

GOLDONI IDEA SERIES

Shop Manual



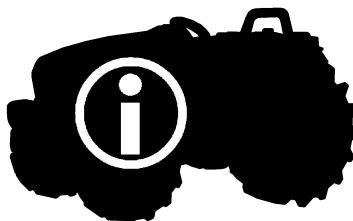
**AGRICULTURAL EQUIPMENT PLANT
GOLDONI S.p.A.**

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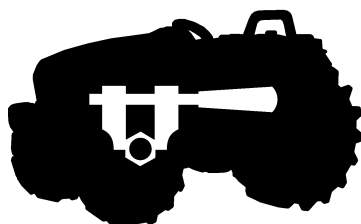
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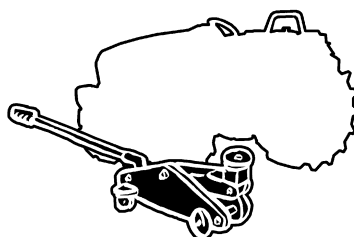
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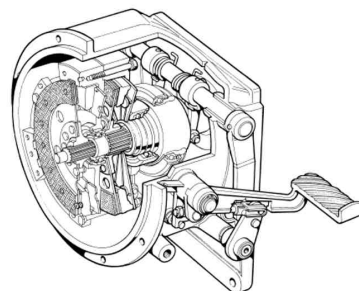
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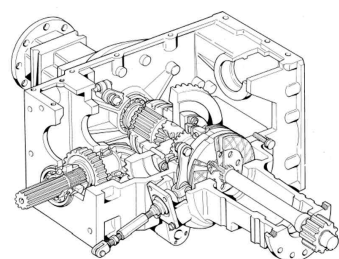
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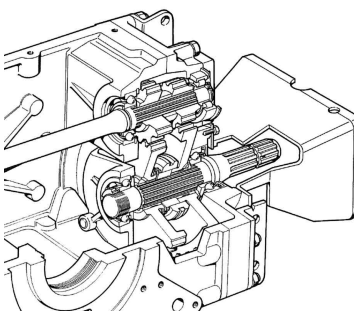
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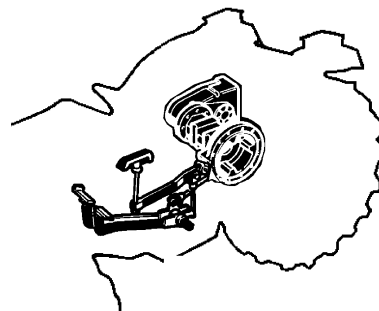
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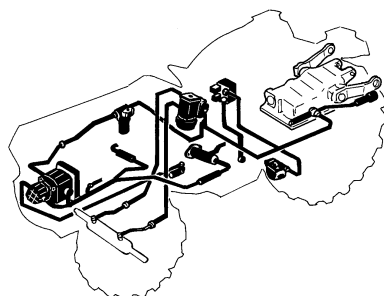
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IDEA

**Shop
Manual**

*Cut and insert in
the pockets in
the package*



**Series
IDEA**

**S.A.T.
Goldoni**



GOLDONI *SERIES* IDEA

Shop Manual

Mod. 20DT-26DT-30DT

PROPOSED CHARTER OF THE ASSOCIATION

ARTICLE I			
PURPOSE			
1.1	TO	OF	THE
1.2	AND	FOR	THE
1.3	AND	FOR	THE
1.4	AND	FOR	THE

Correspondence between GOLDONI - JOHN DEERE - GUTBROD models

<i>GOLDONI</i>	MODELS		
	20DT	26DT	30DT
<i>JOHN DEERE</i>	746	846	946
<i>GUTBROD</i>	5020	5025	5030

NOTICE

Certain sections of this manual are missing and will be added as soon as they are ready.

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SAFETY REGULATIONS



Failure to observe safety regulations is the cause of the majority of industrial accidents in a tractor repair shop.

Our tractors have been designed and built to facilitate repairs and servicing but this fact alone will not prevent accidents from happening.

Only an alert mechanic who observes all safety regulations can offer the best kind of guarantee for his own safety and that of others.

1. Always carry out the procedures as detailed in the manuals.
2. Before doing maintenance or other work on the tractor or the implements hitched to it, the following steps should always be taken:
 - Lower any implement to the floor.
 - Stop the engine and remove the ignition key.
 - Detach the “+” cable from the battery.
 - Place a notice by the driving position prohibiting the operation of any tractor control.
3. Check to make sure that all rotating devices on the tractor (PTO, drive lines, pulleys, etc.) are well protected.
4. Do not wear dangling articles or unfastened clothes which could become trapped in the moving parts of the tractor.
Depending on the nature of the work to be done, wear certified safety clothing and equipment such as helmets, reinforced shoes, gloves, overalls and glasses.
5. Do not service the tractor with a person at the controls unless the person is specially trained for this and is helping with a specific maintenance task.
6. Do not check or work on the tractor with the engine running unless this is specifically required.
In this case, ask for the help of a second person who will keep the mechanic under constant visual control from the driver's seat.
7. Operate the tractor or the implement coupled to it exclusively from the driver's seat and never from any other position.
8. Before removing caps or covers, check your pockets for items that could fall into the openings. The same applies to tools.
9. Do not smoke near flammable liquids or products.

10. To be able to handle emergency situations, it is essential:
 - to have an efficient fire extinguisher and a complete first aid cabinet within easy reach.
 - Keep the telephone numbers for the emergency room at the hospital and the fire station near the telephone.
11. When due to maintenance work the brakes are inoperative, keep the tractor under control using suitable clamping systems.
12. If the tractor has to be towed, use the tow points prepared by the manufacturer and check to make sure the towing equipment is fixed correctly.
Keep well away from tow bars and wires when tension is taken up.
13. When loading a tractor onto a truck, make sure it is well tied down on the truck.
Load and unload the tractor with the truck parked on flat ground.
14. Use hoists or other lifting equipment with adequate lifting capacity when the tractor or heavy parts have to be hoisted. Always check to make sure that the hoisting chains, wires or straps are fully efficient.
Keep all other persons well away from the hoisting zone.
15. Due to its toxic nature, as a safety precaution, do not pour petrol or diesel fuel into wide mouthed or open containers. Do not use these products as detergents but, instead, always use non-flammable and non-toxic brands.
16. When you have to use compressed air to clean parts, always wear safety glasses with side panels.
17. Before starting the engine in a closed area, check to make sure that the tube exhausting the gas to the outside is attached to the exhaust pipe. If the shop has no system to exhaust the gas to the outside, make sure that shop ventilation is adequate and continuous.
18. Move carefully and apply all the necessary precautions if, during work outside the shop, you have to work under the tractor. Choose a flat area, brake the tractor adequately and wear protective clothing.
19. Keep the work area clean and remove any oil or water spilled on the floor.
20. Do not pile up rags soaked in oil or grease since this is a very real fire hazard. Dump any such rags in a metal container which should always be kept covered.
21. When using grinders, sanders and similar equipment always wear certified safety equipment such as helmets, glasses, gloves, special shoes and overalls.
22. Welding should be done wearing certified safety equipment such as helmets, dark glasses, gloves, special shoes and overalls. If a helper is needed, he must always use the safety equipment.
23. Try to avoid creating dust, which is then breathed in, when working on parts that contain asbestos.

Technological advances have eliminated, for all practical purposes, the use of asbestos. But the recommendation given above should still be respected by the mechanic since he may have to work on older machines built before the directives about the use of asbestos went into effect.

Do not use jets of compressed air, grind or brush parts containing asbestos. Whenever you have to work on them, use a respiratory protective device (face mask).

Any spare parts shipped out by Goldoni that contain asbestos are clearly marked as such.

24. Unscrew the radiator cap very slowly to allow the pressure in the cooling circuit to be discharged. If the tractor has an expansion tank, apply this same precaution when removing its cap.
25. Do not use naked flames or cause sparks near the battery since there is a real explosion hazard. Do not smoke.
26. Do not test battery charge level using metal objects as jumpers between the terminals.
27. To prevent acid burns:
 - Wear rubber gloves and safety glasses.
 - Top up the battery in well ventilated areas and do not breathe in the fumes since they are toxic.
 - Do not allow the electrolyte to leak or drip.
 - Charge the battery in well-ventilated areas.
 - Do not charge a frozen battery as it can explode.
28. A pressurised fluid leaking from a tiny hole can be practically invisible but can penetrate the skin and cause serious infection or dermatitis.
In these situations, if you want to check for leaks in the hydraulic circuit, do not use your hand to find it but, rather, a piece of cardboard or wood.
29. Check hydraulic circuit pressure using the requisite instruments.

HOW TO IDENTIFY THE TRACTOR



Fig. 1

0001

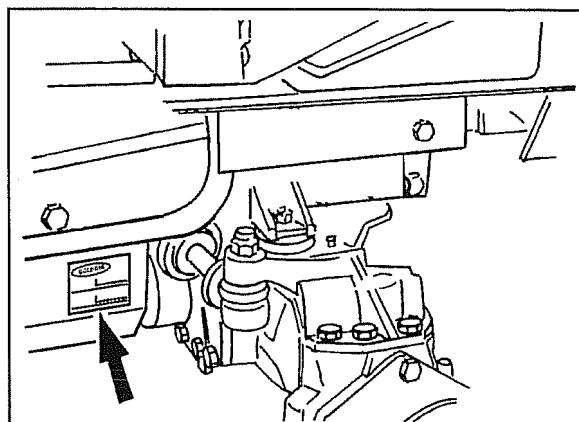


Fig. 2

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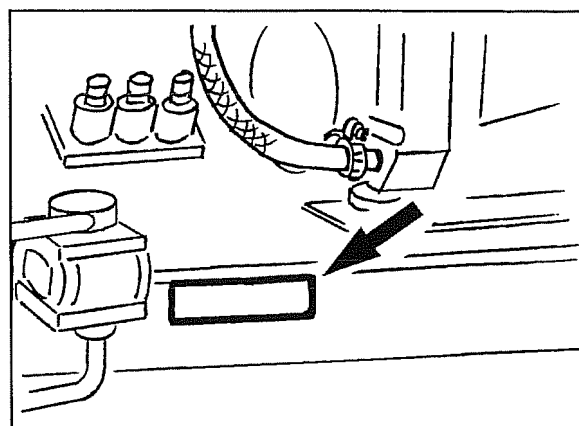


Fig. 3

0003

Whenever you need to contact our Technical Assistance Centre for technical information or to order parts, you will have to specify the data identifying your tractor. You will need to note:

1. Tractor Series and Model.
2. Serial and Chassis Numbers

Tractor model, Serial and Chassis numbers are given on the identification label fig. 1, delivered with every tractor and also stamped on a metal plate fig. 2, attached to the machine in a location easily accessed to read the data.

The chassis number is also stamped on the chassis as illustrated in fig. 3.

For details on the engine, refer to the shop manual from the maker and part of the tractor user kit.

SPARE PARTS AND WARRANTY

The use of **original GOLDONI spare parts**, will ensure tractor quality and performance remain unaltered down the years and guarantee application of the warranty during the time it is in force. To order spare parts correctly and clearly, always specify:

- The code number for the part taking it from the most recent microfiche illustrating the parts catalogues for the various models and series.
- The quantity for each part.
- If in doubt, specify the Model, the Serial and Chassis numbers (refer to the section on "How to identify the tractor").

Engine warranty:

Note the conditions and terms given by the makers.

Tractor warranty:

The conditions and terms are given in our "Warranty Certificate" which should be filled out, signed and mailed to Goldoni by and no later than 10 days from the date the tractor was delivered to the customer.

Under warranty service:

- This work must be accompanied by a "Under warranty service request form" (which you have filled out and signed by the customer and the person who did the work.
Mail this to Goldoni as soon as possible but no later than 30 days after the work. Specify the date of the work as detailed on the form.
- Note that under warranty service work will only be reimbursed for tractors for which Goldoni has received the Warranty Certificate as detailed above.
- If the spare parts used for under warranty service work are not in stock at your workshop, they will be supplied as purchased parts, carriage free under the terms and conditions that govern normal supplies of spare parts.
- Replaced parts, adequately labelled, should be kept at your premises at our disposal for a minimum of 120 days from the date of the service work. This will permit us to examine the parts which we reserve the right to do without any prior notice.
- Radiators, electric and hydraulic parts must be forwarded to us within 30 days from the work accompanied by the requisite "Under warranty service request".
- If the GOLDONI S.A.T. wishes to examine other parts replaced, you will be asked to send the parts to us, carriage forward. The parts should reach us within 15 days from the request.
- Within 60 days from receipt of the "Under warranty service Request", we will grant the request (or not) by issuing the requisite document (fac-simile invoice) with which you are authorised to issue your invoice to us.

UPDATES

The manual will be updated by reprinting the assemblies or their parts that have been modified or added to. Updates will be mailed to your address.

You will be responsible for updating your manual by substituting the modified sections.

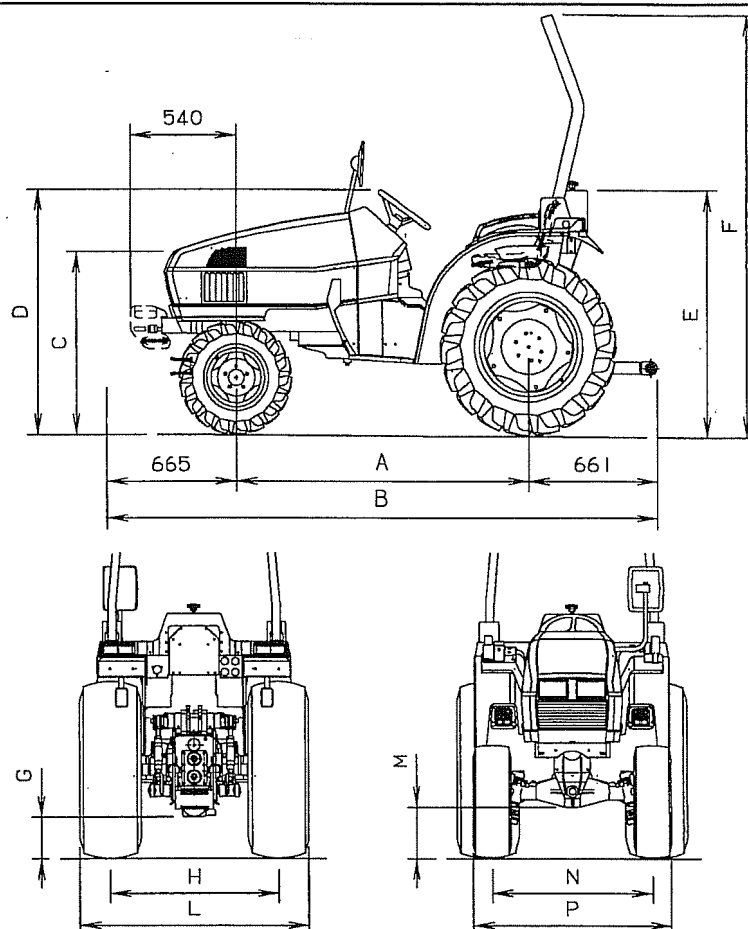
The previous version can be scrapped since the updates will highlight the ante and post modification work required or will give the procedures needed if the assembly has to be transformed.

NOTICE

The terms "*right*", "*left*", "*front*" and "*back*", used to describe the service work always refer to tractor or implement driving direction.

TRACTOR TECHNICAL SPECIFICATIONS

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VERSIONE TRATTORE	A	B	PNEUMATICI POSTERIORI	C	D	E	F	G	M
IDEA 20 DT:TS3	1445	2771	250/80-18"	881	1195	1196	1956	162	241
IDEA 26 DT:TS5			260/80-20"	925	1239	1240	2000	206	258
IDEA 30 DT:TS7	1520	2846	29-12.50-15"	820	1134	1135	1895	101	201
			31-12.50-15"	828	1143	1143	1903	109	
			33-12.50-15"	848	1163	1163	1923	129	227

PNEUMATICI POSTERIORI		H		L		PNEUMATICI ANTERIORI (e)		N		P		PNEUMATICI ANTERIORI (ee)		N		P		
	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
250/80-18"	790	1098	1030	1338	6-12"		824	988	969	1133	6-12"		908	1124	1063	1279		
260/80-20"	820	1028	1078	1286	6.50/80-12"		824	988	989	1153	6.50/80-12"		908	1124	1073	1289		
29-12.50-15"	810	906	1135	1231	20-8.00X10"		861	951	1053	1143								
31-12.50-15"	810	906	1138	1234	23-8.50X12"		859	951	1072	1164	23-8.50X12"		990	1042	1203	1255		
33-12.50-15"	810	906	1148	1244														

(*) - Measurements **N** and **P** are good to tractor chassis N° C461083.

(**) - Measurements **N** and **P** are good from tractor chassis N° C461084.

9000

Cab dimensions (Mod. SIAC)

TYRES	RADIUS	CAB HEIGHT (ABOVE HUB CENTRE) mm:	CAB HEIGHT FROM GROUND mm:
250/80 - 18"	415	1600	2015
260/80 - 20"	450	1600	2050
8.00 - 20"	455	1600	2055
GARDEN			
TYRES I	RADIUS	CAB HEIGHT (ABOVE HUB CENTRE) mm	CAB HEIGHT FROM GROUND mm
33 -12.50 -15"	368	1600	1968

Tractor width with wheel set

- 12.4 R 20" - 7.00 - 12" / Wide front axle / Standard wheel disks -

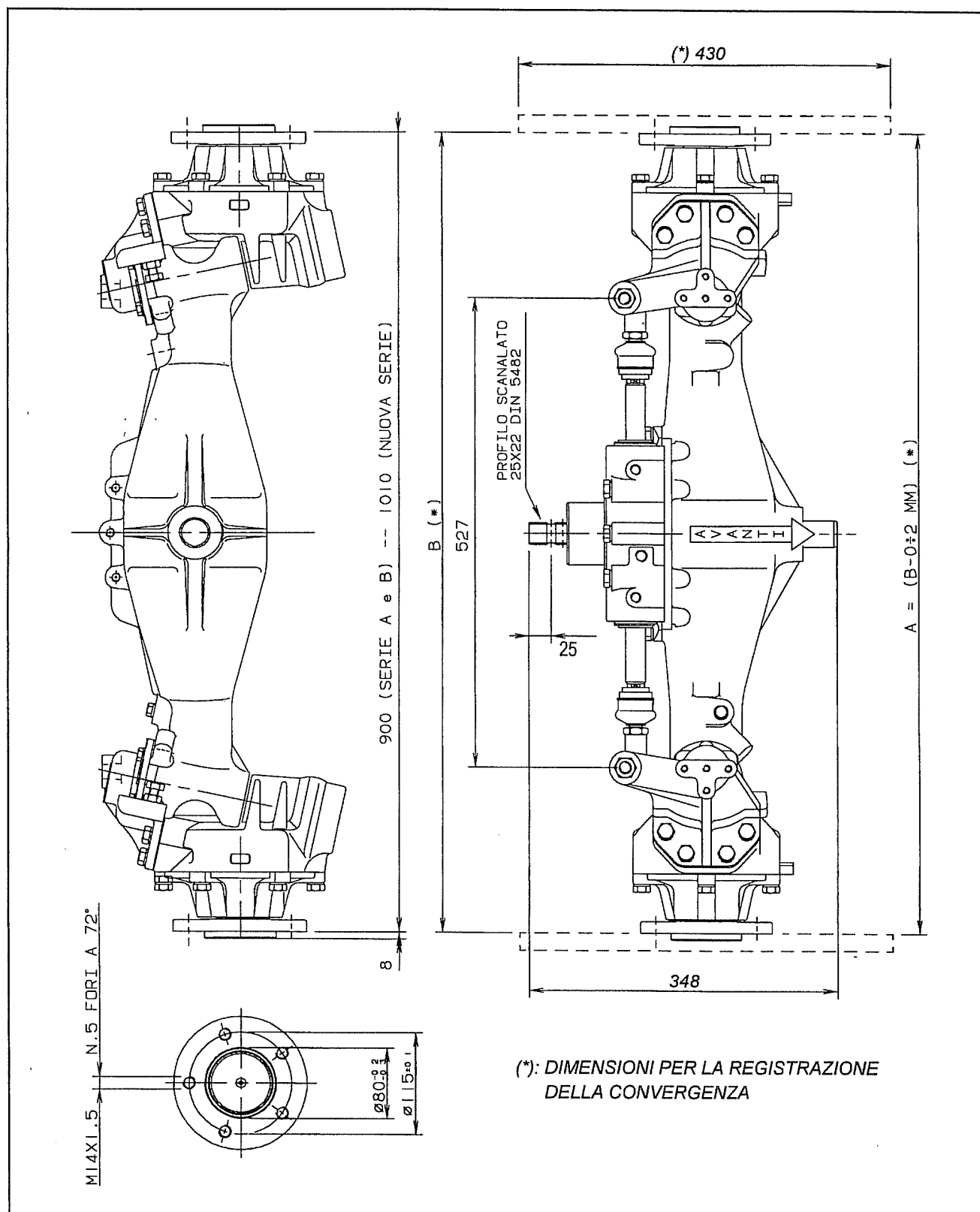
CALCULATING WHEEL SET TRACKS			
Tractor pitch	mm.	1.520	
Flange width	mm.	1.010	850
Axle centre distance as H	mm.	158.5	
Wheel disk axle		Front	Rear
Flange height	mm.	26	46.5
Flange thickness	mm.	6	8
Disk height Z	mm.		
Min. disk centre distance Z	mm.	4	8.5
Max. disk centre distance Z	mm.	31	41.5
Tyre	type	"7.00 - 12""	"12.4 R 20""
Cross-section width	mm.	192	315
Outside diameter	mm.	685	1.035

FRONT AXLE dimensions									
		FLANGES TURNED TO INSIDE				FLANGES TURNED TO OUTSIDE			
Track	mm.	908	962	990	1.044	988 (**)	1,042	1,070	1,124
Wheel inside	mm.	1,100	1,154	1,182	1,236	1,180(**)	1,234	1,262	1,316
Wheel outside	mm.	716	770	798	852	796 (**)	850	878	932
		REAR AXLE dimensions							
		FLANGES TURNED TO INSIDE				FLANGES TURNED TO OUTSIDE			
Track	mm.	690 (*)	756 (*)	806 (*)	872	844 (*)	910	960	1,026
Wheel outside	mm.	1,005(*)	1,071(*)	1,121(*)	1,187	1,159 (*)	1,225	1,275	1,341
Wheel inside	mm.	375 (*)	441 (*)	491 (*)	557	529 (*)	595	645	711

TRACTOR SET	
Difference in height between rear and front axle	16.5
Tractor axis slope	0.01085569

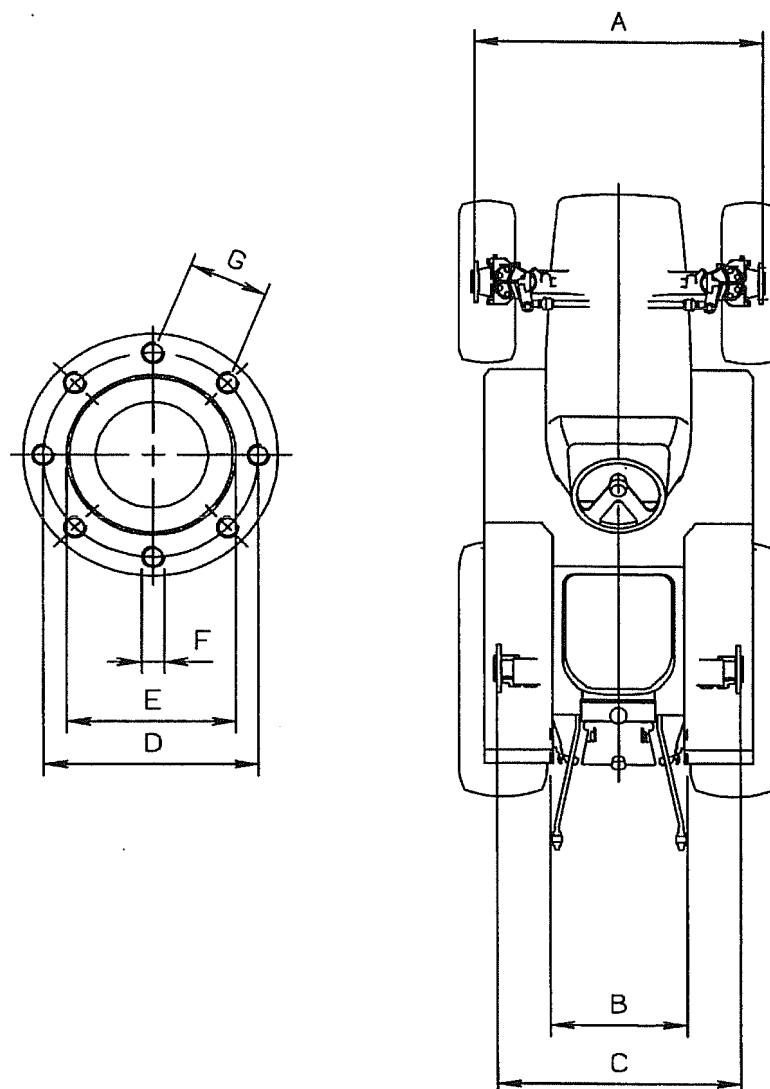
BASE VERSION	
(*)	NOT POSSIBLE versions (interfere with mudguard or chassis)
(**)	NOT RECOMMENDED versions (limit turning circle)

Front axle dimensions and toe-in



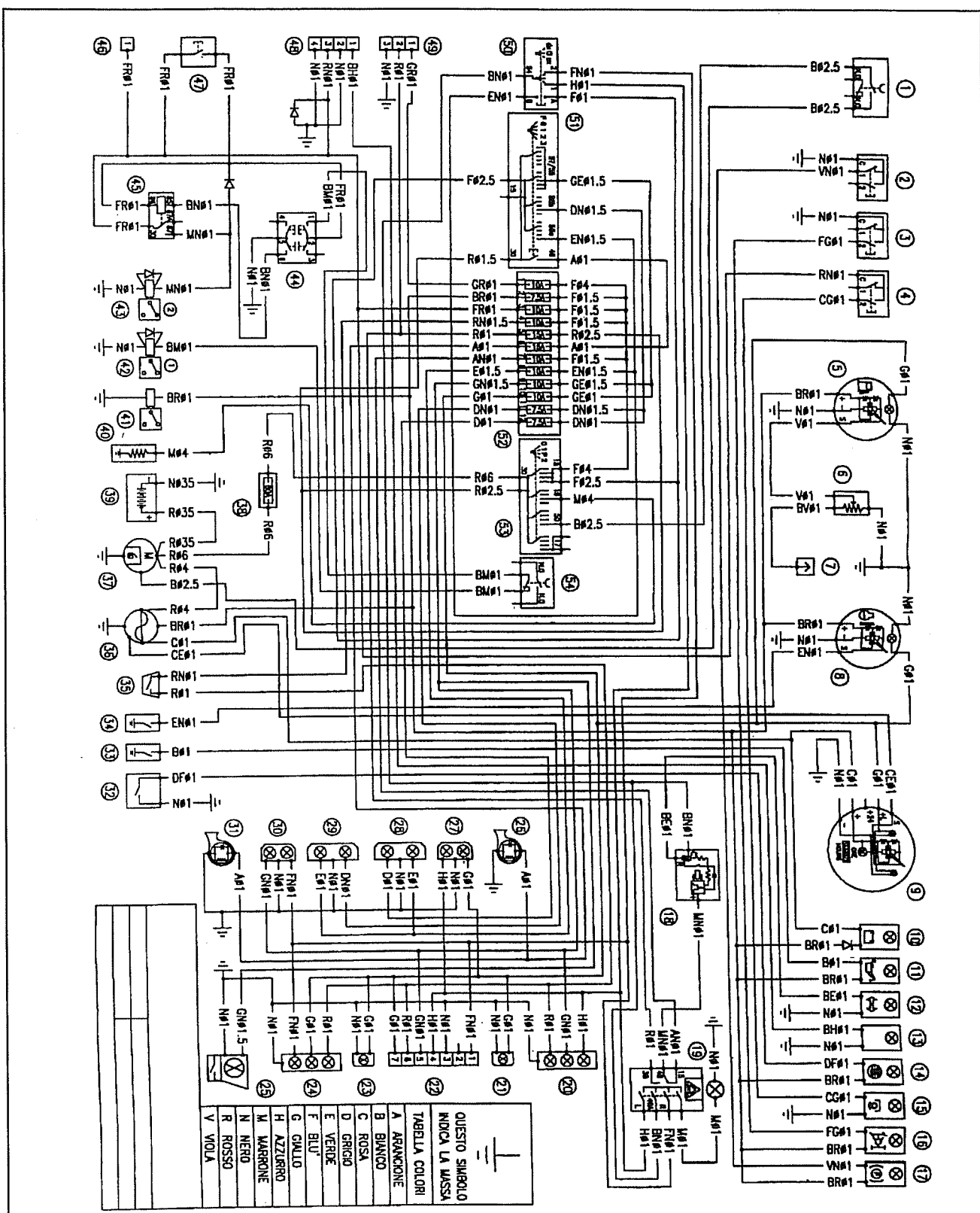
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Front and rear axle dimensions



	(**) A mm		B mm	C mm	D mm	E mm	F	G mm
	SERIES A-B	SERIES C						
FRONT AXLE	900	1010			+0.1 115 -0.1	-0.2 80 -0.3	5 HOLES M14X1,5	67.6
REAR AXLE			550	850	+0.1 140 -0.1	-0.2 94 -0.3	6 HOLES M14X1.5	70
REAR AND FRONT AXLE TRANSMISSION RATIO								
1 : 1.60								
(**) : WITH A FRONT BUCKET A SERIES C AXLE MUST BE INSTALLED								

9002



9003

REF.	DESCRIPTION
1	Start enable switch
2	Parking brake switch
3	Dual traction switch
4	Rear PTO switch
5	Fuel level instrument
6	Fuel gauge
7	Low fuel light pre-engineering
8	Temperature indicator
9	Speedometer/tachometer
10	Battery warning light
11	Oil warning light
12	Indicator lights
13	Front PTO warning light
14	Filter clog warning light
15	Rear PTO warning light
16	Dual traction indicator light
17	Parking brake indicator light
18	Blinkers
19	Hazard switch
20	Rear right light
21	Right number plate light
22	7-pin socket
23	Left number plate light
24	Rear left light
25	Floodlight
26	Horn
27	Right side light

REF.	DESCRIPTION
28	Right front headlight
29	Left front headlight
30	Left side light
31	Optional beeper
32	Filter clog sensor
33	Oil pressure sensor
34	Water temperature sensor
35	Brake light
36	Alternator
37	Starter motor
38	Maxi main fuse
39	Battery 12V
40	Glow plugs
41	Engine stop solenoid
42	Hydraulic lift raise solenoid
43	Hydraulic lift lower solenoid
44	Lift control selector switch.
45	Lift lower control relay
46	Controlled position and draft central control unit power supply
47	Lift lower button
48	Front PTO connector
49	Cab connector
50	Indicator switch
51	Headlight switch
52	Fuse box
53	Ignition switch
54	Lift raise enable switch

FUSE BOX	
<pre> 1 2 3 4 [10A] [7.5A] [10A] [10A] 5 6 7 8 [15A] [15A] [10A] [10A] 9 10 11 12 [10A] [10A] [7.5A] [7.5A] </pre>	
N°	UTILITIES
1	Cab power supply +15
2	Power supply for: battery warning light, oil warning light, filter clog warning light, dual traction indicator light, parking brake indicator light, engine stop solenoid, alternator energising.
3	Power supply for: clutch line, controlled position-draft central unit, optional front PTO, rear PTO switch, lift lower control button.
4	Brake light power supply.
5	Cab power supply +30, hazard light +30
6	Horn
7	Hazard light switch power supply +15
8	Right and left high beams
9	Left front dipped lights and rear right light -7-pin socket, flood light
10	Right front dipped lights and left rear light, 7-pin socket. right and left number plate light, instrument panel lighting, fuel indicator, temperature indicator.
11	Left low beam headlight
12	Right low beam headlight

Engine rating and torque

MODEL		20 DT	26 DT	30 DT
NOMINAL Rpm		2800 Rpm		
MAX. TORQUE	Nm	58.4	75	83.1
	Kgm	5.9	7.6	8.5
MAXTORQUE Rpm	Rpm	1210	2000	1792
MAX RATING	Kw	14.7	19.8	21.7
	Hp	19.8	26.7	29.5
MAX POWER Rpm	Rpm	2800	2800	2800

Table of speeds

TRACTOR SPEED EXPRESSED IN KPH															
SPEED WITH 12.4 R 20 WHEELS:															
WHEEL RADIUS IN...mm.: 490															
ROLLING CIRCUMFERENCE in...m.: 3.08															
ENGINE SPEED															
Rpm			800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	
FORWARD REVERSE	F	L	1	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75
		E	2	0.30	0.38	0.45	0.53	0.60	0.68	0.75	0.83	0.91	0.98	1.06	1.13
		N	3	0.43	0.54	0.65	0.76	0.87	0.97	1.08	1.19	1.30	1.41	1.52	1.62
		T	4	0.61	0.76	0.92	1.07	1.22	1.37	1.53	1.68	1.83	1.98	2.14	2.29
	O	M	1	0.73	0.91	1.09	1.27	1.46	1.64	1.82	2.00	2.18	2.37	2.55	2.73
		E	2	1.10	1.37	1.64	1.92	2.19	2.47	2.74	3.01	3.29	3.56	3.84	4.11
		W	3	1.57	1.97	2.36	2.75	3.15	3.54	3.93	4.33	4.72	5.11	5.51	5.90
		A	4	2.22	2.77	3.32	3.88	4.43	4.99	5.54	6.09	6.65	7.20	7.76	8.31
	R	V	1	2.55	3.19	3.83	4.47	5.10	5.74	6.38	7.02	7.66	8.29	8.93	9.57
		E	2	3.84	4.80	5.76	6.72	7.68	8.64	9.60	10.56	11.52	12.48	13.44	14.40
		L	3	5.51	6.89	8.27	9.65	11.03	12.40	13.78	15.16	16.54	17.92	19.30	20.67
		O	4	7.77	9.71	11.65	13.59	15.53	17.47	19.42	21.36	23.30	25.24	27.18	29.12
REVERSE	L	1	0.96	1.20	1.44	1.68	1.92	2.16	2.39	2.63	2.87	3.11	3.35	3.59	
	E	2	1.44	1.80	2.16	2.52	2.88	3.24	3.60	3.97	4.33	4.69	5.05	5.41	
	N	3	2.07	2.59	3.10	3.62	4.14	4.66	5.17	5.69	6.21	6.73	7.24	7.76	
	T	4	2.92	3.64	4.37	5.10	5.83	6.56	7.29	8.02	8.75	9.47	10.20	10.93	

Hydraulic pump and power steering

ENGINE			HYDRAULIC PUMP					
MODEL	Rpm	PUMP/ MOTOR	MODEL	CAPACIT Y.DM3	VOLUME IN LITRES/Rpm			
					1000 Rpm	2000 Rpm	2600 Rpm	2800 Rpm
PERK.103-10	2800	1 / 0.846	AP2/11 D 279	0.011	9.3	18.6	24.2	26.1
PERK.103-13								
PERK.103-15								

PRIORITY VALVE			POWER STEERING				
MODEL	SETTING		MODE L	CAPACIT Y. CM3	VOLUME BY STEERING RATE LITRE / 1'		SETTING
	L / 1'	BAR			60 Rpm	100 Rpm	BAR
COMATROL VME - 06	4	150	MST 32	32	1,9	3,2	85/90

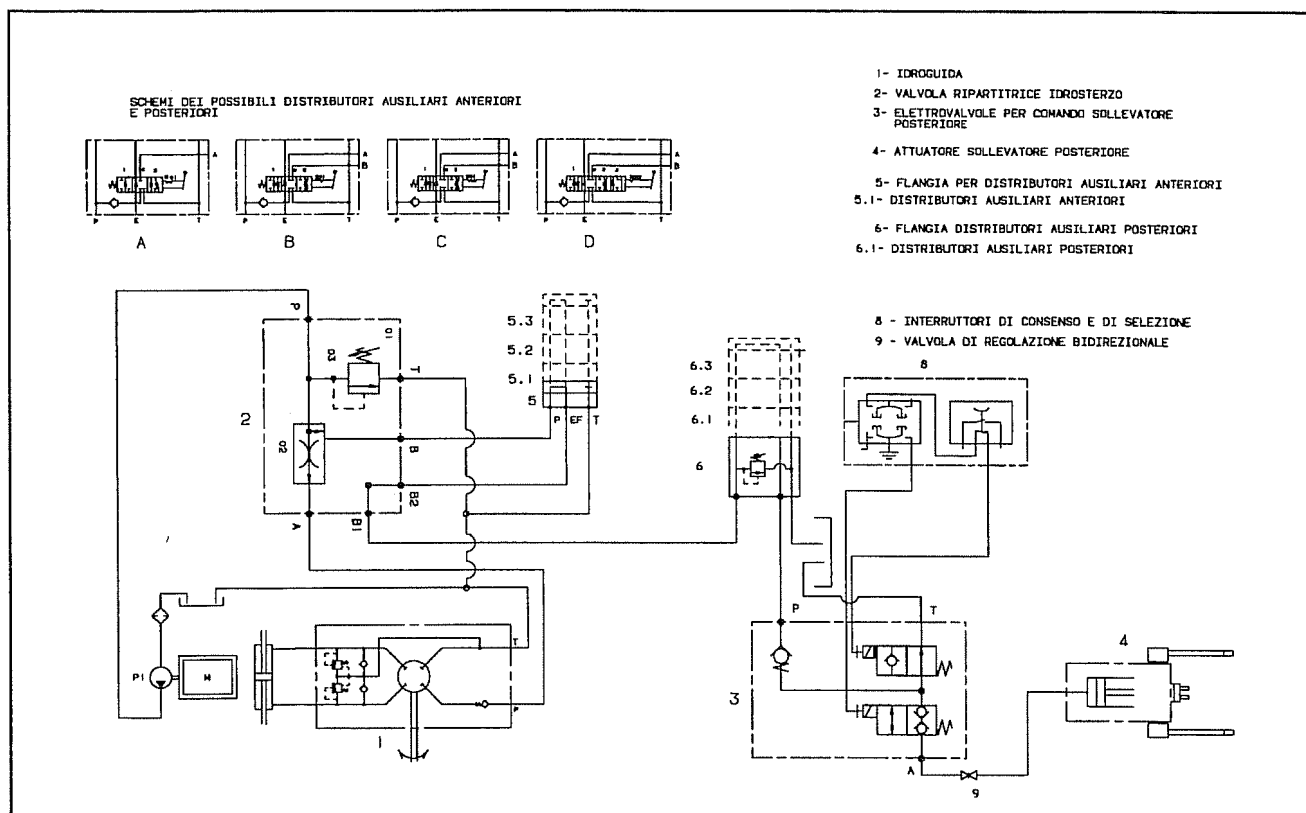
Note: The priority valve guarantees a volume of 4 litres for the power steering REGARDLESS of the overall volume of the circuit.

Note: The circuit has a relief valve set for 150 BAR.

