(A)**.
5 - Fit the windscreen wiper (see “Refitting the windscreen wiper motor”).
6 - Switch the headlamps to dipped beam, and adjust for position.

Caution!

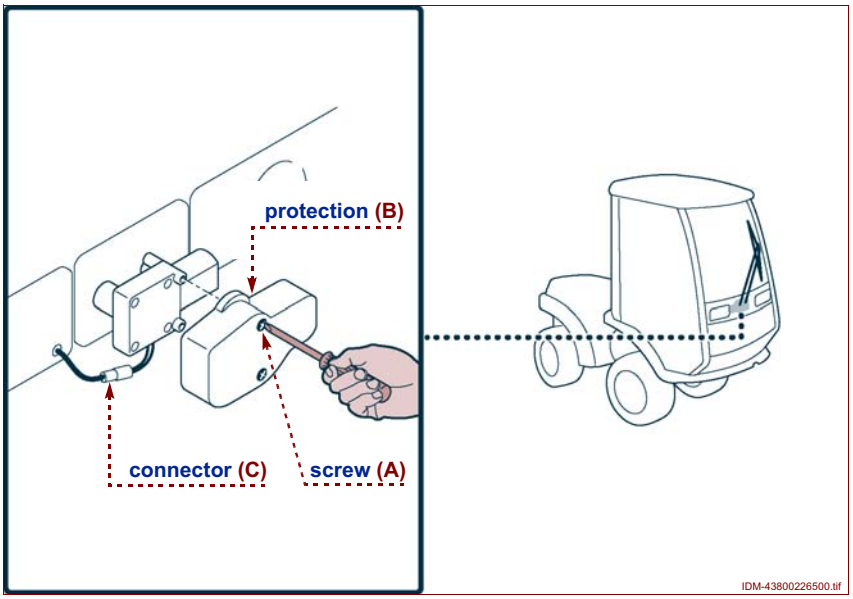
When driving on the road, the headlights must be adjusted so as not to dazzle the drivers of other vehicles, and in accordance with the regulations of the highway code.

WINDSCREEN WIPER SYSTEM 8.4

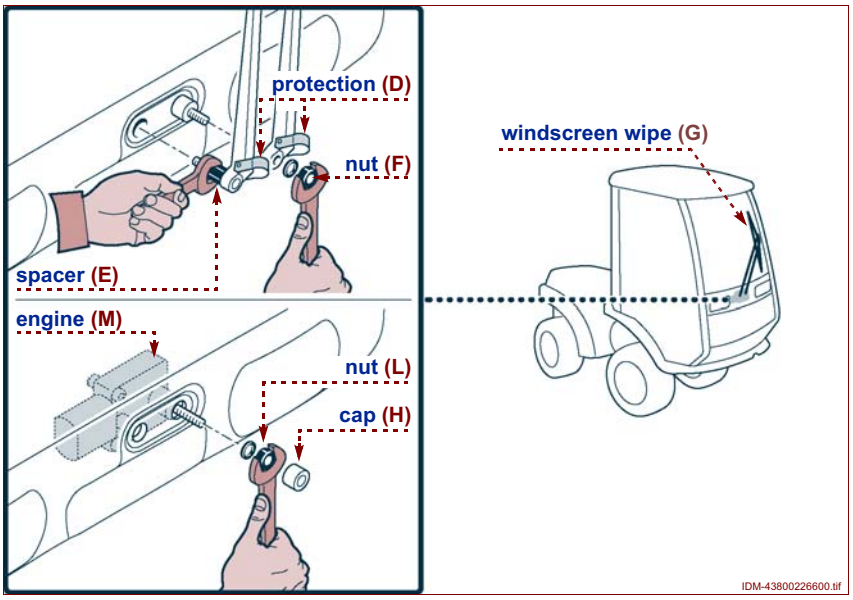
Removing the windscreen wiper motor

Proceed as follows.

1 - Undo the screws **(A)** and remove the guard **(B)**.
2 - Separate the connector **(C)**.



3 - Lift the caps **(D)**.
4 - Unscrew the spacer **(E)** and the nut **(F)**, and detach the wiper **(G)**.
5 - Remove the nut concealer **(H)** and undo the nut **(L)**.
6 --Detach the motor **(M)**.

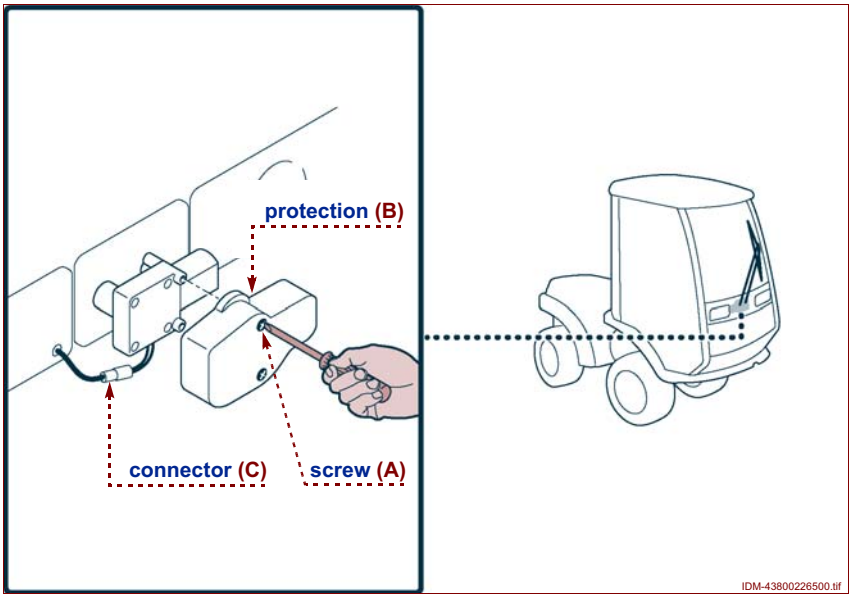


Refitting the windscreen wiper motor

Proceed as follows.

1 - Position the motor **(M)**, locate the washer and secure with the nut **(L)**.
2 - Fit the nut concealer **(H)**.
3 - Fit the wiper **(G)**, locate the washers and secure with the nut **(F)**.
4 - Tighten the spacer **(E)**.
5 - Reposition the caps **(D)**.

6 - Join up the connector **(C)**.
7 - Fit the guard **(B)** and secure with the screws **(A)**.



HEATING/VENTILATION SYSTEM 8.5

Removing the fan unit

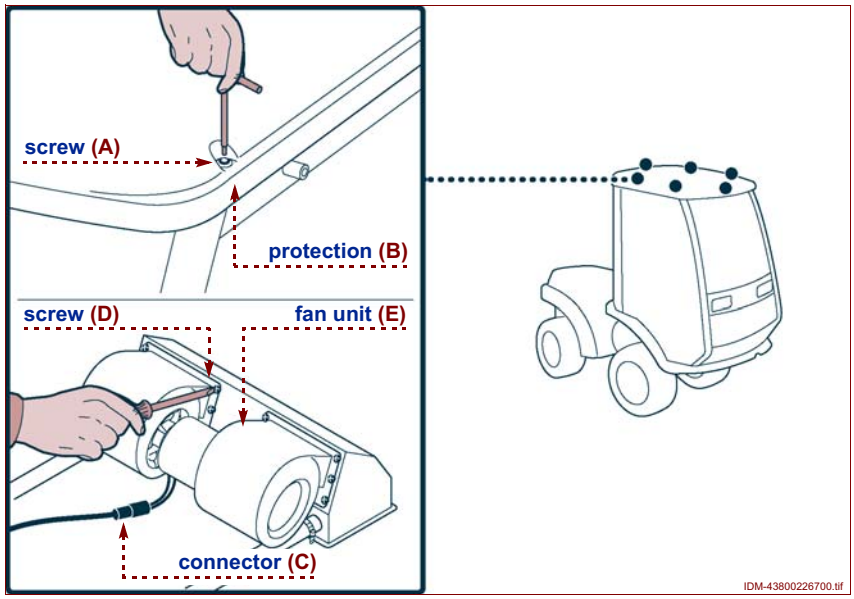
Proceed as follows.

1 - Undo the bolts screws **(A)** and remove the guard **(B)**.
2 - Separate the connector **(C)**.
3 - Undo the screws **(D)** and detach the fan unit **(E)**.

Refitting the fan unit

Proceed as follows.

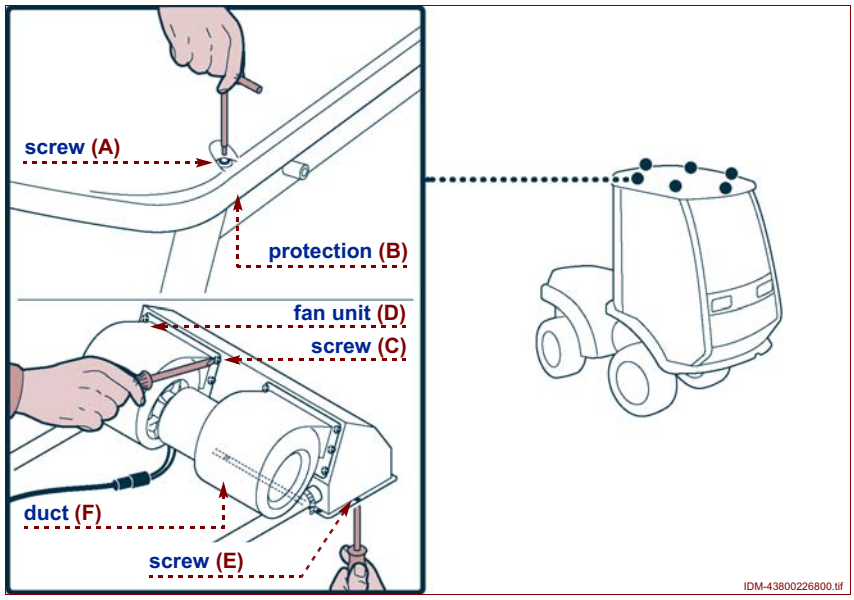
1 - Position the fan unit **(E)** and secure with the screws **(D)**.
2 - Join up the connector **(C)**.
3 - Fit the guard **(B)** and secure with the screws **(A)**.



Removing the radiator

Proceed as follows.

1 - Undo the screws **(A)** and remove the guard **(B)**.
2 - Undo the screws **(C)** and detach the fan unit **(D)**.
3 - Undo the screws **(E)** located internally of the cab, around the air vents, and draw the duct **(F)** out of the cab.

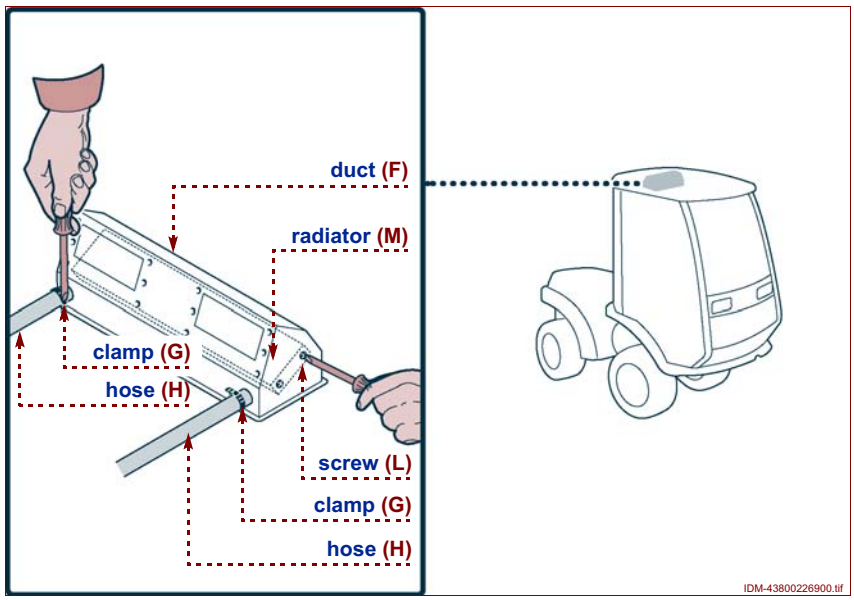


4 - Loosen the clips **(G)** and disconnect the hoses **(H)**.
5 - Undo the screws **(L)** and remove the heater radiator **(M)**.

Refitting the radiator

Proceed as follows.

1 - Fit the radiator **(M)** into the duct **(F)** and secure with the screws **(L)**.
2 - Connect the hoses **(H)** and secure with the clips **(G)**.

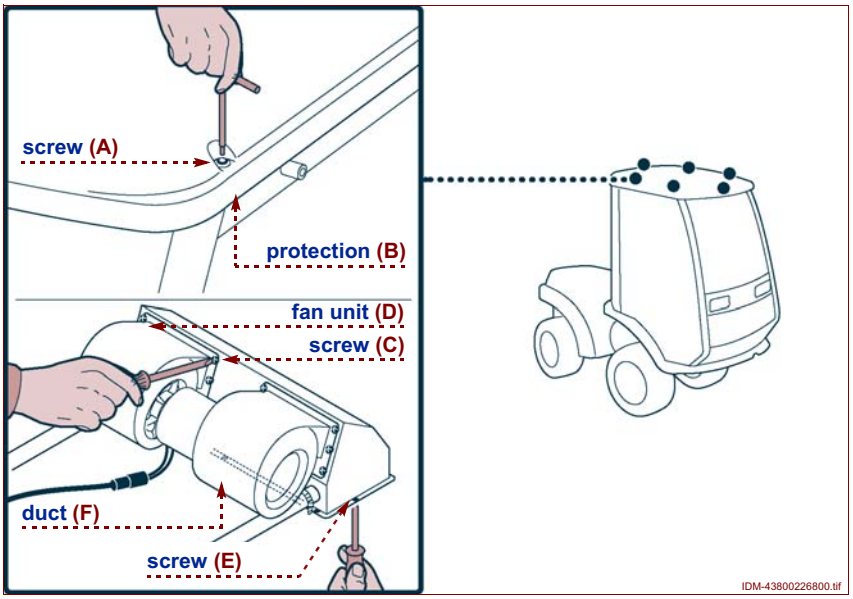


IDM-C843800201.fm

3 - Locate the duct **(F)** in the cab and secure with the screws **(E)**.
4 - Fit the guard **(B)** and secure with the screws **(A)**.

Caution!

Open up the heater valve in the cab Start the engine and throttle to 2500 rev/min for about 2-3 minutes so that the heater and the relative hoses will fill with coolant. Thereafter, check the level of liquid in the radiator and top up if necessary.



HYDRAULIC SYSTEM 9.1

ELECTRICAL SYSTEM 9.2

IDM-C943800201.fm

HYDRAULIC SYSTEM 9.1

Technical specifications

Flow rate of hydraulic pump ..... 7,9 (cm^3/rev)
Flow control valve ..... 0-25 litres/min

Filter

Type ..... Paper element
Filtration capacity ..... 10 µ

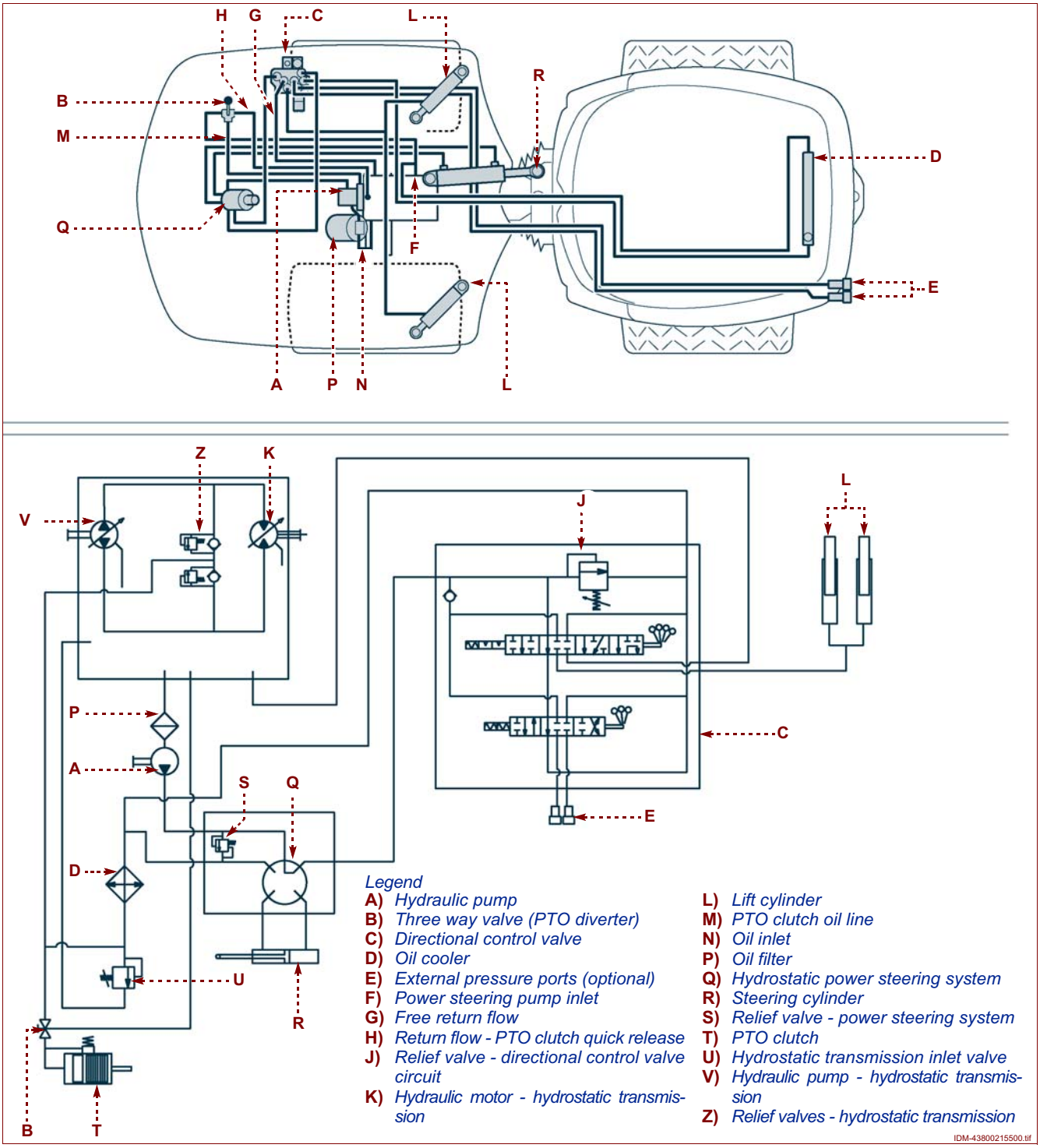
Hydraulic circuit diagram

The machine is equipped with a pressurized hydraulic system serving the power steering and hydraulic lift services. The relief valves of these two services unload oil at 20 bar to the low pressure side of the circuit.

Directional control valve

Type ..... Monobloc with one spool, manually operated.
Monobloc with two spools, manually operated (optional)
Relief valve setting ..... 12 Mpa (120 bar)
External pressure ports (optional). Female quick coupler

This pressure, added to the relief valve setting (120 bar), gives the overall system pressure at which the relief valves cut in to protect the circuit, i.e. 140 bar.



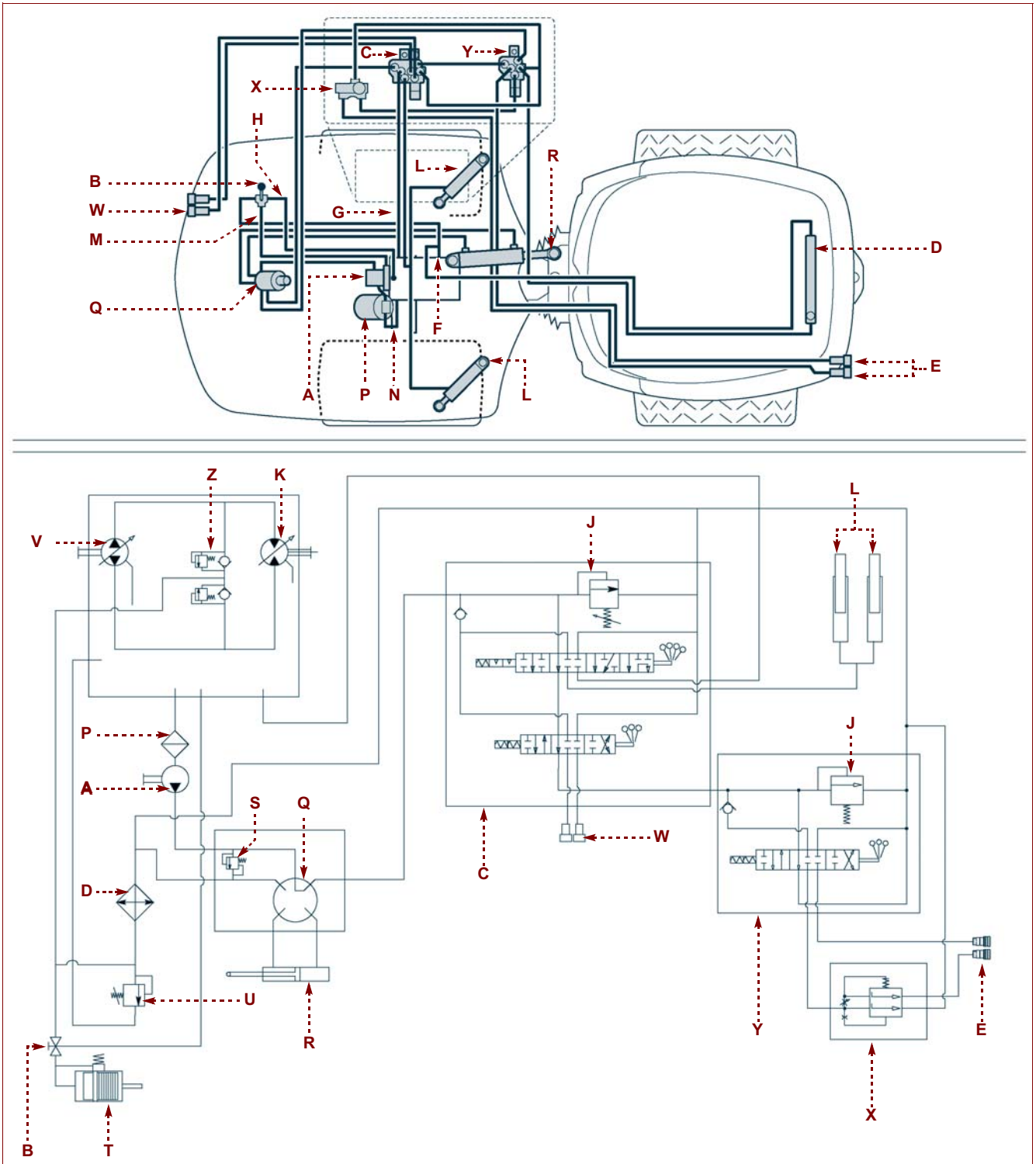
Legend

- **A)** *Hydraulic pump*
- **B)** *Three way valve (PTO diverter)*
- **C)** *Directional control valve*
- **D)** *Oil cooler*
- **E)** *External pressure ports (optional)*
- **F)** *Power steering pump inlet*
- **G)** *Free return flow*
- **H)** *Return flow - PTO clutch quick release*
- **J)** *Relief valve - directional control valve circuit*
- **K)** *Hydraulic motor - hydrostatic transmission*
- **L)** *Lift cylinder*
- **M)** *PTO clutch oil line*
- **N)** *Oil inlet*
- **P)** *Oil filter*
- **Q)** *Hydrostatic power steering system*
- **R)** *Steering cylinder*
- **S)** *Relief valve - power steering system*
- **T)** *PTO clutch*
- **U)** *Hydrostatic transmission inlet valve*
- **V)** *Hydraulic pump - hydrostatic transmission*
- **Z)** *Relief valves - hydrostatic transmission*

IDM-43800215500.tif

IDM-C943800201.fm

Hydraulic circuit diagram (with front pressure ports)



Legend

- **A)** *Hydraulic pump*
- **B)** *Three way valve (PTO diverter)*
- **C)** *Directional control valve (ML2)*
- **D)** *Oil cooler*
- **E)** *Pressure ports (rear)*
- **F)** *Hydrostatic transmission pump inlet*
- **G)** *Free return flow*
- **H)** *Return flow - PTO clutch quick release*
- **J)** *Relief valve - directional control valve circuit*
- **K)** *Hydraulic motor - hydrostatic transmission*
- **L)** *Lift cylinder*
- **M)** *PTO clutch oil line*
- **N)** *Oil inlet*
- **P)** *Oil filter*
- **Q)** *Hydrostatic power steering system*
- **R)** *Steering cylinder*
- **S)** *Relief valve - power steering system*
- **T)** *PTO clutch*
- **U)** *Hydrostatic transmission inlet valve*
- **V)** *Hydraulic pump - hydrostatic transmission*
- **W)** *Pressure ports (front)*
- **X)** *Flow control valve*
- **Y)** *Directional control valve (ML1)*
- **Z)** *Relief valves - hydrostatic transmission*

IDM-43800223200.tif

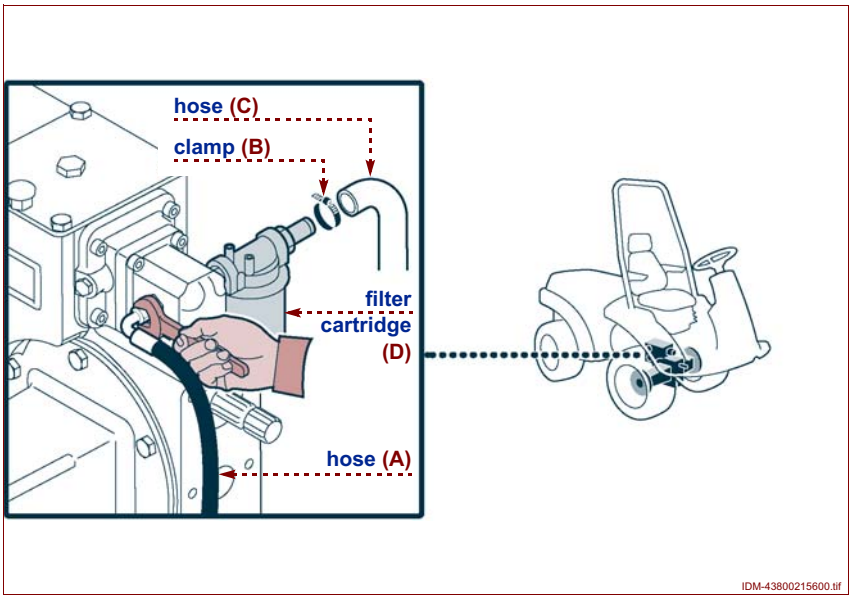
IDM-C943800201.fm

9.1

Removing the hydraulic pump and filter

Proceed as follows.

1 - Position a vessel under the work area to catch any oil that may spill.
2 - Disconnect the oil line **(A)** and plug temporarily to prevent any leakage of oil.
3 - Loosen the clip **(B)** and detach the hose **(C)**.
4 - Unscrew the filter **(D)**.



5 - Undo the screws **(E)** and remove the bracket **(F)**.
6 - Remove the filter flange **(G)**.
7 - Undo the screws **(H)** and remove the bracket **(L)**.
8 - Undo the bolts **(M)** and detach the pump **(N)**.

Important!

To remove a long-case pump (fitted to certain machines and identifiable from the head bolts, which project from the body), it will first be necessary to remove the platform and then loosen the bolts securing the pump flange to the front end transmission housing.

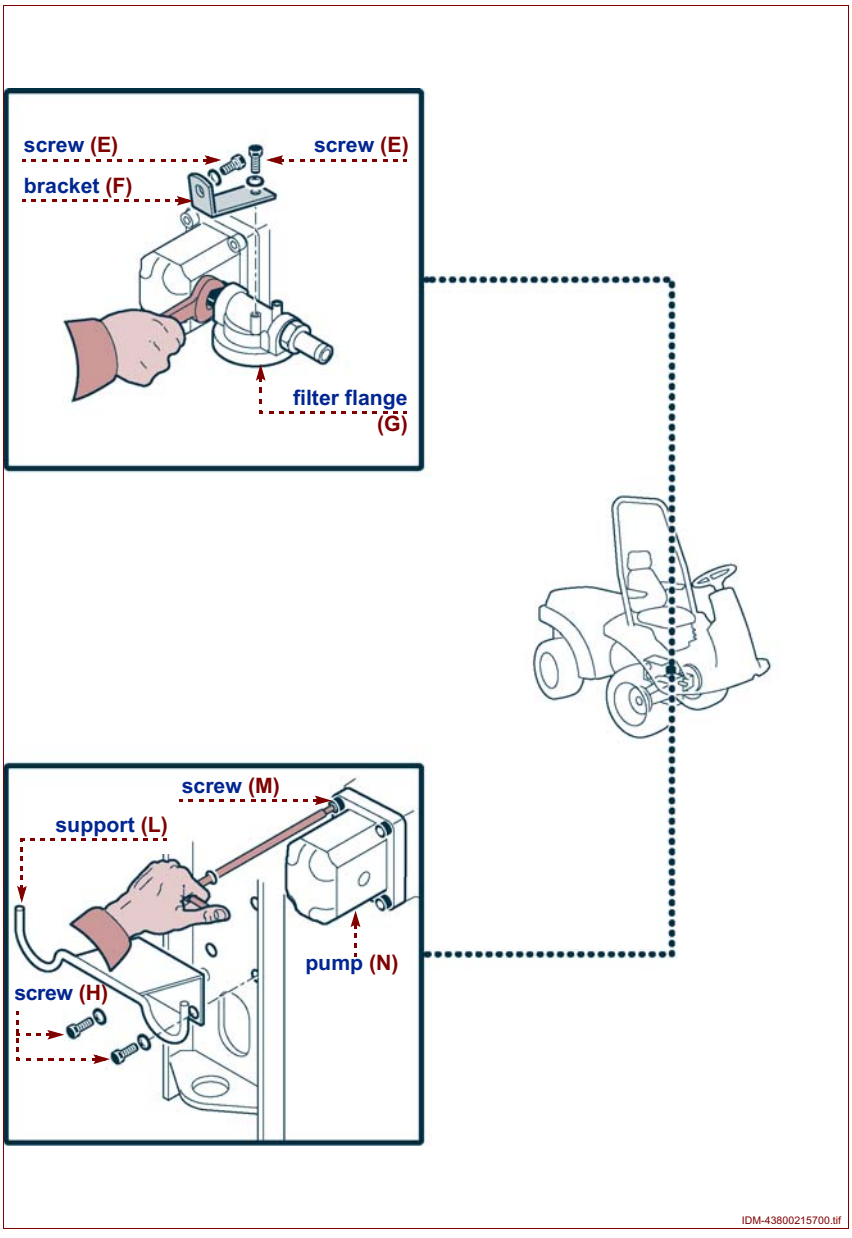
Refitting the hydraulic pump and filter

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

Proceed as follows.

1 - Clean all disassembled parts and ensure they are not damaged. Make certain the mating surfaces are clean.
2 - Fit the pump **(N)** and secure with the bolts **(M)**.
3 - Fit the bracket **(L)** and secure with the screws **(H)**.



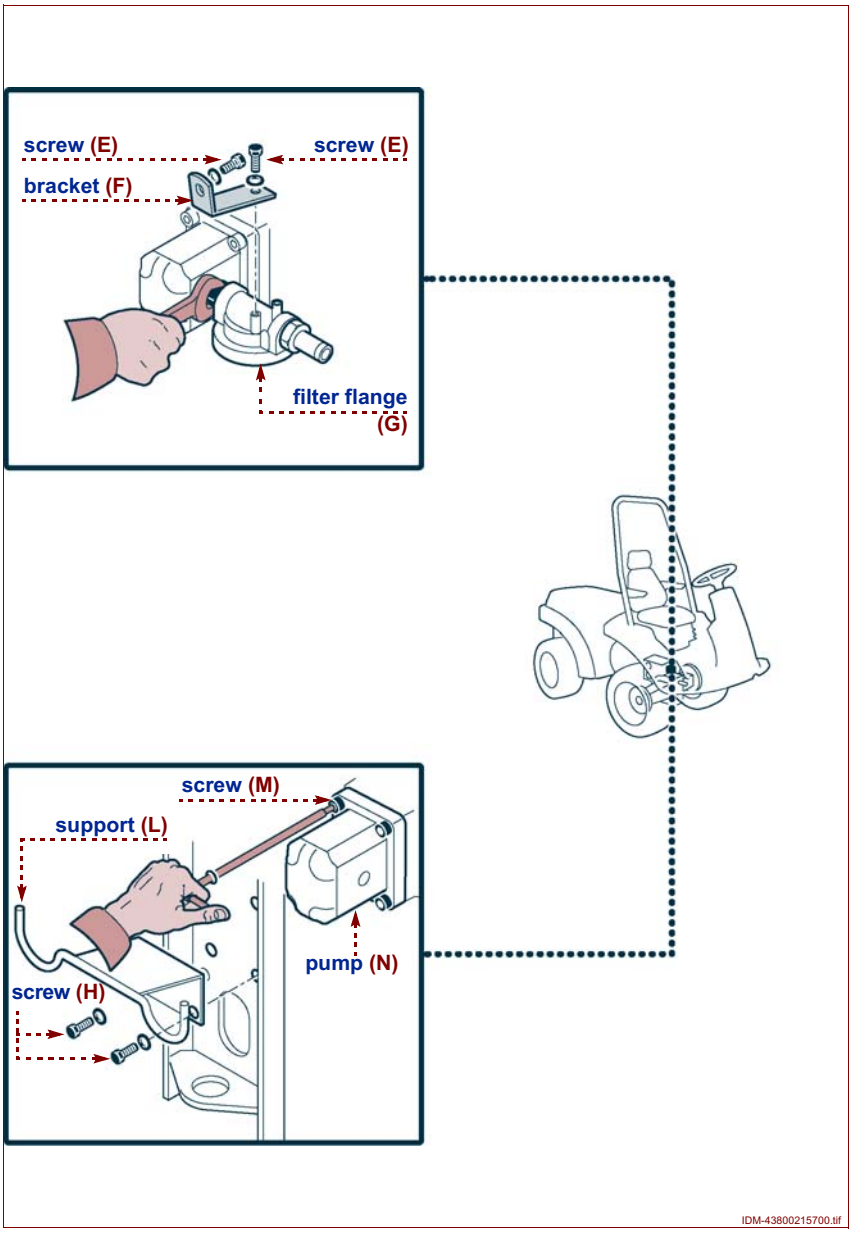
IDM-C943800201.fm

4 - Fit the filter flange **(G)**.

Important!

When fitting the filter flange, be certain to check the flow direction of the oil at the pump inlet (indicated by an arrow on the flange).

5 - Fit the bracket **(F)** and secure with the screws **(E)**.
6 - Screw on the filter **(D)**, renewing if necessary.
7 - Attach the hose **(C)** and tighten the clip **(B)**.
8 - Reconnect the oil line **(A)**.



Removing the control valve

Proceed as follows.

1 - Position a vessel under the work area to catch any oil that may spill.

Important!

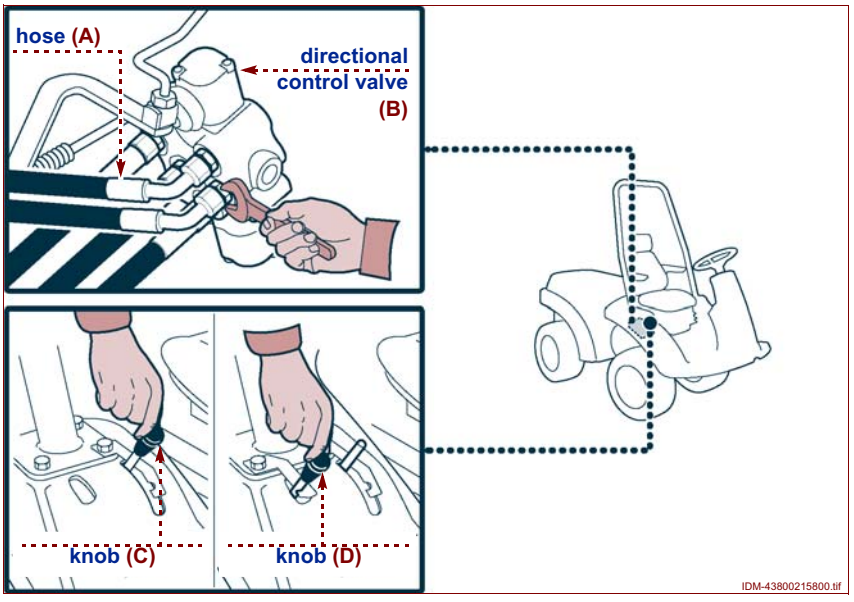
If the machine is equipped with hose guards, these must be removed before disconnecting the hoses.

2 - Disconnect the oil lines **(A)** from the control valve **(B)**.

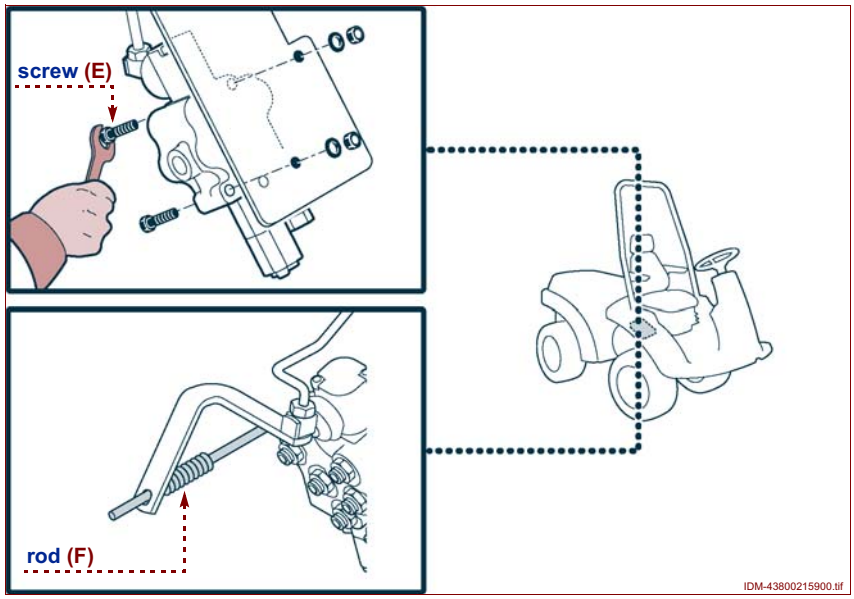
Important!

Mark the oil lines before disconnecting, so as to facilitate reconnection subsequently.

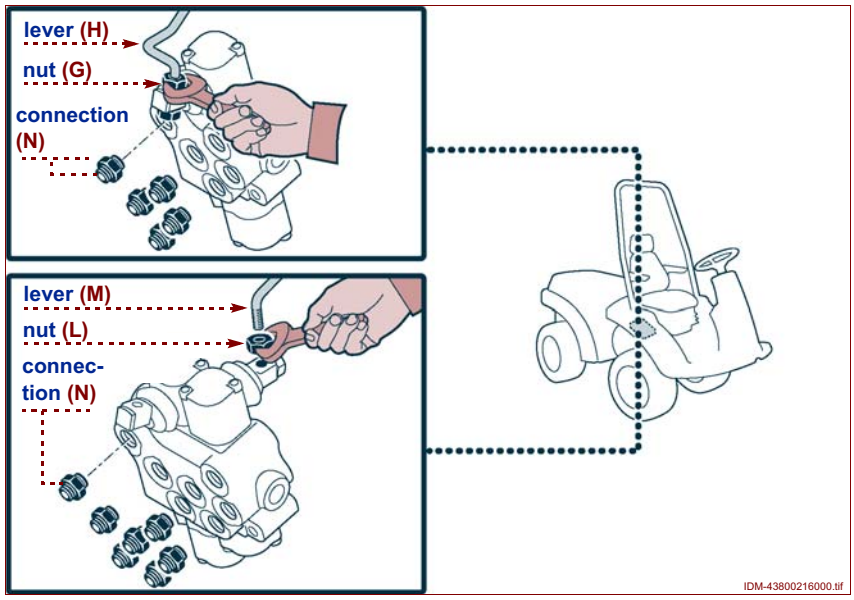
3 - Remove the knob **(C)** of the lift control lever.
4 - If the control valve has two levers, remove the second knob **(D)** also.



5 - Undo the bolts **(E)** and remove the control valve.
6 - Uncouple the rod **(F)** of the PTO safety device.



7 - Unscrew the nut and lock nut **(G)**, and detach the lift control lever **(H)**.
8 - If the control valve has two levers, unscrew the nut **(L)** and remove the second lever **(M)**.
9 - Unscrew the fittings **(N)** and detach from the valve body.

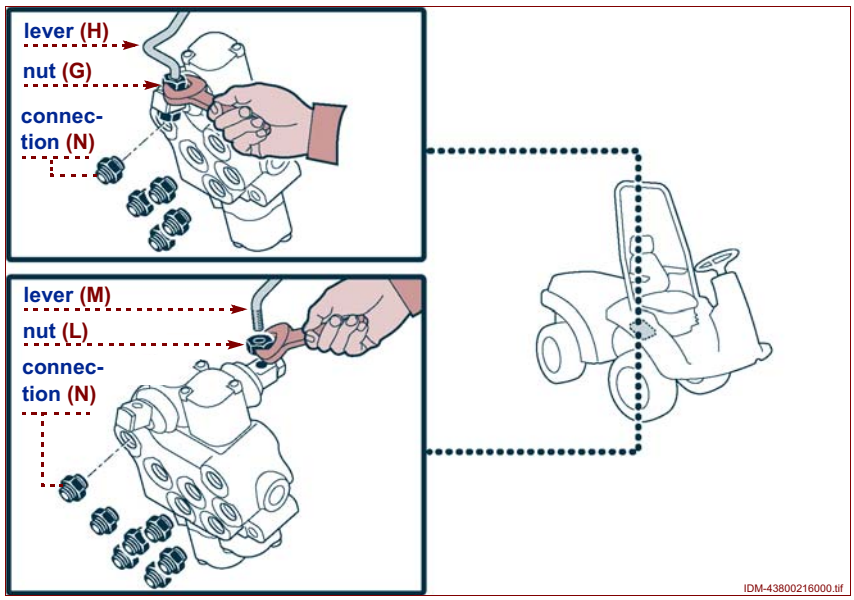


Refitting the control valve

Important!

When fastening nuts and bolts, apply the tightening torques indicated in the table (see *chap 01 - 10*).

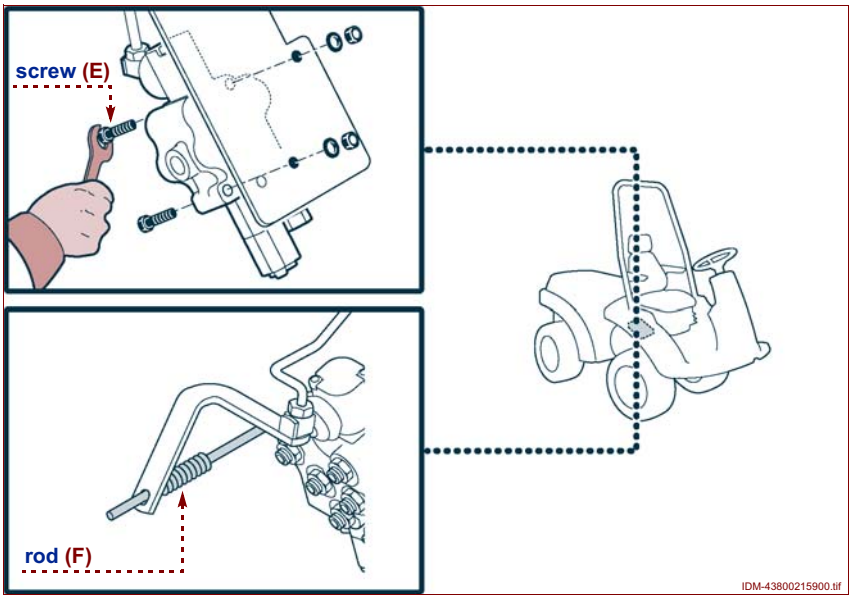
Proceed as follows.
1 - Attach the fittings **(N)** to the control valve.
2 - Fit the lift control lever **(H)** and secure with the nut and lock nut **(G)**.
3 - If the control valve has two levers, fit the second lever **(M)** and secure with the nut **(L)**.



IDM-C943800201.fm

9.1

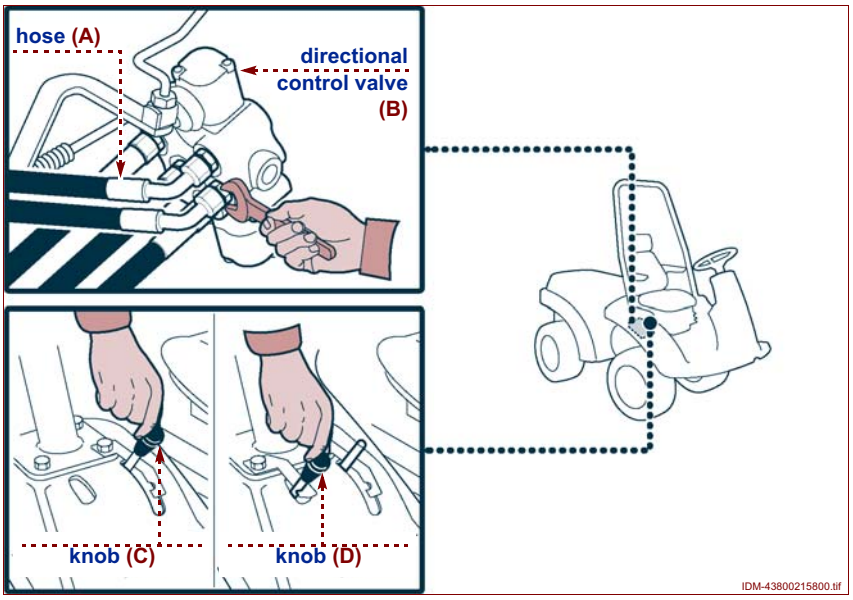
4 - Couple the rod **(F)** of the PTO safety device.
5 - Fit the control valve and secure with the bolts **(E)**.



