

WORKSHOP MANUAL

Agroplus
60
70
80

introduction

This publication is intended for the trained technician who must operate on our tractors.

It contains all general information relating to our tractor range, and in particular it highlights the inspection, overhauling and adjustment procedures as well as the main instructions for dismantling and reassembling operations.

The workshop manual is a natural summary for the mechanic who has attended the vocational training and specialization courses, which are held every year at our Service School, to permit him to perform a precise and qualified work on tractor.

Its contents are therefore an exhaustive reference book for the experienced mechanic who desires to refresh his memory on the sequence of the operations to be done. It is then good practice for every authorized dealer mechanic to have at his disposal this publication, so that it may be consulted quickly when necessary.

We wish to thank in advance for the cooperation all those people, who will let us have their suggestions in order to make this publication more complete.

List of contents

Tractor configurations AGROPLUS 60 - 70 - 80	6
Dimensions and weights.....	7
Prescribed lubricants and capacities	8
Conversion tables.....	9
Parts	10
1 - ENGINE	11
2 - CLUTCH	
Gearshift clutch.....	12
General specifications	12
Checking clutch	16
Adjusting clutch control pedal.....	16
Bleeding air from the hydraulic circuit.....	16
Stripping the slave cylinder.....	17
Stripping the master cylinder	18
Diagnosing malfunctions	20
POWERSHIFT unit, general specifications	21
POWERSHIFT unit detach from the gear box	24
Assembly of POWERSHIFT unit.....	35
Re-assembly of the POWERSHIFT unit.....	37
Fitting the oil manifolds of the POWERSHIFT unit	39
Diagnosing malfunctions	44
3 - TRANSMISSION	
General specifications	45
Technical specifications.....	45
Speed change configurations	47
Section through transmission	51
Section through transmission with POWERSHIFT unit	52
Separating the front gearbox from the engine	61
Dismantling the gearbox.....	62
Removal of the gearbox input and P.T.O. shafts.....	62
Separating the POWERSHIFT unit from the gearbox	62
Removal of the gear train positioned in the front gearbox	63
Disassembly of the inverter control rods and forks	64
Dismantling of the gearchange rod and fork assembly	65
Dismantling of the gearchange selector rods and forks assembly	66
Removal of the shaft with the actuator for engagement/disengagement of the front-wheel drive	67
Removal of the range gear shaft	67
Examining parts removed.....	68
Adjusting play of the gearbox shafts by means of the thrust plates on the mini/inverter shaft and the secondary shaft	69
Warnings related to assembly of the gears of the P.T.O. unit, the range reduction unit and synchronised P.T.O. shaft	73
Assembly of the P.T.O.	73
Installation of the range reduction unit, the gear for the front-wheel drive shaft and the parking brake discs.....	73
Points where sealant is to be used.....	75
Tightening torques	78
Bevel drive adjustment	81
Servicing operations	82
Rear power take-off	83
P.T.O. clutch	88
Technical specifications.....	89
Correct positions of P.T.O. sensors and cables	89
Clutch inspection	91
Checking clutch hydraulic pressures	92
Checking the end-play of the front shaft of the P.T.O. clutch	93
Renewal of the rear P.T.O. clutch	94
Main operations for removal of the rear P.T.O. unit	95
Diagnosing malfunctions	100

4 - AXLES

Rear axle	101
Installing the rear half-shafts	102
Removal and disassembly of the epicyclic reduction unit.....	104
Fitting lateral stub axles of the wheel	105
2WD extendible axle.....	106
Removing the axle from the front support	108
Centre steering lever	111
Wheel hub	112
End float adjustment.....	114
Front-wheel drive.....	115
Specifications	115
Epicyclic reduction unit.....	119
Side hubs.....	121
Tightening torques.....	122
Adjusting bevel gears	124
Adjustment of the internal control of the mechanical differential lock.....	125
Installing the differential assembly into the drive axle	125
Diagnosing malfunctions	126

5 - VEHICLE

Brakes - General information.....	127
Hydraulic pump.....	128
Assembly of brake master cylinder	130
Checking the front brake disks on 2WD and 4WD front axles and the rear brake disks.....	131
Adjusting service brake pedals.....	131
Correct installation of inspection cover for parking brake discs.....	132
Checking parking brake pads	134
Bleeding air from the brake hydraulic system.....	135
"Separate Brakes" valve	136
Diagnosing malfunctions	140
Hydraulic lift with "load sensing"	141
Installing the lift and front cover plate of the gearbox	142
Lift mechanism	142
Checking the safety valves.....	142
Checking the protrusion of the non-return valve.....	143
Adjusting the lift	145
Lift hydraulic circuit.....	147
Sensing arm assemblyMontaggio dell'organo sensibile	154
Power-lift distributor valve spring setting specifications	155
Electronic lift	156
Control panel	157
Control level or depth control knob.....	157
Mix position/draft control.....	157
Lowering speed control knob.....	158
Maximum lift height control knob	158
Up/Down control switch	158
Up control	158
Control/Float mode	158
Lift status indicator light.....	158
Remote pushbuttons for lift operation from ground	159
Lift operation	160
List of electronic lift tests	164
Precautions for electronic equipment	173
Checking the electronics system.....	173
Checking mechanical components.....	173
Front hydraulic liftSollevatore idraulico anteriore.....	174
Hydraulic accumulator and antishock valve for front lift	176
Front power take-off - General information.....	177
Section of the P.T.O.	178
Fitting the "RING-FEEDER" rings.....	182
Checking the clutch	183
Diagnosing malfunctions	184
Spring specifications.....	184

6 - CONTROLS

Hydrostatic steering	185
Inspections and checks	186
Steering pump	186
Directional control valve	186
Check the setting of the pressure relief valve	186
Bleeding the hydraulic circuit	186
Assembly of orbital pump unit	186
Teering wheel shaft and steering cylinders	187
Instructions for the hydrostatic steering distributor assembly	189
Diagnosing malfunctions	192
Mechanical controls	196
Electro-hydraulic controls	197
Front P.T.O. clutch engagement control	202
Rear P.T.O. clutch engagement control	202
Differential lock engagement control	202
Front-wheel drive engagement control	202
Rear P.T.O. engagement control	202
Gearbox	202
Front and rear lift	202
Hydraulic circuit diagram	202
Solenoid valve - Specifications	207
Adjustment of front and rear differential lock control	214

7 - BODYWORK

Platform	215
Cab - General information	216
Cab air filter	218
Screen wash	218
Screen wipers (front and rear)	218
Removing the driving platform complete with cab	219
Breakage of the top hood release cable	220
High visibility cab roof	222

8 - SYSTEMS

Ventilation	223
Heating System	223
Air conditioning unit for cabs	227
Operation and maintenance of the air-conditioning system	228
Water dripping from the points at which condensate drain lines are connected to the conditioning unit	229
Checking system	231
System safety elements	231
Temperature regulation	231
Charging the system	232
Filling the metering unit	232
Refilling the system with oil	232
Verifying operation of the system after recharging	234
Directions for tightening air conditioning system pipeline fittings	234
Diagnosing malfunctions	241
Hydraulic system	242
Oil filters	243
Hydraulic pumps	243
Checking the relief valves of the hydraulic lift system	243
Stripping the hydraulic pump	244
Auxiliary hydraulic spool valves	247
Checking the pressure relief valve setting	250
Checking the operating pressure	250
Conversion of auxiliary spool valves from double acting to single acting operation	250
Checking the surface of the valve spools	250
Trailer hydraulic braking system	251
Use of the tractor with CUNA 341/01 hydraulic trailer braking	253
Installing the hydraulic braking valve for trailers equipped with "safety brake" (ITALIAN version)	258
Electrical system AGROPLUS 60 (up serial number 1017) - 70 (up serial number 2773) - 80	261
Electrical system AGROPLUS 60 (under serial number 1016) - 70 (under serial number 2772)	445