QUICK COUPLES		
	FRONT	REAR
MODEL	1/2" NPTF	1/2" NPTF
WORK PRESSURE	150 Bar	150 Bar

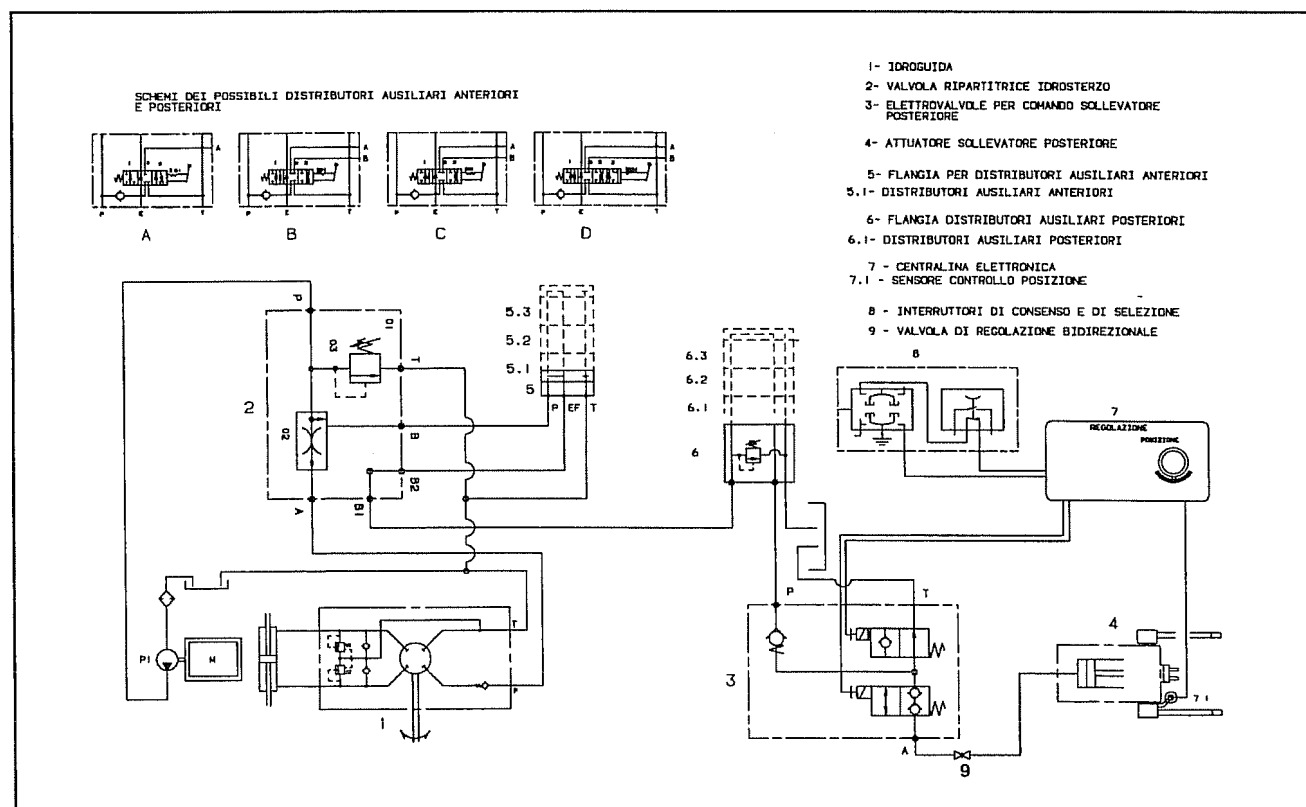
CALIBRATION HYDRAULIC LIFT CIRCUIT	
MAX. WORK PRESSURE	150 Bar

Hydraulic schematic for the "raise-lower" version from tractor chassis N° B455170



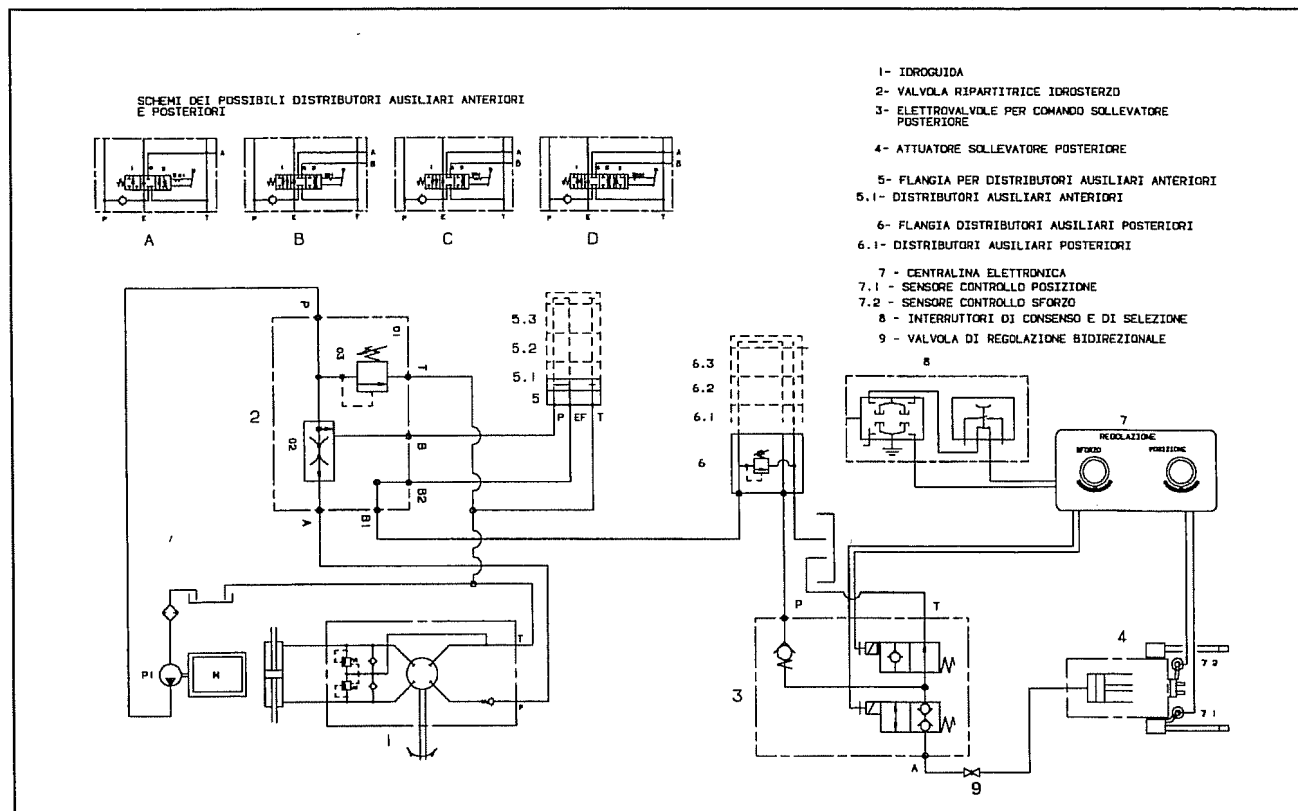
9005

Hydraulic system schematic "Controlled position" version from tractor chassis N° B455170

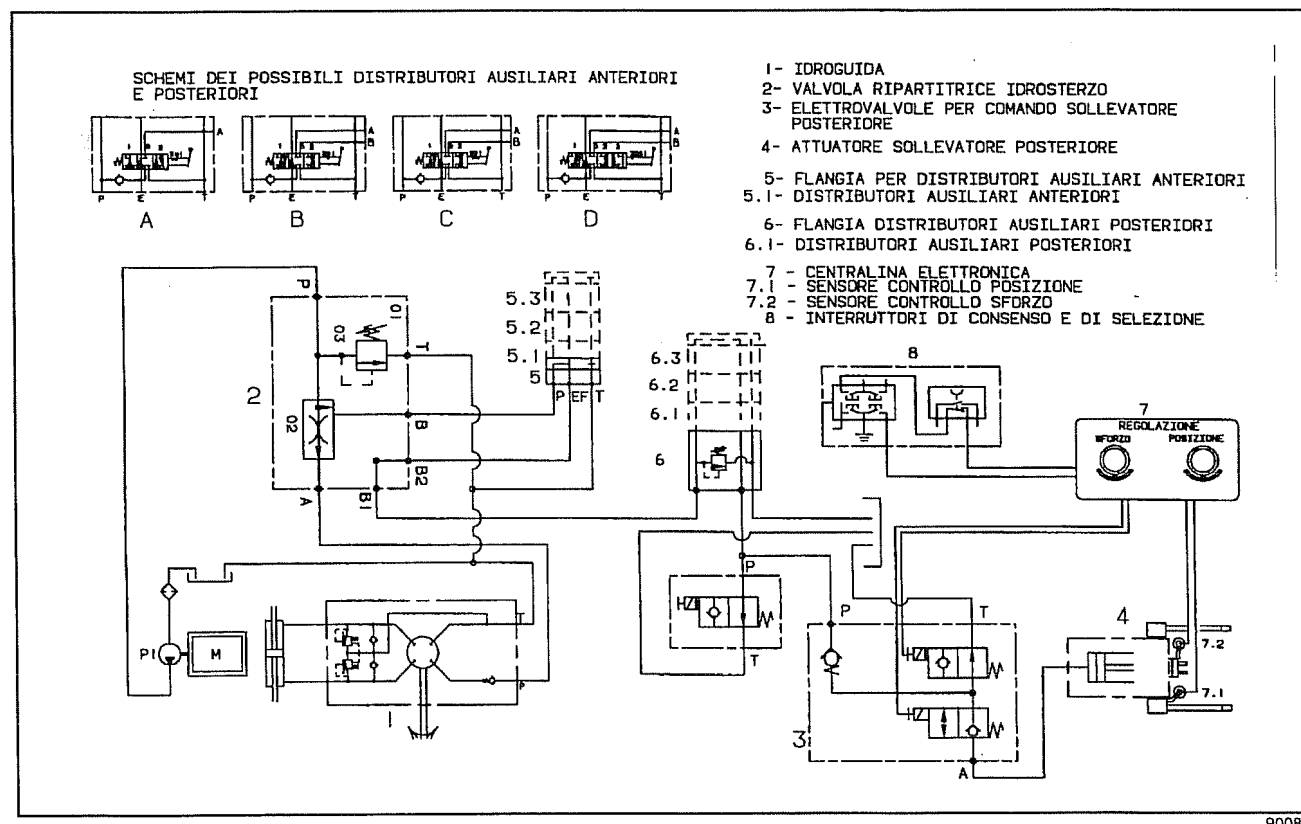


9006

Hydraulic system schematic for "Controlled position and draft" version from tractor chassis N° B455170



Hydraulic system schematic "Controlled Position and draft" version to tractor chassis N° B455169



PTO

SYNCHRONISED PTO	
HALF AND REAR AXLE TURNS	REAR PTO TURNS
1	21.21

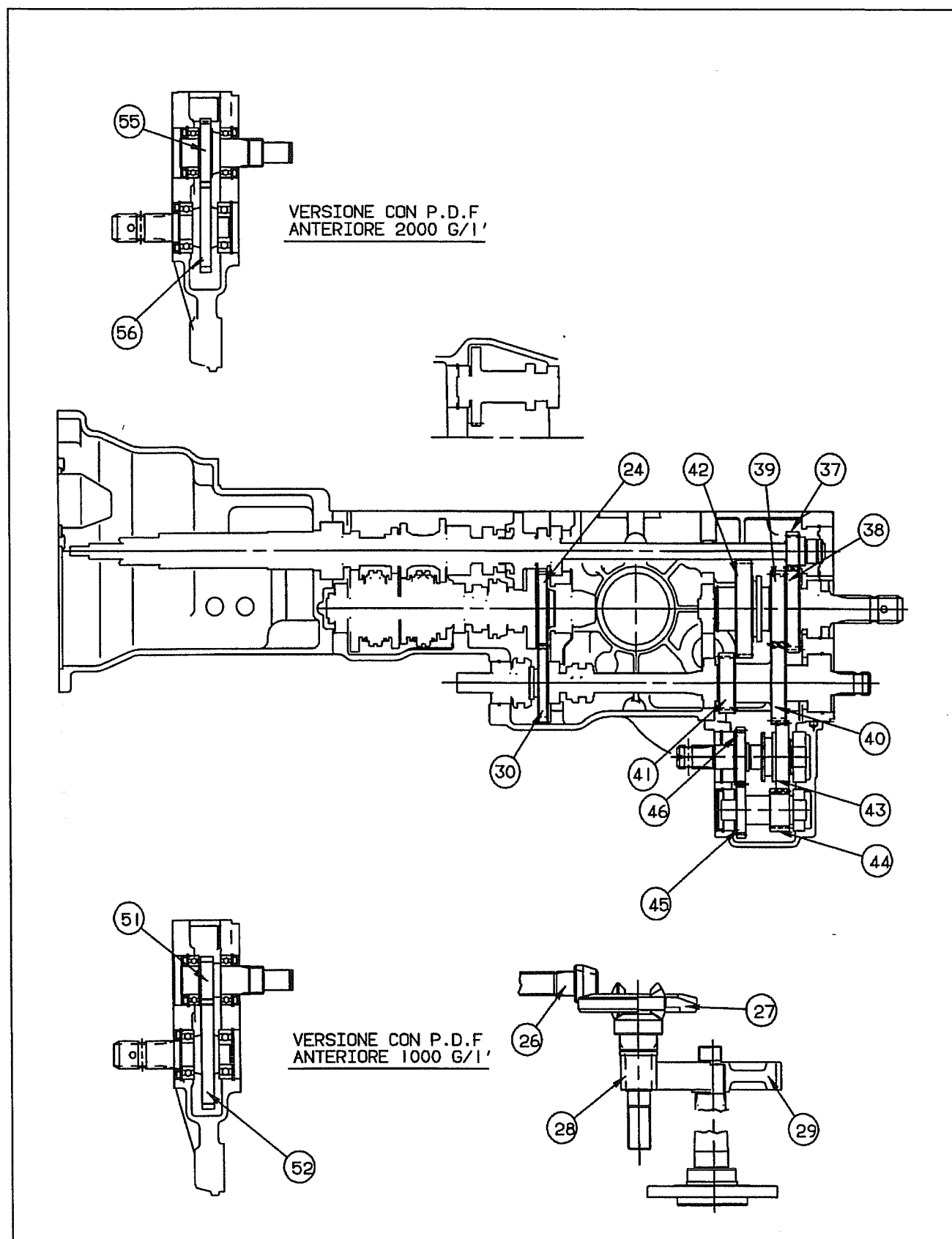
INDEPENDENT PTO													
							RATIO	PTO SPEED WITH ENGINE AT MIN. RPM					MIN. RPM
1 CREEP GEAR COMBINATION							TRANSM	ENGINE AT RPM					PTO AT
2 PARTIAL TRANSMISSION RATIO							TOTAL	1500	1800	2300	2800	3000	OPERATING SPEED
		1ST CRP	2ND CRP	3RD CRP	4TH CRP	5TH CRP							
REAR	1	13 34	29 31	22 38	1 1	1 1							
540	2	2.62	1.07	1.73	1.00	1.00	4.83	311	373	476	580	621	2607.6
REAR	1	13 34	1 1	1 1	1 1	1 1							
1000	2	2.62	1.00	1.00	1.00	1.00	2,62	574	688	879	1.071	1.147	2615.3
REAR	1	19 28	1 1	1 1	1 1	1 1							
2000	2	1.47	1.00	1.00	1.00	1.00	1.47	1018	1221	1425	1629	1900	2947.3
UNDER BELLY	1	13 34	29 31	31 28	28 15	21 22							
2000	2	2.62	1.07	0.90	0.54	1.05	1.42	1,058	1,270	1,623	1,976	2,117	2834.4
FRONT	1	17 44	1 1	1 1	1 1	1 1							
1000	2	2.59	1.00	1.00	1.00	1.00	2.59	580	695	889	1,082	1,159	2588.2
FRONT	1	26 35	1 1	1 1	1 1	1 1							
2000	2	1.35	1.00	1.00	1.00	1.00	1.35	1,114	1,337	1,709	2,080	2,229	2692.3

PTO rating

MODEL		20 DT	26 DT	30 DT
NOMINAL Rpm		2800 Rpm		
REAR PTO				
RUNNING Rpm	Rpm	540 / 1000 / 2000		
MAX. RATING	Kw	12.5	16.1	18.4
	CV	17	22	25
FRONT PTO				
RUNNING Rpm	Rpm	1000 / 2000		
MAX. RATING	Kw	10.3	13.2	14.7
	CV	14	18	20

PTO schematic

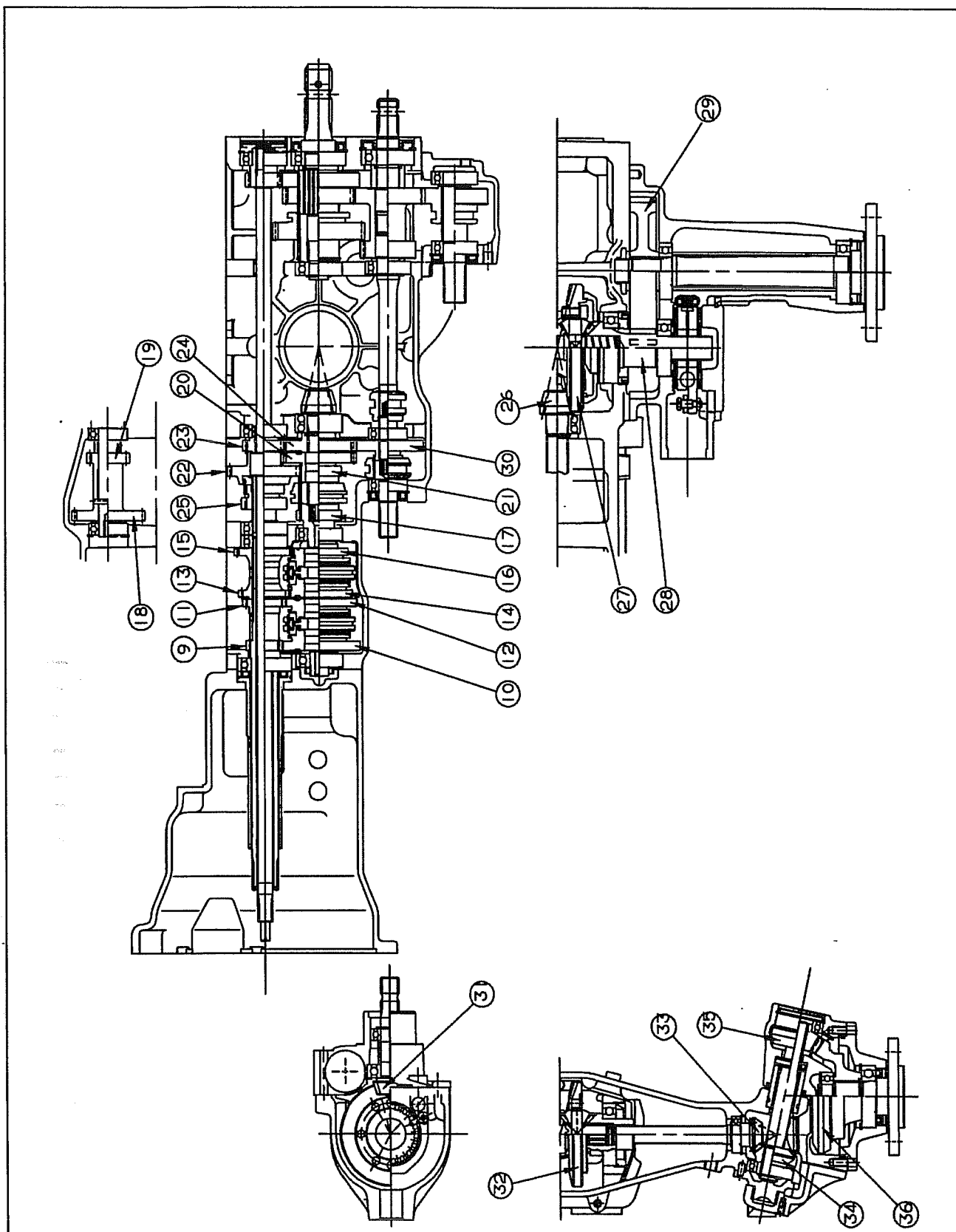
INDEPENDENT REAR PTO GEAR UNIT	
37	Driven wheel 1st step-down
38	Driven wheel 1st step-down
39	Drive wheel 1st step-down
40	Driven wheel 1st step-down
41	Drive wheel 1st step-down
42	Driven wheel 1st step-down
SYNCHRONISED REAR PTO GEAR UNIT	
24	Drive wheel synchronised PTO
30	Driven wheel synchronised PTO
26	Rear axle bevel pinion
27	Rear axle ring wheel
28	Final drive - drive wheel
29	Final drive - driven wheel
INDEPENDENT UNDER BELLY PTO GEAR UNIT	
40	Under belly PTO drive wheel
43	Driven wheel 1st step-down
44	Driven wheel 1st step-down
45	Driven wheel 1st step-down
46	Driven wheel 1st step-down
FRONT PTO FINAL DRIVE	
51	Front PTO drive wheel
52	Front PTO driven wheel
55	Front PTO drive wheel
56	Front PTO driven wheel



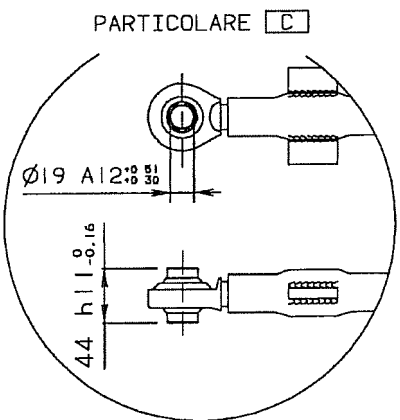
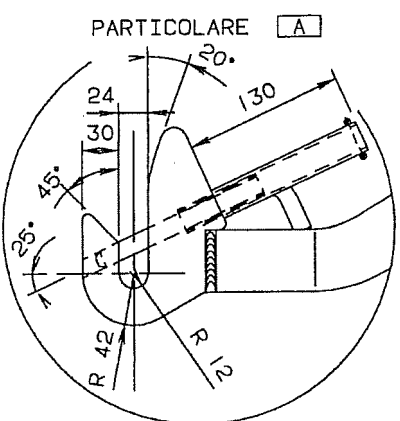
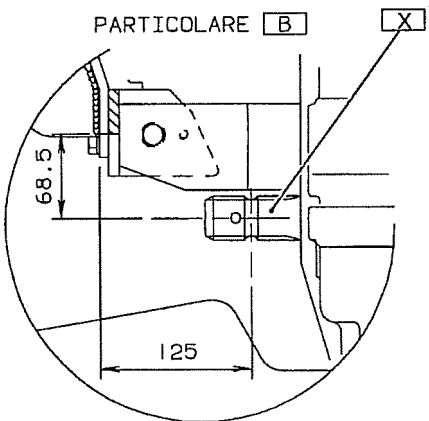
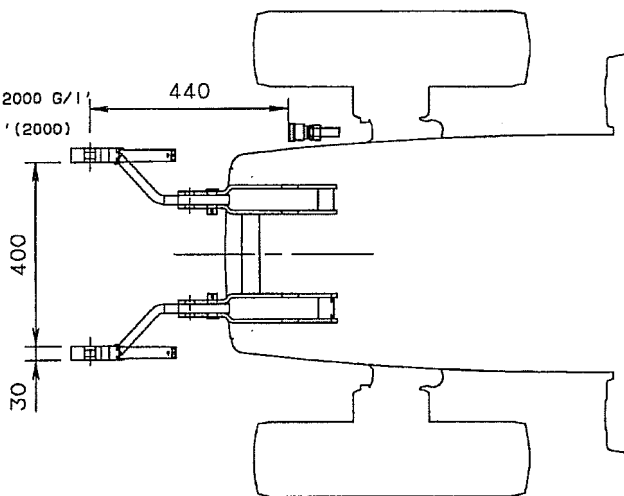
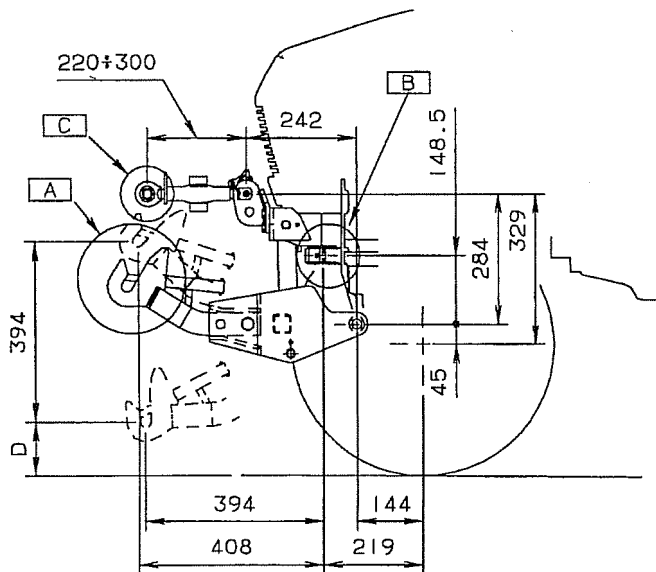
9010

Synchronised transmission schematic

TRANSMISSION	
9	Drive wheel 1st gear
10	Driven wheel 1st gear
11	Drive wheel 2nd gear
12	Driven wheel 2nd gear
13	Drive wheel 3rd gear
14	Driven wheel 3rd gear
15	Drive wheel 4th gear
16	Driven wheel 4th gear
CENTRAL GEAR UNIT C-M-F - REV	
17	Drive wheel 1st step-down
18	Driven wheel 1st step-down
19	Drive wheel 2nd step-down
20	Driven wheel 2nd step-down
21	Drive wheel 3rd step-down
22	Driven wheel 3rd step-down
23	Drive wheel 4th step-down
24	Driven wheel 4th step-down
25	Reversing transmission
REAR AXLE BEVEL GEAR PAIR	
26	Rear axle bevel pinion
27	Rear axle ring wheel
REAR FINAL DRIVE	
28	Final drive Drive wheel
29	Final drive driven wheel
FRONT DRIVE UNDER-BELLY PTO	
24	Under-belly PTO drive wheel
30	Under-belly PTO driven wheel
FRONT AXLE BEVEL GEAR PAIR	
31	Front axle bevel pinion
32	Front axle ring wheel
FRONT AXLE JOINT BEVEL GEAR UNIT	
33	Bevel gear unit drive wheel
34	Bevel gear unit driven wheel
FRONT AXLE FINAL DRIVE	
35	Front final drive bevel drive wheel
36	Front final drive bevel driven wheel



9011



CARICO MAX DI SOLLEVAMENTO ALLE ESTREMITA' DELLE ROTULE : 450 KG

X PROFILO SCANALATO ASAE 1 3/8" DIN 9611A

SENSO DI ROTAZIONE: ANTIDIRARIO (PDF VISTA DI FRONTE)

REGIME DI ROTAZIONE PDF: 1000 G/1' (STANDARD) OPTIONAL 2000 G/1'

GIRI MOTORE CON PDF A REGIME: 2588 G/1' (1000) 2692 G/1' (2000)

TARATURA FRIZIONE ELETTROMAGNETICA A 2800 G/1'

POTENZA TRASMISSIBILE CV: 28 (KW 20,7)

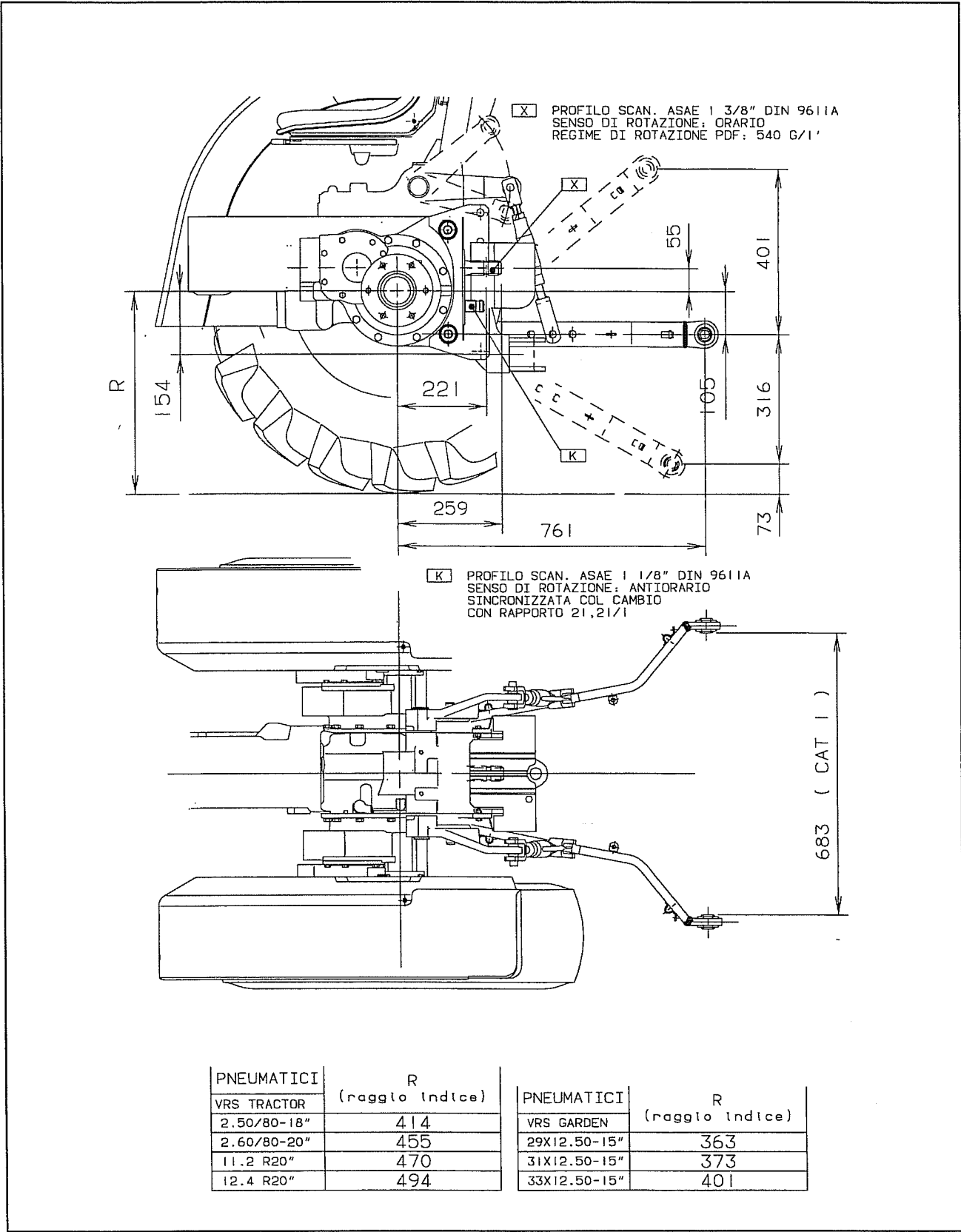
COPPIA TRASMISSIBILE Kg·m: 8.9 (Nm 87.7)

PNEUMATICI ANTERIORI

VRS TRACTOR	D	R. INDICE
6-12"	101	271
6.50/80-12"	118	288
5.00-15"	141	316
7.00/12"	156	326

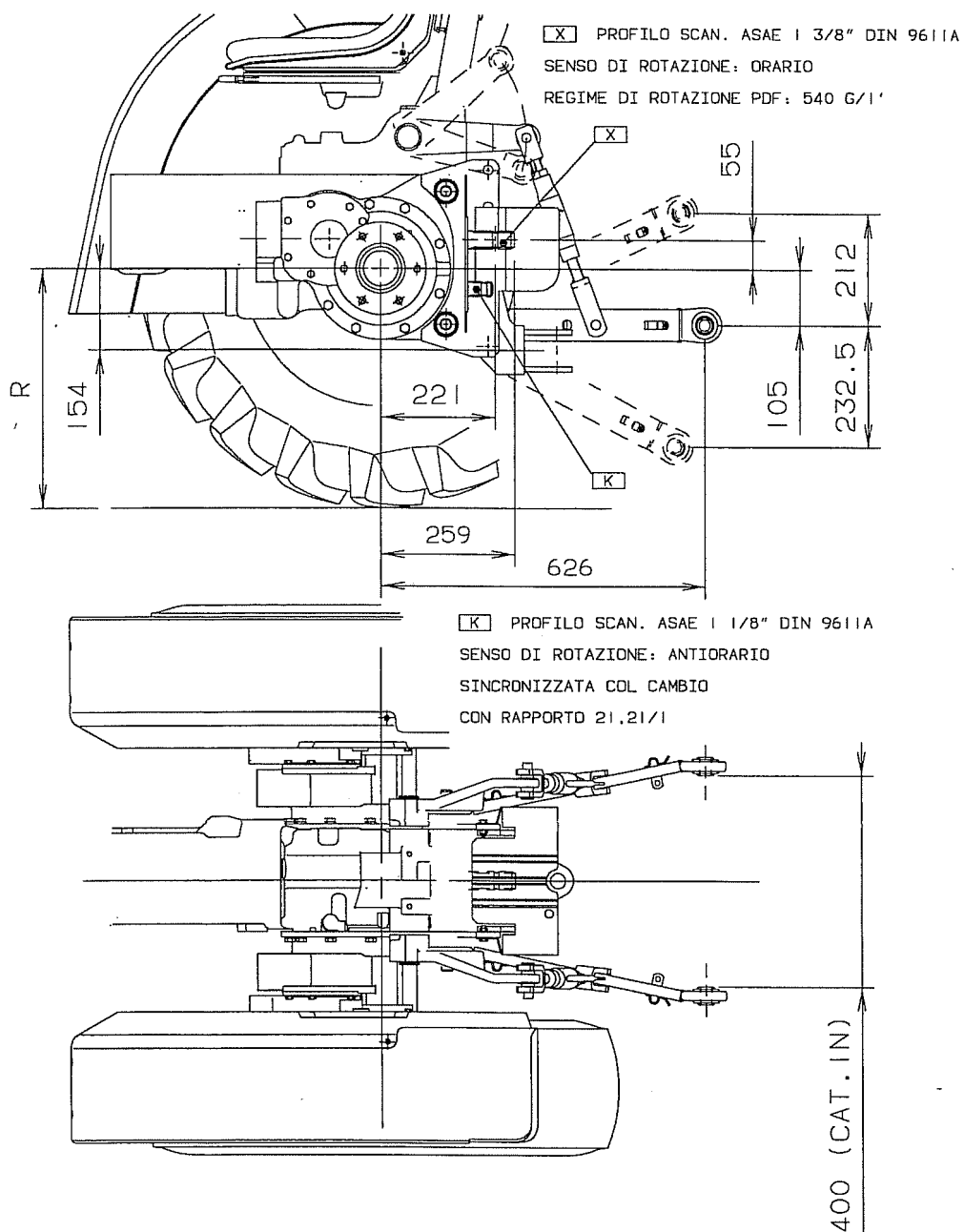
VRS GARDEN	D	R. INDICE
6X12"	112	282
20X8.00-10"	61	231
23X8.50-12"	87	257

Rear PTO and hydraulic lift dimensions (CAT 1)



9013

Rear PTO and hydraulic lift dimensions (CAT 1N)

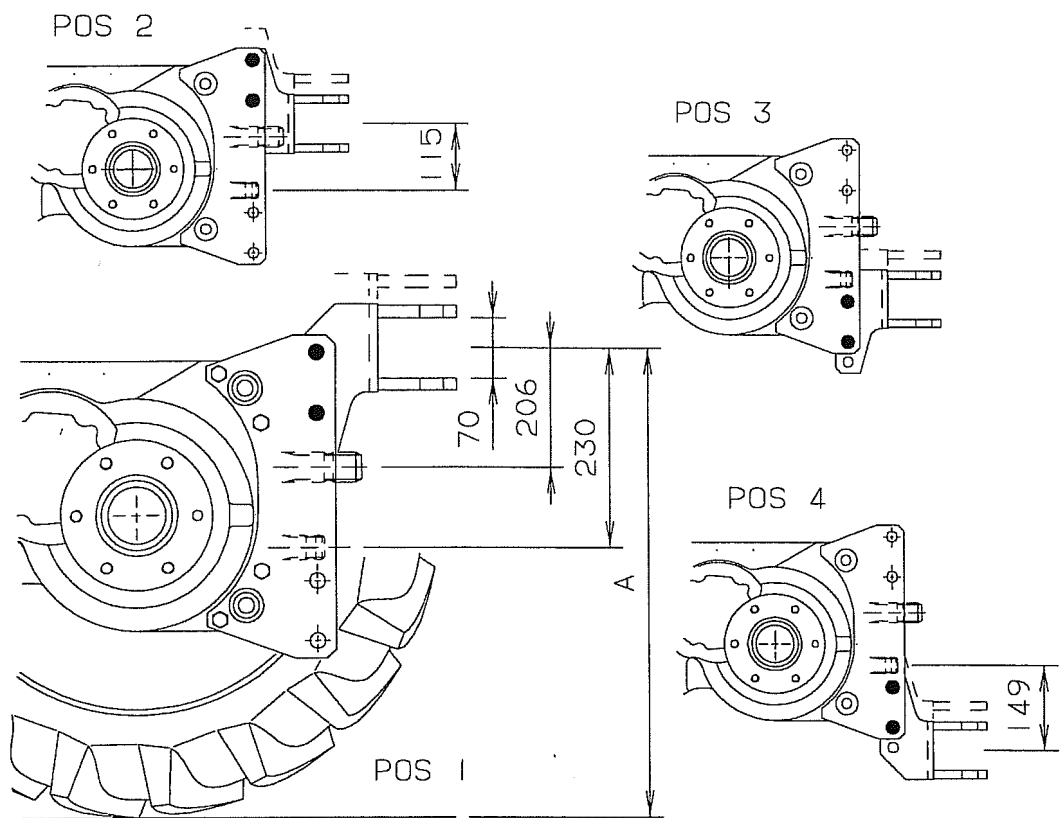


PNEUMATICI	R (raggio indice)
VRS TRACTOR	
2.50/80-18"	414
2.60/80-20"	455
11.2 R20"	470
12.4 R20"	494

PNEUMATICI	R (raggio indice)
VRS GARDEN	
29X12.50-15"	363
31X12.50-15"	373
33X12.50-15"	401

9014

Hitch dimensions



TUTTE LE POSIZIONI POSSONO ESSERE AUMENTATE DI MM 35
(PARTE TRATTEGGIATA NEL DISEGNO)

MACCH.		PNEUMATICI				A (mm)	
		POS 1	POS 2	POS 3	POS 4		
IDEA	VERS BASSA	PIRELLI 8.00-R20"	648	533	384	269	
		PIRELLI 250/80-R18"	598	483	334	219	
		PIRELLI 260/80 R20"	638	523	374	259	
	VERS ALTA	PIRELLI 8.3X24"	672	557	408	293	
		PIRELLI 12.4X20"	683	568	419	304	
		PIRELLI 11.2X20"	658	543	394	279	
		PIRELLI 320/70-R20"	658	543	394	279	
	VERS GARDEN	G. YEAR 29X12.50-15"	533	418	269	154	
		G. YEAR 31X12.50-15"	541	426	277	162	
		G. YEAR 33X12.50-15"	561	446	297	182	
		FIRESTONE 9.5-18"FD	628	513	364	249	

9015

TIGHTENING TORQUE

Mod. 20 DT to Chassis N° C464607

- 1- Right and left reinforcement
- 2- Right and left face bar.
- 3- Driving direction arrow.
- 4- Special centring screw.
M12x1.25x35 (Kgm9 - Nm88)
- 5- Special centring screw.
M12x35 (Kgm8.5 - Nm83)

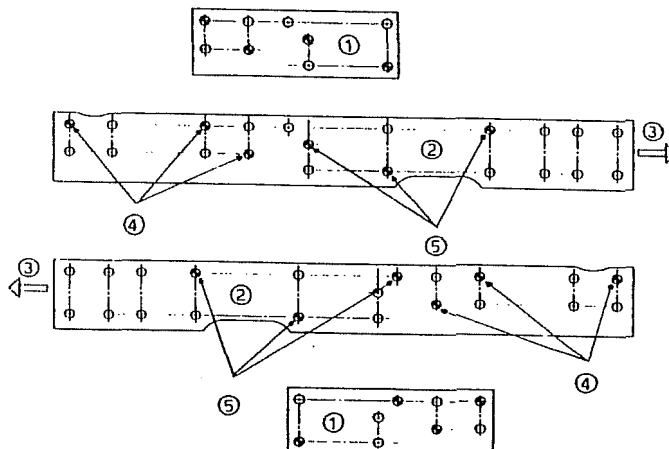


Fig. 1

0004

Mod. 26 DT and 30 DT to chassis N° C460863

- 1- Right reinforcement.
- 2- Right and left face bar.
- 3- Left reinforcement.
- 4- Driving direction arrow.
- 5- Special centring screw.
M14x1.5x40 (Kgm12 - Nm118)
- 6- Special centring screw.
M12x35 (Kgm8.5 - Nm83)

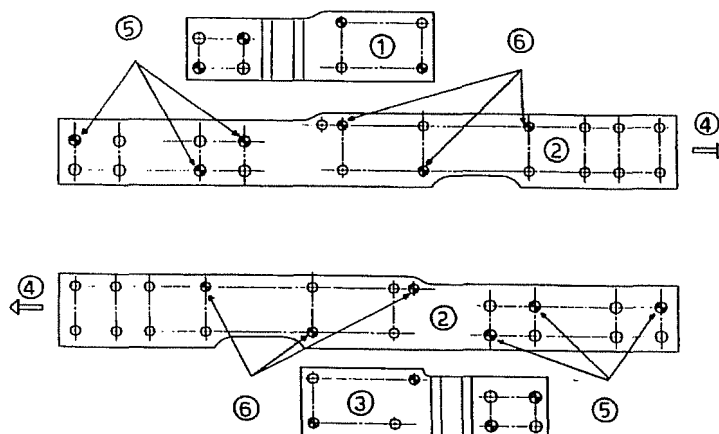


Fig. 2

0005

The two Figures illustrate the exact fixing system for the engine/axle support bars and the corresponding tightening torque good from chassis N° C464607 for Model 20 DT and from chassis N° C460863 for Models 26 DT and 30 DT.

Mod. 20 DT from chassis N° C464608

- 1- Left and right reinforcement
- 2- Right and left support bars
- 3- Drive direction arrow
- 4- Stud
M12x1.25x40 (Kgm9 - Nm88)
- 5- Short bushing
- 6- Long bushing
- 7- Special centring screw.
M12x1.25x35 (Kgm9 - Nm88)

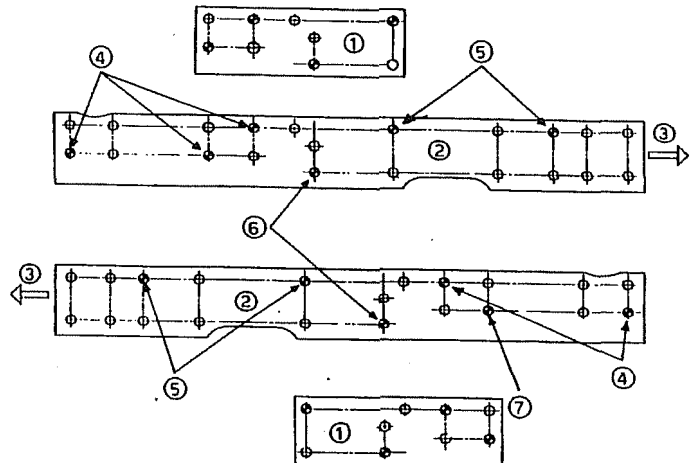


Fig. 3

0006

Mod. 26 DT and 30 DT from chassis N° C460864

- 1- Right reinforcement.
- 2- Right and left support bar.
- 3- Left reinforcement.
- 4- Stud.
M14x1.5x60 (Kgm12 - Nm118)
- 5- Short bushing.
- 6- Long bushing.
- 7- Special centring screw.
M14x1.5 (Kgm12 - Nm118)
- 8- Drive direction arrow.

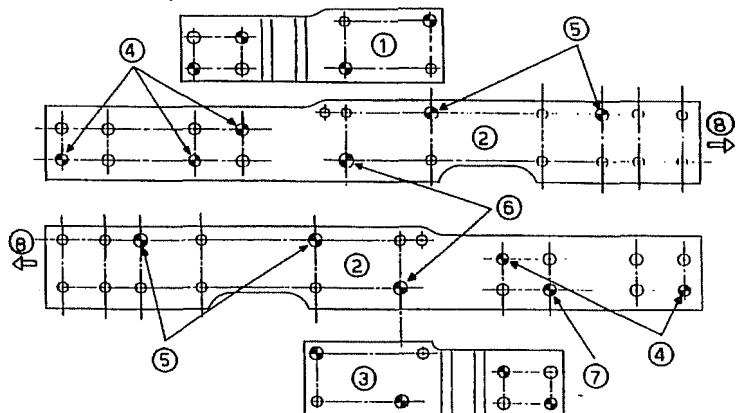


Fig. 4

0007

The two Figures illustrate the exact fixing system for the engine/axle support bars and the corresponding tightening torque good from chassis N° C464608 for Model 20 DT and from chassis N° C460864 for Models 26 DT and 30 DT.

Applying the new support bars on Model 26 DT and 30 DT to chassis N° C460863

- 1- Right reinforcement.
- 2- Right and left support bars.
- 3- Left reinforcement.
- 4- Special centring screw.
M14x1.5 (Kgm12 - Nm118)
- 5- Special centring screw.
M12x35 (Kgm8.5 - Nm83)
- 6- Short bushing.
- 7- Long bushing.
- 8- Driving direction arrow.

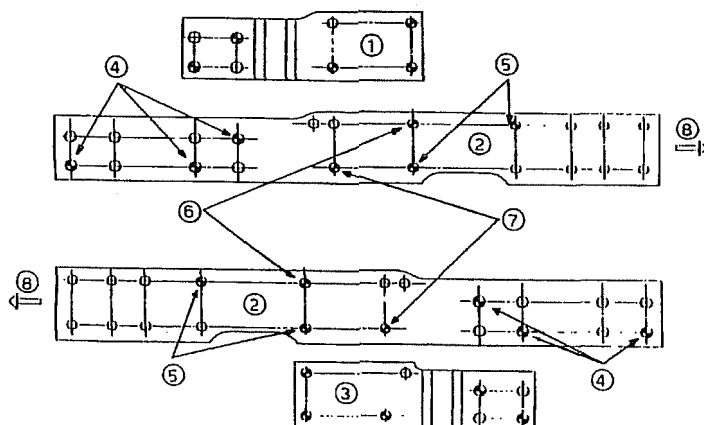


Fig. 5

0008

The Figure illustrates how to attach the new axle/engine support bars with the corresponding tightening torque in tractors set up for the old type bars
For tractors to chassis N° C460863 for models 26 DT and 30 DT.