6 - Fit the knob **(C)** of the lift control lever.
7 - If the control valve has two levers, fit the second knob **(D)**.
8 - Reconnect the oil lines **(A)** to the control valve **(B)**, and with everything in place, make certain there are no leaks.

Important!

If the machine is equipped with hose guards, these must be refitted after reconnecting the hoses.



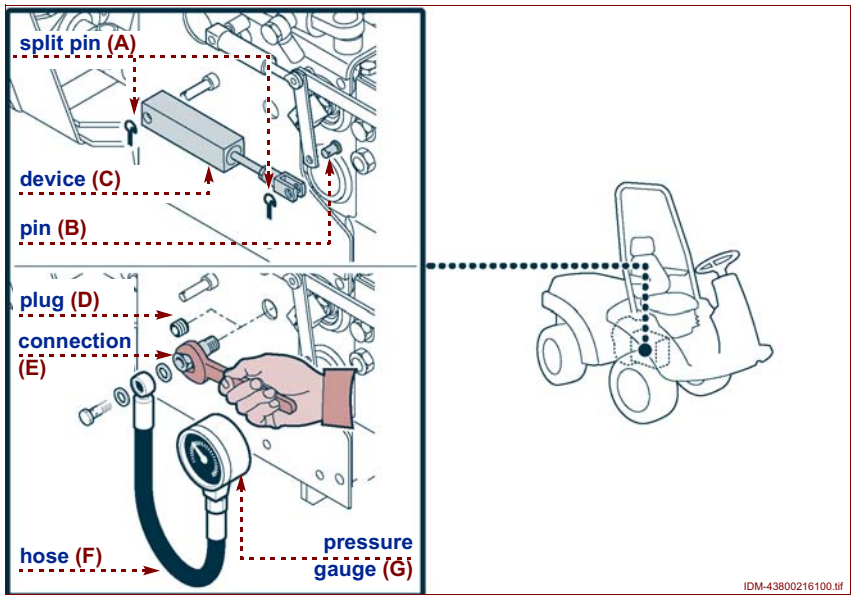
IDM-C943800201.fm

9.1

Checking the hydrostatic transmission relief pressure setting

Begin the operation with the engine off, proceeding as follows.

1 - Disassemble the split pins **(A)** and the relative pivots **(B)**, and remove the adjuster **(C)**.
2 - Position a vessel under the work area to catch any oil that may spill.
3 - Unscrew the plug **(D)** and screw in the fitting **(E)** of the pressure testing kit (AT 37981859).
4 - Connect the hose **(F)** of the kit (AT 37981859) to the gauge **(G)** (AT37981330) and to the fitting **(E)**.
5 - Select neutral, start the engine and throttle up to maximum rpm.
6 - Depress the drive pedal and check that the pressure gauge registers 300 bar.



Important!

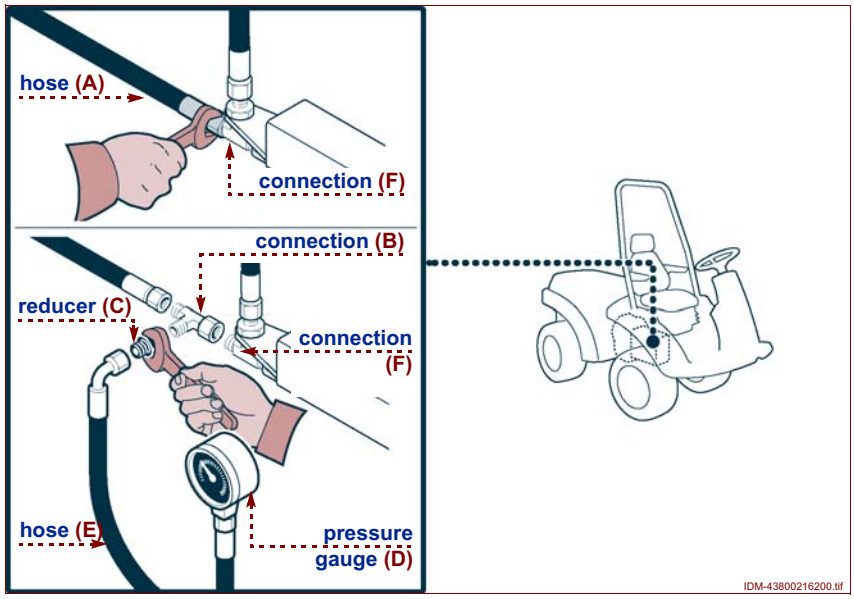
If the value fails to register, locate the cause of the fault and take the appropriate action.

7 - Stop the engine, disconnect the hose **(F)** and unscrew the fitting **(E)**.
8 - Screw in the plug **(D)**, refit the adjuster **(C)**, and with everything in place, make certain there are no leaks.

Checking the hydrostatic transmission inlet pressure

Begin the operation with the engine off, proceeding as follows.

1 - Position a vessel under the work area to catch any oil that may spill.
2 - Disconnect the oil line **(A)**, then screw the Tee **(B)** and reducer **(C)** of the kit (AT 37981859) to the fitting **(F)**.
3 - Connect the oil line **(A)** to the Tee **(B)**.
4 - Connect the hose **(E)** of the kit (AT 37981859) to the gauge **(D)** (AT37981769) and to the Tee **(B)**.
5 - Start the engine, throttle to 1000 rpm and check that the pressure gauge registers 12-13 bar.
6 - Throttle up to 2600 rpm and check that the gauge registers 15-16 bar.



Important!

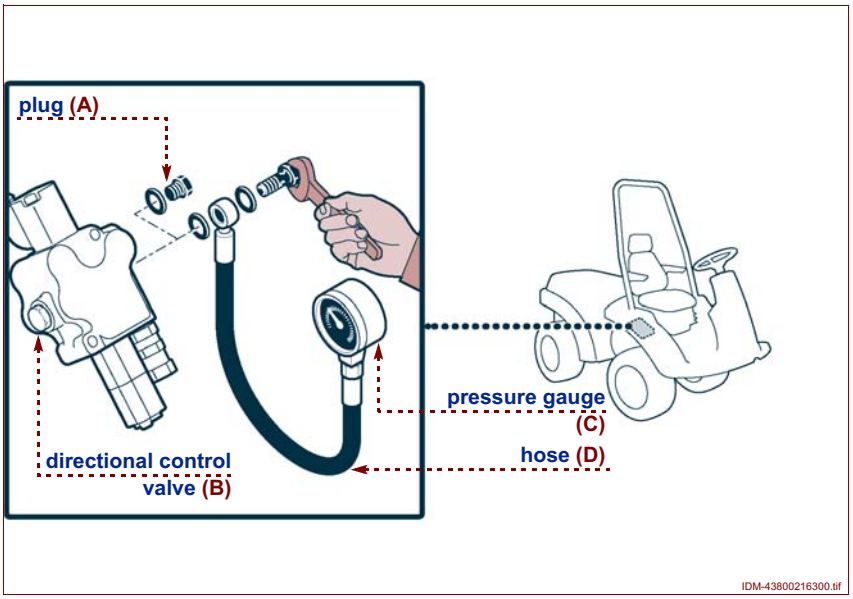
If these values fail to register, locate the cause of the fault and take the appropriate action.

7 - Stop the engine and disconnect the hoses **(A - E)**
8 - Remove the Tee **(B)** and reconnect the oil line **(A)** to the fitting **(F)**.

Checking the directional control valve relief pressure setting

Begin the operation with the engine off, proceeding as follows.

1 - Position a vessel under the work area to catch any oil that may spill.
2 - Unscrew the plug **(A)** from the body of the control valve **(B)**.
3 - Connect the hose **(D)** of the kit (AT 37981859) to the gauge **(C)** (AT37981758) and to the valve **(B)**.
4 - Start the engine and throttle to 1600 rpm.
5 - Operate the lift control lever and check that the pressure gauge registers 140 bar.



Important!

If the pressure registering on the gauge is not as prescribed, adjust the setting (see "Adjusting the control valve relief pressure setting").

6 - Stop the engine, disconnect the hose **(D)**, refit the plug **(A)** and make certain there are no leaks.

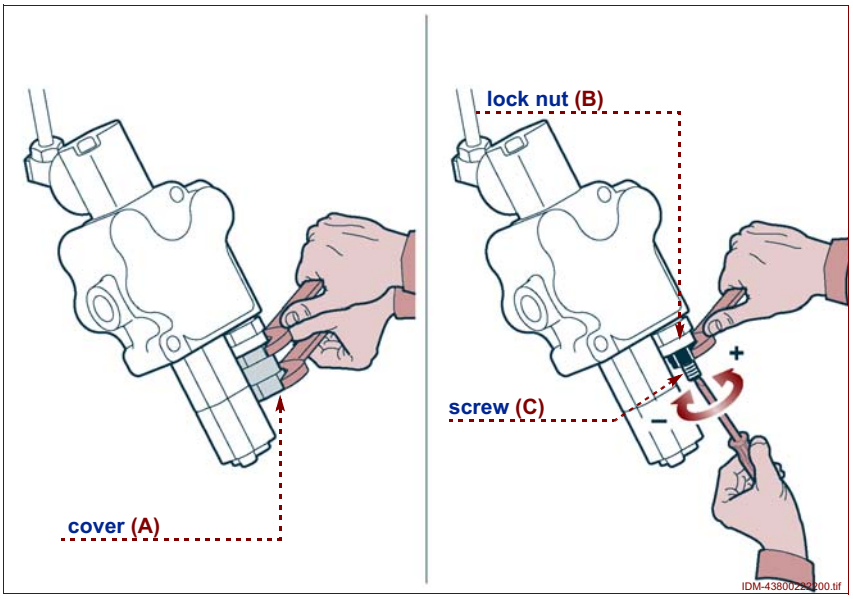
Adjusting the control valve relief pressure setting

1 - Remove the cover **(A)**.
2 - Loosen the lock nut **(B)** and turn the screw **(C)** to adjust the pressure setting.

Important!

Turning the screw (C) just a few degrees will produce a significant variation of the valve pressure setting.

3 - Adjust the valve setting so as to obtain a maximum circuit pressure of 140 bar with the engine running at 1600 rpm (see "Checking the directional control valve relief pressure setting").



Caution!

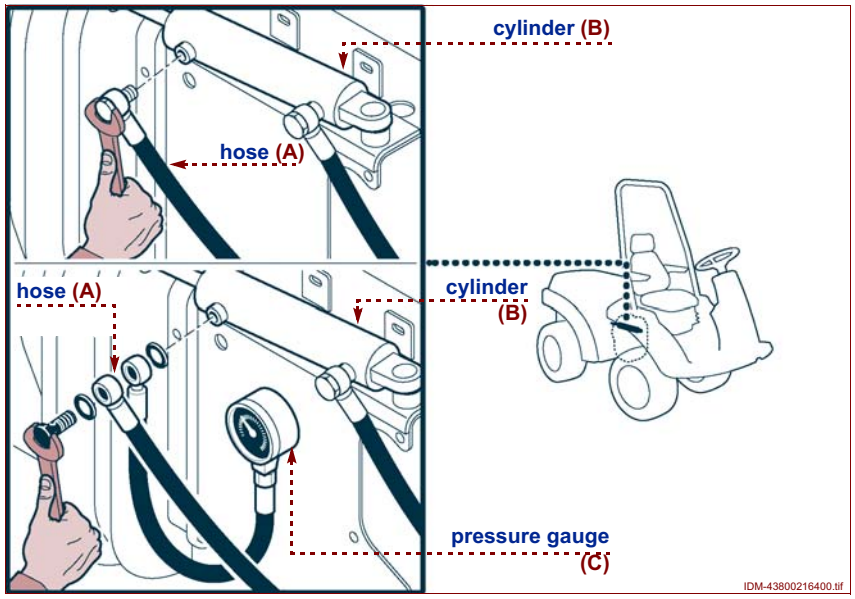
A valve setting that allows the circuit to pressurize beyond 140 bar may cause damage to the oil lines or to other components of the hydraulic system.

IDM-C943800201.fm

Checking the hydrostatic steering relief pressure setting

Begin the operation with the engine off, proceeding as follows.

1 - Position a vessel under the work area to catch any oil that may spill.
2 - Disconnect the oil line **(A)** from the steering cylinder **(B)**.
3 - Connect the hose **(D)** of the kit (AT 37981859) to the gauge **(C)** (AT 37981758) and to the cylinder **(B)**.
4 - Reconnect the oil line **(A)**.
5 - Start the engine and throttle to 1000 rpm.
6 - Turn the steering wheel with the torque gauge (AT 37981196), to the point of engaging full lock.
7 - Continue applying a torque of 180 Ncm using the torque gauge (AT 37981196) and check that the pressure gauge registers 140 bar.



Important!

If these values fail to register, locate the cause of the fault and take the appropriate action.

8 - Stop the engine, disconnect the test hose **(D)**, reconnect the oil line **(A)** and make certain there are no leaks.

IDM-C943800201.fm

ELECTRICAL SYSTEM 9.2

Technical specifications

Battery

Nominal voltage ..... 12 V
Rated capacity ..... 55 Ah
Discharge current..... 255 A

Starter motor

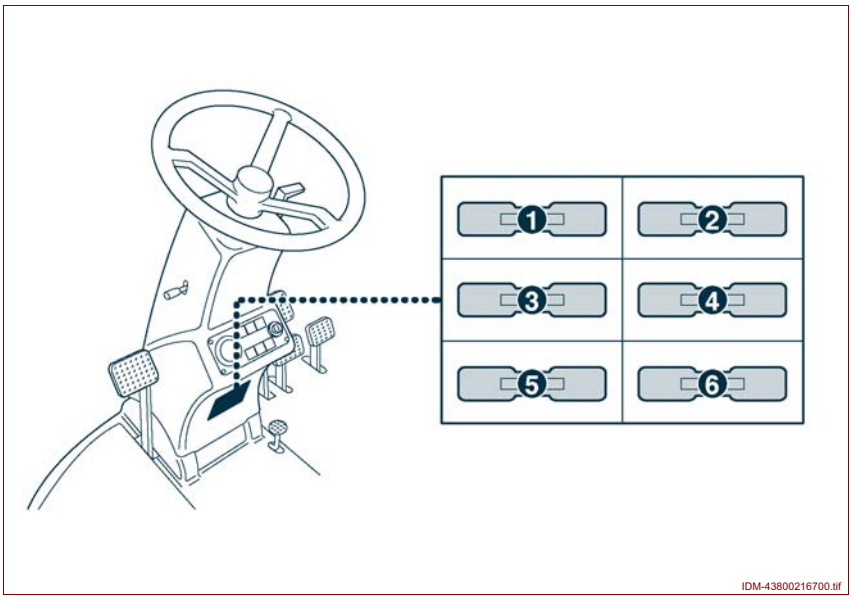
Voltage ..... 12 V
Rated power..... 1.2 kW
Activation.....Electromagnetic
Engagement.....Bendix gear and pinion

Alternator

Type .....Three-phase self-rectifying
Output voltage..... 12 V
Output current ..... 40 A
Voltage regulator ..... built-in, electronic
Main fuse..... 40 A

Fuses

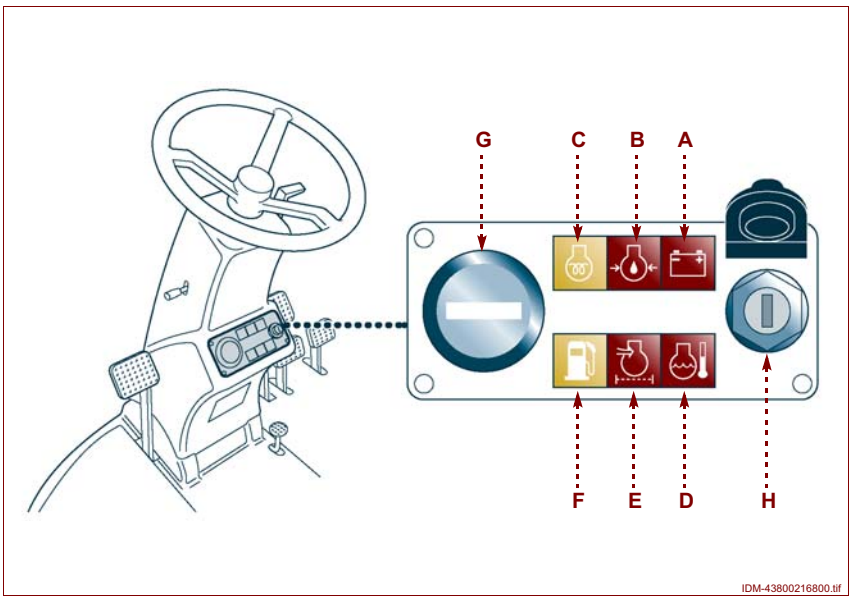
1) Warning indicators, one pin socket.....7.5 A
2) Alternator, glow plug control unit, solenoid on/off, hold .....10 A
3) Power supply to cab (optional) .....10 A
4) Brake lights (optional) .....15 A
5) Direction indicators (optional).....15 A
6) Hazard warning lights (optional)..... 15



IDM-43800216700.tif

Instrument panel

A) Battery charge
B) Engine oil pressure
C) Glow plugs
D) Engine coolant temperature
E) Air filter
F) Fuel level
G) Hourmeter
H) Starter switch
Pos. P - Panel light (key removable).
Pos. 0 - All auxiliary circuits off (key removable).
Pos. 1 - Enable starter circuit.
- Indicators and instruments operational.
- Auxiliary circuits on
Pos. 2 - Preheat combustion chamber (key returns automatically to pos. 1 when released).
Pos. 3 - Start engine (key returns automatically to pos. 1 when released).



IDM-43800216800.tif

IDM-C943800201.fm

Dashboard controls (optional)

All controls are enabled only when the starter switch is in position (1).

A) Direction indicators (green light). Lights up when indicators are on.

B) Main beam (blue light). Lights up when main headlight beam is on.

C) Sidelights (green light). Lights up when sidelights are on.

D) Emergency lights (red light). Switches on the emergency lights.

E) Column stalk

Pos. **E0** – Lights off.
Pos. **E1** – Sidelights on.
Pos. **E2** – Dipped headlight beam on.
Pos. **E3** – Rx direction indicators on.
Pos. **E4** – Lx direction indicators on.
Pos. **E5** – Main beam flash.
Pos. **E6** – Main headlight beam on.
Pos. **E7** – Horn.

F) Fuse box: houses the fuses protecting the electrical system.

G) Fuse (10 A): protection of horn circuit.

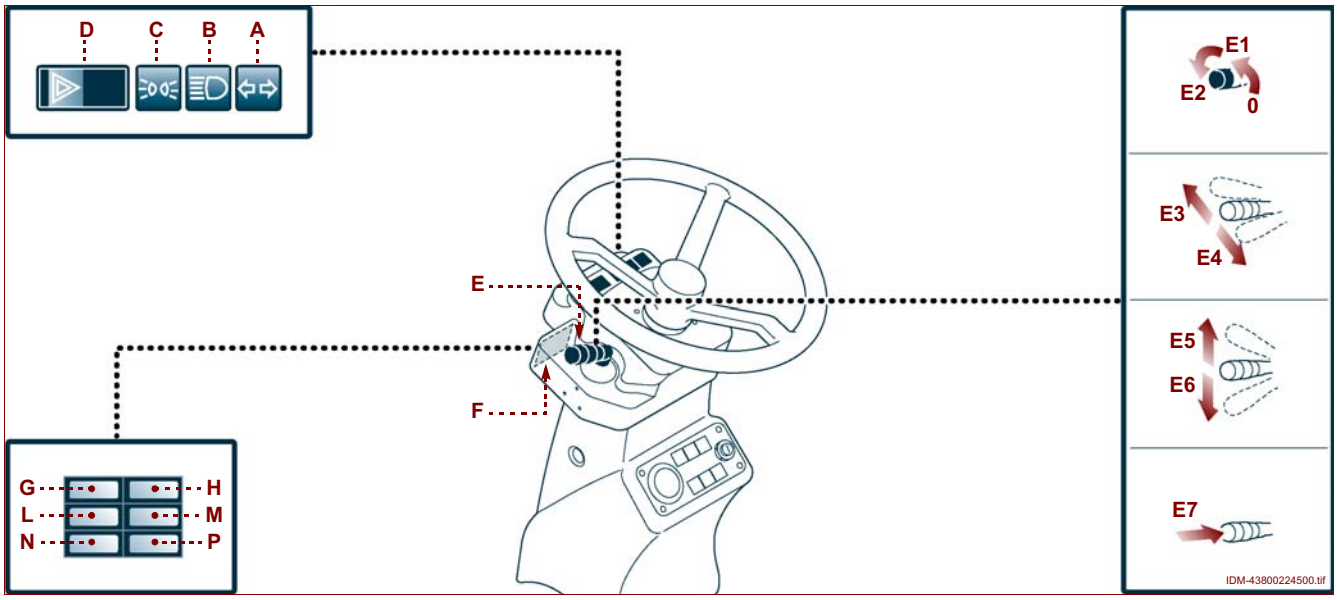
H) Fuse (7,5 A): protection of front Rx side, rear Lx tail, licence plate and indicator lights circuit.

L) Fuse (7,5 A): protection of front Lx side and rear Rx tail lights circuit.

M) Fuse (7,5 A): protection of Rx dipped beam circuit.

N) Fuse (7,5 A): protection of Lx dipped beam circuit.

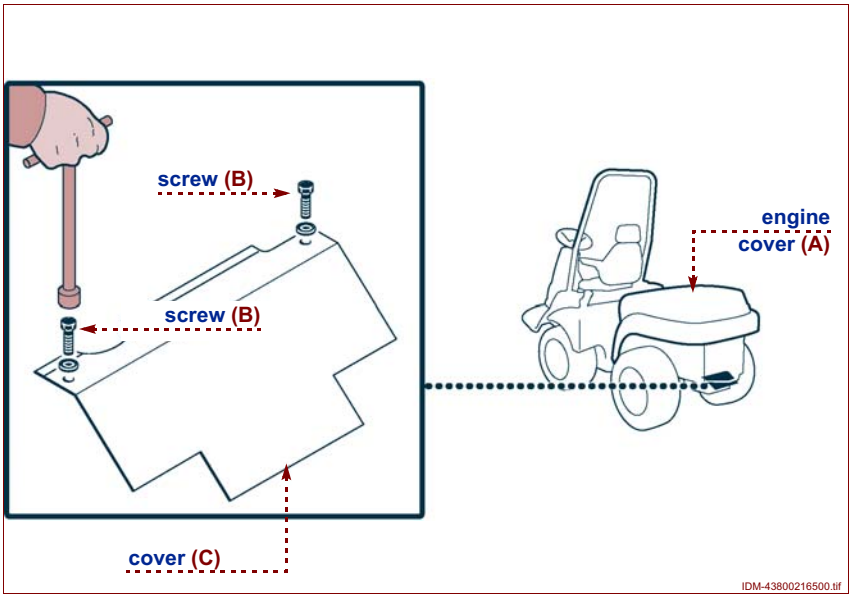
P) Fuse (10 A): protection of main beam circuit.



Removing the battery

Proceed as follows.

1 - Raise the engine hood **(A)**, undo the bolts **(B)** and detach the cover **(C)**.



IDM-C943800201.fm

2 - Undo the nuts **(D)** and detach the front panel **(E)**.
3 - Detach the terminals **(F)**.

Important!

Disconnect the negative terminal (-) first.

4 - Lift the battery **(G)** clear.

Installing the battery

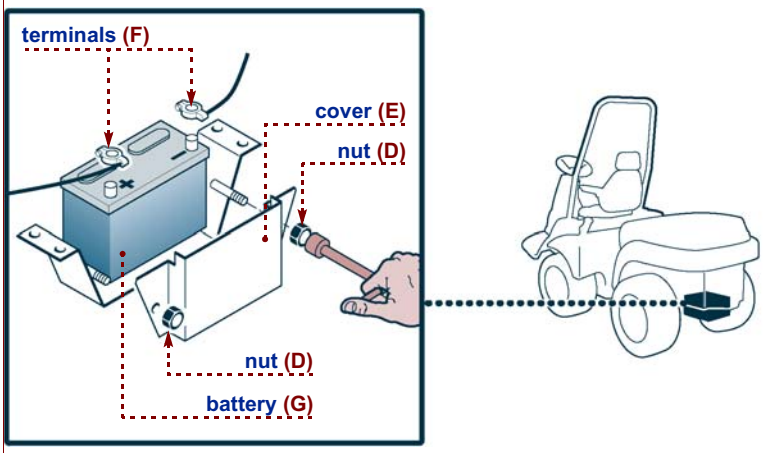
Proceed as follows.

1 - Position the battery **(G)** on the shelf.
2 - Connect the terminals **(F)**.

Important!

Be certain to match the polarity of the terminals and posts. Smear the positive terminal (+) with grease and connect first.

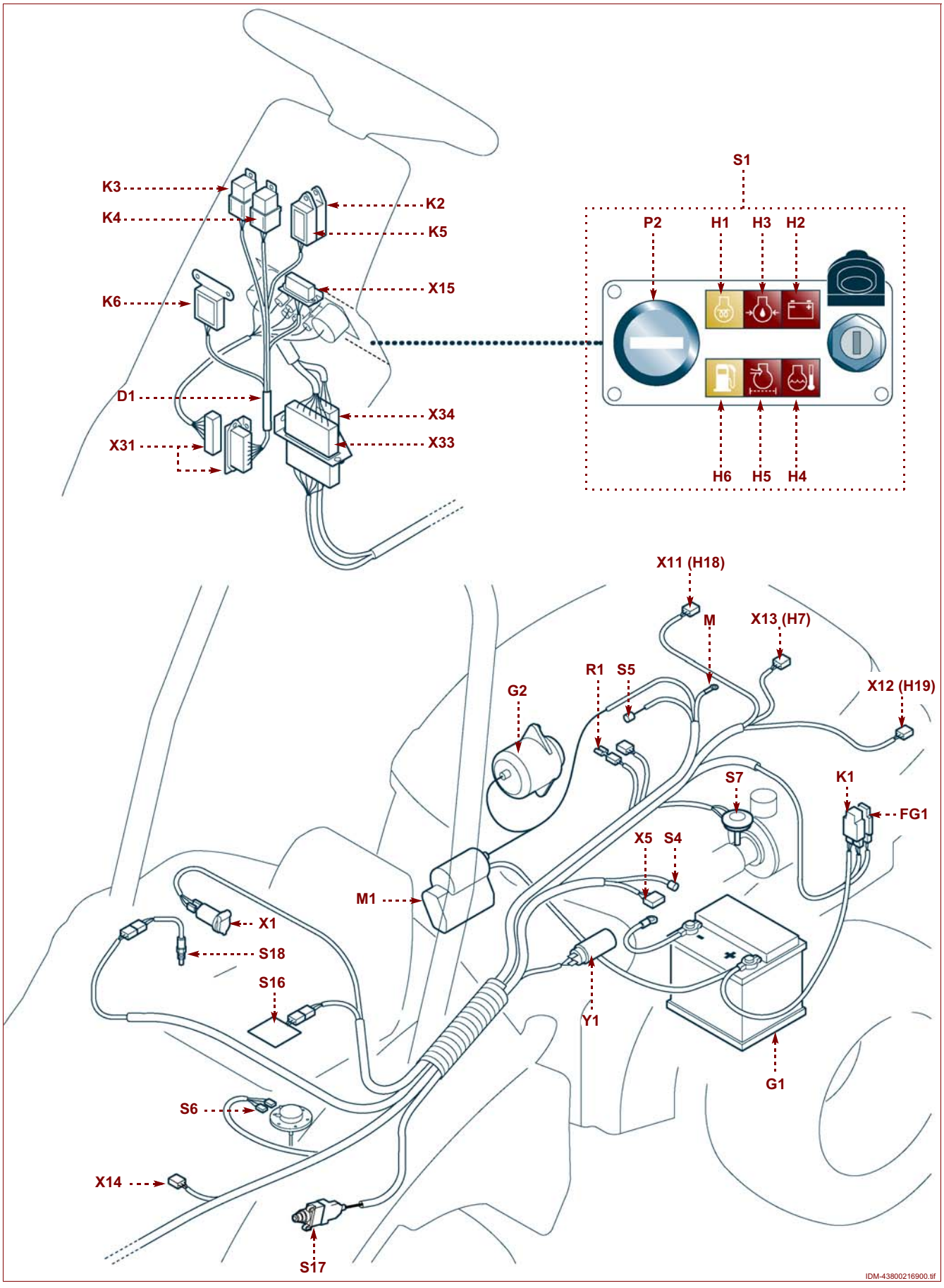
3 - Refit the front panel **(E)** and secure with the nuts **(D)**.
4 - Refit the cover **(C)**, secure with the bolts **(B)** and, when done, close the hood **(A)**.



IDM-43800216600.tif

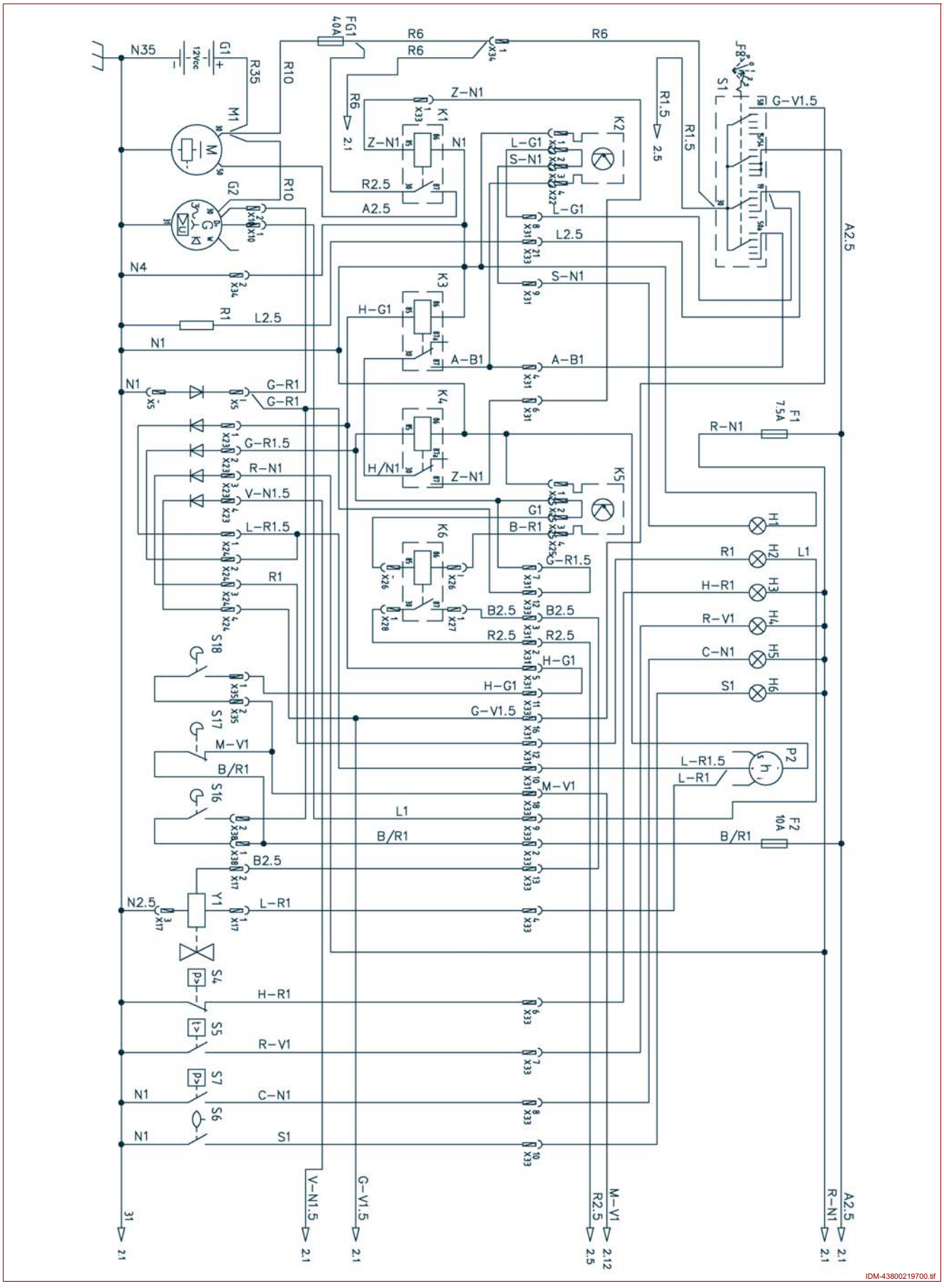
IDM-C943800201.fm

Electrical system layout (first version)



IDM-C943800201.fm

Electrical system diagram (1) (first version)



Electrical system parts table (first version)

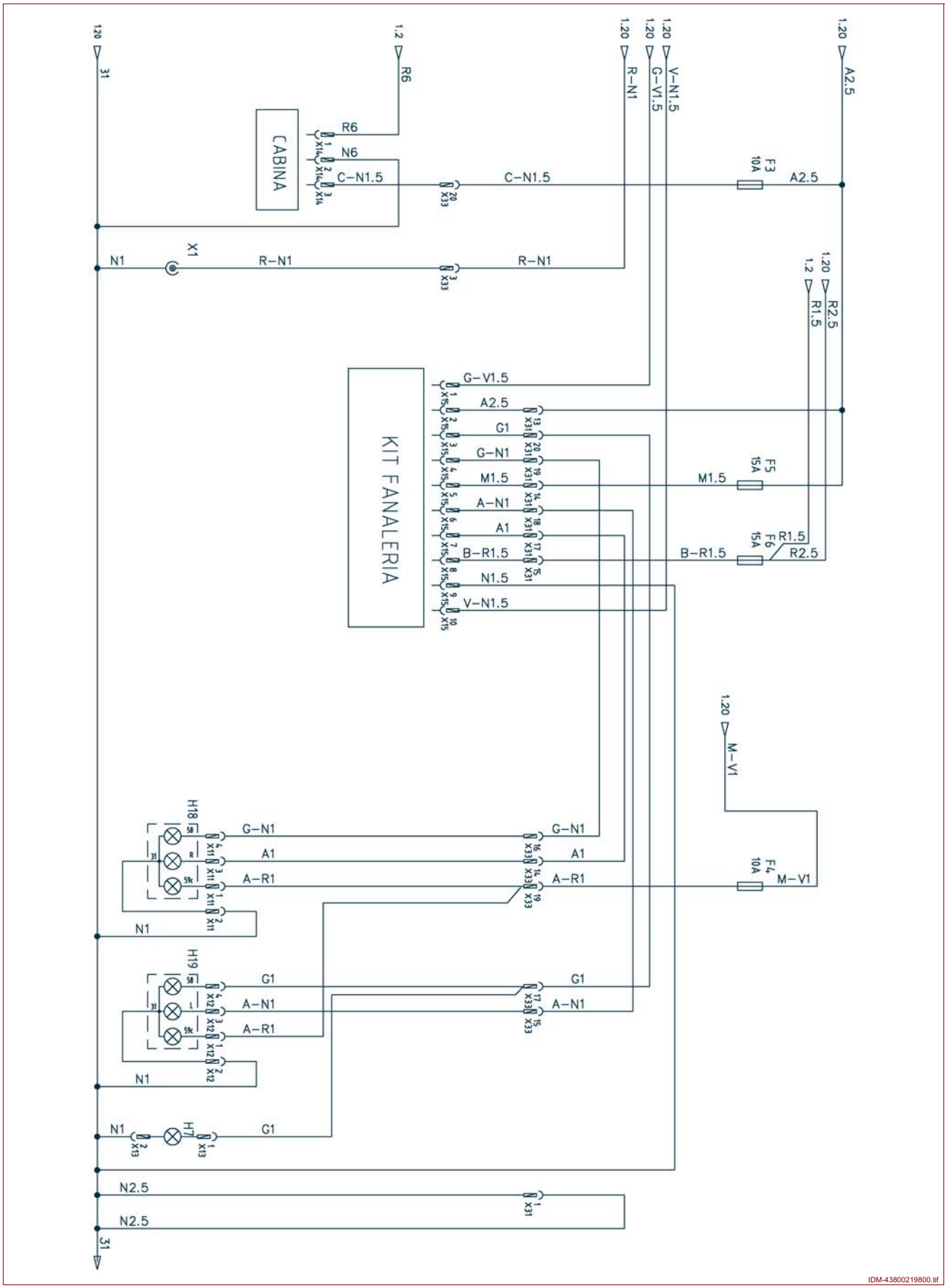
Name	Description
D1	BLOCKING DIODES
F1	7.5A FUSE, INDICATOR POWER SUPPLY, ONE PIN SOCKET
F2	10A FUSE, SEAT SWITCH, CONTROL UNIT
F3	10A FUSE, CAB
F4	10A FUSE, BRAKE LIGHTS
F5	15A FUSE, DIRECTION INDICATORS
F6	15A FUSE, HAZARD WARNING LIGHTS
FG1	40A MAIN FUSE
G1	BATTERY
G2	ALTERNATOR
H1	GLOW PLUGS INDICATOR
H18	RH REAR LIGHT
H19	LH REAR LIGHT
H2	ALTERNATOR INDICATOR
H3	ENGINE OIL PRESSURE INDICATOR
H4	ENGINE COOLANT TEMPERATURE INDICATOR
H5	AIR FILTER CLOGGING INDICATOR
H6	FUEL LEVEL INDICATOR
H7	NUMBER PLATE LIGHT
K1	STARTER RELAY
K2	GLOW PLUGS CONTROL UNIT
K3	PTO RELAY
K4	DRIVING SEAT RELAY
K5	FIELD COIL CONTROL UNIT
K6	FIELD COIL RELAY
M	EARTH
M1	STARTER MOTOR
P2	HOUR COUNTER
R1	GLOW PLUGS
S1	STARTING SWITCH BLOCK
S16	DRIVING SEAT SWITCH
S17	BRAKE LIGHT SWITCH
S18	PTO SWITCH
S4	PRESSURE SWITCH, LOW ENGINE OIL PRESSURE
S5	THERMOSTAT, ENGINE COOLANT HIGH TEMPERATURE
S6	FUEL RESERVE
S7	PRESSURE SWITCH, AIR FILTER CLOGGED
X1	POWER SOCKET
Y1	“EV1” SOLENOID VALVE, ENGINE FUEL CUTOFF
X10	3 WAY CONNECTOR
X11	4 WAY CONNECTOR - DEUTSCH
X12	4 WAY CONNECTOR - DEUTSCH
X13	2 WAY CONNECTOR - DEUTSCH
X14	3 WAY CONNECTOR
X15	11 WAY CONNECTOR - MARK
X17	3 WAY CONNECTOR
X22	4 WAY CONNECTOR
X23	4 WAY CONNECTOR
X24	4 WAY CONNECTOR
X25	4 WAY CONNECTOR
X26	2 WAY CONNECTOR - 90°
X27	1 WAY CONNECTOR
X28	1 WAY CONNECTOR
X31	21 WAY CONNECTOR - MARK
X33	21 WAY CONNECTOR - MARK
X34	4 WAY MAXI-CONNECTOR
X35	2 WAY CONNECTOR - DEUTSCH
X38	2 WAY CONNECTOR - DEUTSCH
X5	2 WAY CONNECTOR - 90°

Wire colours	
A	LIGHT BLUE
B	WHITE
C	ORANGE
G	YELLOW
H	GREY
L	DARK BLUE
M	BROWN
N	BLACK
R	RED
S	PINK
V	GREEN
Z	PURPLE

Note: The same colour codes are used to identify two-colour wires, for example:
G/V = YELLOW/GREEN (cross stripes)
G-V = YELLOW-GREEN (lengthwise stripes)

IDM-C943800201.fm

Electrical system diagram (2) (first version)



IDM-43800219800.tif

IDM-C943800201.fm

Electrical system parts table

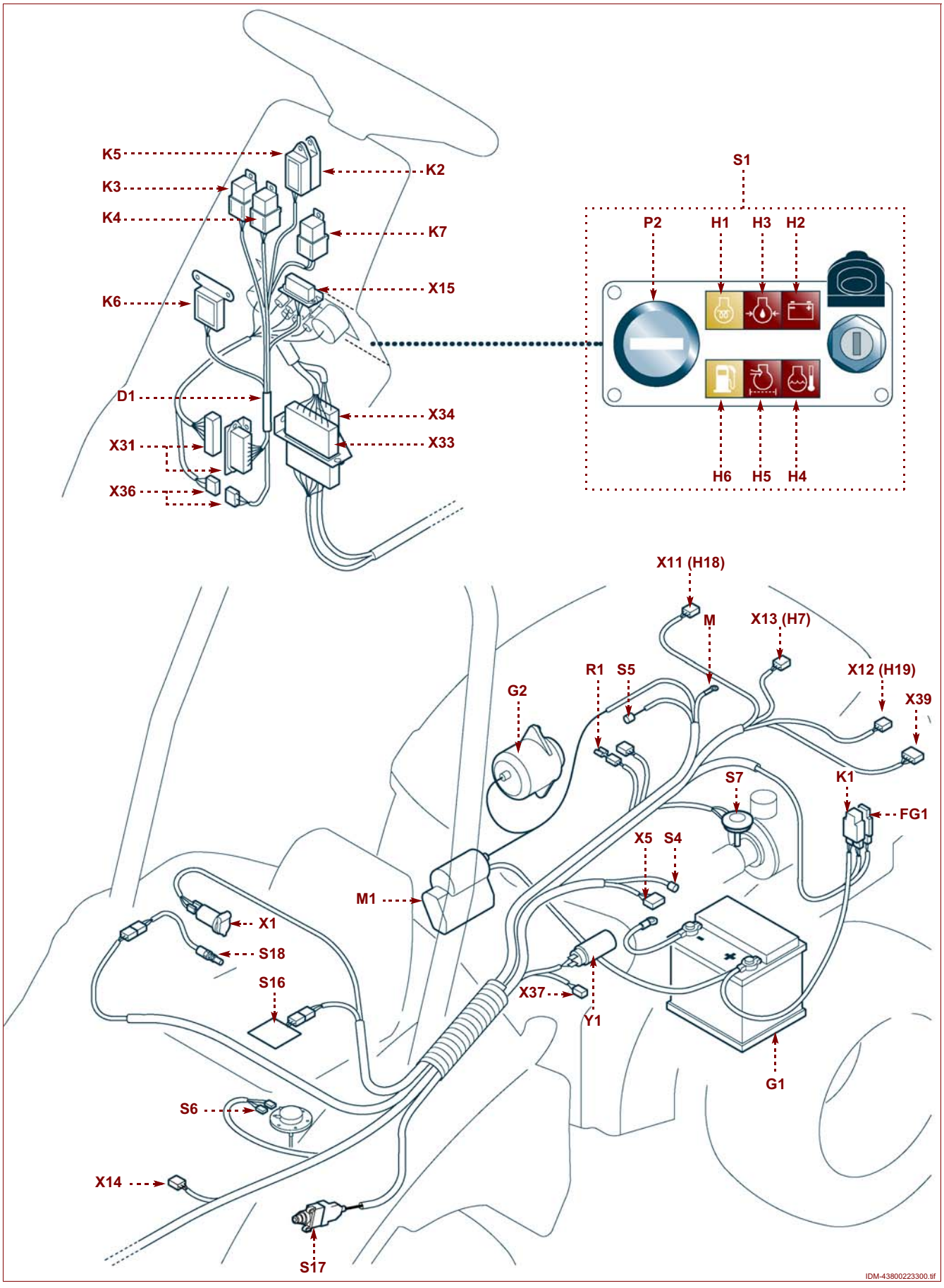
Name	Description
D1	BLOCKING DIODES
F1	7.5A FUSE, INDICATOR POWER SUPPLY, ONE PIN SOCKET
F2	10A FUSE, SEAT SWITCH, CONTROL UNIT
F3	10A FUSE, CAB
F4	10A FUSE, BRAKE LIGHTS
F5	15A FUSE, DIRECTION INDICATORS
F6	15A FUSE, HAZARD WARNING LIGHTS
FG1	40A MAIN FUSE
G1	BATTERY
G2	ALTERNATOR
H1	GLOW PLUGS INDICATOR
H18	RH REAR LIGHT
H19	LH REAR LIGHT
H2	ALTERNATOR INDICATOR
H3	ENGINE OIL PRESSURE INDICATOR
H4	ENGINE COOLANT TEMPERATURE INDICATOR
H5	AIR FILTER CLOGGING INDICATOR
H6	FUEL LEVEL INDICATOR
H7	NUMBER PLATE LIGHT
K1	STARTER RELAY
K2	GLOW PLUGS CONTROL UNIT
K3	PTO RELAY
K4	DRIVING SEAT RELAY
K5	FIELD COIL CONTROL UNIT
K6	FIELD COIL RELAY
M	EARTH
M1	STARTER MOTOR
P2	HOUR COUNTER
R1	GLOW PLUGS
S1	STARTING SWITCH BLOCK
S16	DRIVING SEAT SWITCH
S17	BRAKE LIGHT SWITCH
S18	PTO SWITCH
S4	PRESSURE SWITCH, LOW ENGINE OIL PRESSURE
S5	THERMOSTAT, ENGINE COOLANT HIGH TEMPERATURE
S6	FUEL RESERVE
S7	PRESSURE SWITCH, AIR FILTER CLOGGED
X1	POWER SOCKET
Y1	“EV1” SOLENOID VALVE, ENGINE FUEL CUTOFF
X10	3 WAY CONNECTOR
X11	4 WAY CONNECTOR - DEUTSCH
X12	4 WAY CONNECTOR - DEUTSCH
X13	2 WAY CONNECTOR - DEUTSCH
X14	3 WAY CONNECTOR
X15	11 WAY CONNECTOR - MARK
X17	3 WAY CONNECTOR
X22	4 WAY CONNECTOR
X23	4 WAY CONNECTOR
X24	4 WAY CONNECTOR
X25	4 WAY CONNECTOR
X26	2 WAY CONNECTOR - 90°
X27	1 WAY CONNECTOR
X28	1 WAY CONNECTOR
X31	21 WAY CONNECTOR - MARK
X33	21 WAY CONNECTOR - MARK
X34	4 WAY MAXI-CONNECTOR
X35	2 WAY CONNECTOR - DEUTSCH
X38	2 WAY CONNECTOR - DEUTSCH
X5	2 WAY CONNECTOR - 90°