General safety directions.....	446
Jump start utilizing another battery.....	447
Recharge system.....	449
Heating system.....	450
Starting system.....	450
Ignition key.....	452
Ventilation control.....	452
Push button control.....	452
Beacon push button.....	454
Work lights.....	454
2-Speed windscreen wiper switch.....	454
Relay.....	455
Electronic flasher unit.....	455
Switch controlling.....	456
Switch controlling: differential lock - P.T.O. clutch - 4RM - 540 1000 rpm/min P.T.O. speed selector - Economy P.T.O. - Live P.t.o. - electric starter system.....	456
Switch for emergency brake.....	456
Fuse box.....	457
Instrument panel with digital display.....	458
Operation of the broken belts alarm control unit.....	460
Engine stop operation with a type 2MH engine control unit.....	462
Electrical wiring.....	465

9 - APPENDIX

Power lift tester version 1.24a.....	I
--------------------------------------	---

TRACTOR CONFIGURATIONS:

AGROPLUS 60 - 70 - 80	2RM	WITH PLATFORM
	2RM	WITH CAB
	4RM	WITH PLATFORM
	4RM	WITH CAB

CAB

- ventilation
- ventilation + heating
- ventilation + heating + air conditioning

GEARBOX

Fully synchronised:

20 Forward + 10 Reverse: 5 speeds x 2 ranges (Hair-Tortoise)

+ SYNCHROSPLIT (H/fast-L/slow-R/rearward)

30 Forward + 15 Reverse: 5 speeds x 3 ranges (Hair-Tortoise-Snail)

+ SYNCHROSPLIT (H/fast-L/slow-R/rearward)

45 Forward + 45 Reverse: 5 speeds x 3 ranges (Hair-Tortoise-Snail)

+ shuttle + version POWERSHIFT 

CONTROLS

- rear P.T.O. clutch with electro-hydraulic control
- 4WD with mechanical control or optional electro-hydraulic control
- electronic engine throttle

MECHANICALLY OPERATED REAR POWER-LIFT

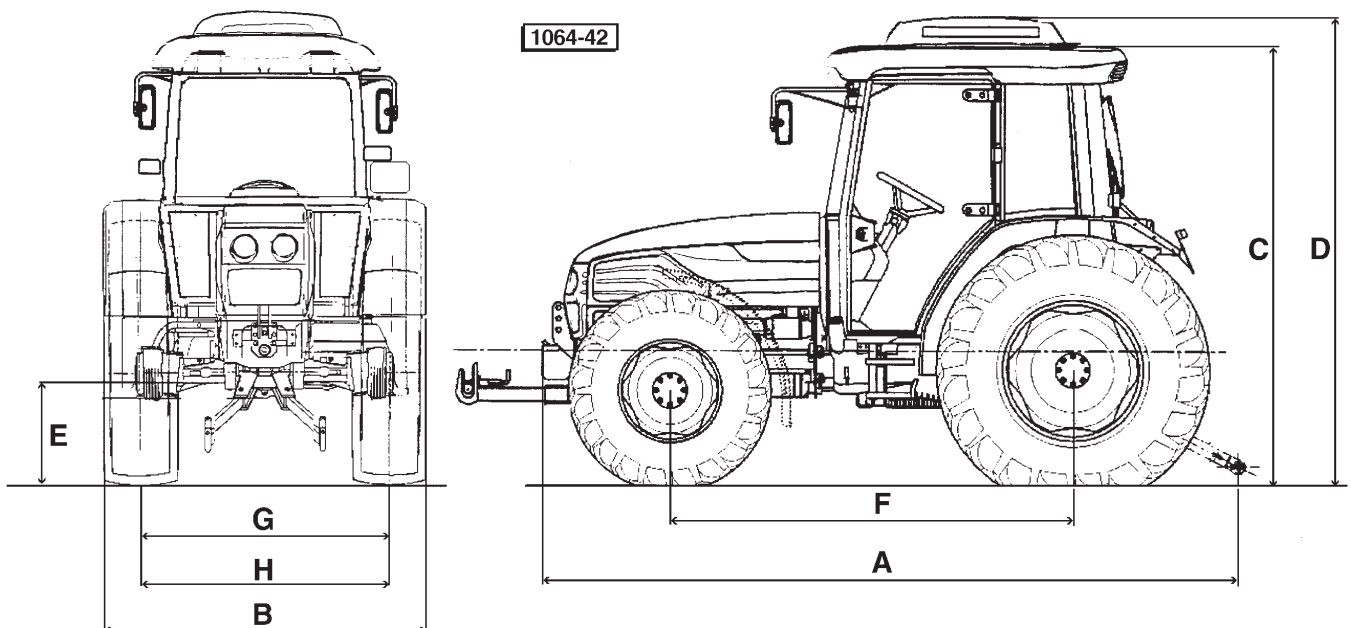
- with supplementary rams
- without supplementary rams

MAIN EQUIPMENT

- front P.T.O.
- front lift
- hydraulic pump capacities increased by 27 l/min (for hydrostatic steering, electro-hydraulic control unit and gearbox lubrication) and by 47 l/min (for trailer braking, auxiliary control valves and lift).
- hydraulic trailer braking
- 4-way or 6-way control valves with "Flow Divider"
- etc.

DIMENSIONS AND WEIGHTS

		AGROPLUS 60		AGROPLUS 70 -80	
		2 WD	4 WD	2 WD	4 WD
Length max:					
- without linkage	(A) mm	3800	3835	3930	3985
- with front and rear linkage	(A) mm	-	4350	-	4480
Width min./max.	(B) mm	1920 -2320	1920-2320	1920-2320	1920-2320
Height:					
- al telai di sicurezza	(C) mm	2420	2420	1490	
- at cab (standard)	(C) mm	2430	2430	1700	
- at cab (with air conditioning)	(D) mm	2595	2595	2360	
Ground clearance	(E) mm	345	345	365	365
Wheel base	(F) mm	2162	2112	2292	2242
Front track base	(G) mm	1400	1440	1400	1440
min./max.		1300-1600	1340-1740	1300-1600	1340-1740
Rear track base	(H) mm	1500	1500	1500	1500
min./max.		1400-1900	1400-1900	1400-1900	1400-1900
Min. turning radius without brakes	(mm)	3500	4050	3700	4300
Operating weight (without front lift)					
- with plataform	kg	2355	2705	2555	2905
- with cab	kg	2550	2900	2750	3100
Max. permissible load					
- front	kg	240	240	240	240
- rear	kg	200	200	200	200
- block	kg	-	250	-	250
Tyres					
- front		7.50-16	12.4R 20	7.50-16	11.2R 24
- rear		14.9R30	14.9R30	16.9R30	16.9R30



PRESCRIBED LUBRICANTS AND FUELS

PRESCRIBED LUBRICANTS AND FUELS AGROPLUS 60/70/80

Part to be supplied	Litres (US gal)	Product	Specifications SDFG	change hours
Engine AGROPLUS 60	9.5** (2.5)	AKROS TURBO 15W40	Sae 15w40 ACEA E3-96 API CF SDFG OM-1991 MIL-L-2104 E level MB 228.3 level	500*
Engine AGROPLUS 70/80	11** (2.9)			
Gearbox and rear axle	41 (10.8)	AKROS MULTI	Sae 10w30 Sae 20w30 UTTO API GL4 SDFG OT-1891	1200
Central axle	6 (6.3)	AKROS MULTI	Sae 10w30 Sae 20w30 UTTO API GL4 SDFG OT-1891	1200
Side reductions	1.5x2 (1.6x2)			
Front PTO	2.5 (2.6)			
Brakes and clutch control	MAX	AKROS MATIC	ATF DEXRON II D SDFG OF-1691	
Lubrication points		AKROS GREASE T2	NLGI 2 - LITIO SDFG GR-1202 L	50