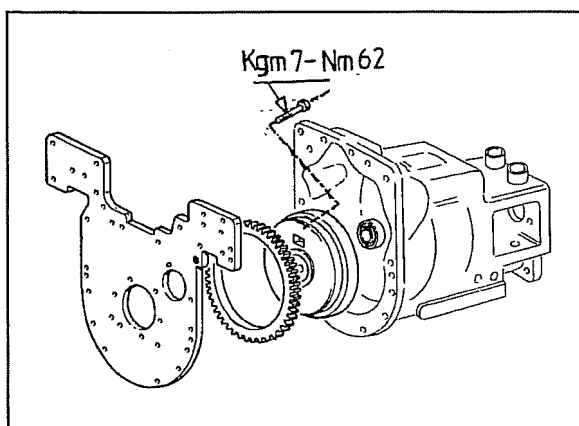


Fig. 6

0009

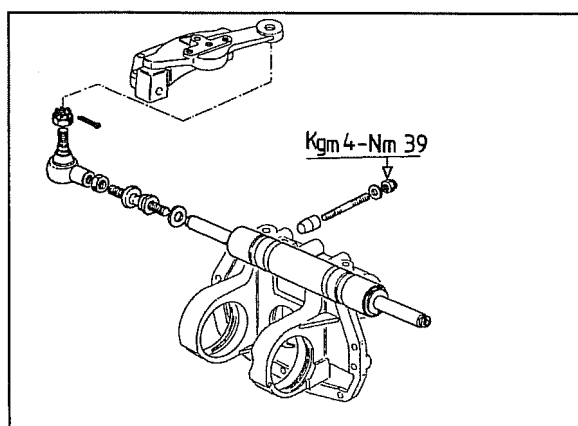


Fig. 7

0010

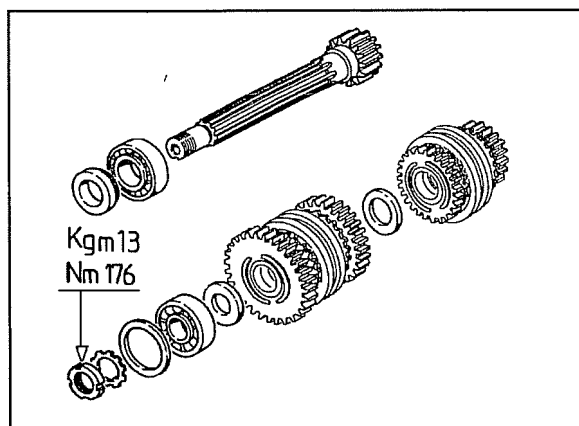


Fig. 8

0011

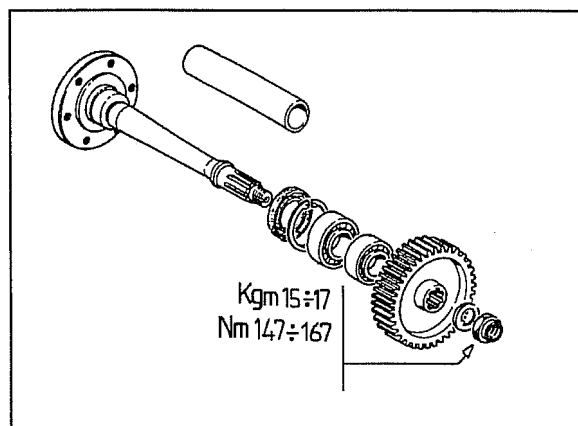


Fig. 9

0012

The Figures detail the tightening torque regarded as essential when assembling the tractor.

Fig. 6 - Engine flywheel fixing screws.

Fig. 7 - Steering cylinder fixing nut.

Fig. 8 - Synchronised shaft fixing lock-ring.

Fig. 9 - Rear half-axle fixing nut.

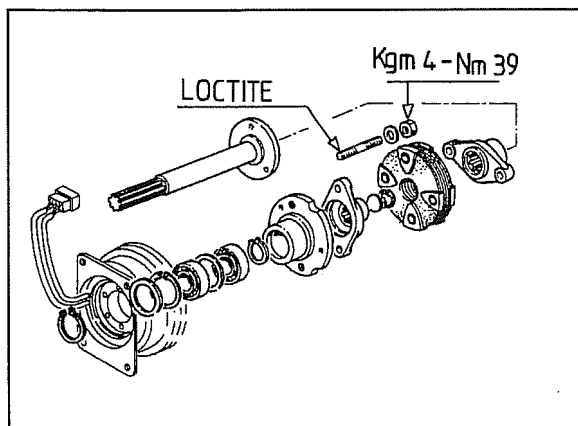


Fig. 10

0013

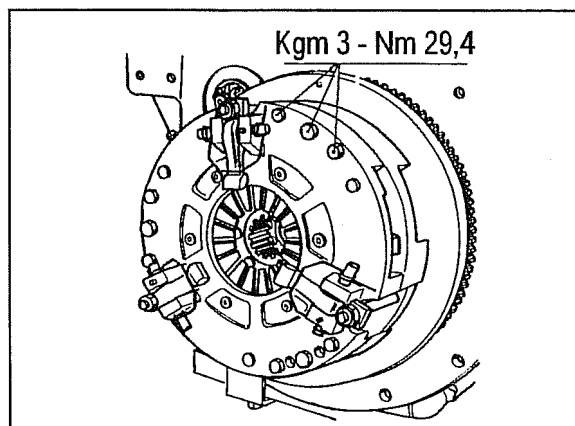


Fig. 11

0159_1

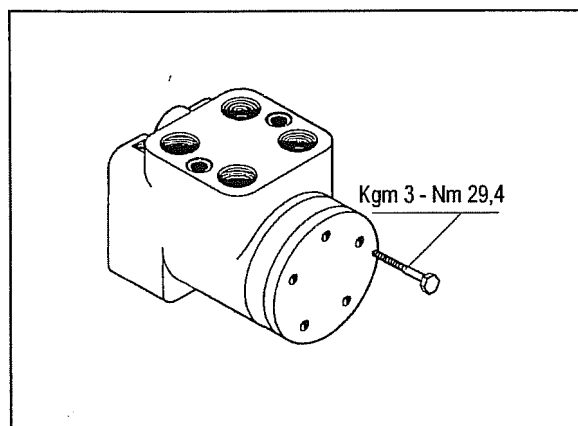


Fig. 12

0187

Fig. 10 - Electromagnetic clutch fixing nut.

Fig. 11 - Clutch fixing screws.

Fig. 12 - Power steering cover fixing screws.

SPECIAL TOOLS

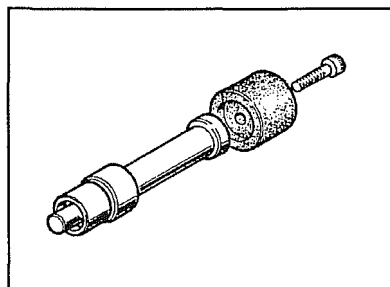


Fig. 1

0014

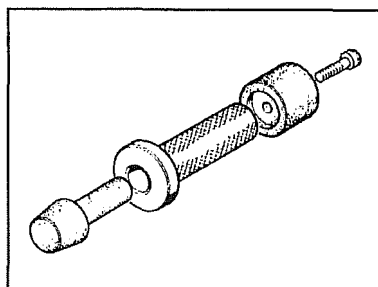


Fig. 2

0015

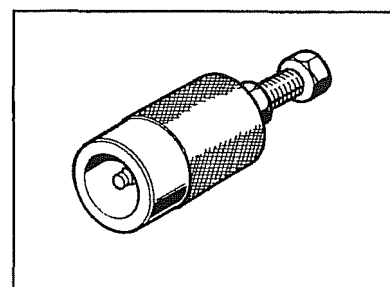


Fig. 3

0016

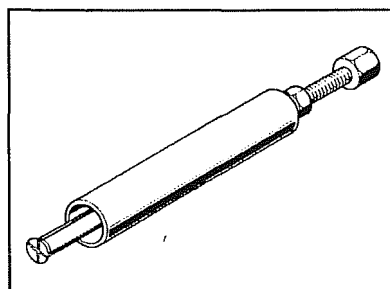


Fig. 4

0017

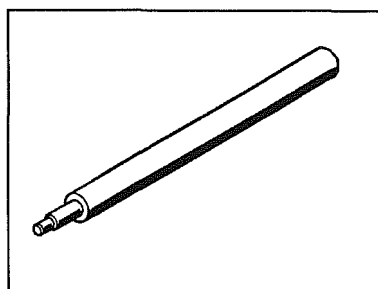


Fig. 5

0018

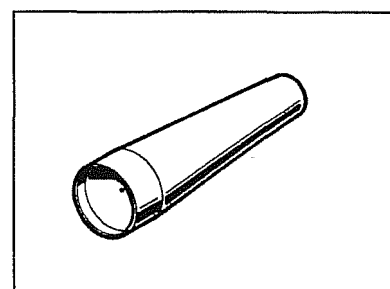


Fig. 6

0019

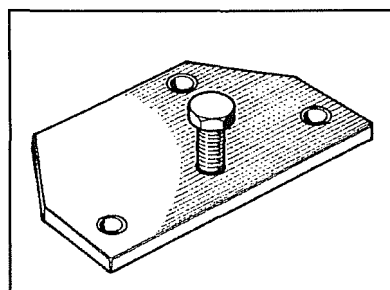


Fig. 7

0020

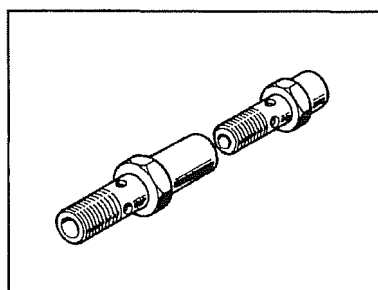


Fig. 8

0021

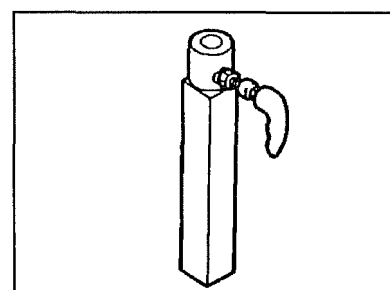


Fig. 9

0269

As you read this manual, you will note that many operations, due to their specific requirements, must be done using special GOLDONI tools.

These tools are important for correct and efficient performance of the work and have been specially designed and fabricated to eliminate dismantling and re-assembling problems. These tools not only reduce wasted time but also prevent calibration and registration using inadequate instruments.

These tools must be part of the standard tool kits of any workshop belonging to the GOLDONI Technical Assistance network.

Here is a list of the special tools with a description and Part Number. They are essential for working on the tractors covered by this manual.

FIG.	DESCRIPTION OF THE TOOL	PART NUMBER
1	Punch to mount oil seals on output shaft	07000268
2	Punch for mounting the oil seal cuff on the brake disk pack linkrod	07000271
3	Tool to pre-load the synchronised and dual drive PTO engage spring.	07000269
4	Rear hub brake cylinder extractor	07000270
5	Clutch centring shaft	07000272
6	Tool to mount the seal rings on brake plungers	07000267
6	Tool to mount rings on rear differential lock pin	07000266
7	Hub extractor	07000265
8	Fitting for hydraulic circuit pressure gauge	07000122
9	Front axle support	07000304

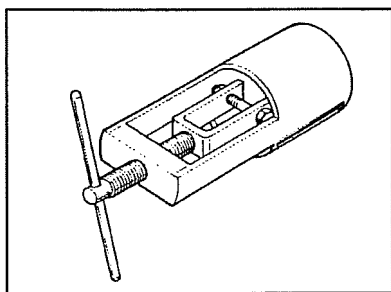


Fig. 10

0145

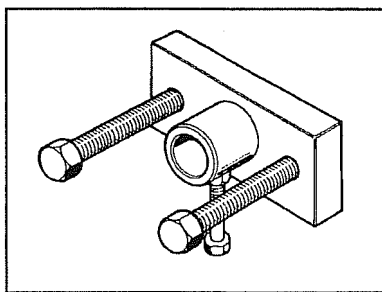


Fig. 11

0146

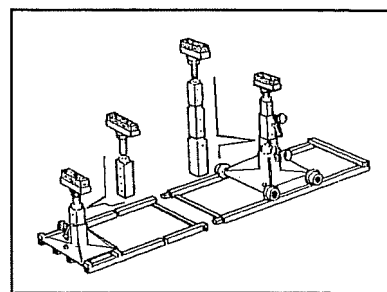


Fig. 12

0147

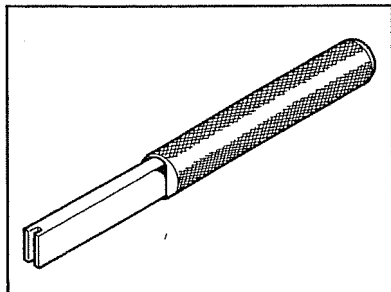


Fig. 13

0202

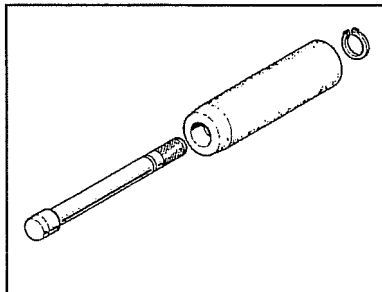


Fig. 14

0203

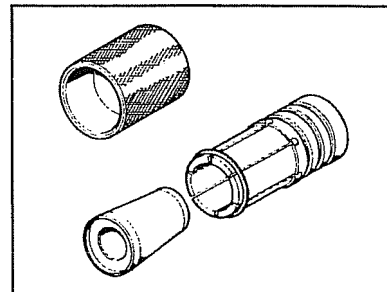


Fig. 15

0204

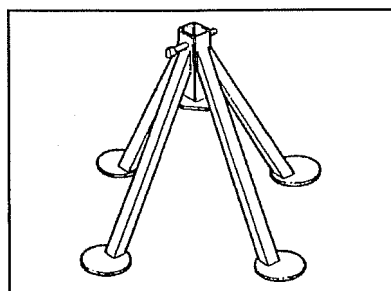


Fig. 16

0278

FIG.

DESCRIPTION OF TOOL

PART N°

- 10 Top PTO shaft extractor
- 11 Bottom PTO shaft extractor
- 12 Mobile support for separated tractor sections
- 13 Power steering spring mounting tool
- 14 Power steering oil seal ring and dust seal mounting tool
- 15 Steering cylinder seal ring mounting kit
- 16 Single header stand

- 07000125
- 07000127
- 07000245
- 07000296
- 07000297
- 07000298
- 07000215

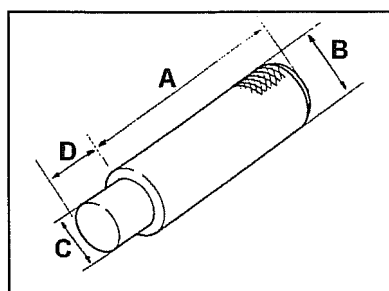


Fig. 17

0023

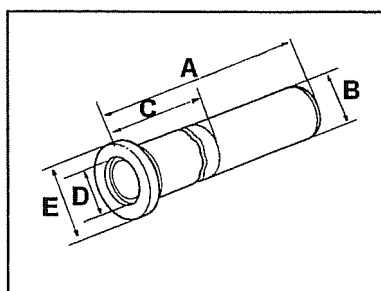


Fig. 18

0027

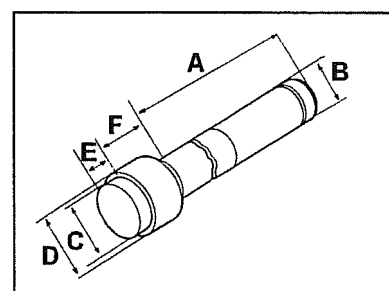


Fig. 19

0025

DESCRIPTION	A	B	C	D	E	F	G
Punch to mount oil seals on front hub cover	65	52	42	40			
Punch for installing reverse and creep gear assemblies	300	33	21	15			
Punch for installing bearings on front inside half-axle	150	45	23.5	23.5			

Fig.17

DESCRIPTION	A	B	C	D	E	F	G
Punch to mount output shaft bearing and rear hub bearings.	360	42	305	36	45,6		
Punch to mount the inside drive engage bearing	430	25	15	28	48,8		
Punch to mount bearing on synchronised transmission shaft and bearing on front hub	180	50	160	29.5	62		

Fig.18

DESCRIPTION	A	B	C	D	E	F	G
Countershaft mounting punch	590	45	25	62.5	10	30	
Thrust bearing sleeve mounting punch	290	45	34.5	60.5	15	15	
Oil seal mounting on thrust bearing sleeve punch	330	32	33.2	61.8	6.4	17	

Fig.19

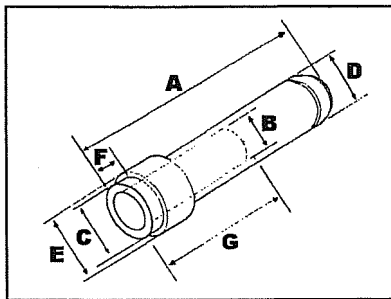


Fig. 20

0024

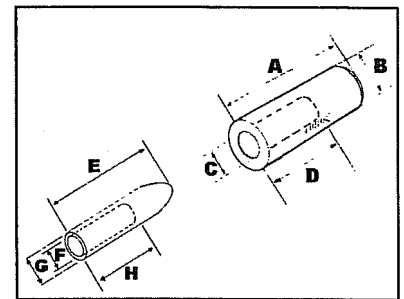


Fig. 21

0026

DESCRIPTION	A	B	C	D	E	F	G	H
Punch for mounting the outside half axle bearing and front differential bearings	180	43.5	68.5	60	78.8	4	155	
Top PTO oil seal mounting punch	130	45	72	50	78	5	110	

Fig. 20

DESCRIPTION	A	B	C	D	E	F	G	H
Punch for mounting the snap ring on the top PTO shaft	210	45	37,2	195	140	30.5	37	125
Punch for mounting the snap ring on the bottom PTO shaft, the rear bevel pair pinion and inside bevel pair pinion	200	39.6	32.7	160	130	30.2	32.5	115
Punch for mounting the seal ring on the bell retainer screw and internal gear selection rods	100	20	11.4	33	140		11	
Punch for mounting the seal ring on the gear selection rods on bell side	200	16.5	12.2	110	160		12	
Punch for mounting the oil seal ring PTO engage lever, drive engage lever and bottom PTO lever	160	30.6	15.2	110	44.6	14	15	
Punch to mount the bearing and oil seal ring on dual traction return shaft	190	51	27	130	100	24.7	26	85
Punch to mount the reverse gear bearing and drive box bearings	300	71	35	200	120	31.8	32.2	60
Punch to mount the front differential box bearing and differential box cover oil seal ring	150	51.5	26	140	65	25	27	50
Punch to mount bearing locking snap ring on front half-axle	165	75	42.5	110	105	30	41.5	90
Punch for mounting the bearing and oil seal ring on bottom PTO	230	71	35	200	120	31.8	32.2	60

Fig. 21

ROUTINE MAINTENANCE

- **Checking and changing engine oil** p. 3
- **Changing fuel filter cartridge** p. 3
- **Checking and changing transmission casing oil** p. 4
- **Checking and changing front axle oil** p. 5
- **Lift hydraulic circuit filter cleaning** p. 5
- **Changing and cleaning air filter** p. 6
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- **Registering the clutch pedal and PTO clutch lever** p. 7
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ROUTINE MAINTENANCE

• Checking and changing engine oil	p. 3
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• Checking and registering the brakes	p. 7
• Tyre inflation pressure	p. 8
• Lubricants	p. 8
• Routine maintenance schedule	p. 9

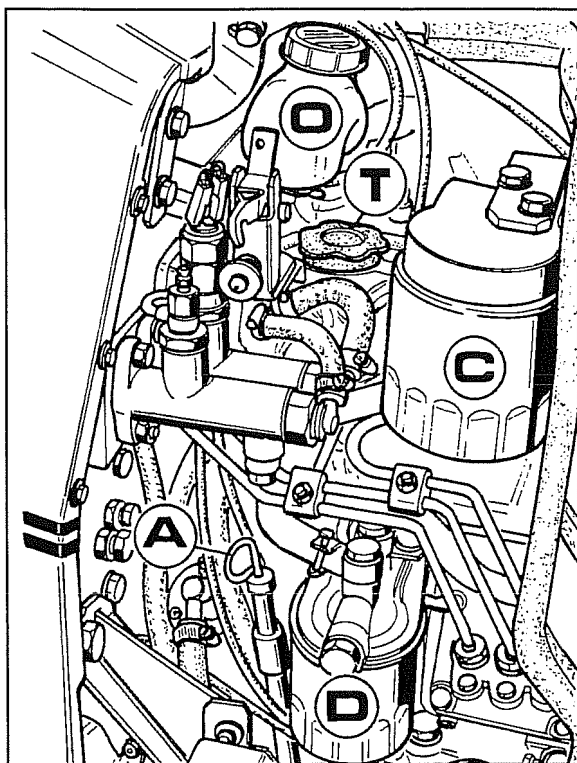


Fig. 1

0028

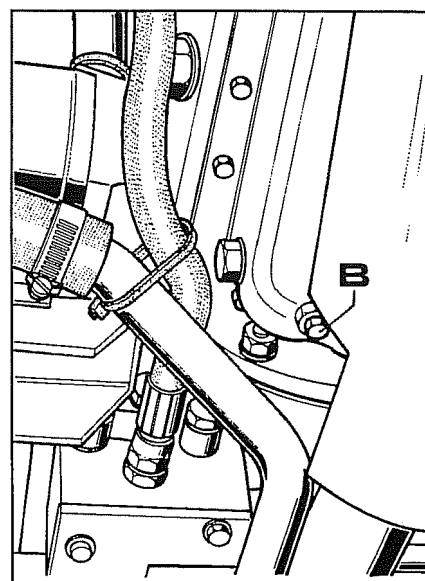


Fig. 2

0029

Checking and changing engine oil

Check the oil with the dipstick **A** fig.1 after every 10 work hours. After the first 50 work hours, make the first oil change and the corresponding filter **C** fig.1.

Thereafter change the oil every 100 work hours and the filter every 200 work hours.

The oil should be changed when the engine is hot to take full advantage of the maximum fluidity of the oil. Drain the oil from plug **B** fig.2 and wait until all the oil has drained out. Fill with new oil through plug **T** fig.1. The amount needed is 3.5 litres for model 20 DT and 5.7 litres for models 26 and 30 DT.

Changing the fuel filter cartridge

Change the fuel filter cartridge **D** fig.1 every 100 work hours.

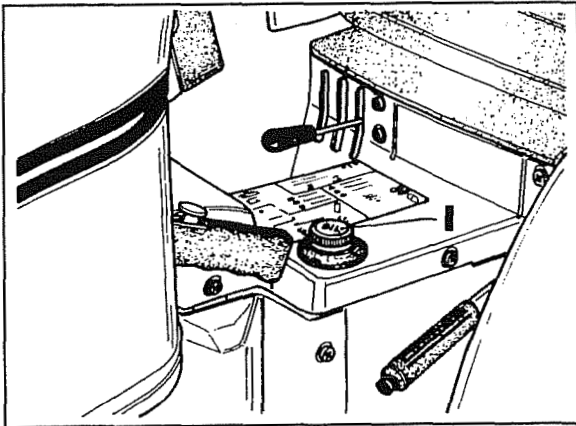


Fig. 3

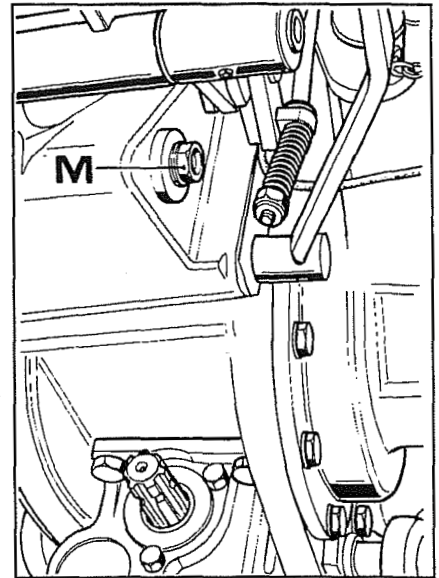


Fig. 4

Checking and changing transmission casing oil

Check the transmission oil level with the dipstick **I** Fig.3 every 50 work hours..
 Do the first oil change after 300 work hours and, thereafter, every 800 hours.
 Change the oil when the tractor has been running and thus take full advantage of maximum oil fluidity. Drain the oil from plug **M** Fig.4 and allow the oil to drain out completely.
 Fill with the new oil through plug **I** Fig.3. The amount required is about 22 kg.
 Monitor oil level which should always be at the maximum with the plug screwed in.
 Keep the oil vent plug clean. You will find it above the lift casing under the seat.

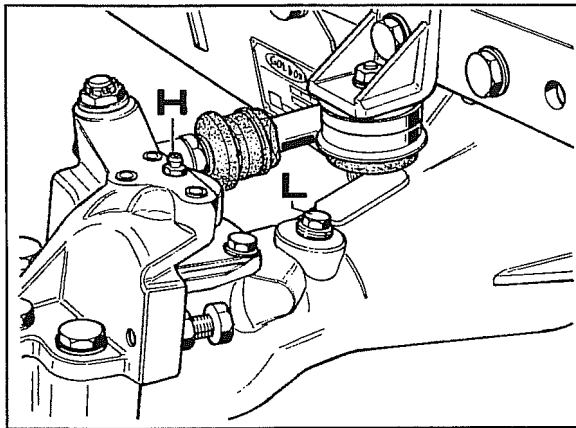


Fig. 5

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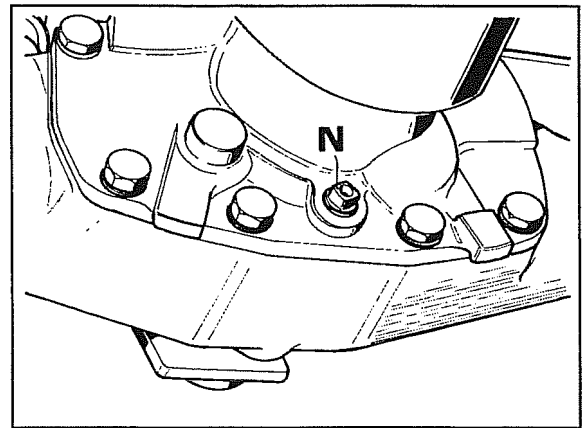


Fig. 6

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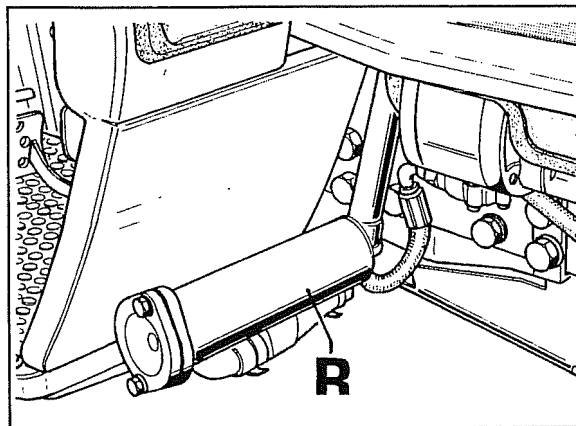


Fig. 7

0034

Checking and changing the front axle oil

Check the oil with dipstick **L** Fig.5 every 50 work hours.

Every 800 work hours change the oil by removing drain plug **N** Fig.6 and allowing the oil to drain out completely.

Fill with new oil through plug **L** Fig.5. The amount needed is 3.15 Kg. Monitor the oil level which should always be at the maximum level with the plug screwed in.

Cleaning lift hydraulic circuit filter

The first filter **R** Fig.7 cleaning should be done after the first 50 work hours and thereafter every 200 work hours and whenever the hydraulic fluid is changed. Clean the hydraulic circuit filter whenever the filter clog LED lights.

Place a container to collect the fluid, remove the cover and remove the filter.

Wash the filter thoroughly, dry it and replace it in its seating. Centre the filter and its seal ring with the stop on the bottom of the container.

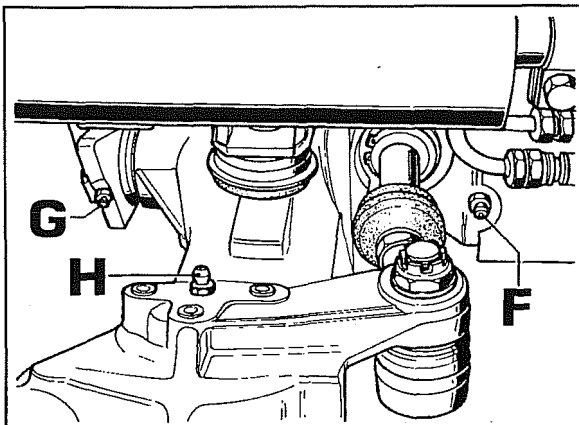


Fig. 8

0035

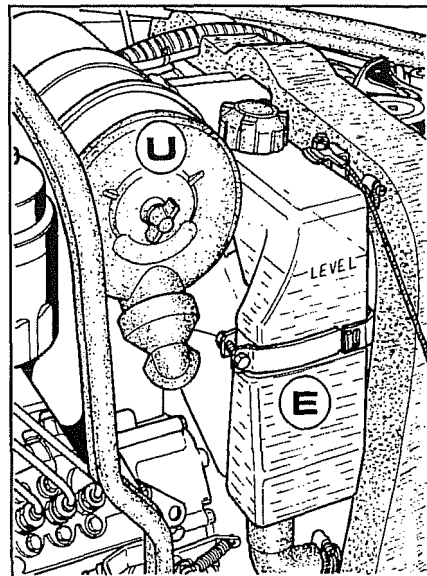


Fig. 9

0036

Changing and cleaning the air filter

After every 10 work hours or whenever the air filter clog LED lights, clean the air filter **U** Fig.9, with a jet of compressed air from the inside towards the outside. Change the filter every 200 work hours.

Important: in harsher working conditions increase filter cleaning and changing frequency.

Grease points

Every 50 work hours grease the kingpin **F**, the front axle pin **G** Fig.8 and the two wheel hubs **H** Fig.8 and 5.

Cleaning the radiator and the cooling circuit

About every 10 work hours or as needed, clean the radiator fins by blowing compressed air from the engine side towards the front.

When the engine is cold, visually check the level of the coolant in the expansion tank **E** Fig.9.

If necessary, top up to the maximum level line.

About every two years empty the cooling completely through the drain plug on the bottom right of the radiator. Close the drain and refill the radiator with new coolant. The amount will vary between 6 and 7 litres depending on the model.

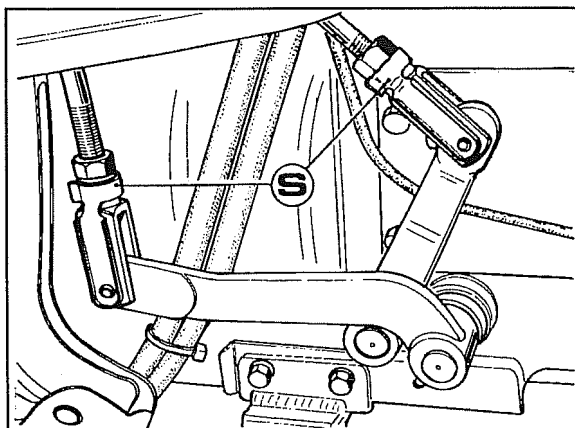


Fig. 10

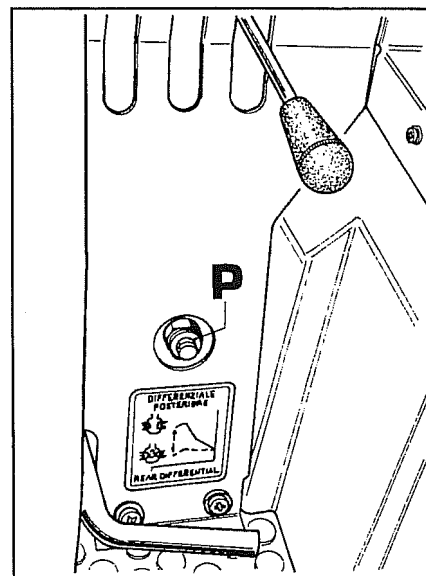


Fig. 11

Registering the clutch pedal and the PTO clutch lever

Check to make sure pedal take-up is about 1/3 of the total travel.
If it not, adjust it with the register forks **S** Fig.10 on the left side of the tunnel.
Make this check after the first 50 work hours and, thereafter, every 100 hours.

Checking and registering the brakes

Check to make sure the brake fluid tank **O** Fig.1 under the bonnet is $\frac{3}{4}$ full. If necessary, register the brake shoes with the registration nuts **P** Fig.11 under the seat to the right and left of the tunnel (refer to the section on "brake registration and bleeding").
This operation should be done for the first time after 50 work hours and thereafter every 100 hours. Change the brake fluid completely every two years and then bleed the air from the brake circuit (refer to the section on "brake registration and bleeding").

TYRE INFLATION PRESSURE					
Front			Rear		
Tyres	Bar	Kpa	Tyres	Bar	Kpa
6x12	1.9	190	250/80x18	2.0	200
6.5/80x12	2.0	200	260/80x20	1.6	160
6.5/80x15	1.9	190	11.2R20	1.6	160
7.00x12	2.0	200	12.4R20	1.6	160
23-8.50x12ST	1.5	150	33-12.50x15ST	1.4	140
20x800-10	0.8	80	31-12.5x15	1.4	140
6x12FD	2.0	200	29-12.50x15	1.4	140
6.5/80x15	1.9	190	320/70x20	1.6	160
			9.5x18	2.2	220
			8.00x20	1.7	170
			8.3x24	3.1	310

Lubricant Chart and equivalent types

LUBRICANT	TYPE	EQUIVALENT
TRANSMISSION LIFT AND FRONT AXLE	AGIP -Super Tractor Universal Sae 15w40	CERMAG -Adara Universale sae 15w40 SHELL -Agroma sae 20w40 BP -Terrac sae 15w40 ESSO -Unifarm sae 15w40 MOBIL -Mobiland Super Universal 15w40 JOHN DEERE -HY Gard J20C
BRAKE FLUID	AGIP -Brake fluid dot 4	ESSO -Brake Fluid Extra JOHN DEERE -Dot Ref. EPYQ 001

Scheduled maintenance chart

	DESCRIPTION OF WORK	1 st SERVICE	FREQUENCY IN HOURS
ENGINE	Check engine oil level		10
	Change engine oil	50	100
	Change engine oil filter	50	200
	Clean air filter		10 (*)
	Change air filter		200 (*)
	Change fuel filter cartridge		100
COOLING CIRCUIT	Check coolant liquid level		10
	Clean radiator fins		10 (*)
	Drain, wash and refill cooling circuit.		2 YEARS
ELECTRIC SYSTEM	Check battery electrolyte level		50
	Check alternator belt tension	50	200
TRANSMISSION	Grease: kingpin, axle pivot and front wheel hubs		50
	Check oil level: transmission and front axle box		50
	Change transmission oil	300	800
	Change front axle box oil		800
BRAKES AND CLUTCH	Check brake fluid level and brake shoe registration	50	100
	Check pedal and main clutch level take-up	50	200
	Change brake fluid		2 YEARS
HYDRAULIC LIFT	Clean hydraulic circuit oil filter	50	200
CAB	Clean cab air filter		10 (*)
CAB	Change cab air filter		500 (*)
SUNDRY	Check tyre pressure		50
	Check wheel retainer tightening performance	50	500

(*) – Increase frequency in particularly harsh working conditions for filters and radiator

TROUBLE-SHOOTING

PROBLEM	CAUSE	REMEDY
CLUTCH		
The clutch slips	1 Clutch tends to disengage.	1 Register the external control and, if necessary the internal linkages.
	2 The clutch is soiled with oil.	2 Eliminate any oil leaks from the engine shaft, the output shaft or the rods. Change the fibre disks. Transmission rods: refer to oil leaks from transmission casing and clutch bell.
	3 Insufficient Belleville washer spring pressure.	3 Change spring.
	4 Linkages have partially seized and this prevents complete pedal or lever return.	4 Lubricate all linkage pivots.
	5 Clutch disks are beyond maximum wear.	5 Change disks.
The clutch does not disengage	1 Excessive clutch take-up.	1 Register the external control and, if necessary the internal linkages.
	2 Clutch disk is corrugated.	2 Change the clutch disks.
	3 Clutch disk seized to the pressure plate due to a long period of inactivity.	3 Drive the tractor with a fast gear engaged. Disengage the clutch by depressing the pedal and press the brake pedal repeatedly. If this does not work, dismantle the clutch and clean it (see clutch overhaul)
	4 Internal controls are faulty.	4 (Refer to work on the clutch control fork split pins.)
BRAKES		
The tractor does not brake	1 Brakes need adjusting.	1 Register the emergency and parking brakes (refer to brake registering and bleeding).
	2 Brakes disks are worn.	2 Change brake disk ass'y (refer to brake disk pack overhauling).
	3 Air in brake circuit.	3 To bleed the brakes: refer to brake registration and bleeding.
	4 Drop in brake fluid in reservoir or brake pedals offer no resistance.	4 Find the leak (refer to leaks in the brake fluid circuit)

PROBLEM	CAUSE	REMEDY
TRANSMISSION		
Gears do not disengage	1 Excessive axial play in synchromesh gears and gear selectors.	1 Reset the prescribed play.
	2 Incorrect synchronism between gear select rod and sliding sleeve.	2 Reset power transmission by eliminating the play and changing, if necessary, selector rod, ball and spring.
	3 Sliding sleeve and gear selectors have worn teeth due to faulty synchromesh functioning.	3 Change the synchromesh ass'y and the gear.
Gears do not engage	1 The clutch does not disengage.	1 Register the clutch as prescribed.
	2 Synchromesh with corrugated brake rings.	2 Change the brake rings.
	3 Synchromesh with brake pre-load springs set too high.	3 Change the springs and grind the parts in contact with them on the sliding sleeve.
	4 Synchromesh and gear selectors with insufficient axial play.	4 Reset the required play.
	5 Anti-twist device worn.	5 Check the anti-twist device (refer to service work on the anti-twist device on the rods inside the gear and speed range boxes).
The creep/reverse gears do not disengage	1 Incorrect synchronism between creep gear selector rod and sliding sleeve.	1 Reset power transmission by eliminating the play and replacing, as necessary, selection rod, ball and spring (refer to service work on medium gears in the creep gearing).
The creep/reverse gears do not engage	1 The clutch does not disengage.	1 Register the clutch as prescribed (refer to clutch overhaul).
	2 Anti-twist device worn.	2 Check anti-twist device (refer to service on the anti-twist device on the rods in the change-speed and creep gear gearing).
PTO		
The PTO disengages	1 Independent or synchronised PTO select controls need to be registered.	1 Register the PTP selector.
The PTO does not engage	1 The clutch does not disengage.	1 Register the clutch as prescribed.

PROBLEM	CAUSE	REMEDY
	2 Live or synchronised PTO selector control out-of-registration.	2 Register the selector.
POWER STEERING		
Loss of control when driving the tractor.	1 Steering cylinder with worn seal rings.	1 Change cylinder oil seals.
Oil leaks from the power steering	1 Fittings are loose.	1 Change the packings and tighten the fittings.
	2 Worn seal rings.	2 Restore power steering seal performance.
	3 Power steering bleeder blocked.	3 Check condition of bleeder tube and functional performance of lift spooling valve
Steering is very hard	1 Foreign bodies in prioritising valve.	1 Clean the valve (refer to section on checking and cleaning the prioritising valve).
	2 Foreign bodies in power steering pressure relief valve.	2 Clean the valve and check if the pressure is 90 bar.
Too much play in the steering	1 Play between steering column, steering wheel or power steering shaft.	1 Change worn parts.
HYDRAULIC LIFT		
The lift raises in jerks.	1 Pump suction filter clogged.	1 Clean the filter or change it as needed.
	2 Air leaks into pump suction line.	2 Check the suction line, fittings and seals. Check oil level.
Pump is overheated	1 Pressure too high.	1 Reduce pressure (refer to section of checking and regulating hydraulic circuit oil pressure).
	2 Cavitation.	2 Clean the suction circuit components (line or filter clogged).
Pump has no pressure	1 Pump shaft broken.	1 Change pump.
Pump noisy	1 Cavitation.	1 Clean the suction circuit components (line or filter clogged).
	2 Bad seal on pump shaft.	2 Change the oil seal.
Volume of oil in the circuit increases until it leaks out	1 Air aspirated into the circuit.	1 Check the suction line, fittings and seals. Check oil level.
	2 Too much oil in the circuit.	2 Check oil level.

PROBLEM	CAUSE	REMEDY
The lift does not raise or lower	1 Lower stopcock closed.	1 Screw the register out (refer to the section on installing a lift lower control valve).
	2 No power supply to solenoid ass'y.	2 Refer to the section on no power supply to the raise/lower control solenoid ass'y; checking coil resistors and testing power supply to the lift limit switch.
	3 No power to the solenoid ass'y when tractor is working with controlled draft and position.	3 Refer to section on checking or changing the sensors, rheostats and central control unit on controlled draft and position lifts..
	4 No oil supply to the solenoid ass'y.	4 Refer to section on checking and cleaning the prioritising valve.
	5 Mechanical defects with the solenoids.	5 Refer to the section on solenoid mechanical faults.
Lifting capacity is not as prescribed.	1 Insufficient hydraulic circuit pressure.	1 Refer to the section on checking and regulating oil pressure in the hydraulic circuit.
The lift has problems with holding the load.	1 Oil leaks into the the hydraulic cylinder.	1 Refer to the section on overhauling the lift cylinder - causes of oil leaks.
With the lift arms at maximum height, engine Rpm are reduced.	1 Limit switch out of regulation or damaged.	1 Refer to the section on no power supply to the lift raise/lower control solenoid ass'y; checking coil resistors and checking power supply to life limit switch or the installation of a new limit switch on the lift.
Excessive controlled draft and position sensitivity	1 Stopcock out of regulation.	1 Regulate the lower stopcock or refer to the section on installing a lift lower regulating valve.
	2 Sensors out of regulation.	2 Refer to the section on sensor regulation when the tractor has a controlled draft and position lift.
Lift arms raise spontaneously	1 Raise solenoid clogged.	1 Refer to the section on solenoid mechanical faults.
	2 Too much oil delivered to solenoid ass'y.	2 Refer to the section about spontaneous lift raising caused by oil delivery.
FRONT AXLE		
Wheels vibrate	1 Toe out of regulation.	1 Adjust toe.
	2 Axle swivel bushings worn.	2 Change bushings.
	3 Steering ball-joints worn.	3 Change the parts and adjust toe.