Wire colours	
A	LIGHT BLUE
B	WHITE
C	ORANGE
G	YELLOW
H	GREY
L	DARK BLUE
M	BROWN
N	BLACK
R	RED
S	PINK
V	GREEN
Z	PURPLE

Note: The same colour codes are used to identify two-colour wires, for example:
G/V = YELLOW/GREEN (cross stripes)
G-V = YELLOW-GREEN (lengthwise stripes)

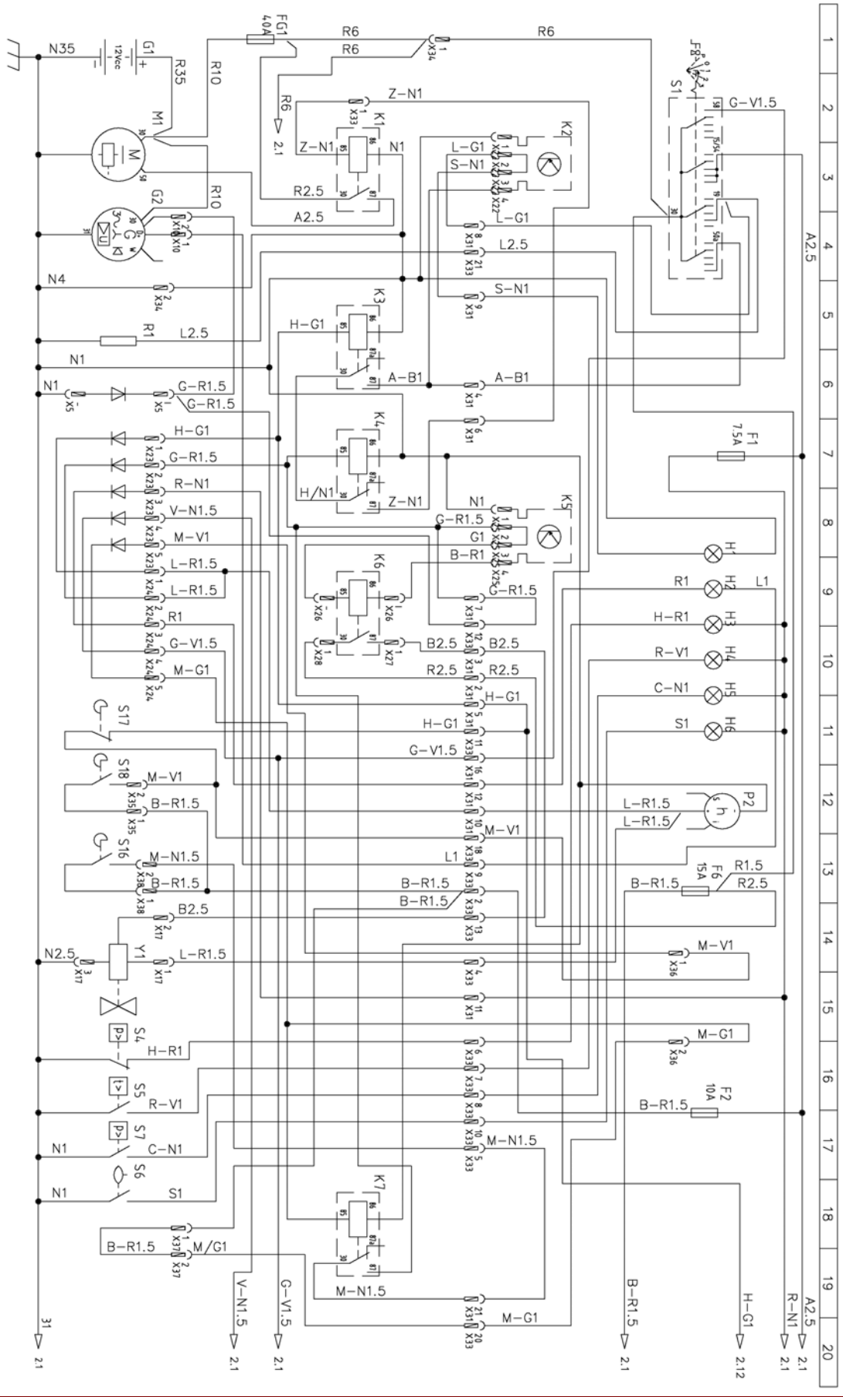
IDM-C943800201.fm

Electrical system layout (second version)



IDM-C943800201.fm

Electrical system diagram (1) (second version)



IDM-43800223400.tif

IDM-C943800201.fm

Electrical system parts table (second version)

Name	Description
F1	7.5A FUSE, PANEL INDICATORS
F2	TURN INDICATOR FUSE, 10A
F3	CAB FUSE, 10A
F4	STOP LAMP FUSE, 10A
F5	15A FUSE, HEADLIGHTS
F6	FUSE 4 INDICATORS 15 A
FG1	MAIN FUSE, 40A
G1	BATTERY
G2	ALTERNATOR
H1	GLOWPLUG FUNCTION INDICATOR
H18	RH REAR LIGHT
H19	LH REAR LIGHT
H2	ALTERNATOR FUNCTION INDICATOR
H3	OIL PRESSURE WARNING LIGHT
H4	ENGINE TEMPERATURE WARNING LIGHT
H5	AIR FILTER CLOGGING INDICATOR
H6	FUEL RESERVE INDICATOR
H7	NUMBER PLATE LIGHT
K1	STARTER RELAY
K2	GLOWPLUG CONTROL UNIT
K3	BRAKE RELAY
K4	DRIVING SEAT RELAY
K5	FIELD COIL CONTROL UNIT
K6	FIELD COIL RELAY
K7	HOPPER/PTO RELAY
M1	STARTER MOTOR
P2	HOUR COUNTER
R1	GLOWPLUGS
S1	STARTING SWITCH BLOCK
S16	DRIVING SEAT SWITCH
S17	BRAKE SWITCH
S18	PTO SWITCH
S4	PRESSURE SWITCH FOR LOW ENGINE OIL PRESSURE
S5	ENGINE COOLANT HIGH TEMPERATURE THERMOSTAT
S6	FUEL RESERVE
S7	AIR FILTER CLOGGED PRESSURE SWITCH
X1	POWER SOCKET

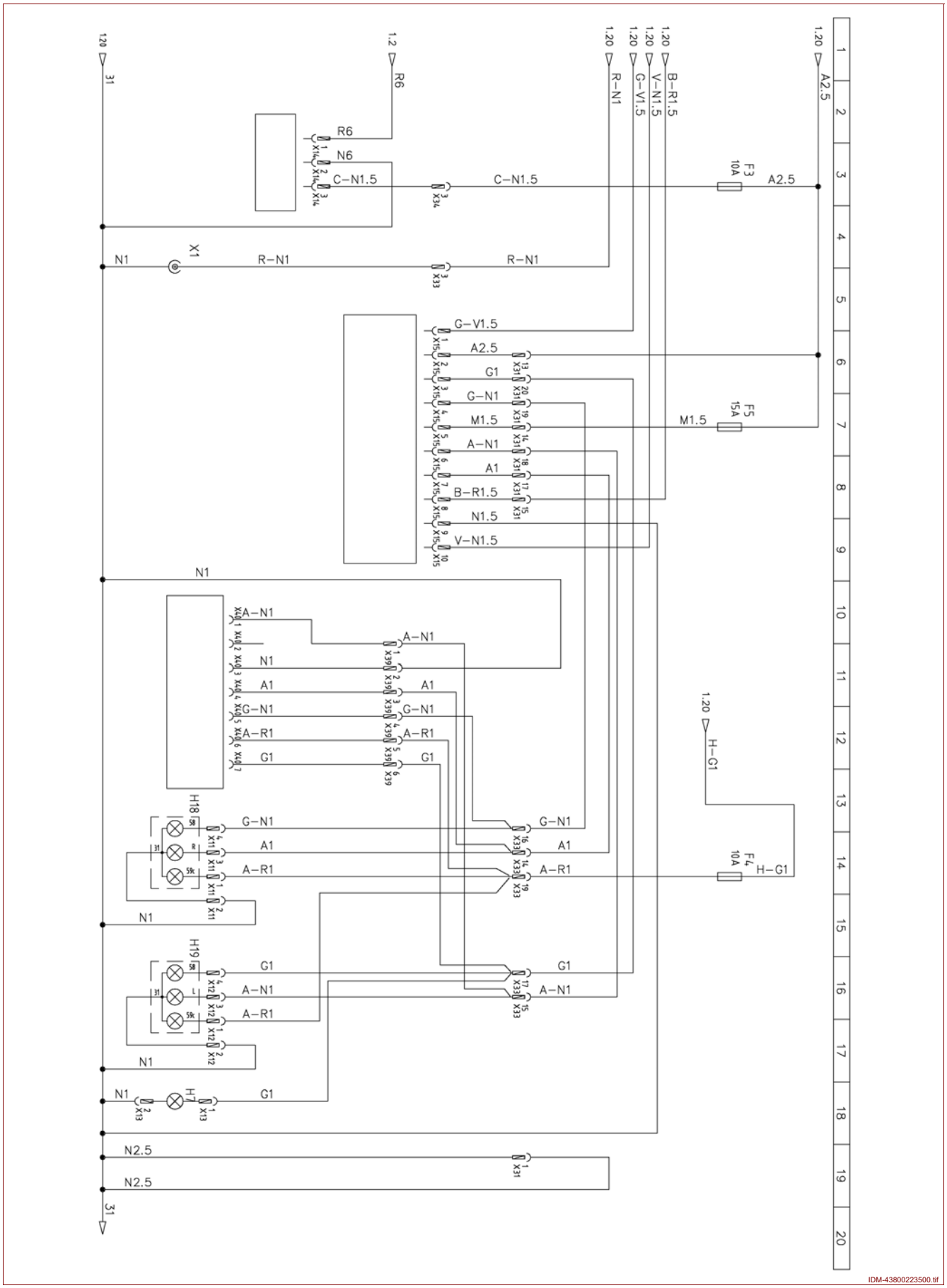
Name	Description
Y1	“EV1” ENGINE STOP SOLENOID VALVE
X10	3 WAY CONNECTOR
X11	4 WAY DEUTSCH CONNECTOR
X12	4 WAY DEUTSCH CONNECTOR
X13	2 WAY DEUTSCH CONNECTOR
X14	3 WAY CONNECTOR
X15	11 WAY MARK CONNECTOR
X17	3 WAY CONNECTOR
X22	4 WAY CONNECTOR
X23	6 WAY CONNECTOR
X24	6 WAY CONNECTOR
X25	4 WAY CONNECTOR
X26	90° 2 WAY CONNECTOR
X27	1 WAY CONNECTOR
X28	1 WAY CONNECTOR
X31	21 WAY MARK CONNECTOR
X33	21 WAY MARK CONNECTOR
X34	3 WAY CONNECTOR
X35	2 WAY CONNECTOR
X36	4 WAY CONNECTOR
X37	2 WAY CONNECTOR
X38	2 WAY CONNECTOR
X39	6 WAY DEUTSCH CONNECTOR
X40	7-PIN TRAILER CONNECTOR
X5	90° 2 WAY CONNECTOR

Wire colours	
A	LIGHT BLUE
B	WHITE
C	ORANGE
G	YELLOW
H	GREY
L	DARK BLUE
M	BROWN
N	BLACK
R	RED
S	PINK
V	GREEN
Z	PURPLE

Note: The same colour codes are used to identify two-colour wires, for example:
G/V = YELLOW/GREEN (cross stripes)
G-V = YELLOW-GREEN (lengthwise stripes)

IDM-C943800201.fm

Electrical system diagram (2) (second version)



Electrical system parts table (second version)

Name	Description
F1	7.5A FUSE, PANEL INDICATORS
F2	TURN INDICATOR FUSE, 10A
F3	CAB FUSE, 10A
F4	STOP LAMP FUSE, 10A
F5	15A FUSE, HEADLIGHTS
F6	FUSE 4 INDICATORS 15 A
FG1	MAIN FUSE, 40A
G1	BATTERY
G2	ALTERNATOR
H1	GLOWPLUG FUNCTION INDICATOR
H18	RH REAR LIGHT
H19	LH REAR LIGHT
H2	ALTERNATOR FUNCTION INDICATOR
H3	OIL PRESSURE WARNING LIGHT
H4	ENGINE TEMPERATURE WARNING LIGHT
H5	AIR FILTER CLOGGING INDICATOR
H6	FUEL RESERVE INDICATOR
H7	NUMBER PLATE LIGHT
K1	STARTER RELAY
K2	GLOWPLUG CONTROL UNIT
K3	BRAKE RELAY
K4	DRIVING SEAT RELAY
K5	FIELD COIL CONTROL UNIT
K6	FIELD COIL RELAY
K7	HOPPER/PTO RELAY
M1	STARTER MOTOR
P2	HOUR COUNTER
R1	GLOWPLUGS
S1	STARTING SWITCH BLOCK
S16	DRIVING SEAT SWITCH
S17	BRAKE SWITCH
S18	PTO SWITCH
S4	PRESSURE SWITCH FOR LOW ENGINE OIL PRESSURE
S5	ENGINE COOLANT HIGH TEMPERATURE THERMOSTAT
S6	FUEL RESERVE
S7	AIR FILTER CLOGGED PRESSURE SWITCH
X1	POWER SOCKET

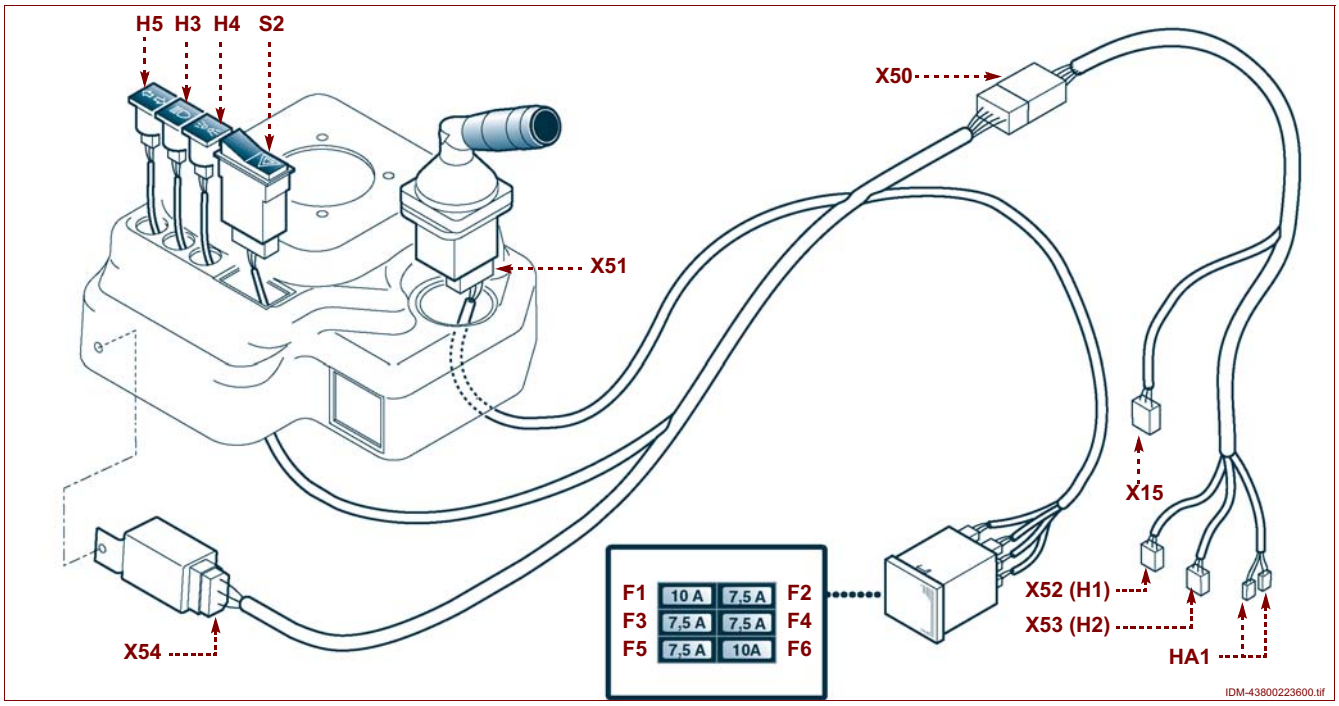
Name	Description
Y1	“EV1” ENGINE STOP SOLENOID VALVE
X10	3 WAY CONNECTOR
X11	4 WAY DEUTSCH CONNECTOR
X12	4 WAY DEUTSCH CONNECTOR
X13	2 WAY DEUTSCH CONNECTOR
X14	3 WAY CONNECTOR
X15	11 WAY MARK CONNECTOR
X17	3 WAY CONNECTOR
X22	4 WAY CONNECTOR
X23	6 WAY CONNECTOR
X24	6 WAY CONNECTOR
X25	4 WAY CONNECTOR
X26	90° 2 WAY CONNECTOR
X27	1 WAY CONNECTOR
X28	1 WAY CONNECTOR
X31	21 WAY MARK CONNECTOR
X33	21 WAY MARK CONNECTOR
X34	3 WAY CONNECTOR
X35	2 WAY CONNECTOR
X36	4 WAY CONNECTOR
X37	2 WAY CONNECTOR
X38	2 WAY CONNECTOR
X39	6 WAY DEUTSCH CONNECTOR
X40	7-PIN TRAILER CONNECTOR
X5	90° 2 WAY CONNECTOR

Wire colours	
A	LIGHT BLUE
B	WHITE
C	ORANGE
G	YELLOW
H	GREY
L	DARK BLUE
M	BROWN
N	BLACK
R	RED
S	PINK
V	GREEN
Z	PURPLE

Note: The same colour codes are used to identify two-colour wires, for example:
G/V = YELLOW/GREEN (cross stripes)
G-V = YELLOW-GREEN (lengthwise stripes)

IDM-C943800201.fm

Electrical system diagram - road lights kit



Electrical system parts - road lights kit

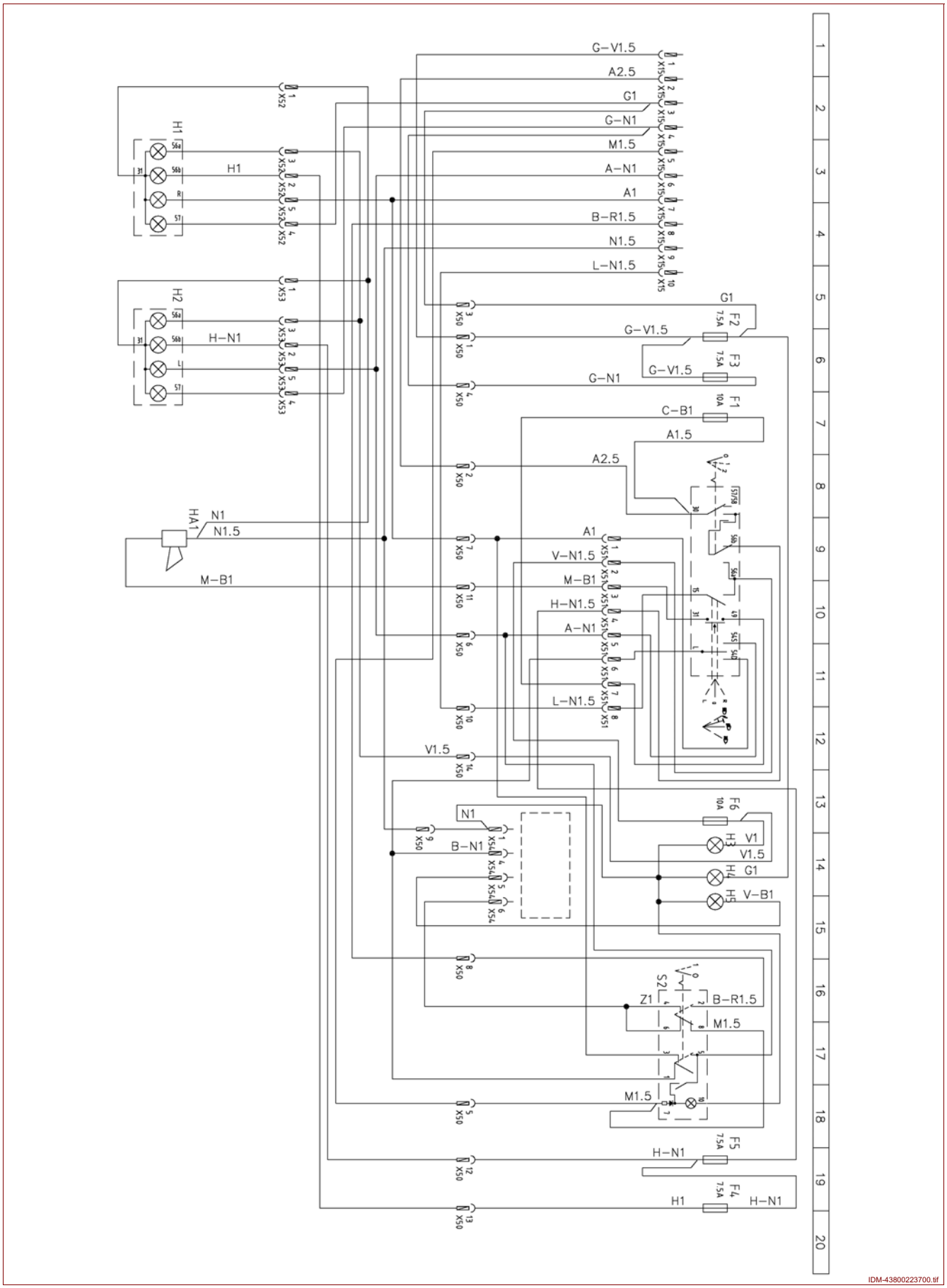
Name	*Description*
F1	10A FUSE, HORN
F2	7.5A FUSE, SIDE LIGHTS
F3	7.5A FUSE, SIDE LIGHTS, LICENCE PLATE LIGHT
F4	7.5A FUSE, RX DIPPED BEAM
F5	7.5A FUSE, LX DIPPED BEAM
F6	10A FUSE, MAIN BEAM
H1	RX HEADLIGHT
H2	LX HEADLIGHT
H3	MAIN BEAM INDICATOR
H4	SIDE LIGHTS INDICATOR
H5	DIRECTION FLASHER INDICATOR
HA1	HORN
S2	WARNING SWITCH
X15	11 WAY MARK CONNECTOR
X50	15-PIN MATE'N'LOCK
X51	8 WAY CONNECTOR
X52	6-PIN RX DEUTSCH CONNECTOR
X53	6-PIN LX DEUTSCH CONNECTOR
X54	6 WAY CONNECTOR

Wire colours	
A	LIGHT BLUE
B	WHITE
C	ORANGE
G	YELLOW
H	GREY
L	DARK BLUE
M	BROWN
N	BLACK
R	RED
S	PINK
V	GREEN
Z	PURPLE

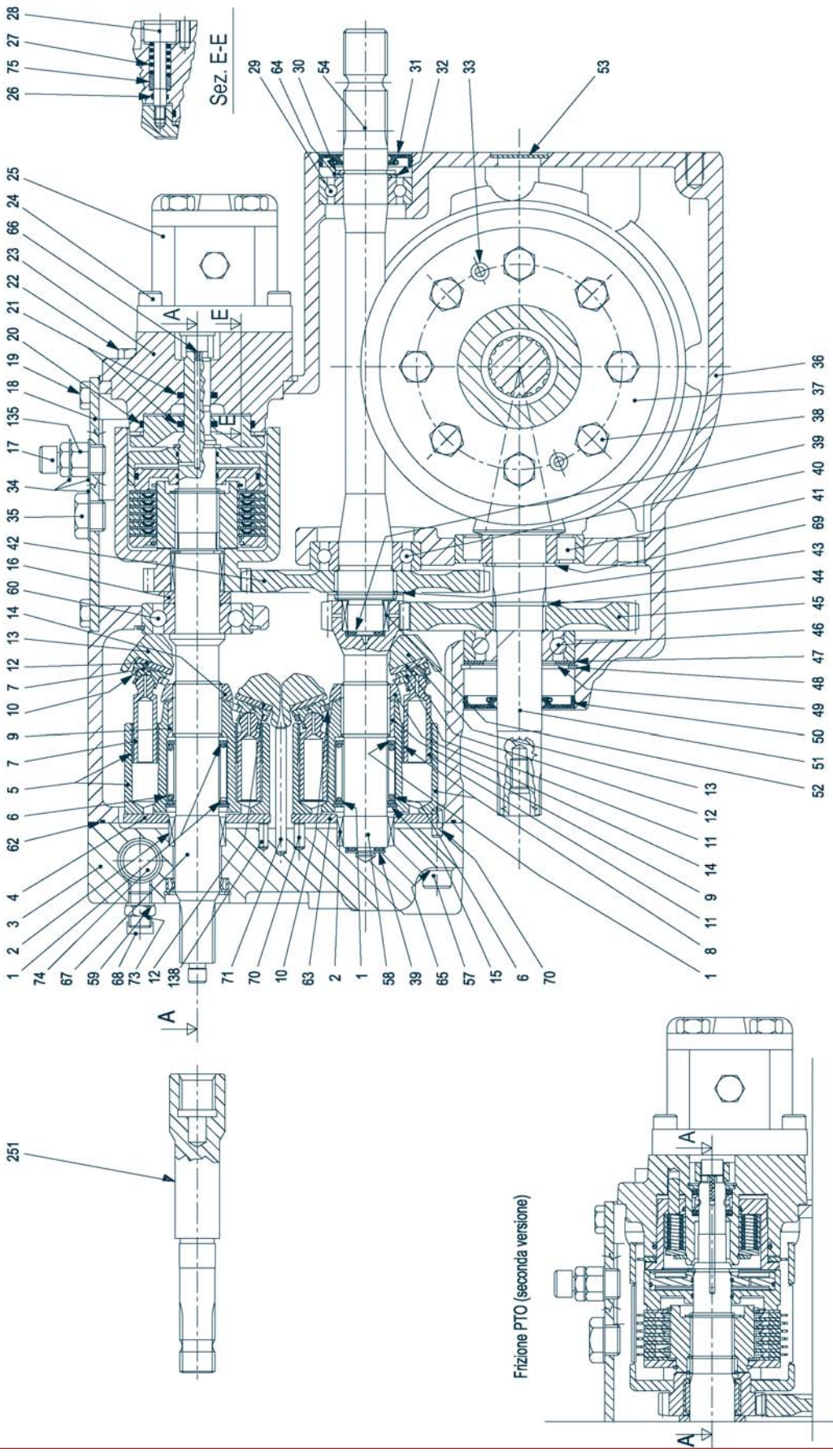
Note: The same colour codes are used to identify two-colour wires in the following way:
G/V = YELLOW/GREEN (cross stripes)
G-V = YELLOW-GREEN (lengthwise stripes)

IDM-C943800201.fm

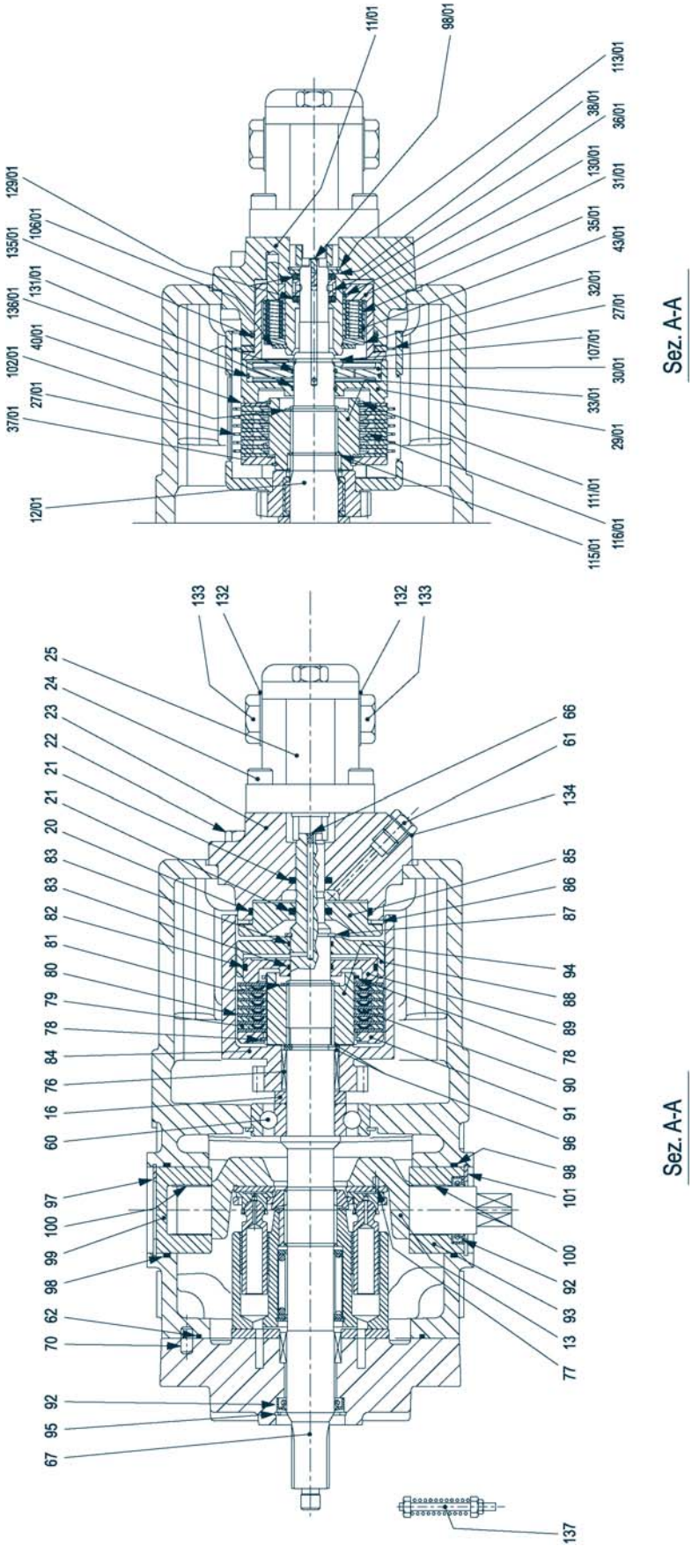
Electrical system diagram - road lights kit



Hydrostatic transmission



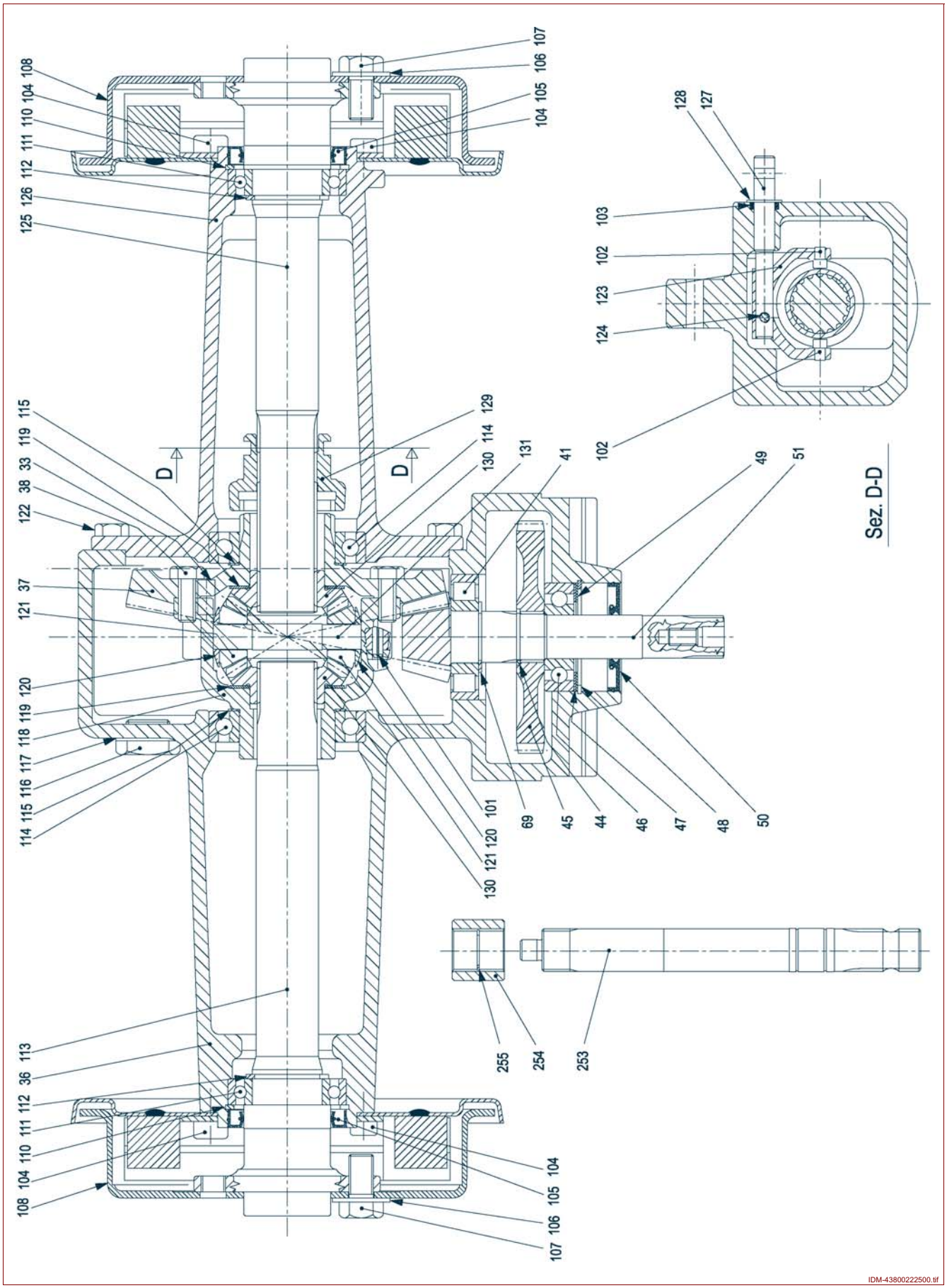
Hydrostatic transmission (PTO clutch)



IDM-43800222400.tif

IDM-CA43800201.fm

Front axle



Hydrostatic transmission parts

Pos.	Description
1	WASHER, CYLINDER BARREL
2	NEEDLE BEARING HK 2516
3	COVER
4	PUMP VALVE PLATE, 9 PISTONS
5	CYLINDER BARREL AND BUSHES D=13
6	SPRING, CYLINDER BARREL
7	PISTON-SHOE ASSEMBLY D=13
8	CYLINDER BARREL AND BUSHES D=15
9	NEEDLE 2.5x23.8
10	9-HOLE SHOE RETAINER
11	PISTON-SHOE ASSEMBLY D=15
12	ANTI-FRICTION WASHER
13	SWASH PLATE
14	BALLGUIDE
15	CIRCLIP UNI 7437
16	SPACER RING
17	PLUG, 3/8 BSP
18	TOP COVER
19	SCREW UNI 5739
20	O-RING 3231
21	SLIPPER RINGS 15x21.8
22	SCREW UNI5739 M8X25
23	COVER/PUMP FLANGE
24	SCREW UNI5931 M8X20
25	GEAR PUMP
26	O-RING 106
27	EXTERNAL SPRING
28	PLUNGER, PTO BRAKE
29	BALL BEARING 6205
30	CIRCLIP UNI 7436
31	OIL SEAL
32	SHIM
33	DOWEL 6x24 DIN 1481
34	WASHER 17X22X1.5
35	PLUG, 3/8 BSP
36	TRANSMISSION HOUSING
37	CROWN WHEEL Z39 M4.35
38	BOLT UNI 5739 M10x25 8.8
39	NEEDLE THRUST BEARING AX 10X22X2,8
40	BALL BEARING 6206
41	NEEDLE BEARING NUP 206 EC
42	SPUR GEAR Z53 M2.5
43	CIRCLIP UNI 7435
44	ABUTMENT RING RW30
45	SPUR GEAR Z52 M2.5
46	BALL BEARING 6305
47	SHIM 40.3X61.7X1
48	CIRCLIP UNI 7437
49	SHIM 40.3X61.7
50	OIL SEAL 25X62X7
51	FRONT PINIONSHAFT Z8 M4.75
52	NEEDLE BEARING K20X26X17

Pos.	Description
53	PLUG 32X2 UNI 1663
54	P.T.O. SHAFT
55	PLUG, 1/4”BSP DIN 908
56	SIGHT GLASS
57	SCREW M10x35 UNI5931
58	PINIONSHAFT Z17 M2.5
59	COPPER WASHER ¼”
60	BALL BEARING 6305 NR
61	PLUG, 1/8” BSP
62	O-RING 2.62x164.77 (2-165) 70SH
63	MOTOR VALVE PLATE
64	SHIM 25.2x34.8x1
65	WASHER, SCHNORR D.10
66	PLUG, HK 030-CK 55-111
67	INPUT SHAFT
68	PLUG, 3/8” BSP
69	ABUTMENT RING, SW30
70	DOWEL 6x14 UNI-EN 22338B
71	DOWEL 6x70 UNI 1707
72	DOWEL 5x14 UNI 1707
73	NIPPLE, 1/4”BSP x 1/4”BSP
74	SHOCK VALVE
75	SPACER, 7x13x14.9
76	NEEDLE BEARING, HK25x30x20
77	NEEDLE 6x8
78	ABUTMENT RING, SW 47
79	EXTERNAL CLUTCH DISC
80	INTERNAL CLUTCH DISC
81	ABUTMENT RING, SW30
82	O-RING, -3256
83	O-RING, -2081
84	COVER, CLUTCH HOUSING
85	PTO BRAKE PISTON
86	EXTERNAL FRICTION DISC
87	CIRCLIP UNI 7436
88	CLUTCH CYLINDER
89	CLUTCH PISTON
90	CIRCLIP 47.2x57.2
91	CLUTCH REACTION DISC
92	RING, 25x35x6/6.5
93	TOP BUSH
94	CLUTCH BUSH
95	CIRCLIP UNI 7437
96	ABUTMENT RING
97	CIRCLIP DIN 984
98	O-RING 2.62x44.12 (2-132) 70SH
99	BUSH
100	BUSH
101	TENSION PIN, DIN 7343
102	TRUNNION PIVOT
103	O-RING 115
104	BOLT UNI5931 M8x18 8.8

Pos.	Description
105	OIL SEAL 50X68X10
106	WASHER 15X42X2.5
107	BOLT UNI 5740 M14x25 10.9
108	DRUM BRAKE
109	
110	CIRCLIP UNI 7437
111	BALL BEARING 6008/C3
112	CIRCLIP UNI 7436
113	FRONT LH HALFSHAFT
114	BALL BEARING 6011
115	SHIM 55.3x67.7
116	PLUG, 3/4" BSP
117	ALUMINIUM WASHER 3/4" BSP
118	DIFFERENTIAL HOUSING
119	SUN GEAR THRUST WASHER
120	PLANET PINION THRUST PLATE
121	PLANET PINION Z10 M4.35
122	BOLT UNI 5739 M10X25
123	DIFFERENTIAL LOCK FORK
124	BOLT UNI5925 M6X10

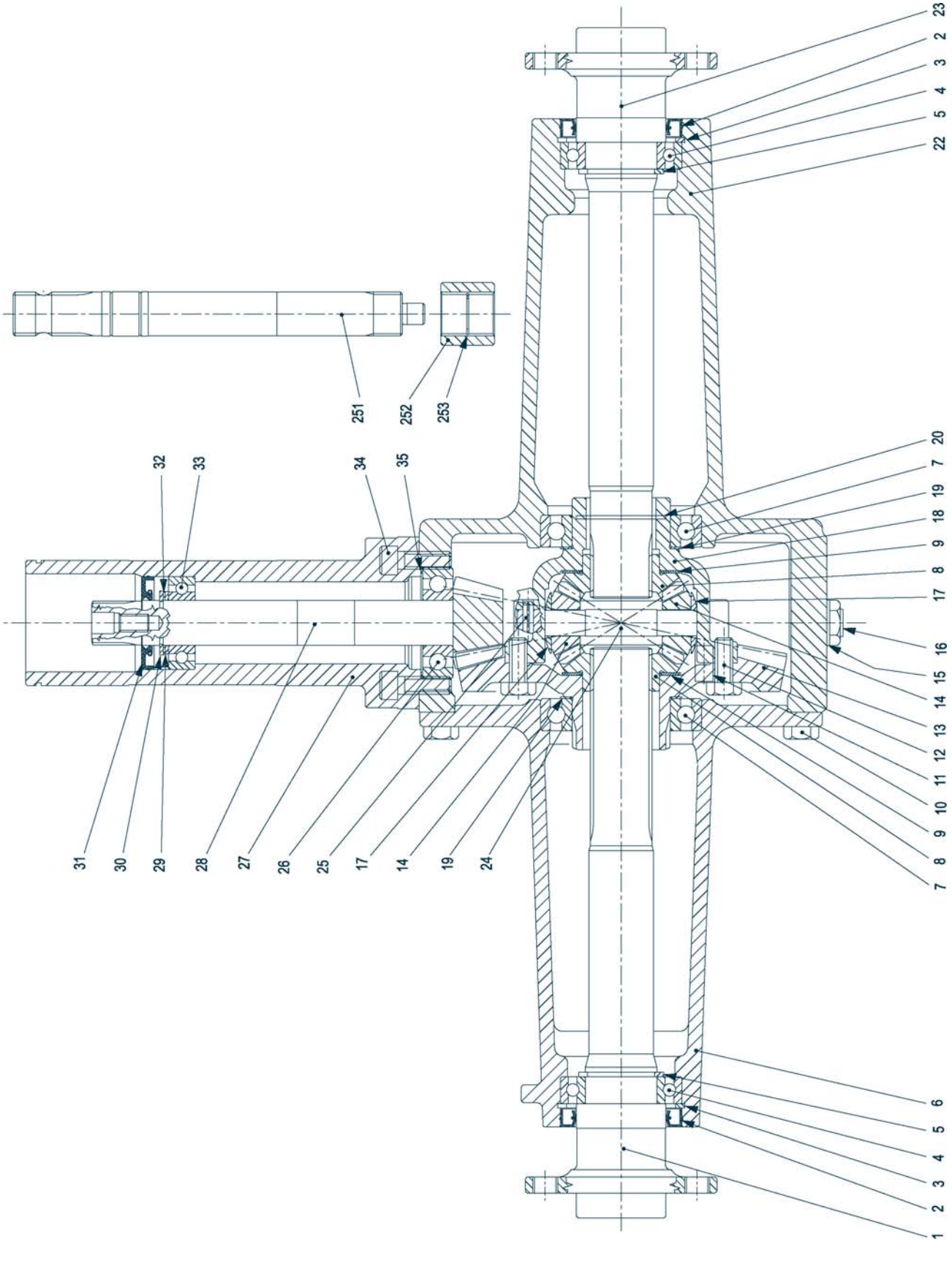
Pos.	Description
125	FRONT RH HALFSHAFT
126	FRONT RH TRUMPET HOUSING
127	DIFFERENTIAL LOCK ROD
128	ABUTMENT RING
129	DIFFERENTIAL LOCK COUPLER
130	SUN GEAR Z16 M4.35
131	CROSS PIN
132	WASHER 1/2 BSP
133	PLUG Al 1/2 BSP
134	WASHER 1/8 BSP
135	PLUG EXTENDER, 3/8 BSP
136	PLUG 1/8 BSP
137	INLET VALVE
138	DOWEL PIN 5x14
251	INPUT SHAFT
252	BOLT UNI 5740 M14X25
253	OUTPUT SHAFT
254	SLEEVE
255	CIRCLIP UNI 7437
256	CIRCLIP UNI 7437

Clutch parts, second version

Pos.	Description
11/01	COVER/PUMP FLANGE
12/01	INPUT SHAFT
27/01	OUTER FRICTION DISC
29/01	CLUTCH PISTON
30/01	CLUTCH CYLINDER
31/01	PTO BRAKE PISTON
32/01	BACKSTOP, PTO BRAKE SPRINGS
33/01	CLUTCH SLEEVE
35/01	SPRING, PTO BRAKE
36/01	INLET SPACER
37/01	REACTION DISC
38/01	COVER
40/01	INNER FRICTION DISC
43/01	DIVIDER, PTO BRAKE SPRINGS

Pos.	Description
98/01	PLUG
102/01	CIRCLIP 25 UNI 7435
106/01	CIRCLIP 30 UNI 7436
107/01	CIRCLIP 20 UNI 7436
111/01	ABUTMENT RING SW 47
113/01	ABUTMENT RING SB 26
115/01	ABUTMENT RING SW 24
116/01	CIRCLIP
129/01	SLIPPER RING 15x21.8
130/01	O-RING 2118
131/01	O-RING 2081
135/01	O-RING 3243
136/01	O-RING 2262

Rear axle

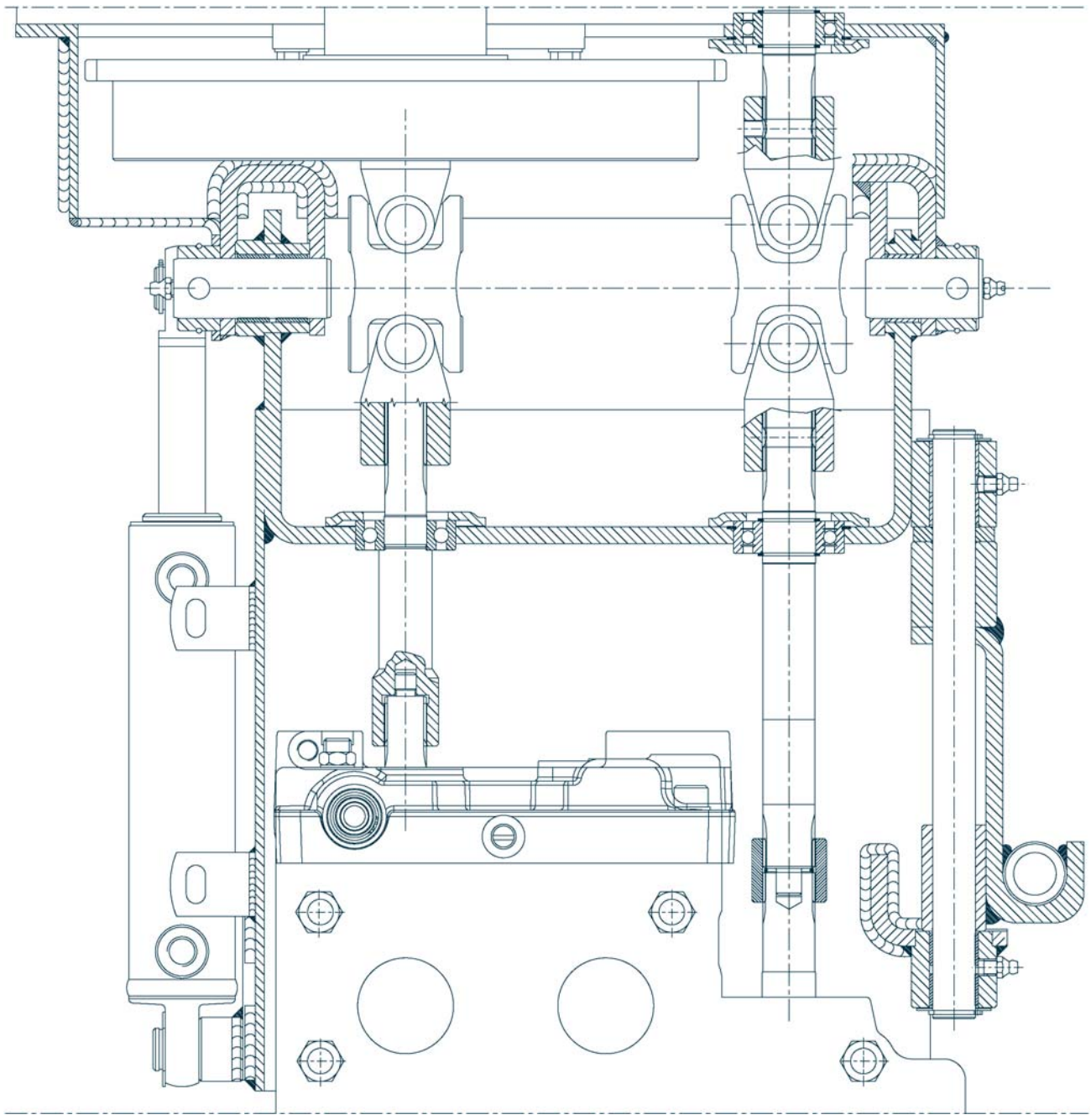


IDM-CA43800201.fm

Rear axle parts

Pos.	*Description*
1	LEFT HAND HALFSHAFT
2	OIL SEAL 50X68X10
3	CIRCLIP 68 UNI 7437
4	BALL BEARING 6008/C3
5	CIRCLIP 40 UNI 7436
6	LEFT HAND TRUMPET HOUSING
7	BALL BEARING 6011
8	DIFFERENTIAL SUN GEAR Z16 M4.35
9	SUN GEAR THRUST WASHER
10	BOLT UNI 5739 M10X25
11	DOWEL 6X24 DIN 1481
12	BOLT UNI 5739 M10x25
13	CROWN WHEEL Z39 M4.75
14	PLANET PINION Z10 M4.35
15	WASHER 17X22X1.5
16	SIGHT GLASS 3/8” BSP
17	THRUST PLATE
18	DIFFERENTIAL HOUSING
19	SHIM 55.3x67.7
20	DATA PLATE
21	TAPPO 3/8 BSP
22	RIGHT HAND TRUMPET HOUSING
23	RIGHT HAND HALFSHAFT
24	CROSS PIN
25	DOWEL 10X20 DIN 7343
26	BALL BEARING 6305 ETN 9/C3
27	REAR AXLE
28	PINIONSHAFT Z8 M4.75
29	SHIM 25.2X34.8X2
30	CIRCLIP 25 UNI 7436
31	OIL SEAL 25X52X7
32	SHIM 25.6x35.3
33	BALL BEARING 6205
34	BOLT UNI 5931 M10X30
35	SHIM 55.3x61.7
251	OUTPUT SHAFT
252	SLEEVE
253	CIRCLIP 22 UNI 7437

Central transmission



IDM-CA43800201.fm

IDM-43800222700.tif

Rondò
Baureihe 33

K 327
K 333

Handbuch für den technischen Kundendienst

11-2003

Cod. 47310050/01

INTRODUCTION

The purpose of this repair time chart is to regulate, in a complete way, the specific times for each job, obtained with the aid of the Technical Assistance Office's team. To measure the job times we worked on a mass-produced tractor, in normal using conditions, and obviously excluding particular cases. To ensure the above operations of a perfect result, the tractor must be clean on the outside and without any additional equipment. The operations are to be considered as carried out in an authorised A. **C**arraro workshop, provided with the special tools for workshops, equipped with average skilled staff and with the immediate availability of A. Carraro original spare parts.
From the foreseen times we have exceeded the time taken for case diagnostic, for incidental de-seizures, for the extraction of any broken screws and the time for testing the machine after completion of the job. Every operation is considered as a single and complete job performed by one person. We do not consider the time taken by a second persona should one be needed to carry out particular operations.

