



Wired and wireless controls

PTO pump

Operation Manual
(Original operating instructions)

2010-9015-019
01 January 2018

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1 General

1.1 Information on the document

The manufacturer reserves the right to make changes due to technical developments in the data and images given in this manual.

Reproductions, translations and copies of any kind, including extracts, require written authorization from the manufacturer.

This manual is supplied with the product.

- This manual should be kept close at hand and remain with the product even if the product is sold.
- This manual is not subject to an amendment service. The most recent version of this manual can be obtained at any time through the technical dealer or directly from the manufacturer.

Necessary documents

- This product documentation is complementary to one of these manuals:

Part Number	Name
2010-90..-012	3-point hitch articulated Agi-Pompe
2010-90..-013	3-point hitch articulated Super Pump
2010-90..-015	Lagoon Agi-Pompe
2010-90..-016	Lagoon Super Pump

Source

The manuals can be sourced as follows:

- Ordering paper versions from the manufacturer
- Downloading file from the Internet (for technical dealers only)
<https://extranet.ft.gea.com/>

Layout elements

Pictograms used



Note

The signaling word indicates information that is important for the product and environment.



This pictogram refers to an information source.
(section, manual, Internet, ...).

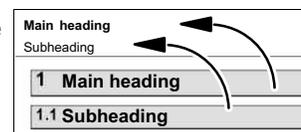
20 .. -90 .. -000 If a manual number is given, the middle 4 digits indicate the language, as follows:

	Language		Language		Language
-9000-	German	-9013-	Dutch	-9032-	Serbian
-9001-	English (United Kingdom)	-9015-	English (North American)	-9034-	Slovak
-9002-	French (France)	-9016-	Polish	-9035-	Chinese
-9003-	Italian	-9018-	Japanese	-9036-	Lithuanian
-9004-	Romanian	-9021-	Danish	-9038-	Portuguese (Brazil)
-9005-	Spanish (Spain)	-9022-	Hungarian	-9039-	French (Canada)
-9007-	Swedish	-9023-	Czech	-9040-	Latvian
-9008-	Norwegian	-9024-	Finnish	-9041-	Estonian
-9009-	Russian	-9025-	Croatian	-9043-	Spanish (Central America)
-9010-	Greek	-9027-	Bulgarian	-9050-	Vietnamese
-9012-	Turkish	-9029-	Slovene		

The instruction manuals may not available in all listed languages.

Header

The top line on each page provides information on the main subject of that page.



1.2 Manufacturer's address

GEA Farm Technologies Canada Inc. / Division GEA Houle
4591 boul. St-Joseph
Drummondville, Qc, J2A 0C6

 +1 819 477 - 7444
 +1 819 477 - 5565
 geahoule@gea.com
 www.gea.com

1.3 Customer service

Authorized Dealer

If necessary, contact your nearest authorized dealer.

There is a comprehensive dealer Internet search function on our website at the following address:

www.gea.com

European contact information:

GEA Farm Technologies GmbH
Siemensstraße 25-27
D-59199 Bönen

 +49 (0) 2383 / 93-70
 +49 (0) 2383 / 93-80
 contact@gea.com
 www.gea.com

US Contact Information:

GEA Farm Technologies, Inc.
1880 Country Farm Dr.
Naperville, IL 60563

 +1 630 369 - 8100
 +1 630 369 - 9875
 contact_us@gea.com
 www.gea.com

2 Safety

2.1 Intended Use

The wired control is exclusively designed to:

- Operate hydraulic components/functions of a GEA articulated pump or a GEA lagoon pump.

Applications which are not listed here are not part of the intended use and are therefore considered as improper use!

The manufacturer/supplier is not liable for any resulting damage. The user alone bears the risk.

Correct use also includes reading the instructions and observing the inspection and maintenance conditions.

- The manufacturer expressly points out that only original parts, original accessories and original chemicals are adapted, tested and authorized to be used with this product.
- The installation or use of products from other manufacturers may affect the specified properties of the original parts and lead to injury to people and animals.
- The manufacturer does not accept any liability for injury to people or animals, or damage to the product, caused by the use of products from other manufacturers.

2.2 Owner's obligation of care

The product has been designed and constructed taking account of a potential risk analysis and after careful selection of the compliant harmonized standards and other technical specifications. It therefore ensures a maximum level of safety.

This safety can only be achieved in practice on the farm however when all of the necessary measures have been taken. It is part of the farmer's obligation of care to plan these measures and check that they are carried out.
(producing appropriate operating instructions for example)

The owner must ensure the following:

- A complete, legible copy of the manual must always be available at the place where the product is installed.
- All persons who carry out work on the product must be able to consult the manual at any time.
- The instructions given in the section on "Basic Safety Instructions" must be followed.
- The legal requirements are observed.
- The product may only be used for its intended purpose.
- The product may only be used if it is in perfect working condition. The safety devices especially must be checked regularly to ensure they are working.
- The personnel is regularly instructed in all relevant matters of safety at work and protection of the environment and is familiar with the manual, particularly the safety instructions it contains.

2.3 Subsequent modifications

Unauthorized product changes may have a negative impact on the service life or function of the product.

For safety reasons, do not carry out any unauthorized changes!

Scheduled modifications must be approved in writing by the manufacturer.

2.4 Explanation of the safety symbols warnings used

The safety symbols draw attention to the importance of the adjacent text.

The design of the warnings is based on ISO 3864-2 and ANSI535.6.

Safety symbols and key words



Danger!

The signaling word indicates an immediate danger that will lead to loss of life or serious physical injury.



Warning!

The signaling word indicates an immediate danger that could lead to loss of life or serious physical injury.



Caution!

The signaling word indicates hazardous situations that could cause physical injury.

Attention!

The signaling word indicates hazardous situations that could cause damage to property or malfunction.

2.5 General safety instructions and dangers

**Note**

There are warnings about specific residual dangers in the corresponding chapters.

- Work or activities connected with the product might involve risks. The safety information and operating instructions in this manual must always be followed to ensure that the product is used safely.
- Permissible operating conditions (pressure ranges, temperature ranges, air flow, etc.) are given in the section on "Technical Data" and must be observed.
- Do not stand underneath suspended loads.
- When working with cleaning and disinfecting agents observe the notes on dangers and protective measures (risk of caustic burns)!
- Do not open or dismantle devices (risk of injury)!

3 Description

3.1 Structural description



1	Wired control
2	Wireless control - optional (1 function)
3	Wireless control - optional (3 functions)
4	Control box
5	Solenoid valve box

3.2 Functional Description

The wired control and wireless control allow to operate hydraulic functions/components of an articulated pump or a lagoon pump. The control box receive command from the wired/wireless control and activates proper solenoid valve controlling the hydraulic function.

3.3 Technical Data

Geometric data

Control box	
Length	10" (254 mm)
Width	7" (178 mm)
Height	5½" (140 mm)

Wired control		
	Configuration # 1-2-3-4	Configuration # 5-6-7-8
Length	6¼" (160 mm)	7½" (180 mm)
Width	3½" (90 mm)	4¾" (120 mm)
Height	2½" (60,5 mm)	2½" (60,5 mm)

Wireless control (3-function model)	
Length	7" (177 mm)
Width	3½" (90 mm)
Height	1¾" (44 mm)

Hydraulic hoses

I.D.	¼"	½"	¾"
O.D.	0.58"	0.86"	1.10"
Quantity of braids	2	2	2
Service pressure	400 bar (5800 psi)	276 bar (4000 psi)	207 bar (3000 psi)

Control box specifications

Certification IP67
DIN connector with 4 ft cable
FUSE CERAMIC 10A 250VAC (EATON BK/MDA-10-R)

Wired control specifications

18 ft (550cm) cable
8 possible configurations

Wireless control specifications

Transmitting frequency: 2.4 GHz
Maximum transmitting distance: 400 ft (122 m)*
Power supply: Rechargeable LiPo battery - 2000 mAh
Splash proof

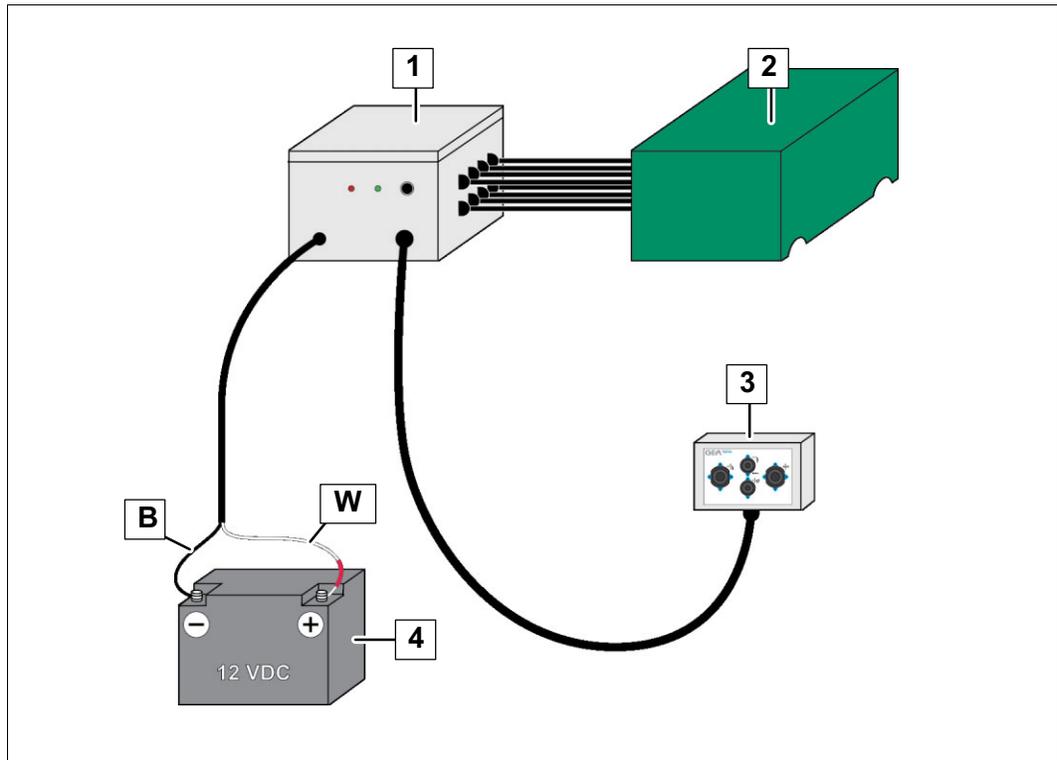
* Distance can be achieved only under favorable climatic conditions (clear sky) and without interferences.