PROBLEM	CAUSE	REMEDY
BODYWORK		
Platform vibrates	1 Minimum engine Rpm too low.	1 Regulate engine minimum Rpm.
	2 Play between control pins and levers on platform.	2 Eliminate play by checking registration performance.
ELECTRIC SYSTEM		
Generator warning light does not turn off even at high Rpm.	1 Regulator not working properly.	1 Overhaul or change the alternator.
	2 Alternator does not shcharge sufficiently.	2 Overhaul or change the alternator.
Hydraulic circuit filter clog warning light comes on (if installed)	1 Suction line filter clogged.	1 Clean filter (refer to section Routine Maintenance).
	2 Defective switch on hydraulic pump.	2 Change switch.
	3 Incorrect lubricating oil.	3 Change oil using the recommended type.
	4 Outside temperature very low.	4 Wait 5/10 minutes with engine at minimum Rpm before starting to work.
Air filter clog warning light comes on	1 Air filter clogged.	1 Clean or, if necessary, change (Refer to section on Routine Maintenance).
	2 Defective air filter switch.	2 Change the switch.
Engine oil pressure warning light comes on	1 Insufficient oil pressure.	1 Bring the oil back to level and change the filter (refer to section on Routine Maintenance).
	2 Defective switch.	2 Change the switch.
Front drive engaged indicator light is on	1 Linkage or switch out of regulation.	1 Register linkage or switch.
	2 Defective switch.	2 Change the switch.
PTO disengaged indicator light is on	1 Control lever or switch out of regulation.	1 Register the lever (refer to section on Routine Maintenance) or the switch.
ENGINE COOLING CIRCUIT		
The engine overheats	1 Radiator clogged.	1 Clean the radiator thoroughly (refer to section in Routine Maintenance).
	2 Pump alternator control belt slack.	2 Tension the belt.
	3 Engine overload for a prolonged period of work time.	3 Use a more appropriate speed range or a more adequate implement
	4 Defective themostat.	4 Change the thermostat.
	5 Cooling liquid leak.	5 Check seal fitting and sleeves. Replace as needed.
	6 Air filter clogged.	6 Clean the filter (refer to section on Routine Maintenance).

PROBLEM	CAUSE	REMEDY
	7 Bad water circulation due to a pump malfunction.	7 Overhaul or change the pump.
POWER CIRCUIT		
Engine gives little power.	1 Fuel filter clogged.	1 Change filter. (refer to section on Routine Maintenance).
	2 Air in the circuit.	2 Eliminate air leaks.
	3 Play in the valves or injectors badly calibrated.	3 Register valves and calibrate the injectors (refer to engine manual).
The engine starts badly.	1 Glow plugs are not working.	1 Change glow plugs.
	2 Injectors badly calibrated.	2 Calibrate the injectors. (refer to engine manual).
	3 Inefficient fuel pump.	3 Change pump.

INSTRUCTIONS ON HOW TO DETERMINE THE SERVICE WORK NEEDED

This section of the manual deals with service work on the tractor. In order to use it to its full potential, follow the instructions detailed below.

- Once you have diagnosed the problem, go to the General Contents and find the assembly it belongs to and from this the number of the Ass'y.
Flip through the manual from the bottom right corner until you reach the beginning of the Ass'y which is printed on each page referring to the ass'y.
The contents page for each Ass'y includes:: "*Job Code N°*", "*Job Description*" and "*Page*":

The "*Job Code N°*" is a 3 or 4 number code where:

XXX (3 numbers), identify the dismantling and reassembling operations for tractor finishing parts.

XXXX (4 numbers), identify the dismantling and reassembling operations for mechanical parts of the tractor.

The "*Job Code N°*" must always be given when filling out the "under warranty repair request form" together with the ass'y to which the service work refers as given at the bottom of the page.

For example: 003 35 where 003 refers to dismantling or reassembling tractor finishing parts. "35" refers to the ass'y to which the finishing part belongs

The number assigned to a "*Job Code*" will always stay the same as long as the same operations detailed in it are repeated.

- "*Job description*" gives a summary description of the job and a list of the main parts involved.
The "*Job description*" should not be included in the "Under warranty service request since it is already identified by the "*Job Code N°*".
A "*Job description*" may contain "*Job Codes*" from a number of Assemblies. In this case the corresponding "*Job description*" can be consulted at the bottom of the contents page.
- "*Page*" tells you where, within an Ass'y, the description and illustration of that operation or job actually begins
- The contents page for each ass'y is broken down into main jobs printed in bold under which all the operations making up the job will be listed. Thus, within the various operations, you can have the same "*Job Code*" repeated.
- All the jobs covered in the manual refer to the base version of the tractor. This means that the dismantling and reassembling operations required in the manual do not include the dismantling and the reassembling of accessories such as the cab, the front lift, the auxiliary spooling valves, the under-belly plate, etc.

CLUTCH ASS'Y CONTENTS

Job Code	Job Description	Page
	Oil leak from transmission casing to clutch bell housing.	1
001 •	Finish: Finish 006 + transmission centre guard and side panels, clutch bell housing side covers.	1
1001 •	Change seal rings.	2
	Clutch overhaul.	3
002 •	Finish: Finish 001, 003, 008 + tractor separation and final brake bleeding.	4
1002 •	Regulate clutch control levers.	10
1003 •	Change and regulate clutch control levers.	9
1004 •	Complete overhaul of dual clutch and replacement of disks.	8
1005 •	Change the dual clutch ass'y.	8
1006 •	Change the thrust bearings.	11
003	Finish: steering wheel, gear lever and gear unit, dash and wiring.	
006	Finish: seat	
008	Finish: steering cylinder hydraulic lines, dual traction shaft guard and dual traction shaft	

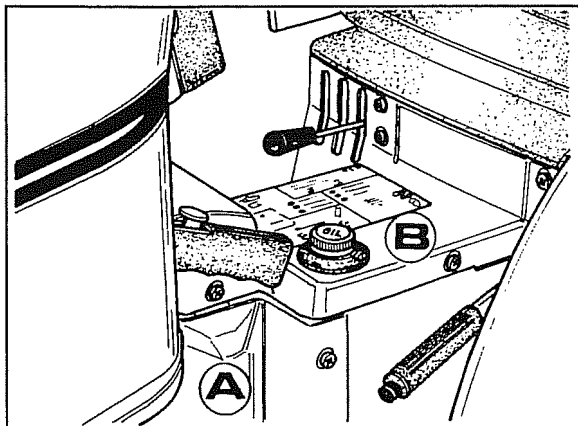


Fig. 1

0039

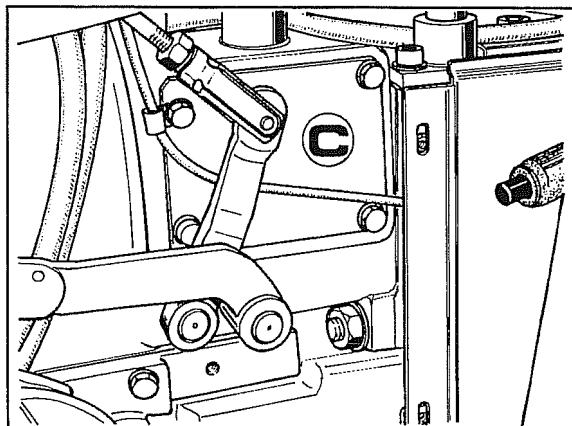


Fig. 2

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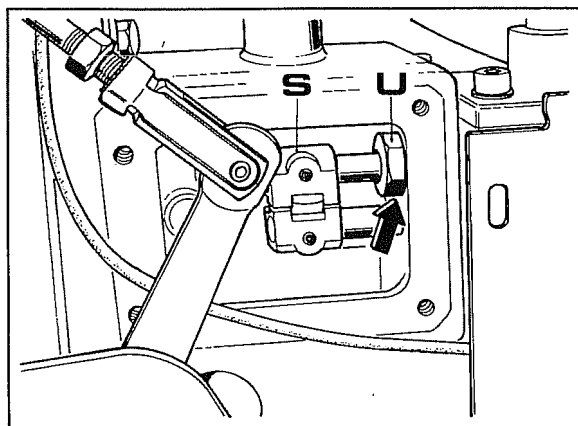


Fig. 3

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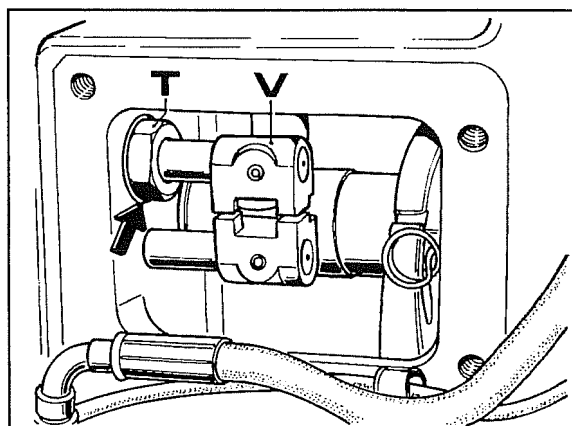


Fig. 4

0044

Oil leaks from transmission casing to clutch bell housing

- 1 Remove the centre cover **B**, side panel **A** and the panel on the opposite side as shown in Fig. 1.
- 2 Remove cover **C** on the clutch bell and the one on the opposite side as shown in Fig. 2.
- 3 Check if the oil leak is on the creep gear control rod identified by the arrow in Fig. 3 or on the gear control rod identified by the arrow in Fig. 4.
- 4 Remove sleeve **S** and unscrew bushing **U** Fig. 3 or sleeve **V** and bushing **T** Fig. 4 based on the rod involved in the leak.

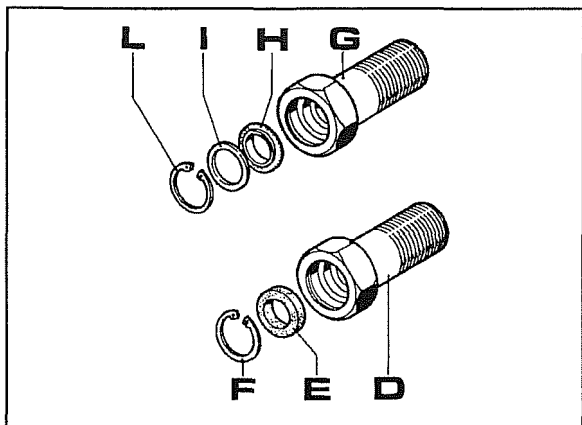


Fig. 5

0045

5. Remove the bushing from the rod and remove the seal ring.
6. If the seal ring **H** is the Combi model illustrated in Fig. 5, replace it with a new one. If it is a traditional type of seal ring **E** illustrated in Fig. 5 its seal performance will have to be upgraded by replacing parts **D-E-F** with parts **G-H-I-L**.

When reassembling pay special attention to the following:

When installing the new parts, check that there are no burrs in the section of the rod where the pin hole is since they would damage the new seal ring.

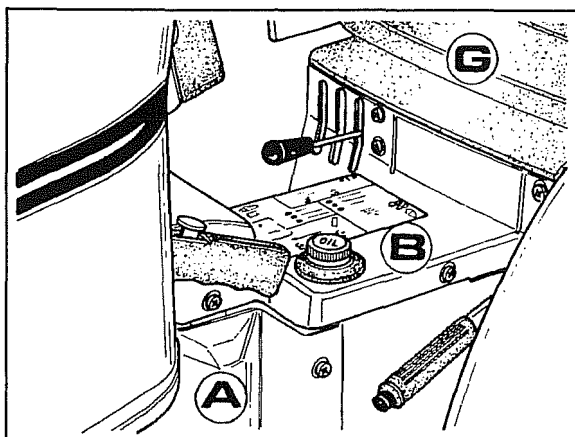


Fig. 8

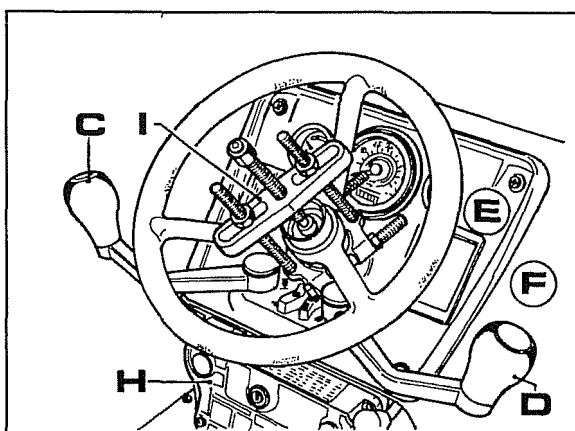


Fig. 9

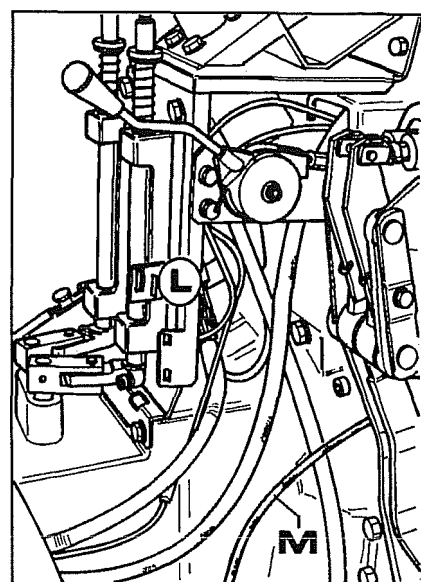


Fig. 10

Overhauling the clutch

This will be necessary when one of the following problems occurs:

- The clutch does not disengage even when pedal adjustment is correct and therefore the tractor continues to move. The cause of this is a prolonged period of tractor inactivity often in a damp environment. The clutch disks become glued together preventing disengagement. Dampness can also be caused by washing the tractor and not working the clutch to drain off any residual water on the disks or if the tractor is left out in wet weather.
- The clutch slips and does not engage even when the pedal has been registered. This means that the tractor cannot move.

The cause can be the disks which have reached the maximum wear or oil has leaked onto them and prevents them from working efficiently. A third cause could be riding the clutch which long-term will produce a vitrification layer on the disk surfaces.

To access the clutch ass'y:

1. Remove the seat **G**, the centre guard **B**, side panel **A** plus the one on the opposite side as shown in Fig. 8.
2. Use an extractor like the one shown in Fig. 9 (**I**) to remove the steering wheel.
3. Remove the speed range control lever **C**, the gear lever **D** and the dashboard **E** Fig. 9.
4. Remove the ignition block **H** Fig. 9 and disconnect the front electric system terminal block from the rear one.
5. Remove the sheet-metal frame piece(s) **F** Fig. 9 that support the dashboard.
6. Remove gear lever mount **L** Fig. 10 and disconnect accelerator pedal cable **M** from under the platform.

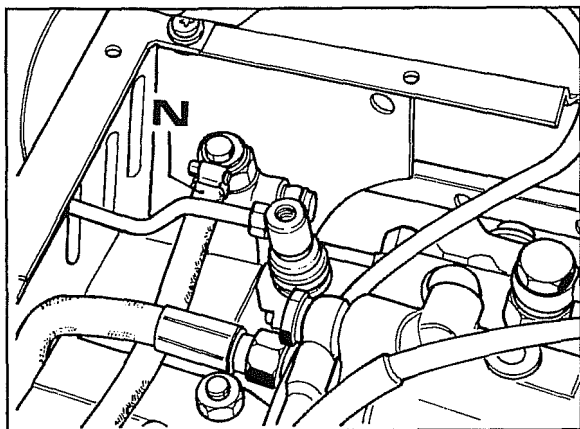


Fig. 11

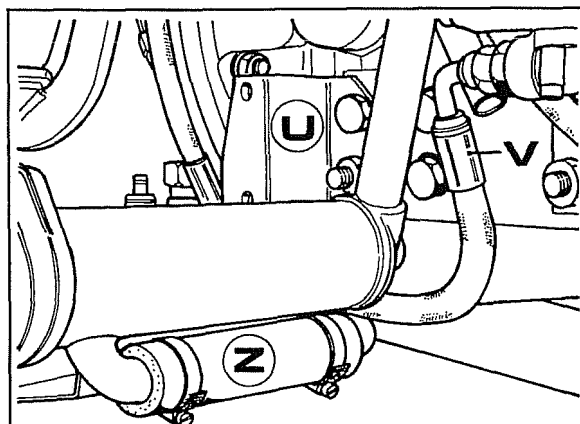


Fig. 13

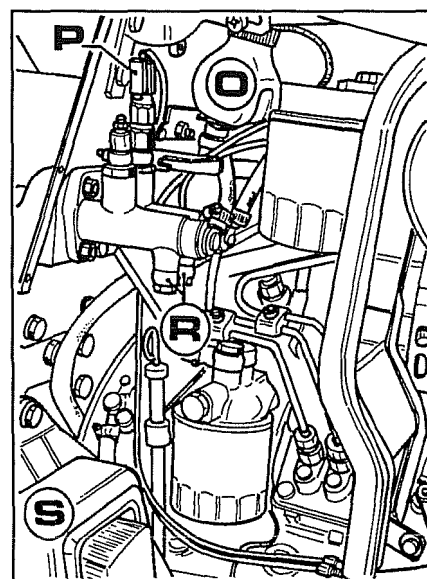


Fig. 12

7. Empty the brake fluid reservoir **O** Fig. 12, and disconnect the delivery pipe **N** Fig. 11 for the differential lock pump.
8. Disconnect the electric wires at terminal block **P** Fig. 12 from the brake light assembly and then remove it through the rear section.
9. Disconnect the delivery tubes **R** Fig. 12 for the brake pumps but be careful to hold them when removing them from the tractor so that they are not damaged.
10. Remove the mudguards **S** and **T** in Fig. 12 and 15 with their wire harnesses.
11. Remove the platform carrier bracket **U** Fig. 13 and the corresponding one on the other side.
12. Disconnect delivery pipe **V** fig. 13 for the prioritising valve oil.
13. Put a container under sleeve **Z** Fig. 13 to catch any oil and insert a plug to stop the oil from draining out. As an alternative, drain out all the oil and re-fill later.

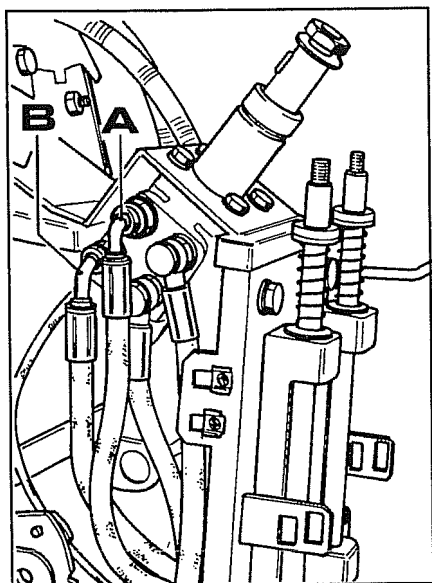


Fig. 14

0154

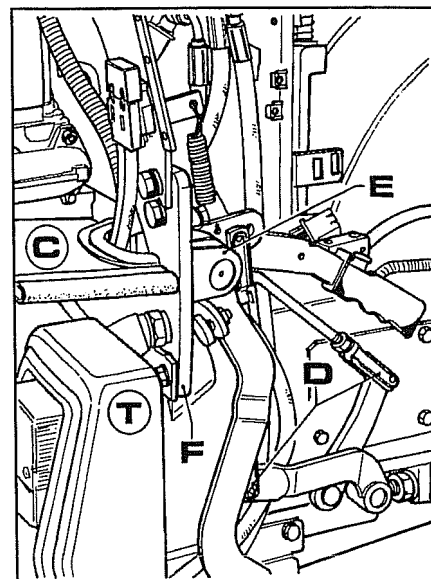


Fig. 15

0155

14. Disconnect the drain pipe **A** Fig. 14 from the power steering to the transmission. Then disconnect delivery pipe **B** from the prioritising valve to the power steering.
15. Remove guard **C**, disconnect forks **D** and then separate mounting **E**, complete with clutch pedal and lever, from flange **F** in Fig. 15.

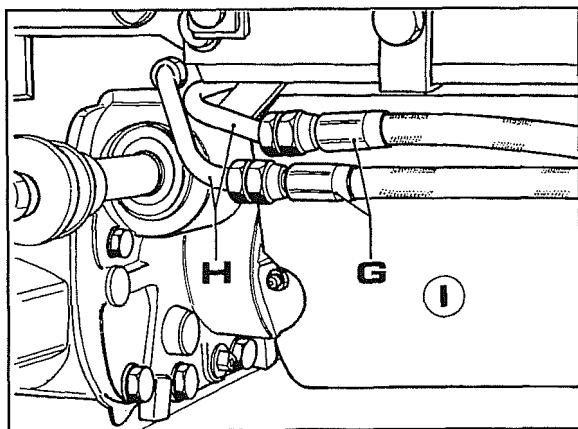


Fig. 16

0156

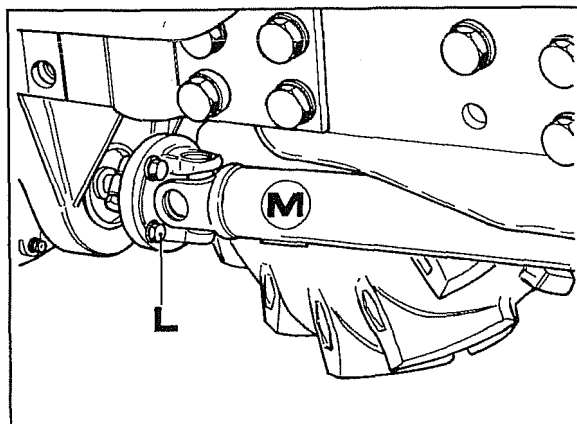


Fig. 17

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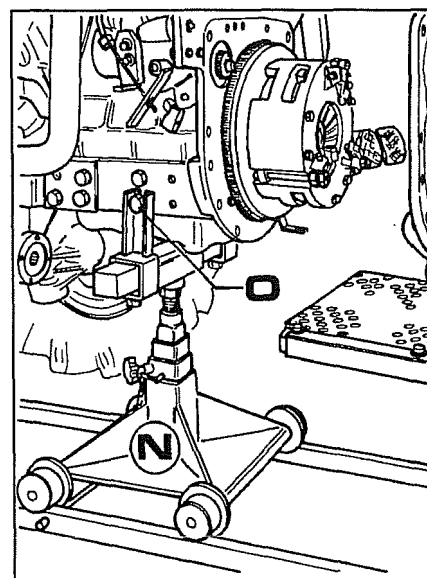


Fig. 18

0158

16. Disconnect the two pipes **G** Fig. 16. Put plugs in the ends of both pipes **H** to prevent oil leaking out whenever the front wheels turn.
Remove guard **I** from the dual drive shaft.
17. Disconnect dual drive shaft **M** by removing screws **L** Fig. 17, then slip it forward and remove it.
18. At this point the tractor halves can be separated. To do this you will need stand **N** Fig. 18 absolutely essential to support and keep the two halves aligned. Fix it in position with screws **O**.

NB: - Before separating the tractor, brake the rear part with the emergency brake and stabilise the front section by putting a wedge under both front axle end pads.

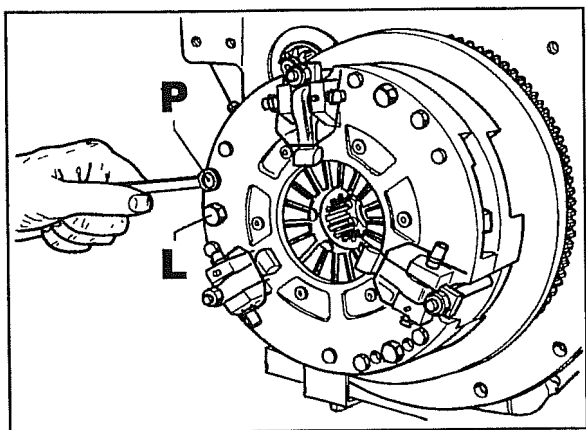


Fig. 19

0159

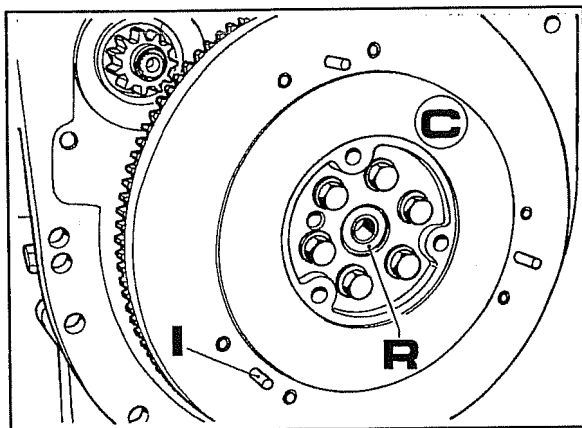


Fig. 20

0160

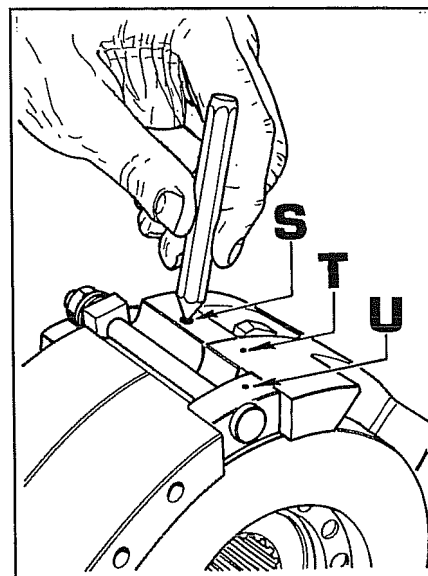


Fig. 21

0161

19. Separate the clutch pack from the engine fly-wheel by removing the 6 screws **P** Fig. 19.
20. Check the condition of bearing **R** Fig. 20.
21. Before separating the clutch disk pack, punch the markings **S-T-U** Fig. 21 so that you can reassemble the three flanges in the same positions. This is to maintain the balancing performance of the entire disk pack during operation.

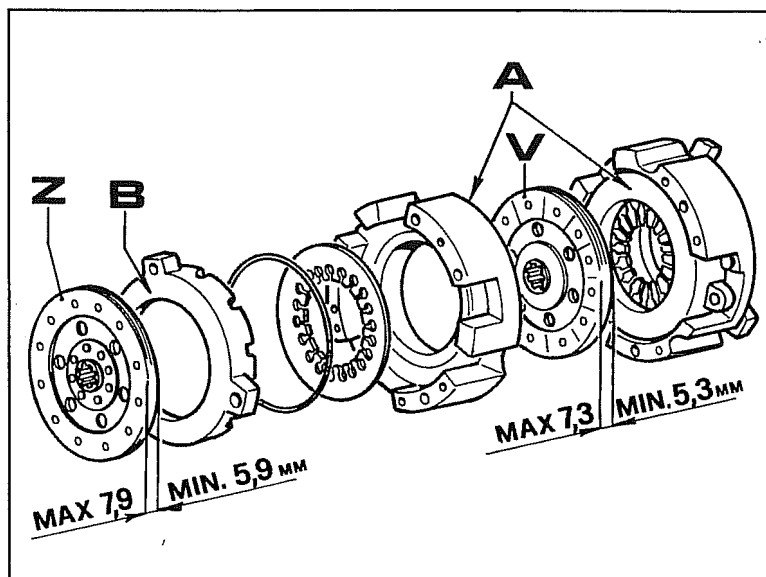


Fig. 22

0162

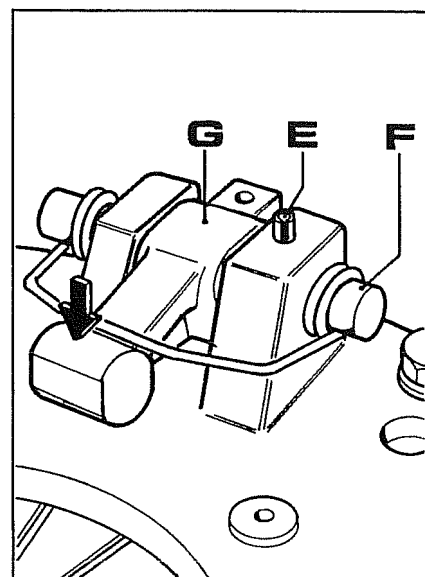


Fig. 23

0163

22. Fig. 22 shows the components forming the dual clutch. Follow these procedures:

- a. Check disk wear by measuring the thickness which should not be less than **5.3 mm** for transmission disk **V** and **5.9 mm** for PTO disk **Z**. If the clutch had to be dismantled because the disks were seized (refer to the causes that made the service work necessary) and, after checking the thickness, you decide to reuse them, you will have to clean the contact surfaces of the disks with emery paper. Bear in mind the **safety regulations** when doing this procedure..
- b. Check to make sure that surfaces **A-B** Fig. 22 and **C** Fig. 20 the disks are in contact with have not worn unevenly. Clean these surfaces with emery paper before remounting the disks.
- c. Check to make sure that lever **G** Fig. 23 heads (identified by the arrow in the figure) are not excessively worn.
If they are, change them as follows:
 - Remove pin **E**.
 - Extract pivot **F**, replace the lever and reposition the spring as shown in Fig. 23.

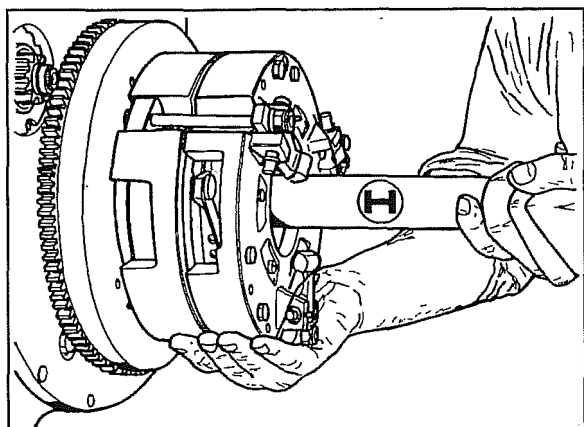


Fig. 24

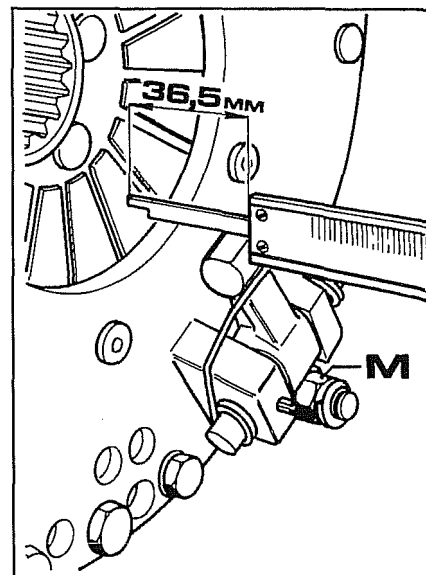


Fig. 25

Points to bear in mind when reassembling the clutch:

- When reassembling the clutch disk pack, position the flanges according to the punch marks you made on them as shown in Fig. 21. Place disks **Z** and **V** in Fig. 22 with the shorter part of the shrunk on hub towards the engine flywheel.
Leave all screws temporarily hand tightened.
Insert the centring punch **H** Fig. 24 in the pack and follow these steps:
 - Insert the punch in bearing **R** Fig. 20 and then slide the clutch pack until it is on the three centring pins **I** Fig. 20.
 - Apply a medium Locktite and cross-tighten the 6 screws **P** Fig. 19 until the pack is against the flywheel but without tightening the screws fully.
 - Tighten at 3 Kgm the 3 screws **L** Fig. 19 which joins clutch disk **V** Fig. 22 with the transmission and then tighten, at 3 Kgm screws **P** Fig. 19.
 - Check alignment of clutch disks and flywheel by placing the assembly punch **H** Fig. 24 in the flywheel bearing. If it goes in with difficulty or not at all, this means that alignment is not satisfactory. In this case, slacken off screws **L** and **P** Fig. 19, reinsert the punch in the bearing to liberate it from anything interfering with it and then retighten the screws as described previously.
- To regulate PTO clutch disengage levers **G** Fig. 23, turn nuts **M** Fig. 25 till you have 36.5 mm from the top of the levers to the spring as shown in the Figure.

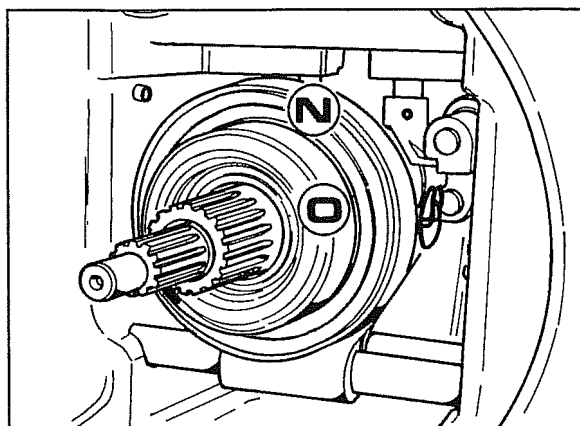


Fig. 26

0166

- Before reassembling the tractor, check to make sure that the two thrust bearings **N** and **O** Fig. 26 are in good condition.
Check them by turning and exercising axial pressure manually without noting any problem with their rolling performance.
Also check correct bearing rolling performance. If necessary lubricate the shimmèd on shafts with a film of grease (do not use oil which could soil clutch disk soiling during operation). The grease will also prevent formation of rust caused by humidity and prolonged tractor storage when the disk could become glued to their shafts.
- When putting the tractor back together, make sure that the shafts keyed to the disks are correctly led in. After this, the clutch bell housing screws can be tightened back down.
- Once re-assembly has been completed, bleed the brakes (refer to "Brake registration and bleeding) and the differential lock.
- To regulate the clutch pedal and the PTO clutch lever, refer to the specific sections under routine maintenance.

CONTENTS: REAR TRANSMISSION ASS'Y

Job Code	Job description	Page
	Work on internal transmission and gear unit gear control rod hindrances	1
001	• Finishing: finishing 006 + central transmission guard and clutch bell housing side panels	1
1007	• Transmission cover.	1
1008	• Work on hindrances and regulating the corresponding transmission and gear unit forks.	1
	Work on middle range gear engage control.	3
001	• Finishing: finishing 006 + central transmission guard and clutch bell casing side panels.	3
1007	• Transmission cover.	3
1009	• Changing select sprint and regulating corresponding fork in the gear unit.	3
1010	• Regulating transmission and gear unit forks.	4

006 Seat finishing

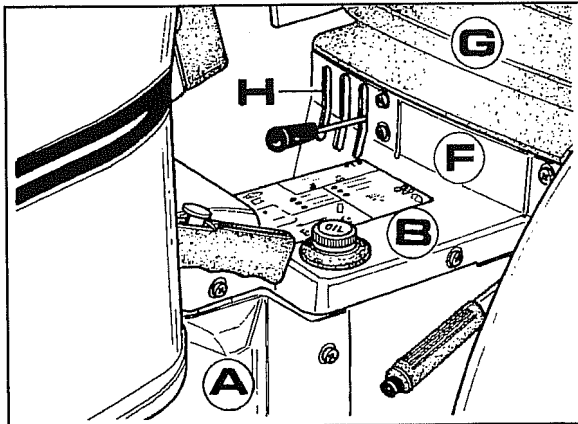


Fig. 1

0046

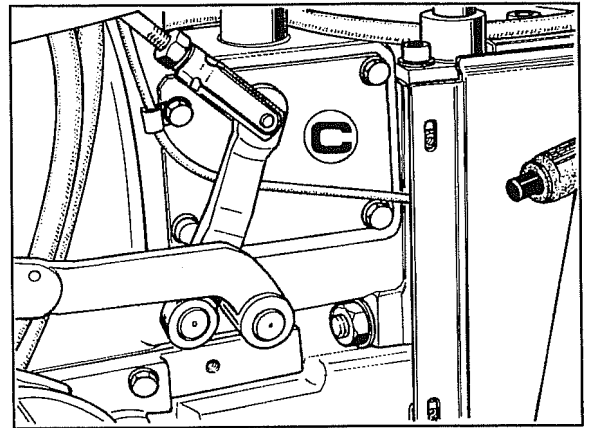


Fig. 2

0040

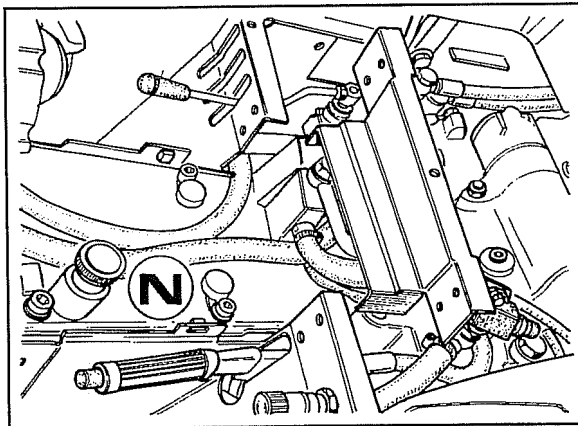


Fig. 3

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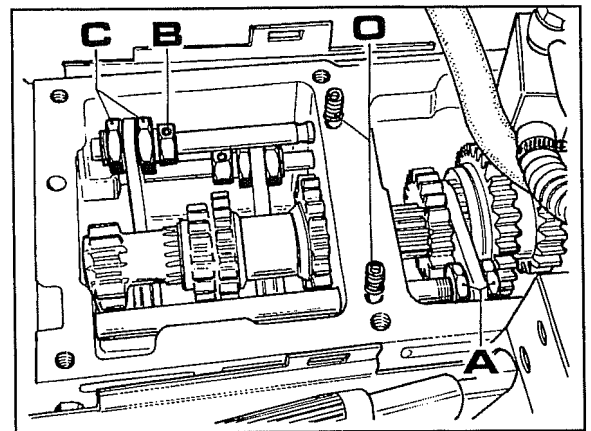


Fig. 4

0048

Work on hindrances and regulating the corresponding transmission and gear unit forks

- 1 Remove the seat **G**, the centre guard **B**, side panel **A** plus the one the opposite side and cross-piece **F** as shown in Fig. 1.
- 2 Remove cover **C** Fig.2 and the one on the opposite side.
- 3 Remove the transmission casing cover **N** Fig.3.
Caution: when lifting up the cover, make sure that spring **O** Fig.4 does not drop into the oil inside the transmission casing. Then remove the balls.
- 4 Release the creep range rod by slackening off nuts **A** Fig.4 and then slip it out forward.

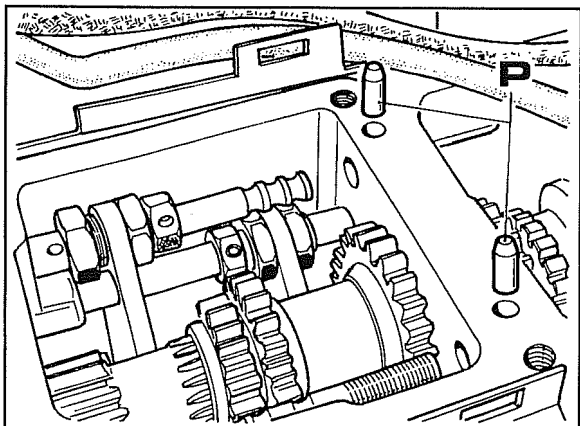


Fig. 5

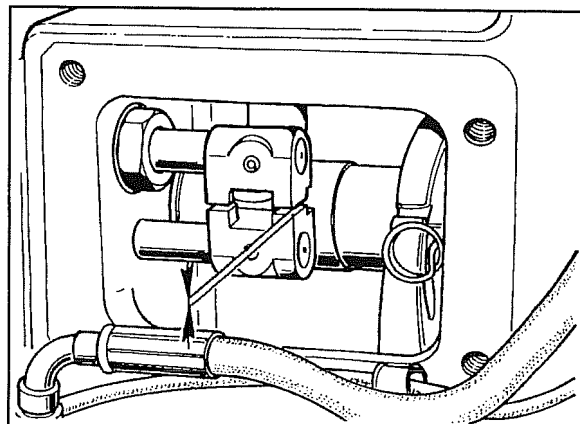


Fig. 6

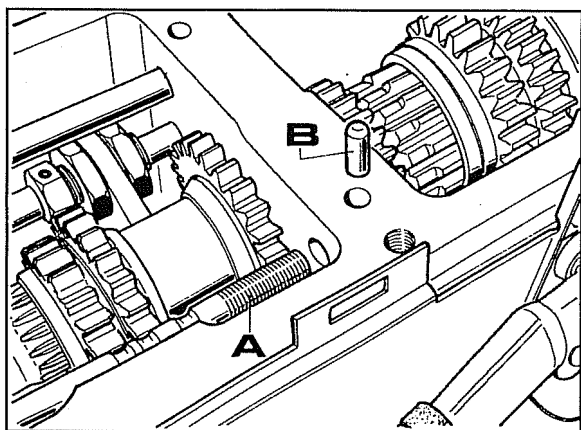


Fig. 7

- 5 Free the gear change rod by slackening off nuts **C** Fig.4. Remove pin **B** to be able to do this and the slip the rod out as shown in Fig. 5.
- 6 Insert the new holding pins **P** (if not present) as shown in Fig. 5.

Points to bear in mind when re-assembling:

- Regulate the forks in their centre position dividing end travel play equally.
- Before tightening them definitively, check sleeve parallelism as shown in Fig. 6.
- When remounting the covers **C** Fig.2, apply silicone to prevent harmful dust and dirt infiltration.

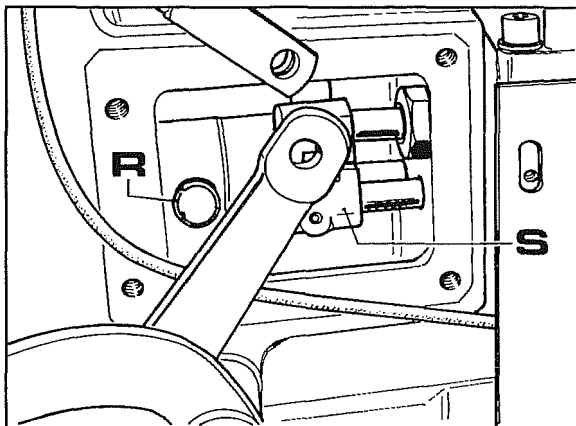


Fig. 8

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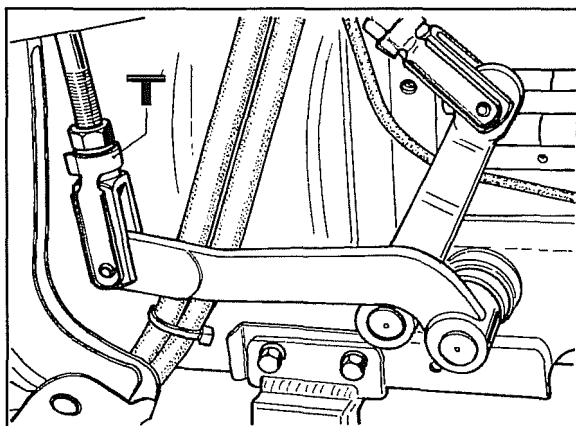


Fig. 9

0053

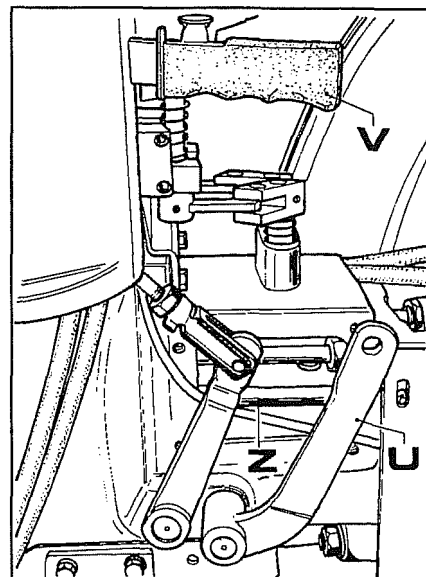


Fig. 10

0054

Work on the medium gear engage mechanism on the creep speed control

First carry out steps 1, 2, 3 and 4 described for the previous job.

