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 thos people, who will let us have their suggestions in order to make this publication more complete.

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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

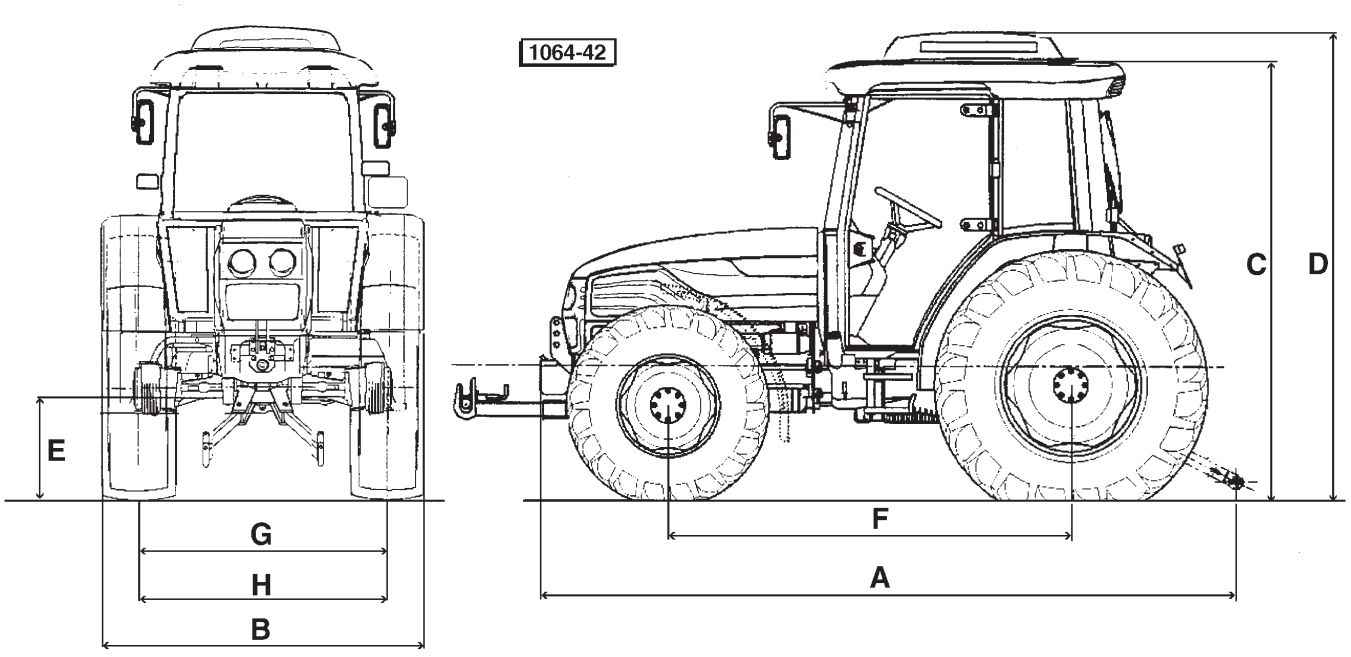
- with supplementary rams
- without supplementary rams

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 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	
Lubrification points		AKROS GREASE T2	NLGI 2 - LITIO SDFG GR-1202 L	50

(*)1° replace after 50 hours
(**) With filter + 1.5 litre

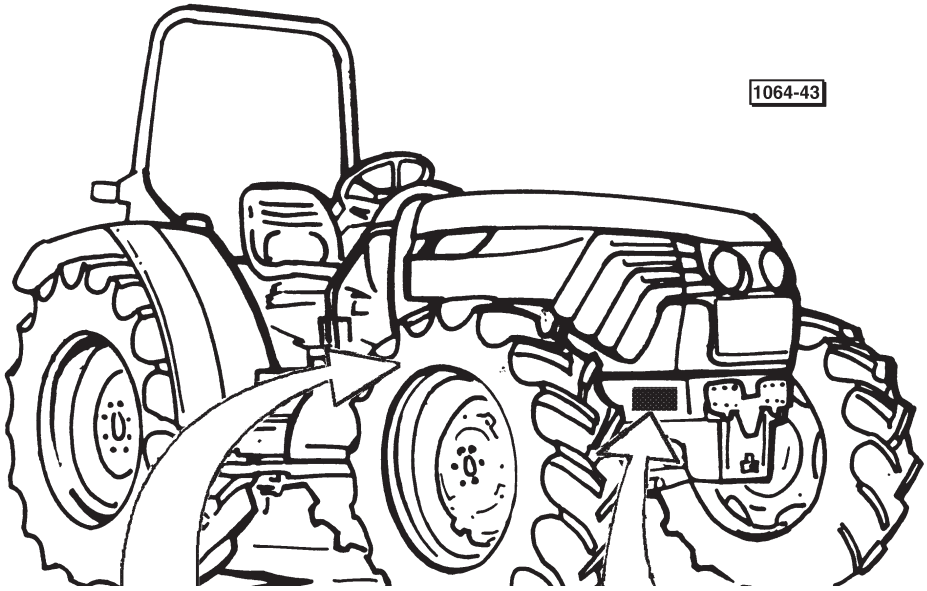
CONVERSION TABLE FROM

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.	cm2	6.452
cm2	Sq.ft.	0.155
Sq.ft.	m2	0.093
m2	Sq.ft.	10.77
Sq.yard	m2	0.835
m2	Sq.yard	1.197
Cu.in.	cm3	16.39
cm3	Cu.in.	0.061
Cu.ft.	Liter	28.36
Liter	Cu.ft.	0.035
Cu.yard	m3	0.763
m3	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/cm2	0.070
kg/cm2	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/m3	16.21
kg/m3	lb./cu.ft.	0.062
cu.ft./lb.	m3/kg	0.062
m3/kg	cu.ft./lb.	16.21
Nm	kgm	0.102
kgm	Nm	9.81
kW	PS	1.36
PS	kW	0.736
bar	kg/cm2	1.014
kg/cm2	bar	0.981
dm3	l	1
l	dm3	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