Warning: The servicing procedures adopted are the same described in the shop manuals or explained during the training courses offered at the manufacturer's mechanics school.

CONSULTATION INSTRUCTIONS

All the part replacement times are expressed in hours and tenths of hours. To find out how many minutes a tenth of an hour corresponds to, just multiply the latter by 60.

Example:

0.25 hours = 0.25 x 60 minutes (e.g. 15 minutes)

2.25 hours = 2 hours and 15 minutes

To search for a part's disassembly and reassembly time, check the times guide tables, which are arranged by functional machine assemblies and which contain references to the spare parts catalogue.

TIMES REVISION REQUEST

If dealers think that the times they have taken do not correspond to the times foreseen by the times chart, they may ask for a time revision by sending the A**.** Carraro Technical Assistance Office the time revision request, using the enclosed form.
We advise you to send the revision request only after having performed at least three tests, following the method explained during the training courses or described in the shop manual, and using the special equipment specified.
In the request, the part concerned must be clearly specified with the respective code number and the job carried out must be described, specifying the equipment used and stating the time taken.

TIMES REVISION REQUEST FORM

DEALER:_____DATE:_____

MODEL:_____SERIES:_____CHASSIS N°.:_____

DETAIL N°.:_____TABLE(TAV):_____FORESEEN TIME:_____

I wish to ask for your time revision for the above-mentioned operation.
I declare that I have performed all the foreseen preliminary operations,
obtaining the following results:

JOB DESCRIPTION:_____

_____

_____

SPECIAL WORK-SHOP EQUIPMENTS USED:

CODE N°_____CODE N° _____

CODE N°_____ CODE N° _____

TIME TAKEN (hours):_____

Abbreviazioni – Abréviations – Abkurzungen – Abbreviations – Abreviaturas

Dx	Destro/a	Dx	Droit/e	Dx	Rechts	Dx	Right-hand	Dx	Derecho/a
Sx	Sinistro/a	Sx	Gauche	Sx	Links	Sx	Left-hand	Sx	Izquierdo/a
ant.	Anteriore	ant.	Avant	ant.	Vorne	ant.	Front	ant.	Delantero
post.	Posteriore	post.	Arrière	post.	Hinten	post.	Rear	post.	Trasero
sup.	Superiore	sup.	Supérieur	sup.	Oben	sup.	Upper	sup.	Superior
inf.	Inferiore	inf.	Inférieur	inf.	Unten	inf.	Lower	inf.	Inferior
est.	Esterno	est.	Externe	est.	Außen	est.	Outer	est.	Exterior
int.	Interno	int.	Interne	int.	Innen	int.	Inner	int.	Interior
lat.	Laterale	lat.	Latéral	lat.	Seitlich	lat.	Lateral	lat.	Lateral
centr.	Centrale	centr.	Central	centr.	Mitte	centr.	Central	centr.	Central
RM	Retromarcia	RM	Marche arrière	RM	Ruckwartsgang	RM	Reverse Gear	RM	Marcha atrás
LV	Lente/Veloci	LV	Lentes/Rapides	LV	Nieder-/Hochtourig	LV	Slow/Fast	LV	Lentas/Veloces
PTO	Presa di potenza	PTO	Prise de puissance	PTO	Zapfwelle	PTO	Power- take-off	PTO	Toma de fuerza
st.	Standard	st.	De série	st.	Standard	st.	Standard	st.	Standard
Z16	Ingranaggio con 16 denti	Z16	Engrenage à 16 dents	Z16	Zahnrad mit 16 Zähnen	Z16	16-tooth gear	Z16	Engranaje de 16 dientes
Z15/25	Coppia ingranaggi tra Z 15 e Z25	Z15/25	Couple engrenage entre Z15 et Z 25	Z15/25	Zahnradpaar Z15 und Z25	Z15/25	Gear pair between Z15 and Z25	Z15/25	Par engranajes entre 15 y 25
ar	A richiesta	ar	Sur demande	ar	Auf Anfrage	ar	On request	ar	Bajo pedido
Ø	Diametro mm	Ø	Diamètre mm	Ø	Durchmesser mm	Ø	Diameter mm	Ø	Diámetro mm
sp.	Spessore	sp.	Epaisseur	sp.	Starke	sp.	Thickness	sp.	Grosor
mt.	Fornito a metri	mt.	Fourni par mètre	mt.	Vom lfd. Meter lieferbar	mt.	Supplied in metres	mt.	Suministrado por metros
Nr.	Numero	Nr.	Numéro	Nr.	Nummer	Nr.	Number	Nr.	Nùmero
Ric.	Ricambi	Ric.	Pièces détachées	Ric.	Ersatzteil	Ric.	Spares	Ric.	Repuestos
Tav.	Tavola	Tav.	Planche	Tav.	Tafel	Tav.	Table	Tav.	Lámina
Fg.	Foglio	Fg.	Page	Fg.	Blatt	Fg.	Sheet	Fg.	Hoja
Fig.	Figura	Fig.	Dessin	Fig.	Abbildung	Fig.	Figure	Fig.	Figura
Q	Quantità	Q	Quantité	Q	Menge	Q	Quantity	Q	Cantidad
Mod.	Modifica	Mod.	Modification	Mod.	Änderung	Mod.	Modification	Mod.	Modificaciòn
Soll.	Sollevamento	Soll.	Soulèvement	Soll.	Hebewerk	Soll.	Lifting	Soll.	Levantamiento
Con cabina		Avec cabine		Mit Kabine		With cab		Con cabina	
Senza cabina		Sans cabine		Ohne Kabine		Without cab		Sin cabina	
Ore		Heures		Stunden		Hours		Horas	
Tempo di sostituzione		Temp de remplacement				Replacement time		Tiempos de sostitución	

INDICE DEI SOTTOGRUPPI

INDEX DES SOUS-GROUPES

VERZEICHNIS DER UNTERGRUPPEN

SUBGROUP INDEX

INDICE DE LOS SUBGRUPOS

TAVOLE DEI TEMPI

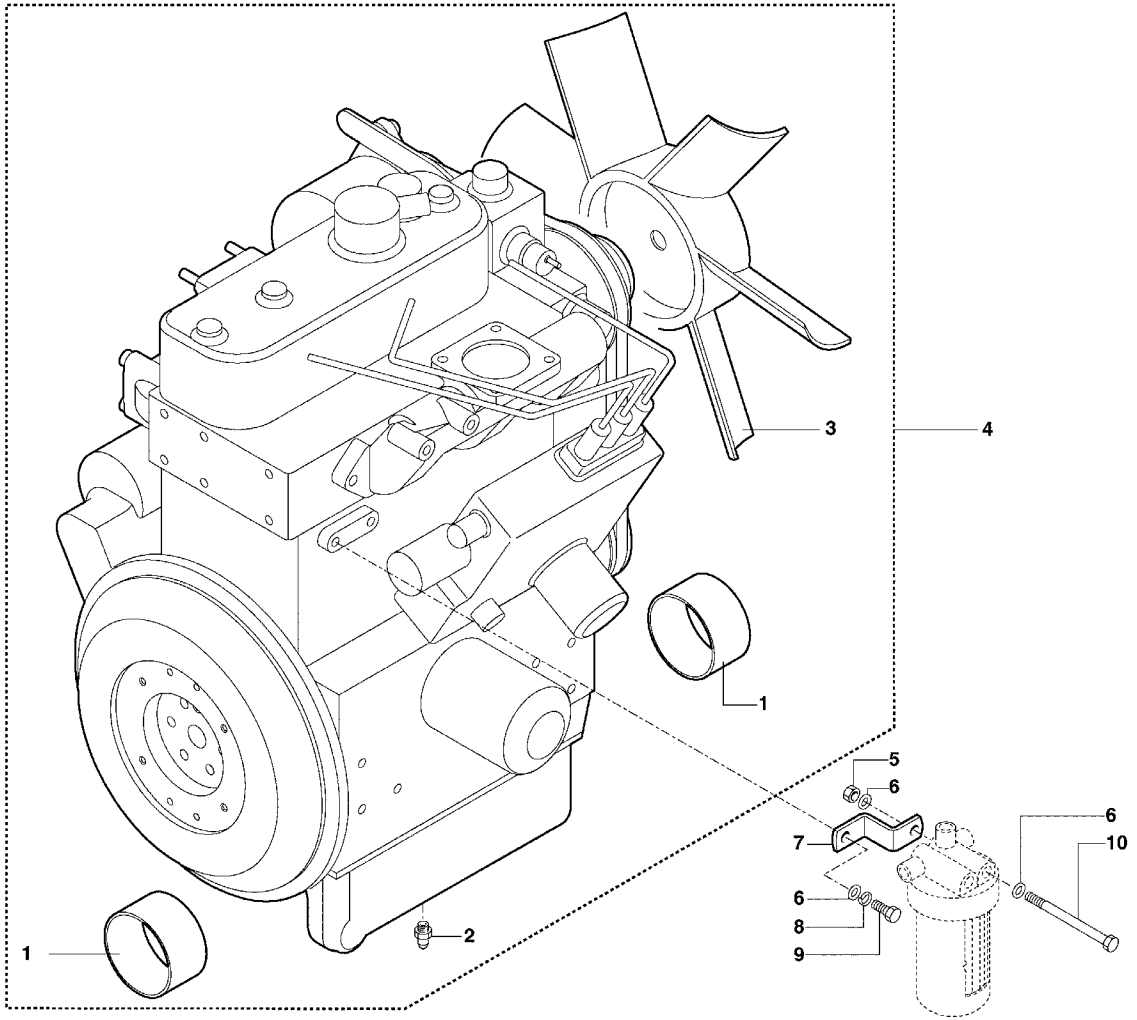
TABLEAUX DES TEMPS

ZEITENTABELLEN

TIMES BOARDS

PROSPECTO DE PROGRAMMATION DE TIEMPOS DE TRABAJO

4380030010 S05



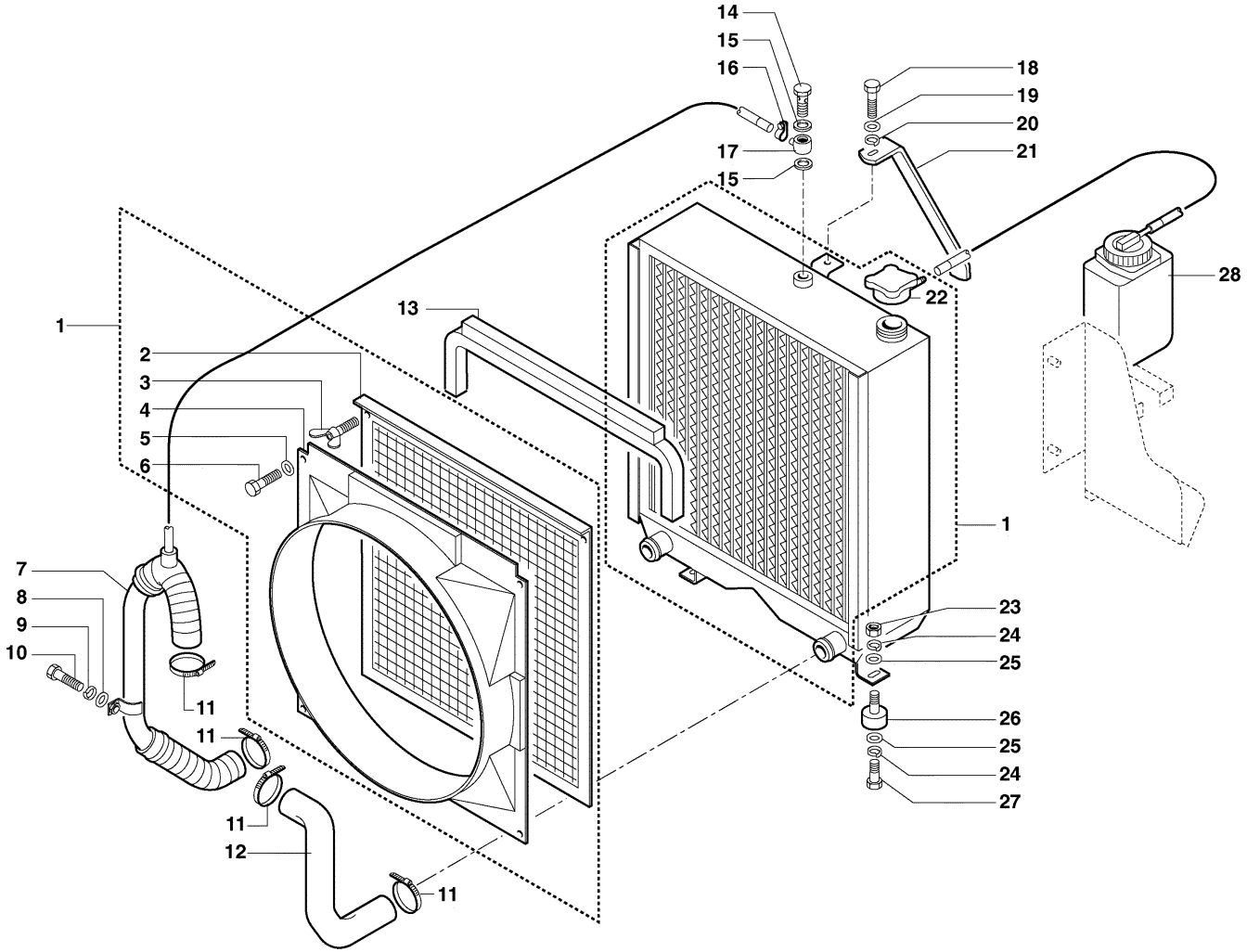
Tempario Serie 33		Tav. A1-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Boccola TFP 707540	Douille	Buchse	Bush	Casquillo	2,75	2,75
3	Ventola motore	Eventoir	Lüfter	Fan	Ventilador	0,75	0,75
4	Motore	Moteur	Motor	Engine	Motor	4	4

RADIATORE
RADIATEUR
KÜLER
RADIATOR
RADIATOR

TAV. A2-10

Da matr.	A matr.
00001	

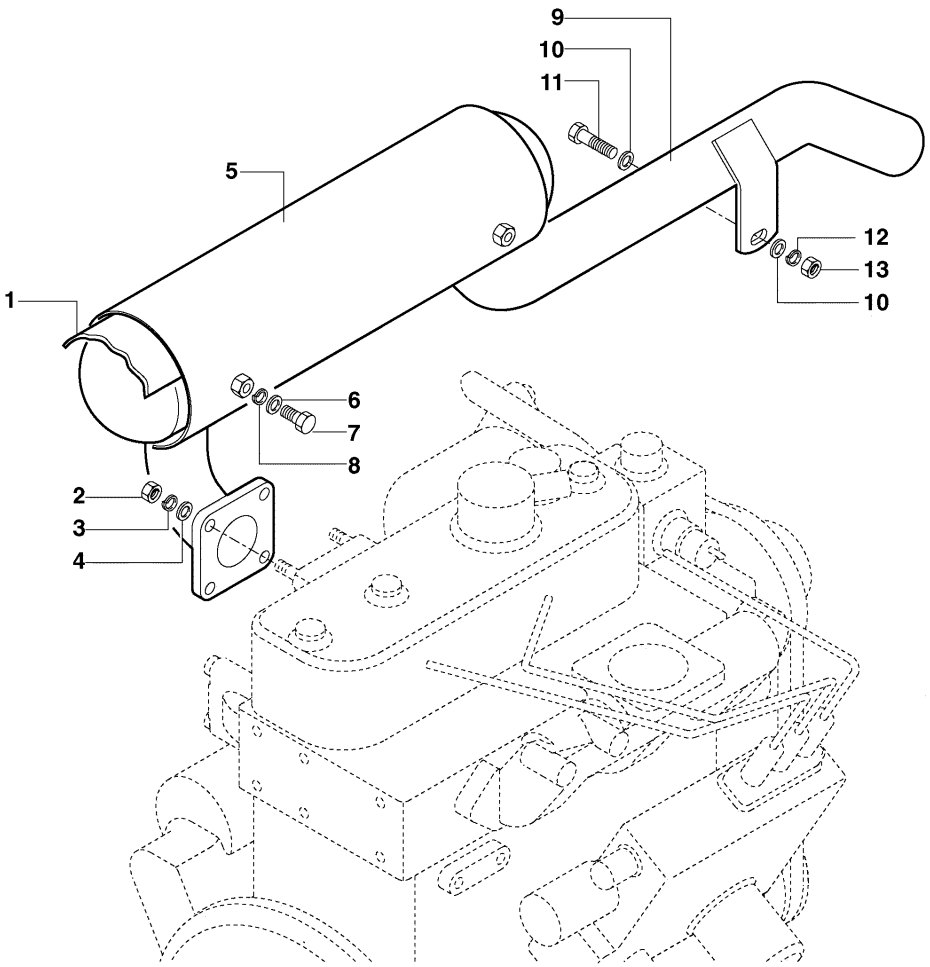
43800300200 S08



Tempario Serie 33		Tav. A2-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Radiatore acqua	Radiateur	Kühler	Radiator	Radiador	1,5	1,5
2	Rete antiintasamento per radiatori	Grille	Gitter	Frame	Red	0,1	0,1
4	Convogliatore aria	Convoyeur	Kühlerhaube	Conveyor	Convertor	0,75	0,75
7	Manicotto acqua pompa-radiatore	Manchon	Muffe	Sleeve	Manguito	1	1
12	Manicotto da radiatore a pompa	Manchon	Muffe	Sleeve	Manguito	1	1
13	Guarnizione	Joint	Dichtung	Gasket	Junta	0,15	0,15
21	Riga supporto radiatore	Barre	Schiene	Line	Barra	0,1	0,1
28	Serbatoio acqua	Réservoir	Tank	Tank	Depósito	0,15	0,15

MARMITTE SCARICO GAS
POT D'ECHAPPEMENT GAZ
ABGAS-AUSPUFFTÖPFE
GAS OUTLET SILENCERS
TUBOS DE ESCAPE GASES

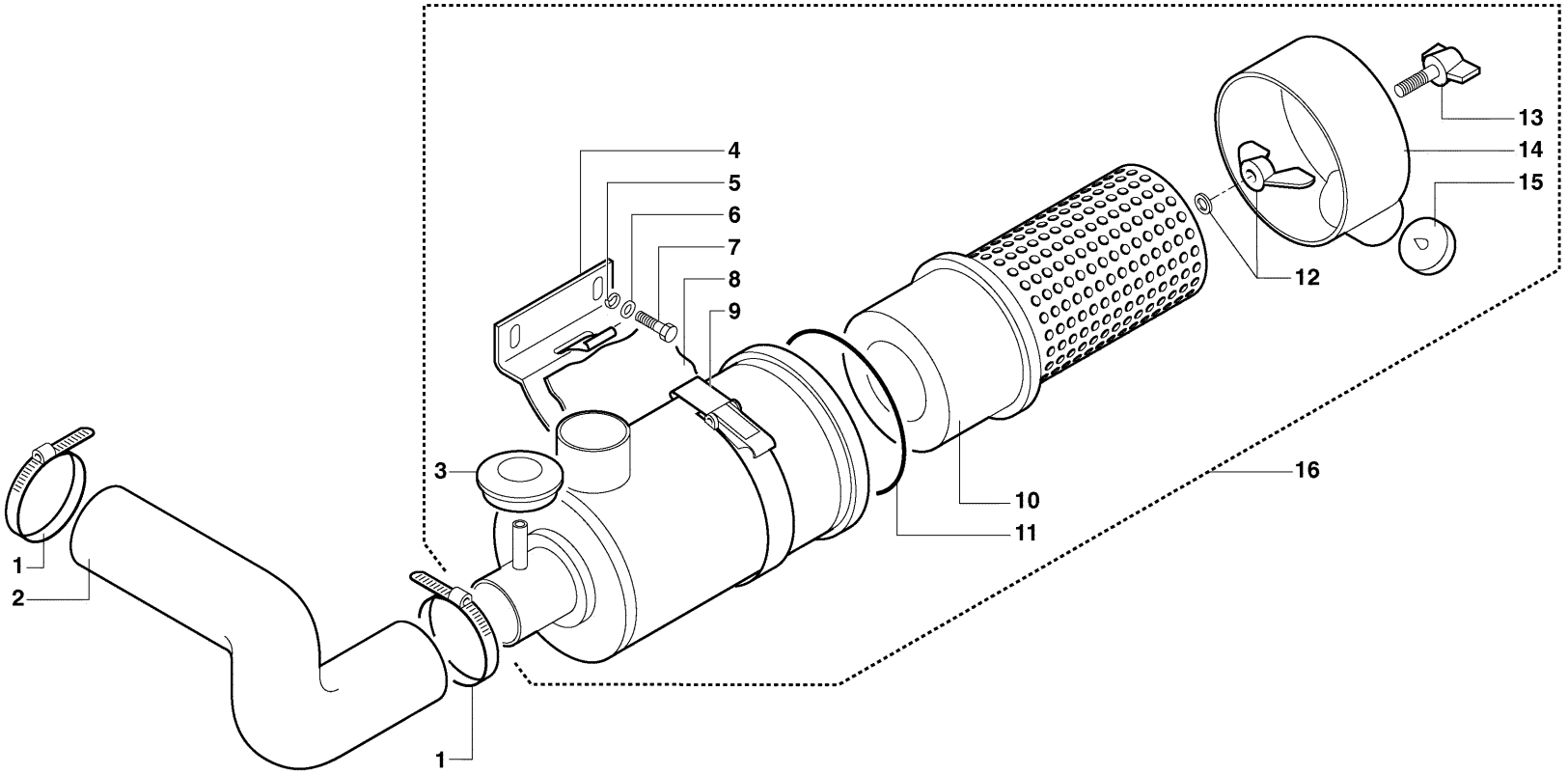
43800300300 S05



Tempario Serie 33		Tav. A3-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Fonoassorbente	Isolant-acoustique	Schallschluckendes	Sound absorbing	Fonoabsorbente	0,35	0,35
5	Protezione marmitta	Protection	Schutz	Shield	Protección	0,35	0,35
9	Marmitta	Pot d'échappement	Auspuffrohr	Silencer	Silenciador	0,25	0,25

FILTRO ARIA
FILTRE AIR
LUFTFILTER
AIR FILTER
FILTRO AIRE

43800300400 S05



Tempario Serie 33		Tav. A4-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
2	Manicotto aspirazione filtro motore	Manchon	Muffe	Sleeve	Manguito	0,2	0,2
3	Indicatore di intasamento	Indicateur	Anzeiger	Indicator	Indicador	0,2	0,2
4	Supporto filtro aria	Support	Halterung	Support	Soporte	0,2	0,2
8	Feltro	Feutre	Filz	Felt	Fieltro	0,2	0,2
9	Bretella	Bretelle	Träger	Brace	Refuerzo	0,2	0,2
10	Cartuccia	Cartouche	Einsatz	Cartridge	Cartucho	0,2	0,2
11	Guarnizione	Joint	Dichtung	Gasket	Junta	0,2	0,2
14	Coperchio	Couverde	Abdeckung	Lid	Tapa	0,1	0,1
15	Valvola a membrana	Soupape	Ventil	Valve	Válvula	0,1	0,1
16	Filtro aria	Filtre	Luftfilter	Filter	Filtro	0,2	0,2

Tempario Serie 33

Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

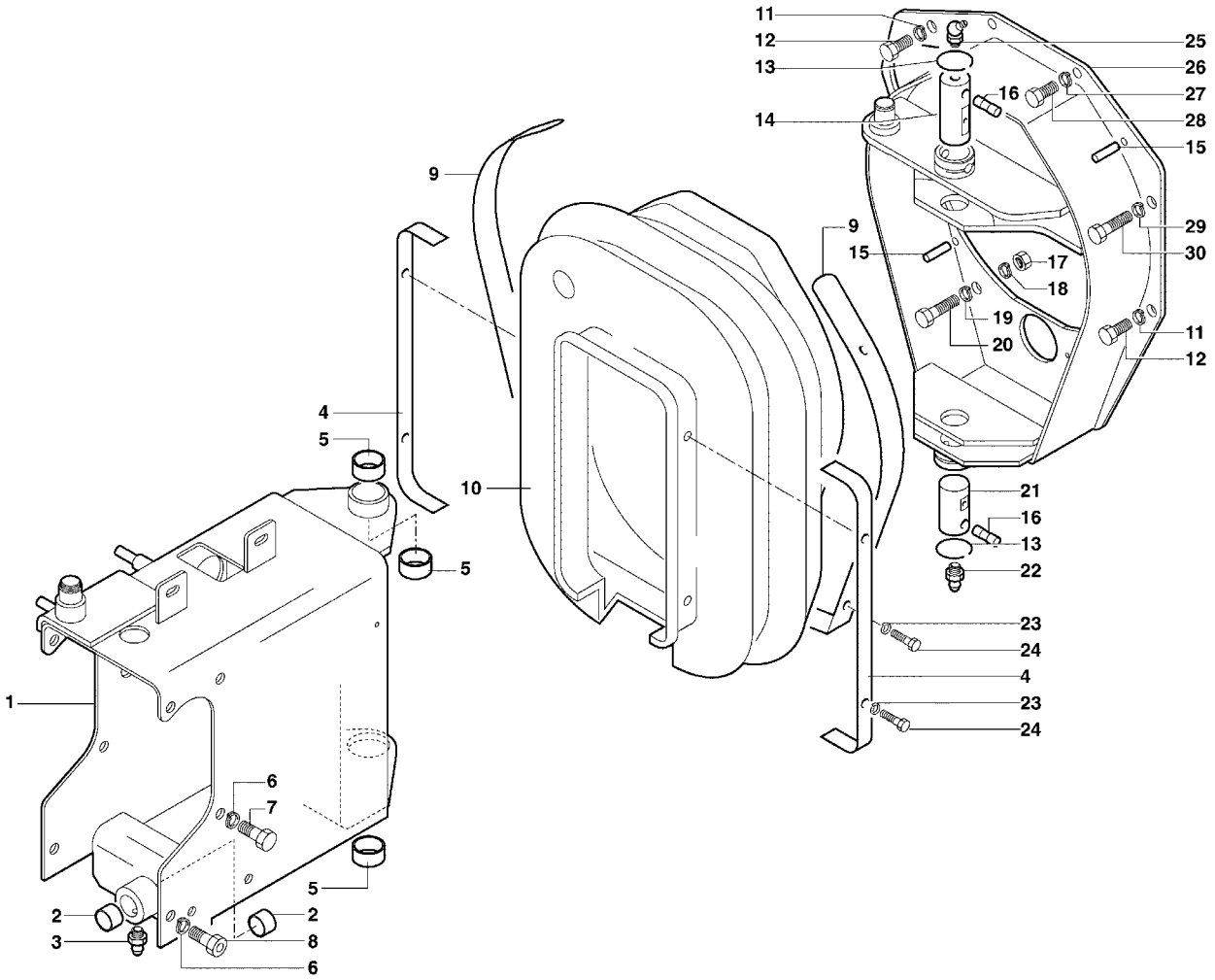
Rondò K327 – Rondò K333

CENTRALE
CENTRAL
ZENTRAL
CENTER
CENTRAL

TAV. B1-10

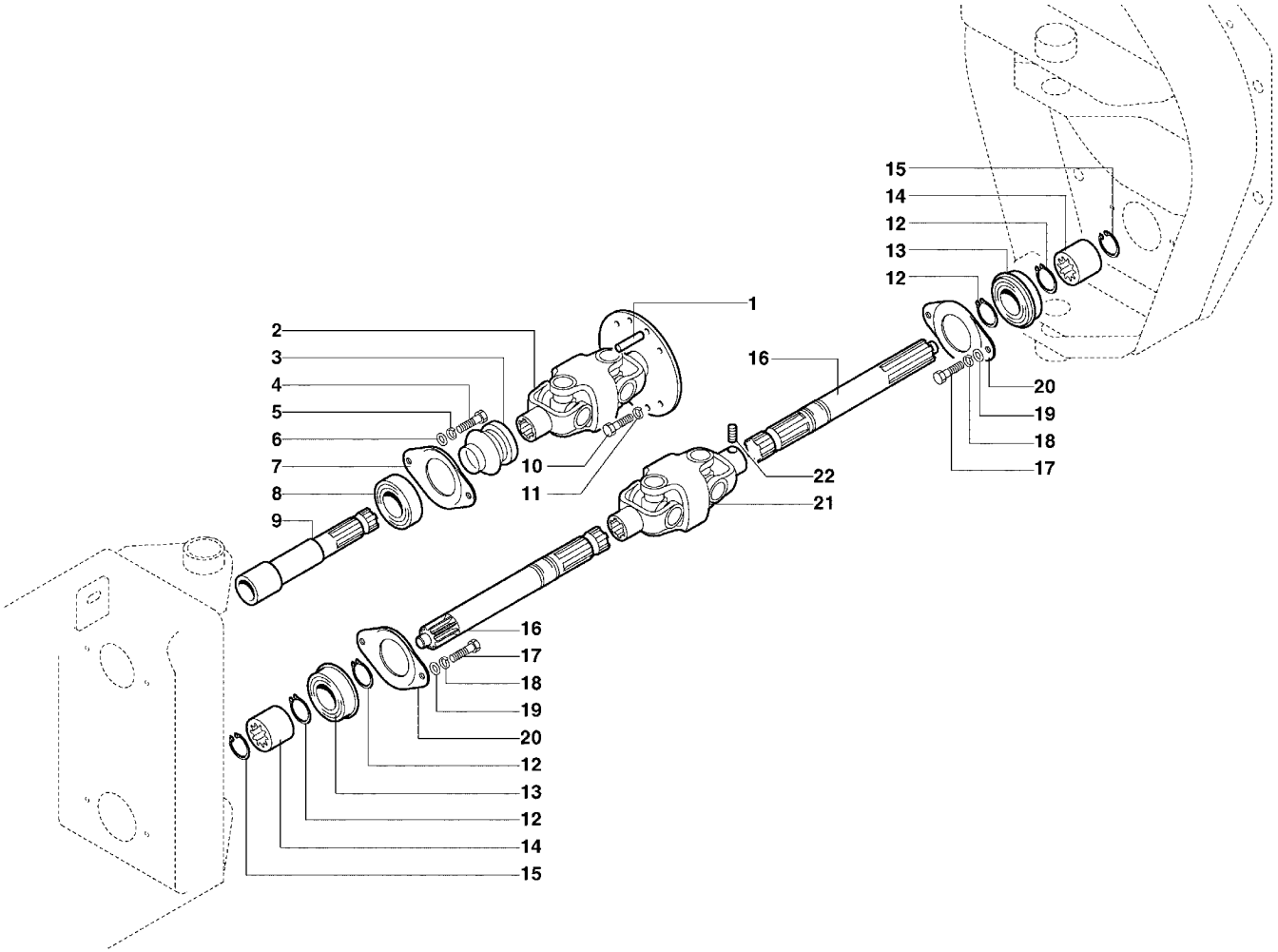
Da matr.	A matr.
00001	

4380030500 S06



Tempario Serie 33		Tav. B1-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Corpetto centrale completo	Corps	Körper	Body	Cuerpo	4	4,25
2	Boccola	Douille	Buchse	Bush	Casquillo	0,75	0,75
4	Riga fermo soffietto	Barre	Schiene	Line	Barra	0,1	0,1
5	Bronzina	Coussinet en bronze	Bronzelager	Bronze bushing	Casquillo de bronce	1,5	1,75
9	Riga fermo soffietto	Barre	Schiene	Line	Barra	0,1	0,1
10	Soffietto snodo centrale	Soufflet	Faltenbalg	Bellows	Fuelle	1,25	1,5
14	Perno superiore snodo centrale	Pivot	Zapfen	Pin	Perno	0,3	0,3
21	Perno inferiore snodo centrale	Pivot	Zapfen	Pin	Perno	0,3	0,3
26	Attacco flangia motore	Arrache	Kupplung	Hitch	Enganche	2	2,25

4380300600 S06



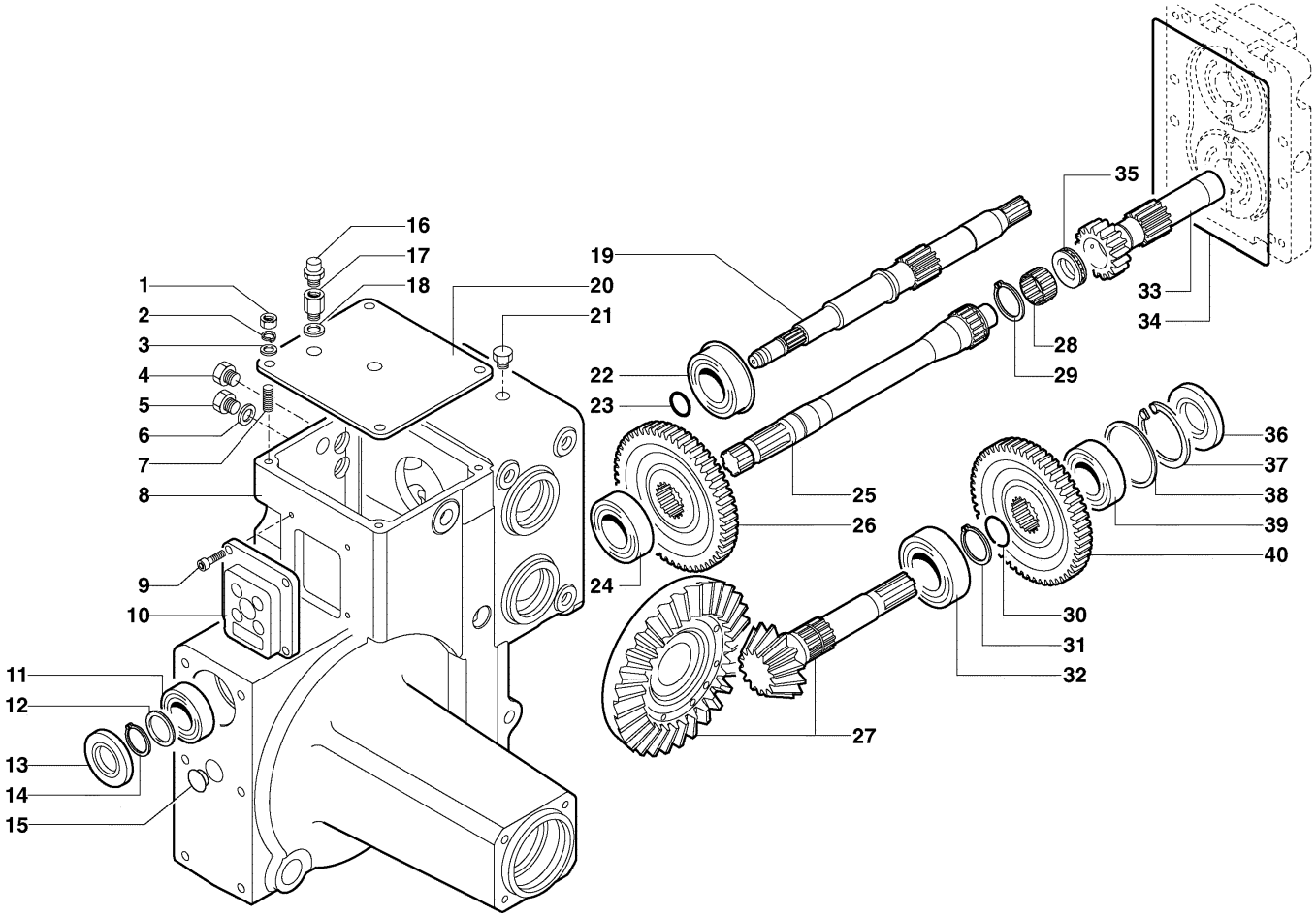
Tempario Serie 33		Tav. B1-20		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
2	Giunto cardanico doppio primario	Joint	kupplung	Joint	Junta	1,75	2
3	Cuffia portagrasso albero primario	Casque	Kappe	Casing	Casquete	1,25	1,5
7	Piastrina fermo cuscinetto	Plaquette	Plättchen	Plate	Plaquita	1,25	1,5
8	Cuscinetto	Palier	Lager	Bearing	Cojinete	1,5	1,75
9	Alberino di ingresso	Arbre	Spindel	Small shaft	Eje	1,5	1,75
13	Cuscinetto	Palier	Lager	Bearing	Cojinete	1,5	1,75
14	Manicotto	Manchon	Muffe	Sleeve	Manguito	1,5	1,75
16	Albero di uscita	Arbre	Welle	Shaft	Arbol	1,5	1,75
20	Piastrina fermo cuscinetto	Plaquette	Plättchen	Plate	Plaquita	1,25	1,5
21	Giunto cardanico doppio inferiore	Joint	kupplung	Joint	Junta	1,25	1,5

SCATOLA E TRASMISSIONE CAMBIO
BOITE ET TRANSMISSION BOITE DE VITESSE
GEHÄUSE UND SCHALTGETRIEBE
GEARBOX AND TRANSMISSION
CAJA Y TRANSMISSION CAMBIO

TAV. B2-10

Da matr.	A matr.
00001	

43800300700 S06



Tempario Serie 33		Tav. B2-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
	Trasmissione idrostatica completa	Trasmission hydrostatique complète	Kompletter Hydrostatischer Fahrantrieb	Complete Hydrostatic transmission	Transmisión hidrostática completa	6,5	7
8	Scatola cambio	Boîte	Gehäuse	Gear box	Caja	9	9,5
10	Coperchio attacco pompa	Couverde	Abdeckung	Lid	Tapa	1,5	1,5
11	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	9	9,5
12	Spessore	Epaisseur	Zwischenlegscheibe	Shim	Chapeta	0,25	0,25
13	Anello di tenuta	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	0,25	0,25
15	Tappo ad espansione	Bouchon	Stopfen	Cap	Tapón	0,1	0,1
16	Tappo sfiato	Bouchon	Stopfen	Cap	Tapón	2	2,5
17	Prolunga 3/8 Gas	Rallonge	Verlängerung	Extension	Alargadera	2	2,5
19	Albero entrata	Arbre	Welle	Shaft	Arbol	9	9,5
20	Coperchio superiore	Couverde	Abdeckung	Lid	Tapa	2,25	2,75
22	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	9	9,5
23	Anello di tenuta slippers	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	9	9,5
24	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	9	9,5
25	Albero PTO	Arbre	Welle	Shaft	Arbol	9	9,5
26	Ingranaggio	Engrenage	Getriebe	Gearing	Engranaje	9	9,5
27	Coppia conica	Couple conique	Kegelradtrieb	Crown wheel and pinion	Par cónico	6	6,5
28	Gabbia a rulli	Cage à roulements	Walzenkäfig	Needle retainer	Jaula de agujas	5	5,5
32	Cuscinetto a rulli	Palier	Lager	Bearing	Cojinete	5	5,5
33	Albero pignone	Arbre	Welle	Shaft	Arbol	5	5,5
34	Anello	Bague OR	O-Ring	OR Ring	Anillo OR	5	5,5
35	Gabbia a rullini	Cage à roulements	Walzenkäfig	Needle retainer	Jaula de agujas	5	5,5
36	Anello di tenuta	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	2,25	2,75
39	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	6	6,5
40	Ingranaggio	Engrenage	Getriebe	Gearing	Engranaje	9	9,5