- 1 Free the creep gear rod by removing nuts **A** Fig.4 and then slip it out from the back. Remove pin **B** as shown in Fig.7.
- 2 Slip out sleeve **S** and remove thrust bearing spring **R** shown in Fig. 8. Remove the spring from the opposite side.
- 3 Disconnect the clutch pedal with fork **T** Fig.9 and turn it all the back as shown in **U**, Fig.10.
- 4 Engage the PTO clutch by lifting lever **V** Fig.10 as far as it will go.
- 5 Release rod **Z** Fig.10 by removing nuts **L** Fig.13 and then slip it forwards until the balls **C** and spring **D** Fig.11 are released.

At this point, check if the length of spring **D** is around 24 mm. If it is less, this means that the spring has jammed and should be replaced.

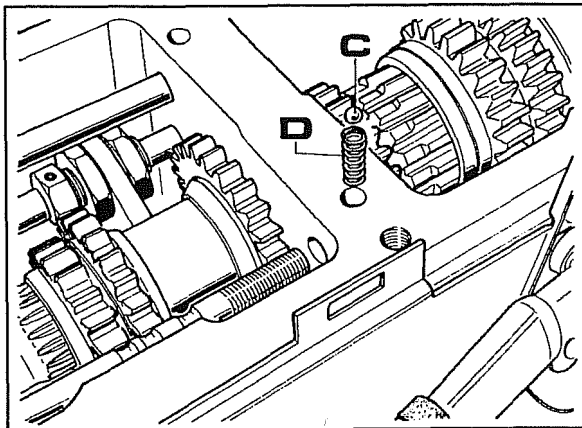


Fig. 11

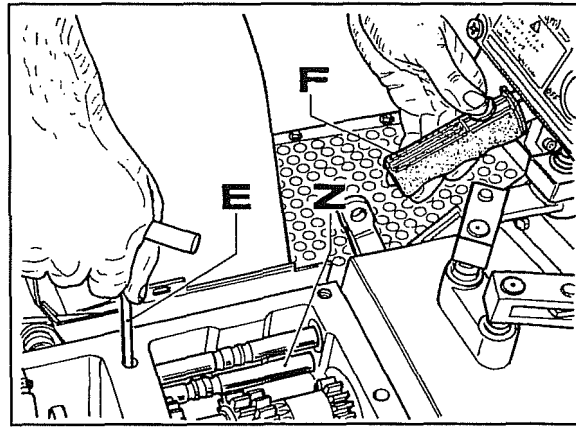


Fig. 12

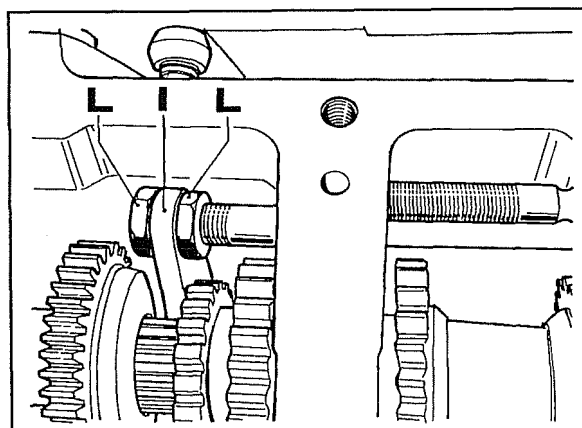


Fig. 13

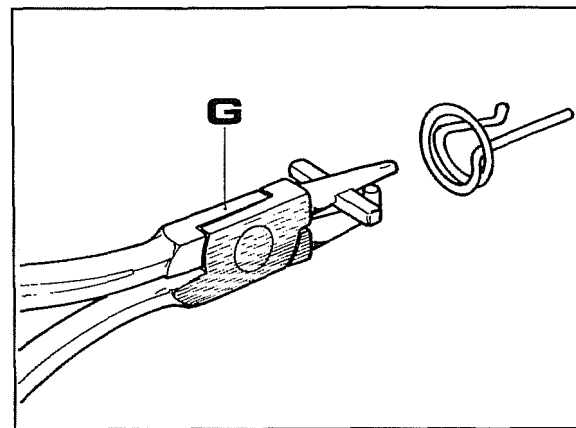


Fig. 14

Points to bear in mind when re-assembling:

- To install spring **D** and ball **C**, pre-load the spring with the special tool (**E** Fig.12) and at the same time release the PTO lever **F** Fig.12 which, thanks to its negative allowance, will shift rod **Z** backwards.
- Reinsert sleeve **S** Fig.8, reinsert fork **I** and regulate it with nuts **L** Fig.13 as described below:
 - To chassis N° B459124, regulate the fork on the medium range with minimum end travel play.
 - From chassis N° B459125, regulate the fork on the medium and fast gear ranges and divide up the end travel play evenly.
- Before tightening home the fork once you have regulated it, check sleeve **S** Fig.8 parallelism in the same way as the sleeves on the other side as illustrated in Fig. 6.
- Use the special tool **G** Fig.14 to facilitate spring **R** Fig.8 insertion.
- Once pin **B** Fig.7 has been inserted, insert and regulate creep gear rod fork as illustrated in the previous procedure.
- When reseating the side covers **C** Fig.2 apply silicone as a gasket to prevent harmful infiltration of dust and dirt.

CONTENTS REAR PTO ASS'L

Job Code	Job description	Page
1055	Overhauling the rear/bottom synchronised PTO.	1
	Overhauling the rear/top independent PTO.	3
006	• Finishing: seat.	3
007	• Finishing: roll-bar, fibreglass body, seat mount, lift wiring and casing.	3
1056	• Overhauling the independent PTO 540/1000 Rpm.	4
002	• Finishing: finishing 001, 003, 008 + separating the tractor and final brake bleeding..	4
1038	• Overhauling the independent PTO 540/2000 Rpm.	4
001	Finishing: finishing 006, + centre guard and front side transmission panels, clutch bell housing side covers.	
003	Finishing: steering wheel, gear and gear range lever, dash and wiring.	
008	Finishing: steering cylinder hydraulic hoses, dual traction shaft guard and dual traction shaft.	

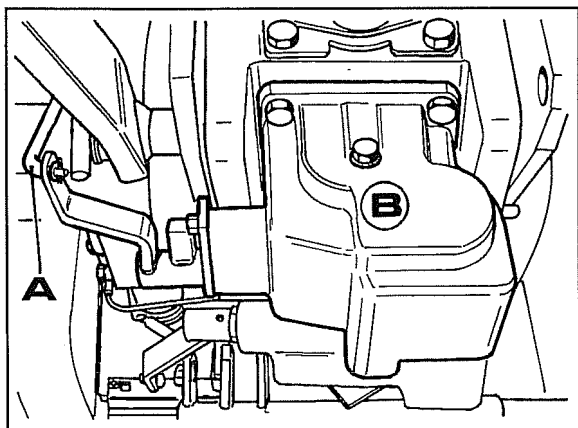


Fig. 1

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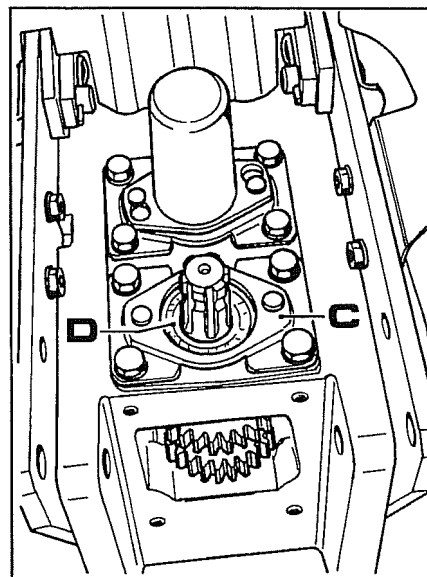


Fig. 2

0168

Overhauling the rear/bottom synchronised PTO.

This job can be done with considerable time saving by working from the bottom casing-i.e., from underneath the tractor. This will eliminate the need to dismantle the rear bodywork, the lift with its hoses and wiring and the top section of the PTO drive line.

The following steps will be required:

1. Prepare the tractor so that you can work underneath it in complete safety.
2. Drain the transmission oil.
3. Disconnect the underbelly PTO **B** Fig. 1 control linkages and then remove the underbelly PTO.

NB - If the underbelly PTO is not installed, remove the cover over the seating where it would normally be installed.

4. Remove cover **C** Fig. 2, then oil seal **D** and the snap ring underneath.

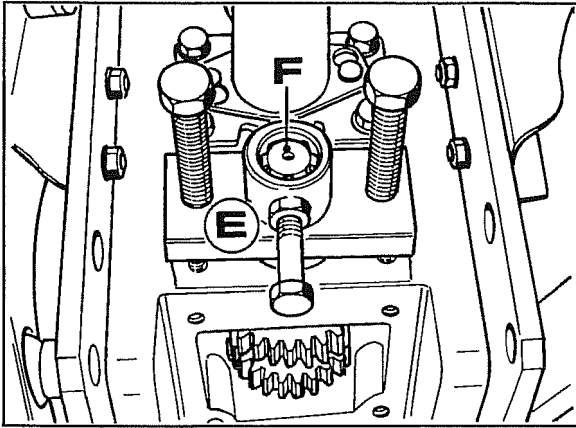


Fig. 3

0169

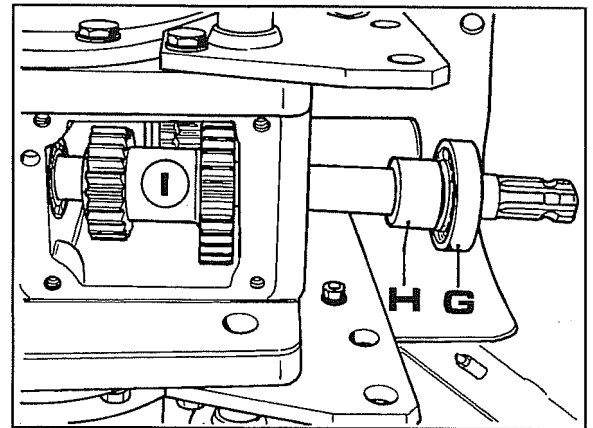


Fig. 4

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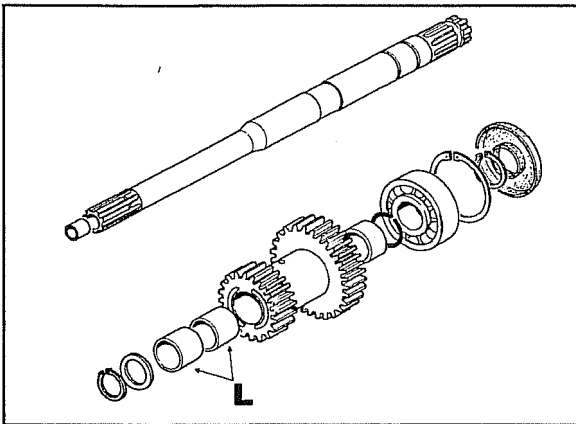


Fig. 5

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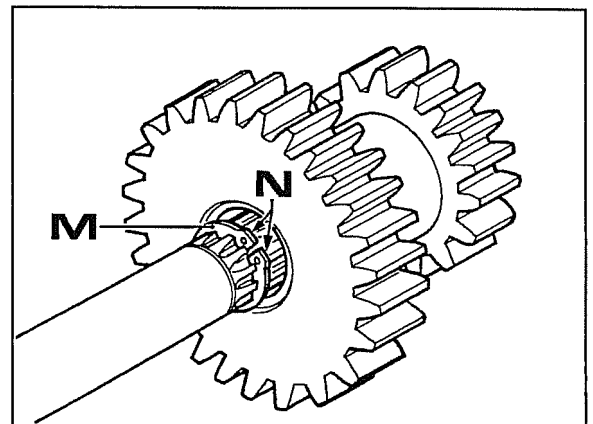


Fig. 6

0172

4. Engage the synchronised PTO with the lever next to the handbrake and, using special tool **E** Fig. 3, extract synchronised PTO shaft **F**.
When the PTO shaft is removed, bearing **G** and washer **H** Fig. 4 will also be removed.
NB - When removing shaft **F** from the casing, support the double gear **I** Fig. 4 to prevent it from falling to the floor.
Fig. 5 highlights all the parts making up the synchronised PTO.
5. Extract and substitute bronze bearings **L** Fig. 5 for the double gear.

Points to be kept in mind when re-assembling the PTO

- Snap ring **M** Fig. 6 will be unavoidably damaged when removing the PTO shaft and should be replaced. Grind off the projections **N** Fig. 6 up to the contact holes. This grinding is necessary so that the shaft can be inserted onto the double gear shaft without damaging the new snap ring and the new bushings.

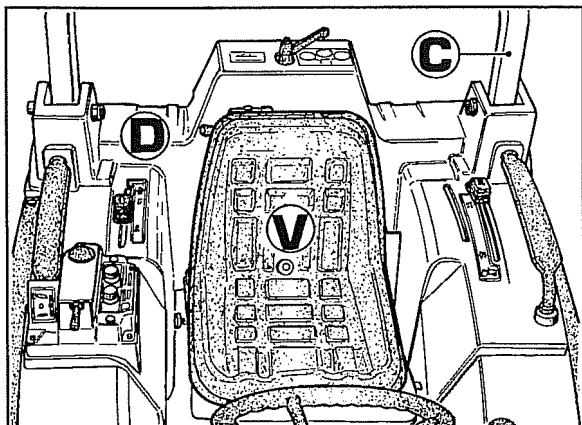


Fig. 7

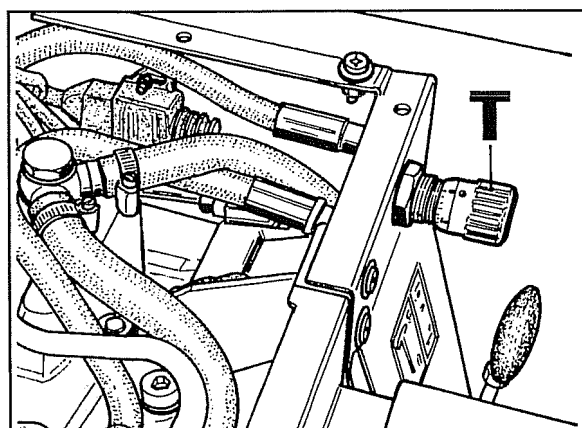


Fig. 9

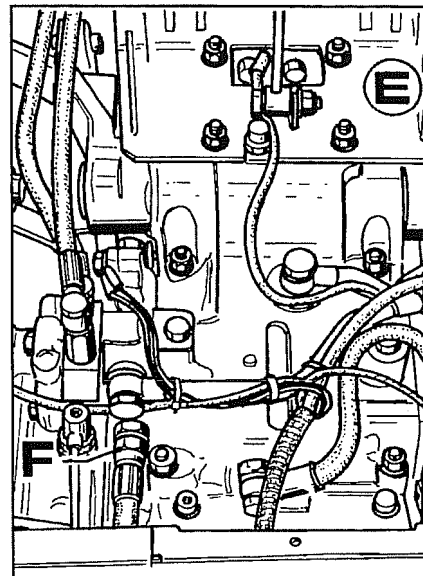


Fig. 8

Overhauling the rear/top independent PTO (540/1000 Rpm or 540/2000 Rpm)

Remove the hydraulic lift casing to be able to work on the independent PTO.

To do this, follow these steps:

1. Move the lift to its fully lowered position.
2. Remove the seat **V** Fig. 7.
3. Remove roll-bar **C** and the fibreglass casing **D** Fig. 7 after removing the various grips, handles and the lift control mounting.
4. Remove the seat mounting **E** Fig. 8, disconnect the wires going to the solenoid, the limit switch and the earth cables.
5. Disconnect the auxiliary spooling valves if installed.
6. Disconnect the hydraulic fluid delivery hose **F** Fig. 8 from the spooling valve mounting and oil delivery valve **T** Fig. 9 to the cylinder.
7. Remove the lift casing.

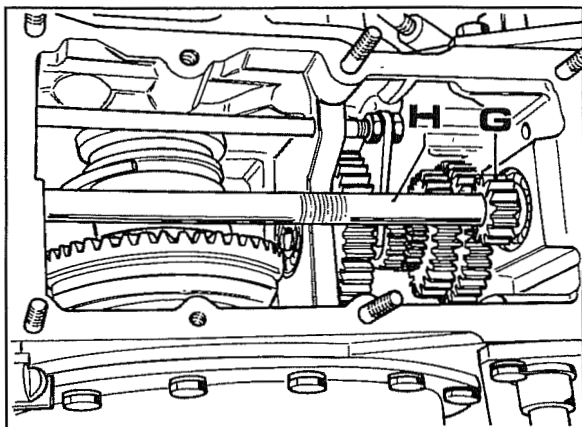


Fig. 10

0175

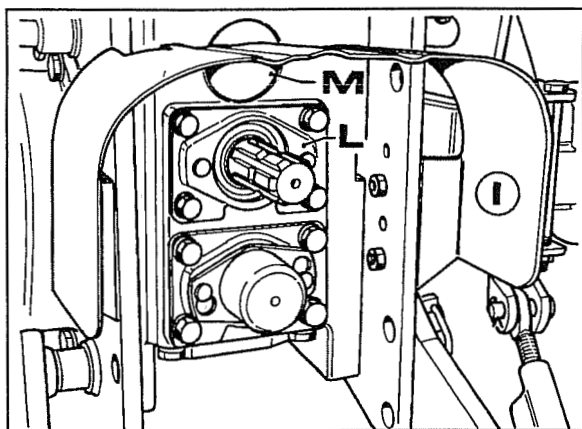


Fig. 11

0176

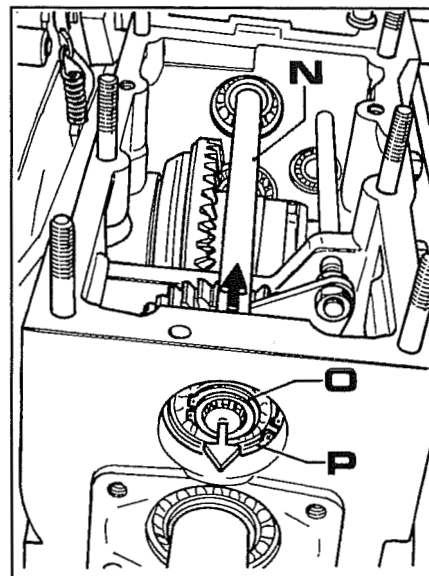


Fig. 12

0177

At this point, before going further, it should be pointed out that if the tractor has a 2000 Rpm PTO, since transmission **G** Fig. 10 has a diameter larger than the rear casing opening, the tractor will have to be separated into two parts in the middle so that shaft **H** can be slipped out from the front.

In this case, the steps required to separate the tractor have been described in the section dealing with "overhauling the dual clutch" and reference should be made to this section.

Follow these steps to work on the independent PTO:

1. Remove the guards **I**, cover **L** and cover **M** in Fig. 11.
2. With a 2000 Rpm PTO, slip shaft **N** Fig. 12 forward in the direction of the black arrow, remove snap ring **O** to remove the gear from the bearing.

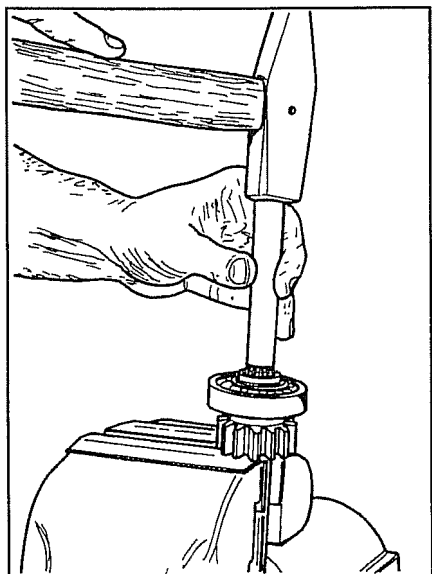


Fig. 13

0178

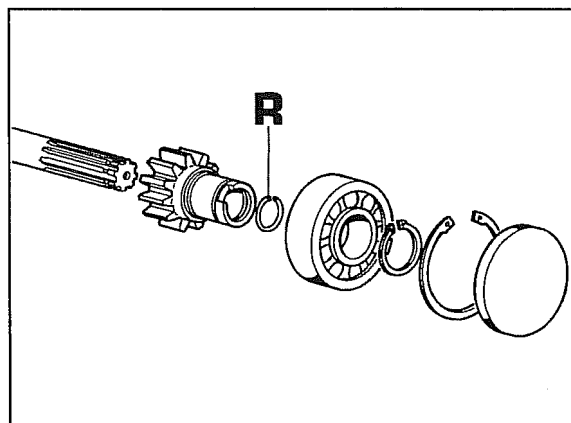


Fig. 14

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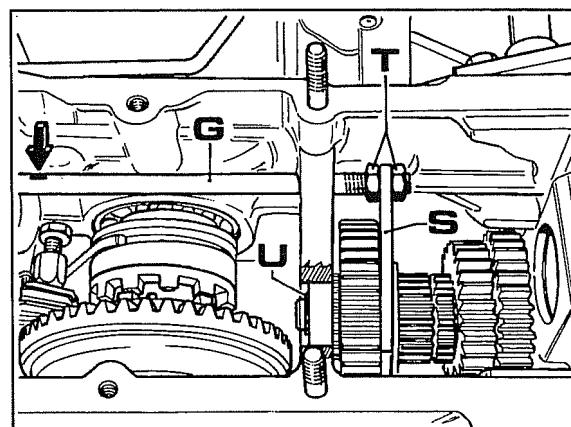


Fig. 15

0180

With a 1000 Rpm PTO remove snap ring **P** Fig. 12.

Check to make sure that the PTO clutch lever is engaged (that is down), so that the corresponding clutch plate is locked in position to prevent it from being dismantled during the next stage.

Remove shaft **N** backwards (following the direction of the white arrow in Fig. 12) complete with bearing and gearwheel. Next separate the shaft from the gearwheel as shown in Fig. 13.

NB - When doing the operation illustrated in Fig. 13, you will see a split ring (**R** Fig. 14) between the shaft and the gearwheel. When the shaft is extracted, this split ring will open in its seating and allow the shaft to be removed.

3. Mark PTO control fork shaft **G** at the point shown by the arrow in Fig. 15. This is necessary to make sure that the shaft can be replaced in its correct rotation position when reassembled.
4. Slacken off PTO select fork **S** Fig. 15 with nuts **T** and then detach it from the rod.
5. Remove bearing retaining snap ring **U** Fig. 15.

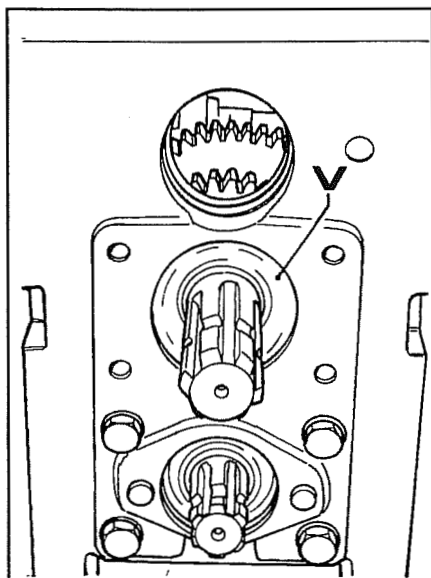


Fig. 16

0181

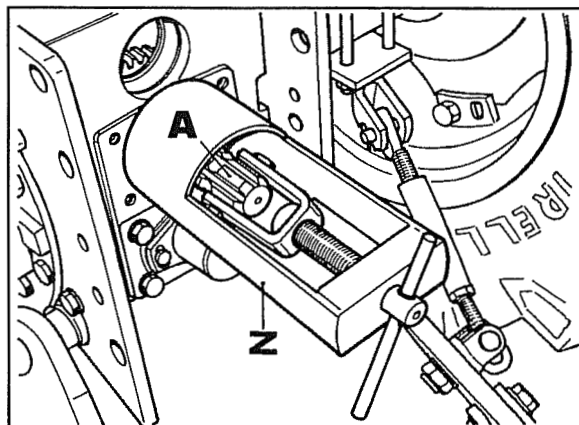


Fig. 17

0182

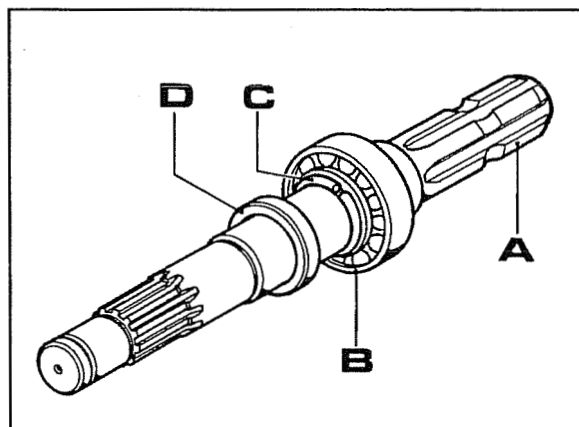


Fig. 18

0183

6. Remove oil seal **V** Fig. 16 and the snap ring below it from the rear of the casing.
7. Use special tool **Z** Fig. 17 to extract the top PTO **A** shaft (Fig. 17 and 18) which comes out complete with bearing **B** clamped to the shaft by the retaining action of split ring **C** Fig. 18. This retaining action is due to the fact that at this stage split ring **C** is covered by washer **D** which prevents it from opening and, hence, the split ring cannot come out of its seating on the shaft.

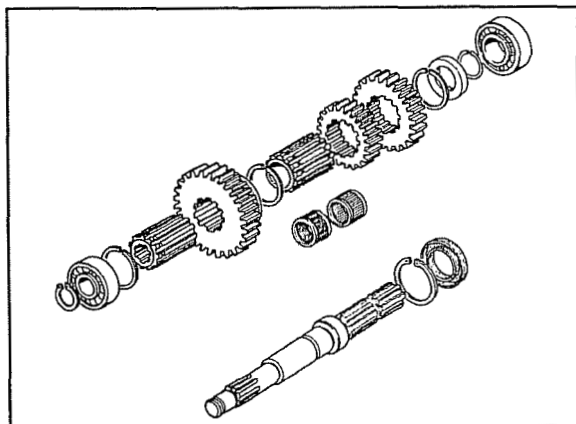


Fig. 19

0184

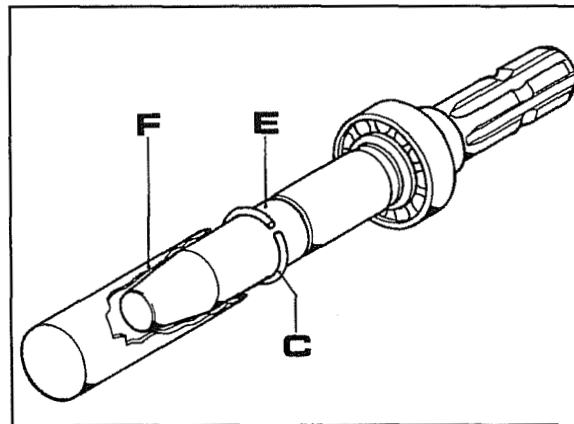


Fig. 20

0185

Fig. 19 illustrates the sequence of components mounted on the independent PTO shaft.

Points to keep in mind when reassembling:

- To reinstall spring ring **C** Fig. 18 and 20, use the special tool with a tapered section **E** Fig. 20 and a cylindrical part **F** needed to push the ring into its seating.
- When fitting fork **S** Fig. 15, don't forget to turn rod **G** so that the mark you made on it (the point indicated by the arrow in Fig. 15) is in the original position. Install the fork and regulate its position so that the play is divided equally between the two speed engagements. Also check to make sure that there is no friction when in neutral. At this point, lock the fork in position with both nuts at the same time so that shaft position with the mark is completely unchanged.

CONTENTS: BRAKE ASS'Y

Job Code	Job description	Page.
1011	Registering and bleeding the brakes.	1
	Leaks in the brake circuit.	3
1012	• Cleaning the by-pass valve, changing the seals, final brake bleeding.	3
003	• Finishing: steering wheel, gear and gear range levers, dash, wiring.	3
1013	• Overhauling a pump including replacement of the seals and final brake bleeding.	3
1014	• Overhauling two pumps including replacement of the seals and final brake bleeding.	3
1015	• Changing one or both pumps and final brake bleeding.	3
004	• Finishing: finishing 001 + rear side panels.	5
1016	• Brake disk pack return control, overhauling the brake piston and cylinder including changing the seals. Final brake regulation and bleeding.	5
1017	• Brake disk pack return control, overhauling the brake piston and cylinder including changing the seals. Final brake regulation and bleeding.	5
1018	• Brake disk pack control and cylinder return control, seat grinding (with kit supplied by Goldoni) fitting new cylinder. Final brake regulation and bleeding.	7
	Overhauling brake disk packs	10
005	• Finishing: finishing 004 + demounting wheels and draining transmission and differential oil.	10
1019	• Overhauling the two brake disk packs, final brake regulation and bleeding.	10
001	Finishing: finishing 006 + centre guard and front side transmission panels and clutch bell housing side covers.	
006	Finishing: seat.	

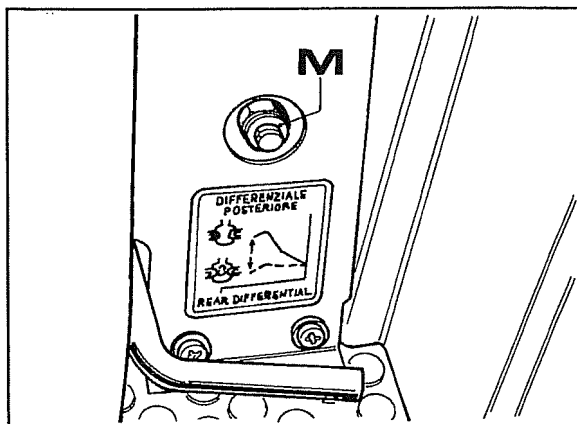


Fig. 1

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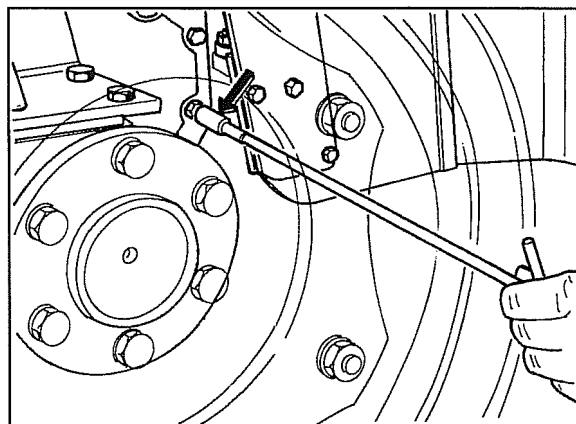


Fig. 2

0060

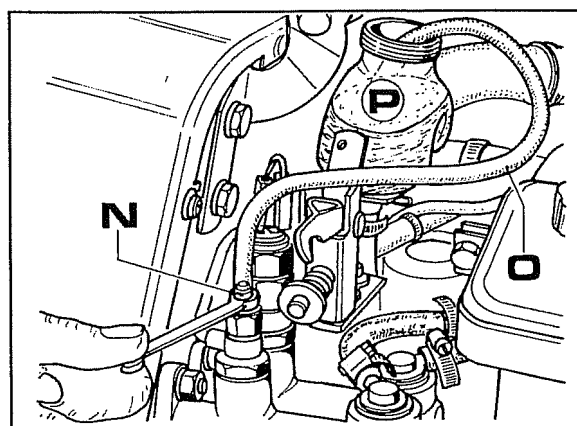


Fig. 3

0061

Regulating and bleeding the brakes

Before dealing with work on braking circuit components, it is good standard operating practice to regulate and bleed the brakes so that you know if they are working correctly or whether there are problems with the brake circuit.

Follow the procedure described below to do this:

- 1 Jack up the rear wheels and screw in the brake adjusting nut **M** Fig.1 until the corresponding wheel locks. Then slacken off the nut a half turn and check if the wheel turns freely. Repeat this procedure on the other wheel.
- 2 To bleed the air from the brake circuit, slacken off the bleed screw on the wheel hub as shown in Fig.2. Allow the brake fluid to drain out until no air bubbles come out, Tighten the screw back. Repeat this procedure on the other wheel. Check to make sure there is enough brake fluid in the reservoir and top up as needed using the same type of brake fluid.
3. To bleed the pumps, insert a transparent tube (**O** Fig.3). between the reservoir **P** Fig.3 and the bleed screw **N**. Slacken off the bleed screw, press the brake pedal (paired) repeatedly until you do not see any air bubbles in the transparent tube. Tighten back the bleed screw.

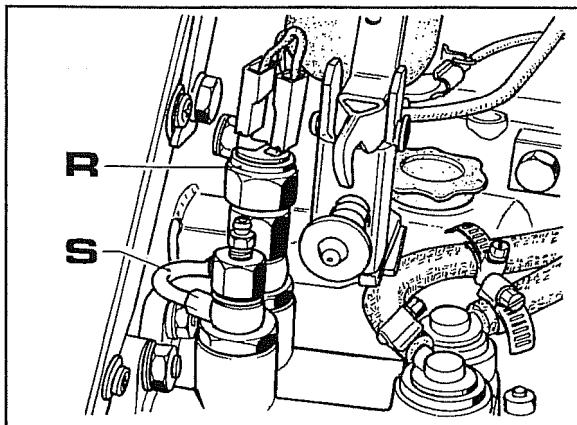


Fig. 4

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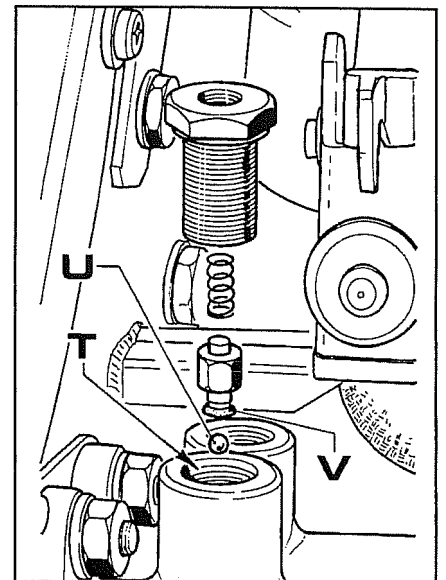


Fig. 5

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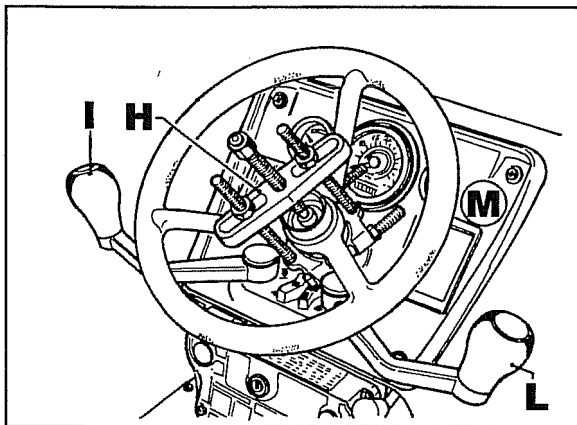


Fig. 6

0149_1

Test braking performance when driving the tractor. If it is not good, a number of causes could be involved:

- a. If pedal resistance is low and the brakes tend to go all the way down, this means that there are leaks in the brake circuit and these, in turn, can be outside or within the circuit itself.
- b. If brake pedal resistance is good, this means that the brake disk pack is worn and the sintered linings will have to be replaced.

Leaks in the brake circuit

Internal leaks:

If the leaks are not visible, this means that they are internal but without showing a drop in brake fluid reservoir level. The cause is likely to be in the brake pumps and, more precisely, in the by-pass valve or brake fluid suction line closing valve. A leak in the by-pass valve is highlighted when you test the brake pedals one at a time and find that one of the two does not offer resistance.

Fix this problems as follows:

- 1 Remove the brake light bulb **R** and the by-pass valve tube **S** (Fig.4).
- 2 Fig.5 shows the parts of one of the two valves. Check if there is dirt between seating **T**, ball **U** and seal ring **V**. Check if seal ring **V** is intact and, if necessary, change it.
NB - Do not clean the parts with petrol or other solvents. Instead use a jet of compressed air and lubricate with the same kind of brake fluid used in the brake circuit.
- 3 Replace the valves, bleed the circuit (refer to instructions on this operations) and test braking performance again.
- 4 A leak in the suction line shut off valve can be noted when you use the paired brake pedals and they offer no resistance. Follow these steps to fix the brakes:
 - a. Remove the brake light bulb **R**, the by-pass valve tube **S** (Fig.4) and then disconnect the delivery and suction lines.
 - b. Use an extractor (**H**) as shown in Fig. 6 to remove the steering wheel.
 - c. Remove the gear range **I** and gear change **L** levers and remove dashboard **M** (Fig.6).

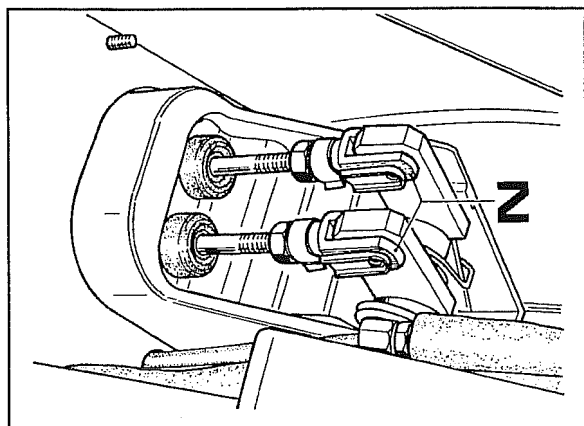


Fig. 7

0065

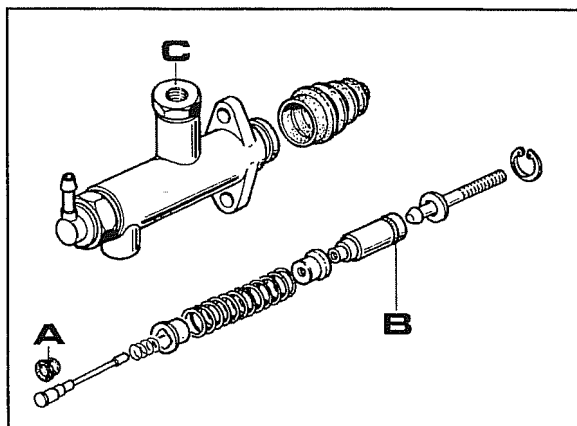


Fig. 8

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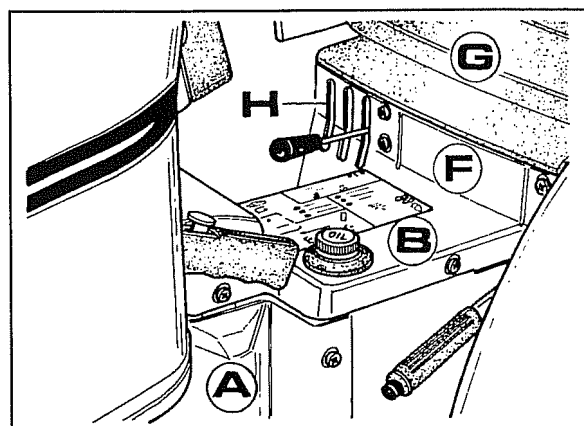


Fig. 9

0046

- d. Disconnect pump push rods from the linkages with forks **Z** Fig.7 and, from the opposite side, remove the screws fixing the pumps to the frame.
- e. Fig.8 shows the parts forming one of the two pumps. Check that there are no foreign bodies and check to make sure seal ring **A** is intact since these are causes of leaks within the circuit.
- f. If substitutions have to be made, it is always best to change all the seal rings comprising parts **V** Fig.5 and **A-B** Fig.8.

NB - Refer to the previous job for instructions on cleaning the pump.

Points to keep in mind when reassembling

- Pump by-pass valve should be installed last to prevent the ball from falling inside the pump casing.
- Connect pump push rods to their linkages with forks **Z** Fig.7. Adjust them so that that push rods do not apply any pressure to the linkages.
- When everything has been reassembled, bleed the brakes (refer to the send detailing this operation) and test the brakes.

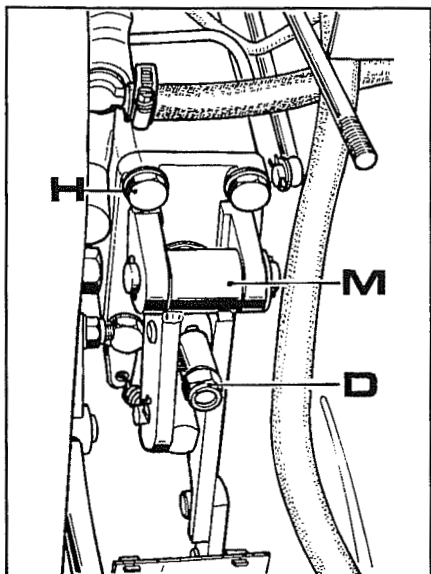


Fig. 10

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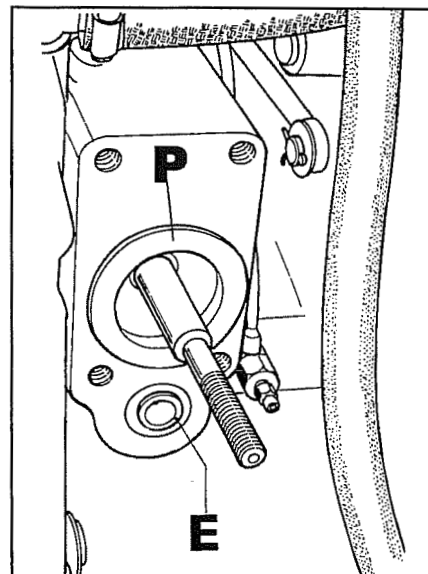


Fig. 11

0068

External leaks:

If you note leaks visible from the outside, these will often be caused by the brake pumps or the brake disk pack control pistons.