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 cuold be ordered to the following addresse:

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

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		

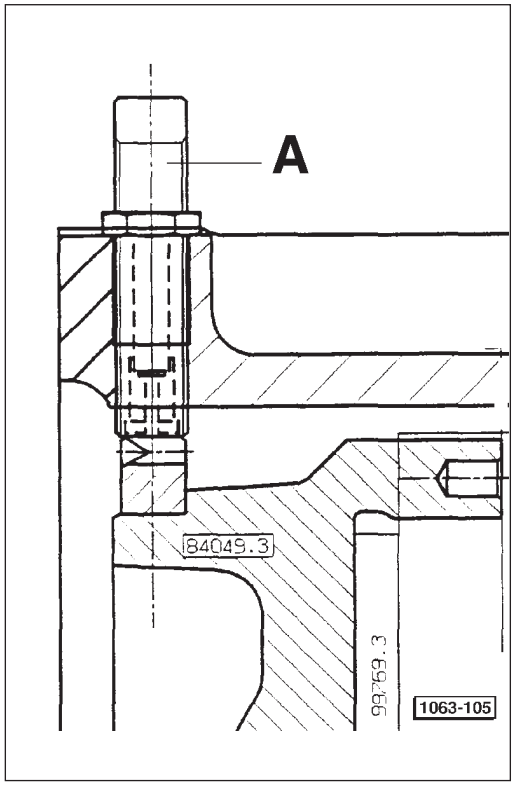


Fig. 1 - Engine rpm pickup.

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.

IIMPORTANT: 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.