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

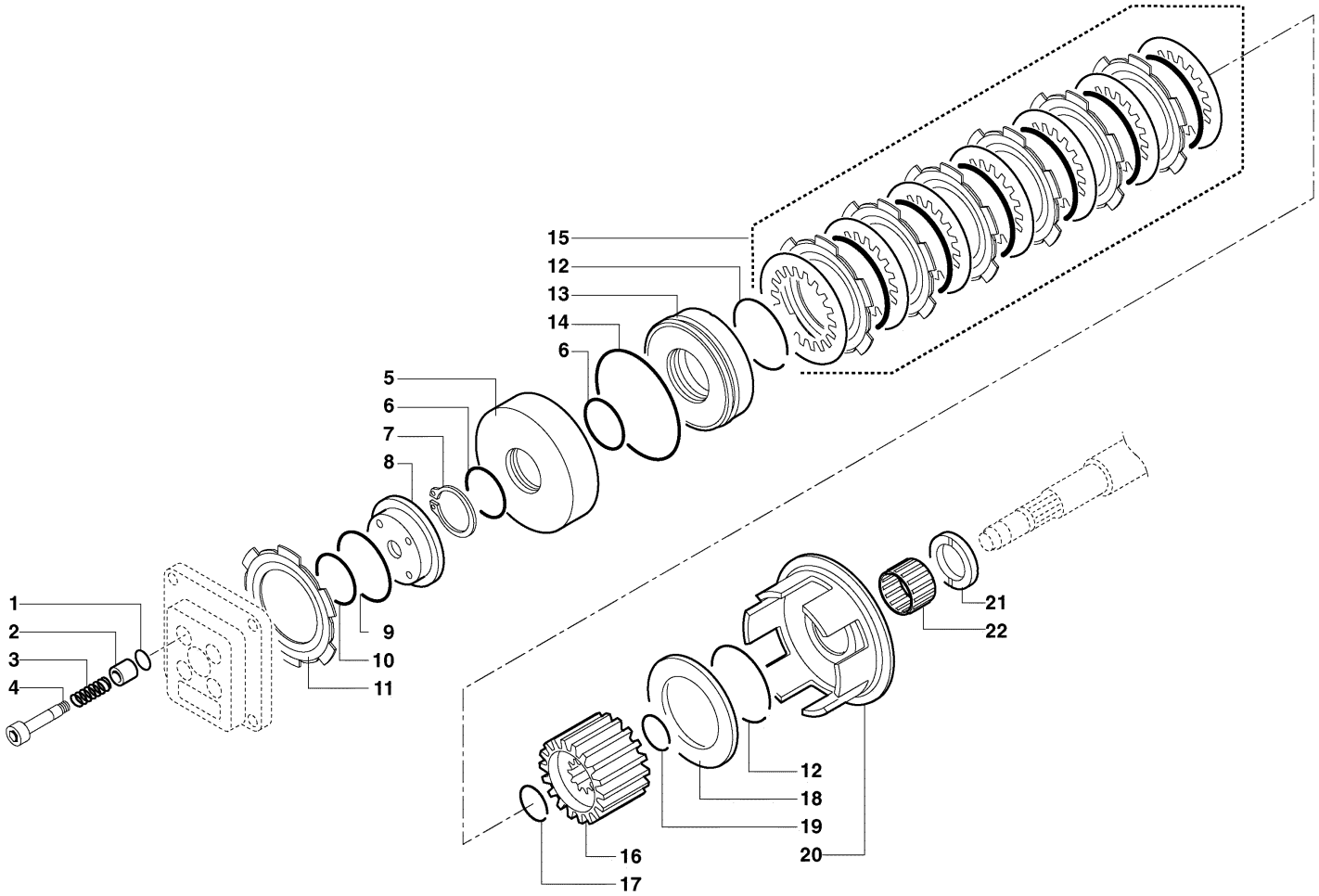
Rondò K327 – Rondò K333

FRIZIONE PTO
EMBRAYAGE PTO
ZAPFWELLENKUPPLUNG
PTO CLUTCH
EMBRAGUE PTO

TAV. B3-10

Da matr.	A matr.
00001	

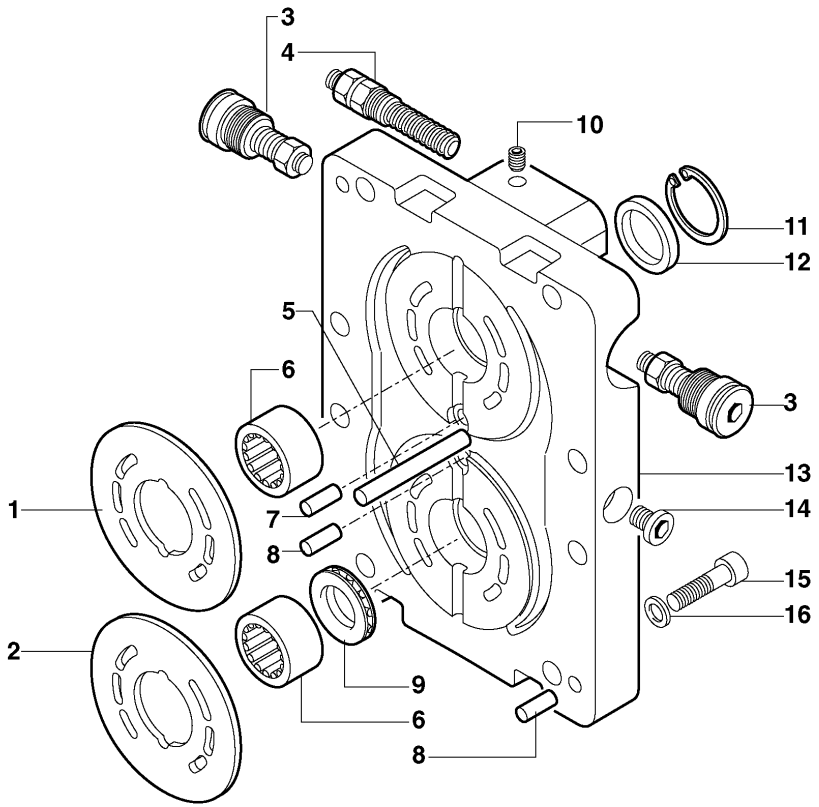
43800300800 S04



Tempario Serie 33		Tav. B3-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
3	Molla estema	Ressort	Feder	Spring	Resorte	1	1
4	Spina freno PTO	Goupille	Stift	Pin	Chaveta	1	1
5	Cilindro frizione	Cylindre	Zylinder	Cylinder	Cilindro	2	2
6	Anello OR	Bague OR	O-Ring	OR Ring	Anillo OR	2	2
8	Pistone freno PTO	Piston	Kolben	Piston	Pistón	1,75	1,75
9	Anello OR	Bague OR	O-Ring	OR Ring	Anillo OR	1,75	1,75
10	Anello di tenuta slippers	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	1,75	1,75
11	Disco frizione esterno	Disque	Scheibe	Disk	Disco	1,75	1,75
13	Pistone frizione	Piston	Kolben	Piston	Pistón	2	2
14	Anello OR	Bague OR	O-Ring	OR Ring	Anillo OR	2	2
15	Pacco dischi	Paquet de disques	Scheibenpaket	Set of discs	Paquete discos	9	9,5
16	Boccola frizione	Douille	Buchse	Bush	Casquillo	9	9,5
18	Controdisco frizione	Contre-disque embrayage	Gegenscheibe der Zapfwellekupplung	Support disk clutch	Contra-disco embrague	9	9,5
20	Coperchio campana frizione	Couverde	Abdeckung	Lid	Tapa	9	9,5
21	Ralla	Rondelle	Unterlegscheibe	Washer	Arandela	9	9,5
22	Gabbia a rulli	Cage à roulements	Walzenkäfig	Needle retainer	Jaula de rodillos	9	9,5

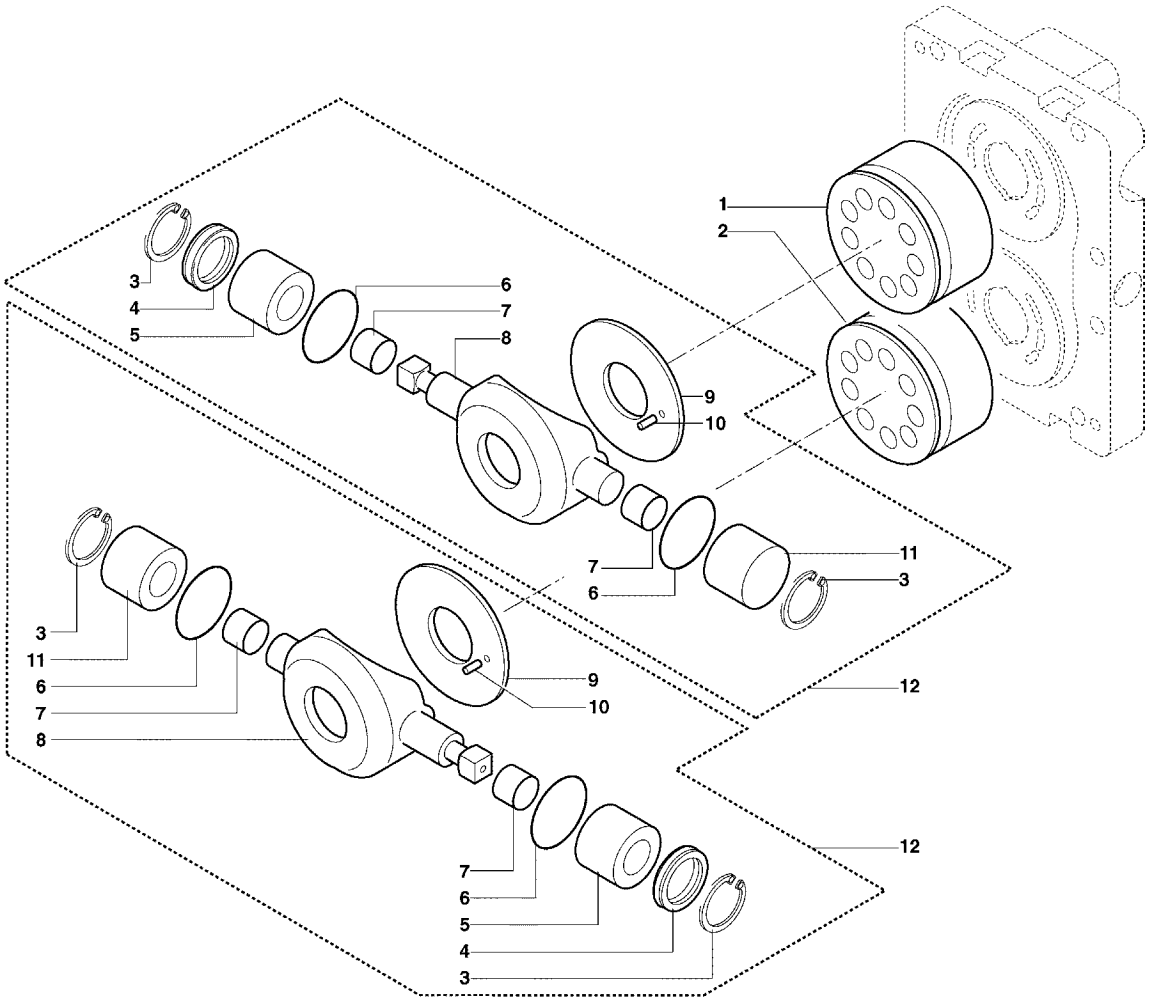
GRUPPO COPERCHIO
GROUPE COUVERCLE
DECKEL
COVER GROUP
CONJUNTO TAPA

43800300900 S04



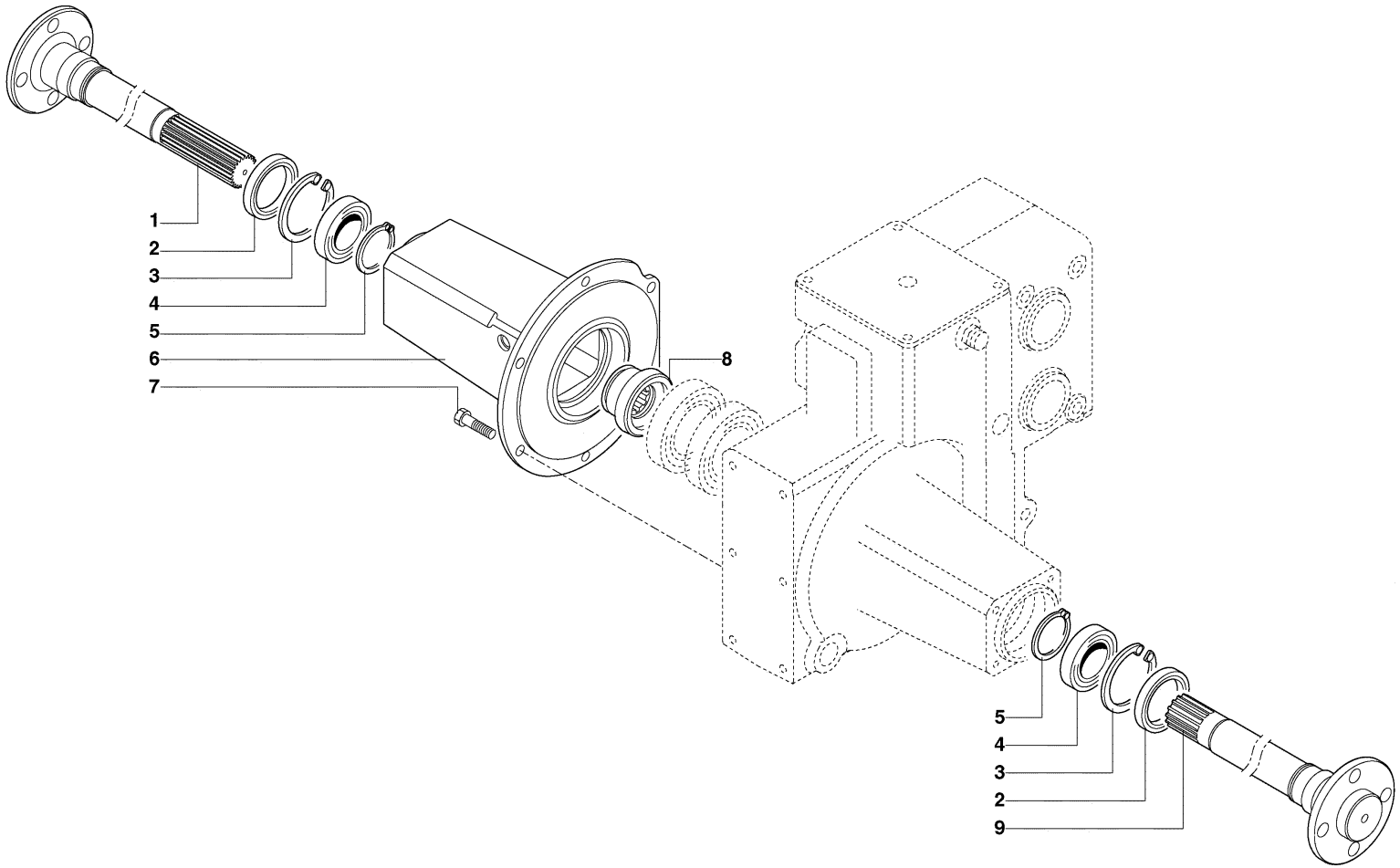
Tempario Serie 33		Tav. B4-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Distributore sinistro	Distributeur	Verteiler	Distributor	Distribuidor	5	5,5
2	Distributore motore	Distributeur	Verteiler	Distributor	Distribuidor	5	5,5
3	Valvola antiurto	Soupape	Ventil	Valve	Válvula	4	4,5
4	Valvola di alimentazione	Soupape	Ventil	Valve	Válvula	0,5	0,5
6	Cuscinetto assiale a rulli	Palier	Lager	Bearing	Cojinete	5	5,5
9	Gabbia a rullini AX 10 x 22 x 2,8	Cage à roulements	Walzenkäfig	Needle retainer	Jaula de agujas	5	5,5
12	Anello di tenuta Babsl 25 x 35 x 6 NBR	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	4	4,5
13	Coperchio idraulico	Couverde	Abdeckung	Lid	Tapa	5	5,5

438003011000 S04



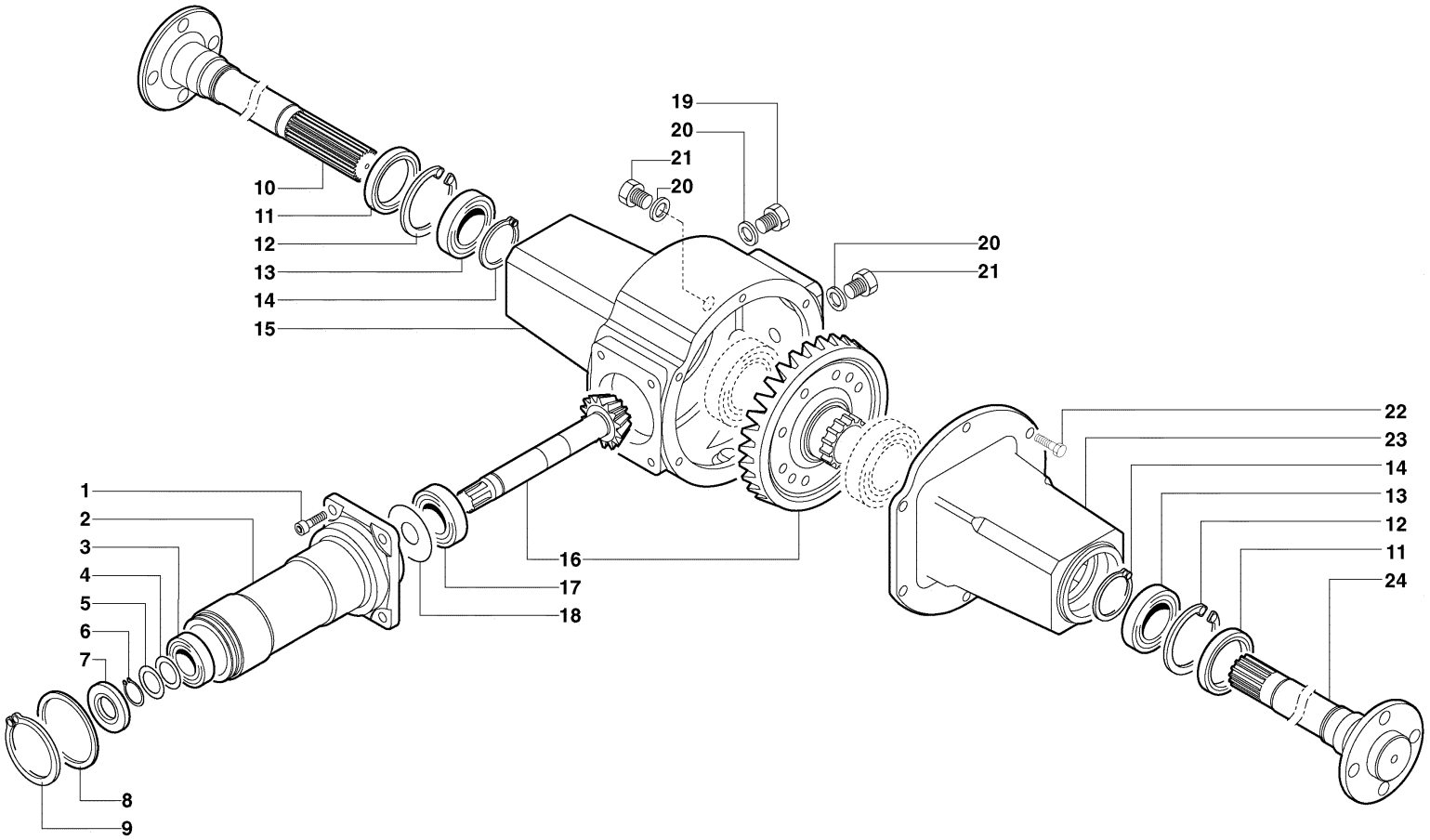
Tempario Serie 33		Tav. B4-20		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Gruppo rotante (pompa)	Groupe tournant	Drehgruppe	Rotating unit	Grupo rodante	5	5,5
2	Gruppo rotante (motore)	Groupe tournant	Drehgruppe	Rotating unit	Grupo rodante	5	5,5
4	Anello di tenuta (destro)	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	0,75	0,75
	Anello di tenuta (sinistro)	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	2	2,25
5	Boccola superiore	Douille	Buchse	Bush	Casquillo	5,25	5,75
6	Anello OR	Bague OR	O-Ring	OR Ring	Anillo OR	5,25	5,75
7	Boccola nastro	Douille	Buchse	Bush	Casquillo	5,25	5,75
8	Oscillante (pompa)	Oscillant (pompe)	Schwinger (pumpe)	Oscillator (pump)	Oscilante (bomba)	9	9,5
	Oscillante (motore)	Oscillant (motor)	Schwinger (motor)	Oscillator (engine)	Oscillante (motor)	5,25	5,75
9	Anello antigrippaggio	Bague	Ring	Ring	Anillo	5	5,5
11	Boccola inferiore	Douille	Buchse	Bush	Casquillo	5,25	5,75
12	Gruppo oscillante pompa	Groupe	Gruppe	Group	Grupo	9	9,5
	Gruppo oscillante motore	Groupe	Gruppe	Group	Grupo	5,25	5,75

43800301100 S06



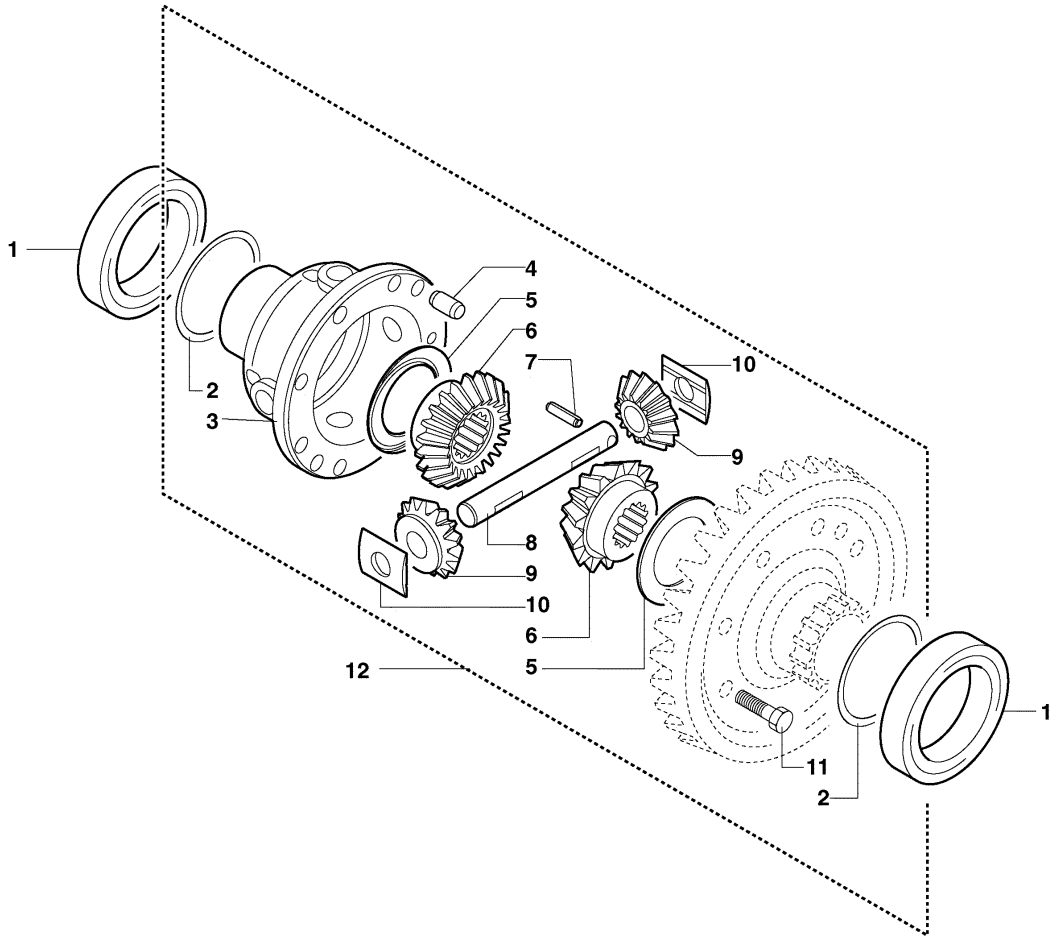
Tempario Serie 33		Tav. B5-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Semiasse	Demi-essieu	Achswelle	Axle shaft	Semieje	1	1
2	Anello di tenuta	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	1	1
4	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	1	1
6	Semiassale anteriore	Demi-essieu	Vordere Halbachse	Front axle shaft	Semieje	2	2
8	Manicotto blocco differenziale	Manchon	Muffe	Sleeve	Manguito	1	1
9	Semiasse	Demi-essieu	Achswelle	Axle shaft	Semieje	1	1

43800301200 S06



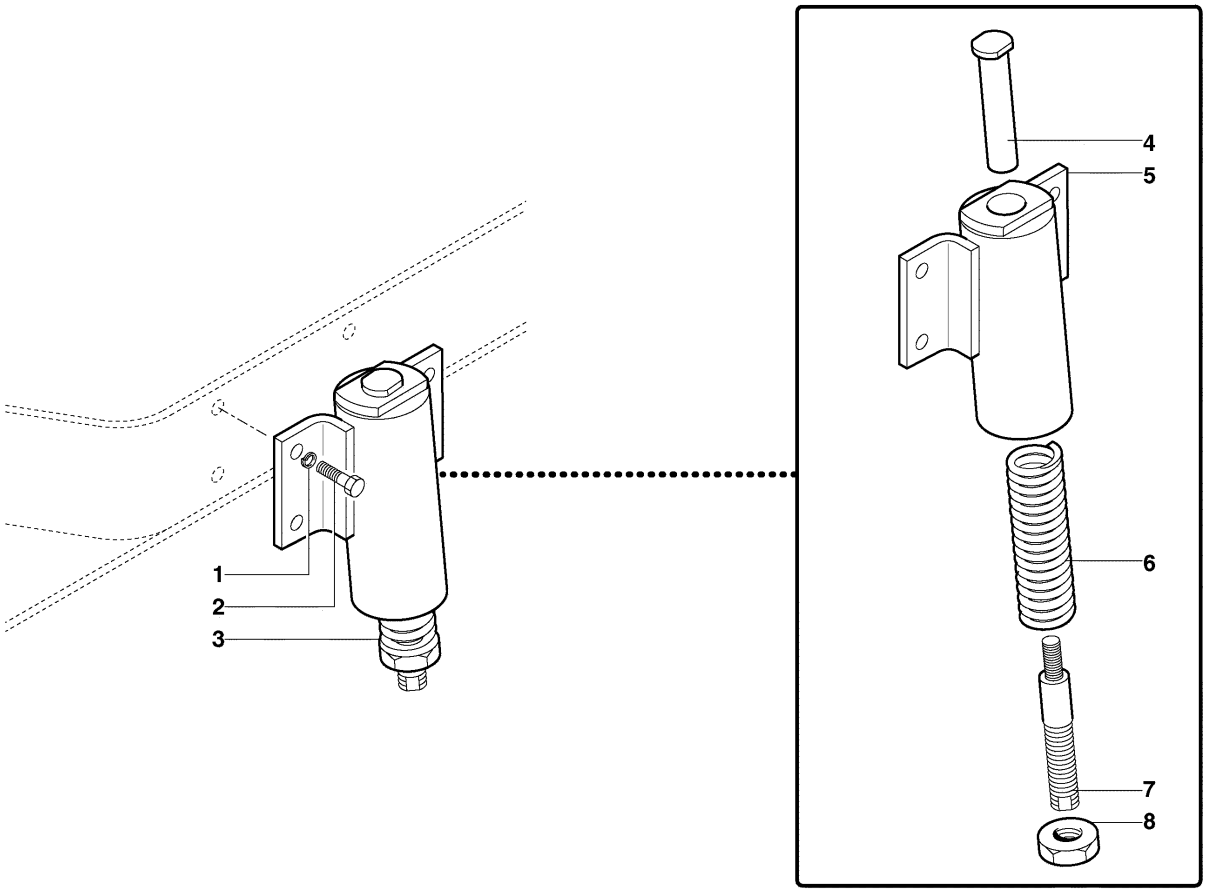
Tempario Serie 33		Tav. B6-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
2	Ponte posteriore	Pont arriere	Hintere Achse	Rear bridge	Eje trasero	1,75	1,75
3	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	1,75	1,75
7	Anello di tenuta Basl	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	1,75	1,75
10	Semiasse	Demi-essieu	Achswelle	Axle shaft	Semieje	1	1
11	Anello di tenuta	Bague d'étanchéité	Dichtring	Check ring	Anillo hermética	1	1
13	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	1	1
15	Semiasse scatola posteriore	Demi-essieu	Achswelle	Axle shaft	Semieje	3,5	3,5
16	Coppia conica	Couple conique	Kegelradtrieb	Crown wheel and pinion	Par cónico	3	3
17	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	1,75	1,75
23	Semiassale posteriore	Demi-essieu	Hinteres Halbachse	Rear axle shaft	Semieje	2	2
24	Semiasse	Demi-essieu	Achswelle	Axle shaft	Semieje	1	1

43800301300 S04



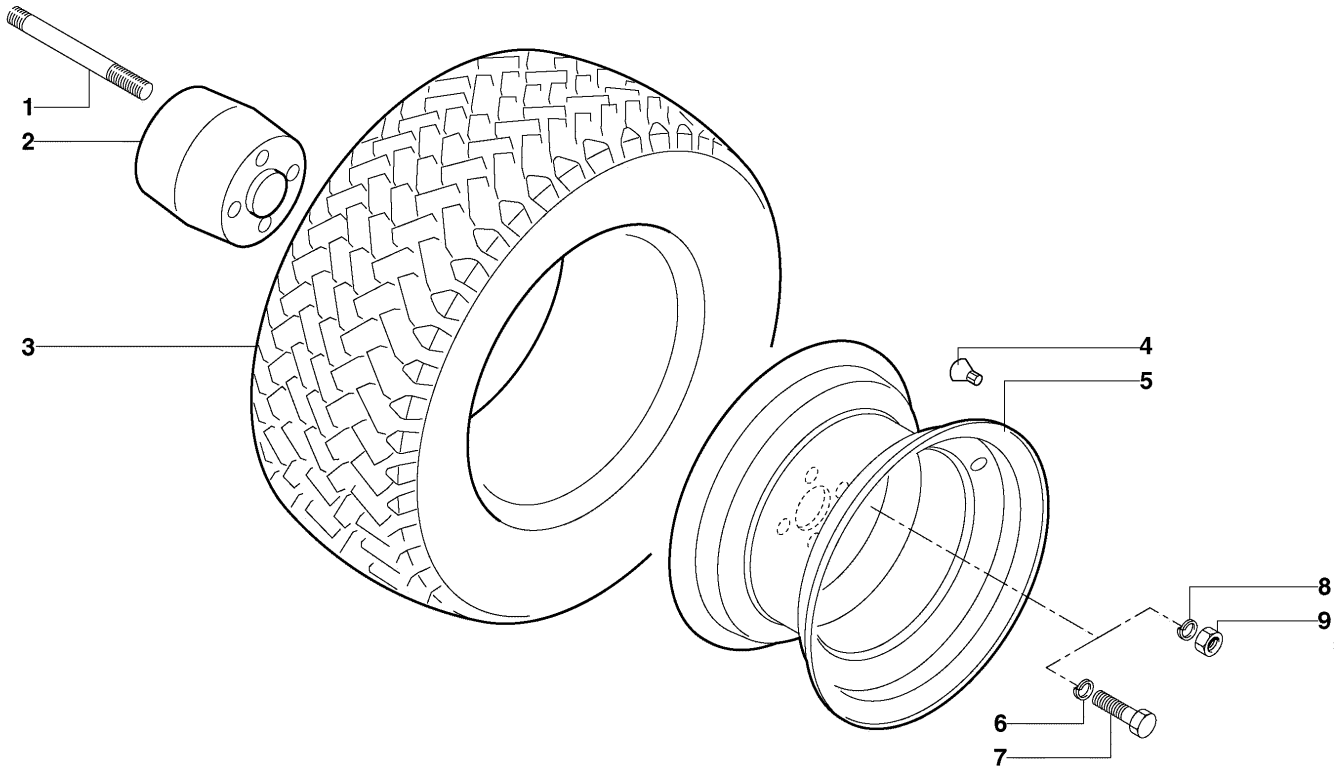
Tempario Serie 33		Tav. B7-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Cuscinetto a sfere	Palier	Lager	Bearing	Cojinete	0,75	0,75
3	Scatola differenziale	Boîte différentiel	Differentialgehäuse	Differential gear box	Caja diferencial	1,5	1,5
5	Ralla planetario	Crapaudine	Scheibe	Fifth wheel	Chumacera	1,5	1,5
6	Planetario	Planétaire	Planetengetriebe	Bevel drive	Pinon satelite	1,5	1,5
8	Perno satellite	Pivot	Zapfen	Pin	Perno	1,5	1,5
9	Satellite	Satellite	Planetenrad	Planetary gear	Satéllite	1,5	1,5
10	Ralla satellite	Crapaudine	Scheibe	Fifth wheel	Chumacera	1,5	1,5
12	Differenziale completo	Différentiel	Differential	Differential	Diferencial	0,75	0,75

43800301400 S05



Tempario Serie 33		Tav. B8-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
3	Stabilizzatore completo	Stabilisateur complet	Kompletter Stabilisator	Complete stabilizer	Estabilizador completo	0,4	0,4
4	Perno superiore registro stabilizzatore	Pivot	Zapfen	Pin	Perno	0,6	0,6
5	Stabilizzatore	Stabilisateur	Stabilisator	Stabilizer	Estabilizador	0,6	0,6
6	Molla stabilizzatore	Ressort	Feder	Spring	Resorte	0,6	0,6
7	Perno inferiore registro stabilizzatore	Pivot	Zapfen	Pin	Perno	0,6	0,6

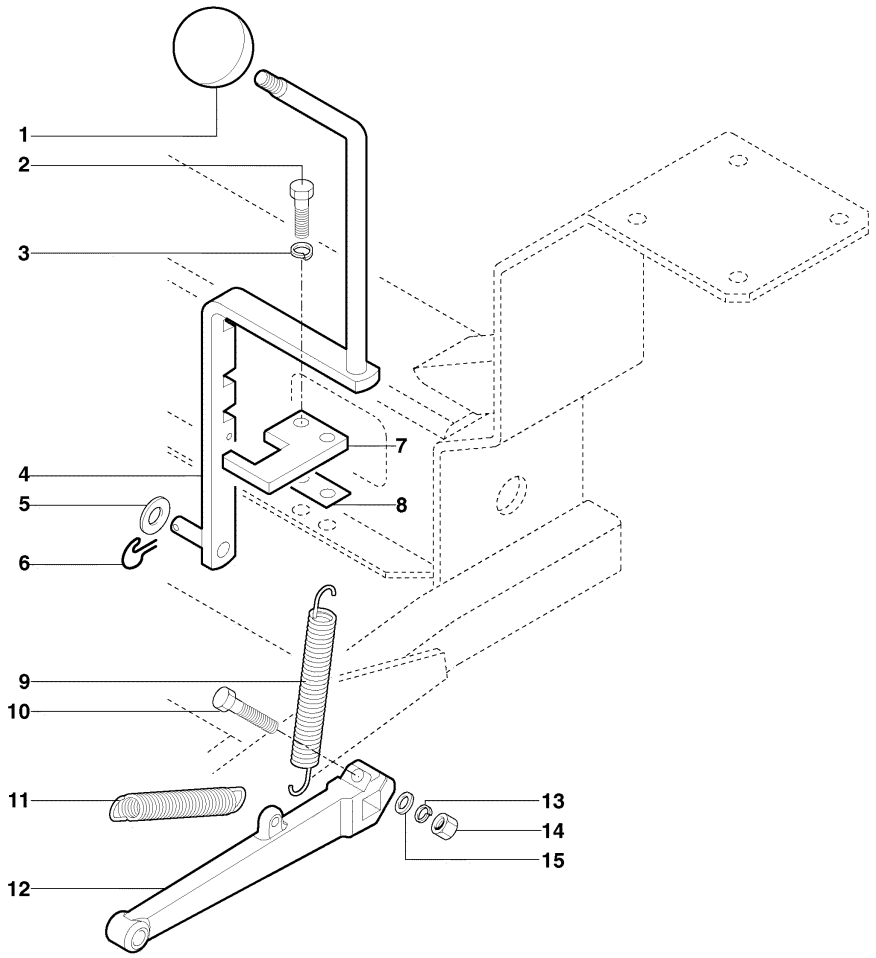
43800301500 S08



Tempario Serie 33		Tav. B9-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
2	Distanziale ruota	Entretoise	Distanzstück	Spacer	Separador	0,25	0,25

COMANDO CAMBIO GAMME
COMMANDE GAMMES
GESCHWINDIGKEITSTUFESTEUERUNG
SPEED GEAR CONTROLS
MANDO GAMAS

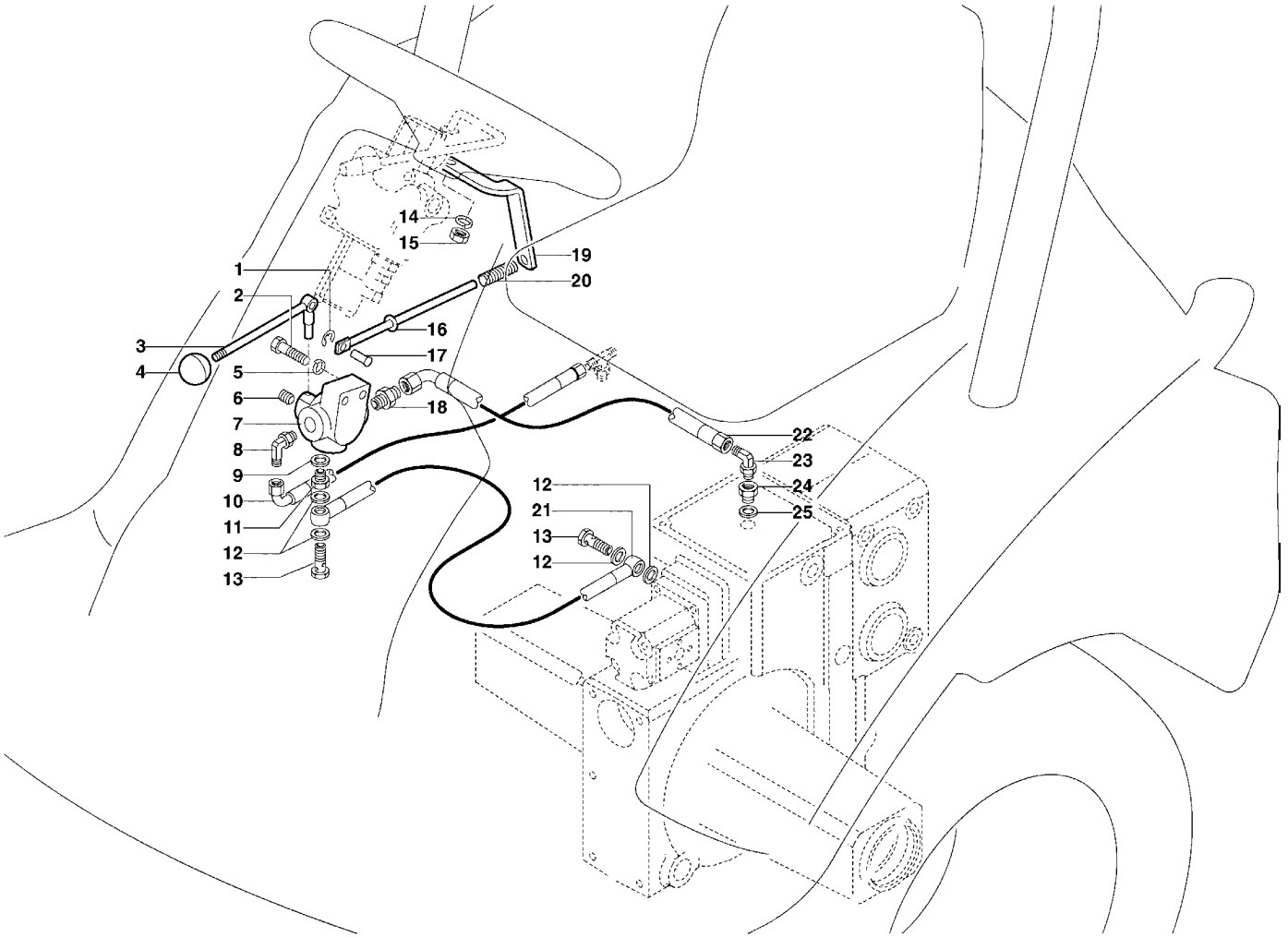
43800301600 S04



Tempario Serie 33		Tav. C1-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
4	Leva selezione velocita'	Levier	Hebel	Lever	Palanca	1	1
7	Riga selettore	Barre	Schiene	Line	Barra	0,5	0,5
9	Molla	Ressort	Feder	Spring	Resorte	0,4	0,4
11	Molla	Ressort	Feder	Spring	Resorte	0,4	0,4
12	Leva comando velocita'	Levier	Hebel	Lever	Palanca	1,5	1,75

COMANDO PTO
COMMANDE PTO
PTO STEUERUNG
PTO CONTROL
MANDO PTO

43800303900 S06



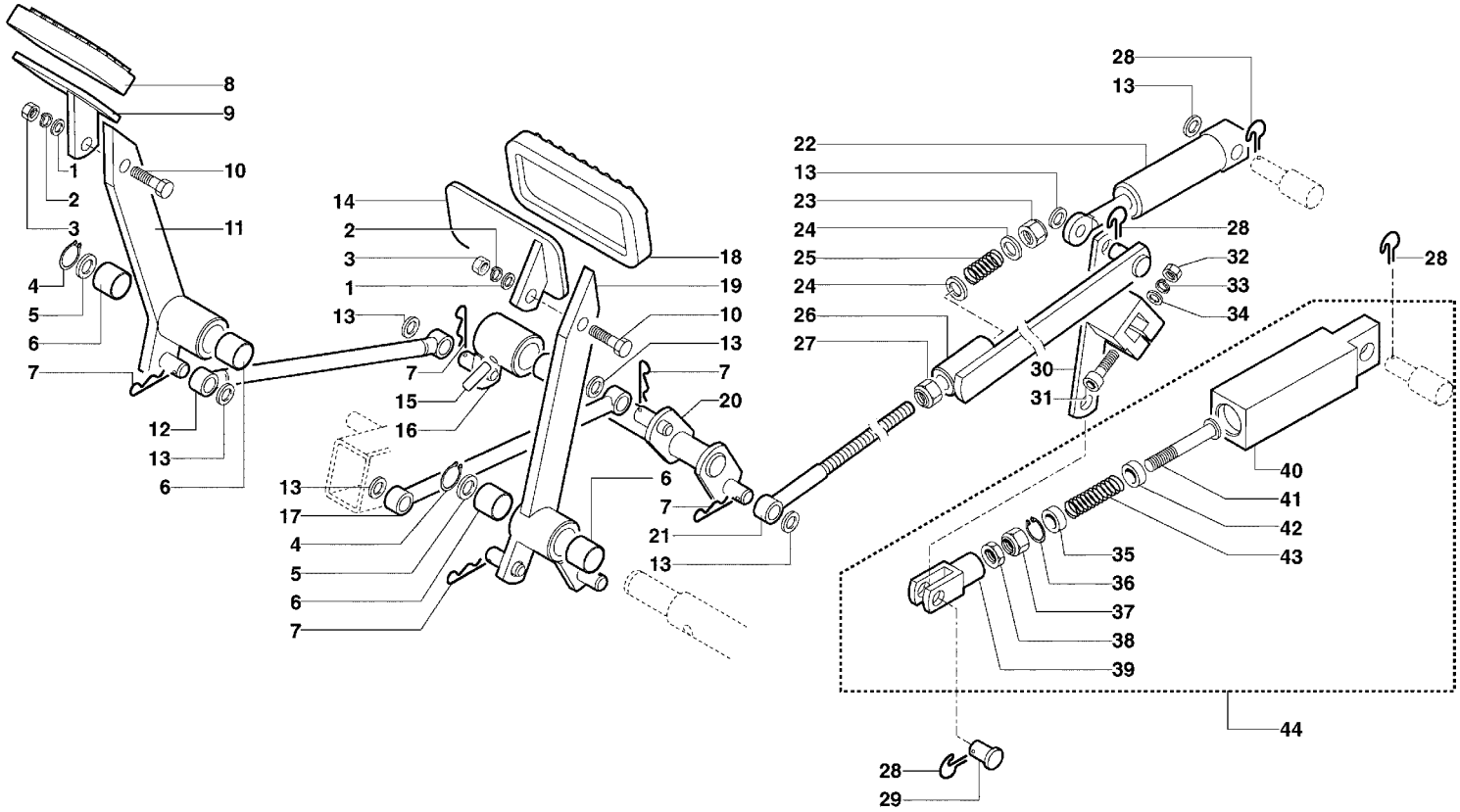
Tempario Serie 33		Tav. C2-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
3	Leva comando deviatore	Levier	Hebel	Lever	Palanca	0,25	0,25
7	Deviatore comando PTO	Déviateur	Verteiler	Switch	Desviador	0,75	0,75
10	Tubo mandata da valvola a PTO	Tuyau	Rohr	Pipe	Tubo	0,25	0,25
16	Tirante disinserimento comando PTO	Tirant	Zugstange	Tie rod	Tirante	0,2	0,2
19	Riga disinserimento comando PTO	Barre	Schiene	Line	Barra	0,15	0,2
20	Molla	Ressort	Feder	Spring	Resorte	0,15	0,15
21	Tubo comando PTO	Tuyau	Rohr	Pipe	Tubo	0,25	0,25
22	Tubo scarico PTO	Tuyau	Rohr	Pipe	Tubo	2	2,25