(*) 1° replace after 50 hours

(**) With filter + 1.5 litre

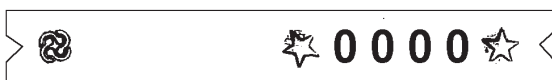
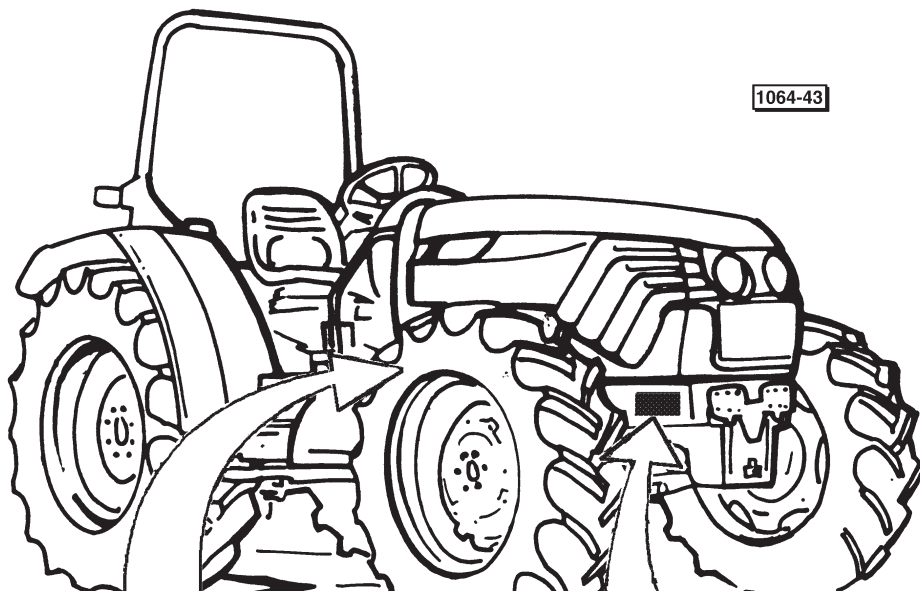
CONVERSION TABLE FROM

FROM	TO	multiply by:
inch	cm	2.540
cm	inch	0.394
foot	m	0.305
m	foot	3.281
yard	m	0.914
m	yard	1.094
Eng. miles	km	1.609
km	Eng. miles	0.622
Sq.in.	cm ²	6.452
cm ²	Sq.ft.	0.155
Sq.ft.	m ²	0.093
m ²	Sq.ft.	10.77
Sq.yard	m ²	0.835
m ²	Sq.yard	1.197
Cu.in.	cm ³	16.39
cm ³	Cu.in.	0.061
Cu.ft.	Liter	28.36
Liter	Cu.ft.	0.035
Cu.yard	m ³	0.763
m ³	Cu.yard	1.311
Imp.gall.	Liter	4.547
Liter	Imp.gall.	0.220
US gall.	Liter	3.785
Liter	US gall.	0.264
pint	Liter	0.568
Liter	pint	1.762
quart	Liter	1.137
Liter	quart	0.880
oz.	kg	0.028
kg	oz.	35.25
lb.	kg	0.454
kg	lb.	2.203
lb.ft.	kgm	0.139
kgm	lb.ft.	7.233
lb/in.	kg/m	17.87
kg/m	lb/in.	0.056
lb./sq.in.	kg/cm ²	0.070
kg/cm ²	lb./sq.in.	14.22
lb./Imp.gall.	kg/l	0.100
kg/l	lb./Imp.gall.	10.00
lb./US gall.	kg/l	0.120
kg/l	lb./US gall.	8.333
lb./cu.ft.	kg/m ³	16.21
kg/m ³	lb./cu.ft.	0.062
cu.ft./lb.	m ³ /kg	0.062
m ³ /kg	cu.ft./lb.	16.21
Nm	kgm	0.102
kgm	Nm	9.81
kW	PS	1.36
PS	kW	0.736
bar	kg/cm ²	1.014
kg/cm ²	bar	0.981
dm ³	l	1
l	dm ³	1

HOW TO ORDER SPARE PARTS

To ensure perfect tractor efficiency thus avoiding serious drawbacks, and to optimize your investment and the operational expenses, the use of "ORIGINAL SPARE PARTS" is recommended.
Spare parts orders must specify the following:

**Tractor serial number and engine serial number (if the engine is concerned).
Spare part name and reference code.**



ENGINE TYPE AND
SERIAL NUMBER

A rectangular label with a thick border and four corner fasteners. It contains the following information:
- Top left: **DEUTZ FAHR** logo.
- Top right: "Made by DEUTZ-FAHR Agrartechnik GmbH D 89415 Lauingen C/O STAB SAME DEUTZ-FAHR GROUP TREVIGLIO ITALY" and a small square box.
- Middle: "Tipo" followed by a horizontal input field.
- Below: "Telaio Nr." followed by a horizontal input field.
- Bottom: "Estremi atto di omologazione" followed by a horizontal input field.

TRACTOR FRAME TYPE
AND SERIAL NUMBER

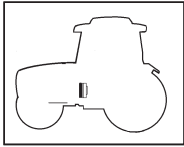
ENGINE

AGROPLUS 60 and AGROPLUS 70 are powered by F3L 913 / F4L 913 engines. The workshop manual for these engines could be ordered to the following address:

DEUTZ-FAHR DEUTSCHLANDGmbH
Abt. LT-ZE
Deutz-Fahr-Straße 1
89415 Lauingen
Telefax-Nr.: 09072/997-360 or -353

Using the following code:

0297 7293



2

Clutch and transmission

23

Clutch

Earshift clutch

General specifications

The clutch, a single stage type, comprises a friction disc, a pressure plate and a diaphragm spring. The hydrostatic control is self-adjusting: a master cylinder operated by the pedal directs oil to the slave cylinder mounted to the left hand side of the intermediate housing, which in turn operates the clutch release lever.

Technical specifications

		Agroplus 60	Agroplus 70-80	Agroplus 60-70-80 (USA) 6 blades
Type of clutch		single disc dry organic facing	single disc dry organic facing	single disc dry cerametallik facing
Type of operation		hydrostatic with automatic take-up of free travel		
Disc p/n		009.6913.3	009.6924.3/20	009.9770.3
Disc diameter	mm	279,4	310	310
Minimum permissible thickness of disc	mm	6	6	9,7
Thickness of friction disc	mm	8,5 ^{+0,3} _{-0,3}	8,5 ^{+0,3} _{-0,3}	10 ^{+0,2} _{-0,2}
Type of facing material on friction disc		TEXTAR T385	TEXTAR T385	UA 330 DX
Type of master cylinder		Benditalia 3/4"		
Type of oil		AKROS MATIC		

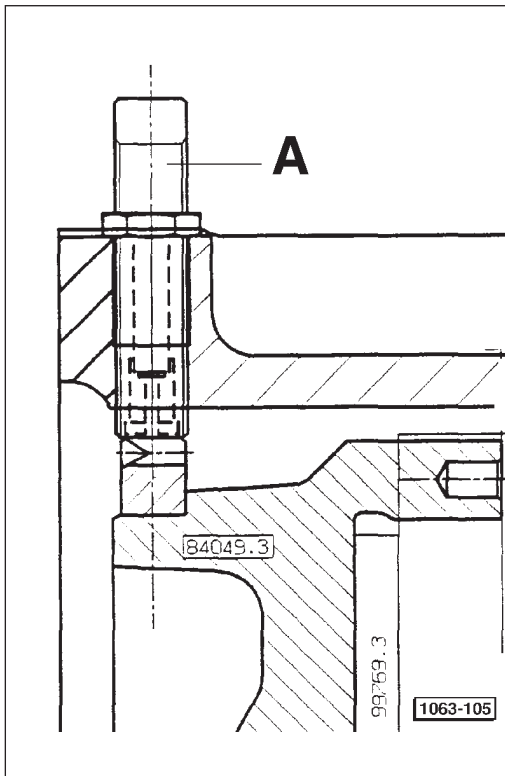


Fig. 1 - Engine rpm pickup.

Spring specifications to Belleville washer for the clutch engagement

Load on the pressure plate	Nm	11000
----------------------------	----	-------

CAUTION: In the event the transmission being split to gain access to the clutch assembly, the pickup (A, fig. 1) must be removed to avoid its being damaged by the teeth of the engine flywheel.

IMPORTANT: In the event of the friction disc being removed, care must be taken during refitment to position the components correctly, as indicated, since the disc is not symmetrical.