4 Assembly and installation

If necessary, contact your nearest authorized dealer.

4.1 Electrical connections

Note Connect the control box to the tractor battery as illustrated.



1	Control box	2	Solenoid valves for hydraulic
3	Wired control	4	Tractor battery (12 VDC)
B	Black wire (-)	W	White wire (+)

4.2 Hydraulic connections

 Refer to hydraulic diagram in Appendix section.

5 Commissioning

 Refer to the pump instruction manual for complete product commissioning.

6 Operation



Refer to the pump instruction manual to correctly and safely operate the pump.

6.1 Wired control operation

6.1.1 Possible configurations

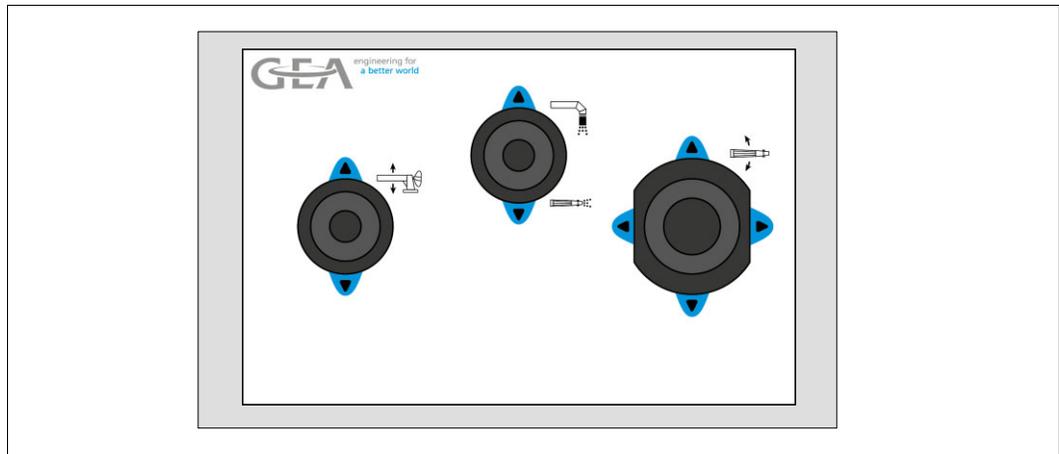
Configuration # 1 (4-function control)

To be used with articulated pump or lagoon pump



Note!

On articulated pump, the first cylinder must be connected directly to the tractor.



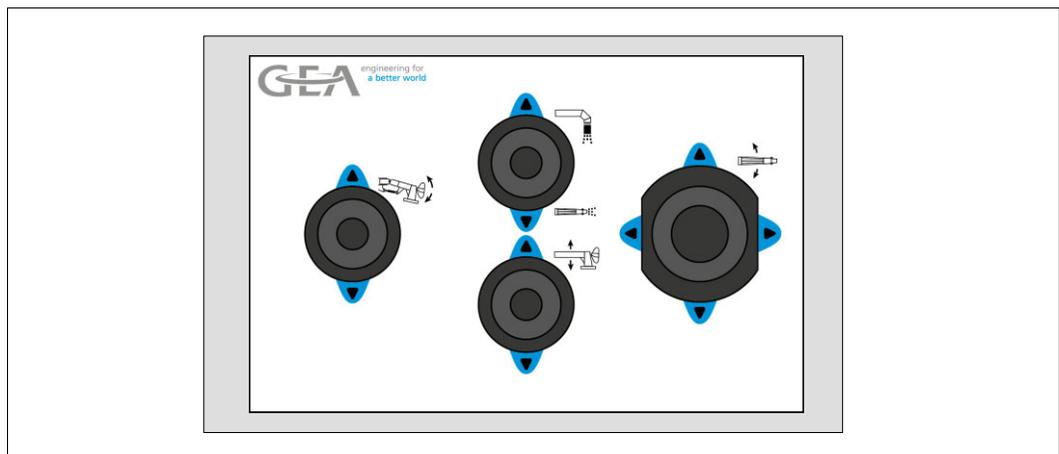
Configuration # 2 (5-function control)

To be used with articulated pump or lagoon pump



Note!

On articulated pump, the first cylinder must be connected directly to the tractor.



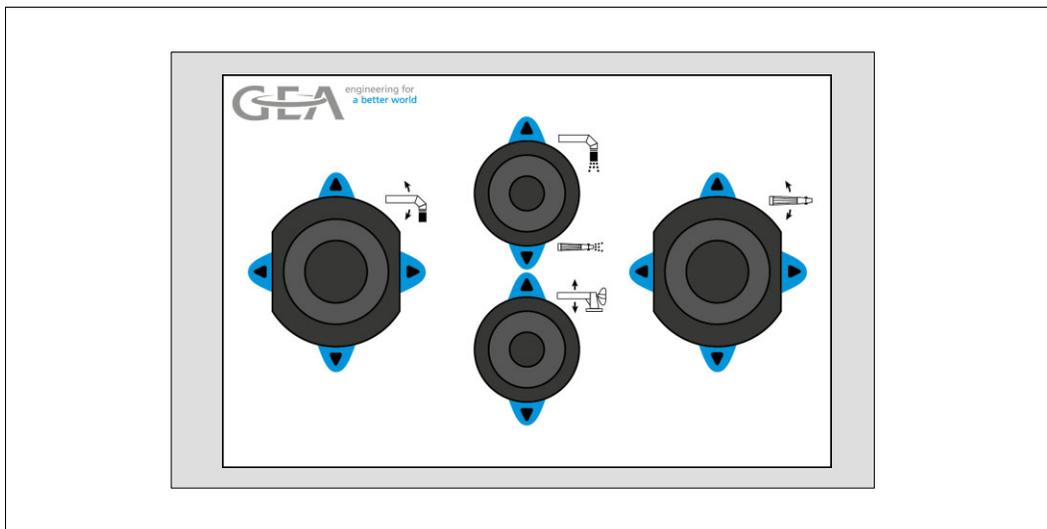
Configuration # 3 (6-function control)

To be used with articulated pump or lagoon pump



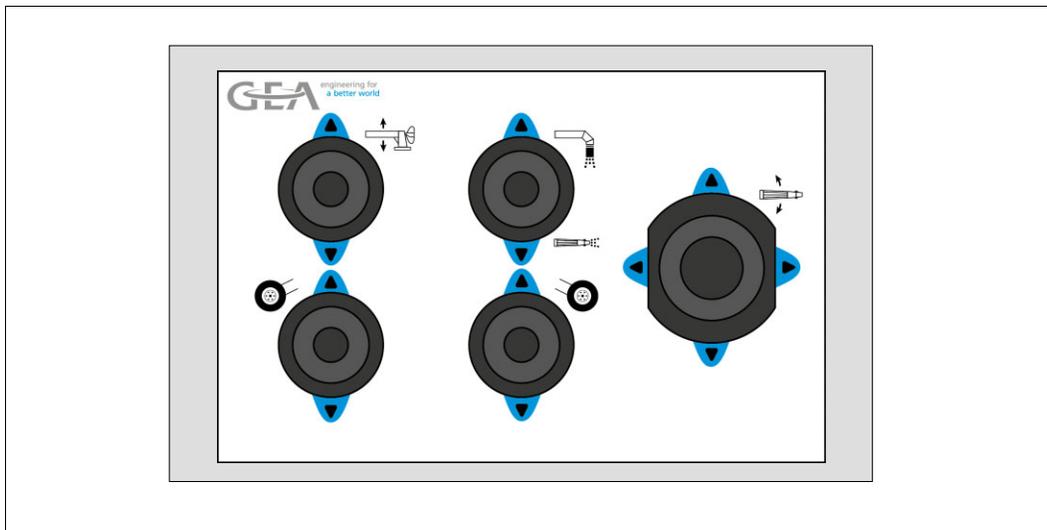
Note!

On articulated pump, the first cylinder must be connected directly to the tractor.