COMANDO POMPA IDROSTATICA
COMMANDE POMPE HYDROSTATIQUE
HYDROSTATISCHEPUMPESTEUERUNG
HYDROSTATIC PUMP CONTROL
MANDO BOMBA HIDROSTÀTICA

TAV. C3-10

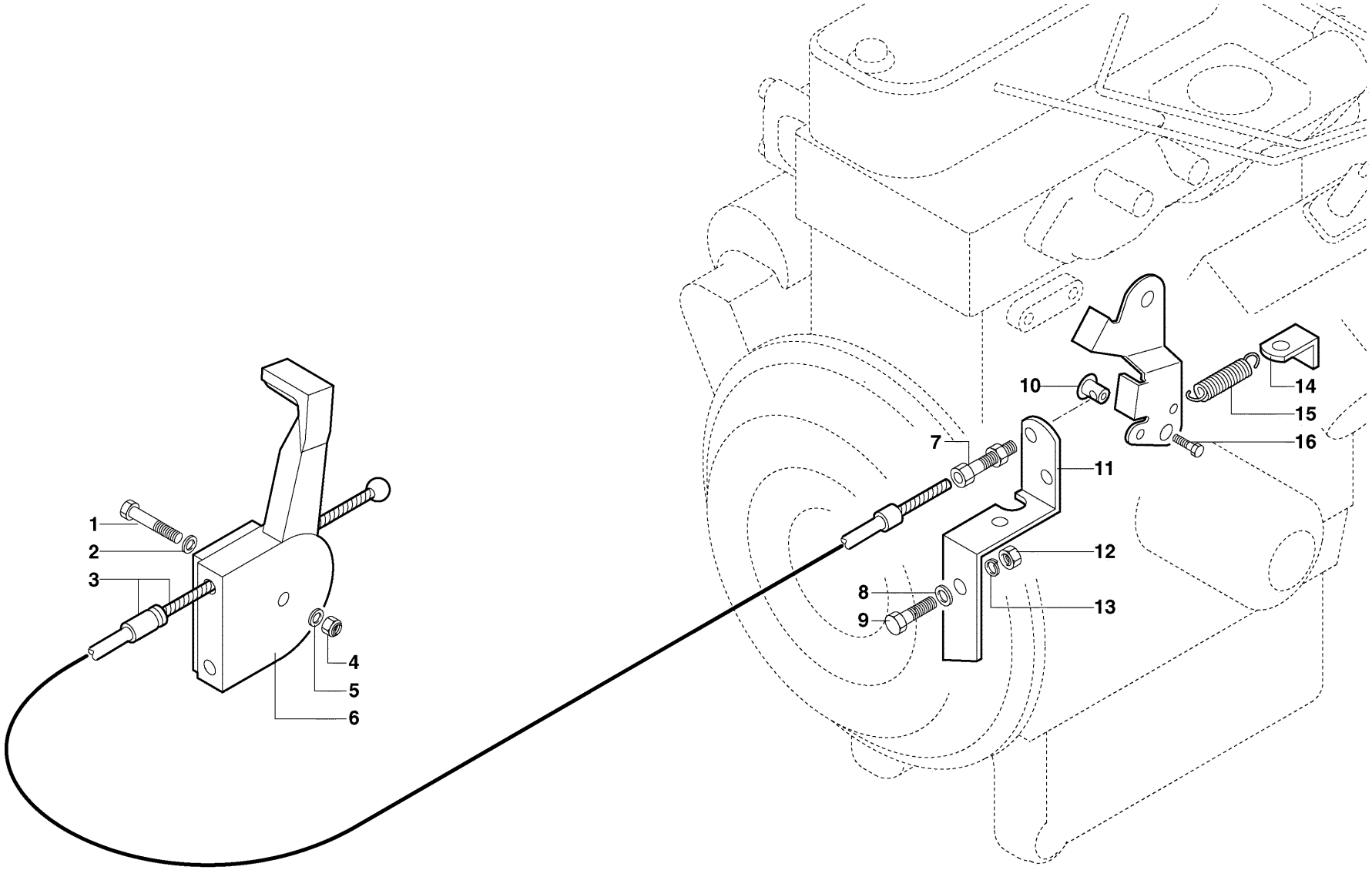
Da matr.	A matr.
00001	

4380030290O S04



Tempario Serie 33		Tav. C3-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
6	Boccola	Douille	Buchse	Bush	Casquillo	1,75	2,25
8	Copripedale retro	Couvre-pédale	Pedalabdeckung	Pedal cover	Cubrepedal	0,1	0,1
9	Pedalina retro completa	Pédale	Pedal	Pedal	Pedal	0,1	0,1
11	Pedale marcia indietro completo	Pédale	Pedal	Pedal	Pedal	1,75	2,25
12	Tirante comandi	Tirant	Zugstange	Tie rod	Tirante	0,15	0,15
14	Pedalina avanzamento completa	Pédale	Pedal	Pedal	Pedal	0,15	0,15
16	Leva comando rinvio	Levier	Hebel	Lever	Palanca	0,25	0,25
17	Tirante comandi	Tirant	Zugstange	Tie rod	Tirante	0,15	0,15
18	Copripedale avanzamento	Couvre-pédale	Pedalabdeckung	Pedal cover	Cubrepedal	0,1	0,1
19	Pedale comando marcia avanti completo	Pédale	Pedal	Pedal	Pedal	0,5	0,5
20	Leva rinvio comandi completo	Levier	Hebel	Lever	Palanca	0,3	0,3
21	Tirante comandi registrabile	Tirant	Zugstange	Tie rod	Tirante	0,75	0,75
22	Ammortizzatore comando pompa	Amortisseur	Stoßdämpfer	Shock absorber	Amortiguador	0,15	0,15
26	Tirante completo comandi	Tirant	Zugstange	Tie rod	Tirante	0,75	0,75
30	Leva comando pompa	Levier	Hebel	Lever	Palanca	0,5	0,5
44	Tirante comando pompa completo	Tirant	Zugstange	Tie rod	Tirante	0,5	0,5

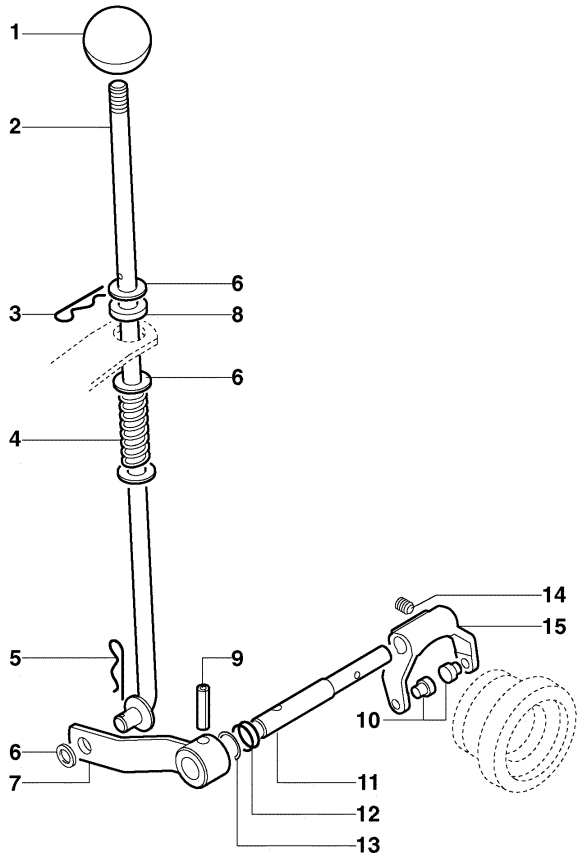
COMANDO ACCELERATORE
COMMANDE ACCELERATEUR
GASSTEUERUNG
ACCELERATOR CONTROL
MANDO ACELERADOR



Tempario Serie 33		Tav. C4-10			Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES		Senza cabina	Con cabina
3	Trasmissione flessibile	Transmission	Getriebe	Transmission	Transmisión		0,5	0,5
6	Leva acceleratore	Levier	Hebel	Lever	Palanca		0,25	0,25

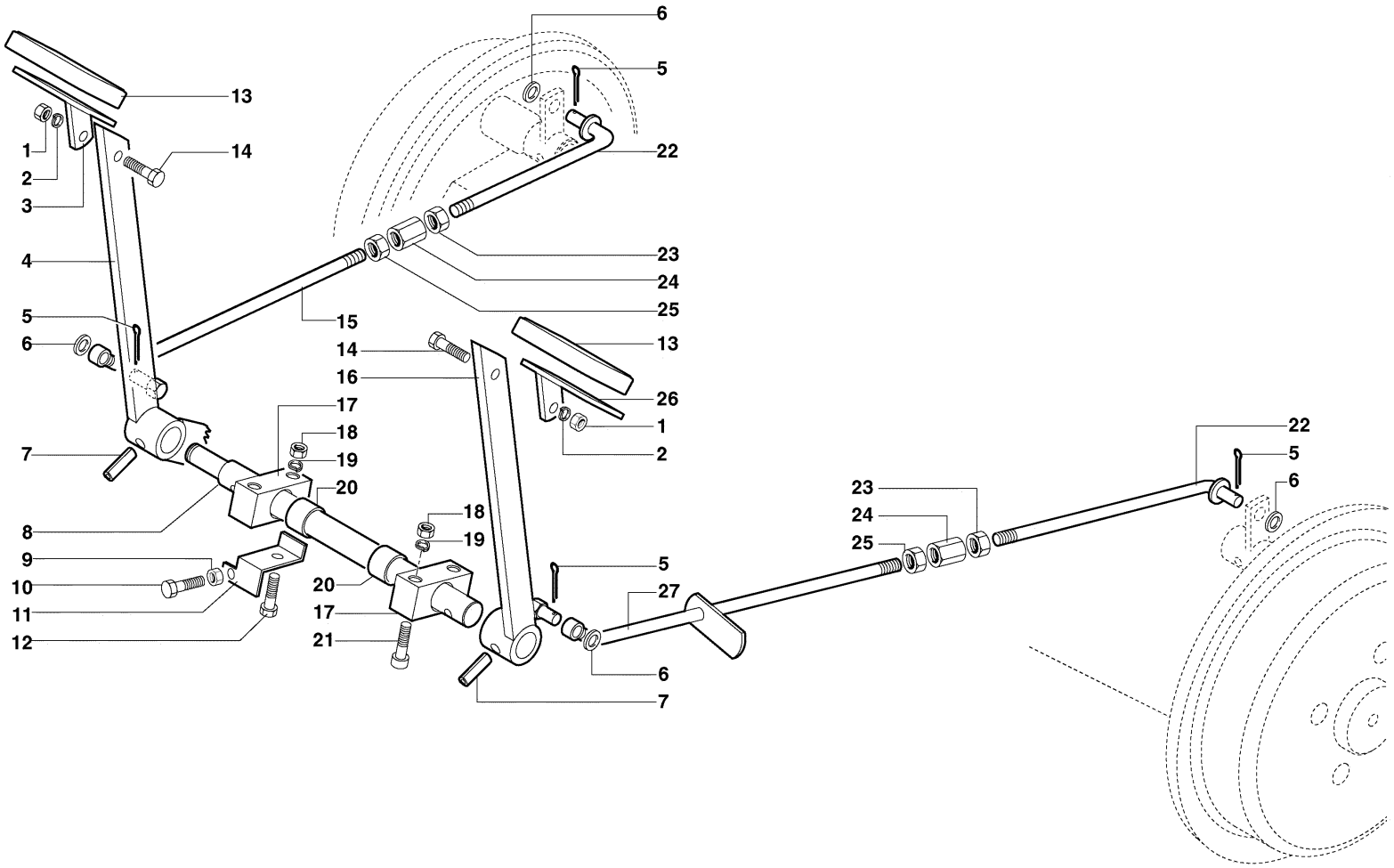
COMANDO BLOCCAGGIO DIFFERENZIALE
COMMANDE BLOCAGE DIFFERENTIEL
STEUERUNGEN DIFFERENTIALBLOCKIERUNG
DIFFERENTIAL BLOCKAGE CONTROL
MANDO BLOQUEO DIFERENCIAL

43800302500 S04



Tempario Serie 33		Tav. C5-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
2	Asta comando bloccaggio differenziale	Tige	Stange	Rod	Varilla	0,15	0,15
4	Molla	Ressort	Feder	Spring	Resorte	0,15	0,15
7	Leva comando bloccaggio differenziale	Levier	Hebel	Lever	Palanca	0,15	0,15
10	Perno blocco differenziale	Pivot	Zapfen	Pin	Perno	1	1
11	Asta blocco differenziale	Tige	Stange	Rod	Varilla	1,25	1,25
15	Forcella bloccaggio differenziale	Fourche	Gabelstück	Fork	Horquilla	1,25	1,25

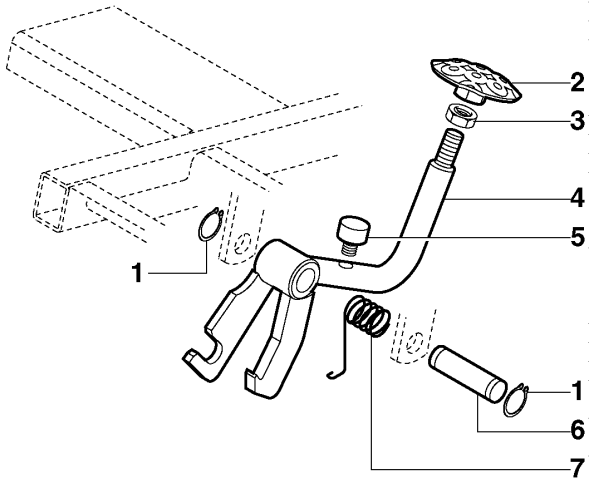
43800302600 S04



Tempario Serie 33		Tav. C6-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
3	Pedalina freno completa	Pédale	Pedal	Pedal	Pedal	0,15	0,15
4	Pedale freno completo	Pédale	Pedal	Pedal	Pedal	1	1
8	Perno rotazione comandi	Pivot	Zapfen	Pin	Perno	1	1
11	Riga fermo pedale freno	Barre	Schiene	Line	Barra	0,1	0,1
13	Copripedale	Couvre-pédale	Pedalabdeckung	Pedal cover	Cubrepedal	0,1	0,1
15	Tirante freno	Tirant	Zugstange	Tie rod	Tirante	0,25	0,25
16	Pedale freno completo	Pédale	Pedal	Pedal	Pedal	1	1
17	Supporto albero comandi	Support	Halterung	Support	Soporte	1	1
20	Boccola	Douille	Buchse	Bush	Casquillo	1	1
22	Tirante registrabile freni	Tirant	Zugstange	Tie rod	Tirante	0,25	0,25
26	Pedalina freno completa	Pédale	Pedal	Pedal	Pedal	0,1	0,1
27	Tirante freno completo	Tirant	Zugstange	Tie rod	Tirante	0,3	0,3

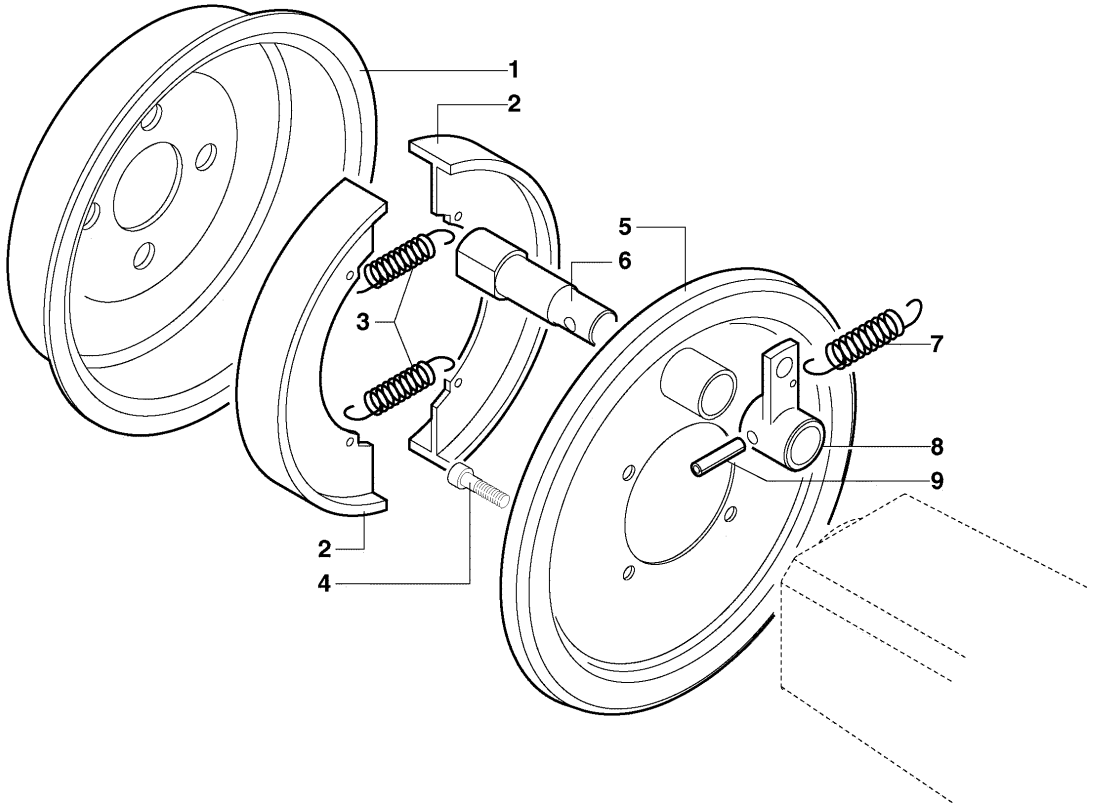
FRENO DI STAZIONAMENTO
FREIN DE STATIONNEMENT
FESTSTELLBREMSE O HANDBREMSE
PARKING BRAKE
FRENO DE MANO

43800302700 S04



Tempario Serie 33		Tav. C6-20		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
2	Staffa pedale acceleratore	Etrier	Bügel	Bracket	Estribo	0,1	0,1
4	Leva freno di stazionamento completa	Levier	Hebel	Lever	Palanca	0,3	0,3
6	Perno freno di stazionamento	Pivot	Zapfen	Pin	Perno	0,3	0,3
7	Molla	Ressort	Feder	Spring	Resorte	0,3	0,3

43800302800 S04



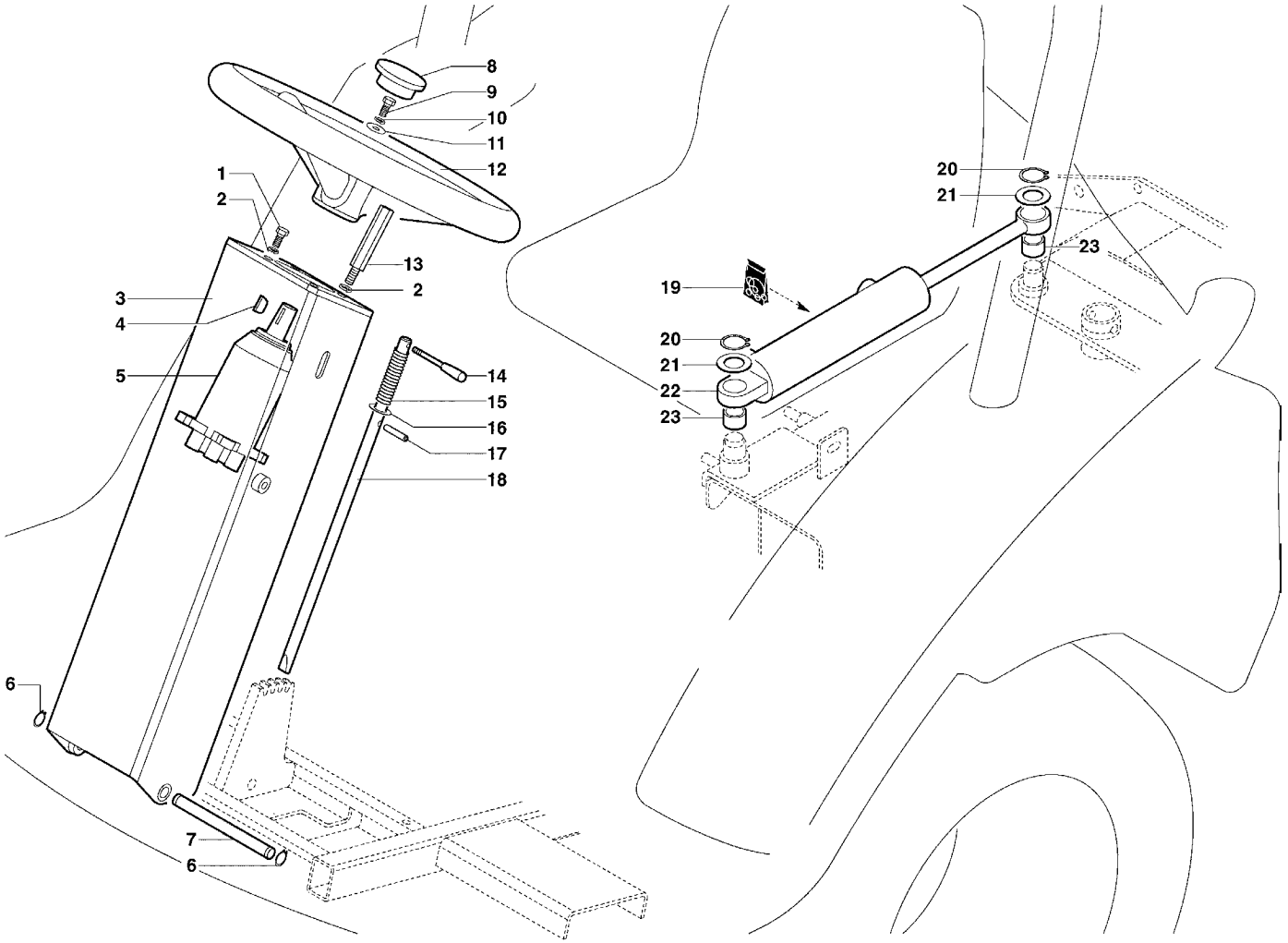
Tempario Serie 33		Tav. C6-30		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Tamburo freno	Tambour	Trommel	Drum	Tambor	0,2	0,2
2	Coppia ganascie	Couple mâchoires	Bremsbacken	Pair of brake shoes	Par zapatas	0,3	0,3
3	Coppia molle	Couple ressorts	Feder	Pair of springs	Par muelles	0,3	0,3
5	Flangia	Bride	Flansch	Flange	Brida	1,25	1,25
6	Perno oliva	Pivot	Zapfen	Pin	Perno	0,4	0,4
7	Molla	Ressort	Feder	Spring	Resorte	0,1	0,1
8	Leva freno destra	Levier frein droite	Rechter Bremshebel	Right brake lever	Planca freno derecha	0,15	0,15
	Leva freno sinistra	Levier frein gauche	Linker Bremshebel	Left brake lever	Planca freno izquierda	0,15	0,15

COMANDO STERZO
COMMANDE DIRECTION
LENKSTEUERUNG
STEERING WHEEL CONTROL
MANDO DIRECCIÓN

TAV. C7-10

Da matr.	A matr.
00001	

4380302900 S08



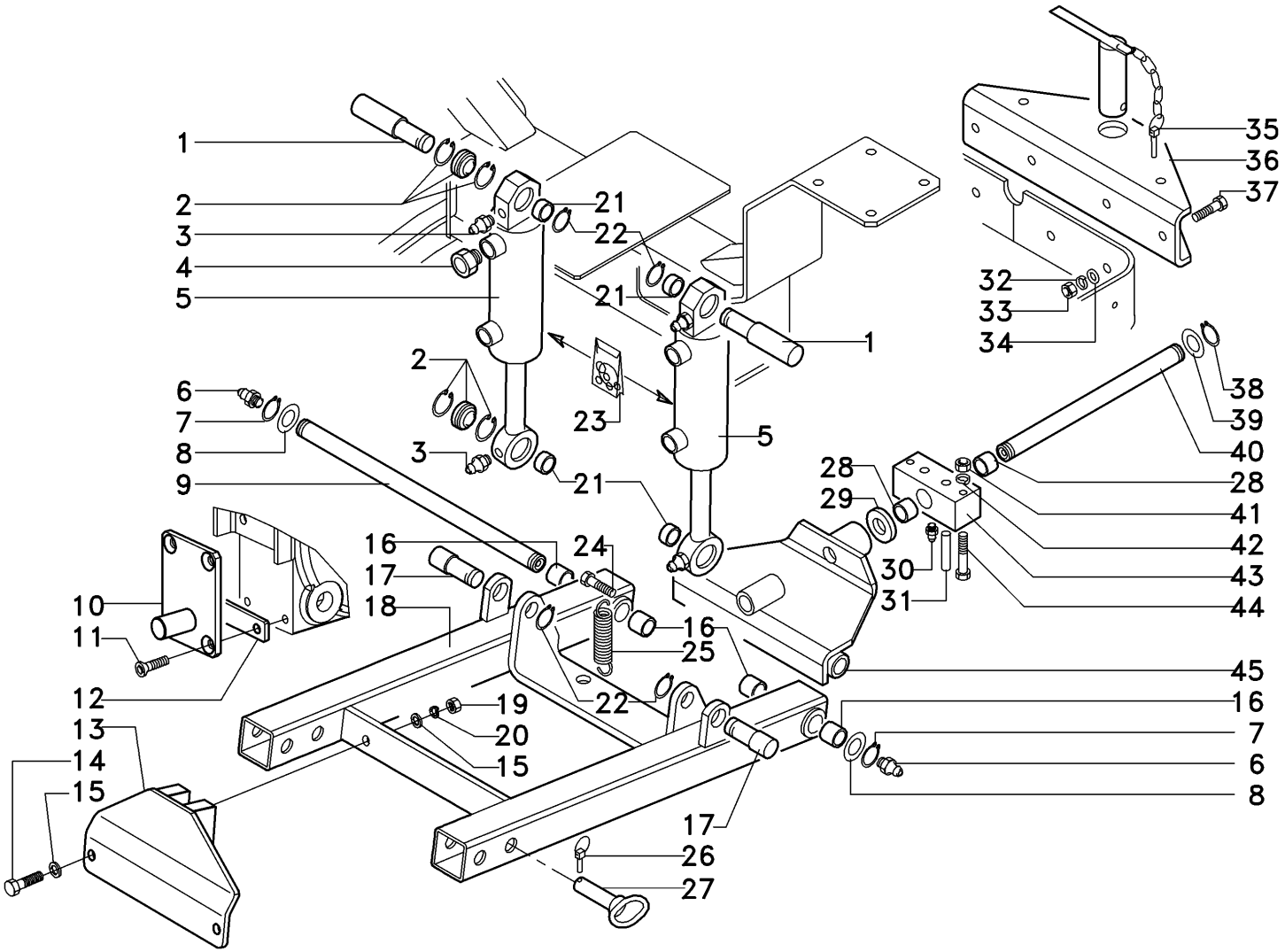
Tempario Serie 33		Tav. C7-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
3	Supporto idroguida	Support	Halterung	Support	Soporte	2	2,5
5	Idroguida OSPM 50 PB	Hydroguidage	Hydrolenkung	Hydrodrive	Hidroguía	1	1
12	Volante Ø 360	Volant	Lenkrad	Hand wheel	Volante	0,15	0,15
14	Impugnatura	Poignée	Griff	Hand-grip	Empuñadura	0,1	0,1
18	Asta posizionatrice torretta	Tige	Stange	Rod	Varilla	1	1
19	Serie guanizioni (23405018)	Série de joints	Dichtungen	Set of gaskets	Juego de juntas	1	1
22	Cilindro a doppio effetto	Cylindre	Zylinder	Cylinder	Cilindro	0,7	0,7
23	Boccola MB 2015 DU	Douille	Buchse	Bush	Casquillo	0,7	0,7

DISPOSITIVO ATTACCO ATTREZZI
DISPOSITIF ATTACHE DES OUTILS
GERÄTE - KUPPLUNGSVORRICHTUNG
IMPLEMENTS COUPLING DEVICE
DISPOSITIVO ENGANCHE UTENSILIOS

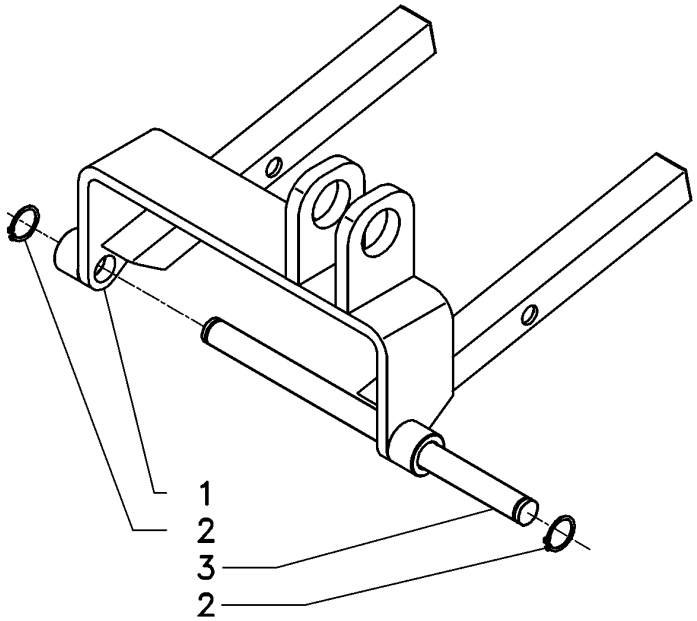
TAV. D1-10

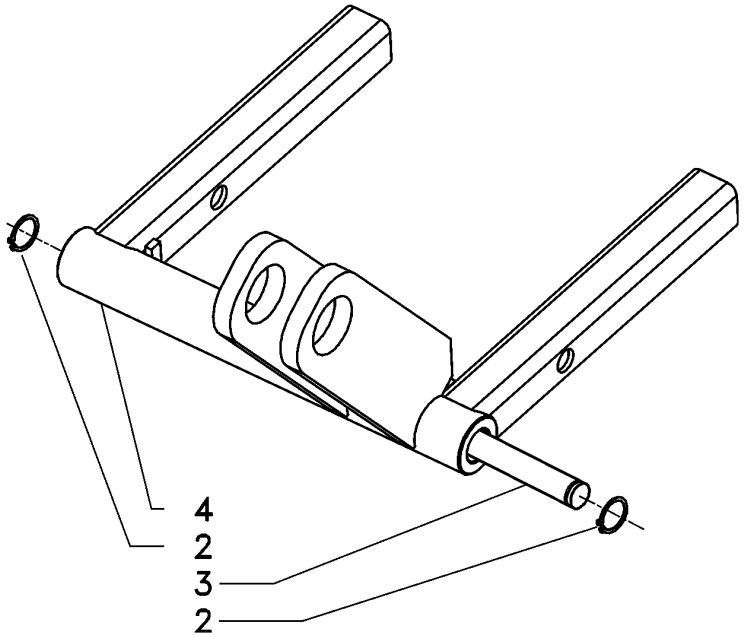
Da matr.	A matr.
00001	

02–09–2003



Tempario Serie 33		Tav. D1-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
5	Cilindro sollevamamento doppio effetto	Cylindre	Zylinder	Cylinder	Cilindro	2,5	2,75
9	Perno oscillazione barre sollevamento	Pivot	Zapfen	Pin	Perno	0,25	0,25
10	Guida rinforzo sollevamento	Guidage	Schiene	Guide	Guía	0,15	0,15
12	Riga	Barre	Schiene	Line	Barra	0,15	0,15
13	Rinforzo sollevamento	Renfort	Verstärkung	Reinforcement	Refuerzo	0,15	0,15
16	Boccola	Douille	Buchse	Bush	Casquillo	0,3	0,3
18	Attacco sollevamento completo	Arrache	Kupplung	Hitch	Enganche	0,5	0,5
21	Bussola distanziale (superiore)	Douille	Buchse	Bush	Forro	2,25	2,5
	Bussola distanziale (inferiore)	Douille	Buchse	Bush	Forro	0,3	0,3
23	Serie guarnizioni (23405020)	Série de joints	Dichtungen	Set of gaskets	Juego de juntas	2,75	3
25	Molla	Ressort	Feder	Spring	Resorte	0,1	0,1
28	Boccola MB 2015 DU	Douille	Buchse	Bush	Casquillo	1	1
29	Ralla di usura sollevamento	Rondelle	Unterlegscheibe	Washer	Arandela	0,75	0,75
36	Attacco gancio di traino	Arrache	Kupplung	Hitch	Enganche	0,25	0,25
40	Perno oscillazione sollevamento	Pivot	Zapfen	Pin	Perno	0,75	0,75
43	Blocchetto supporto perno oscillazione	Bloc	Block	Block	Bloque	1	1
45	Snodo sollevamento completo	Joint	Gelenk	Articulation	Articulación	0,75	0,75


1
2
3
2


4
2
3
2

Tempario Serie 33		Tav. D1-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Attacco sollevamento (R 1500 - RT 1500)	Attelage élévateur tondeuse à gazon	Hubwerkkupplung des Rasenmährs	Lawn mower lifting attachment	Ataque elevador cortacéspedes	0,25	0,25
3	Perno	Pivot	Zapfen	Pin	Perno	0,25	0,25
4	Attacco sollevamento (RP 1500)	Arrache	Kupplung	Hitch	Enganche	0,25	0,25

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

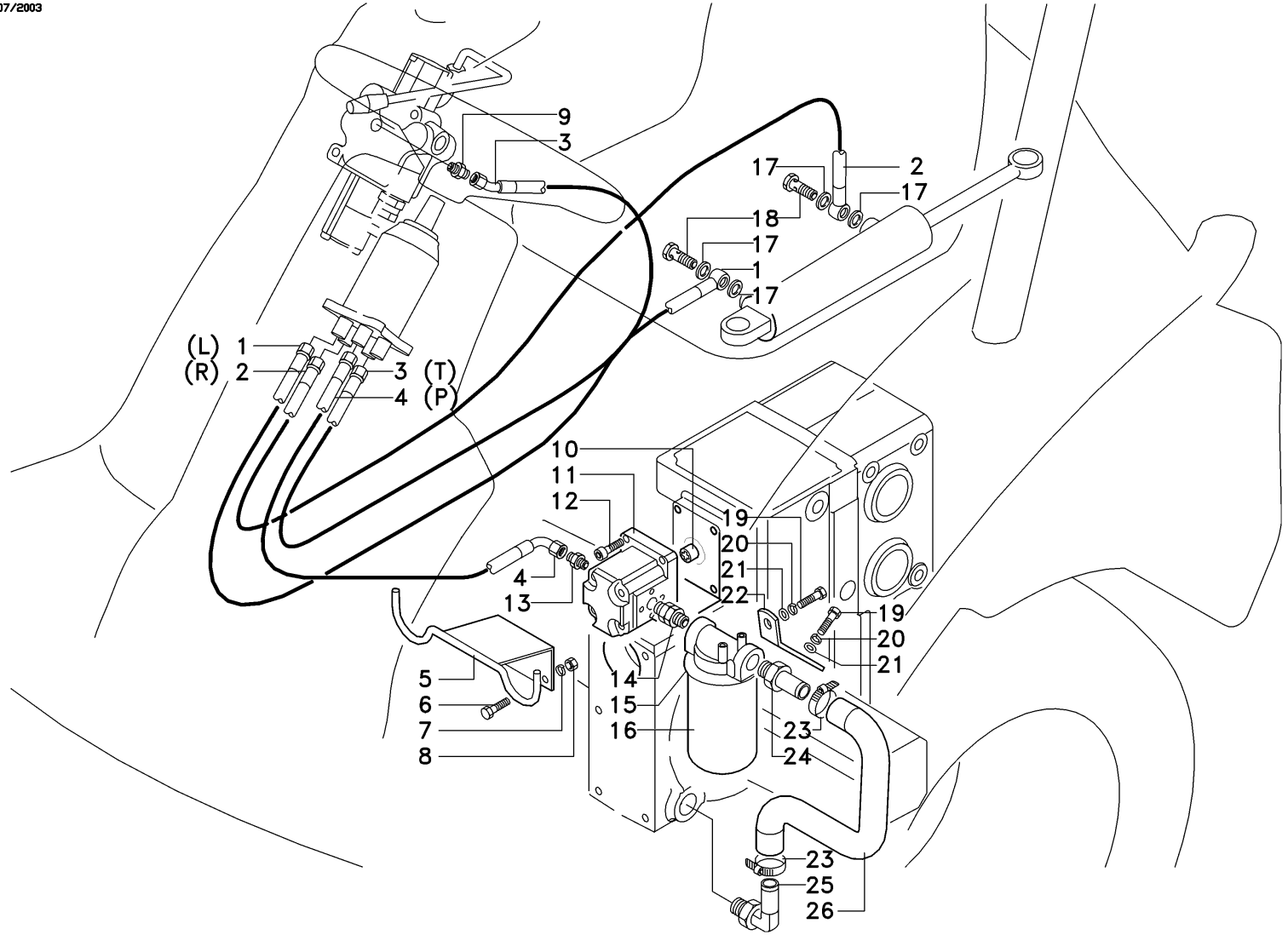
Rondò K327 – Rondò K333

IMPIANTO IDRAULICO DA POMPA A IDROGUIDA
INSTALLATION HYDRAULIQUE DE LA POMPE A HYDROGUIDE
HYDROANLAGE VON DER PUMPE ZUR HYDROLENKUNG
HYDRAULIC SYSTEM FROM PUMP TO HYDRODRIVE
INSTALACIÓN HIDRÁULICA DE BOMBA A HIDROGUÍA

TAV. D2-10

Da matr.	A matr.
00001	

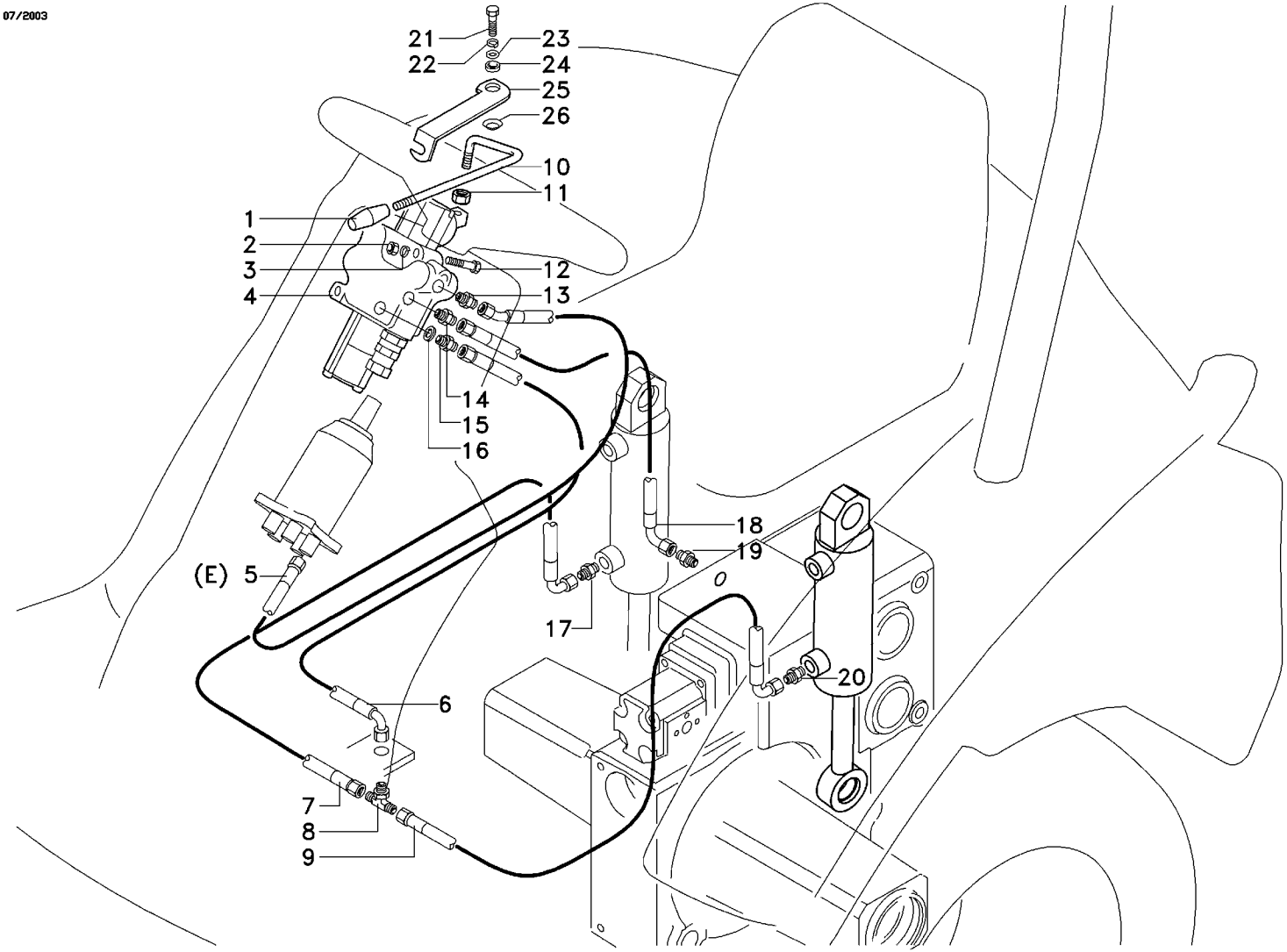
07/2003



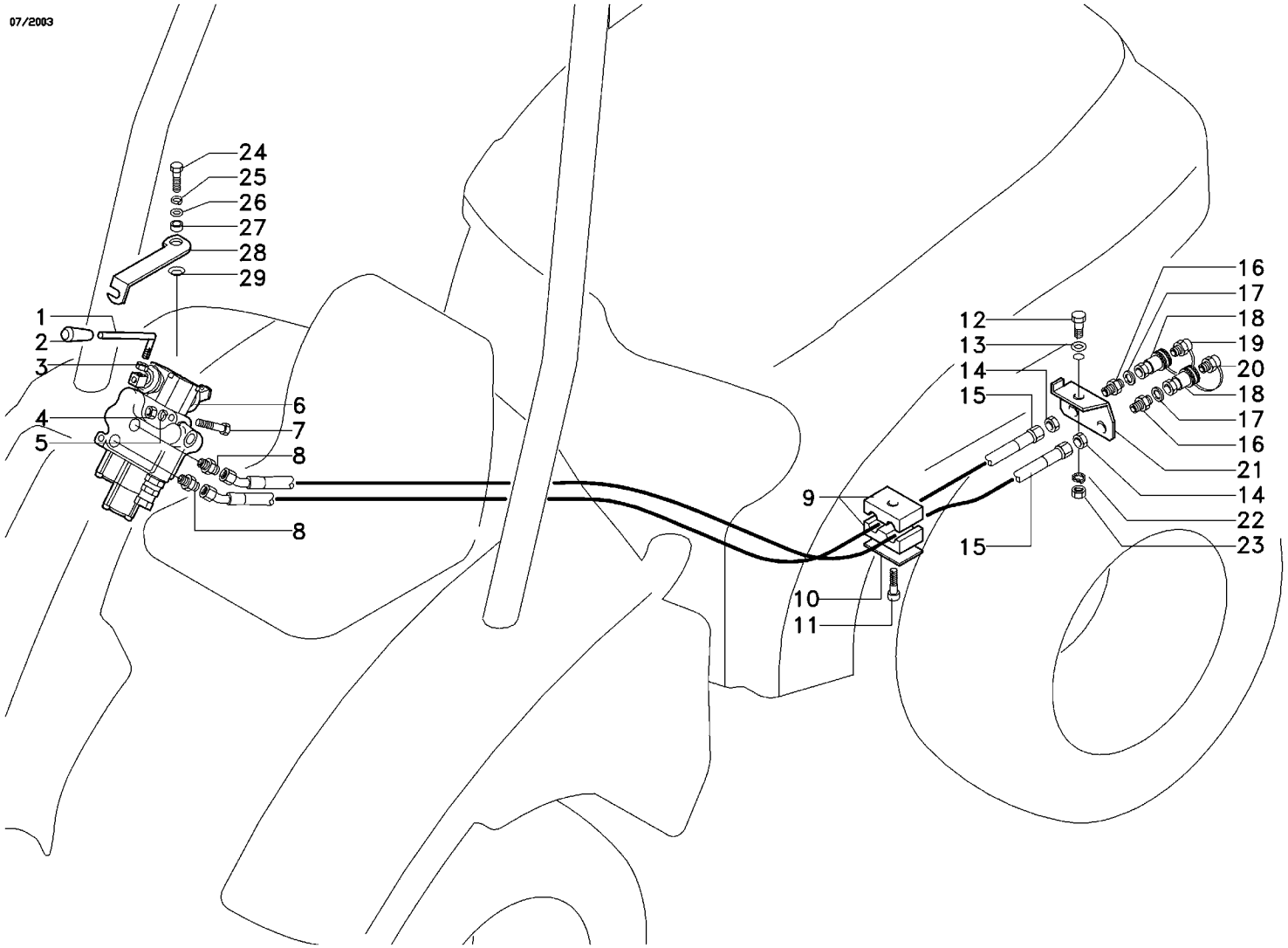
Tempario Serie 33		Tav. D2-10		Da matr. 00001		A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION		DENOMINACIONES	Senza cabina	Con cabina
1	Tubo mandata da idroguida a cilindro sterzo	Tuyau	Rohr	Pipe		Tubo	1	1
2	Tubo mandata da idroguida a cilindro sterzo	Tuyau	Rohr	Pipe		Tubo	1	1
3	Tubo scarico idroguida	Tuyau	Rohr	Pipe		Tubo	1	1
4	Tubo mandata da pompa a idroguida	Tuyau	Rohr	Pipe		Tubo	1	1
5	Supporto tubi	Support	Halterung	Support		Soporte	0,15	0,15
10	Giunto a croce per pompa	Joint	kupplung	Joint		Junta	1	1
11	Pompa idroguida (corta)	Pompe	Pumpe	Pump	(short)	Bomba	1	1
	Pompa idroguida (lunga)	Pompe	Pumpe	Pump	(long)	Bomba	2,5	2,75
15	Supporto filtro olio	Support	Halterung	Support		Soporte	0,35	0,35
16	Filtro	Filtre	Filter	Filter		Filtro	0,15	0,15
26	Manicotto di aspirazione	Manchon	Muffe	Sleeve		Manguito	0,25	0,25