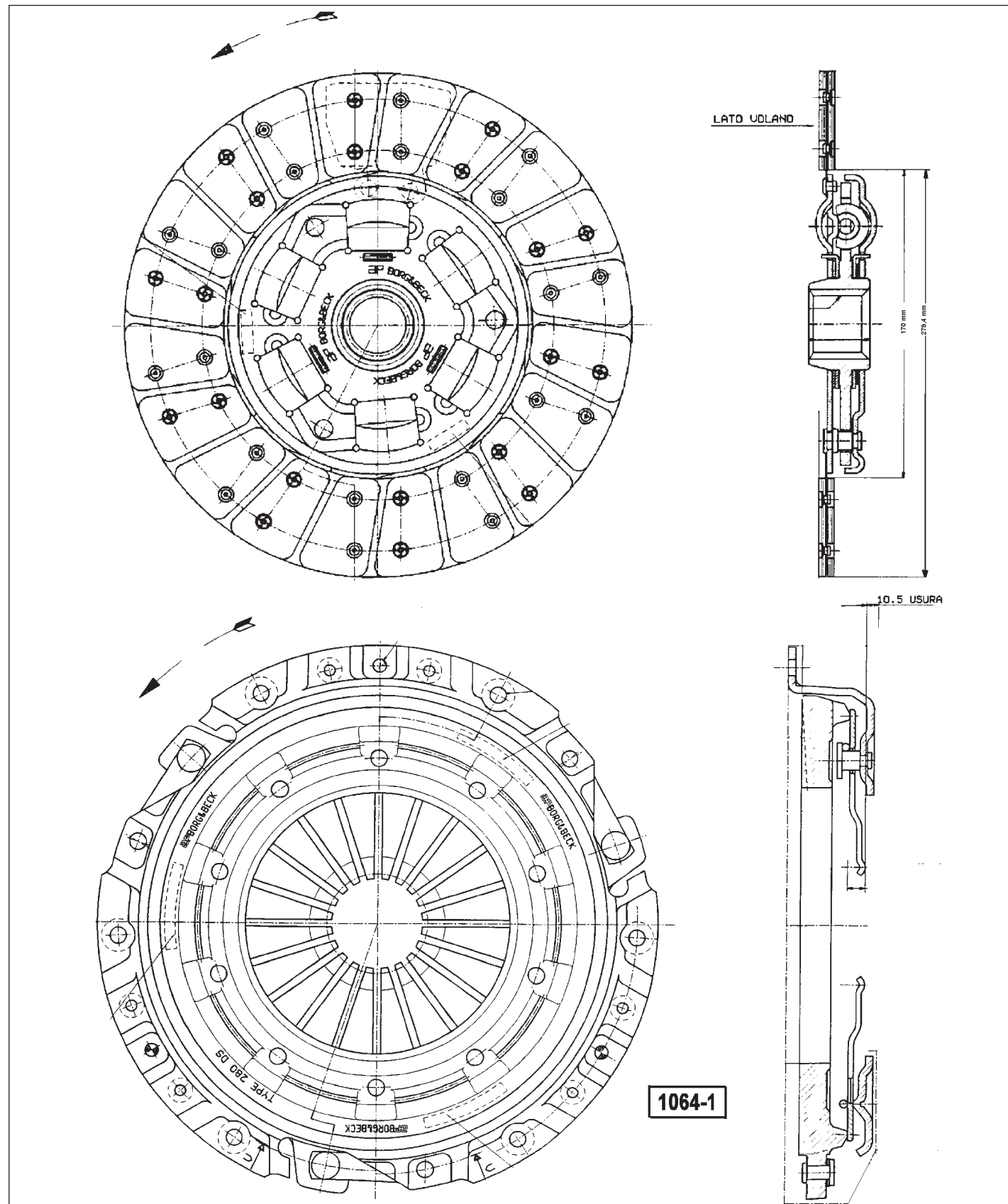
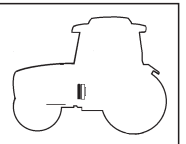


Fig. 2 - Clutch unit for AGROPLUS 60

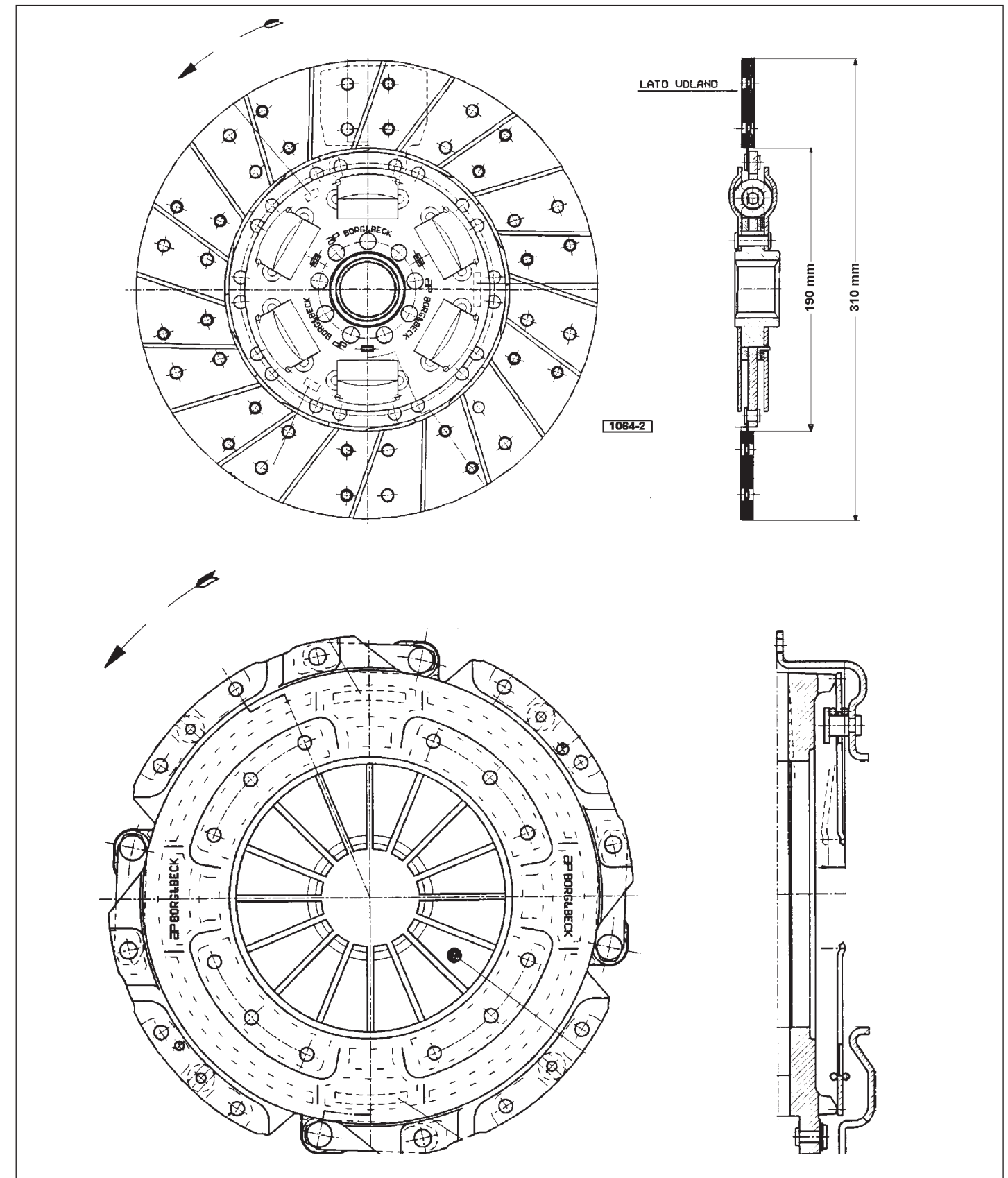
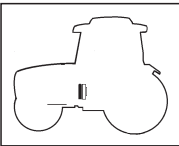
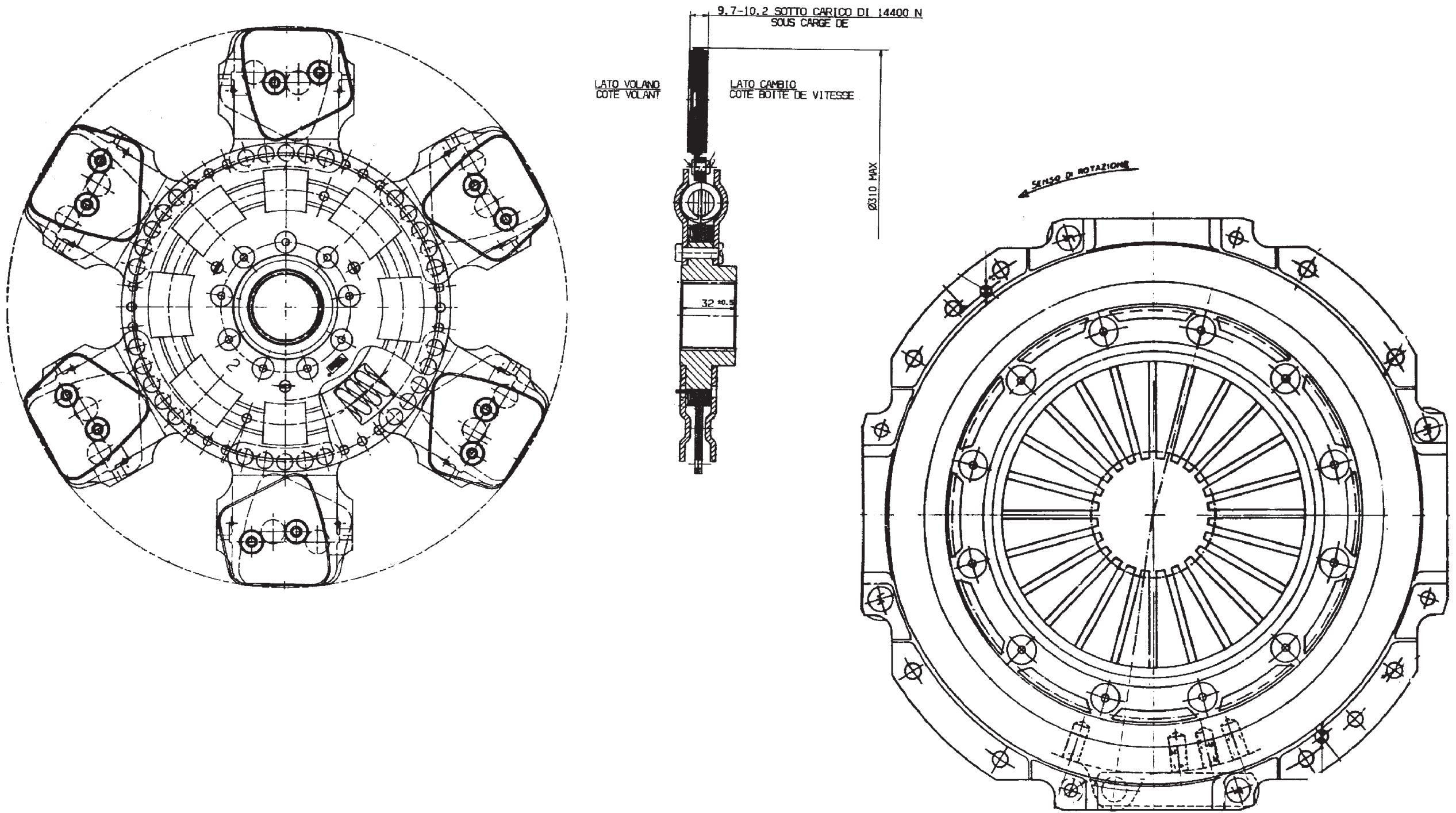