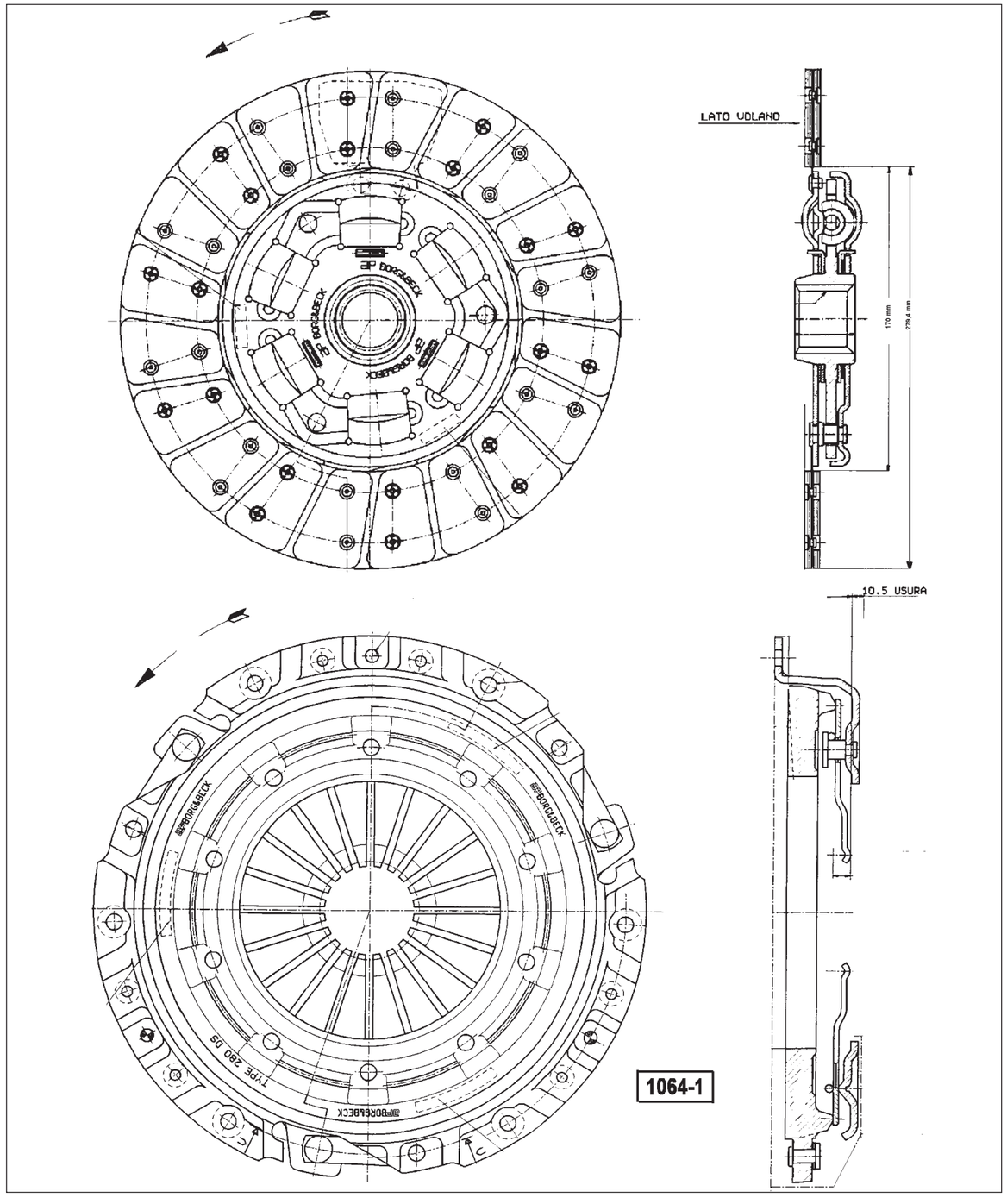


Fig. 2 - Clutch unit for ***AGROPLUS 60***

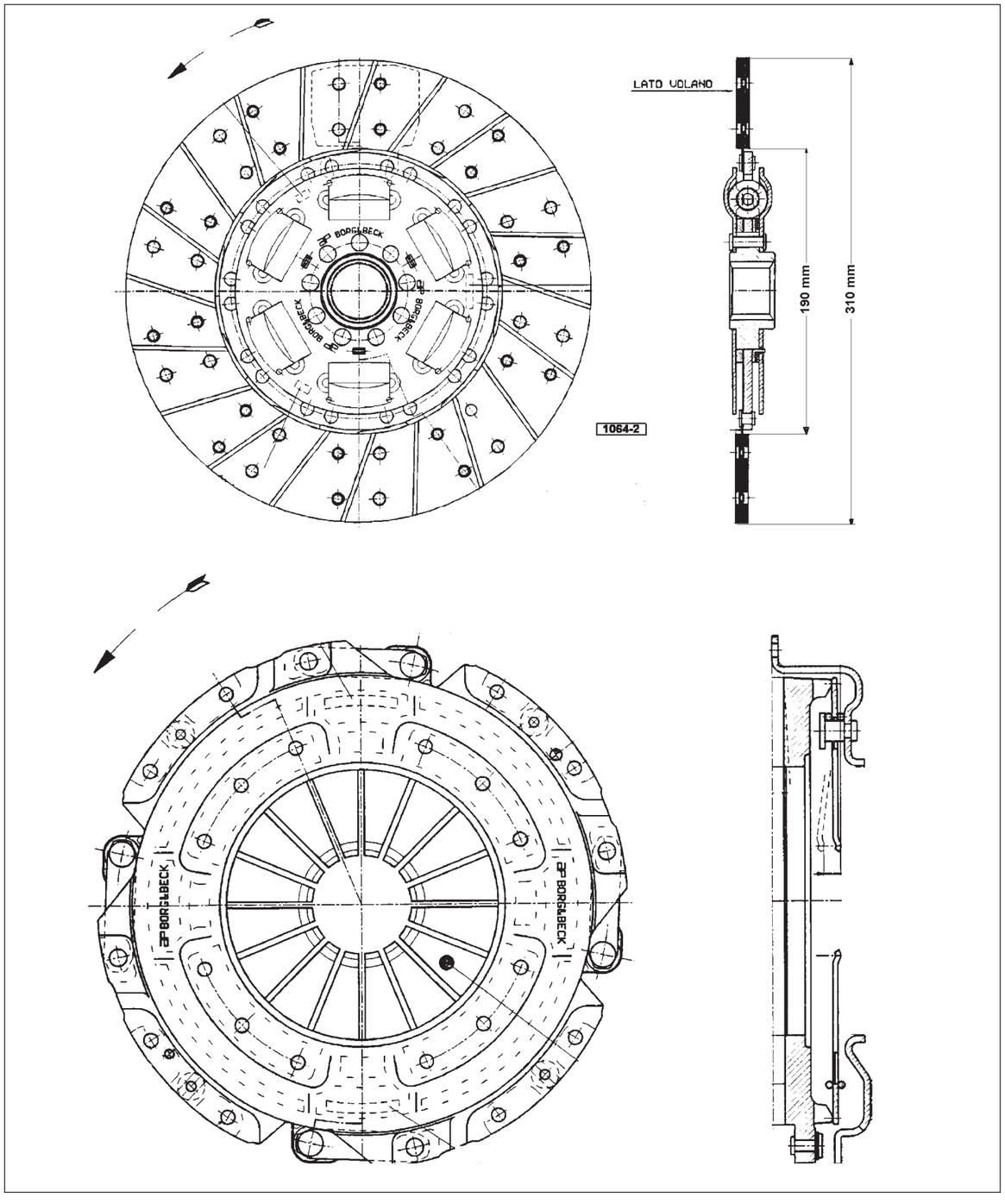