IMPIANTO IDRAULICO DA IDROGUIDA A SOLLEVAMENTO
INSTALLATION HYDRAULIQUE DE L'HYDROGUIDE AU SOULEVEMENT
HYDRAULIKANLAGE VON DER HYDROLENKUNG ZUM HEBEWERK
HYDRAULIC SYSTEM FROM HYDRODRIVE TO LIFTING
INSTALACION HIDRAULICA DE HIDROGUIA A ELEVADOR

07/2003

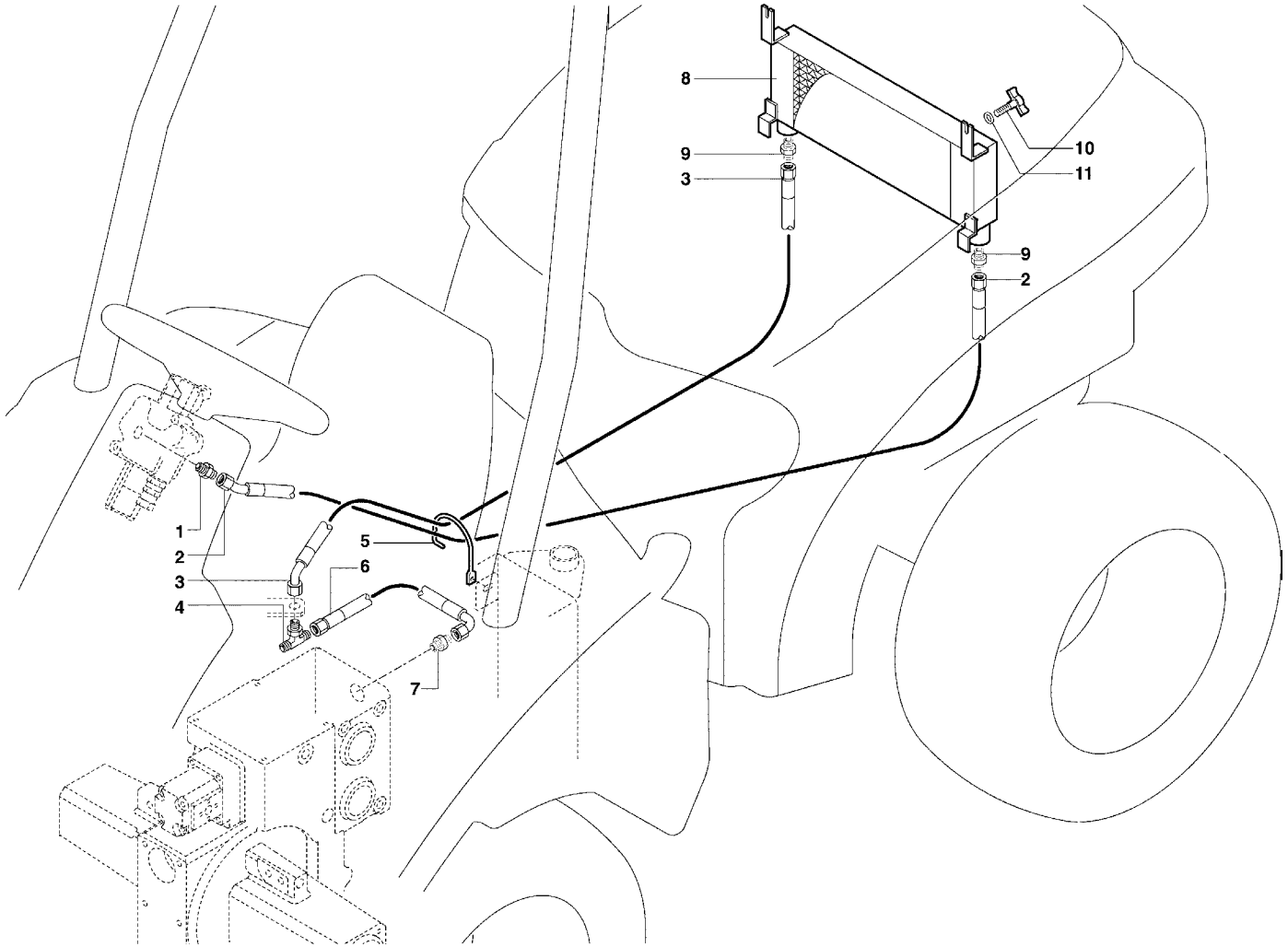


Tempario Serie 33		Tav. D3-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
4	Distributore M/1 spola speciale	Distributeur	Verteiler	Distributor	Distribuidor	0,75	0,75
5	Tubo scarico idroguida mandata distributore	Tuyau	Rohr	Pipe	Tubo	1	1
6	Tubo mandata ai cilindri sollevamento	Tuyau	Rohr	Pipe	Tubo	0,5	0,5
7	Tubo mandata ai cilindri sollevamento	Tuyau	Rohr	Pipe	Tubo	0,75	0,75
9	Tubo mandata ai cilindri sollevamento	Tuyau	Rohr	Pipe	Tubo	0,75	0,75
10	Leva interna comando distributore	Levier	Hebel	Lever	Palanca	0,4	0,4
18	Tubo scarico da deviatore a coperchio PTO	Tuyau	Rohr	Pipe	Tubo	0,25	0,25
25	Riga (00150->)	Barre	Schiene	Line	Barra	0,1	0,1
26	Molla a disco Ø 14,2 x 28 x 1 DIN 2093	Ressort	Feder	Spring	Resorte	0,1	0,1

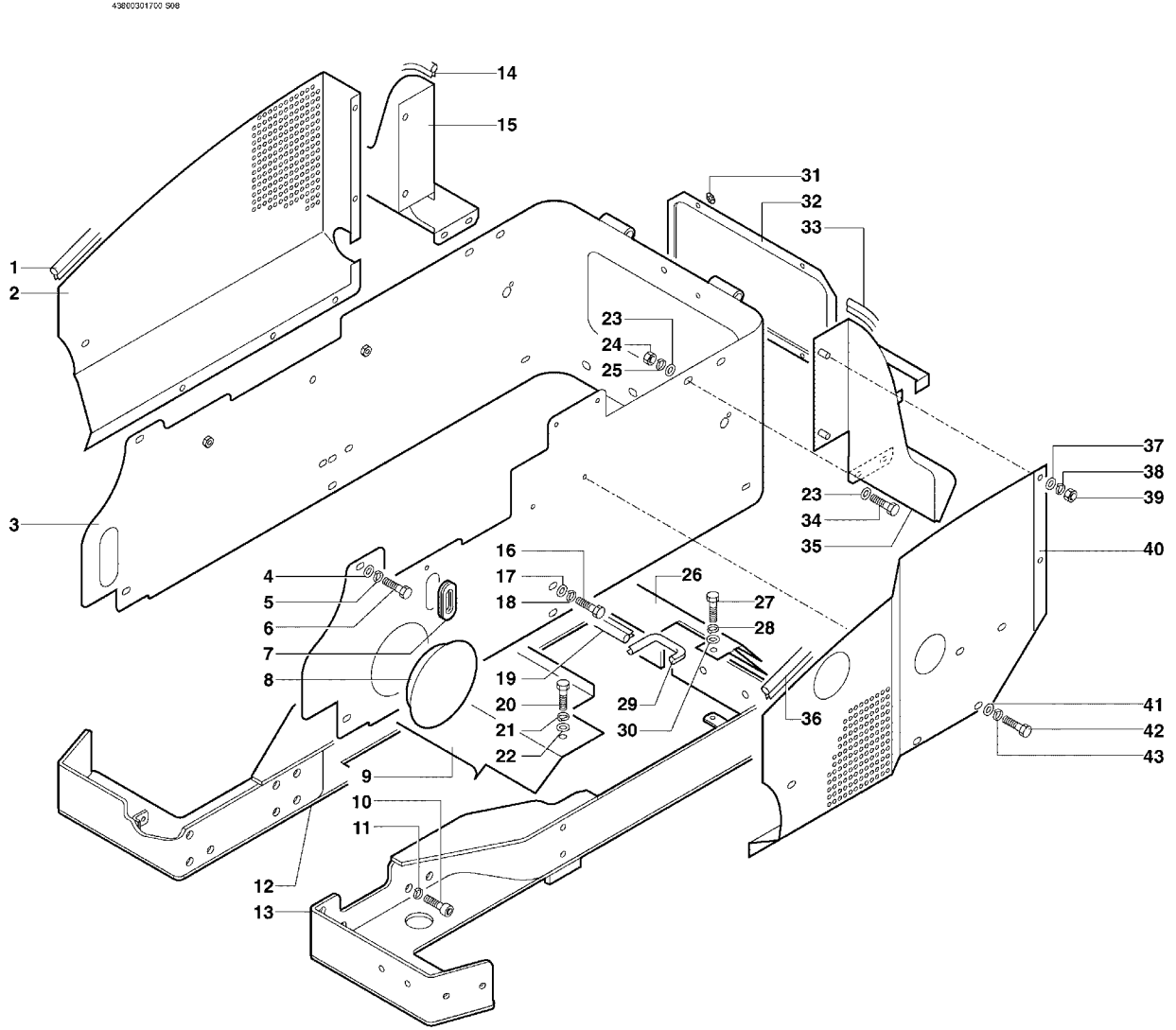

07/2003
24
25
26
27
28
29
1
2
3
4
5
6
7
8
8
9
10
11
12
13
14
15
15
16
17
18
19
20
18
17
16
21
14
22
23

Tempario Serie 33		Tav. D4-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Leva distributore ausiliario	Levier	Hebel	Lever	Palanca	0,1	0,1
6	Distributore 2 leve	Distributeur	Verteiler	Distributor	Distribuidor	1	1
9	Semicollare fermatubi	Support fixation tuyaux	Halbbundring zur Schlauchbefestigung	Pipe support	Soporte fijaciòn tubos	0,1	0,1
10	Piastra superiore fermatubi	Plaque	Platte	Plate	Placa	0,1	0,1
15	Tubo prese idrauliche	Tuyau	Rohr	Pipe	Tubo	0,4	0,4
18	Presa idraulica femmina	Prise hydraulique	Hydraulik-Anschluß	Hydraulic outlet	Toma hidráulica	0,1	0,1
21	Supporto prese idrauliche	Support	Halterung	Support	Soporte	0,25	0,25
28	Riga	Barre	Schiene	Line	Barra	0,1	0,1
29	Molla a disco	Ressort	Feder	Spring	Resorte	0,1	0,1

4380030400 S08



Tempario Serie 33		Tav. D5-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
2	Tubo mandata radiatore olio	Tuyau	Rohr	Pipe	Tubo	0,5	0,5
3	Tubo da radiatore a raccordo	Tuyau	Rohr	Pipe	Tubo	0,5	0,5
5	Tondo per cavallotto supporto tubi	Arrêt	Anschlag	Catch	Tope	0,15	0,15
6	Tubo mandata motore idrostatico e PTO	Tuyau	Rohr	Pipe	Tubo	0,8	0,8
8	Radiatore olio	Radiateur	Kühler	Radiator	Radiador	0,5	0,5


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43

Tempario Serie 33		Tav. E1-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
2	Paratia laterale	Cloison	Schott	Bulkhead	Mampara	0,1	0,1
3	Fiancata completa	Joue	Seitenwand	Body side	Flanco	1,5	1,5
9	Lamiera di chiusura inferiore	Tôle	Platte	Plate	Chapa	0,25	0,25
12	Supporto fiancate	Support	Halterung	Support	Soporte	2,25	2,25
13	Supporto fiancate	Support	Halterung	Support	Soporte	2,25	2,25
15	Paratia divisione	Cloison	Schott	Bulkhead	Mampara	0,15	0,15
26	Lamiera deviatrice di flusso	Tôle	Platte	Plate	Chapa	0,15	0,15
32	Mascherina frontale	Couvre	Maske	Grille	Rejilla	0,15	0,15
35	Paratia divisione	Cloison	Schott	Bulkhead	Mampara	0,15	0,15
40	Paratia laterale	Cloison	Schott	Bulkhead	Mampara	0,3	0,3

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

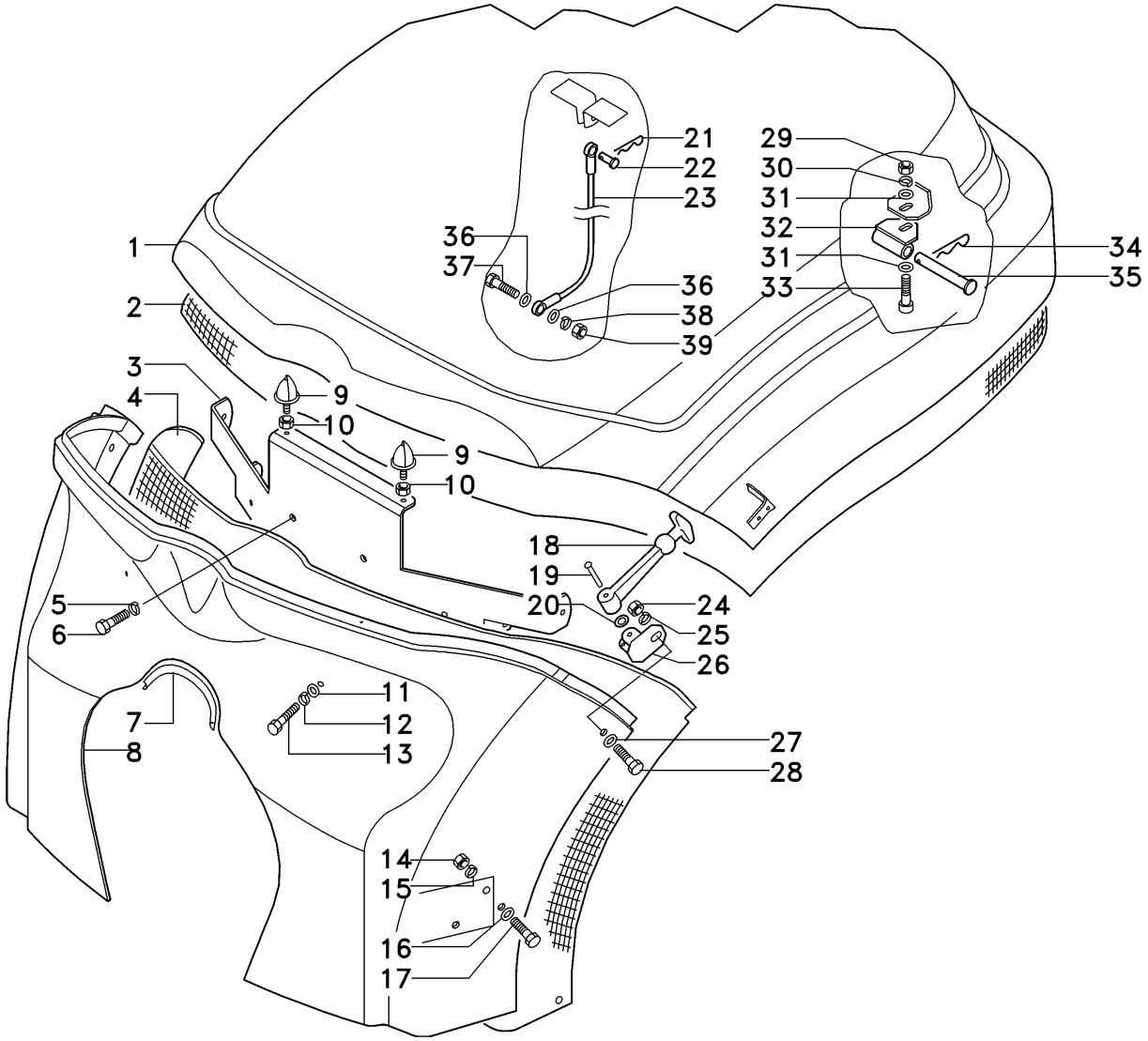
Rondò K327 – Rondò K333

COFANATURA
COFFRE
HAUBE
BONNET
CAPÓ

TAV. E1-20

Da matr.	A matr.
00001	

07/2003



Tempario Serie 33		Tav. E1-20		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	**DENOMINAZIONE**	**DESIGNATION**	**BENENNUNG**	**DESCRIPTION**	**DENOMINACIONES**	**Senza cabina**	**Con cabina**
1	Manto cofano	Capot	Mantel	Lining	Manto capo	**0,15**	**0,15**
	Manto cofano e insonorizzante	Capot et Insonorisant	Mantel und Schallschluckendes	Lining and Soundproofing system	Manto capo y Insonorizador	**0,35**	**0,35**
	Manto cofano, insonorizzante e adesivi	Capot, Insonorisant et autocollants	Mantel, Schallschluckendes und aufkleber	Lining, Soundproofing system and stickers	Manto capo, Insonorizador y adhesivos	**0,5**	**0,5**
2	Insonorizzante	Insonorisant	Schallschluckendes	Soundproofing system	Insonorizador	**0,25**	**0,25**
3	Piastra supporto fiancate	Plaque	Platte	Plate	Placa	**0,4**	**0,4**
4	Insonorizzante	Insonorisant	Schallschluckendes	Soundproofing system	Insonorizador	**0,25**	**0,25**
8	Protezione centrale motore	Protection	Schutz	Shield	Protección	**0,15**	**0,15**
	Protezione centrale motore e insonorizzante	Protection et Insonorisant	Schutz und Schallschluckendes	Shield and Soundproofing system	Protección y insonorizador	**0,35**	**0,35**
	Protezione centrale motore, insonorizzante e adesivi	Protection, insonorisant et autocollants	Schutz, Schallschluckendes und Aufkleber	Shield, soundproofing system and stickers	Protección, insonorizador y adhesivos	**0,5**	**0,5**
18	Tirante	Tirant	Zugstange	Tie rod	Tirante	**0,15**	**0,15**
23	Fune	Câble	Seil	Cable	Cable	**0,15**	**0,15**

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

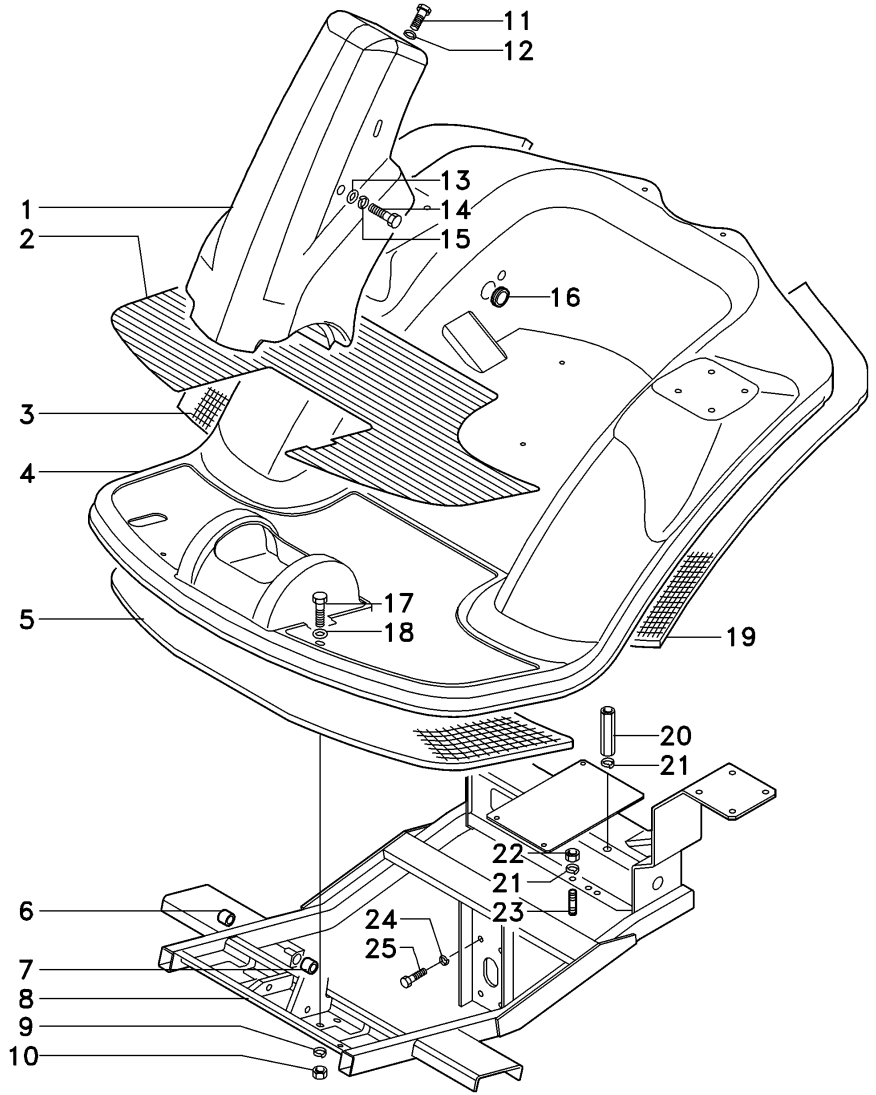
Rondò K327 – Rondò K333

PIATTAFORMA
PLATE-FORME
PLATTFORM
PLATFORM
PLATAFORMA

TAV. E2-10

Da matr.	A matr.
00001	

03–09–2003



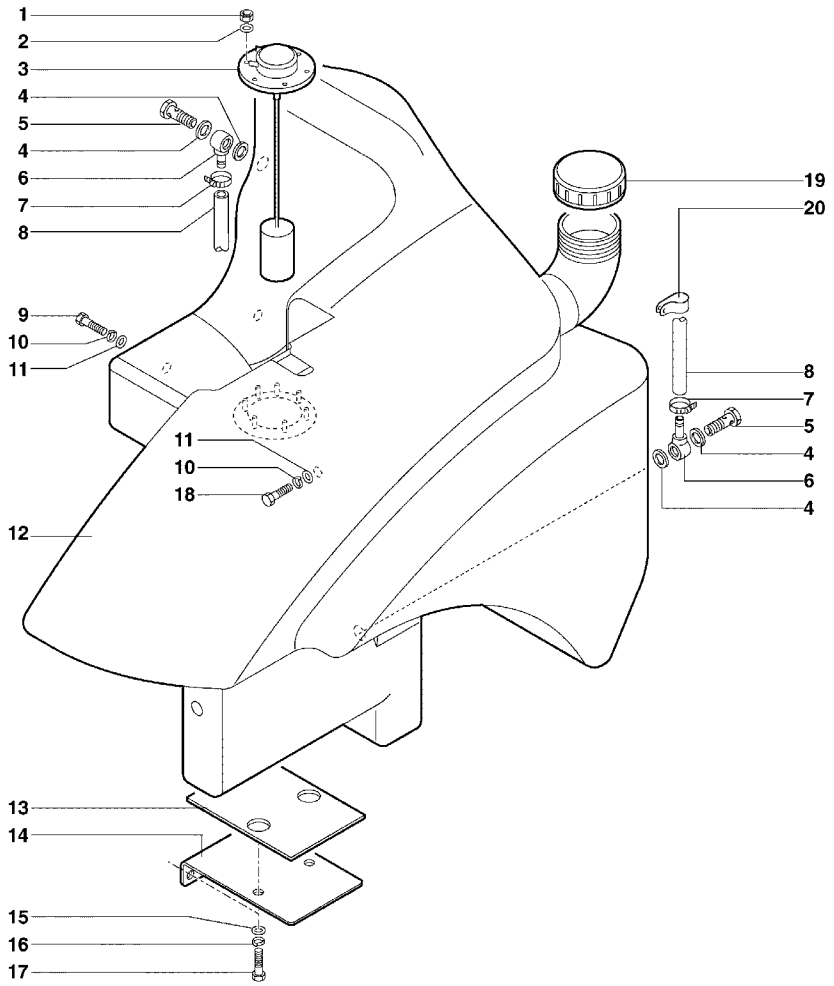
Tempario Serie 33		Tav. E2-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Torretta completa	Tourelle complète	Kompletter Turm	Complete turret	Torreta completa	0,7	0,8
3	Insonorizzante	Insonorisant	Schallschluckendes	Soundproofing system	Insonorizador	2	2,5
4	Piattaforma	Plate-forme	Plattform	Platform	Plataforma	1,75	2,25
5	Insonorizzante	Insonorisant	Schallschluckendes	Soundproofing system	Insonorizador	2	2,5
8	Supporto piattaforma	Support	Halterung	Support	Soporte	6	6,5
19	Insonorizzante	Insonorisant	Schallschluckendes	Soundproofing system	Insonorizador	2	2,5

SERBATOIO
RESERVOIR
TANK
TANK
DEPÓSITO

TAV. E3-10

Da matr.	A matr.
00001	

43800302000 S06



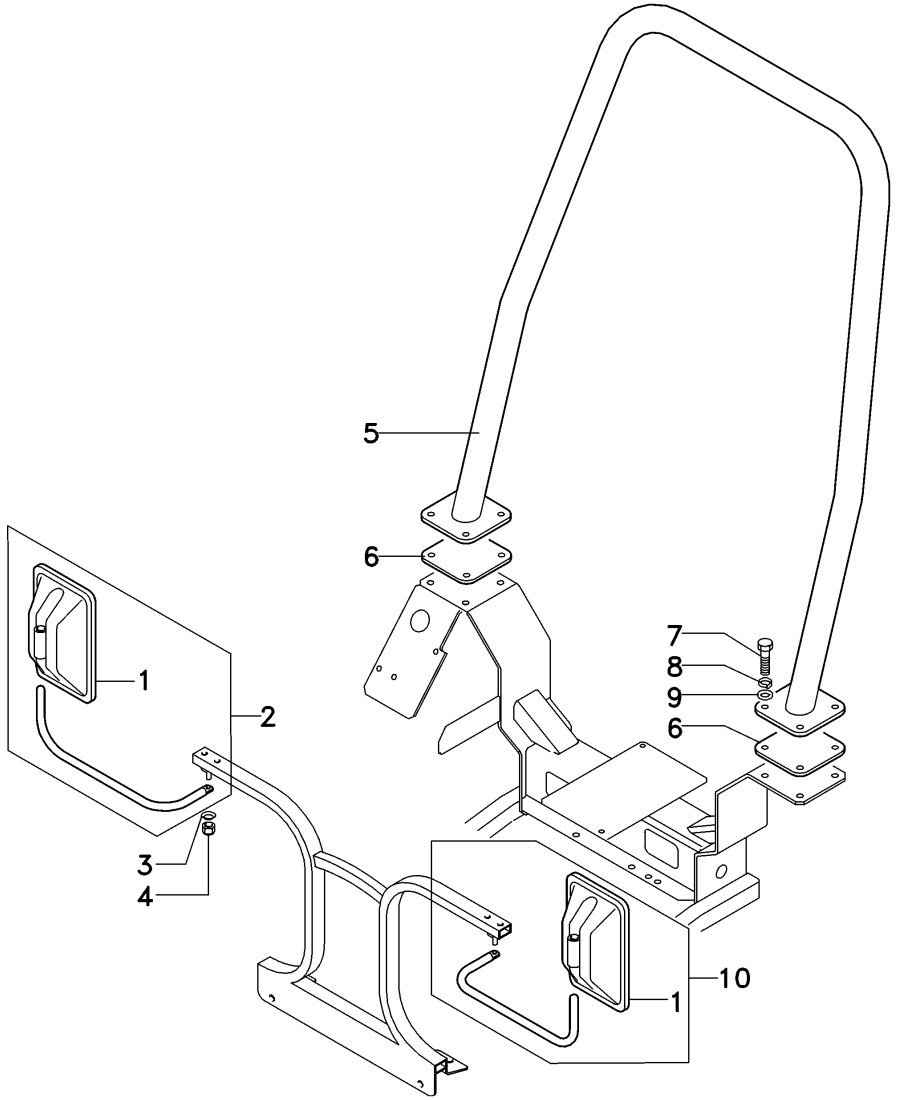
Tempario Serie 33		Tav. E3-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
3	Galleggiante	Flotteur	Schwimmer	Float	Flotador	1,15	1,4
8	Tubo Ø 7 x 13	Tuyau	Rohr	Pipe	Tubo	0,25	0,25
12	Serbatoio combustibile	Réservoir	Tank	Tank	Depósito	1	1,25
13	Feltro appoggio serbatoio	Feutre	Filz	Felt	Fieltro	0,25	0,25
14	Piastra supporto serbatoio	Plaque	Platte	Plate	Placa	0,25	0,25

TELAIO DI SICUREZZA
CHASSIS DE SECURITÉ
SICHERHEITSRAHMEN
SAFETY CHASSIS
BASTIDOR DE SEGURIDAD

TAV. E4-10

Da matr.	A matr.
00001	

07/2003



Tempario Serie 33		Tav. E4-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Coppa specchio	Carter rétroviseur	Spiegelhause	Mirror housing	Caja espejo retrovisor	0,2	
2	Specchio completo Dx	Rétroviseur	Spiegel	Mirror	Espejo	0,2	
5	Arco di protezione	Roll-bar	Überrollbügel	Roll-bar	Barra antivuelco	0,25	
10	Specchio completo Sx	Rétroviseur	Spiegel	Mirror	Espejo	0,2	

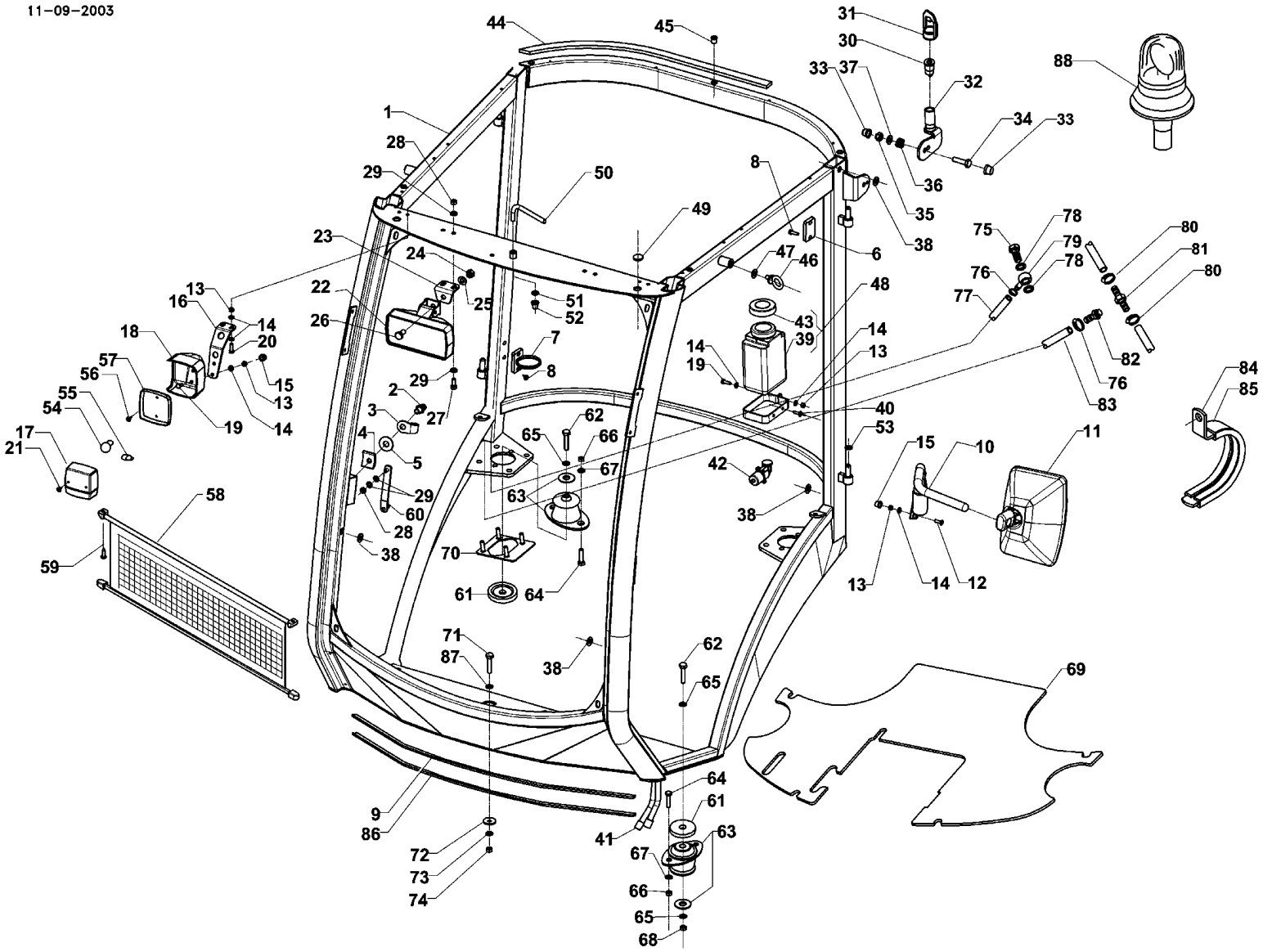
Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

Rondò K327 – Rondò K333

STRUTTURA
STRUCTURE
STRUKTUR
STRUCTURE
ESTRUCTURA

TAV. E5-10

Da matr.	A matr.
00001	



Tempario Serie 33		Tav. E5-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
	Cabina completa	Cabine complète	Kompletter Kabine	Complete cab	Cabina completa		2
10	Asta sinistra	Tige gauche	Linker Stange	Left Rod	Varilla izquierda		0,15
	Asta destra	Tige droite	Rechter Stange	Right Rod	Varilla derecha		0,15
11	Coppa specchio	Carter rétroviseur	Spiegelhause	Mirror housing	Caja espejo retrovisor		0,15
17	Vetro fanale direzione e posizione	Vitre	Glas	Glass	Cristal		0,15
18	Carenatura sinistra	Carénage gauche	Linke Verkleidung	Left fairing	Carena izquierda		0,25
	Carenatura destra	Carénage droit	Rechte Verkleidung	Right fairing	Carena derecha		0,25
22	Faro di lavoro	Phare	Scheiinwerfer	Headlight	Faro		0,15
32	Supporto	Support	Halterung	Support	Soporte		0,15
42	Elettropompa 12 V	Electropompe	Elektropumpe	Electropump	Electrobomba		0,2
48	Serbatoio conpleto	Réservoir	Tank	Tank	Depósito		0,15
50	Tubo	Tuyau	Rohr	Pipe	Tubo		0,6
57	Fanale anteriore direzione e posizione	Phare	Leuchte	Light	Luz		0,25
61	Fermocorsa superiore	Butèe de fin de course	Hubanschlag	Travel stop	Dispositivo de bloqueo		0,5
63	Silent-block	Silent bloque	Silent-Block	Silent-bloc	Silent-bloc		0,6
69	Tappeto piattaforma	Tapis	Teppich	Carpet	Alfombrilla		0,25
70	Piastra	Plaque	Platte	Plate	Placa		0,6
77	Tubo	Tuyau	Rohr	Pipe	Tubo		1
83	Tubo	Tuyau	Rohr	Pipe	Tubo		1

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

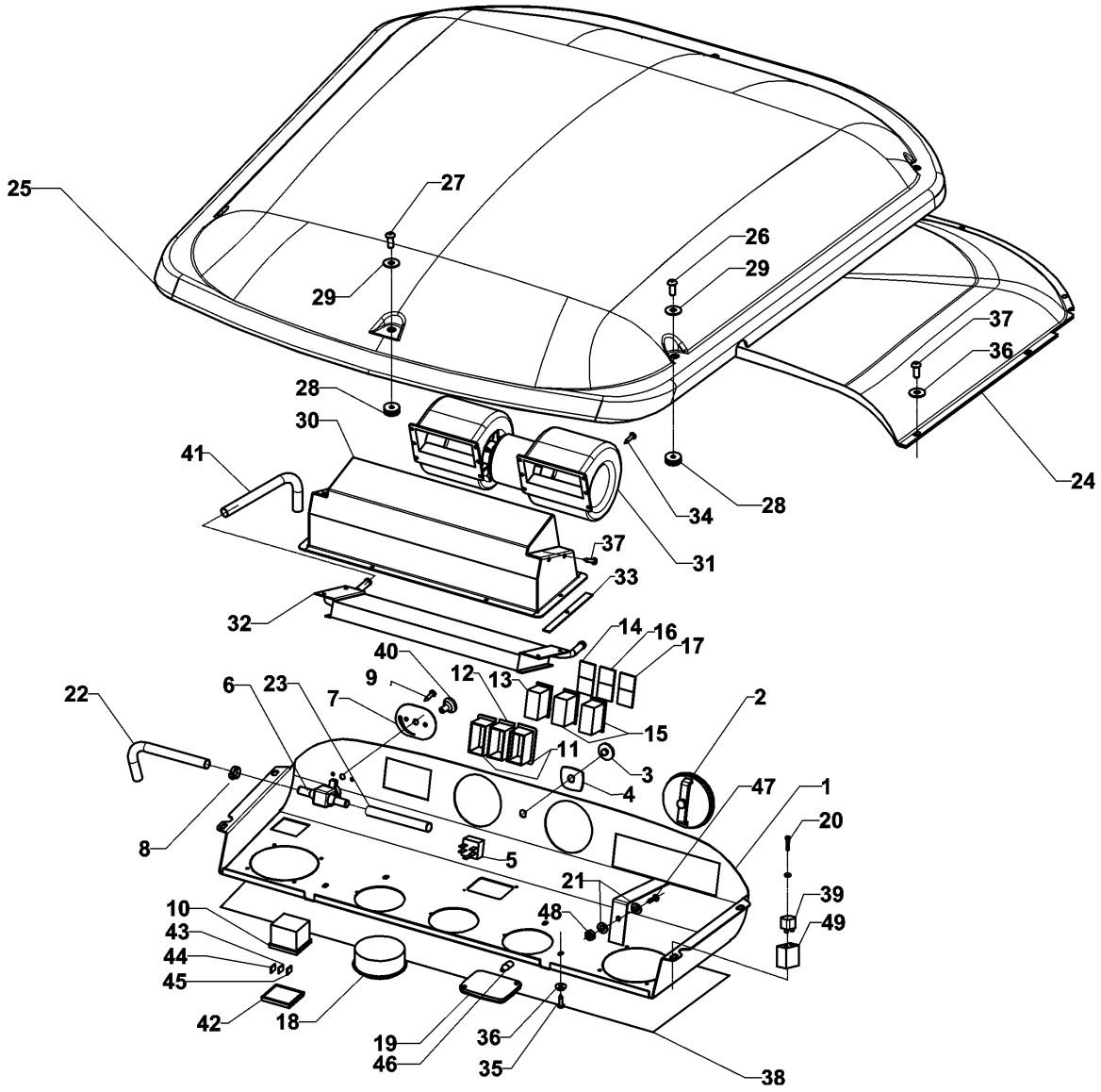
Rondò K327 – Rondò K333

TETTO E SOTTOTETTO
TOIT ET REMBOURAGE
DACH UND DACHBODEN
ROOF AND UNDERROOF
TECHO Y SUBTECHO

TAV. E5-20

Da matr.	A matr.
00001	

28-07-2003



Tempario Serie 33		Tav. E5-20		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Sottotetto	Galetas	Söller	Under roof	Subtecho		2
5	Interruttore	Intérrupteur	Schalter	Switch	Interruptor		0,5
6	Rubinetto riscaldamento	Robinet	Hahn	Tap	Grifo		0,6
10	Portafusibile	Porte-fusible	Sicherungskasten	Fuse-holder	Portafusible		0,5
13	Interruttore tergi	Intérrupteur	Schalter	Switch	Interruptor		0,5
15	Interruttore fari	Intérrupteur	Schalter	Switch	Interruptor		0,5
22	Tubo	Tuyau	Rohr	Pipe	Tubo		1
23	Tubo	Tuyau	Rohr	Pipe	Tubo		0,6
24	Guscio sottotetto	Coque rembourrage	Dachbodenschale	Underroof shell	Casco subtecho		0,6
25	Tetto	Toit	Dach	Roof	Techo		0,35
30	Scatola	Boîte	Gehäuse	Box	Caja		0,75
31	Elettroventilatore	Ventilateur électrique	Elektroventilator	Electric ventilator	Electroventilador		0,7
32	Radiatore	Radiateur	Kühler	Radiator	Radiador		0,75
39	Relè 12 V	Relais	Relais	Relay	Relé		0,35
41	Tubo	Tuyau	Rohr	Pipe	Tubo		1

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

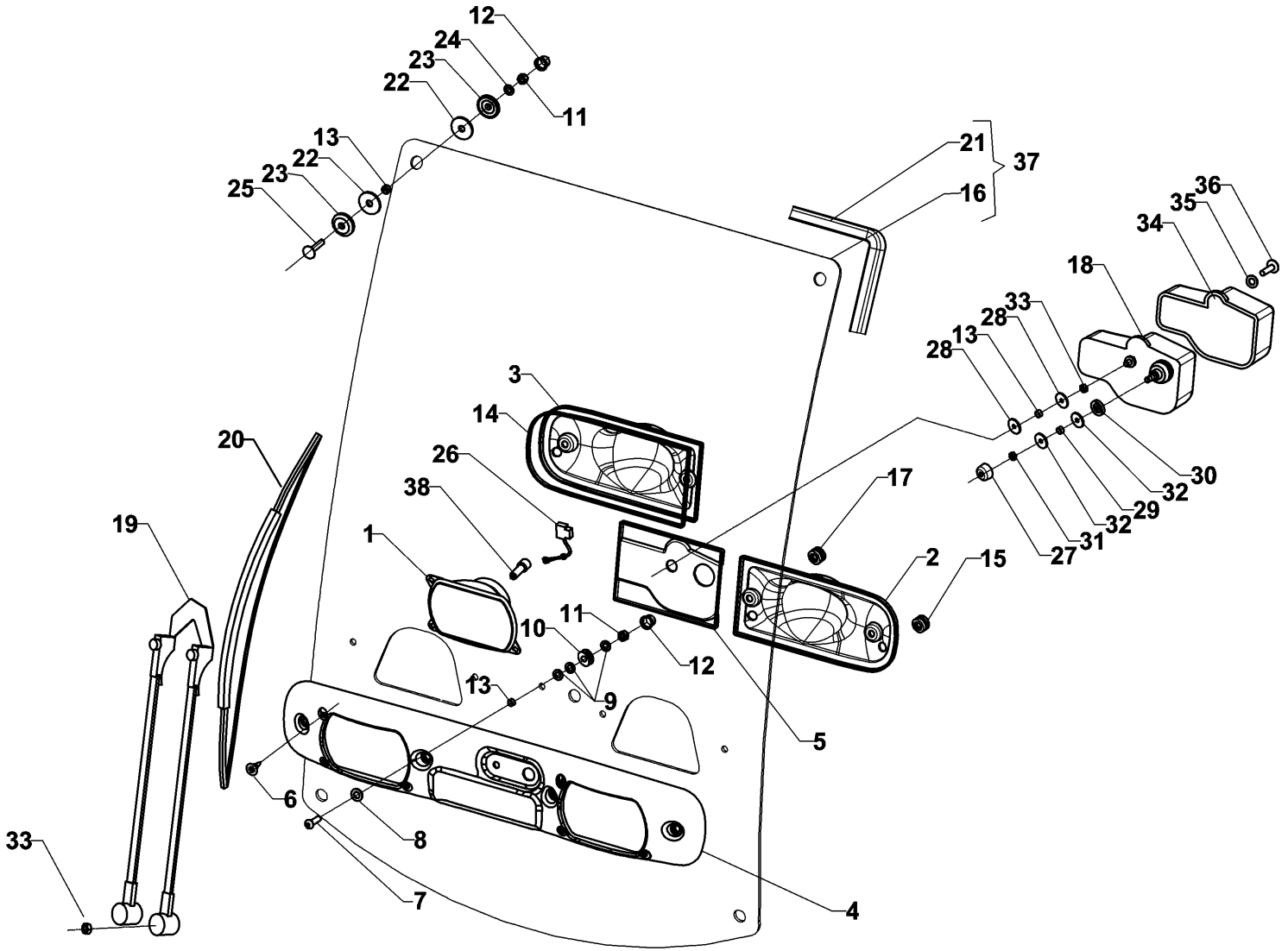
Rondò K327 – Rondò K333

VETRO FRONTALE
VITRE FRONTAL
FRONTSCHEIBE
FRONT GLASS
CRISTAL FRONTAL

TAV. E5-30

Da matr.	A matr.
00001	

28–07–2003



Tempario Serie 33		Tav. E5-30		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Faro di lavoro	Phare	Scheiinwerfer	Headlight	Faro		0,75
2	Coppa retrofaro	Coupe retro-phare	Hintenscheinwerfers-wanne	Rear light cup	Cárter retro-faro		0,5
3	Coppa retrofaro	Coupe retro-phare	Hintenscheinwerfers-wanne	Rear light cup	Cárter retro-faro		0,5
4	Mascherina anteriore	Couvre	Maske	Grille	Rejilla		0,75
5	Mascherina interna	Couvre	Maske	Grille	Rejilla		0,5
16	Vetro anteriore	Vitre	Glas	Glass	Cristal		1,25
18	Motorino tergi 90°	Moteur	Motor	Motor	Motorcillo		0,5
37	Vetro anteriore	Vitre	Glas	Glass	Cristal		1