Fig. 3 - Clutch unit for AGROPLUS 70-80



2 Clutch and transmission

23 Clutch



Clutch unit for **AGROPLUS 60-70-80 (USA)** 6 blades

Clutch and transmission

2

Clutch

23

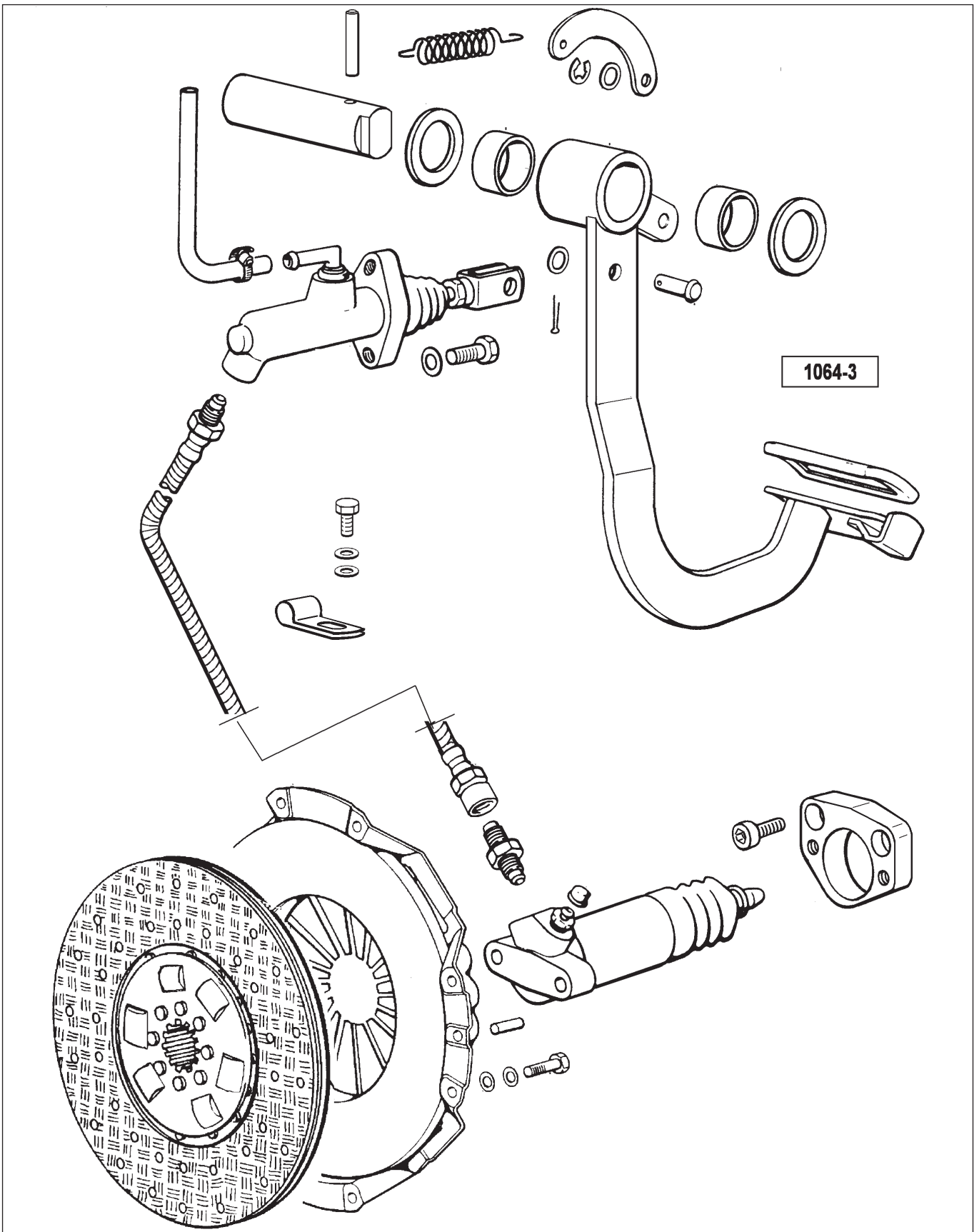
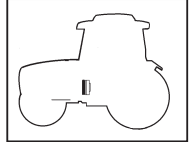
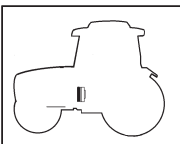


Fig. 4 - Components of clutch assembly

**2**

Clutch and transmission

23

Clutch

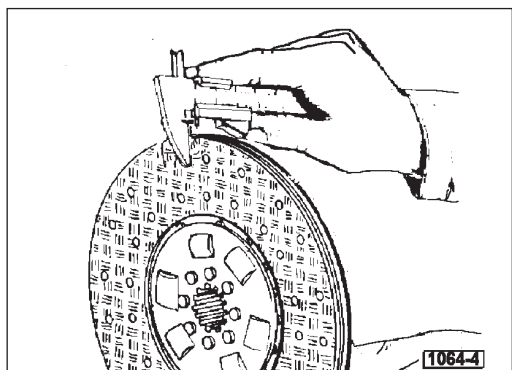


Fig. 5 - Checking clutch disk thickness.