Configuration # 4 (6-function control)

To be used with lagoon pump



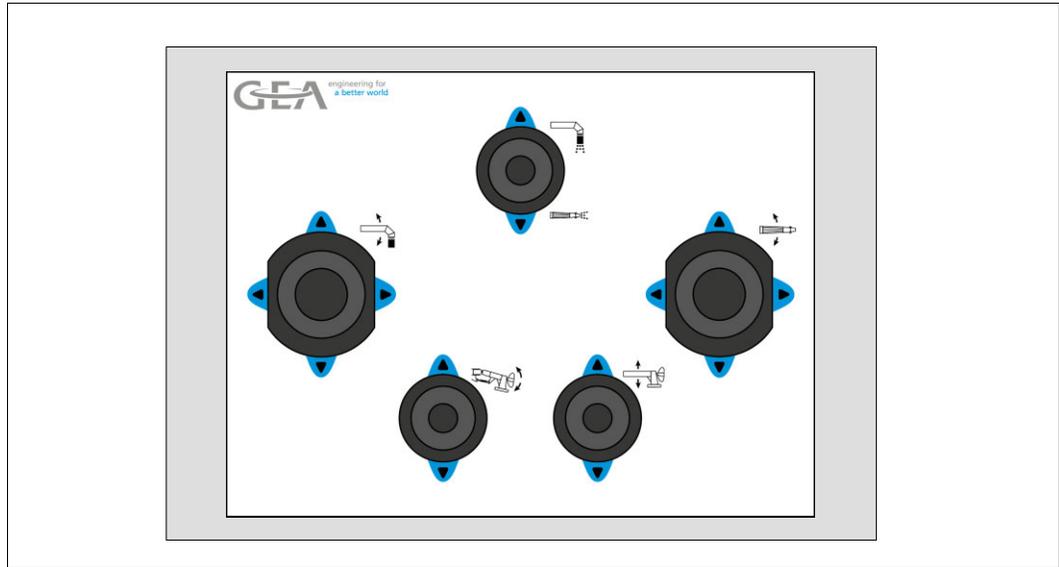
Configuration # 5 (7-function control)

To be used with articulated pump or lagoon pump



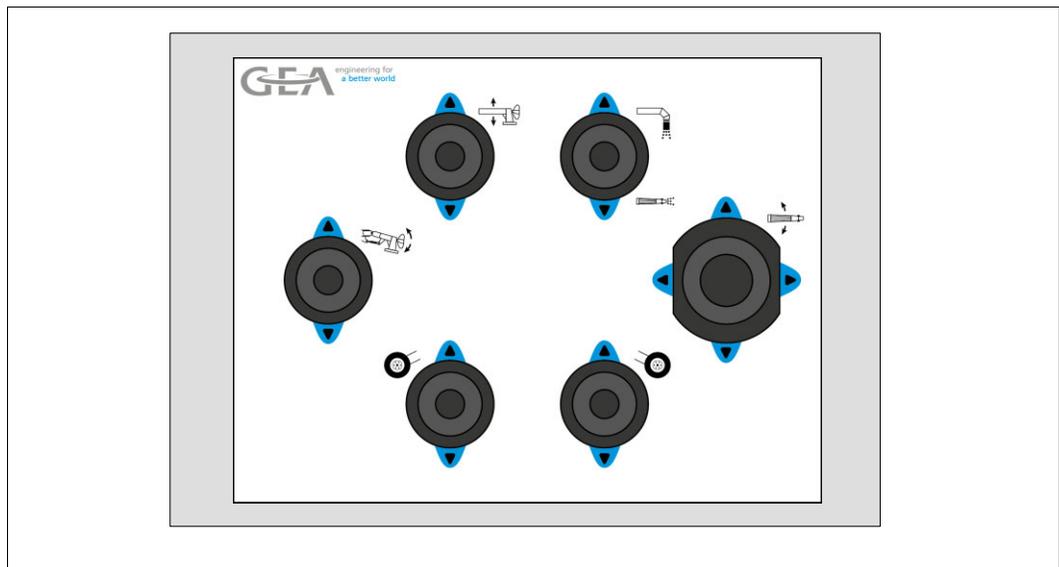
Note!

On articulated pump, the first cylinder must be connected directly to the tractor.



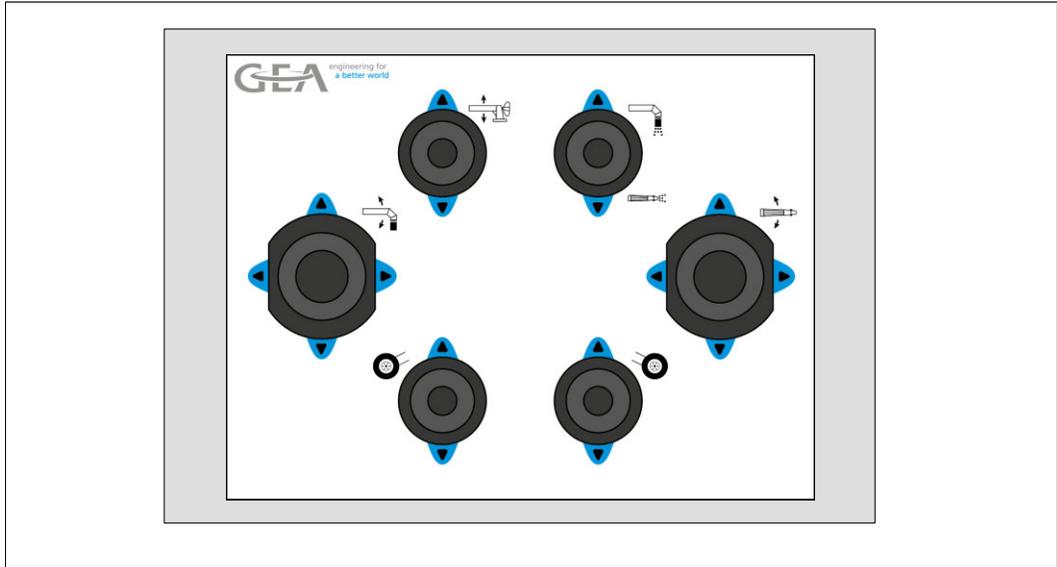
Configuration # 6 (7-function control)

To be used with lagoon pump



Configuration # 7 (8-function control)

To be used with lagoon pump



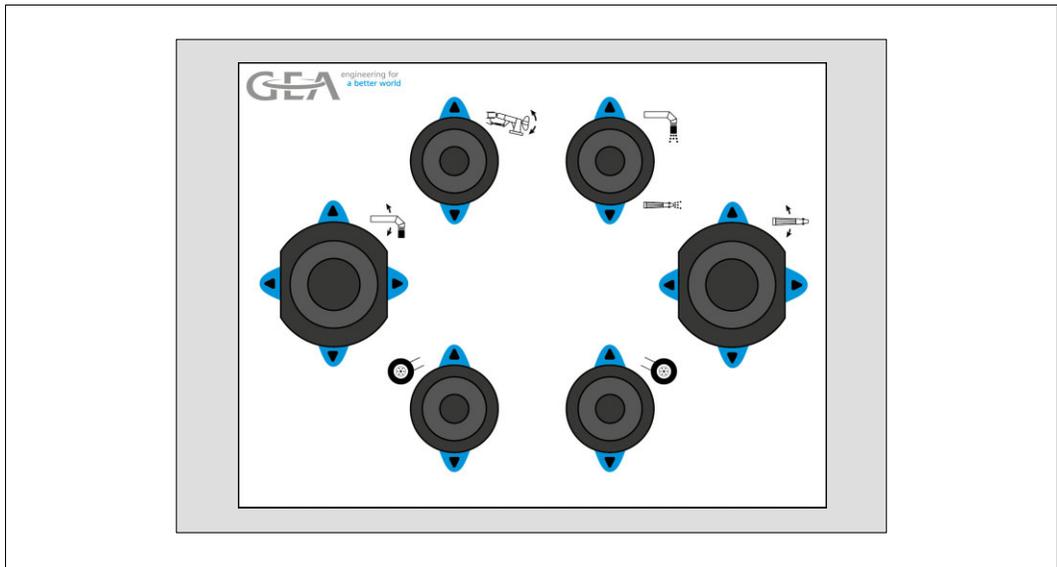
Configuration # 8 (8-function control)

To be used with lagoon pump

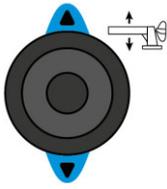
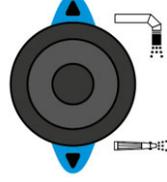
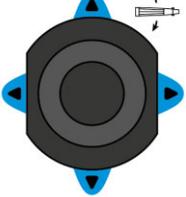
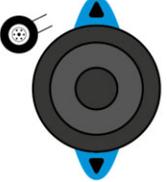
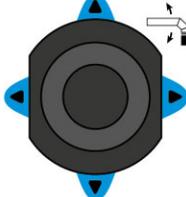


Note!

Hydraulic hoses for the function allowing to raise or lower the pump must be connected directly to the tractor.



6.1.2 Description of control elements

	<p>Allows to raise or lower the pump.</p>
	<p>Allows to select loading or agitation mode.</p>
	<p>Allows to move the agitation nozzle (up - down - left - right).</p>
	<p>Allows to raise or lower the right wheel.</p>
	<p>Allows to raise or lower the left wheel.</p>
	<p>Allows to position the articulated loading pipe (up - down - left - right).</p>
	<p>Allows to raise or lower the articulated propeller.</p>

6.1.3 Wired control operation



Warning!

Always operate the pump from the tractor cab to quickly stop the tractor in case of emergency.



Warning!

Never leave the equipment unattended while the tractor is operating.

Attention!

Never set the hydraulic flow over 16 GPM when operating the pump.