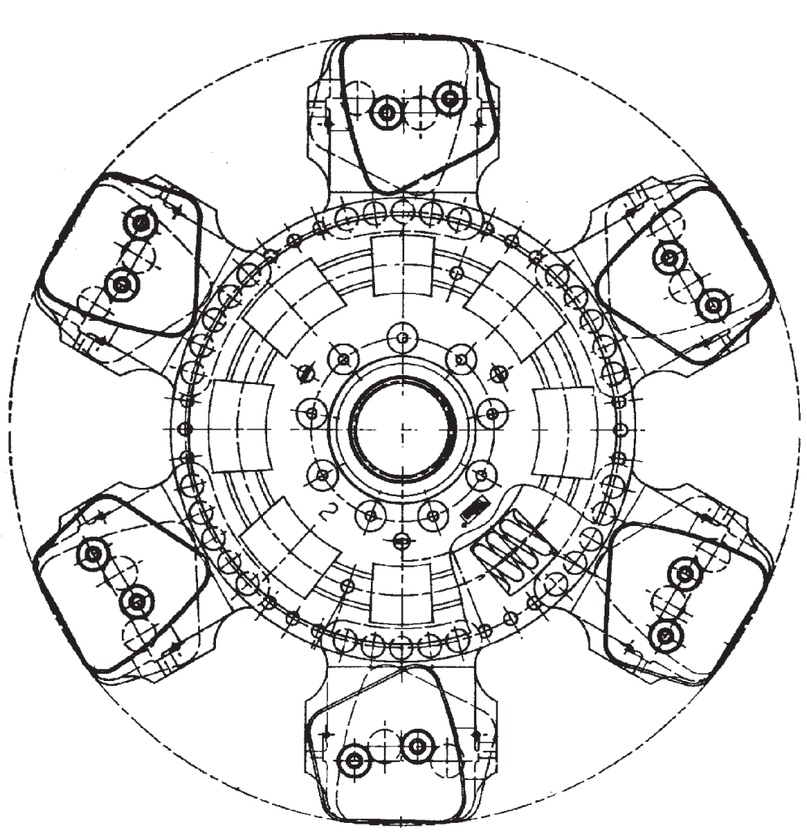
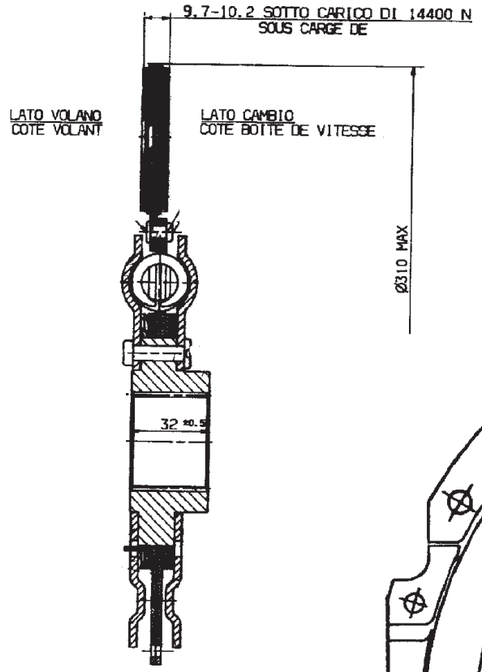
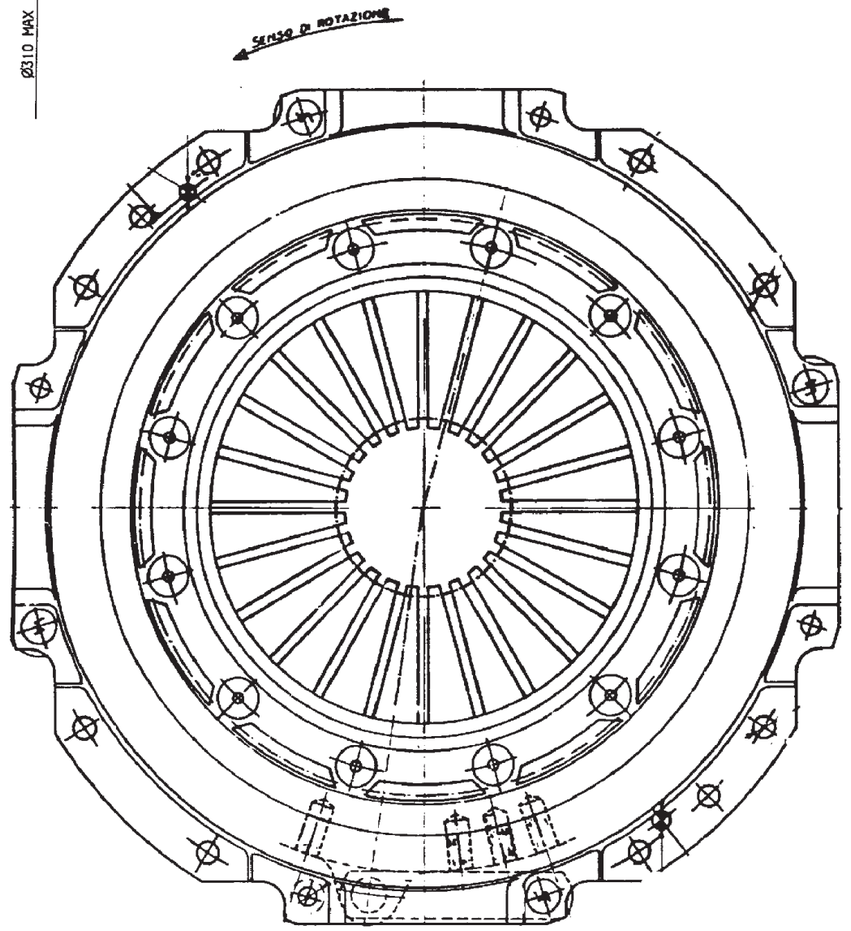