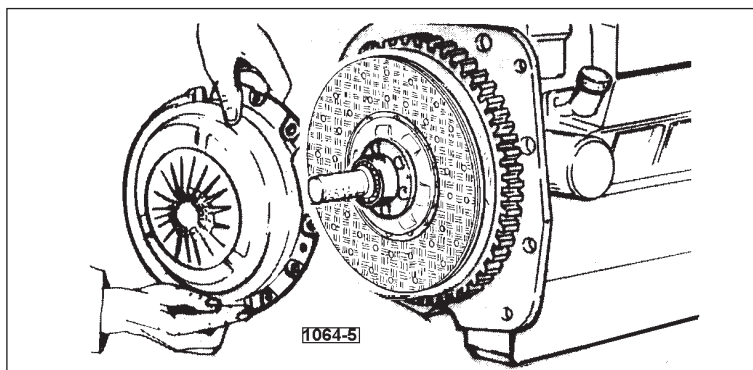


Fig. 9 - Installing clutch assembly through n. 5.9030.256.4/10 equipment.

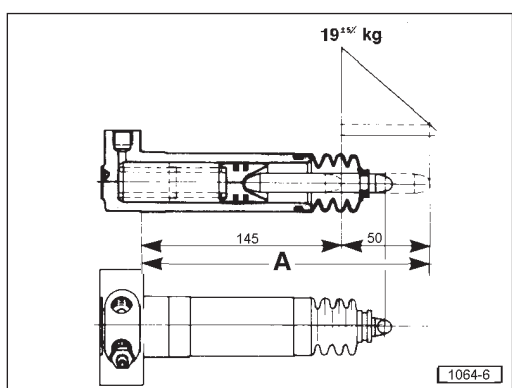


Fig. 6 - Clutch assembly hydraulic operating cylinder.

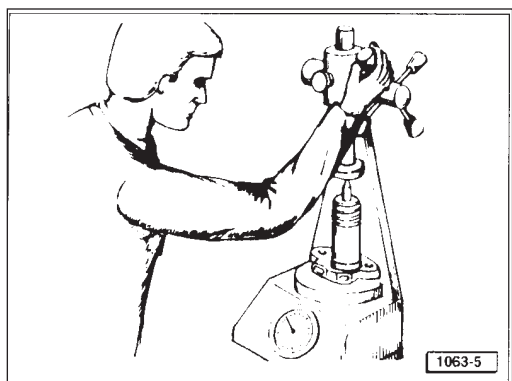


Fig. 7 - Checking operating cylinder inside spring efficiency.

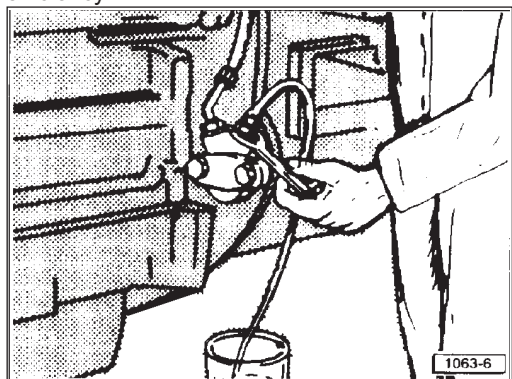


Fig. 8 - Bleeding the air from the clutch hydraulic circuit.

Checking clutch

Check the disk lining for signs of chipping and the disk friction face for scoring which may prevent the clutch from operating properly.

Check that the sliding surface of the engine flywheel is not scored; if signs of scoring are evident, machine the surface.

Check the disk thrust plate for scoring or bluish areas caused by tempering and also ensure the diaphragm-type spring has not lost its efficiency; if so the whole clutch assembly shall be replaced.

Be sure the clutch disk is free to move in its housing and the friction lining securing rivets are duly riveted.

Should any wear be found on the thrust bearing or the diaphragm-type spring, an exhaustive check over the spring operating conditions installed in the disk thrust lever operating cylinder (see Fig. 6) shall be performed; replace if necessary.

On reassembly ascertain dimension **A** (see Fig. 6) between the operating cylinder fixing face and the push rod contacting the engagement lever is 195 mm.

NOTE: To facilitate correct clutch disk assembly the use of no. 5.9030.256.4/10 centering tool is recommended.

Warning: With engine running, never ride the clutch pedal with your foot to prevent the clutch disk from being damaged because of overheating.

Important: The thrust bearing is prelubricated, and must never on any account be cleaned with fuel oil or other solvents as these will render the prelubrication treatment ineffective.

Adjusting clutch control pedal

Make sure the distance between pump fixing surface and fork hole centre is **106 1** (Fig. 15) otherwise loosen nut **A** and operate adjusting stay rod **B** (Fig. 15).

Bleeding air from the hydraulic circuit

Operate the clutch pedal several times, then keeping the clutch pedal in fully depressed position, slightly unscrew and soon after tighten the air bleeding screw valve again (this being located on thrust lever operating cylinder).

This operation should be repeated as many times as the oil flows out of the bleeding screw valve without air bubbles.

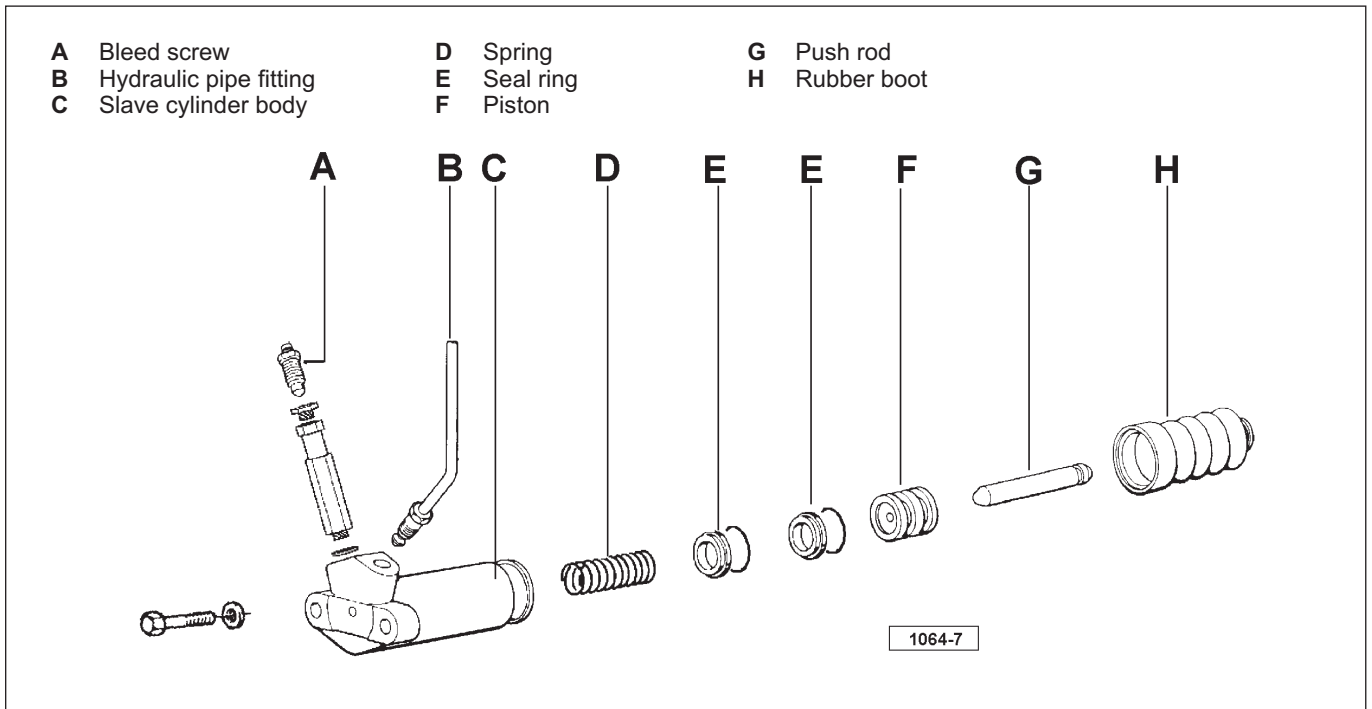
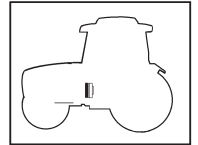


Fig. 10 - Clutch operating cylinder

Stripping the slave cylinder (Fig. 10)

Remove the boot **H**. Withdraw the piston **F** carefully from the cylinder **C**, blasting with compressed air at low pressure to assist removal. Remove the spring **D** from the cylinder and loosen the bleed screw **A**.