In both these cases, you will also note a drop in the brake fluid level in the reservoir.

Follow these steps if the tractor has a single pump:

- 1 Remove the pump following steps a, b, c, and d as described in the previous procedure.
- 2 Dismantle the pump as shown in Fig.8.

Check if there are foreign bodies and check if seal ring **B** is intact since defects such as these will cause an external leak. Refer to the instructions for the previous procedures.

When reassembling the pump, keep in mind the same pointers detailed for the previous procedure.

If the problem is with the brake disk pack control piston, follow these steps:

- 1 Remove seat **G**, the centre guard **B** and the side panels **A-H** as shown in Fig.9.
- 2 Remove nut **D** Fig.10, and then remove return **M** by slackening off screws **H**.
- 3 Remove piston **E** Fig.11 and the spring inside it **F** (Fig.12).

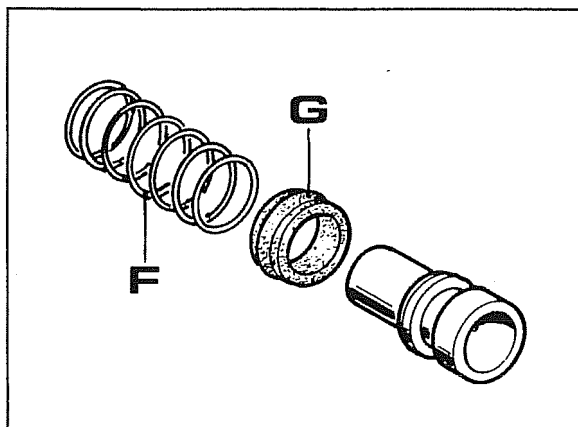


Fig. 12

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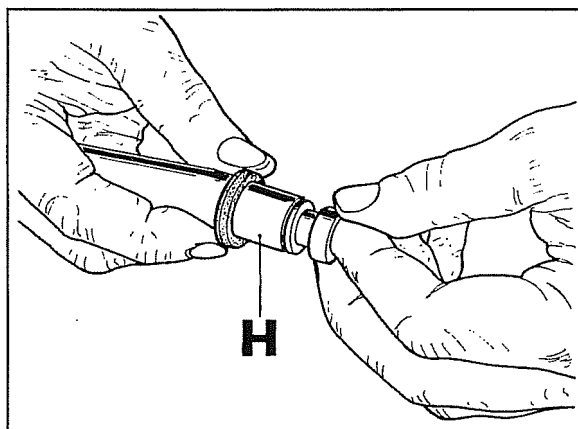


Fig. 13

0070

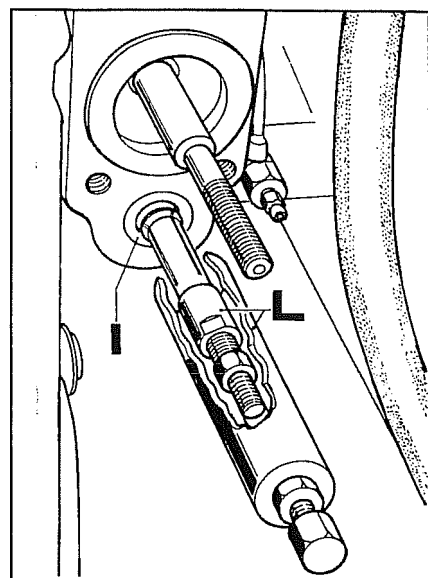


Fig. 14

0071

- 4 Check if seal ring **G** Fig.12 is intact and, if necessary change it using the special tool **H** Fig.13.
- 5 Check the inside surface of cylinder **I** Fig.14. If it is rough, change it using the requisite extractor **L** Fig.14. In this case, also change the seal ring **U** Fig.15.

NB -Do not clean the parts with petrol or other solvents. Instead, use a jet of compressed air and lubricate with the same brake fluid used in the circuit. When the reassembly is complete, bleed the circuit (refer to the description of this procedure) and test the brakes.

With tractors with a chassis number lower than B467494, the piston **E** Fig.11 slides in a cylinder whose outside diameter is less (**N** Fig.15) or in a seating machined on the hub.

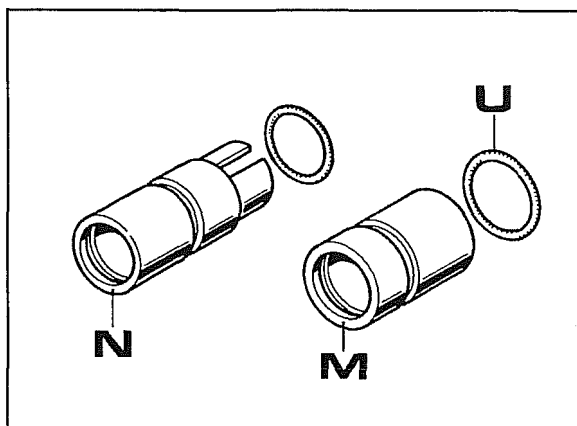


Fig. 15

0072

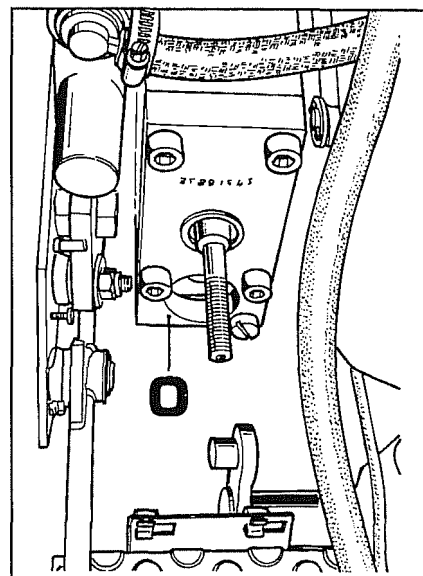


Fig. 16

0073

In both cases, if there leaks in the brake circuit and the cause is not bad seal performance, you will have to modify the hole on the hub so that you can fit a different cylinder **M** Fig.15 using a kit prepared expressly for this purpose by GOLDONI for its Technical Assistance Centres. Follow these steps:

- a. When you reach the dismantling stage as shown in Fig. 11, free the hole on the hub by removing piston **E** and, possibly also cylinder **N** Fig.15.
- b. Fit plate **O** Fig.16 but do not fix it.

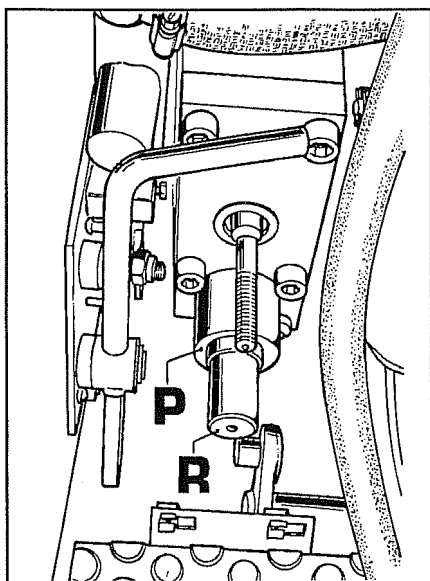


Fig. 17

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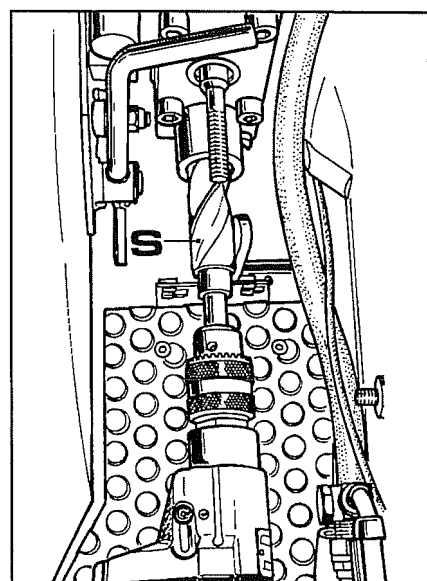


Fig. 18

0075

c. Fix bushing **P** with inside diameter 29 mm to the plate and then insert the centring punch **R** (Fig.17).

d. Fix the plate and remove the centring punch and bushing.

At this point, if the seating for the piston has been machined directly on the hub, you will have to make a new seating in 4 stages:

- 1 Attach the 25 mm inside diameter bushing to the bracket and then make the first hole using the requisite bit (**S** Fig.18) with the drill at slow speed.
- 2 Attach the 28.5 mm inside diameter bushing to the bracket and then make the first hole using the requisite bit (**S** Fig.18) with the drill at slow speed.

NB -The depth of these two holes should be 2 mm more than cylinder length so that, at the next step, you ream out the hole for the length of the cylinder.

Naturally, these operations will be done on both hubs.

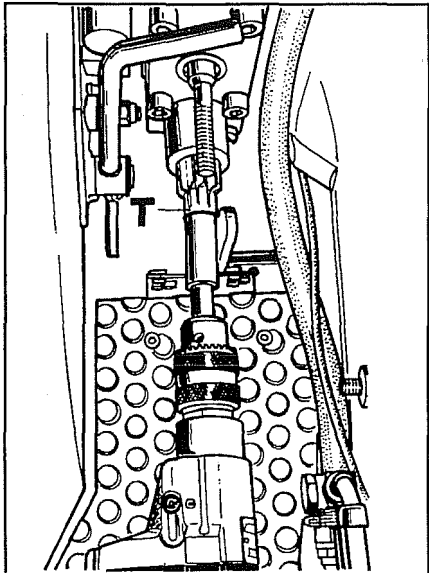


Fig. 19

0076

- 3 Attach the 29 mm inside diameter bushing to the bracket and then finish the seating with the reamer **T** Fig.19, with the drill at its slow speed and the variable speed motor at low Rpm. If, on the other hand, the cylinder seating **N** Fig.15, is on the hub, make the new seating starting from the 2nd and 3rd stage.

Important: It is essential to lubricate the bits during drilling and reaming with lubricants formulated specifically for this purpose.

- 4 Remove plate **O** Fig.16 from the hub and bevel the holes slightly using a countersinking bit to prevent damage to the seal ring **U** Fig. 15 when the cylinder **M** Fig.15 is fitted.

Refer to the notes for the previous procedure when reassembling.

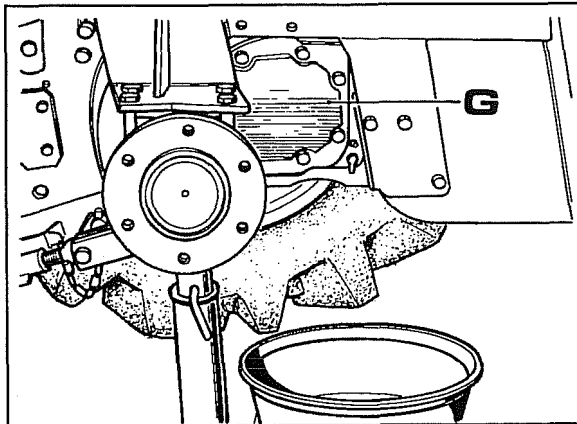


Fig. 20

0077

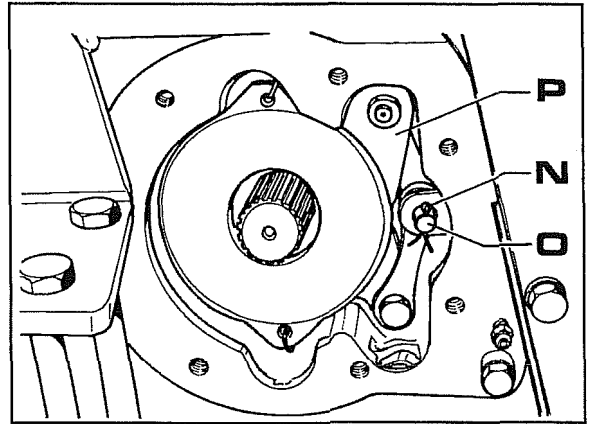


Fig. 21

0078

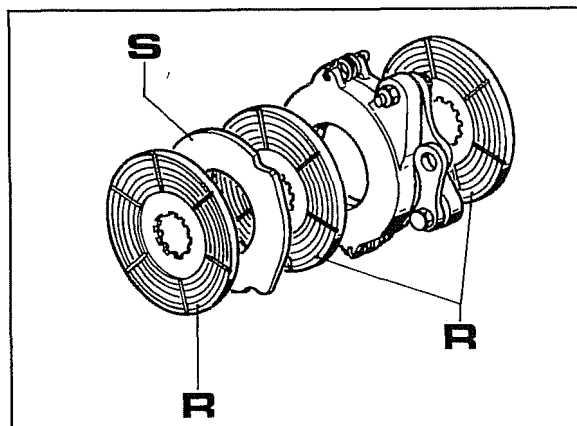


Fig. 22

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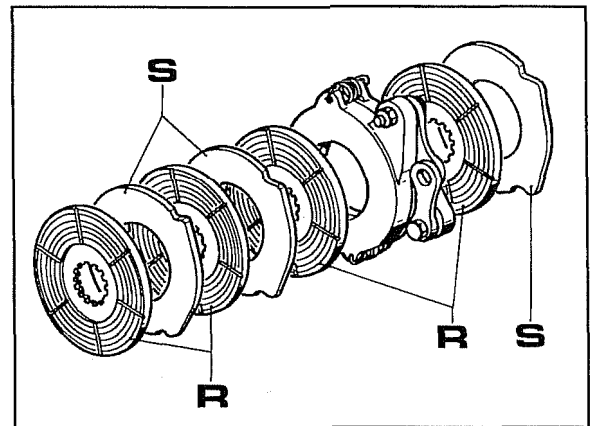


Fig. 23

0080

Overhauling the brake disk pack

For a complete overhaul, the operations described below should be done on both brake disk packs.:

Do steps 1 and 2 for repairing a leak in the brake disk pack control cylinder.

- 1 Jack up the tractor, remove the wheel and drain the oil from the transmission. Remove cover **G** Fig.20.
- 2 Remove the disk pack up to the expansion plate as illustrated in Fig.21.
- 3 Disconnect pivot **O** Fig.21 removing cotter **N**, extract expansion flange **P** and then the disk(s) behind the flange.

If pivot **O** Fig. 21 is turned with the cotter turned towards the inside, it will be easier to dismantle the disk pack if you first remove the housing **P** Fig. 11 and the O-ring under it.

- Fig.22 illustrates a brake disk pack ass'y installed on tractors with chassis number up to C467493.
- Fig.23 illustrates a brake disk pack ass'y installed on tractors with chassis number from C467494 onwards.
- Change the sintered disks **R** and check the condition of the steel disks **S**.

Points to bear in mind when reassembling:

- Install the brake disk pack and fill the transmission with oil. Check to make sure the oil is the correct type so as not to negatively affect braking performance.
- When reinstalling housing **O** and its O-ring as mentioned in point 3 above, check that they are intact and undamaged. Change them as needed.
- Adjust the brakes as described in the section on "Adjusting and bleeding brakes".

Important - Before testing braking performance, drive the tractor around so that the sintered disks are completely immersed in the oil as they turn.

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Job Code	Job Description	Page
1021	Checking and cleaning the prioritising valve.	2
	No power supply to the Raise/Lower solenoid ass'y; checking coil resistance; check power supply to hydraulic lift limit switch.	3
006	• Finishing: seat.	3
1022	• Check raise control solenoid from tractor chassis N° B455170.	3
1023	• Check and change as necessary limit switch from tractor chassis N° B455170.	4
1024	• Check and change as necessary raise/lower switch, relay, diode and safety switch.	4
1025	• Check lower control solenoid.	5
1026	• Check solenoid coil resistance from tractor chassis N° B455170.	6
1035	• Check raise control solenoid to tractor chassis N° B455169.	7
1037	• Check and changes as necessary the limit switch to tractor chassis N° B455169.	7
1039	• Check solenoid coil resistors to tractor chassis N° B455169.	8
	Solenoid mechanical problems.	9
006	• Finishing: seat.	9
1027	• Clean and check raise control solenoid from tractor chassis N° B455170.	9
1028	• Clean and check lower control solenoid.	11
1040	• Clean and check raise control solenoid to tractor chassis N° B455169.	12
	Checking and adjusting oil pressure in the hydraulic circuit.	13
006	• Finishing: seat.	13
1029	• Checking hydraulic circuit pressure.	13
1030	• Regulating hydraulic circuit pressure.	14
	Spontaneous lift raising due to oil delivery up to tractor chassis N° B449208.	15
006	• Finishing: seat.	15
1031	• Fitting the drilled screw with grubscrew.	15
	Overhauling the lift cylinder due to leaks in the hydraulic circuit.	16
006	• Finishing: seat.	16
1028	• Cleaning and checking lower control solenoid.	16
1032	• Changing seal rings in delivery hose fittings.	16
007	• Finishing: roll-bar, fibreglass casing, seat mounting, lift wiring and casing.	17
1033	• Overhauling the lift cylinder.	18
1034	• Changing the bushings on the lift casing.	18
	Installing a lift lower regulating valve on tractors to chassis N° B455169.	19
006	• Finishing: seat.	19
1036	• Installing a lift lower regulating valve.	19

Job code	Job Description	Page
	Installing a limit switch on the hydraulic lift up to tractor chassis N° B455169.	20
1041	• With Raise/Lower lift.	20
1042	• With controlled draught and position lift.	21
	Check and/or replace central unit, rheostats and sensors with controlled draught and position lift fro tractor chassis N° C467700.	23
1043	• Check performance and/or replace rheostats from tractor chassis N° C467700.	25
1044	• Check performance and/or replace central unit and sensors from tractor chassis N° C467700.	26
	Check and/or replace central unit rheostats and sensors with controlled draught and position lift from tractor chassis N° C467699.	28
006	• Finishing: seat.	30
1045	• Check performance and/or replace and sensors from tractor chassis N° C467699.	30
1046	• Check rheostat/central unit performance to tractor chassis N° C467699.	30
1047	• Change central unit to tractor chassis N° C467699.	30
1048	Regulate sensors with controlled draught and position lift from tractor chassis N° C467700.	31
	Regulate sensors with controlled draught and position lift from tractor chassis N° C467699.	33
006	• Finishing: seat.	33
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	Check and clean power steering pressure relief valve.	35
1021	• Check and clean prioritising valve.	35
003	• Finishing: steering wheel, gear change and gear range lever, dashboard and wiring.	35
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	Overhaul power steering due to problems with oil leaks.	36
003	• Finishing: steering wheel, gear change and gear range lever, dashboard and wiring..	36
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	Overhauling steering cylinder due to problems with oil leaks.	39
1052	• Check cylinder, change seal rings between piston and cylinder without dismantling the axle.	40
008	• Finishing: cylinder command hydraulic hoses, steering, dual traction shaft and guard.	42
1053	• Dismantling the axle.	42
1054	• Check and replace seals between cylinder and differential casing and/or change the cylinder.	43

Before attempting to find the cause of the problem, always check the type and level of the hydraulic fluid and check if the filter is clean.

At this point, problems can be caused by a variety of electric or hydraulic factors.

The chart below sets out to help you define the cause of the various problems that can occur:

Hydraulic components that can cause problems to the hydraulic lift or the power steering system:

PRIORITISING VALVE
- Seal problems
Dirt causing clogging

HYDRAULIC PUMP
- Seal problems
(often due to wear)

Hydraulic components that can cause problems with the power steering:

POWER STEERING RELIEF VALVE
- Seal problems
- Dirt causing clogging

STEERING CYLINDER
- Internal oil leaks

Hydraulic or electric components that can cause problems with the lift:

CONTROL SOLENOID ASS'Y
RAISE/LOWER AND LIMIT SWITCH

- Electric problems
- Coil resistor problems
- Dirt causing mechanical malfunction

CENTRAL UNIT AND SENSORS (FOR
TRACTORS WITH CONTROLLED
DRAUGHT AND POSITION)
- Electric problems
- Incorrect regulation

LIFT CYLINDER
- Internal oil leaks

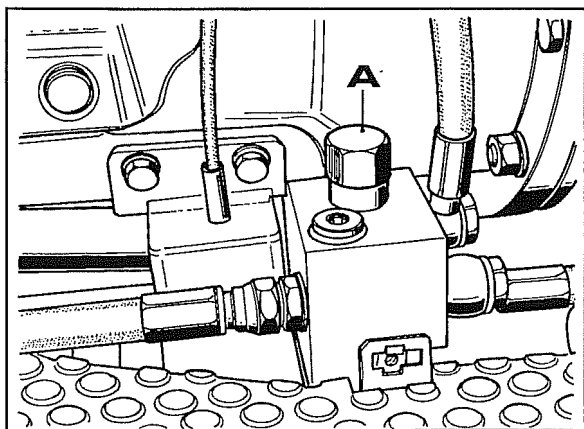


Fig. 1

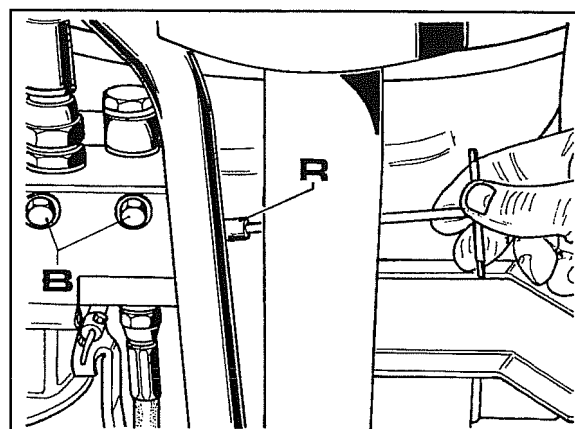


Fig. 2

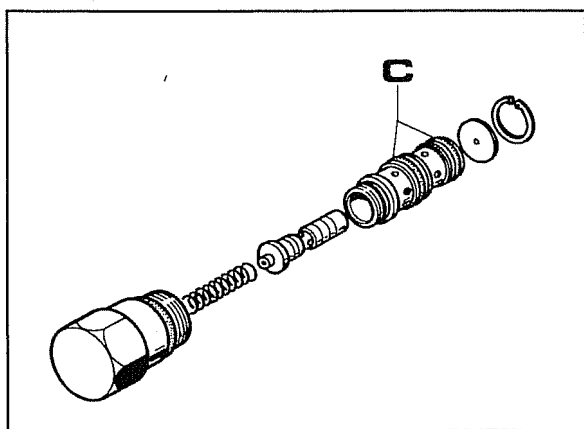


Fig. 3

Checking and cleaning the prioritising valve

Whenever the steering wheel is hard to turn or the lift does not raise, the first step is to check the functional performance of the prioritising valve.

Follow these steps to do this:

1. Remove the centre tunnel cover and the side panel on the brake pedal side to access the prioritising valve **A** Fig.1.
2. To remove this valve, remove the two screws **B** fixing the valve ass'y located under the ass'y, see Fig.2.
3. Dismantle the valve which will appear as illustrated in Fig.3.
4. Check the condition of the two seal rings **C** Fig.3 and change them if necessary. Wash all the parts and dry them with an air jet to eliminate every trace of dirt.
5. Reassemble the valve lubricating the parts with the type of oil used in the circuit.

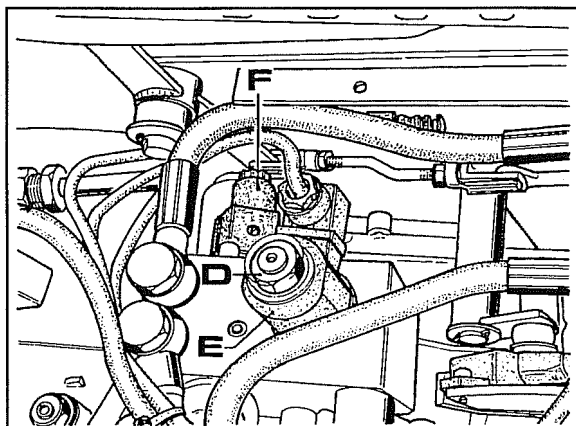


Fig. 4

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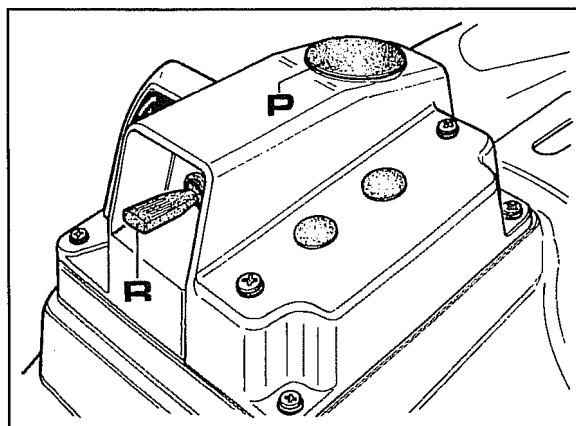


Fig. 6

0092

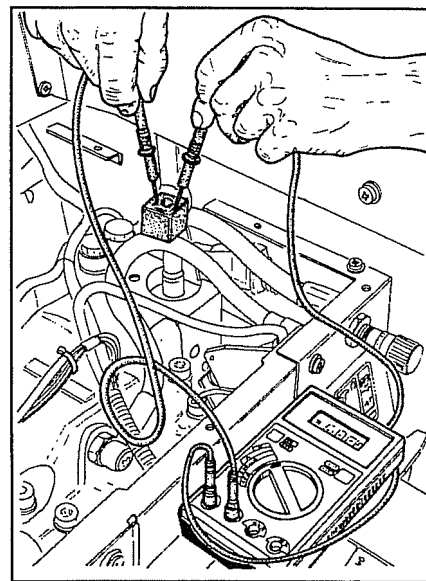


Fig. 5

0091

No power supply to the lift up/down control solenoid; check coil resistors and check the lift limit switch

Before checking the electric system, check the fuse in the fuse box for the corresponding circuit. If the fuses are OK, remove the seat and follow these steps:

Checking raise control solenoid from tractor chassis N° B455170:

1. After removing the seat, take off the solenoid cover, remove nut **D** Fig.4, and remove coil **E** from the solenoid.
2. To check if there is power supply, test the voltage on the wiring plug to the solenoid (Fig.5). Don't forget that before doing this, the lift must be lowered all the way, turn the ignition key on, press the safety button **P** Fig.6 and lift up hydraulic lift control lever **R** Fig.6.
If the tester shows no power, check the functional performance of the lift limit switch.

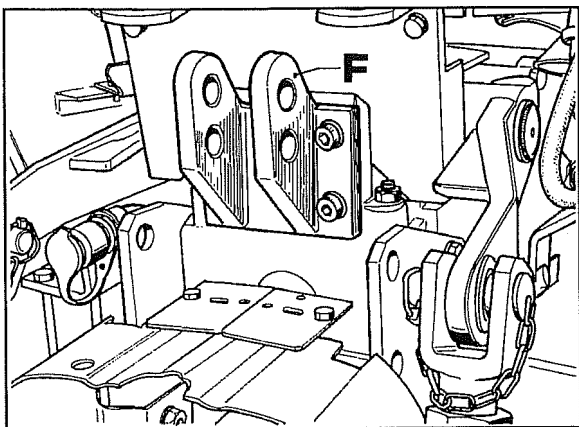


Fig. 7

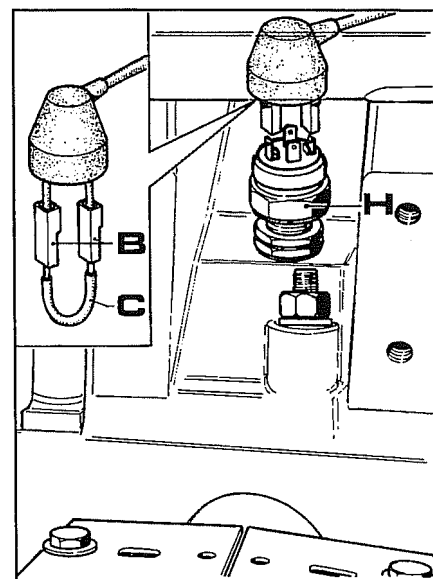


Fig. 8

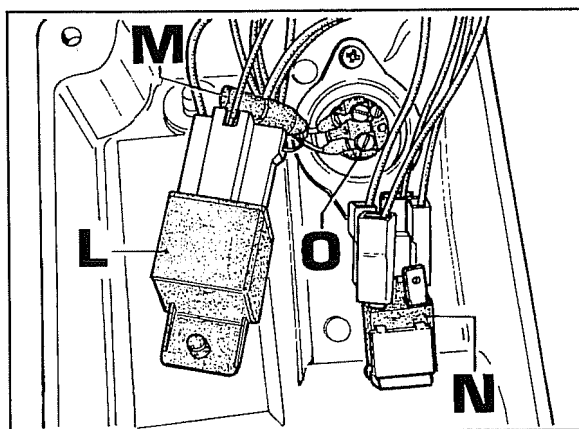


Fig. 9

- 3 To access this limit switch, remove the 3-point hitch **F** Fig.7.
4. Disconnect wires **B** Fig.8 from switch **H** and then connect them with a jumper (**C** Fig.8). This way, if the power supply reaches the solenoid, it means that the limit switch must be changed.
To do this follow these steps:
 - a. Manually raise the lift arms as high as they will go.
 - b. Screw in the new switch until it is against the inside link rod. Unscrew it a half turn so that the link rod does not damage it as it moves (for example, if the implement trailed bounces heavily). Clamp the switch in this position making sure it does not move during fixing.
 - c. Check its precise position as follows:
 - Re-establish the connection making sure the wires are connected to the connectors joined together by the plastic tangs.
 - Switch the tractor on
 - Raise the lift all the way up
 - Check manually to see if the lift arms have an extra 5-10 mm of travel.
5. If no voltage is measured at the jumper described previously, use the tester to check the functional performance of the raise/lower switch **N**, relay **L**, diode **M** and safety switch **O** shown in Fig.9, under the right mudguard mounting on the platform.

Checking the lower control solenoid

To test voltage at the wiring plug to solenoid **F** Fig.4, just disconnect the wire from the solenoid. Don't forget to prepare the tractor first by moving lift control lever **R** Fig.6 down and then press the safety button **P** Fig.6.

If there is no voltage detected, check the components as described in point 5 above.

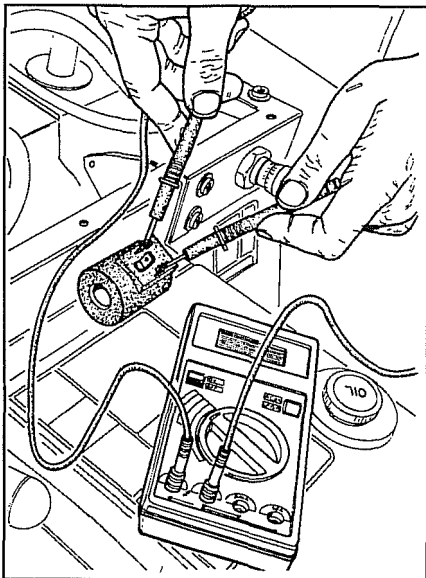


Fig. 10

0096

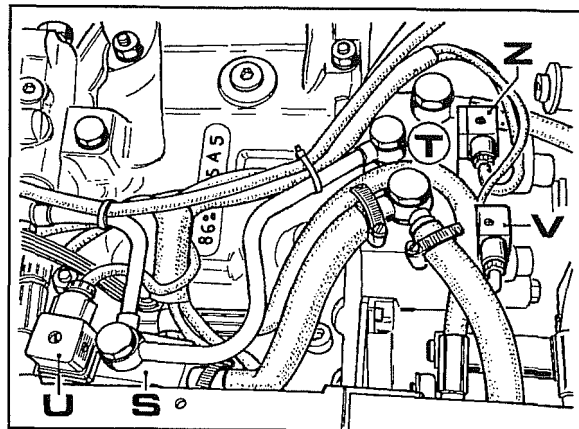


Fig. 11

0097

Checking solenoid coil resistance from tractor chassis N° B455170:

If the tester shows that there is power to the solenoid, use the tester to check the resistance of the corresponding coils as illustrated in Fig. 10.

The resistance found should be around 5.7 ohm for both solenoids.

If the reading is around zero, this means there is a short-circuit.

If the circuit is broken, there will be not reading at all.

In both these situations, replace the coil.

To tractor chassis N° B455169:

Once the seat has been removed you can check to make sure that the two solenoids are as illustrated in Fig. 11: solenoid assembly **S** with just one solenoid **U** on the delivery hose that controls lift raise and another assembly **T** with two solenoids where **V** controls lift raise and **Z** that controls lift lowering.

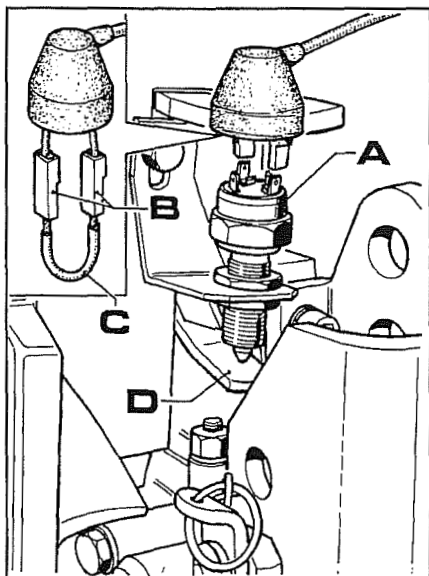


Fig. 12

0098

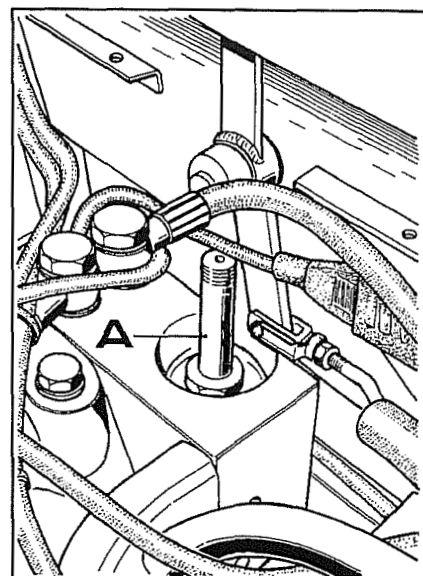


Fig. 13

0099

Check lift raise control solenoid to tractor chassis N° B455169:

1. Test for voltage on these two solenoids following the same procedure (point 2) as the previous operation.

If the outcome is not positive, check the functional performance of limit switch **A**. Fig.12.

2. Disconnect wires **B** Fig.12 from the switch and connect the wires together with a jumper (**C** Fig.12).

If voltage reaches the solenoids, this means that the limit switch is faulty and must be replaced as follows:

- a. Manually raise the lift arms as high as possible.
- b. Bring the tip of the new limit switch in contact with lever **D** Fig.12 and fix the switch in this position.
- c. Check its exact position. To do this:
 - Re-establish the connection making sure the wires are connected to the connectors joined together by the plastic tangs.
 - Switch the tractor on
 - Raise the lift all the way up
 - Check manually to see if the lift arms have an extra 5-10 mm of travel.

3. If there is no voltage at the jumper described above, refer to point 5 of the previous procedure.

Checking the lower control solenoid.

Test the voltage on solenoid **Z** Fig.11 following the procedure detailed above for the previous lower control solenoid.

Checking solenoid coil resistance to tractor chassis N° B455169:

This procedure is similar to the previous one but in this case the resistance is 5.7 ohm for the lower control solenoid coil and 8.2 ohm for the raise control coil.

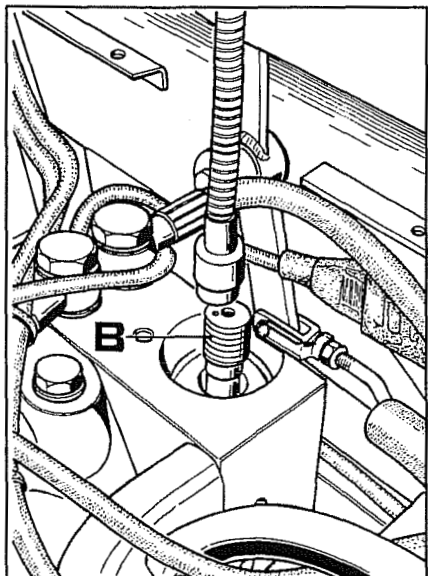


Fig. 14

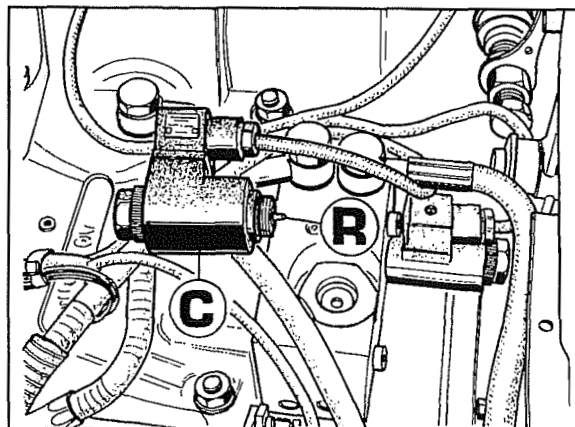


Fig. 15

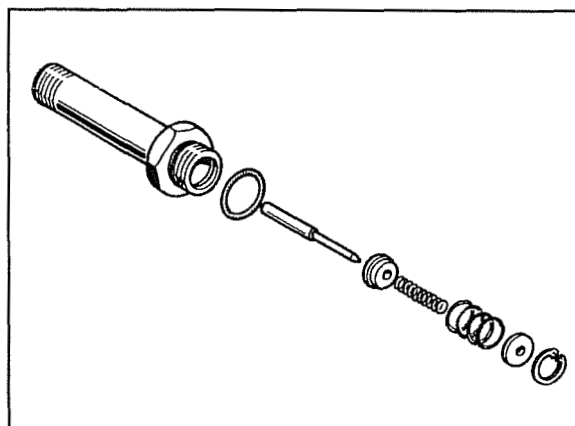


Fig. 16

Solenoid mechanical malfunctions

In addition to electric problems and coil functional performance problems, solenoids can have mechanical problems such as clogging or blockages caused mainly by dirt in the hydraulic circuit. To access the solenoids, follow the steps described previously for the other service jobs. To access the solenoid mechanical parts, follow these steps:

Cleaning and function performance checking on raise control solenoid from tractor chassis N° B455170:

1. Remove the cover, unscrew nut **D** Fig.4 and remove coil **E** from the solenoid.
2. Unscrew and remove solenoid **A** (Fig.13) from the solenoid casing.
3. Use a magnet to extract the piston **B** (Fig.14) from the solenoid. Clean it and dry it with a jet of compressed air.
4. Use the jet of compressed air to clean the piston seating and lubricate the piston with the oil in the hydraulic circuit. Replace the piston in its seat.

5- Before reinstalling the solenoid, test its functional performance. To do this:

- a. Reinstall the coil **C** Fig.15 on the solenoid.
- b. Connect the tractor wiring.
- c. Switch the power on by turning the ignition switch.
- d. With the lift lowered, turn the lift control lever to "Raise" (hold the safety button down). Check to make sure the solenoid tip **R** (Fig.15) carries out its stroke. If it does, the solenoid is OK.

If, on the other hand, when you repeatedly move the Raise/Lower lever, the solenoid tip does not move at all, the solenoid will have to be cleaned.

Fig.16 highlights the components making up a solenoid. Wash them, dry them with a compressed air jet, lubricate them with the same type of oil used in the circuit and then re-fit them.

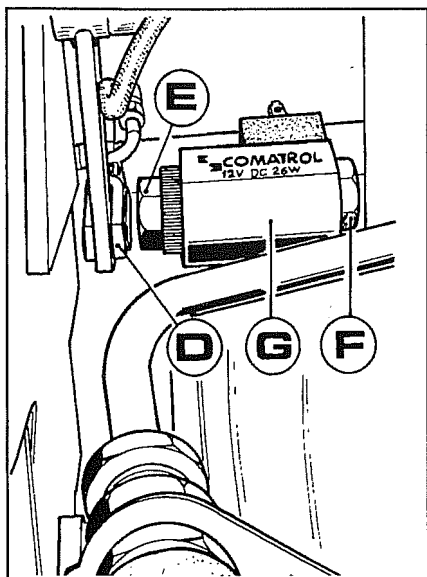


Fig. 17

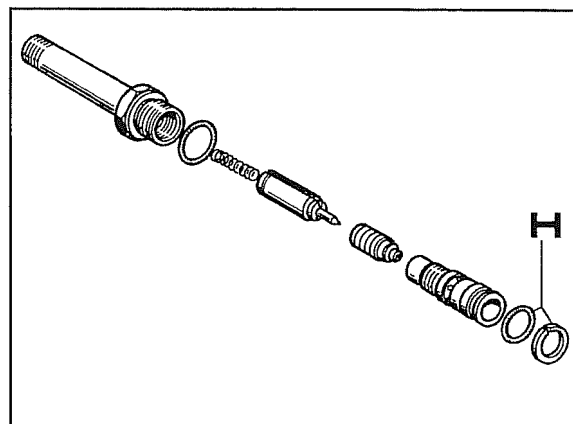


Fig. 18

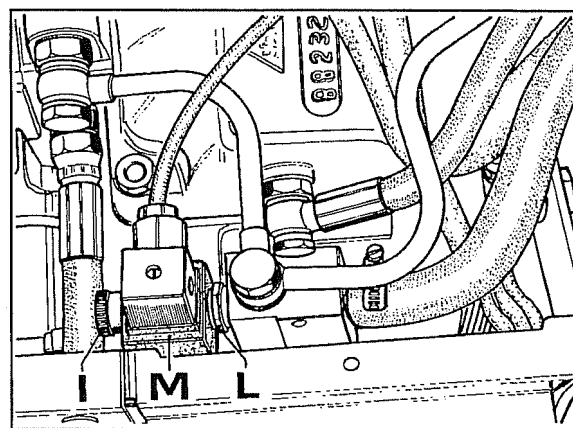


Fig. 19

Cleaning and checking the functional performance of lower control solenoid:

- 1- Lower the lift all the way down.
- 2- Disconnect the dual traction control fork **D** Fig.17 to prevent it from getting in the way when you remove the solenoid coil.
3. Slacken off nut **E** Fig.17 so that coil **G** can be moved away and you can use a wrench to slacken off nut **F** on the solenoid and then remove the entire assembly.
Fig.18 details the parts making up a solenoid. Wash, dry them with a jet of compressed air and lubricate them with the same oil used in the circuit before refitting them.
- 4- Checking solenoid functional performance. To do this:
 - a. Mount coil **G** Fig.17 on the solenoid.
 - b. Connect it to the tractor wiring.
 - c. Turn the tractor electric system on from the ignition key.
 - d. Move the lift control to "lower" (hold the safety button down). Check to make sure you can hear the tip inside the solenoid click against the piston.