Fig. 3 - Clutch unit for ***AGROPLUS 70-80***







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

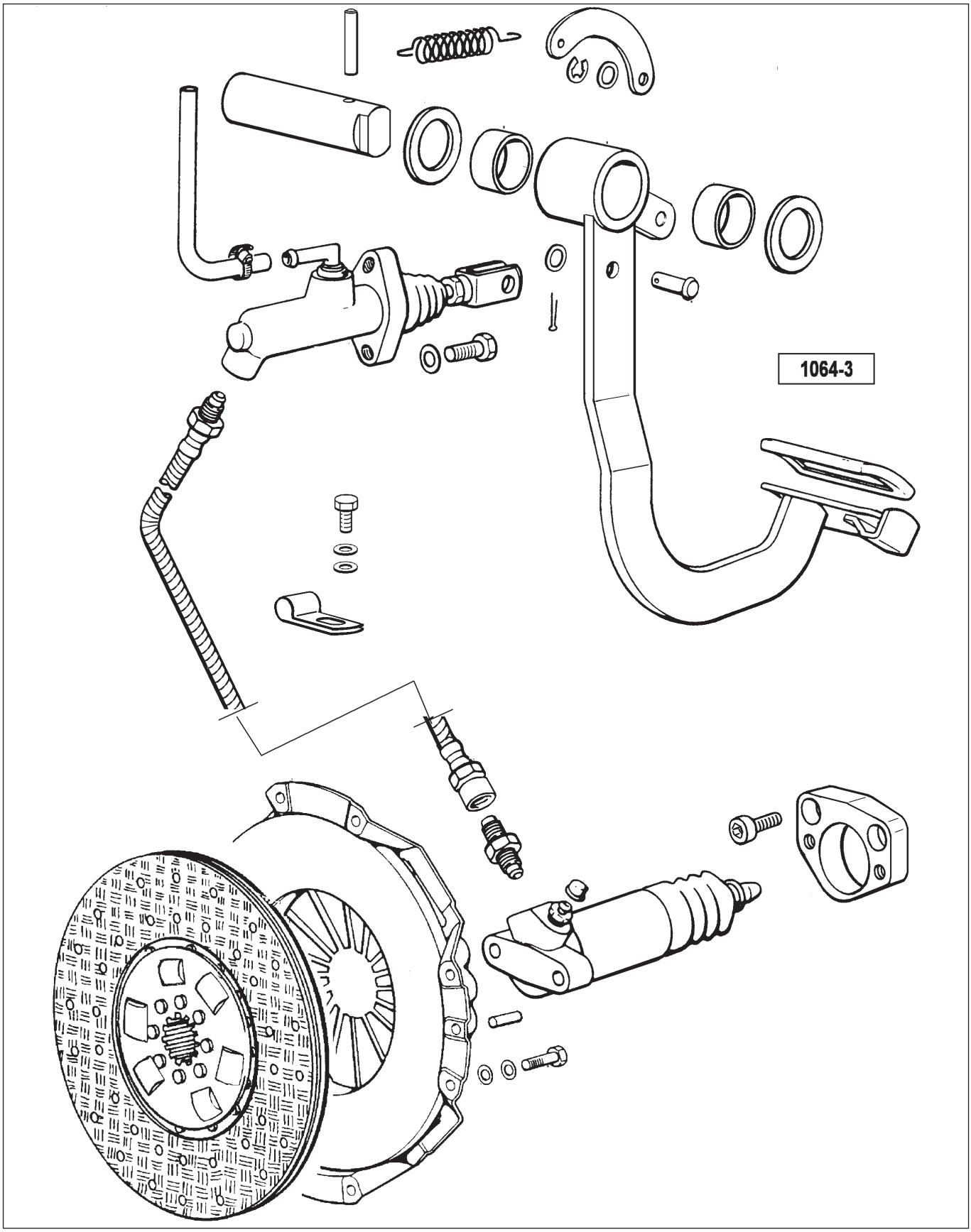


Fig. 4 - Components of clutch assembly

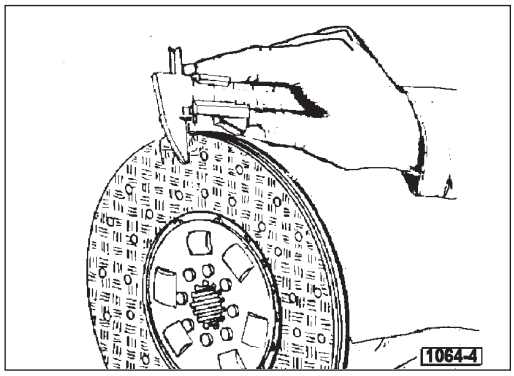


Fig. 5 - Checking clutch disk thickness.

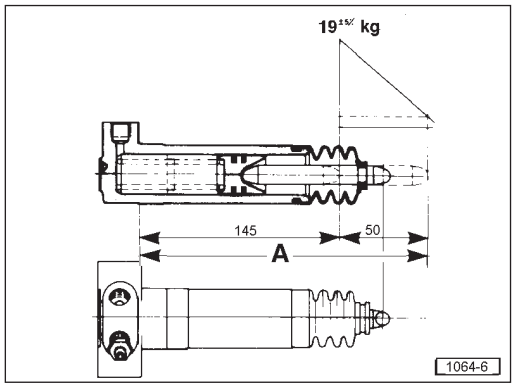


Fig. 6 - Clutch assembly hydraulic operating cylinder.

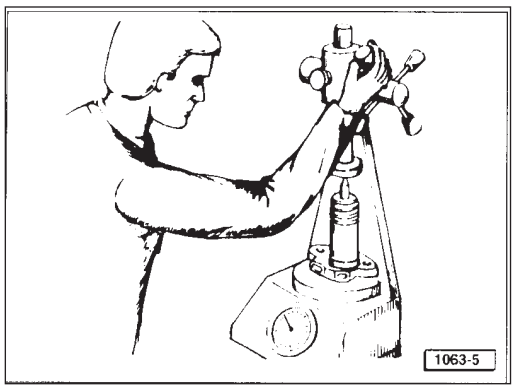


Fig. 7 - Checking operating cylinder inside spring efficiency.