Remove the seals **E** from the piston **F**.

CAUTION: When cleaning the components of the cylinder, use only specifically formulated brake and clutch fluids (see page 110). Do not use petrol, paraffin or other mineral oils as these will damage parts in rubber.

Inspections

- Check both internal and external piston surfaces for scratching. Replace if required.
- Make sure the seal ring grooves are duly clean; blow the grooves with compressed air if necessary.
- Inspect seal ring, dust boot conditions as well as spring efficiency, worn-out parts should be replaced.
- Ensure the air bleeding hole is free from impurities.

Notes on refitment

- When reconnecting the transmission housing, check that the clutch fork remains correctly positioned and free to rock on its fulcrum pivot. This can be ensured by removing the side plug from the flange of the intermediate housing and viewing the fork through the hole. In the event of the fork pivot being unseated, reposition correctly with the aid of a screwdriver inserted through the hole vacated by the plug.
- Before refitting the slave cylinder, fill with the recommended oil so as to facilitate the subsequent bleeding procedure.
- Once all components are correctly and securely in place, bleed the hydraulic circuit.

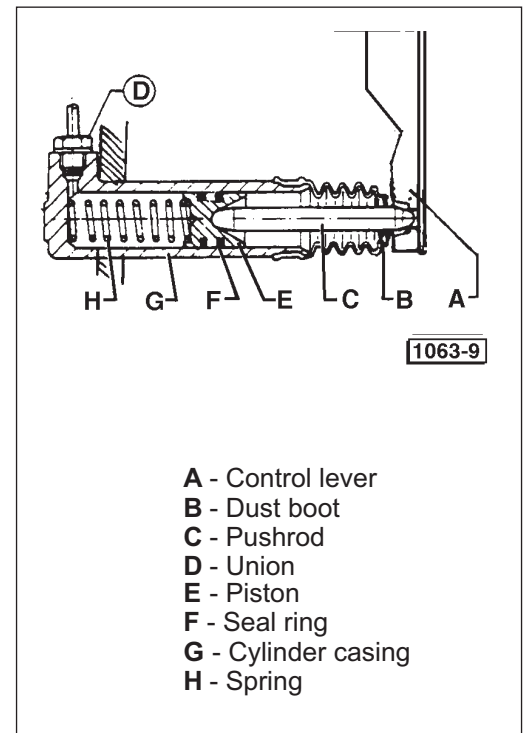
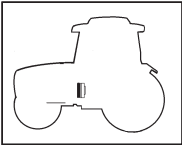


Fig. 11 - Clutch operating cylinder cutaway view.



2

Clutch and transmission

23

Clutch

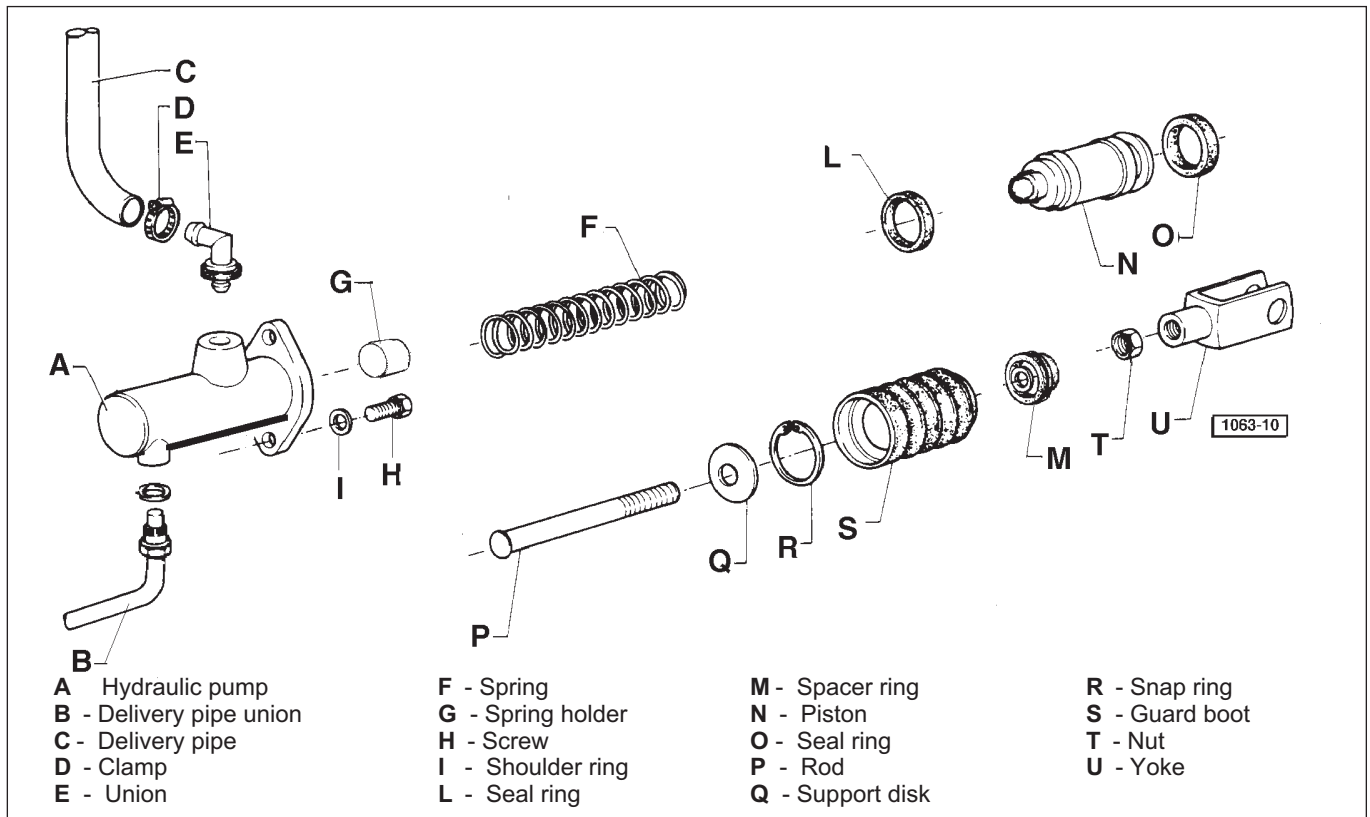


Fig. 12 - Clutch hydraulic pump parts.

Stripping the master cylinder

Referring to figure 14, remove the protective boot **E**, dislodge the circlip **B** and withdraw the rod **D** together with the disc **C**.

Remove the piston together with the spacer, the seal, the backup washer and the spring beneath.

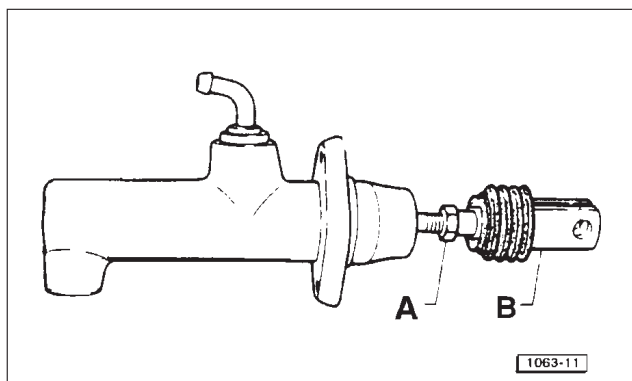


Fig. 13 - Clutch pump control positioning.