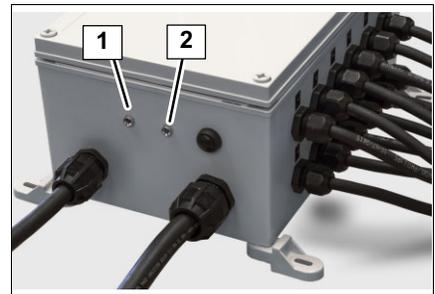


Note

Prior to use the control, make sure the control box and the hydraulic hoses are connected to the tractor.

6.1.3.1 Control box indicator light

- When the control box is supplied, the red LED (1) flashes once a second.
- When an hydraulic function is activated by the control, the green LED (2) turns on for a second then stays off during operation.



Refer to Troubleshooting section

6.1.3.2 Wired control

- To operate the pump hydraulic components, use the corresponding button on the remote control. Refer to section Description of control elements.

6.1.3.3 Control box fuse replacement



Warning!

Risk of electric shock!

Do not replace the fuse when the control box is supplied.

- ▶ Always shut down or disconnect the control box before removing the control box cover.

Attention!

Risk of electric damage!

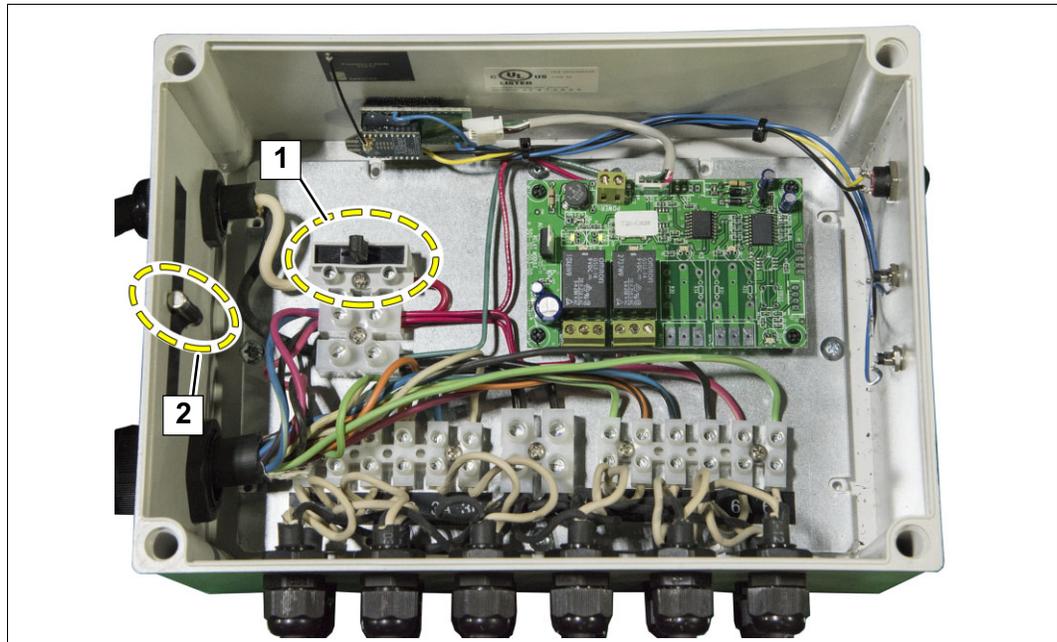
Do not use metal tools and/or objects to remove the fuse from the control box.

- ▶ Use fingers.



Note

Do not perform work inside the control box other than replacing the fuse.



- Remove the control box cover using a screwdriver;
- Open the fuse socket (1) using fingers;
- Replace the fuse. Use the spare fuse (2) provided;
- Close the fuse socket (1) using fingers and install the cover.

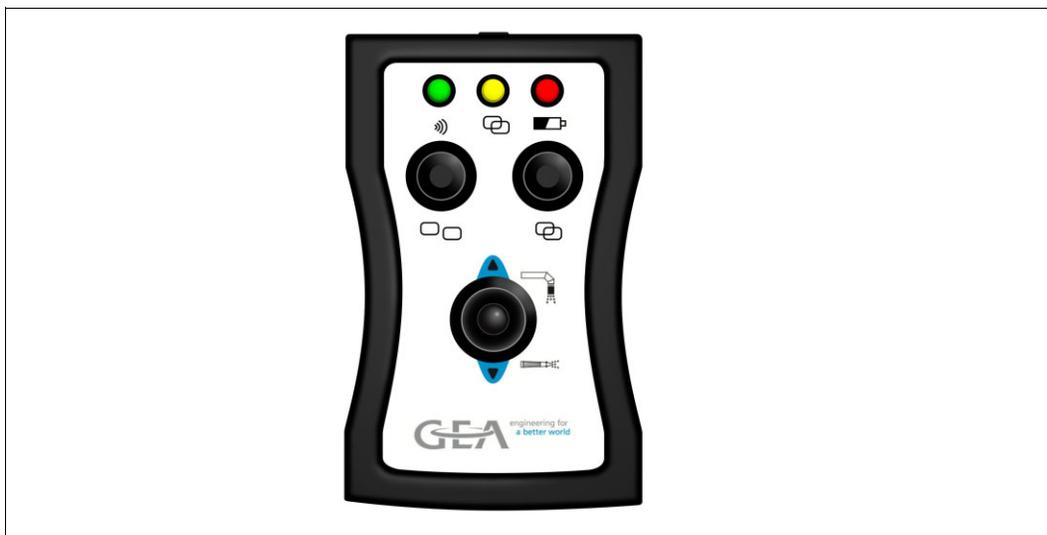
6.2 Wireless remote control operation (option)

Note
The wireless remote control can operate within a 400 ft (122m) range from the control box.

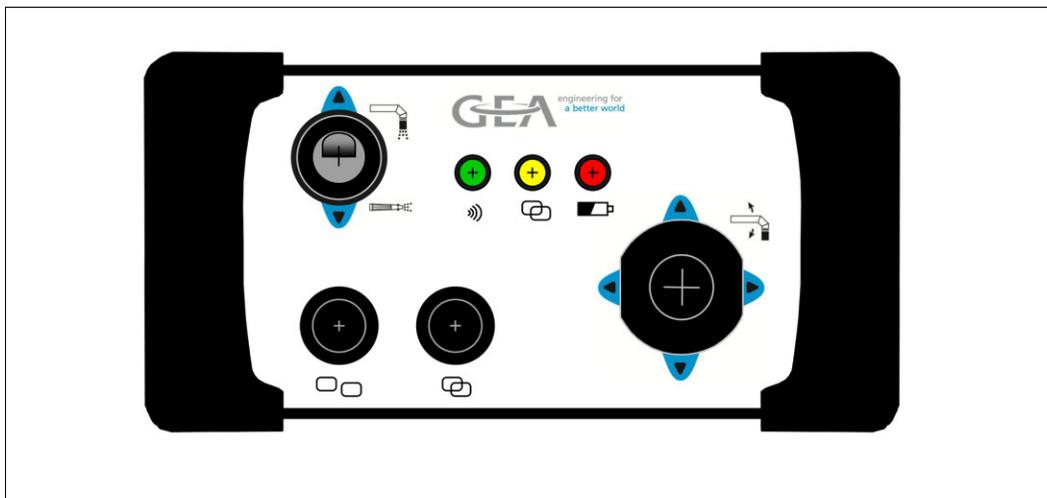
Note
A maximum of 16 wireless remote control can be connected to a control box. Only one wireless remote control can be connected at a time.

6.2.1 Possible configurations

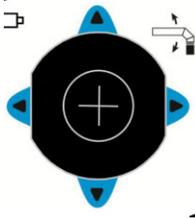
1-function remote control



3-function remote control



6.2.2 Description of control elements

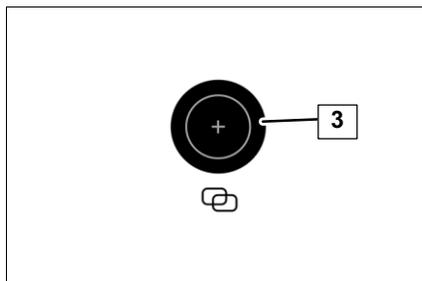
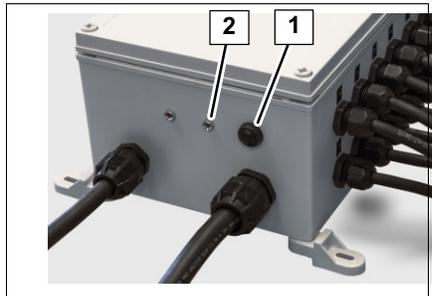
	<p>Allows to select loading or agitation mode.</p>
	<p>Allows to position the articulated loading pipe (up - down - left - right).</p>
	<p>Allows to disconnect the remote from the control box.</p>
	<p>Allows to connect the remote to the control box.</p>
	<p>Transmitting indicator light The LED flashes quickly when a remote function is activated.</p>
	<p>Connection indicator light The LED turns on when the remote is connected to the control box.</p>
	<p>Low batteries light indicator The LED turns on when the battery is low. (less than 20%)</p>
	<p>Charging indicator light The LED turns on when charging is activated</p>
	<p>Charging plug</p>

6.2.3 Remote control setting

6.2.3.1 Remote control programming

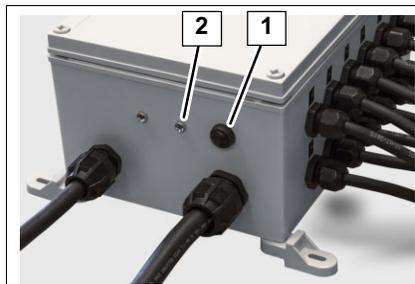
1. Push and hold the control box button (1) for 3 seconds then release it.
 - The green LED (2) turns on when the programming mode is activated. Once activated, the remote must be programmed within 60 seconds. After 60 seconds, the programming mode turns off.