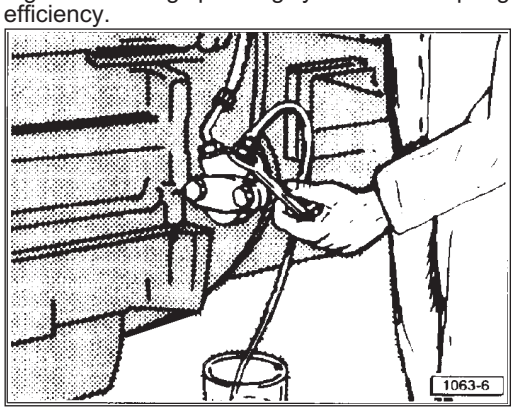


Fig. 8 - Bleeding the air from the clutch hydraulic circuit.

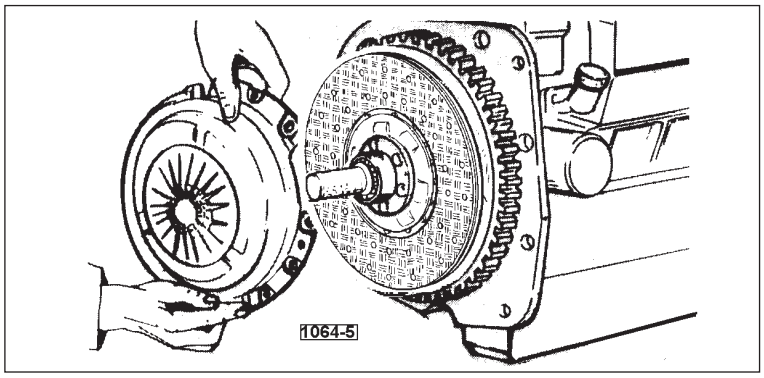


Fig. 9 - Installing clutch assembly through n. 5.9030.256.4/10 equipment.

Cecking 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.

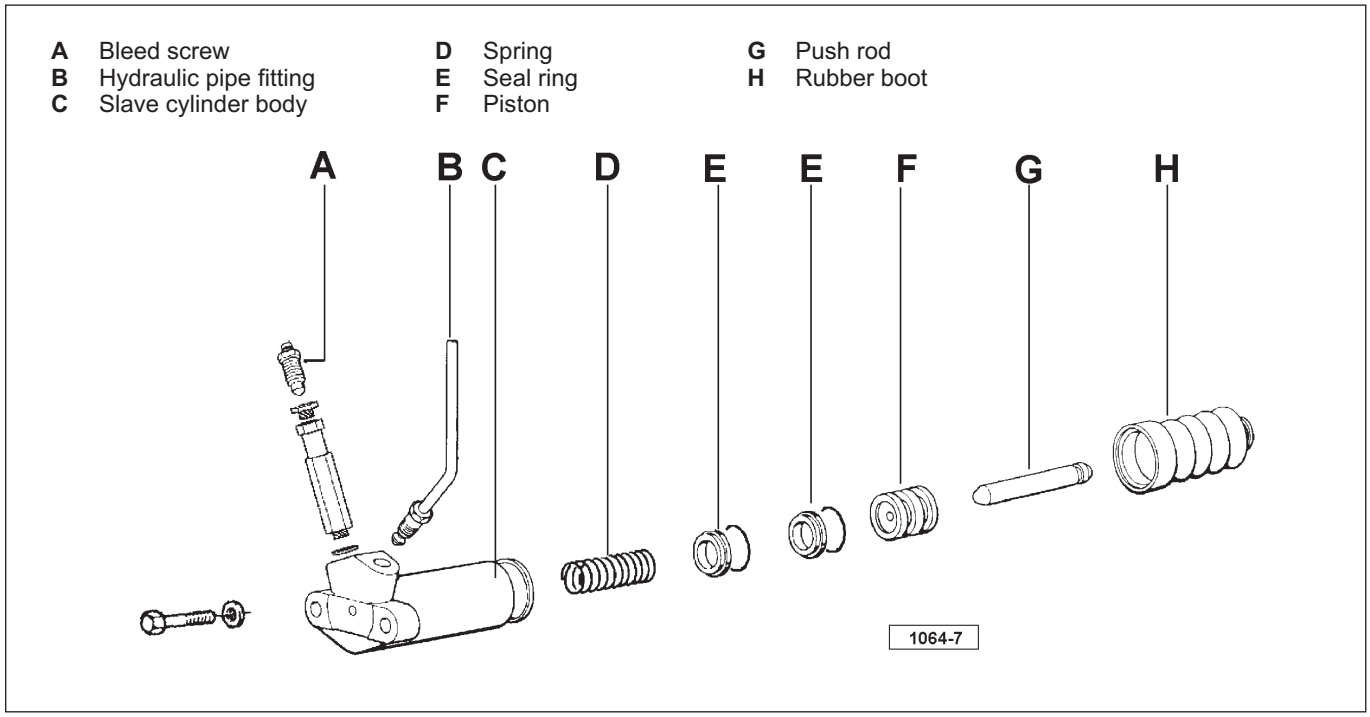


Fig. 10 - Clutch operating cylinder

Stripping the slave cylinder (Fig. 10)

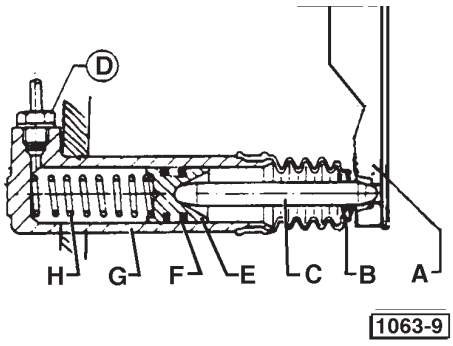
Remove the boot **H**. Withdraw the piston **F** carefully from the cylinder **C**, blasting with compressed air at low pressure to assist removal.
Remove the spring **D** from the cylinder and loosen the bleed screw **A.**
Remove the seals **E** fom the piston **F.**
CAUTION: When cleaning the components 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.