Points to bear in mind when re-assembling:

Check to make sure internal seal rings **H** Fig.18 are intact.

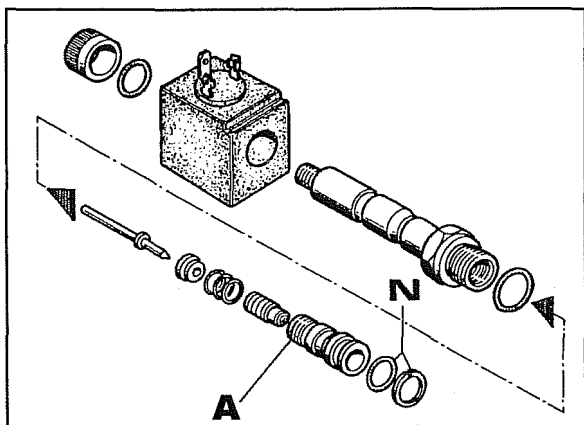


Fig. 20

0106

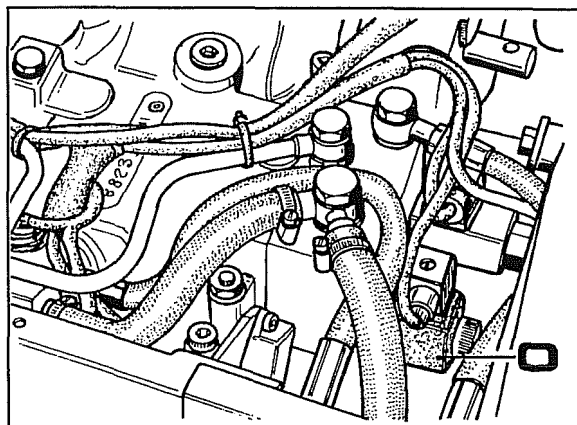


Fig. 21

0107

Cleaning and functional performance checks on raise control solenoid to tractor chassis N° B455169 :

1. Slacken off locking ring **I** Fig.19 so that you can move coil **M** and slacken off nut **L** Fig.19 on the solenoid with a wrench. Figure 20 shows the components making up a solenoid. Wash them, dry them with a jet of compressed air and lubricate them with the same oil as the circuit before refitting them.
- 2- Checking solenoid functional performance. To do this:
 - a. Mount coil **M** Fig.19 on the solenoid.
 - b. Connect it to the tractor wiring.
 - c. Turn the tractor electric system on from the ignition key.
 - d. With the lift lowered, move the lift control to "raise" (hold the safety button down). Check to make sure you can hear the tip inside the solenoid click against the piston.

Points to bear in mind when re-assembling:

- Check to make sure that seal rings **N** Fig.20 are intact.
- When mounting cylinder **A** (Fig. 20) use a couple of drops of Loctite on the threads to be able to control tightening performance and permit better tip movement regulation (referring to step **d** above. At a purely indicative level, once you have tightened this cylinder all the way down, unscrew it about a turn and a half).
- On the solenoid ass'y:
Solenoid **O** Fig.21 is identical with the one on the delivery hose and therefore it will be dismantled, cleaned and checked following the same procedures.

Cleaning and checking functional performance of lift lowering control solenoid:

This solenoid is exactly the same as the one described in the new version and therefore dismantling, cleaning and checking will be done in exactly the same way.

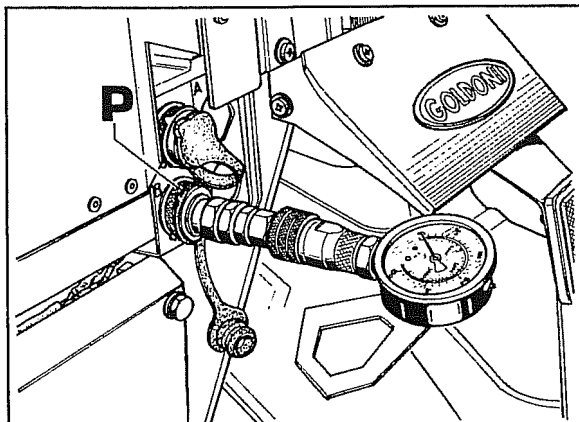


Fig. 22

0108

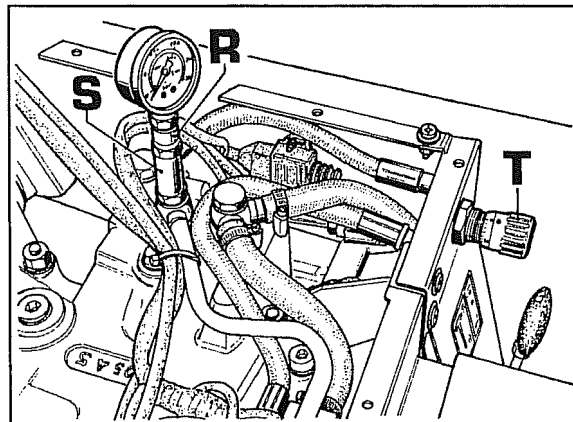


Fig. 23

0109

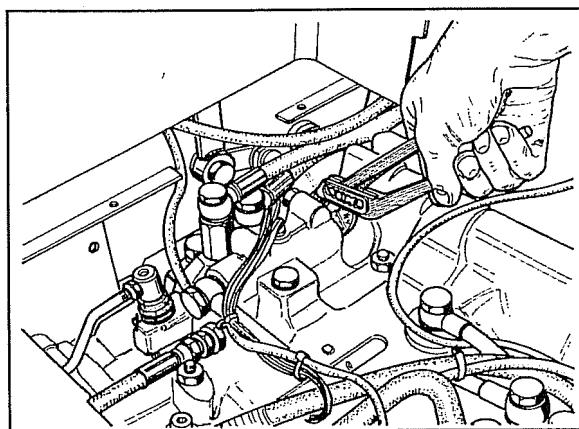


Fig. 24

0110

Checking and regulating oil pressure in the hydraulic circuit

When the lift raises slowly or cannot lift the required load, you should check the oil pressure in the hydraulic circuit.

If the tractor has rear auxiliary spooling valves, this check will be made directly on a quick couple **P** as shown in Fig.22.

If the tractor does not have rear auxiliary spooling valves, once the seat has been removed, connect the delivery hose of the solenoid assembly as illustrated in Fig.23, using the special combination tool **R-S**. Don't forget that for tractors up to chassis N° B455169 use the same tool to make the connection but eliminate the **S** part.

On these tractors also make sure that the drilled screw removed to install the pressure gauge **must not be mistaken** for other similar drilled screws since inside it has a grubscrew with a calibrated opening

Once the hook up has been made, start the engine and run it at around 1500-1600 Rpm. If the gauge is fitted to an quick couple, use the corresponding spooling valve and read the pressure shown on the gauge. The pressure should be around 150 bar.

If the gauge is connected to the solenoid assembly delivery line, shut valve **T** Fig.23, turn the lift lever to Raise (holding the safety button down) and check the pressure on the gauge

If the tractor does not have valve **T**, disconnect the lift limit switch from the wiring and reconnect the wires with a jumper (see Fig.12), turn the lift lever to Raise (holding the safety button down) and check the pressure on the gauge

In either case, if the pressure is much different from the 150 bar level, regulate the circuit to the right pressure as follows:

- a. Unscrew and remove the cover, turn the pressure regulating screw on the spooling valve mounts as shown in Fig.24. If this does not bring the circuit back to its work pressure as read on the gauge, regulate the prioritising valve control (**U** Fig.25) to reset the pressure. When the pressure is correct, tighten back the prioritising valve.
- b. When the reading on the gauge is 150 bar, use the pressure regulating screw on the spooling valve mount Fig. 24 to lower the setting below 150 bar.
- c. At this point, use the same pressure adjusting screw to bring the pressure back up to 150 bar and then turn the screw another quarter turn.

This last quarter turn is done to raise the pressure on the spooling valve mount about 5 bar higher than the prioritising valve. This setting is not detected directly on the gauge because it is affected by the pressure of the prioritising valve. If you cannot reset the correct pressure either with the spooling valve or with the prioritising valve, this means that there are problems with pump seal or dirt in the solenoids.

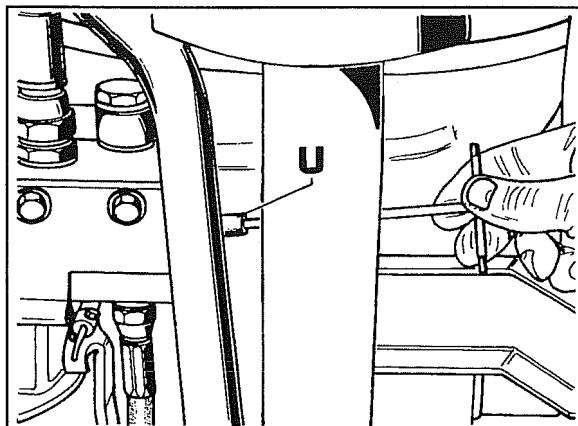


Fig. 25

0111

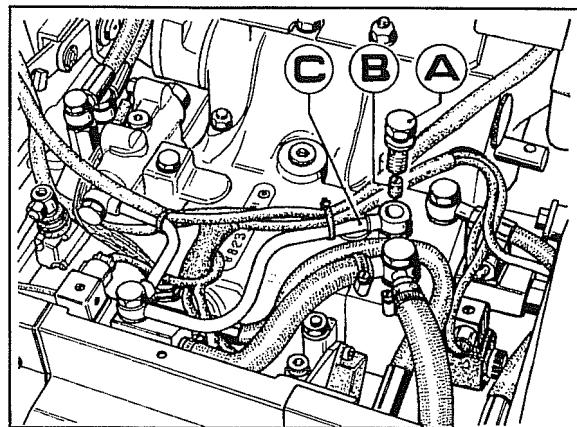


Fig. 26

0112

Spontaneous raising by the hydraulic life due to oil delivery on tractors to chassis N° B449208

When the oil is cold and even more so under very cold weather conditions, the lift can raise spontaneously even though the control lever is in the neutral position.

This problem can be eliminated as follows: remove the seat and regulate the volume of oil to the solenoid using the specific drilled screw **A** Fig.26 fitted with a grubscrew **B** with a 2 mm through hole.

NB:- The tractors that could require this grubscrew are those equipped with two lift raise control solenoids connected together by hose **C** as shown in Fig.26.

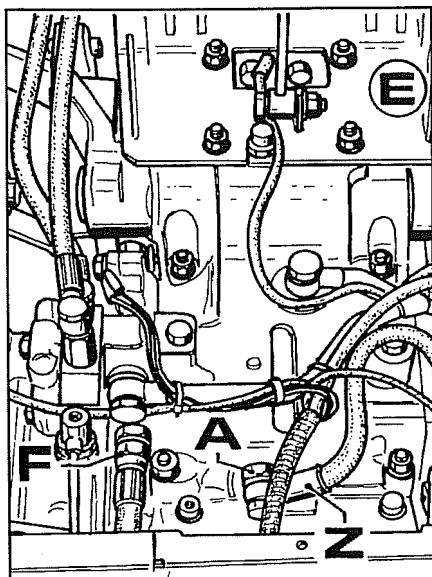


Fig. 27

0113_1

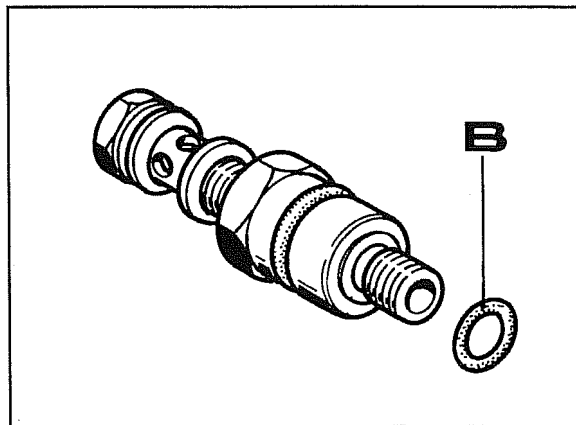


Fig. 28

0114

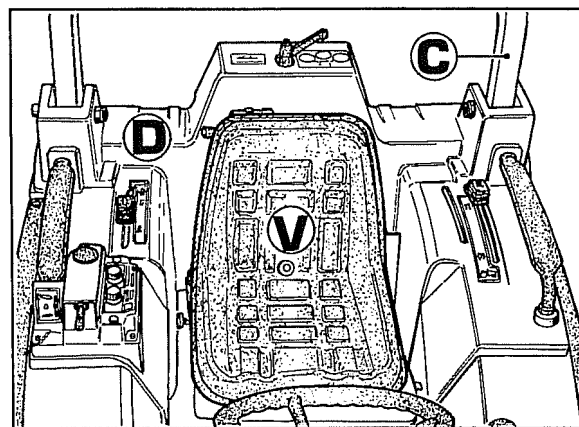


Fig. 29

0115

Overhauling the lift cylinder due to oil leaks

To check for leaks inside the lift casing, couple the lift to an implement and set it on "raise". If the tractor is equipped with valve **T** Fig.23, the valve should be closed.

If the lift lowers, this means that there is an internal oil leak either in the lift cylinder or on the delivery hose fitting (**A** Fig.27).

On tractors up to chassis N° B455169, if the lift lowers with valve **T** open, the first thing to check is the good functional performance of the lower solenoid (refer to the requisite operation)

Since there is no way of telling from the outside which of the two components is leaking (fitting or cylinder), follow these steps:

1. Remove seat **V** Fig.29.
2. Set the lift in its fully lowered position.
3. Disconnect hose **Z** Fig.27 and unscrew fitting **A** from the lift casing.
4. Fig. 28 offers an exploded view of the parts making up the fitting. Check if seal **B** is intact and then refit the fitting and the delivery hose.

5. Test the lift again. If it lowers once more, this means that the leak is on the lift cylinder.
Follow these steps:
- Set the lift in its fully lowered position.
 - Remove the **C** and the fibreglass body-piece **D** Fig.29 having removed the various grips, handles and lift control mount.
 - Remove the seat mount **E** Fig.27, disconnect the wiring to the solenoids, the limit switch and the earth circuit cables (see Fig.27).
 - Disconnect the auxiliary spooling valves if the tractor has any.
 - Disconnect the oil delivery hose **F** Fig.27 from the spooling valve mount and the oil delivery valve (**T** Fig.23) from the cylinder.
 - Remove the lift casing and place it on a work bench as shown in Fig. 30.

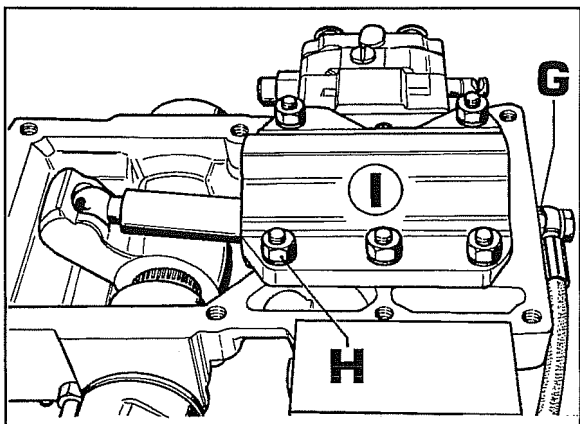


Fig. 30

0116

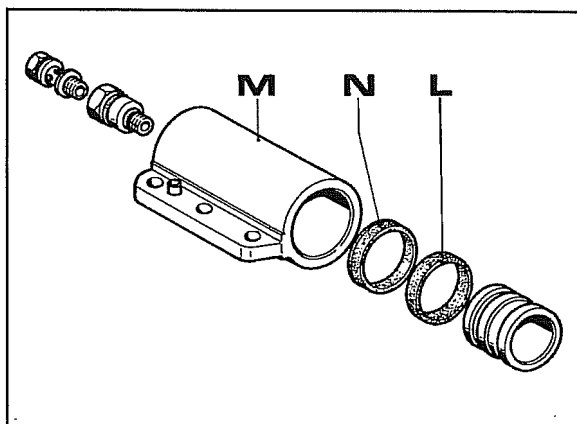


Fig. 31

0117

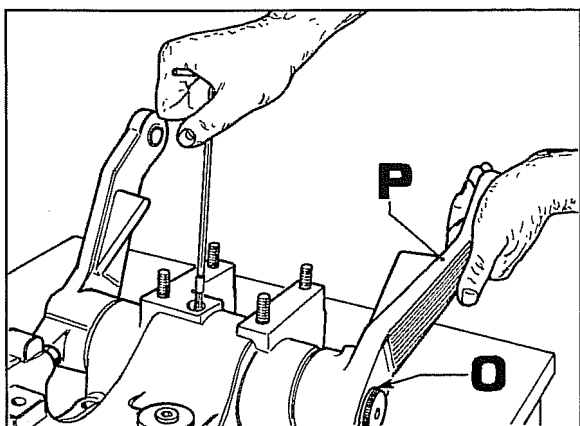


Fig. 32

0118

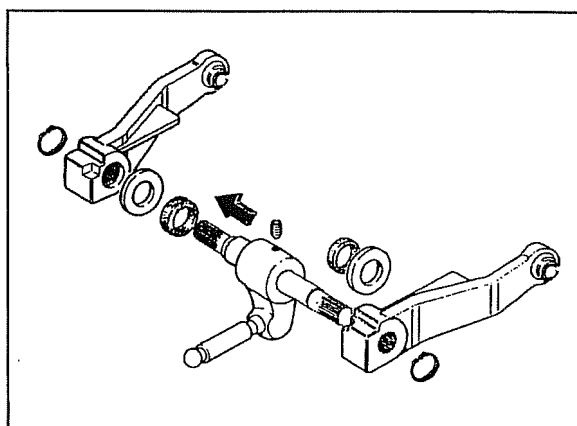


Fig. 33

0119

g. Disconnect fitting **G** Fig.30, remove screws **H** and remove cylinder **I**.

Fig.31 gives an exploded view of the parts comprising the cylinder/piston.

h. Substitute seal ring **N** Fig.31.

i. Check if guide ring **L** and cylinder **M** are in good condition. If not, replace them.

Points to bear in mind when reassembling:

Lubricate the parts with the same oil used in the circuit. When refitting the seal ring make sure it is in the correct direction so as not to damage the lip when it is inserted.

Changing bushings on the lift casing.

- Remove the vent plug on the lift casing. In the hole where the plug was, find the linkrod fixing grub screw by moving the lift arms by hand as shown in Fig.32. Screw the grub screw out.
- Remove the snap rings **O** and slip out the lift arms **P**.
- Turn the assembly upside-down and remove the shaft from the part that has the largest diameter-i.e., towards the right depending on the driving direction (direction shown by the arrow in Figure 33).
- Fig.33 shows an exploded view of the linkrod, shaft and lift arm ass'y.
- Remove and change the bushings on the lift casing.

Points to bear in mind during reassembly:

Use Loctite on the linkrod fixing grub screw when you reinsert it.

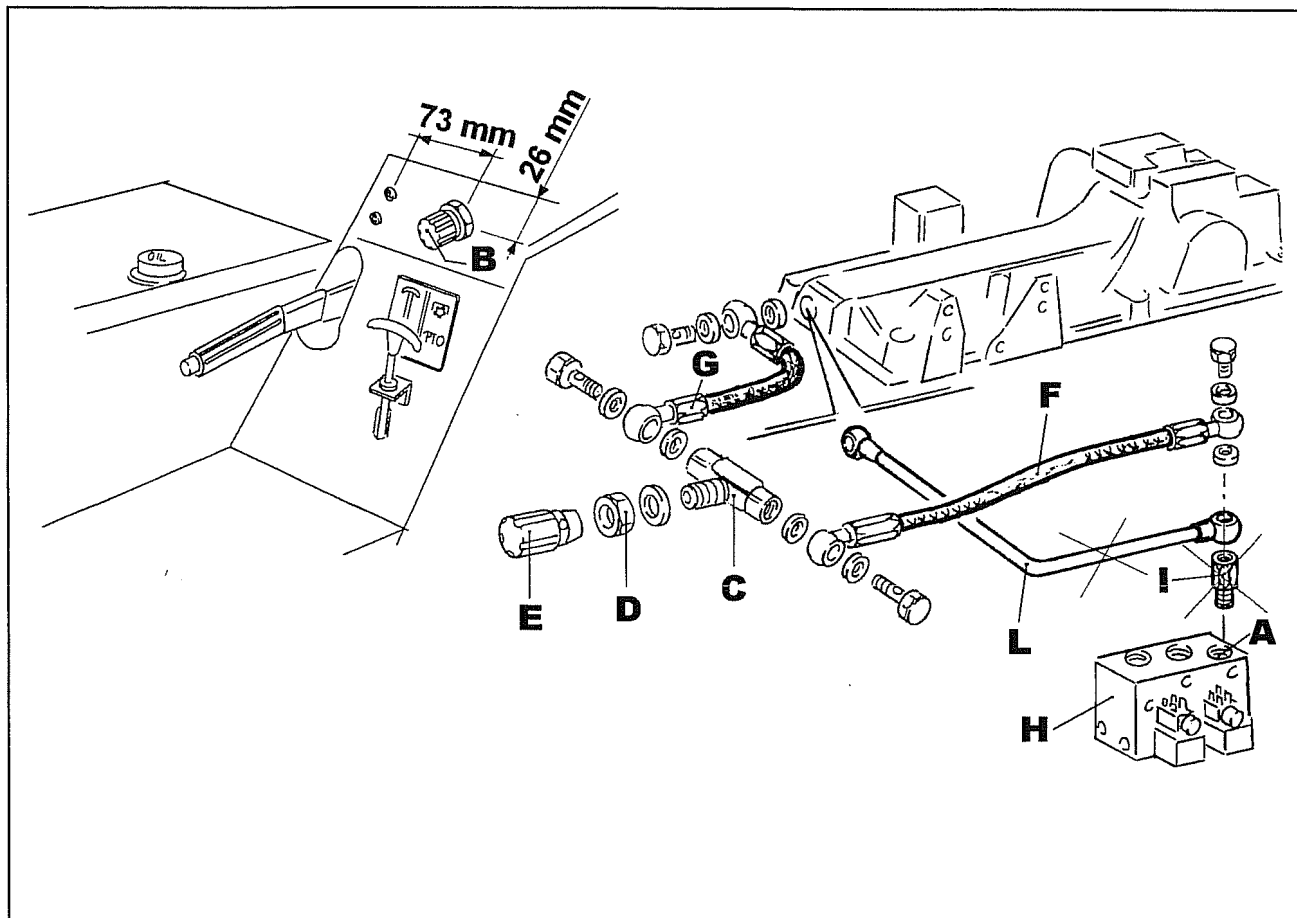


Fig. 34

0120

Fitting a lift lowering regulation valve - to tractor chassis N° B455169

This device permits better implement lowering speed regulation.

Follow these steps:

1. Remove the seat and set the lift in its fully lowered position.
2. Drill a 20 mm hole in the left panel at the position indicated by point **B** Fig.34.
3. Disconnect delivery hose **L** and fitting **I** complete with its plug nut from hole **A**
4. Connect hoses **F** and **G**, as shown in Figure 34.
5. Remove handle **E** from its mount, install valve **C** on the panel using nut **D**. Make sure that use a washer on the valve side.

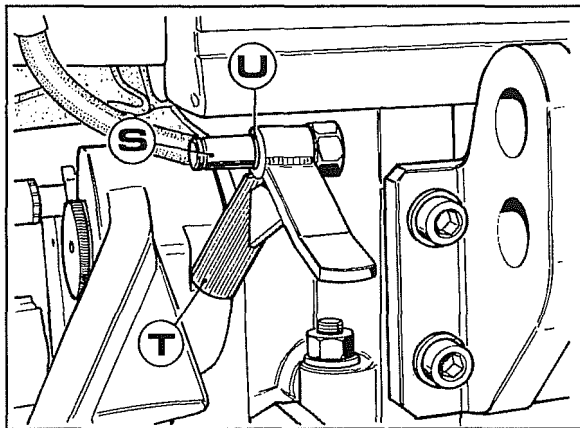


Fig. 35

0121

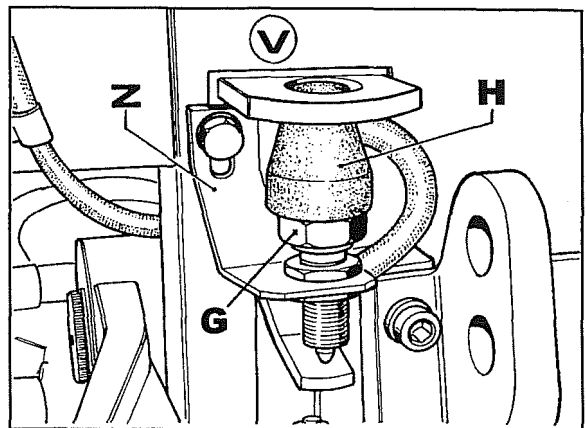


Fig. 36

0122

Fitting a limit switch on the hydraulic lift for tractors to chassis N° B455169:

This device prevents damage to the structure when implements are trailed and the lift it at its fully raised position, the implement bounces heavily.

With a Raise/Lower lift, follow these steps:

1. Remove the rear guard fixed to the seat mounting.
2. Screw pin **S** Fig.35 into the pre-drilled hole on the lift casing.
3. Install lever **T** and fix it with snap ring **U** Fig.35.
4. Replace guard **V** Fig.36 cut as needed to permit the switch and its lever to be installed and worked (see Fig.36).

Fit switch **Z** and **G** mountings with wiring **H** Fig.36. Connect the wires to the connectors joined by the plastic tangs. Push the cable from the right of switch under the seat mount and bring it to the raise/lower control box mount.

5. Connect cable **M** Fig.38. To do this, disconnect the double brown wire with black dots **I** from the raise/lower control **L** and the other cable to double cable **I**.
6. Check the precise position of the limit switch.

To do this:

- a. Turn the tractor on.
- b. Raise the lift as high as it will go.

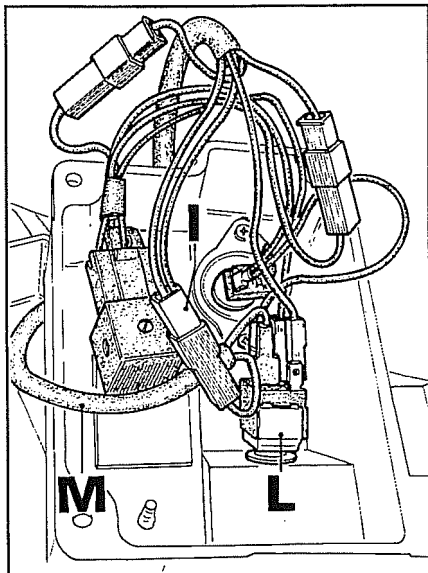


Fig. 38

0124

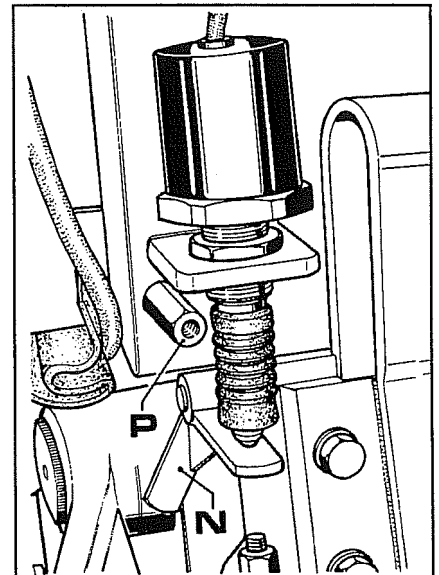


Fig. 39

0125

- c. Check by hand if the lift arms have an additional travel of 5-10 mm.
- d. If they do not, reset this condition by correcting limit switch height with the regulating nuts.

With a controlled draught and position lift, follow these steps:

1. Remove the rear guard attached to the seat mount.
2. Substitute sensor lever **N** Fig.39 with sensor/limit switch lever **O** Fig.40.
3. Remove stud **P** Fig.39 and fix limit switch mounting **R** with the new stud **A** Fig.40 and then fit switch **B**.

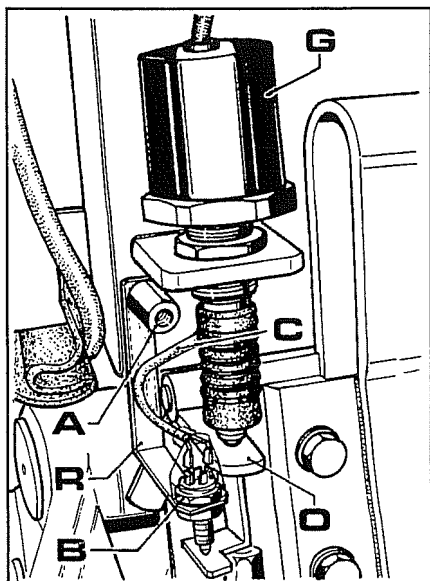


Fig. 40

0126

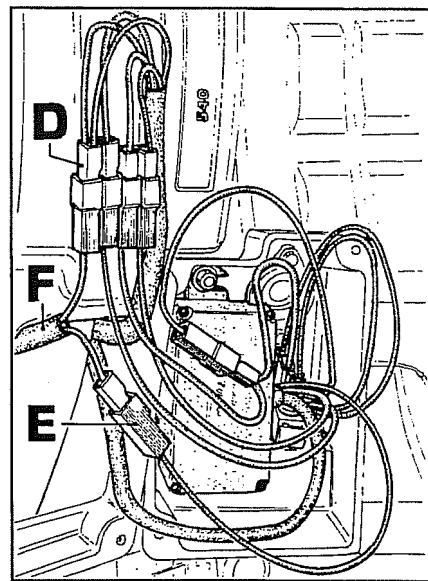


Fig. 41

0127

4. Connect cable **C** Fig.40 to the switch passing it under the seat mounting to reach the raise/lower control box mount.
5. Disconnect the double cable with black dots **D** Fig.41 from the brown/white wire **E** on the central unit and then connect cable **F** Fig.41 with a cable to the double cable with black dots and the other cable to the brown/white central unit cable.
6. Check the exact position of sensor **G** Fig.40 by lowering the lift all the way and then regulate the sensor so that its tip is in contact with lever **O**.
7. Check the exact position of the limit switch as described in the previous operation above.

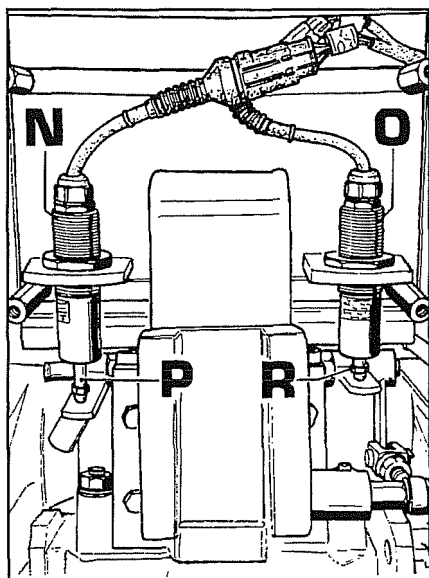


Fig. 42

0128

Checking functional performance and/or changing rheostats, central unit and sensors with controlled draught and position lifts for tractors with chassis N° from C467700

If the tractor has a controlled draught and position lift, whenever there are problems with lift raising/lowering, the first step in diagnosing the problem is to check if the sensors are regulated correctly.

Follow these steps to do this:

1. Remove the rear guard attached to the seat mounting to access the sensors and their operating levers (see Fig.42) where **N** is the position controlling sensor and **O** the draught controlling sensor.
2. Check that the sensor operating levers are not damaged or seized due to dirt or oxidation.
3. Check to make sure that the tips **P-R** are in good contact with the corresponding levers and their travel is positioned more or less as shown in Fig.42.
4. If these checks do not reveal any defect, the next step is to take these devices off-line electrically.
5. To do this, remove the rheostat holder box on the right mudguard and turn it upside-down as shown in Fig. 43
6. Before disconnecting wires **A-B-C** to the central unit from the raise/lower switch, check their match up which should be as follows (see Fig.43):

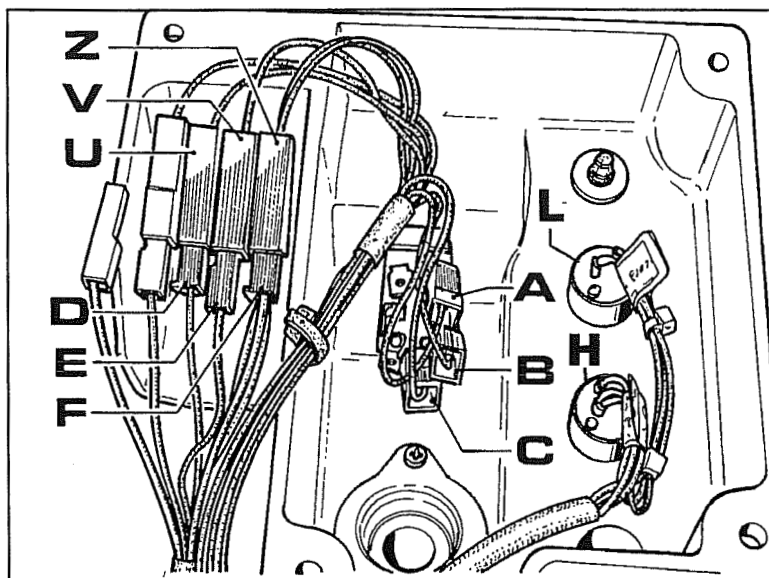


Fig. 43

0129

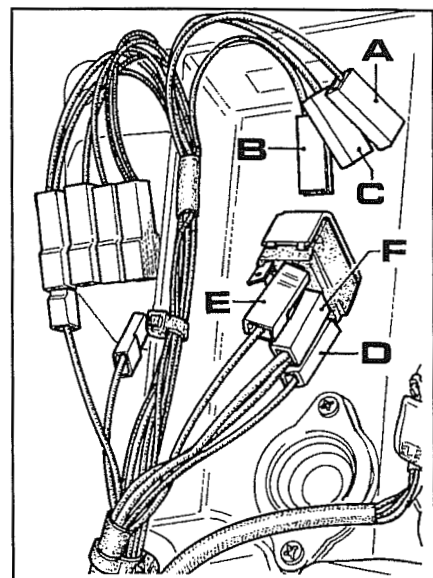


Fig. 44

0130

SWITCH POSITION

- 1
- 2
- 3

WIRE COLOUR

- ORANGE (A)
- LIGHT BLUE/RED (B)
- GREY (C)

7. Disconnect wires **D-E-F** in the tractor wiring harness noting (*) wiring connections to the central unit by means of their colours. The match up is as follows:

TRACTOR WIRING

- (*) BROWN/BLACK (D)
- (*) BROWN/WHITE (E)
- DOUBLE BLUE/RED (F)

CENTRAL UNIT WIRING

- BROWN/GREY (U)
- BROWN/BLACK (V)
- DOUBLE LIGHT BLUE/RED (Z)

(*) - *In a certain number of tractors the set up is with the wire colour reversed.*

8. Connect the tractor wiring harness wires **D-E-F** to the raise/lower switch with the following match up scheme (see Fig.44):

SWITCH POSITION	WIRE COLOUR
1	BROWN/WHITE (E)
2	DOUBLE BLUE/RED (F)
3	BROWN/BLACK (D)

9. At this point, if, when you test the lift, you find that the initial problem with the raise/lower function is still present, this tells you that you will have to check the good electrical and mechanical performance of the solenoids. Refer to the various sections describing these operations. If, on the other hand, when testing the lift the original raise/lower problem is no longer found, this means that you should check the functional performance of the electric and electronic components of the equipment you disconnected. In other words, the sensors, the rheostats and the central unit. To do this, first reconnect the power supply and follow these steps:

Checking functional performance and/or changing rheostats for tractors up to chassis N° C467700:

To check the functional performance of the rheostats, use a tester to read the resistance in Ohm for both.

Connect the rheostats as follows to take this reading:

	RHEOSTAT POSITION	WIRE COLOUR
POSITION RHEOSTAT (H Fig.43)	A	WHITE
	B	PINK
DRAUGHT RHEOSTAT (L Fig.43)	A	WHITE
	B	WHITE/BLUE

Note the resistance reading on the tester during rheostat travel.

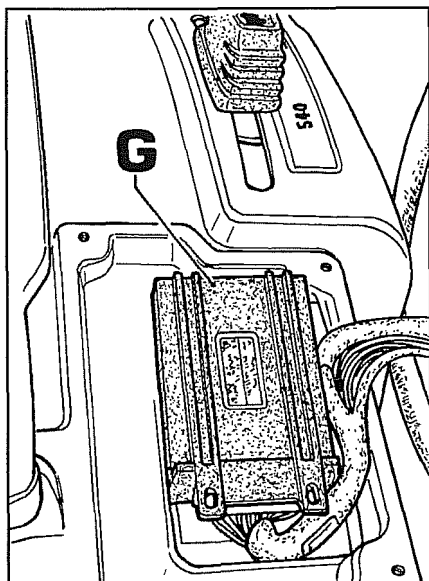


Fig. 45

0131

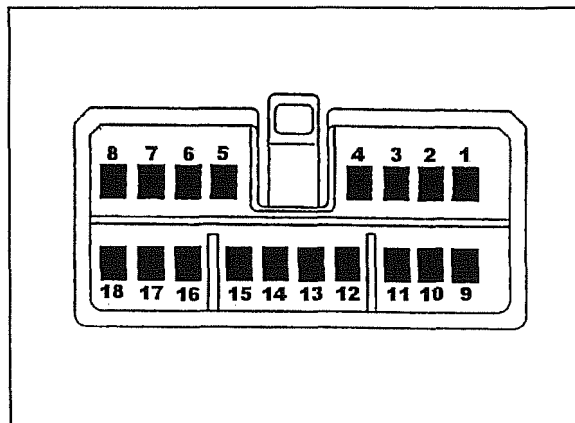


Fig. 46

0132

Checking functional performance and/or replacing central unit and sensors from tractor chassis N° C467700:

1. To make this check, access the central unit **G** Fig.45 located under the rheostat holder box which can be removed from the mudguard as it is attached with double adhesive tape.
2. Switch the dashboard on and following Fig. 46 showing the numbering for the multiple wire central unit connector, take the following readings with the tester:

POSITION SENSOR (N Fig.42):

1st reading (central unit)

Tester positive on position 6 (yellow wire)

Tester negative on 9 (red wire)

Reading around

4.4 Volt

2nd reading (sensor).

Tester positive on position 10 (green wire).

Tester negative on position 9 (red wire).

Reading around

from 1.8 to 3.4 Volt

The 1.8 a 3.4 Volt scale is with the lift lowered all the way and moving sensor tip **P** (Fig.42) by hand all the way out and all the way in.

DRAUGHT SENSOR (O Fig.42):

1st reading (central unit)

Tester positive on position 5 (yellow/black wire)

Tester negative on 2 (red/black wire)

Reading around

4.4 Volt

2nd reading (sensor).

Tester positive on position 3 (green/black wire).

Tester negative on position 2 (red/black wire).

Reading around

from 1.8 to 3.4 Volt

The 1.8 a 3.4 Volt scale is found with the lift lowered all the way and moving sensor tip **R** (Fig.42) by hand all the way out and all the way in.

NB - To permit tip **R** travel, disconnect the coupling rod between the 3-point hitch and the sensor control lever (see Fig. 42).

Conclusion: If the 1st readings are "0" or considerably different from the 4.4 Volt reading, this means that the problem is with the central unit. If with the second readings you do not have a reading range but rather a fixed reading, this means that the problem is with the corresponding sensor.

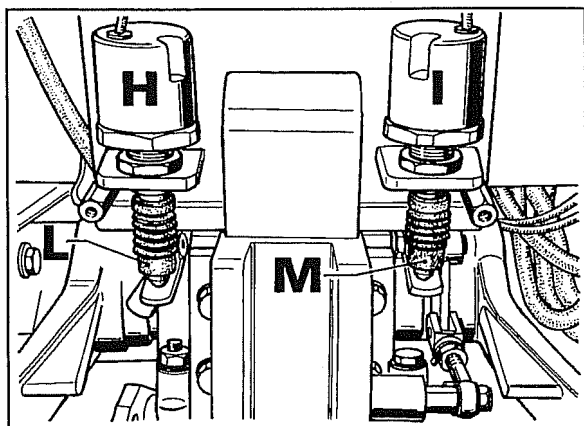


Fig. 47

0133

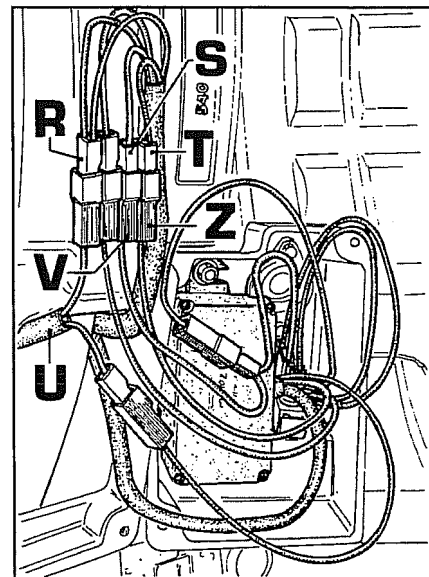


Fig. 48

0134

Checking functional performance and/or change sensors, rheostats/central unit with controlled draught and position lift for tractor chassis N° to C467699

If the tractor has a controlled draught and position lift, whenever there are problems with lift raising/lowering, the first step in diagnosing the problem is to check if the sensors are regulated correctly.