2. Push the connection button (3) on the remote control to synchronize it with the control box.
 - The remote green LED flashes every 5 seconds.
 - The yellow LED is on when the remote is programmed.



6.2.3.2 Remote control reset

1. Push and hold the control box button (1) for 15 seconds then release it.
 - The green LED (2) flashes for 3 seconds and the remote LEDs turn off when the remote is reset.



Note

Once reset, the remote cannot be connected to the control box.

6.2.3.3 Remote control battery charge



Note

When the battery is low, the remote control cannot connect with the control box.

To charge the remote battery, connect the remote control to a 12VDC power source from the tractor. On the remote control, the charging light indicator turns on while the remote is charging.

Charge time	
1-function remote	6 hours
3-function remote	9.5 hours

6.2.4 Wireless remote control operation

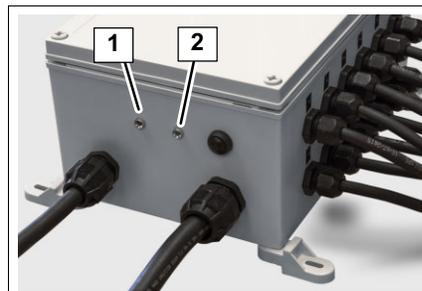


Note

Prior to use the remote control, make sure the control box and the hydraulic hoses are connected to the tractor.

6.2.4.1 Control box indicator lights

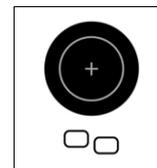
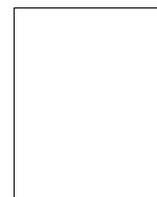
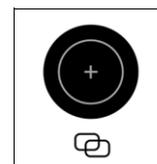
- When the control box is supplied, the red LED (1) flashes every second.
- When an hydraulic function is activated, the green LED (2) flashes once then stays off during operation.



Refer to Troubleshooting section

6.2.4.2 Wireless remote control

1. Push the button to connect the remote to the control box.
 - When connected, the remote beeps once and the connection indicator light turns on. The transmission indicator light (green LED) flashes every 5 seconds.
2. To operate the pump hydraulic components, use the corresponding button on the remote control. Refer to section Description of control elements.
 - When operating a hydraulic component with the remote, the transmission indicator light (green LED) flashes quickly.
3. Push the button to disconnect the remote from the control box.
 - When disconnected, the remote control beeps twice and the indicator lights turn off.



Note

When the remote is out of range for more than 40 seconds, the remote control disconnects from the control box automatically.

7 Troubleshooting

If necessary, contact your nearest authorized dealer.

7.1 Faults and troubleshooting help

Wired and wireless control		
Symptom	Possible Cause	Remedy (by)
The hydraulic component of the pump does not move when engaging a function on the remote.	The tractor hydraulic lever is in the wrong position.	Set the tractor hydraulic lever on the opposite way and try again.
	The control box is not supplied.	Check if the control box red LED indicator flashes every second. If not, check electric connection.
		Replace the fuse. Refer to section Operation - Wired control operation - Control box fuse replacement.
	The wireless remote control is not connected.	Push the connection button on the wireless control. The green light should blink every 5 seconds.
The wireless remote control is not programmed.	Program the wireless control. Refer to section Operation - Wireless remote control operation - Remote control setting.	
The tractor makes loud noise when no hydraulic function is engaged. The noise reduces when engaging an hydraulic function.	The control box is not adapted for a tractor equipped with an open center hydraulic system.	Contact your dealer to convert the control to an open center hydraulic system.

Wireless control		
Symptom	Possible Cause	Remedy (by)
The remote control turns off by itself.	Too much distance between the remote control and the control box.	Reduce the distance between the remote control and the control box.
	Obstacle between the remote control and the control box.	Move to another location to reconnect.
	Wireless remote battery is low.	Charge the battery.
The remote control remains off and beeps twice.	Another remote control is already connected to the control box.	Try to connect later.
The remote control does not disconnect from the control box.	Too much distance between the remote control and the control box.	Reduce the distance between the remote control and the control box. Remove the obstacle.
		Wait for the system to disconnect the remote by itself. It will take about 40 seconds.
	Obstacle between the remote control and the control box.	Move to another location to reconnect.
The remote control green LED indicator keeps on flashing when trying to reset the remote control.	The remote cannot be reset since the system is in programming mode.	Press and hold the reset button for 15 seconds. Contact your dealer if the problem persists.
No lights, no sound when pressing any button.	The battery is too low.	Charge the battery.

Troubleshooting

Faults and troubleshooting help

Wireless control		
Symptom	Possible Cause	Remedy (by)
The remote control does not connect.	The control box is not supplied.	Check if the control box red LED indicator flashes every second. If not, check electric connection. Replace the fuse. Refer to section Operation - Wired control operation - Control box fuse replacement.
	The wireless remote control is not programmed.	Program the wireless control. Refer to section Operation - Wireless remote control operation - Remote control setting.

7.2 Light indicator

Control box		
Light	Status	Meaning
RED	Flashes every second	The wired or wireless system is supplied.
GREEN	Turns on for a second then turns off	The wired or wireless system is supplied.
	Flashes every 5 seconds	The wireless remote control communicates with the control box.

Wireless remote control		
Light	Status	Meaning
GREEN	Flashes quickly	The wireless remote control button is pressed and operates normally.
	Flashes every 5 seconds	The wireless remote control is synchronized with the control box.
	Turns on for a second then turns off	The wireless remote control is not programmed.
YELLOW	On	The wireless remote is synchronized with the control box.
RED	On	The wireless remote battery is low (under 20%). Charge is required.
RED (Charging)	On	The wireless remote is plug and is charging.

8 Shut-down

8.1 Temporary decommissioning

Attention!

Risk of damage!

Wet and warm environment can damage the wireless control battery.

- Make sure to store the remote control in a dry and cool environment, at a temperature ranging between 5°C and 20°C.

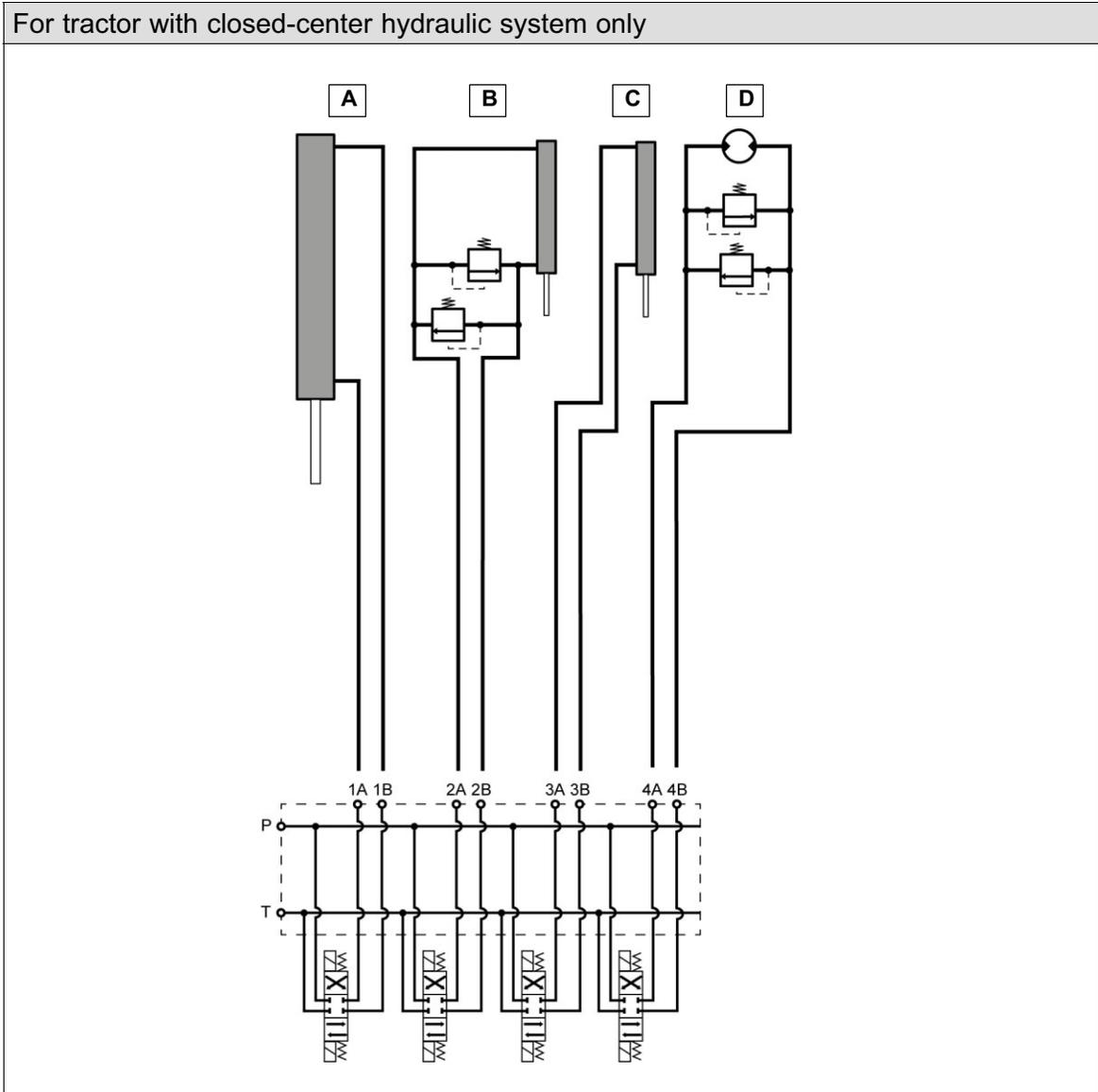
Attention!