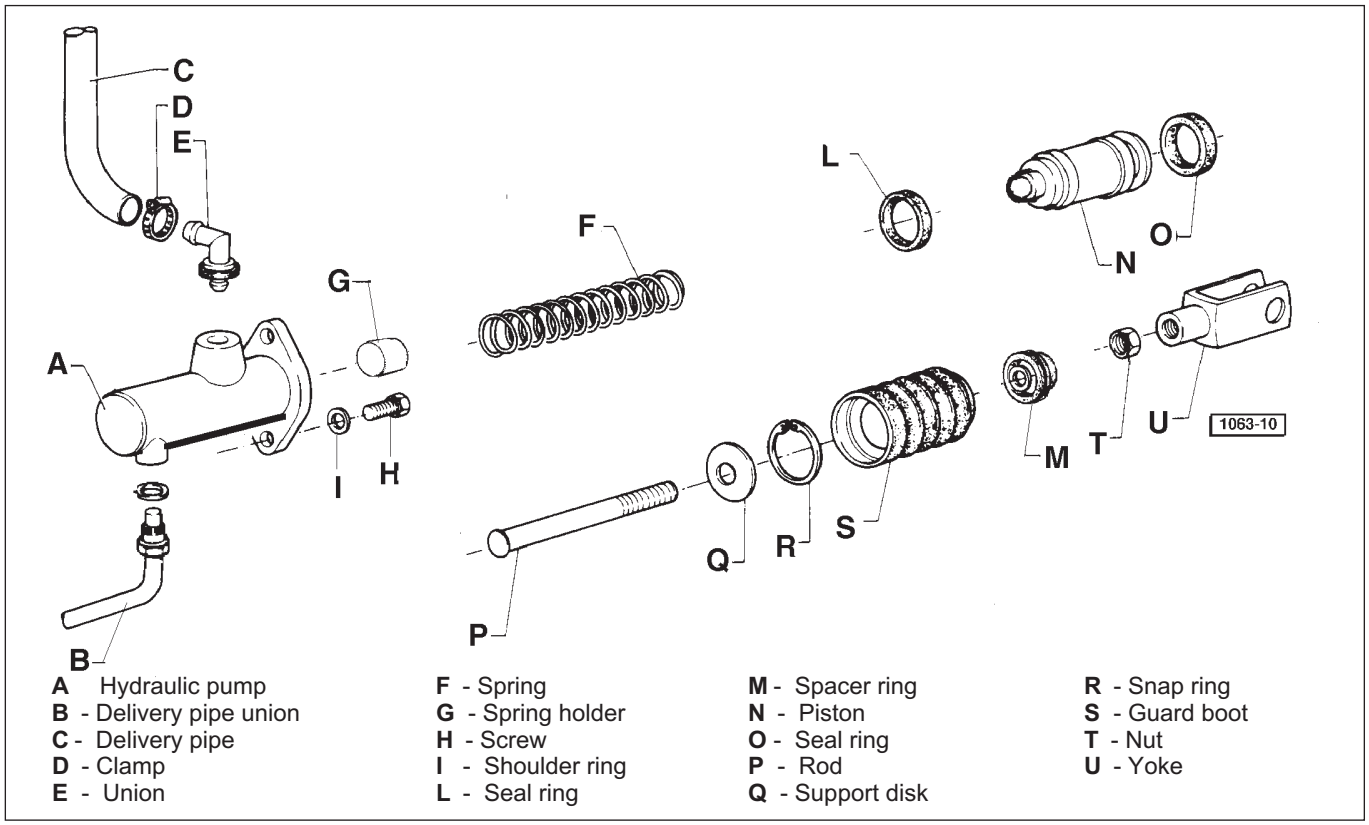
Notes on refitment

— 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.



A - Control lever
B - Dust boot
C - Pushrod
D - Union
E - Piston
F - Seal ring
G - Cylinder casing
H - Spring

Fig. 11 - Clutch operating cylinder cutaway view.



A Hydraulic pump
B - Delivery pipe union
C - Delivery pipe
D - Clamp
E - Union
F - Spring
G - Spring holder
H - Screw
I - Shoulder ring
L - Seal ring
M - Spacer ring
N - Piston
O - Seal ring
P - Rod
Q - Support disk
R - Snap ring
S - Guard boot
T - Nut
U - Yoke

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.