Follow these steps to do this:

1. Remove the rear guard attached to the seat mounting to access the sensors and their operating levers (see Fig.42) where **H** is the position controlling sensor and **I** the draught controlling sensor.
2. Check that the sensor operating levers are not damaged or seized due to dirt or oxidation.
3. Check to make sure that the tips **L-M** are in good contact with the corresponding levers and their travel is positioned more or less as shown in Fig.47.
4. If these checks do not reveal any defect, the next step is to take these devices off-line electrically.
5. To do this, remove the rheostat holder box on the right mudguard and turn it upside-down as shown in Fig. 48
6. Before disconnecting wires **N-O-P** Fig. 49 to the power pack from the raise/lower switch, check their match up which should be as follows (see Fig.49):

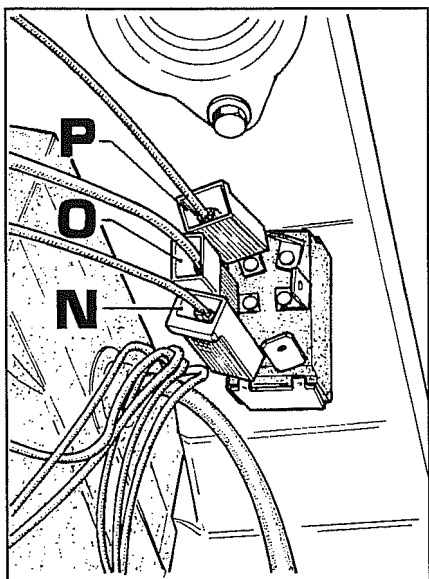


Fig. 49

0135

SWITCH POSITION

1
2
3

WIRE COLOUR

ORANGE (N)
BLUE/RED (O)
GREY (P)

7. Disconnect wires **R-S-T** Fig.48 from tractor wiring harness noting the connection to the central unit wiring by means of the colours. The match up is as follows:

TRACTOR WIRING

DOUBLE BROWN WITH BLACK DOTS (R)
BLUE/RED (S)
BROWN/BLACK (T)

CENTRAL UNIT WIRING

LIMIT SWITCH WIRE (U)
BLUE/RED (V)
BROWN/BLACK (Z)

8. Connect tractor wires **R-S-T** (Fig.48) to the raise/lower switch following this match up scheme:

SWITCH POSITION

1
2
3

WIRE COLOUR

DOUBLE BROWN WITH BLACK DOTS (R)
BLUE/RED (S)
BROWN/BLACK (T)

9. At this point, if when you test the lift you note that the initial raise/lower problem still exists, this means that you should check the good functional performance of solenoid electric and mechanical components. If, on the other hand, the tests on the lift show that the original raise/lower problem no longer exists, this means that you should check the electric and electronic performance of the components you disconnected: sensors and the central unit. To do this, re-establish the electric connection:

Checking functional performance and/or changing sensors up to tractor chassis N° C467699:

This check, good for both sensors, should be done with the tester to take the resistance reading in Ohm. To do this, remove the seat, disconnect the sensor plugs from the central unit wiring and take a reading connect the tester as detailed below:

Tester positive on position 1 (yellow wire).
Tester negative on position 3 (red wire).

Tester reading
from 4.6 Kohm to 740 Ohm

The 4.6 Kohm to 740 Ohm reading scale requires the lift to be lowered all the way and manually move sensor tips **L** and **M** (Fig.47) for their entire travel-i.e., all the way out and all the way in.

NB - To permit tip **M** travel, disconnect the linkrod between the 3-point hitch and the sensor control lever (see Fig. 47).

Checking rheostat/central unit functional performance for tractors with chassis N° to C467699:

Turn the power to the dash on (and so power will reach the central unit wiring socket and then to the sensors) and read the volts on the plugs connecting the tester as follows:

DRAUGHT SOCKET

Tester position on position 1-3 (yellow and pink wires)
Tester negative on position 2 (green wire).

Tester reading
4.4 Volt

POSITION SOCKET

Tester positive on position 1-3 (yellow and pink wires)
Tester negative on position 2 (green wire).

Tester reading
4.4 Volt

Conclusion: If the sensor readings do not show a range but rather a set level, this means that the problem is with the corresponding sensor. If the central unit readings are "0" or considerably different from the 4.4 Volt level, this means that the problem is with the central unit.

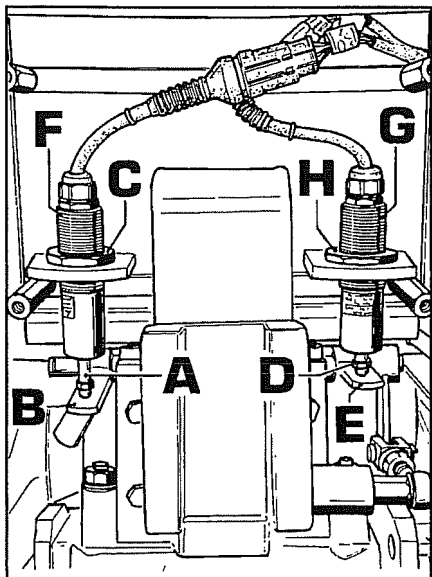


Fig. 50

0136

Regulating sensors with controlled draught and position lift from tractor chassis N° C467700

To access the sensors and regulate them, first remove the rear guard attached to the seat mount.

Set the lift in its fully lowered position.

In order to regulate the sensor/rheostat combination, first regulate the sensors separately.

To do this:

1. Regulating the controlled position sensor **F** (Fig.50):
 - a. Bring tip **A** into contact with lever **B**.
 - b. Screw out nut **C** until it is about 2 mm from the contact base.
 - c. Screw the sensor in until nut **C** touches the base and then lock it in this position
2. Regulating controlled draught sensor **G** (Fig.50):
 - a. Screw in the sensor until tip **D** is hard against lever **E**.
 - b. Screw in nut **H** until it touches the base.
 - c. Screw the sensor out 3-4 mm then screw nut **H** down and tighten it home.

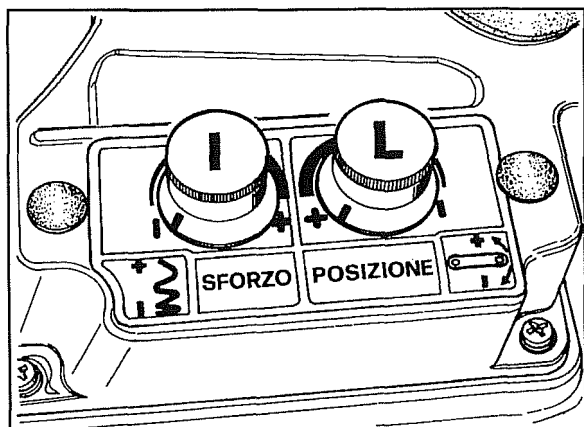


Fig. 51

0137

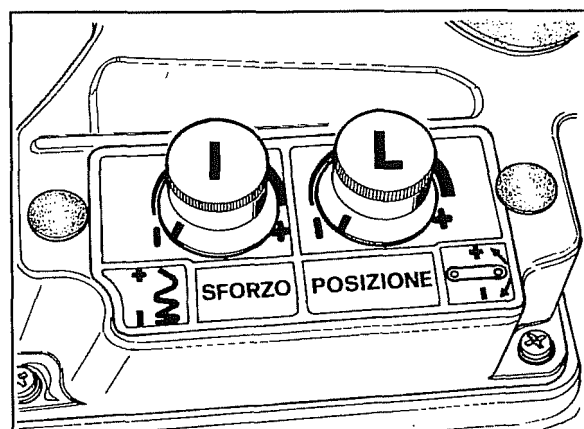


Fig.52

0138

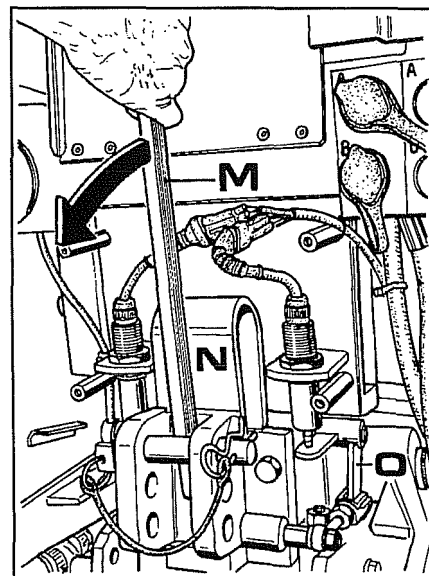


Fig. 53

0139

3. Combined rheostat/sensor regulation

- a. Start the tractor, lower the lift leaving the raise/lower control lever turned downwards
- b. Regardless of what the stickers indicate Fig.51 and 52, turn both rheostats **I-L** all way counter-clockwise.
- c. Insert a lever (**M** Fig.53) behind the 3-point hitch and move it in the direction shown by the arrow. In this way, you will move hitch carrier spring **N** and, as a result thanks to the reaction of the linkage (**O**) lower the controlled draught tip contact blade. At this point the lift should begin to raise and, if you release the lever, the lift should lower again.
- d. If this does not happen, slacken off the nut retaining the sensor and screw the sensor down until the lift begins to lower and then tighten the nut back. At this point the lift is correctly regulated-i.e., draught adjustment corresponds to rheostat working scale.
- e. To check the controlled position sensor **F** Fig.50 regulation, turn the tractor on, lower the lift leaving the raise/lower lever in the lower position.
- f. Turn the rheostat **L** (F.fig.52) clockwise. At about the halfway point of its travel, the lift should begin to raise. If it does not, correct the regulation made previously screwing the sensor in or out on its mounting.

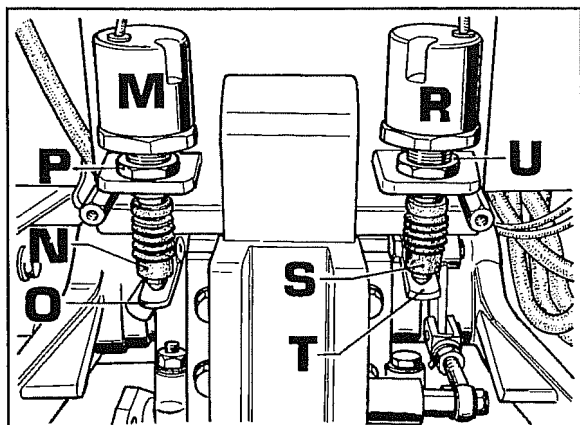


Fig. 54

0140

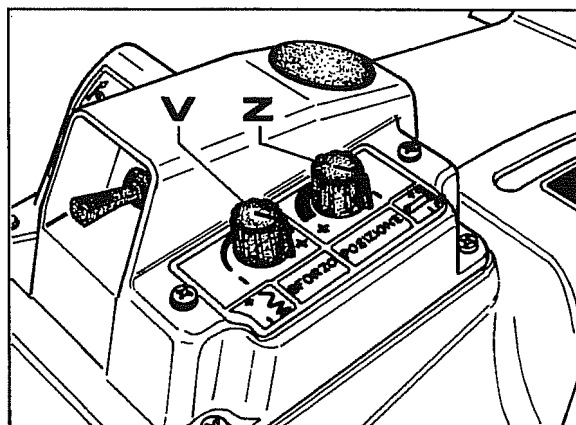


Fig. 55

0141

Regulating sensors with controlled draught and position lift for tractors up to chassis N° C467699

To access the sensors for this regulation, remove the seat and the rear guard attached to the seat mounting. Set the lift to its fully lowered position.

In order to regulate the sensor/rheostat combination, first regulate the sensors separately.

To do this:

1. Regulating the controlled position sensor **M** (Fig.54).
 - a. Bring tip **N** into contact with lever **O**.
 - b. Turn nut **P** until it touches the contact base.
2. Regulating controlled draught sensor **R** (Fig.54).
 - a. Screw in the sensor until tip **S** is hard against lever **T**.
 - b. Screw in nut **U** until it touches the base.
 - c. Screw the sensor out 5 mm then screw nut **U** down and tighten it home.

Combined rheostat/sensor regulation

- a. Start the tractor and lower the lift leaving the raise/lower control lever in the lower position.
- b. Turn both rheostats **V-Z** (Fig.55) all the way clockwise.
- c. Couple an implement weighing at least 100 kg to the lift.
- d. Turn rheostat **V** towards the negative sign (-). If the lift does not raise, this means it is regulated correctly. If, on the other hand, the lift raises the implement, a further regulation will have to be made. Follow these steps to regulate the controlled draught sensor **R** Fig.54:

d1. Screw nut **U** out and screw the sensor in until the lift begins to lower and then lock in this position with the nut. At this point the lift is correctly regulated-i.e., draught regulation corresponds to rheostat working range.

- e. To check the controlled position sensor **M** Fig.54:

e1. Disconnect the implement and move the lift raise/lower control lever in the lower position.

e2. Check to make sure rheostat **Z** (Fig.55) is turned to the negative sign (-). Push sensor control lever **O** (Fig.54) upwards by hand. If the lift lowers more, the previous regulation should be fine tuned as follows:

- a. Slacken off nut **P**, screw sensor in about one turn and then retighten the nut.
- b. Raise the lift and then lower it again.

c. Push lever **O** upwards again. If the lift does not move, this means that the regulation is perfect. If it lowers, readjust the position of the sensor repeating steps e2, a, b.

At this point, regulate the sensor/rheostat combination turning the latter towards the plus sign (+). Check to make sure that the lift begins to raise as the rheostat is turned.

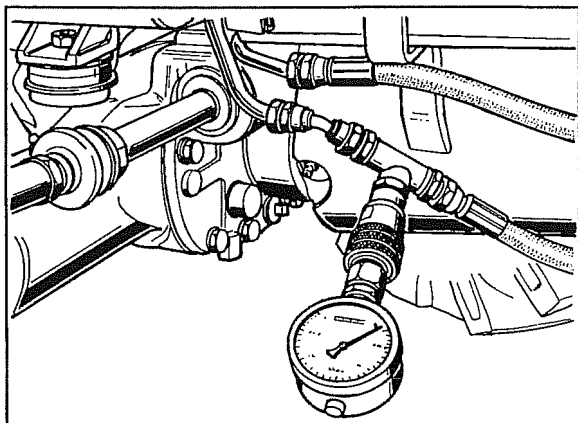


Fig. 56

0142

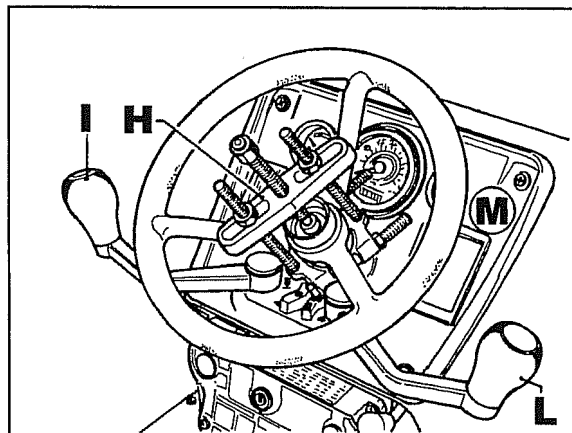


Fig. 57

0149_1

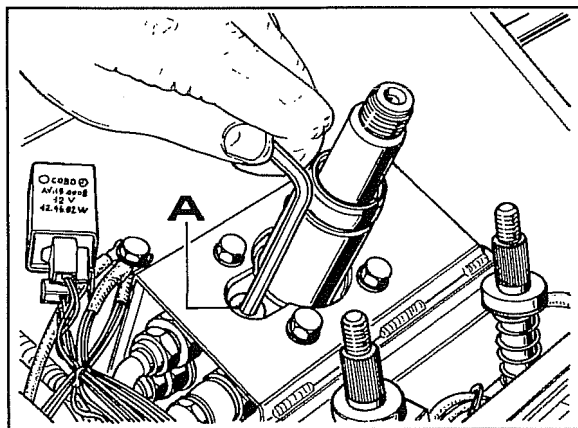


Fig. 58

0143

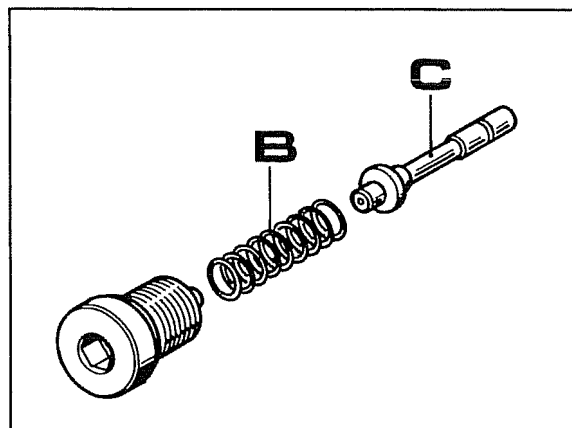


Fig. 59

0144

Checking and cleaning the power steering relief valve

If the steering wheel becomes stiff even with limited steering action, you can diagnose the cause following this procedure:

1. Apply a pressure gauge to one of the two oil delivery hoses to the cylinder as shown in Figure 56.
2. Start the tractor.
3. Turn the steering wheel (in one direction or the other) and check the pressure reading on the gauge. The pressure should be between 85 and 90 Bar.
4. If the pressure is less, switch the engine off and clean the prioritising valve as described in the specific section of this manual.
5. Test circuit pressure again. If the problem persists, clean the power steering pressure relief valve as follows:
 - a. Use an extractor **H** as shown in Fig.57, to remove the steering wheel.
 - b. Remove the gear range lever **I** and the gear change lever **L** and remove dashboard **M** (Fig.57).
 - c. Unscrew the plug **A** Fig.58 on the pressure relief valve and remove spring **B** and pin **C** (Fig.59).

Fig.59 gives an exploded view of the parts making up the pressure relief valve. Wash them thoroughly, dry them with a compressed air jet and lubricate them with the same type of oil as in the circuit before reinstalling the valve.

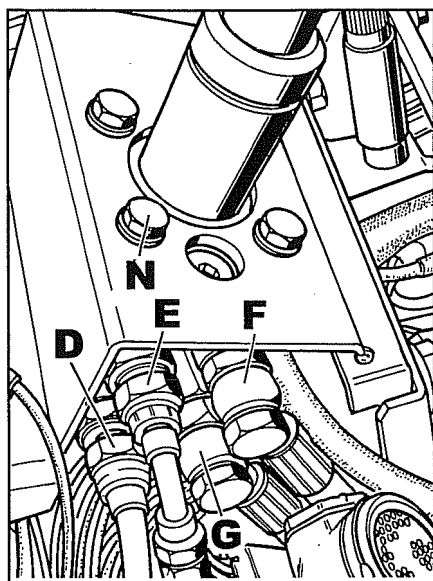


Fig. 60

0064

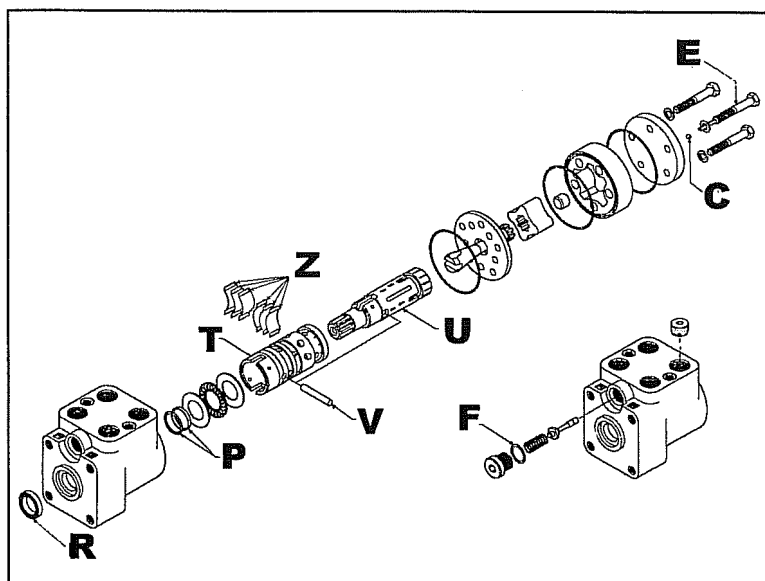


Fig. 61

0148

Overhauling the power steering due to problems with oil leaks.

Oil leaks from the power steering system will not negatively effect the functional performance of the power steering. However, the cause should be found and the problem eliminated.

When leaks occur, the power steering system will have to be overhauled to change the set of seal rings.

Follow these steps:

1. Carry out the steps detailed in points **a** and **b** in the previous operation to access the power steering system.
2. Mark and disconnect hoses **D-E-F-G** Fig. 60. Remove screws **N** to detach the steering column for the power steering plant underneath.
3. Push the hoses under the power steering and remove the assembly from the side as shown in Fig. 62.
4. Fig. 61 shows an exploded view of the power steering ass'y.
5. Wash all the parts and dry them with a jet of compressed air. Lubricate the centre control cylinder with the same type of oil used in the circuit.
6. When reinstalling the power steering assembly, change all the seal rings and washers as shown in Fig. 63.

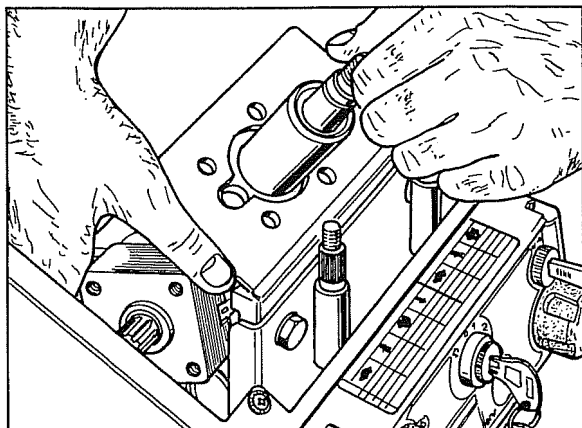


Fig. 62

0123

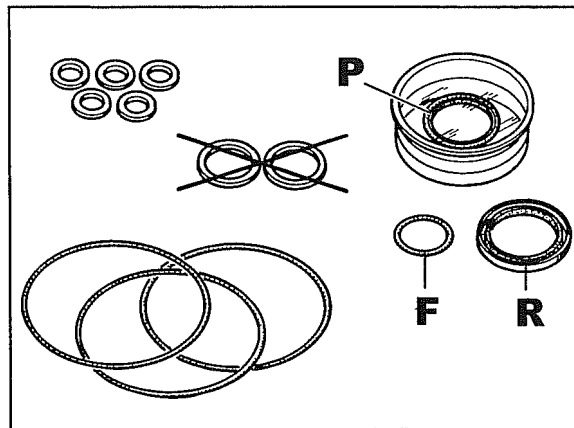


Fig. 63

0173

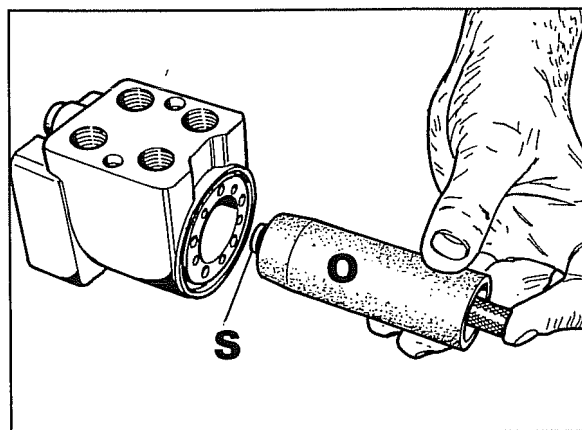


Fig. 64

0174

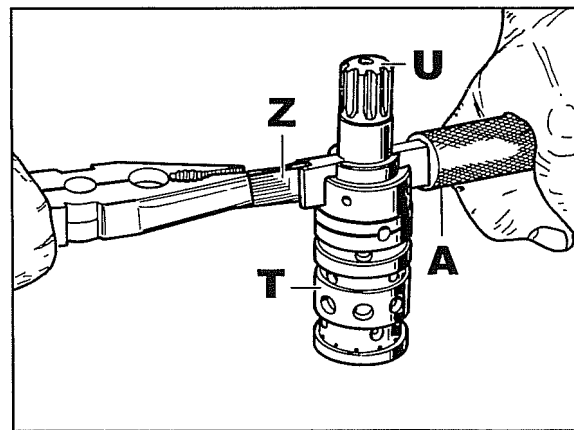


Fig. 65

0186

Things to bear in mind when reassembling:

- Use the special tool **O** Fig. 64 to fit the Combi **P** ring and the dust seal ring **R** Fig. 61 and 63.
- Use the tool as follows to fit ring **P**:
 - a. Place the ring on the inside pin **S** Fig. 64 of the tool.
 - b. Hold the inside pin pressed down as shown in Fig. 64, insert the ring in its seating.
 - c. Hold the outside part **O** of the tool in position, extract the inside pin **S** and then retract the outside section.
- Pre-install the centre distributor cylinder (**T-U** Fig. 61 and 65) inserting pin **V**. Next insert the springs **Z** (Fig. 61 and 65) as shown in Fig. 65.
Use the special tool **A** to insert the springs.

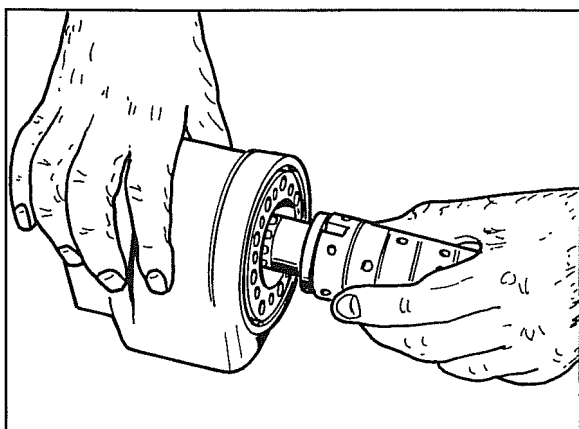


Fig. 66

0188

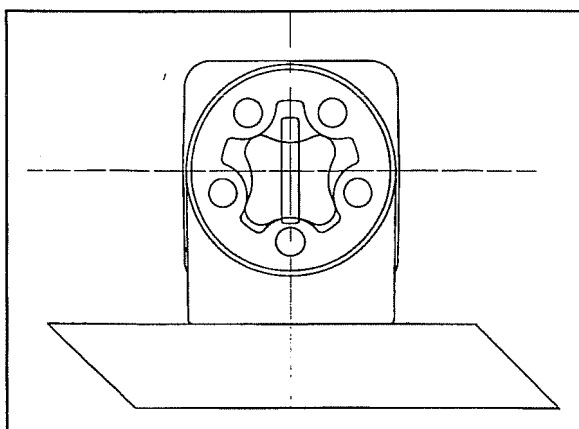


Fig. 67_1

0201

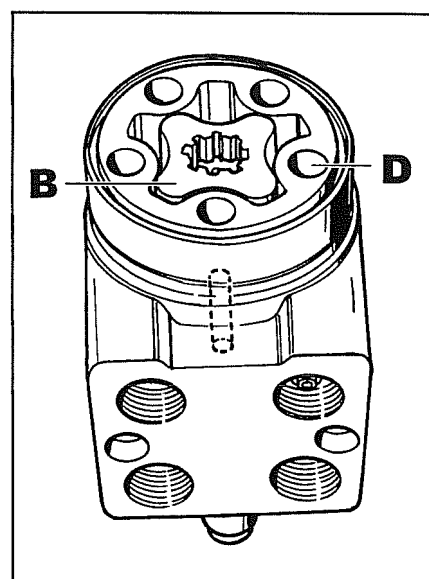


Fig. 67

0189

- Insert the distributor cylinder on the power steering unit body positioning it as shown in Fig. 66.

Caution: the distributor cylinder coupling pin must be **horizontal** during the entire coupling stage to prevent it from slipping out and inserting into one of the other holes inside the power steering unit body.

- For precise power steering timing, Fig. 67 shows the exact position of rotor **B** with the hose coupling surface.

Pin **V** Fig. 61 and 67, must be perpendicular to this hose coupling as shown in Fig. 67_1.

- Screw **E** and its ball **C** Fig. 61 are positioned in hole **D** Fig. 67.
- Lubricate the 5 cover screws, screw them in and tighten them home with a cross pattern using a torque wrench set for 3 Kgm.
- Seal ring **F** Fig. 61 and 63, one of the set of seal rings, is used to replace the seal ring in the pressure relief valve plug.

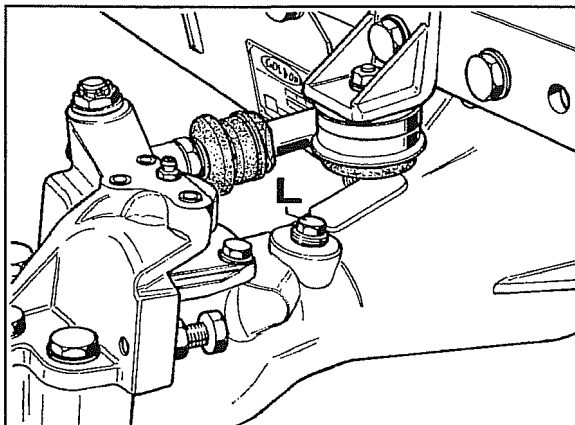


Fig. 68

0032_1

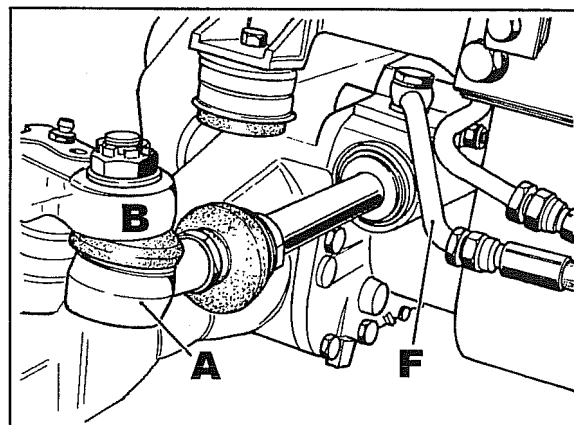


Fig. 69

0190

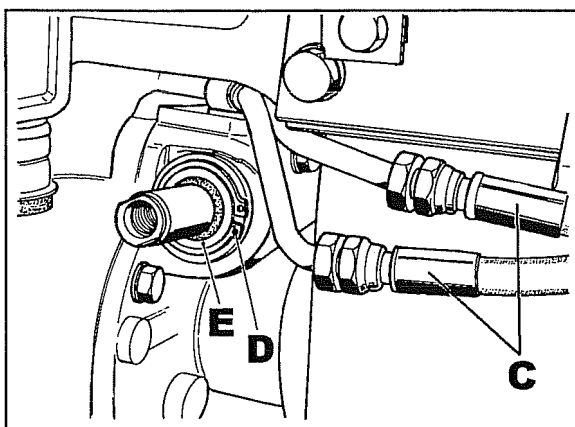


Fig. 70

0191

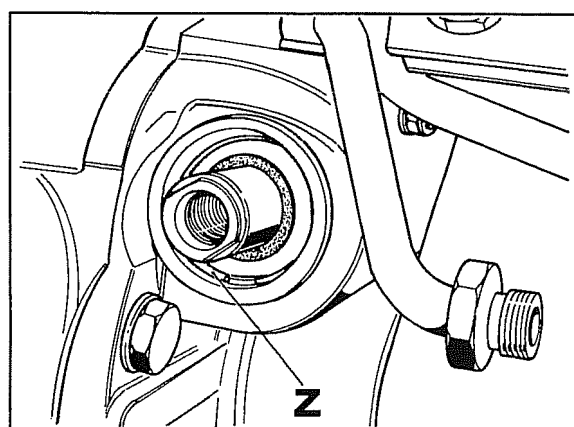


Fig. 71

0192

Overhauling the steering cylinder due to problems with oil leaks

When problems with tractor steering are noted-i.e, the tractor does not drive straight but needs to be continually corrected with the steering wheel, the problem (excluding toe-linked problems) will often be found in leaks in the steering cylinder.

The cylinder can show leaks visible from the outside if they occur:

1. between the piston rods and the outside seal rings
2. on the outside seal rings between cylinder and casing.

There can also be leaks that are not visible from the outside as they occur:

3. between piston and cylinder.
4. on the inside seal rings between cylinder and casing so that the oil is transferred into the front differential.

Use the following test to check for leaks between piston and cylinder (point 3):

- a. Turn the steering wheel all the way to the right.
- b. Disconnect the tube that acts as a drain when steering to the right (**F** Fig. 69).
- c. With the engine running, continue to turn the steering wheel to the right. When you do this, if oil continues to come out of tube **F**, this means that there is a leak. If no oil comes out and you need a certain amount of force to turn the steering wheel, this means there is no leak between piston and cylinder.

If there is a leak on the inside seal rings between cylinder and casing, the oil will drain from the cylinder to the differential. You have proof of this leak when you note the oil level through plug **L** Fig. 68 has increased. If the differential is completely filled, the oil will come out through the oil in the vent plug **G** Fig. 78.

When you have the kind of leaks referred in points 1 and 3, there is no need to dismantle the axle. Just follow these steps:

1. On one side, disconnect the ball joint **A** Fig. 69 from the cylinder rod and on the other side remove the ball joint disconnecting it from both the cylinder rod and the wheel hub control arm **B** Fig. 69.
2. Place a container underneath to hold the oil and then disconnect tubes **C** Fig. 70.
3. Remove the snap ring **D** Fig. 70.
4. Use the special punch to drive cylinder cover **E** inwards until split ring **Z** Fig. 71, is uncovered and then remove the ring.

Repeat steps 3 and 4 on the other side.

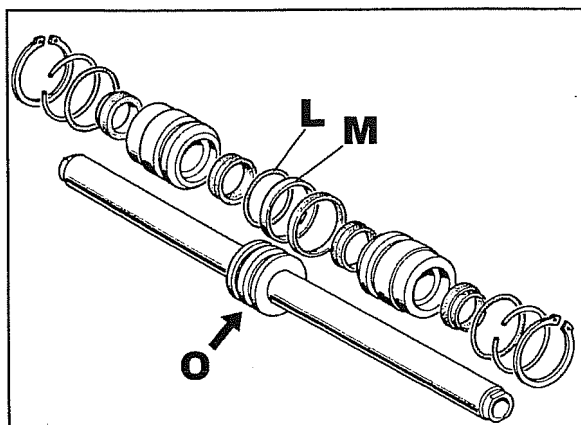


Fig. 72

0193

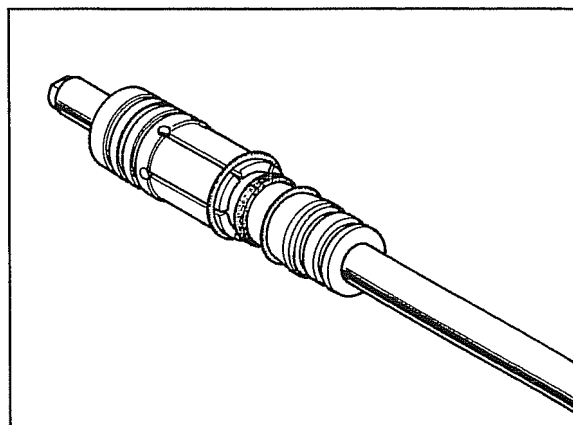


Fig. 73

0194

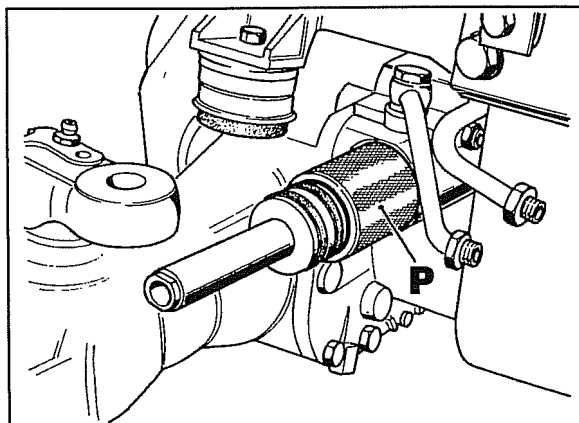


Fig. 74

0195

5. On the side where you remove the ball joint, slip out the piston rod complete with cover, seal rings and piston and then remove the cover on the opposite side.

Fig. 72 gives an exploded view of all the internal parts of the steering cylinder.

6. Change the complete seal kit.

Points to bear in mind when reassembling:

- To fit rings **L-M** Fig. 72 in the seating **O** on the piston, use the combination punch **N** Fig. 73. It is best to heat ring **M** so that it is easier to install due to its thermal expansion.
- Inspect the cylinder to make sure there is no burring that could damage the seal rings during reassembly or scoring that could cause oil leaks.
- Use the special punch **P** Fig. 74 to install the piston in the cylinder. Its internal seating is tapered to facilitate the insertion of the seal rings in the cylinder without damaging them.

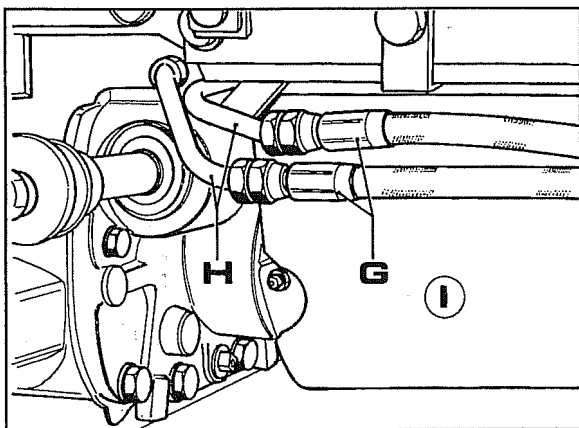


Fig. 75

0156

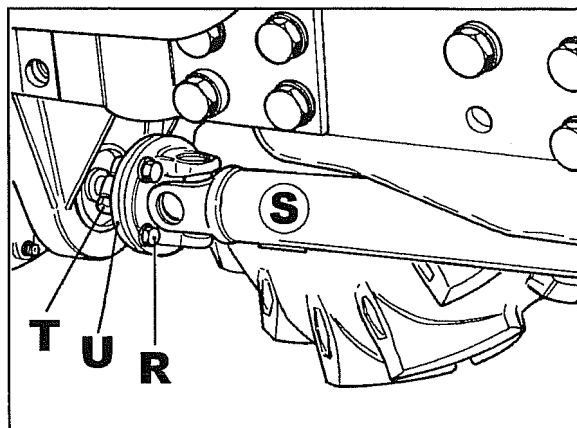


Fig. 76

0157_1

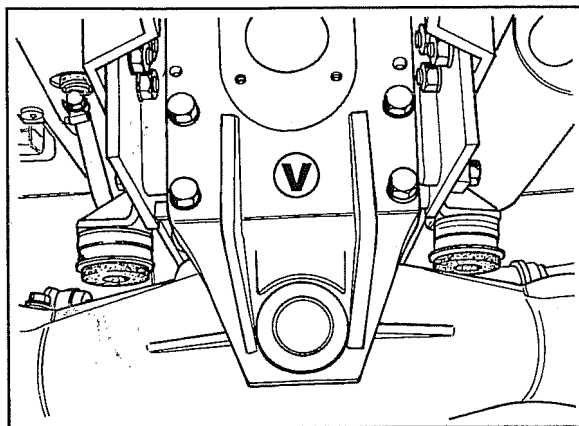


Fig. 77

0196

When you have the kinds of leaks described in points 2 and 4 above, the axle will have to be dismantled from the tractor as follows:

7. Disconnect the two lines **G** Fig. 75. Put plugs in the ends of lines **H** to prevent the oil from leaking out every time the front wheels are turned.

Remove the dual traction shaft guard **I**.

8. Disconnect the dual traction shaft **S** by removing screws **R** Fig. 76 and slide the shaft forward to remove it.

9. Remove screw **T** Fig. 76 and remove flange **U**.

10. Jack up the front of the tractor high enough so that the weight of the tractor is taken off the front axle. Take all necessary precautions so that you can continue to work under absolutely safe conditions.

11. Remove front axle mount **V** Fig. 77, and slide the axle forward so that you can separate it from the tractor.

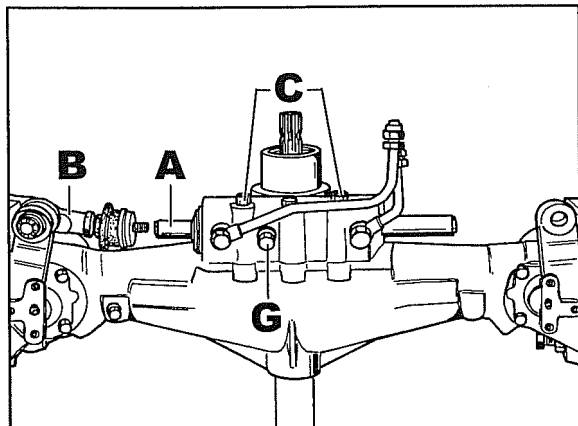


Fig. 78

0197

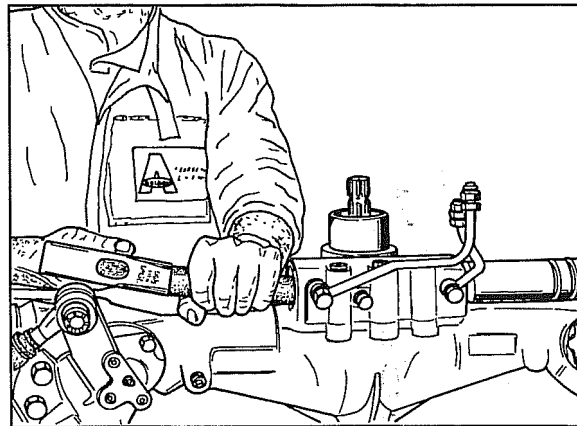


Fig. 79

0198

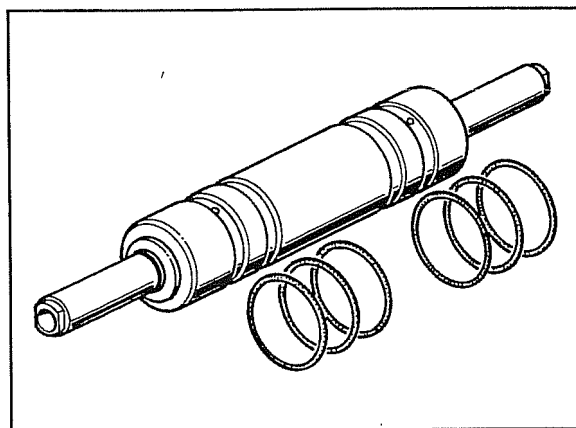


Fig. 80

0199

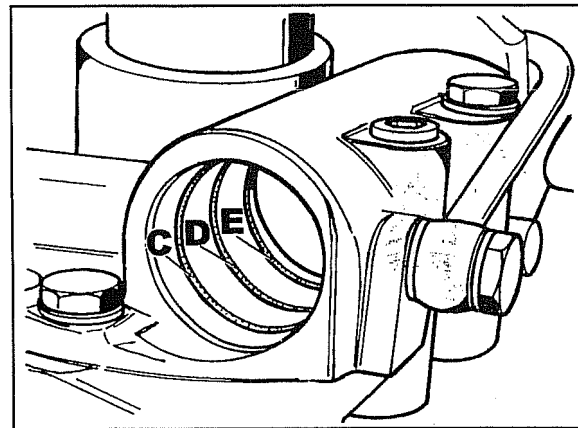


Fig. 81

0200

12. Place the axle as shown in Fig. 78 on a work bench or stand.

13. On one side of the axle, disconnect rod **A** from ball joint **B** Fig. 78 and on the other side remove the ball joint ass'y completely.

14. Remove the two nuts **C** Fig. 78 removing their studs to release the tapered seat cylinder retainer bushings.

15. Place a container to collect the oil underneath the axle and then remove the cylinder from the side from which you disconnected the ball joint. Follow the steps illustrated in Fig. 79.

16. Fig. 80 shows the cylinder with the O-rings to be replaced.

Points to bear in mind when reassembling:

- Before fitting the new rings **C-D-E** (Fig. 81) check to make sure that their seatings in the cylinder are without burrs that could damage the rings when installed and without scoring that could be the source of leaks.
Inspect the cylinder to make sure it is not scored.
- The cylinder retainer nuts **C** Fig. 78 should be tightened to 4 Kgm.