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

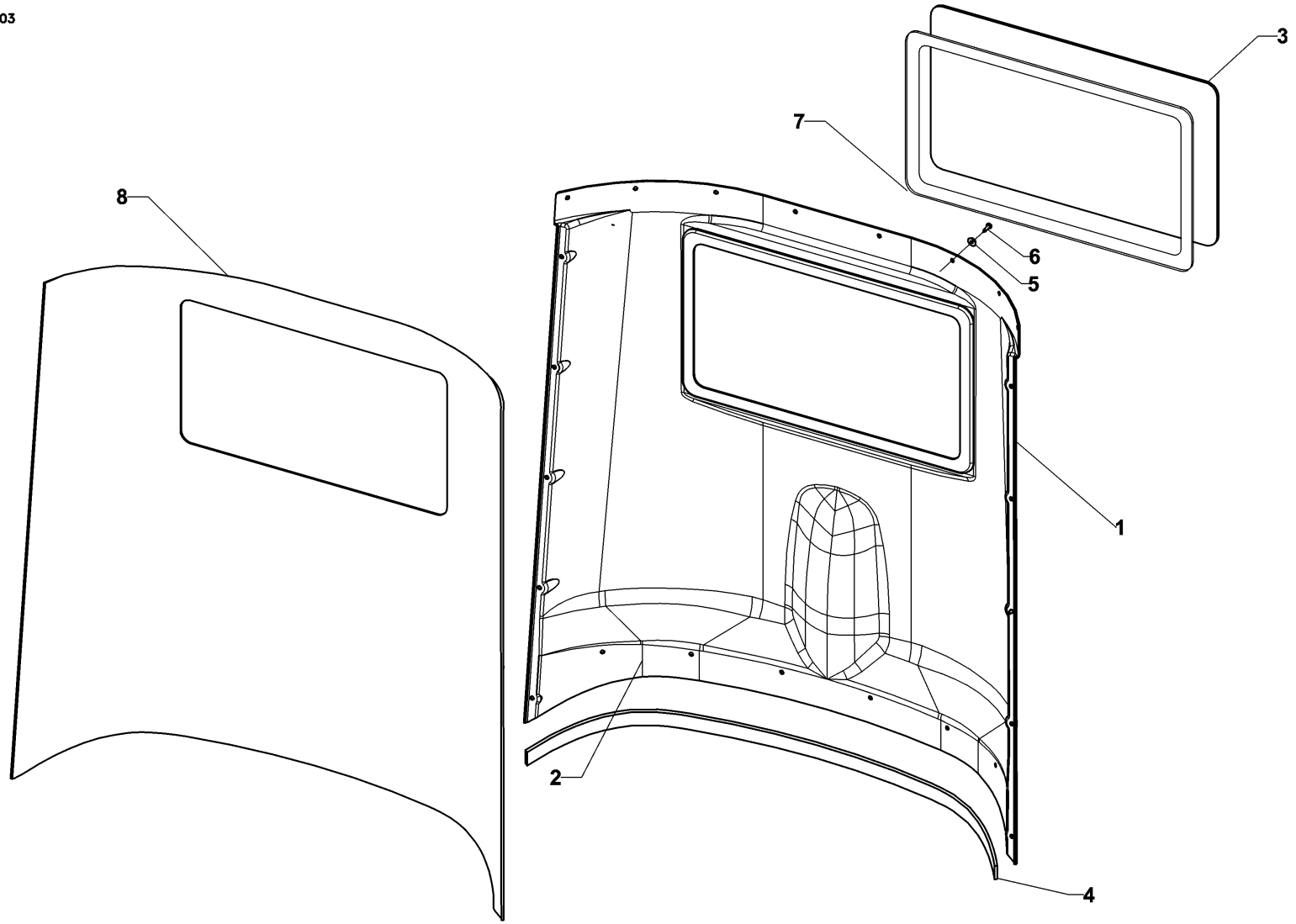
Rondò K327 – Rondò K333

PARATIA POSTERIORE
CLOISON POSTERIEUR
HINTERSCHOTT
REAR BULKHEAD
MAMPARO POSTERIOR

TAV. E5-40

Da matr.	A matr.
00001	

28–07–2003



Tempario Serie 33		Tav. E5-40		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Kit paratia posteriore	Kit	Kit	Kit	Kit		0,75
2	Guscio paratia posteriore	Coque cloison postérieur	Hinterschottschale	Rear bulkhead shell	Casco mamparo posterior		1,25
3	Vetro posteriore	Vitre	Glas	Glass	Cristal		0,35
8	Rivestimento	Rembourage	Wattierung	Upholstery	Relleno		1,25

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

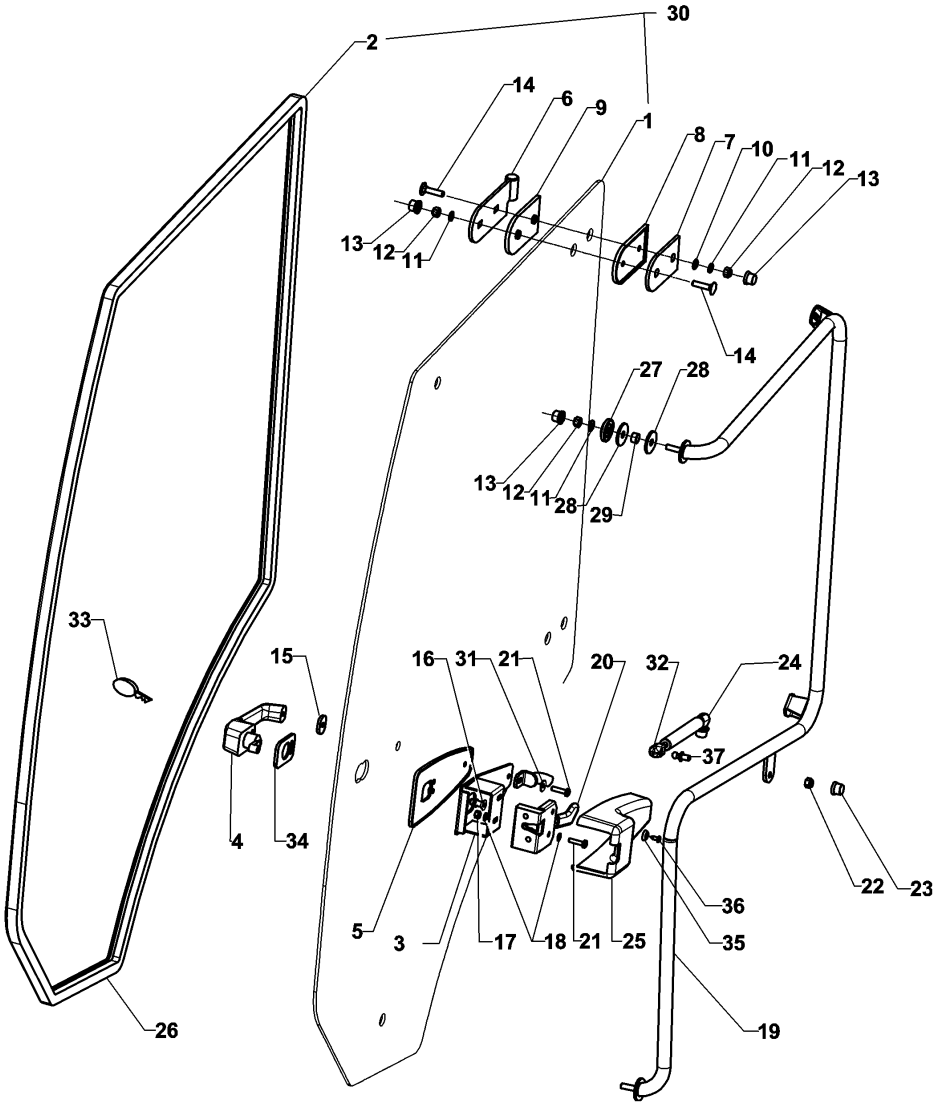
Rondò K327 – Rondò K333

PORTA
PORTE
TÜR
DOOR
PUERTA

TAV. E5-50

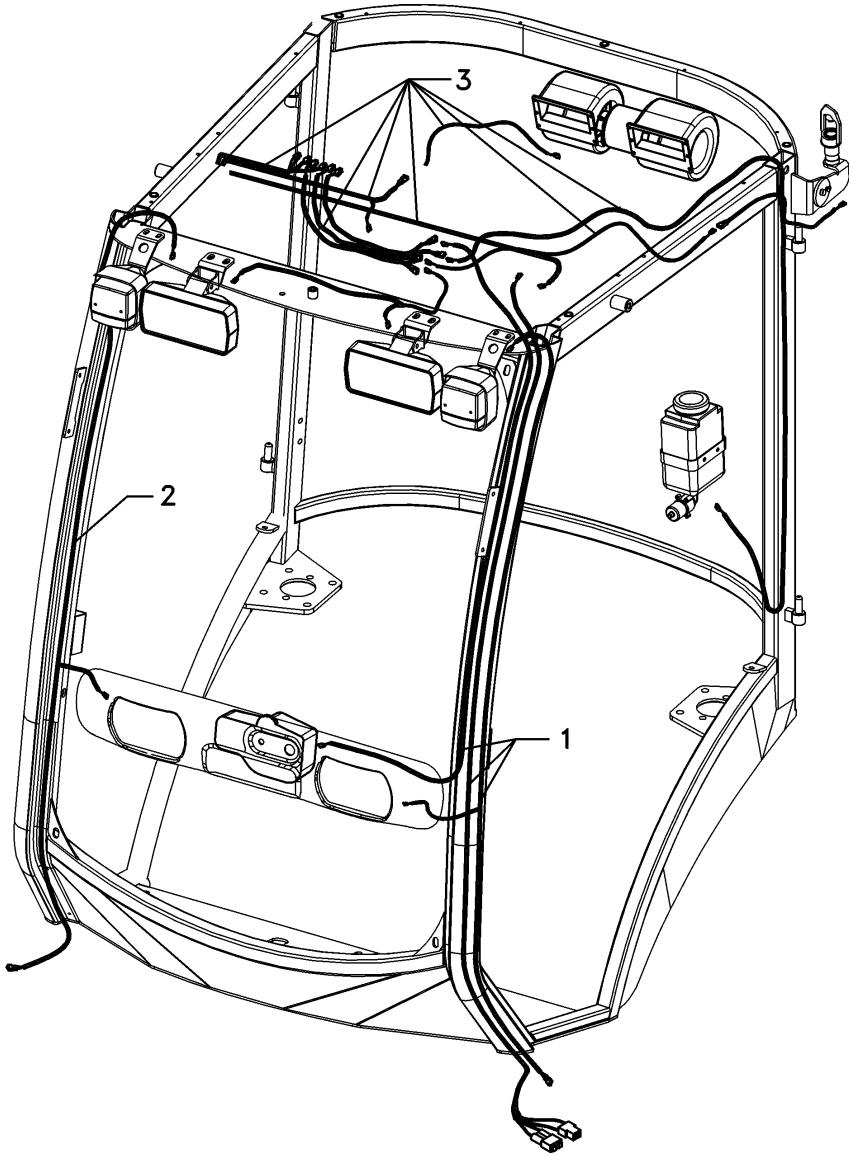
Da matr.	A matr.
00001	

28-07-2003



Tempario Serie 33		Tav. E5-50		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Vetro porta	Vitre	Glas	Glass	Cristal		1,5
2	Guarnizione	Joint	Dichtung	Gasket	Junta		0,35
19	Maniglione	Poignée	Handgriff	Door handle	Manilla		0,3
26	Porta completa	Portière complète	Kompletter Tür	Complete door	Puerta completa		0,3
30	Vetro	Vitre	Scheibe	Glass	Cristal		1,15

03-09-2003



Tempario Serie 33		Tav. E5-60		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Cablaggio piantone	Câblage	Kabelverbindung	Harness	Cableado		1,5
2	Cablaggio piantone	Câblage	Kabelverbindung	Harness	Cableado		1
3	Cablaggio sottotetto	Câblage	Kabelverbindung	Harness	Cableado		1,5

Tempario Serie 33

Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

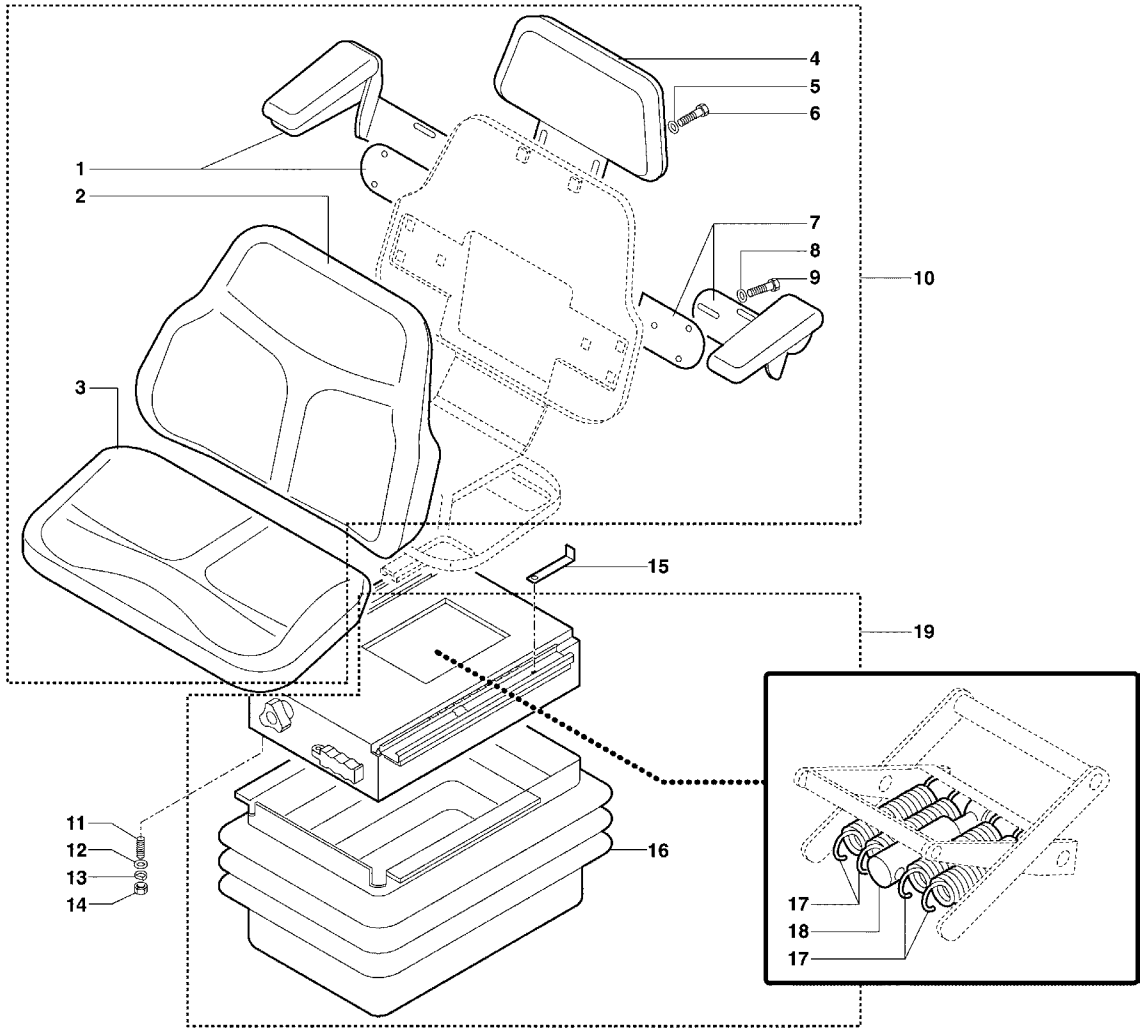
Rondò K327 – Rondò K333

SEDILE
SIÈGE
SITZ
SEAT
ASIENTO

TAV. E6-10

Da matr.	A matr.
00001	

4390302200 S08



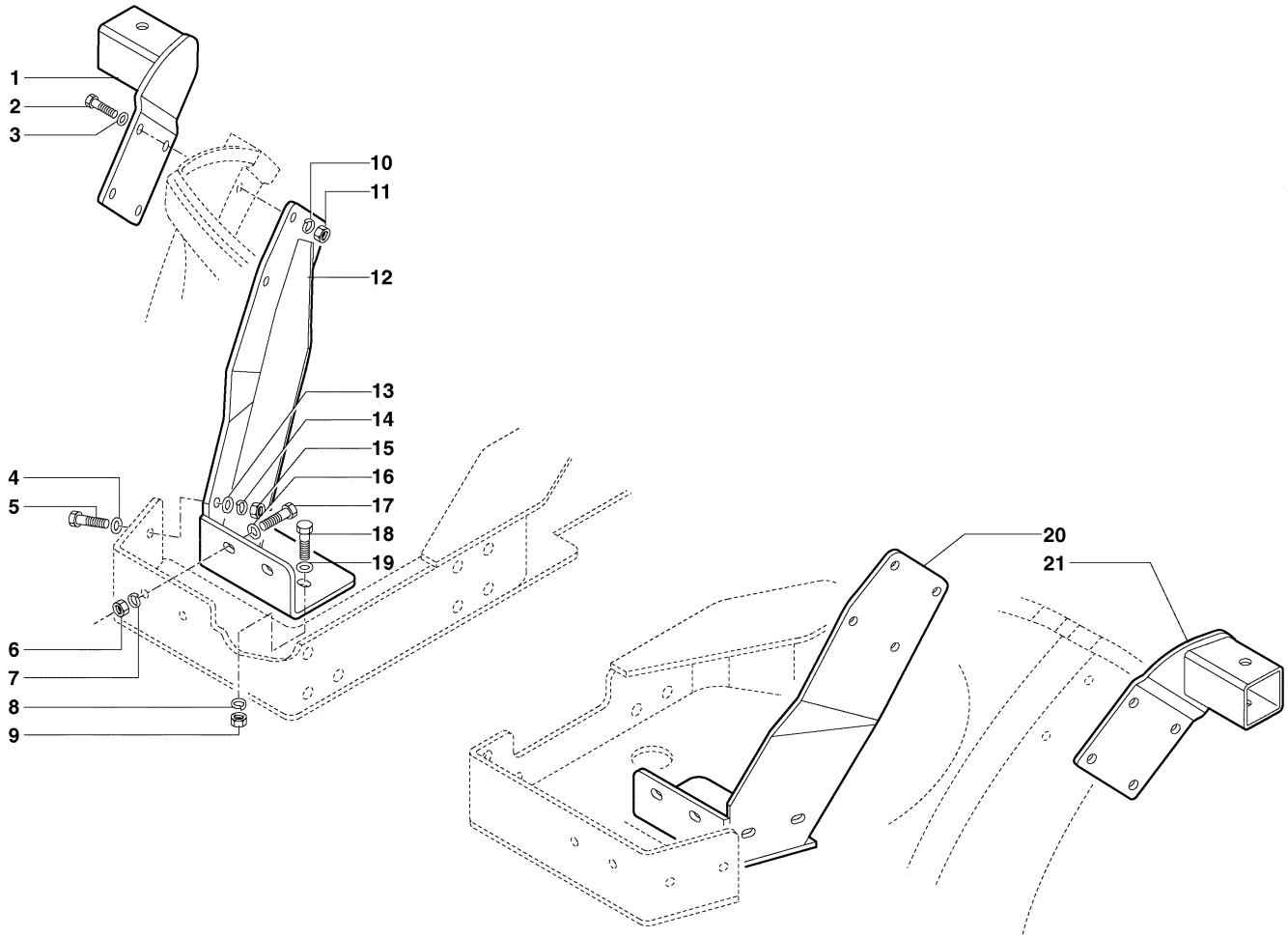
Tempario Serie 33		Tav. E6-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Bracciolo completo	Bras	Ausleger	Arm	Brazo	0,15	0,15
2	Schienale	Dossier	Rücklehne	Back	Respaldo	0,25	0,25
3	Sedile	Siège	Sitz	Seat	Asiento	0,25	0,25
4	Appoggiatesta	Appuie-tête	Kopflehne	Headrest	Apoyacabeza	0,25	0,25
7	Bracciolo completo	Bras	Ausleger	Arm	Brazo	0,15	0,15
10	Sedile completo	Siège	Sitz	Seat	Asiento	0,4	0,4
16	Soffietto molleggio	Soufflet	Faltenbalg	Bellows	Fuelle	0,4	0,4
19	Molleggio	Suspension	Federung	Suspension	Suspensión	0,6	0,6

APPLICAZIONE RACCOGLITORE
APPLICATION BAC DE RAMASSAGE
SAMMELBEHÄLTERVORRICHTUNG
PICKER APPLICATION
APLICACIÒN CONTENEDOR DE RECOGIDA

TAV. E7-10

Da matr.	A matr.
00001	

4380303500 S06



Tempario Serie 33		Tav. E7-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Piastra supporto	Plaque	Platte	Plate	Placa	0,2	0,2
12	Attacco raccoglitore	Arrache	Kupplung	Hitch	Enganche	0,4	0,4
20	Attacco raccoglitore	Arrache	Kupplung	Hitch	Enganche	0,4	0,4
21	Piastra supporto	Plaque	Platte	Plate	Placa	0,2	0,2

Tempario Serie 33
Tableau des temps / Zeitentabelle
Times board / Prospecto de programación de tiempos de trabajo

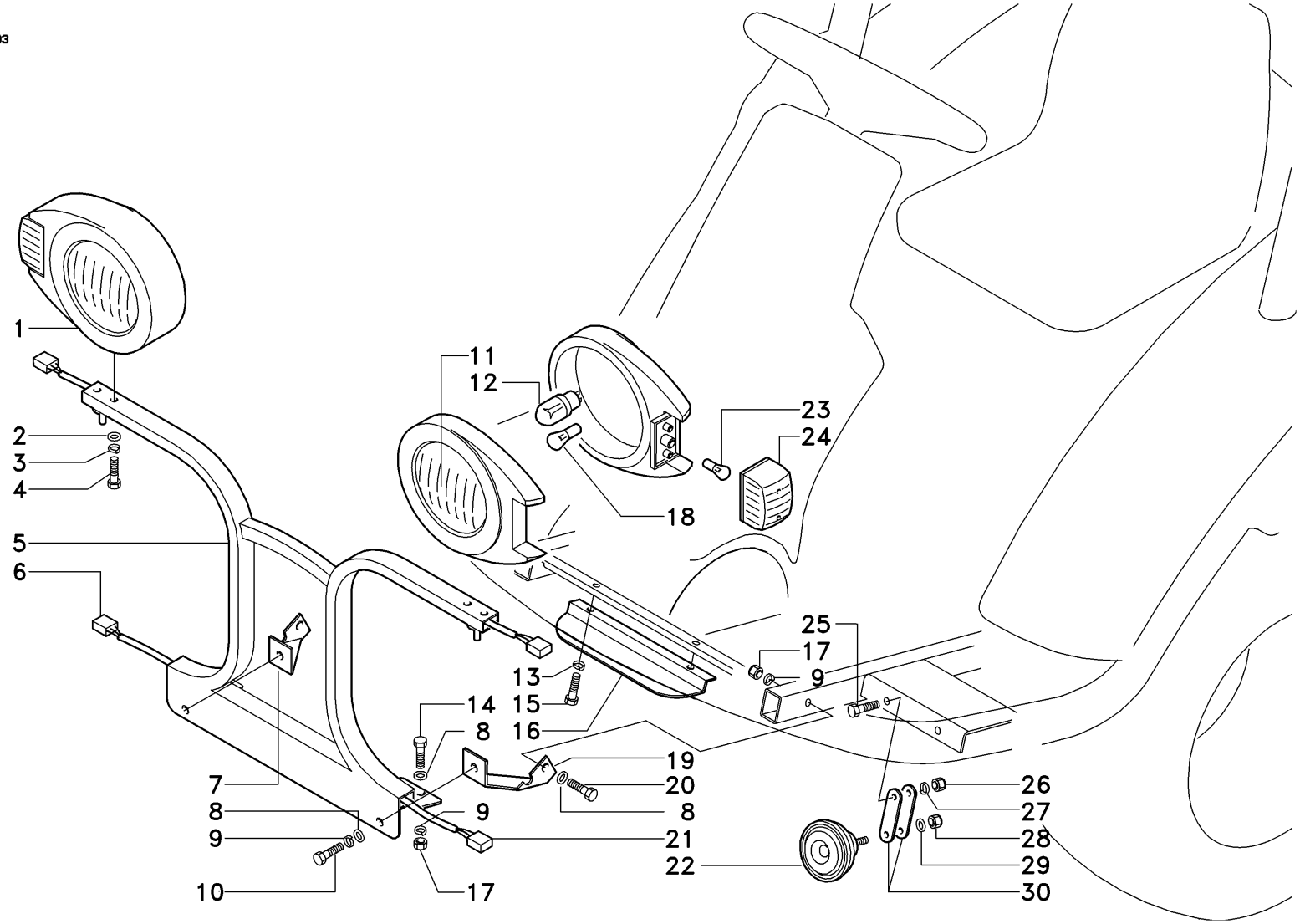
Rondò K327 – Rondò K333

IMPIANTO ELETTRICO ANTERIORE
INSTALLATION ELECTRIQUE AVANT
VORDERE ELEKTRISCHE ANLAGE
FRONT ELECTRIC SYSTEM
INSTALACIÓN ELECTRICA DELANTERA

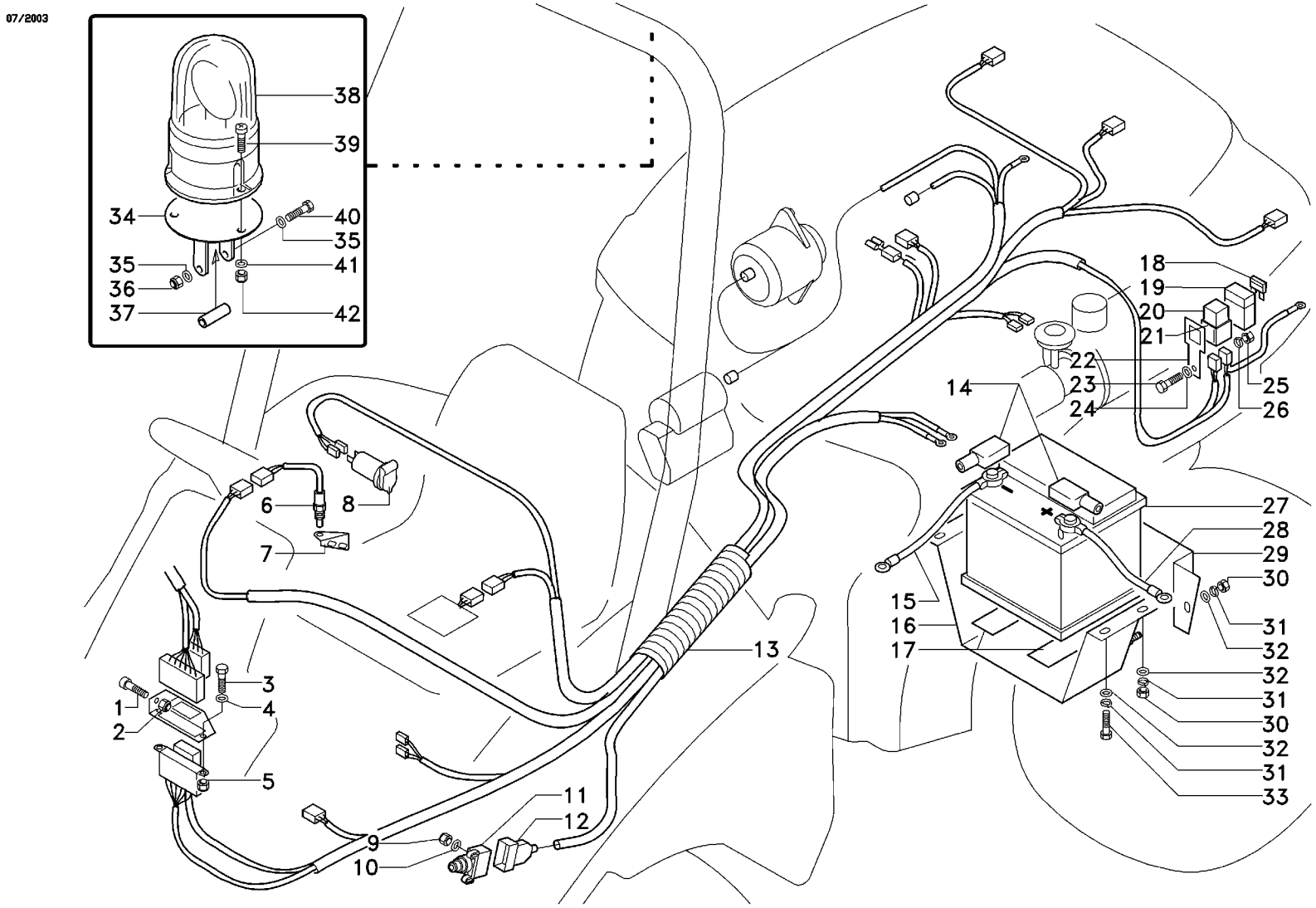
TAV. F1-10

Da matr.	A matr.
00001	

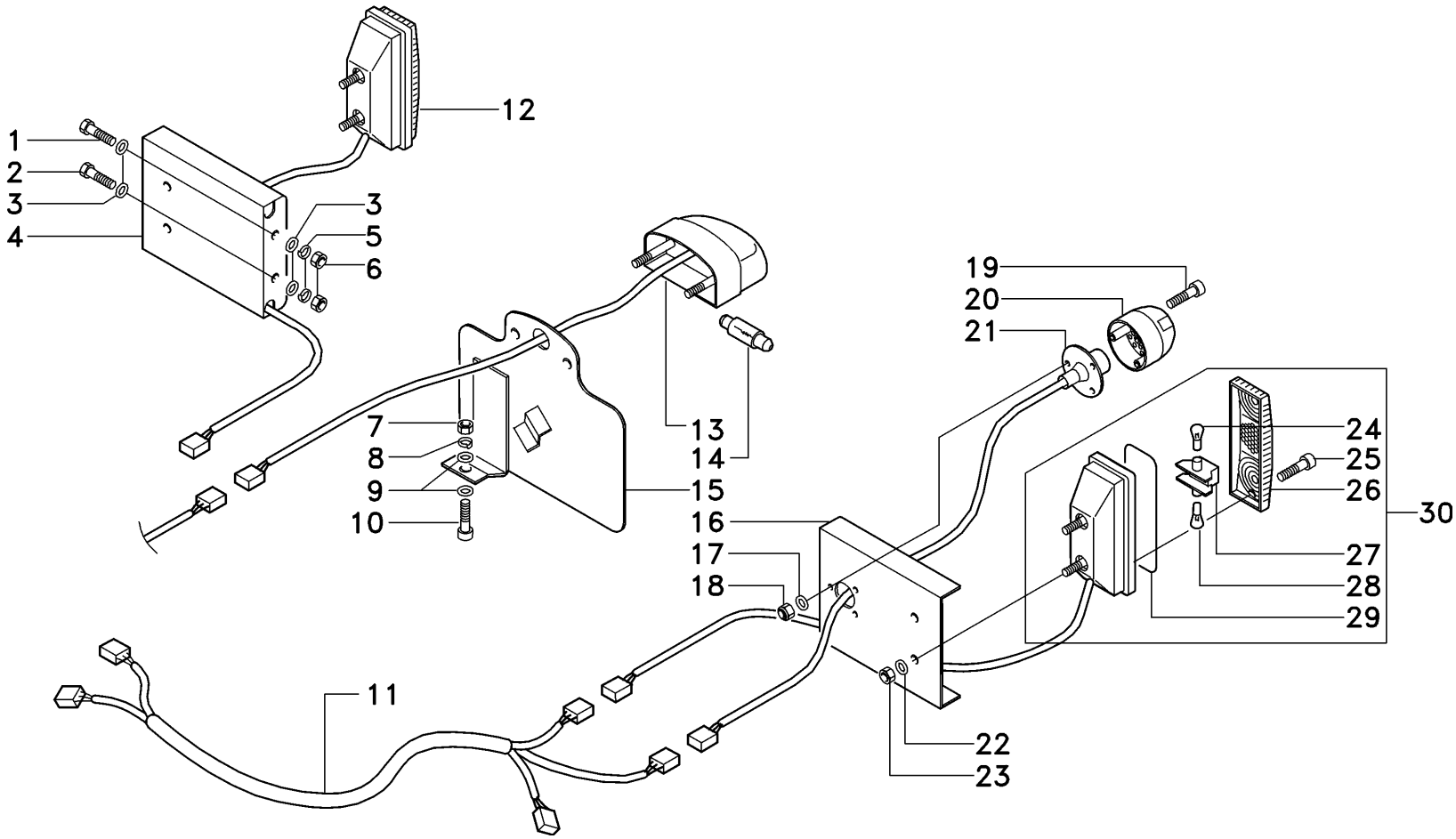
07/2003



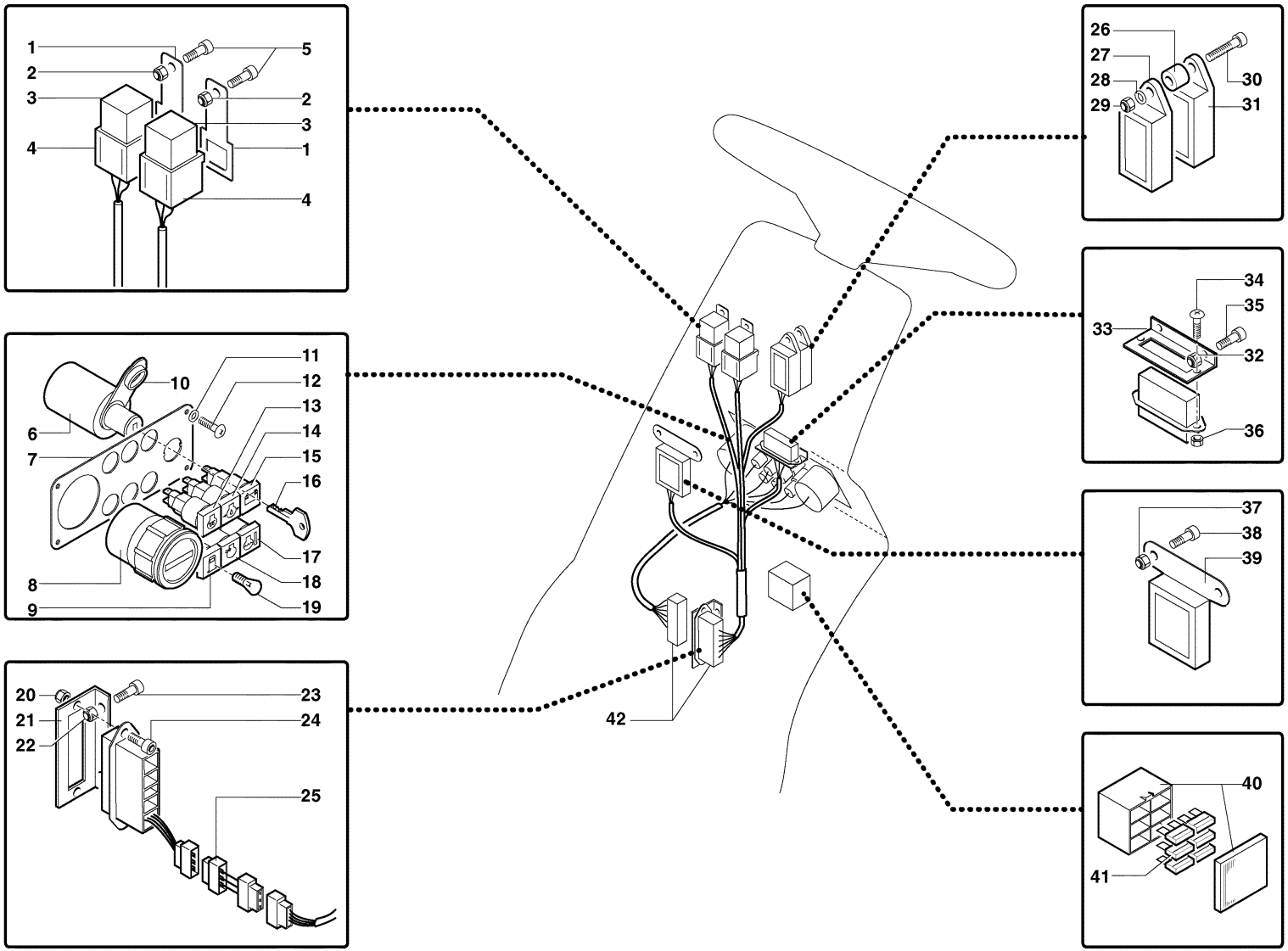
Tempario Serie 33		Tav. F1-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
1	Faro Sx	Phare	Scheiinwerfer	Headlight	Faro	0,2	
5	Supporto fanali	Support	Halterung	Support	Soporte	0,5	
6	Prolunga Dx	Rallonge	Verlängerung	Extension	Alargadera	0,2	
11	Gruppo ottico	Groupe	Gruppe	Group	Grupo	0,25	
16	Supporto	Support	Halterung	Support	Soporte	0,1	0,1
21	Prolunga Sx	Rallonge	Verlängerung	Extension	Alargadera	0,3	


07/2003
38
39
34
40
35
35
41
36
37
42
18
19
20
21
22
23
24
25
26
14
6
8
7
27
28
29
30
15
16
17
31
32
13
32
3
31
1
4
30
2
32
5
31
11
33
12
9
10

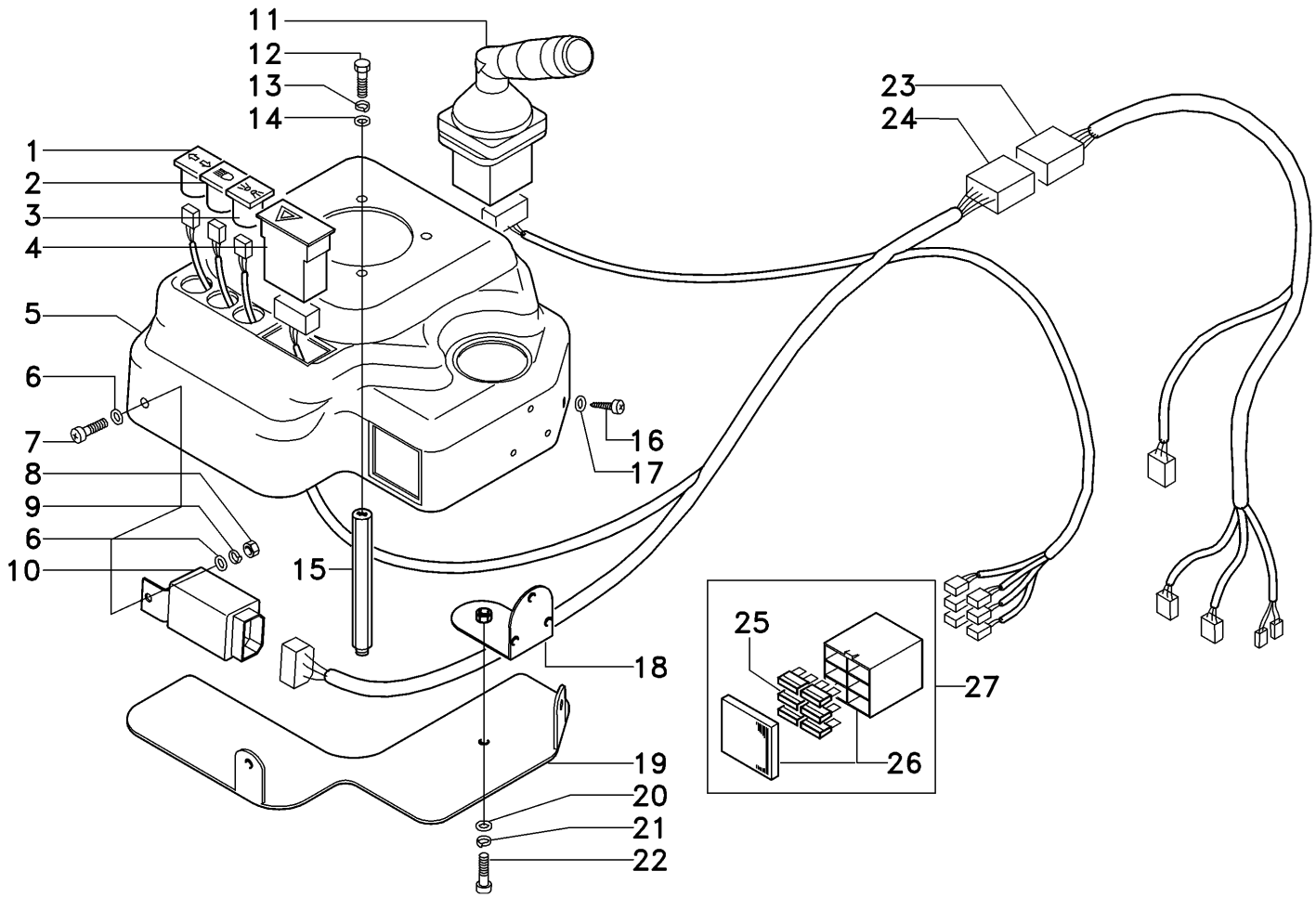
Tempario Serie 33		Tav. F2-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
6	Interruttore segnale PTO	Intérrupteur	Schalter	Switch	Interruptor	0,5	0,5
11	Interruttore di sicurezza	Intérrupteur	Schalter	Switch	Interruptor	0,2	0,2
13	Cablaggio linea motore	Câblage	Kabelverbindung	Harness	Cableado	2,5	2,75
16	Supporto batteria completo	Support	Halterung	Support	Soporte	0,2	0,2
20	Relè	Relais	Relais	Relay	Relé	0,1	0,1
27	Batteria 50 Ah	Batterie	Batterie	Battery	Batería	0,2	0,2
29	Lamiera fissaggio batteria	Tôle	Platte	Plate	Chapa	0,1	0,1
34	Attacco lampeggiante	Arrache	Kupplung	Hitch	Enganche	0,25	0,25
38	Lampada rotante	Lampe	Lampe	Bulb	Lámpara	0,2	0,2


1
2
3
4
12
3
5
6
7
8
9
10
13
14
15
16
17
18
19
20
21
24
25
26
27
28
29
30
11
22
23

Tempario Serie 33		Tav. F3-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
4	Supporto Dx	Support	Halterung	Support	Soporte	0,3	0,3
11	Cablaggio	Câblage	Kabelverbindung	Harness	Cableado	0,15	0,15
12	Fanale posteriore Dx	Phare	Leuchte	Light	Luz	0,25	0,25
13	Luce targa	Lumière plaque minèr.	Kennzeichenbeleuchtung	Number plate light	Luz placa	0,2	0,2
15	Portatarga	Porte-plaque	Kennzeichenschildhalter	Identification plate	Portaplaca	0,3	0,3
16	Supporto Sx	Support	Halterung	Support	Soporte	0,3	0,3
20	Presa elettrica	Prise électrique	Steckdose	Electric plug	Toma elétrica	0,15	0,15
21	Cablaggio	Câblage	Kabelverbindung	Harness	Cableado	0,25	0,25
30	Fanale posteriore Sx	Phare	Leuchte	Light	Luz	0,25	0,25


1
2
3
4
5
2
3
1
4
10
11
12
13
14
15
16
6
7
17
8
18
9
19
20
21
22
23
24
25
42
26
27
28
29
30
31
34
35
33
32
36
37
38
39
40
41

Tempario Serie 33		Tav. F4-10		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
3	Relè	Relais	Relais	Relay	Relé	0,7	0,8
6	Interruttore avviamento	Intérrupteur	Schalter	Switch	Interruptor	0,4	0,4
8	Contaore	Compte-heurs	Betriebs-stundenzaeler	Timer	Cuentahoras	0,4	0,4
25	Gruppo 4 diodi antiritorno	Groupe	Gruppe	Group	Grupo	0,7	0,8
27	Centralina comando	Centrale	Aggregat	Unit	Centralita	0,8	0,9
31	Centralina comando candelette	Centrale	Aggregat	Unit	Centralita	0,8	0,9
39	Relè	Relais	Relais	Relay	Relé	0,8	0,9
42	Cablaggio linea cruscotto e anteriore	Câblage	Kabelverbindung	Harness	Cableado	1	1,1


11
12
13
14
1
2
3
4
5
6
7
8
9
6
10
15
16
17
18
19
20
21
22
23
24
25
26
27

Tempario Serie 33		Tav. F4-20		Da matr. 00001	A matr.	TEMPO DI SOSTITUZIONE [ORE]	
FIG.	DENOMINAZIONE	DESIGNATION	BENENNUNG	DESCRIPTION	DENOMINACIONES	Senza cabina	Con cabina
10	Intermittenza	Intermittence	Blinklicht	Flashing light	Intermitencia	0,5	0,5
11	Devioguida	Levier commutateur	Umschalter	Commutator lever	Palanca conmutador	0,3	0,3
19	Chiusura cruscotto	Fermeture	Abdeckung	Cover	Cierre	0,2	0,2
23	Prolunga cruscotto	Rallonge	Verlängerung	Extension	Alargadera	0,7	0,8
24	Cablaggio cruscotto	Câblage	Kabelverbindung	Harness	Cableado	0,4	0,4

Antonio Carraro s.p.a.
Via Caltana 24 – 35011 Campodarsego Padova
Telefono 049 921 9 921 – Fax S.A.T. 049 921 99 99
http:// www.antoniocarraro.com