A - Locknut
B - Yoke

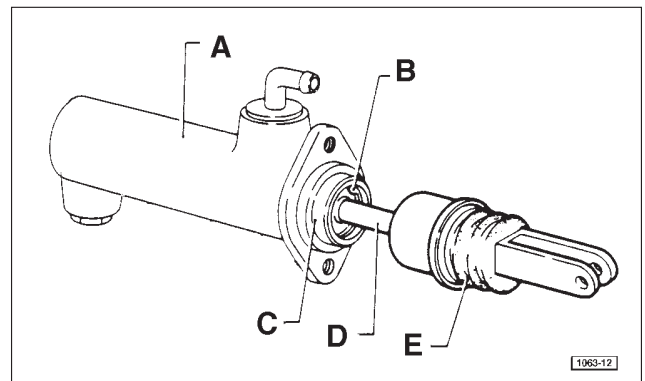
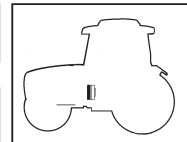


Fig. 14 - Pump control seal ring.

A - Pump
B - Snap ring
C - Support disk
D - Rod
E - Guard boot



Inspections and checks

WARNING: To clean and wash the hydraulic pump components use only the oil type recommended for brakes and clutch. Never use petrol, kerosene or other mineral oils to prevent damaging the rubber parts. Inspect both internal and external piston sliding surfaces for scratching. Replace if required. Make sure the seal ring grooves are duly clean; blow the grooves with compressed air if necessary. Inspect seal ring, dust boot conditions as well as spring efficiency, worn-out parts should be replaced. Inspect all pump internal compartments, apertures and passages and make sure these are properly clean and free from foreign matters. Check that the spring is neither lazy nor deformed; replace if necessary.

Reassembly

Reassemble the cylinder, repeating the disassembly steps in reverse order and observing the following directions:
 — Lubricate surfaces engaged in relative sliding contact, using the recommended oil (see page 12).
 — Verify correct operation of the cylinder, making certain that the piston is able to complete its full stroke unimpeded. In the event that the fork linking the master cylinder with the pedal has been removed, check that with the push rod fully extended, the distance between the reference surface of the cylinder and the centre of the hole in the fork is as indicated in figure 15.
 If not (referring to fig 13), remove the boot, loosen the lock nut **A** and screw or unscrew the fork **B** to obtain the prescribed clearance, then retighten the lock nut and reposition the boot.

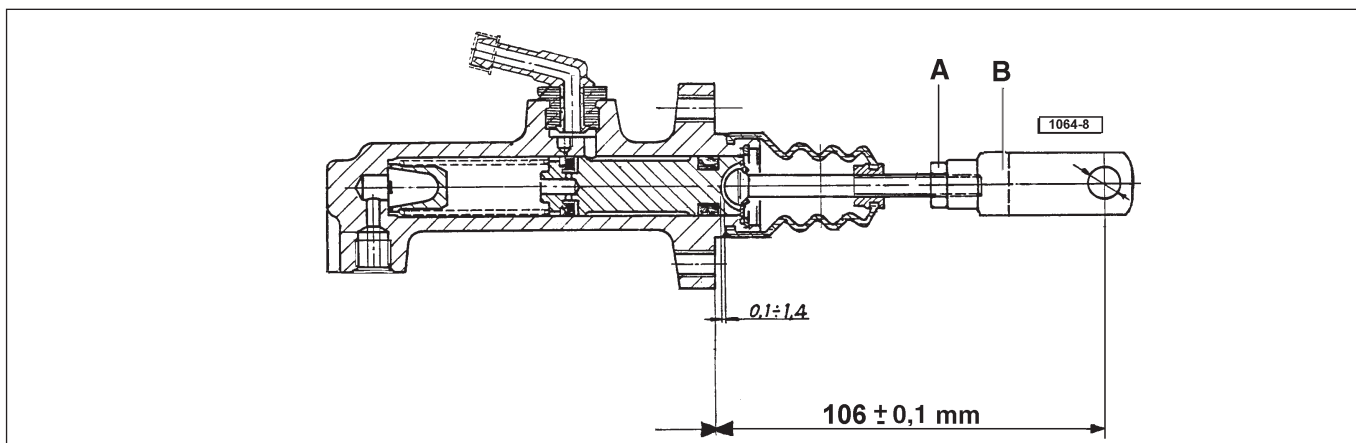
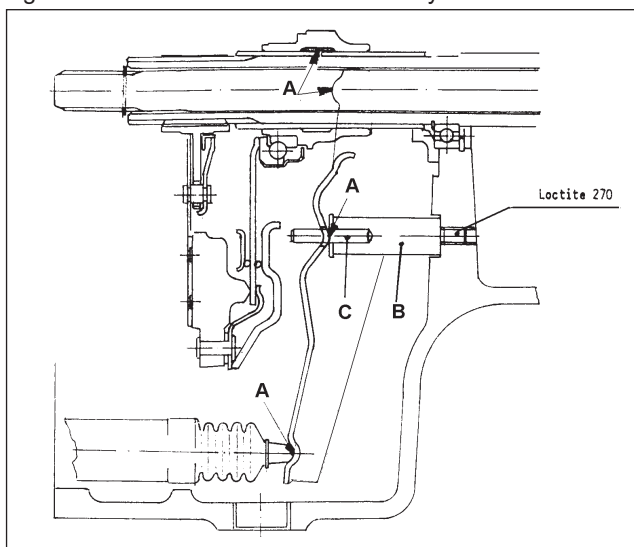
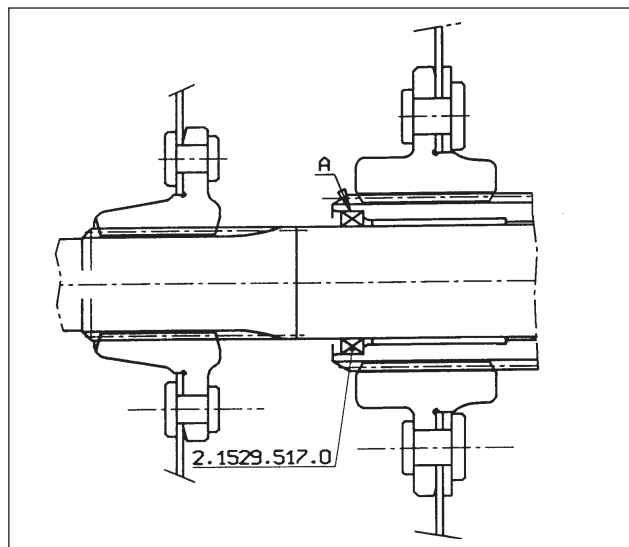


Fig. 15 - Section view of clutch master cylinder



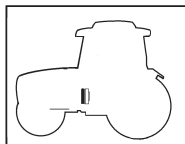
Clutch greasing points.

Apply Molikote Gn-plus at all the points indicated in the figure with letter **A**.
 Fit part **B** with Loctite 270.
 Fit pin **C** with Loctite 601.



Fitting the P.T.O. shaft oil seal

Before fitting the oil seal 2.1529.517.0 apply Loctite 222 to the outer face **A** indicated in the figure.



2

Clutch and transmission

Diagnosing malfunctions

	lubricant in clutch housing	renew the front gearbox oil seal and the rear engine oil seal	clean oil seal contact surfaces with petrol	replace disk
clutch slips	clutch worn	check condition of clutch disk	check condition of the spring disk	fit new clutch assembly
	thrust bearing sticking	clean surfaces and apply grease	replace thrust bearing	clean or replace the disk
clutch jerks	clutch disk surfaces dirty	clean the friction surfaces		
	clutch disk warped	clutch disk surfaces dirty	replace clutch disk	
		clutch disk worn	replace clutch disk	
		plate seals loose	replace clutch disk	
clutch fails to disengage	difficulty in engaging gears when engine running	clutch disk warped	replace disk	
		hydraulic pump inefficient	check the stroke of the clutch control piston and replace any worn parts	
		clutch disk stuck to flywheel	clean contact surfaces with a wire brush and petrol	
clutch noisy when disengaged	worn parts in clutch engagement mechanism	replace parts		