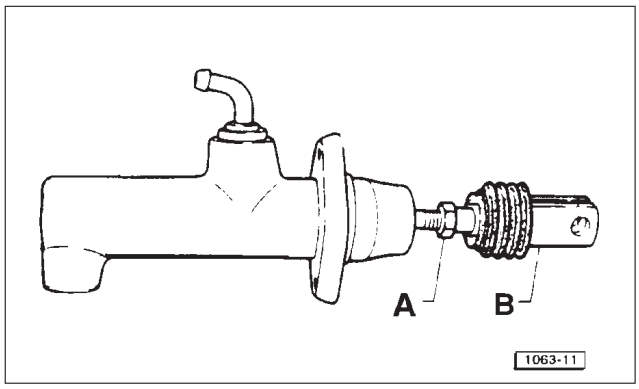


Fig. 13 - Clutch pump control positioning.
A - Locknut
B - Yoke

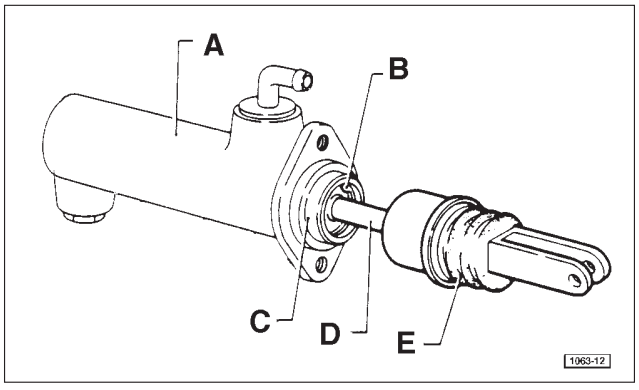


Fig. 14 - Pump control seal ring.
A - Pump
B - Snap ring
C - Support disk
D - Rod
E - Guard boot

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.

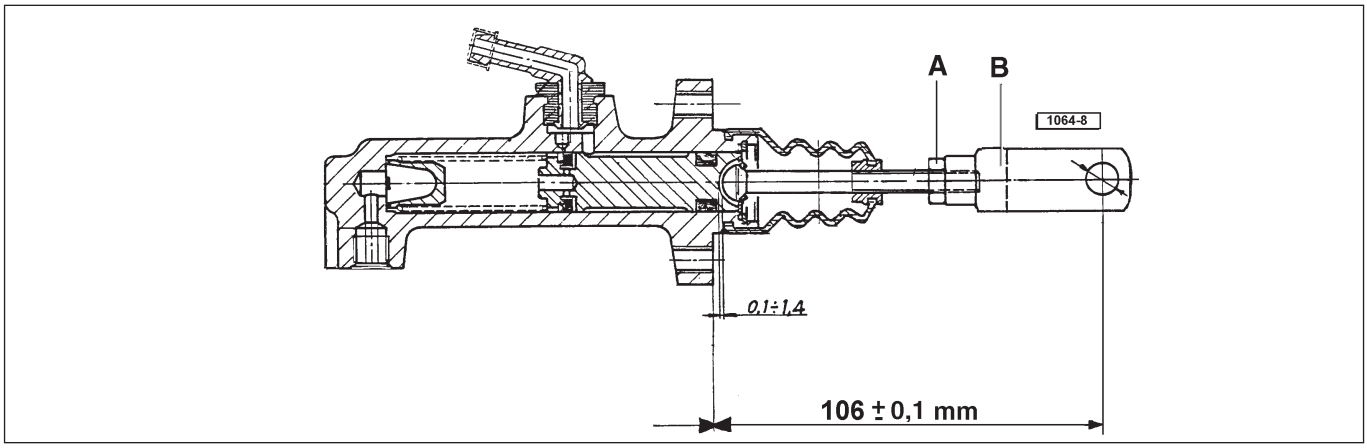
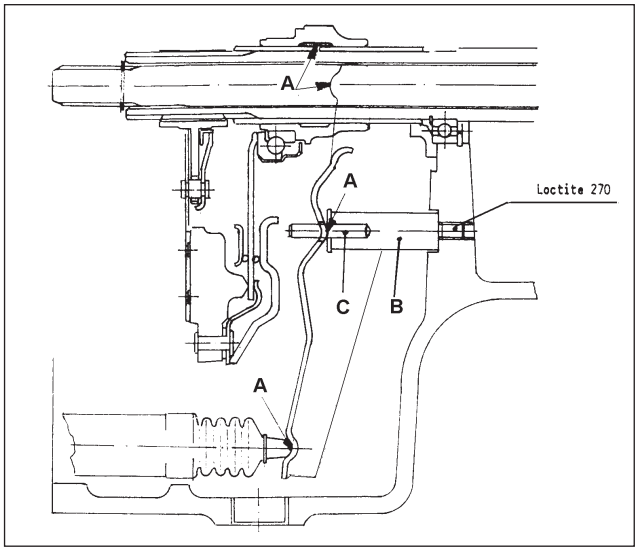
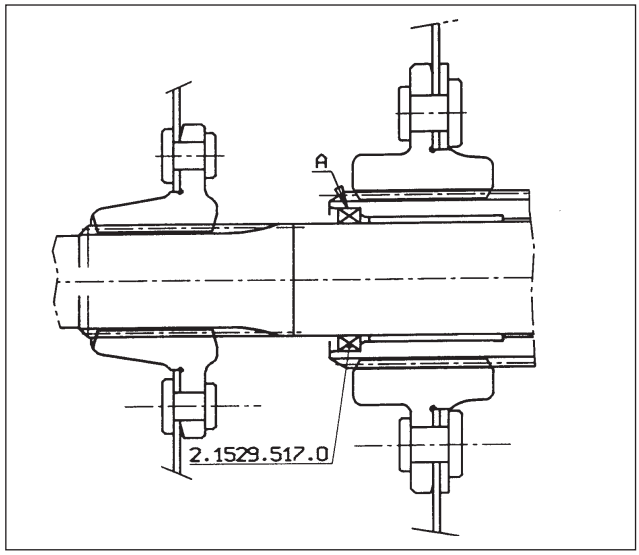


Fig. 15 - Section view of clutch master cylinder



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.

	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		