Make sure to charge the battery before storing the remote control.

9 Appendix

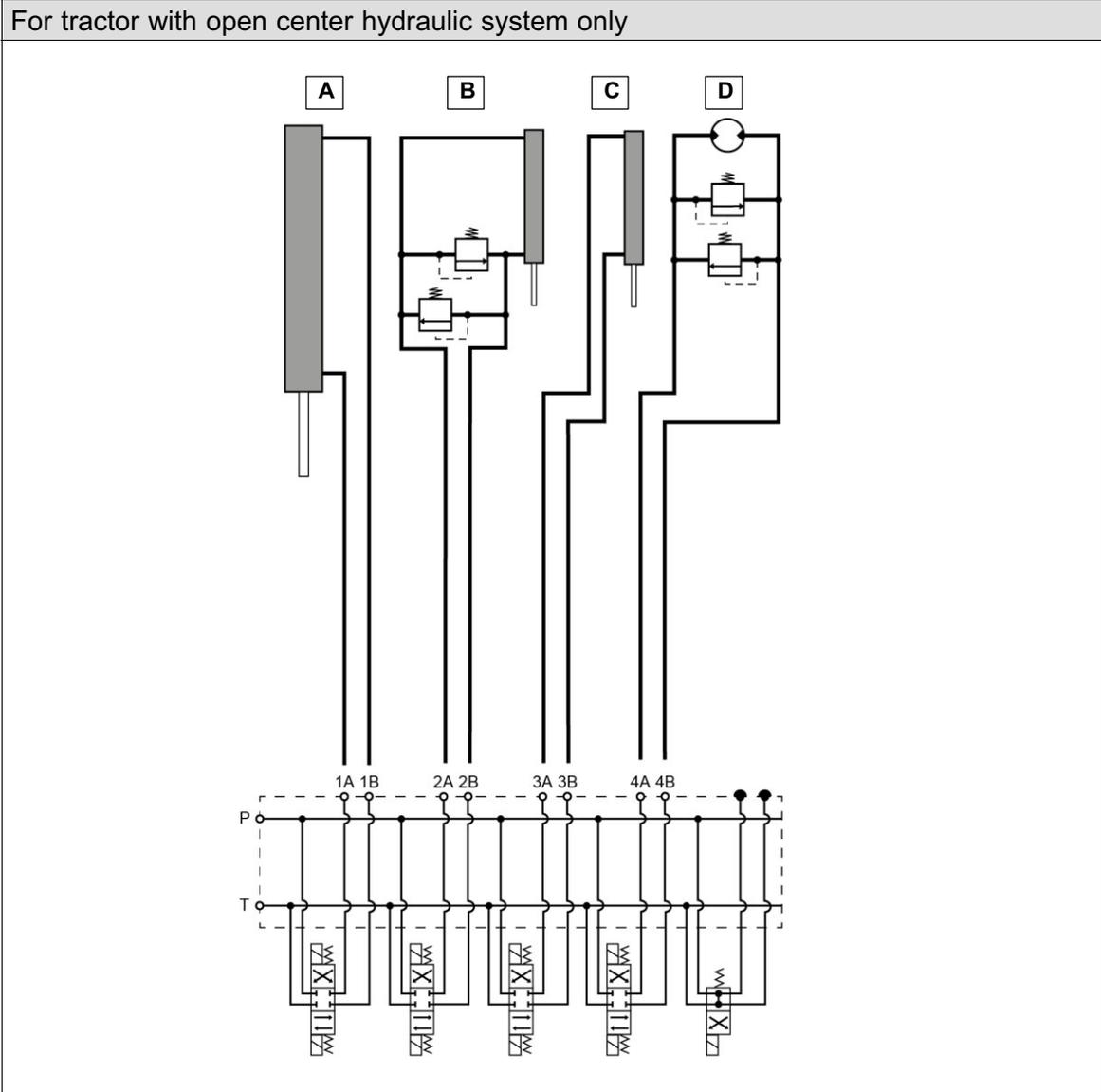
9.1 Hydraulic diagram

9.1.1 4 Functions - Articulated pump



Legend:

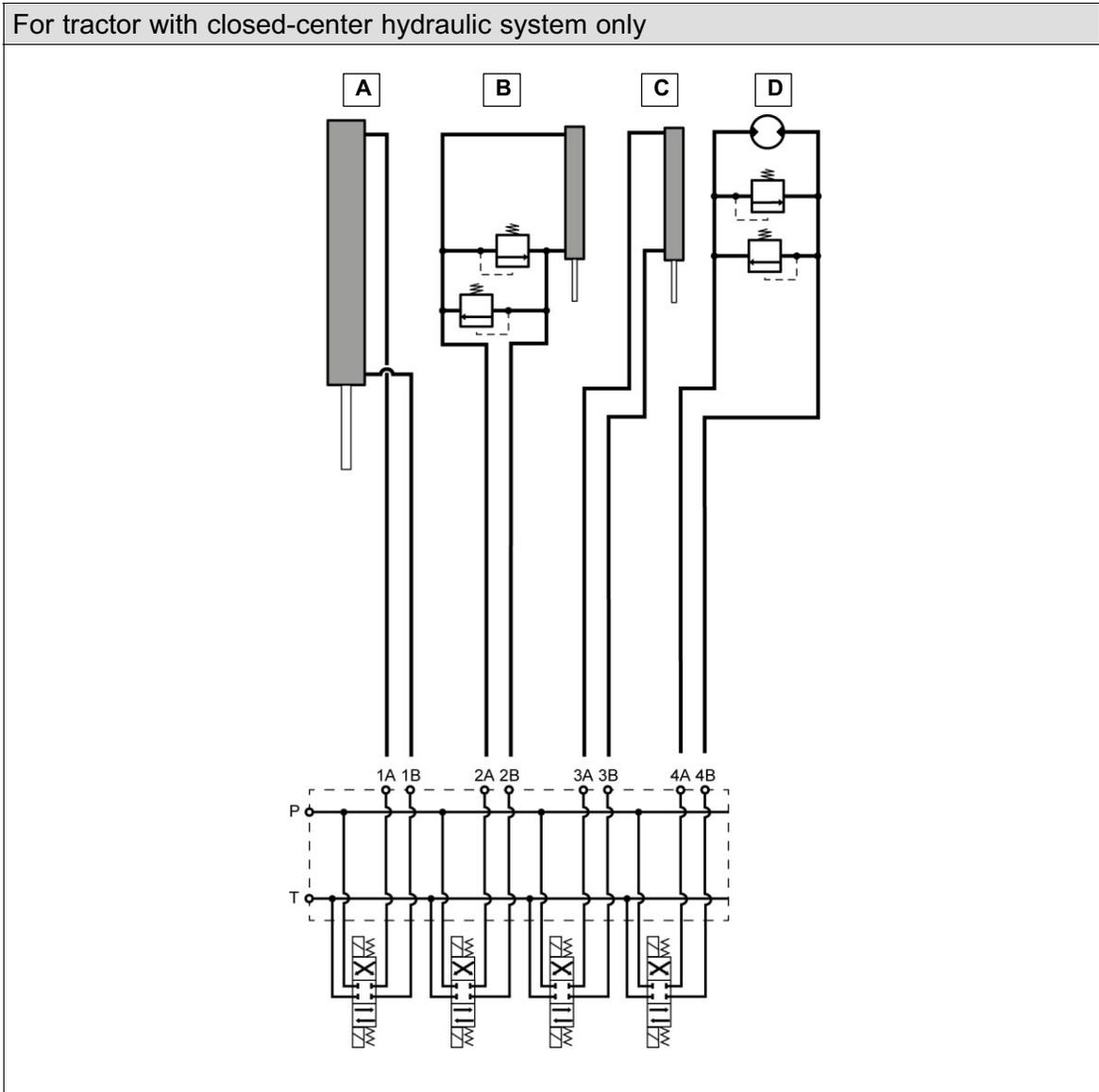
A	Articulation cylinder	C	Nozzle articulation cylinder
B	Directional valve cylinder	D	Nozzle hydraulic motor



Legend:

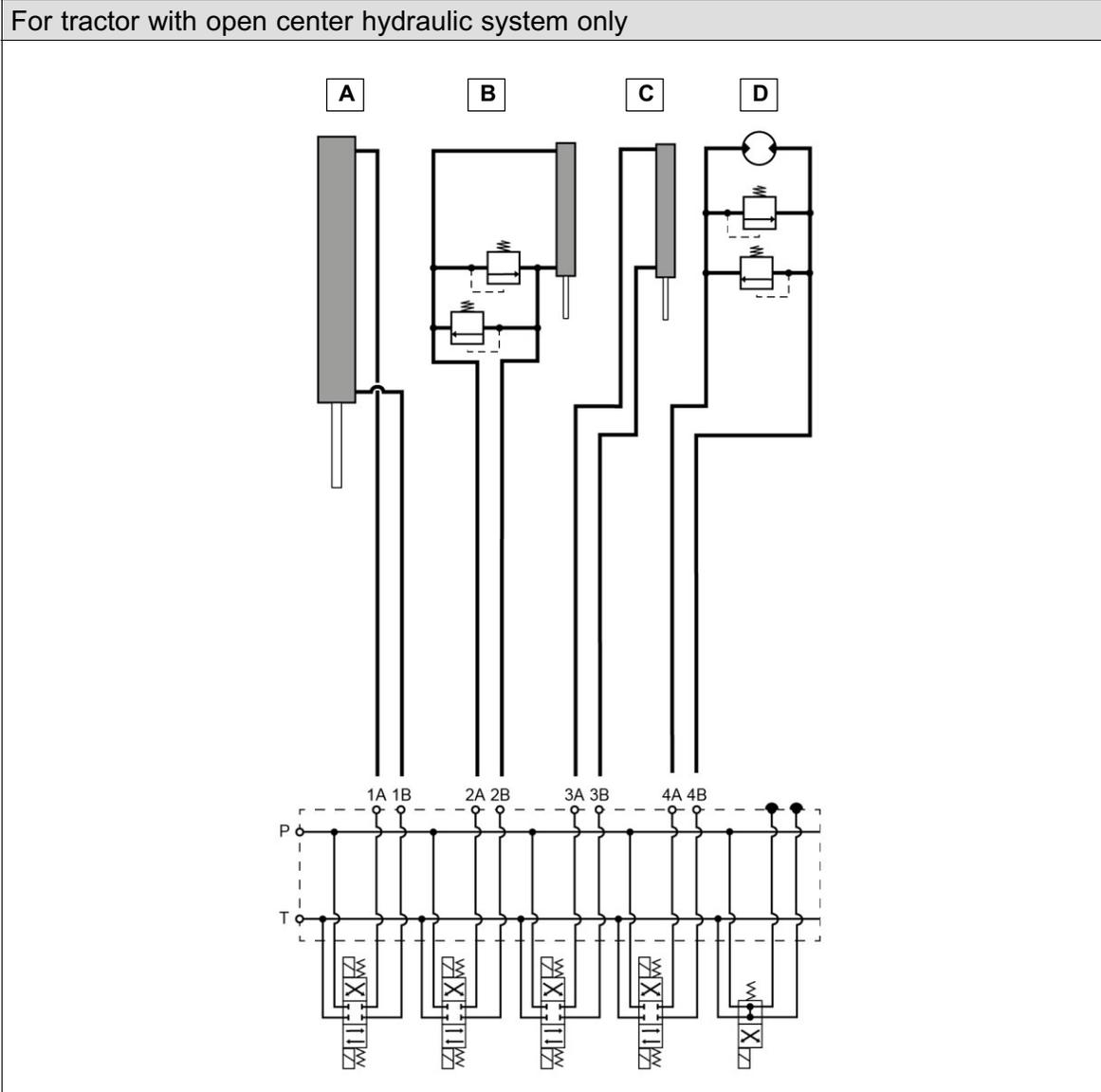
A	Articulation cylinder	C	Nozzle articulation cylinder
B	Directional valve cylinder	D	Nozzle hydraulic motor

9.1.2 4 Functions - Lagoon pump



Legend:

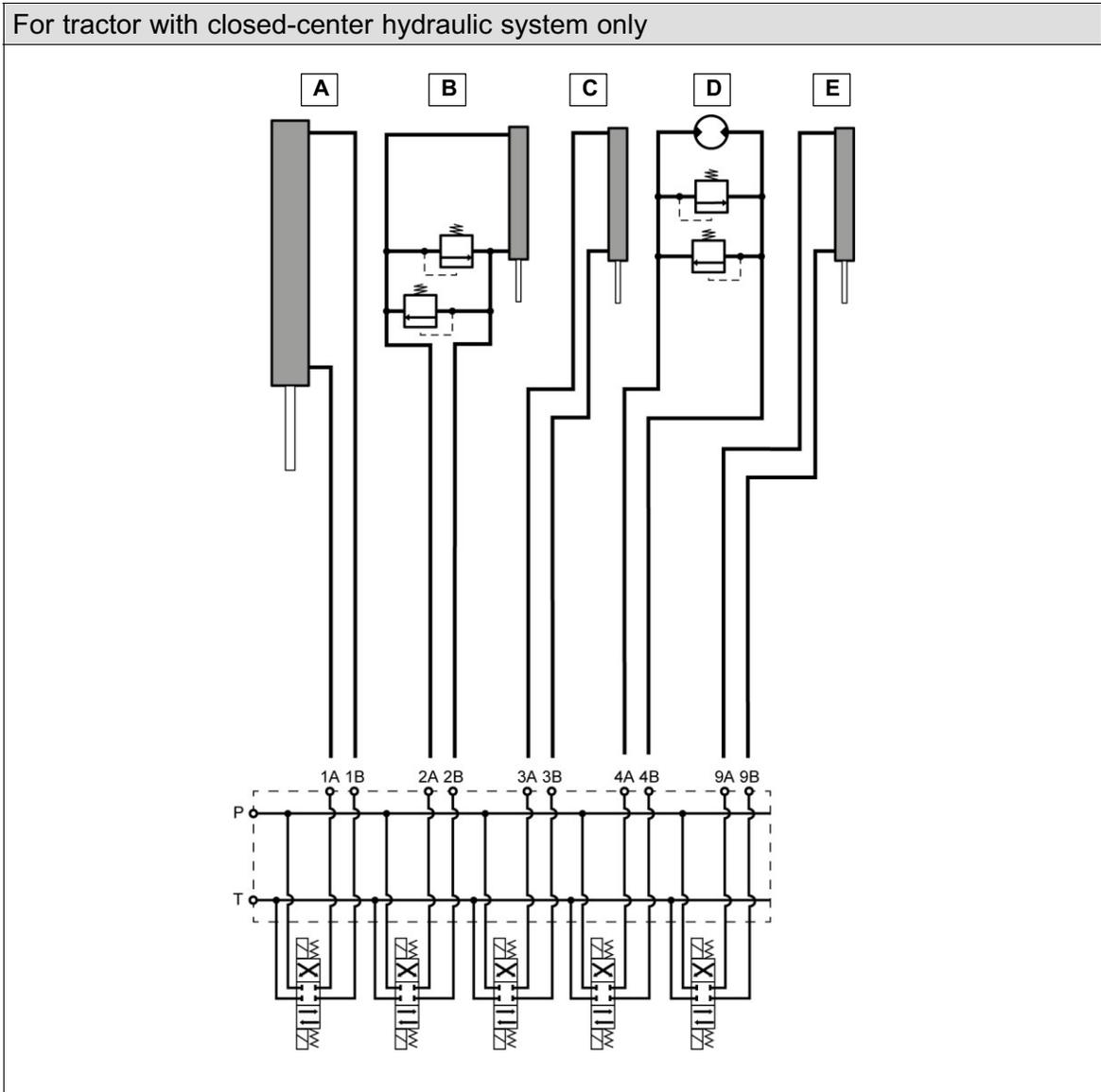
A	Undercarriage cylinder	C	Nozzle articulation cylinder
B	Directional valve cylinder	D	Nozzle hydraulic motor



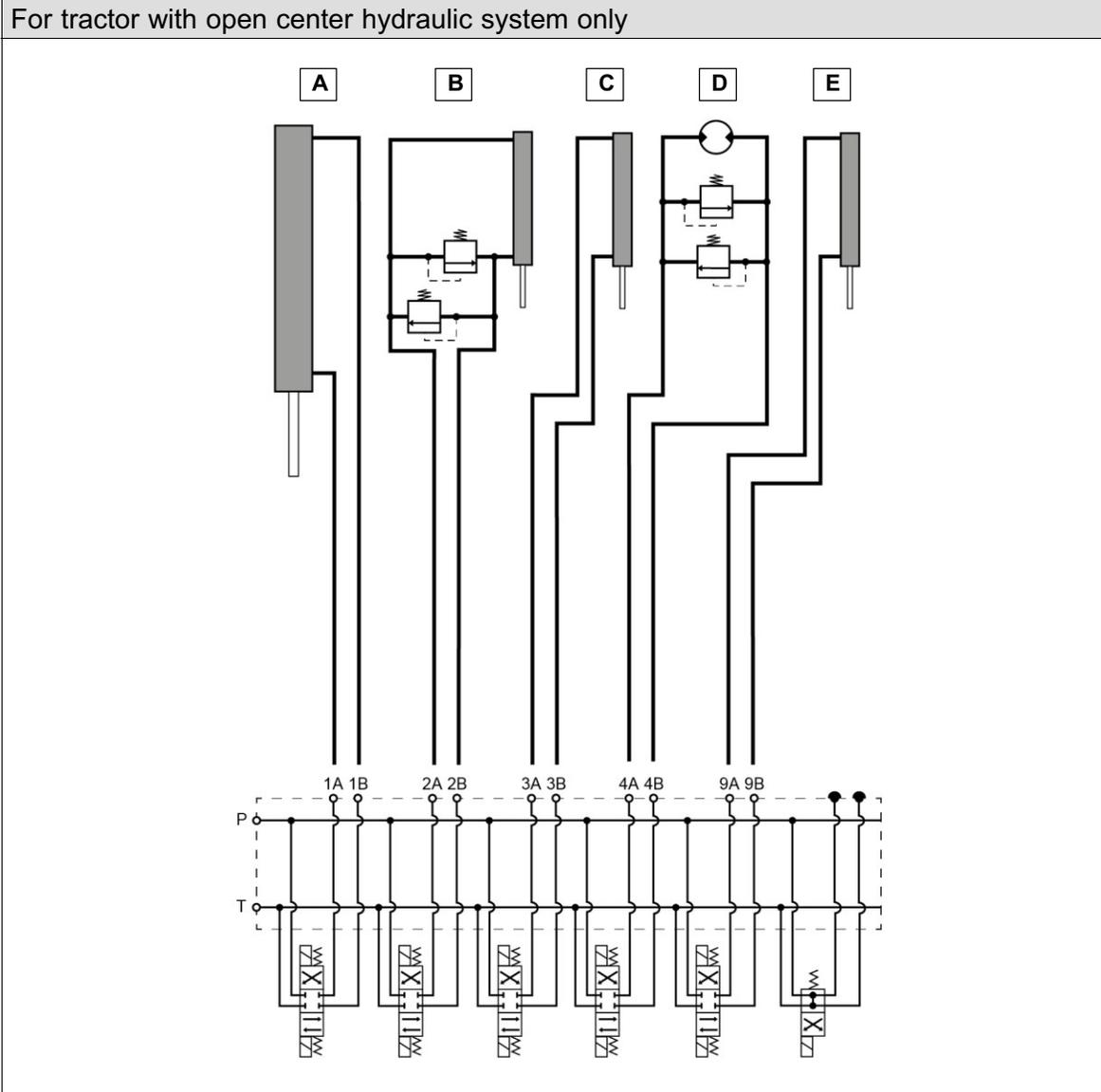
Legend:

A	Undercarriage cylinder	C	Nozzle articulation cylinder
B	Directional valve cylinder	D	Nozzle hydraulic motor

9.1.3 5 Functions - Articulated pump

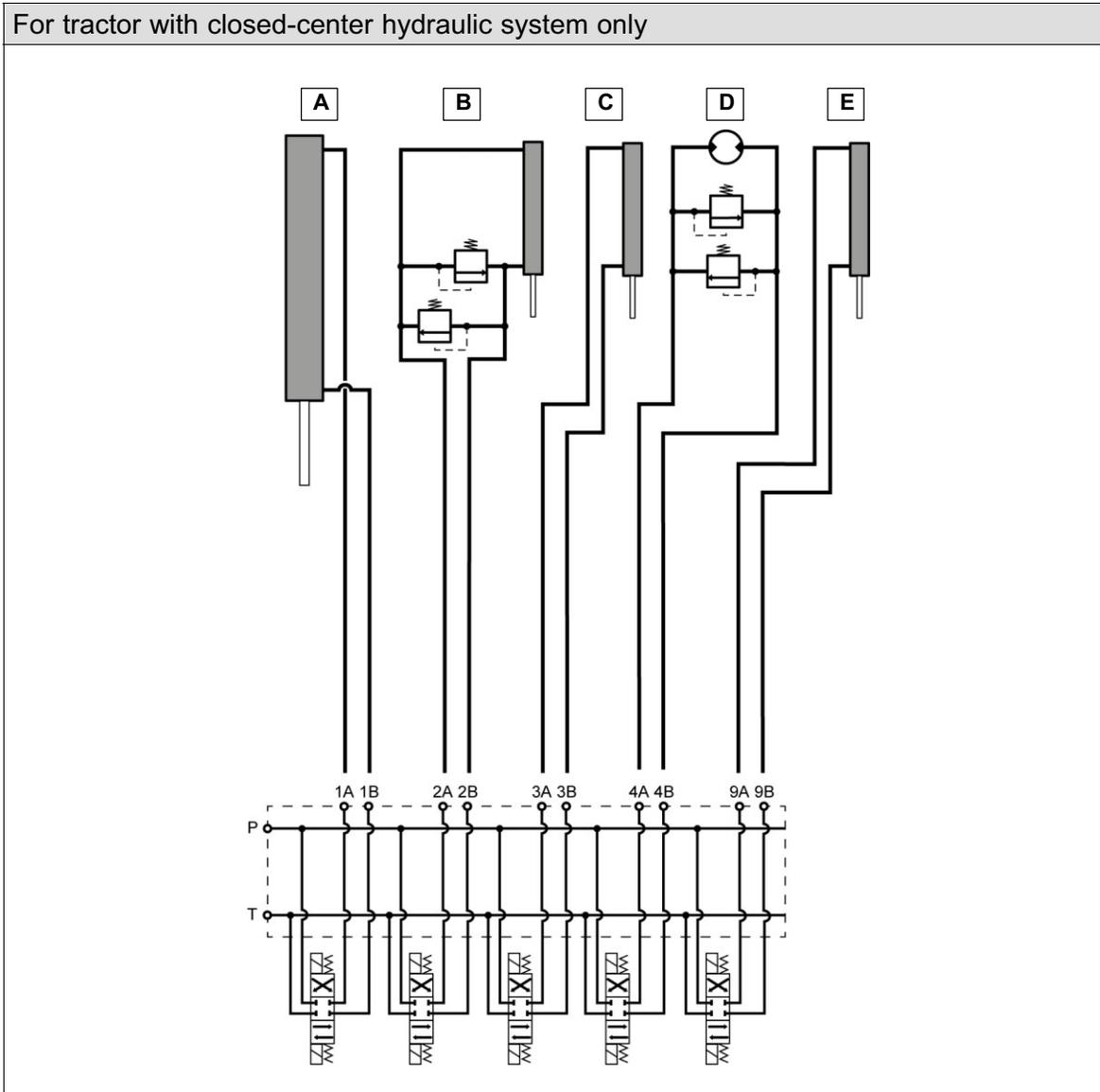


Legend:			
A	Articulation cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Housing articulation cylinder
C	Nozzle articulation cylinder		



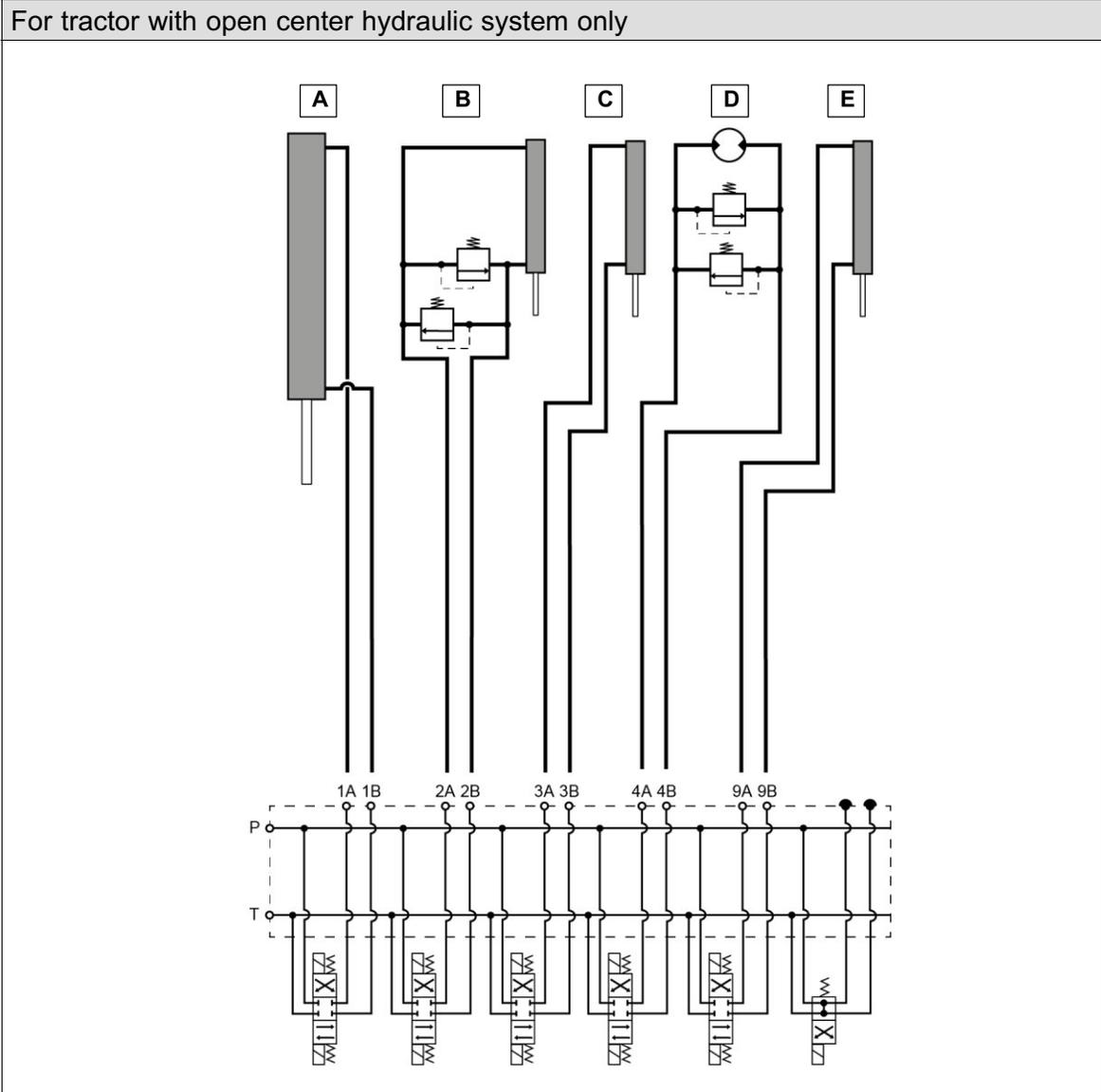
Legend:			
A	Articulation cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Housing articulation cylinder
C	Nozzle articulation cylinder		

9.1.4 5 Functions - Lagoon pump with standard undercarriage



Legend:

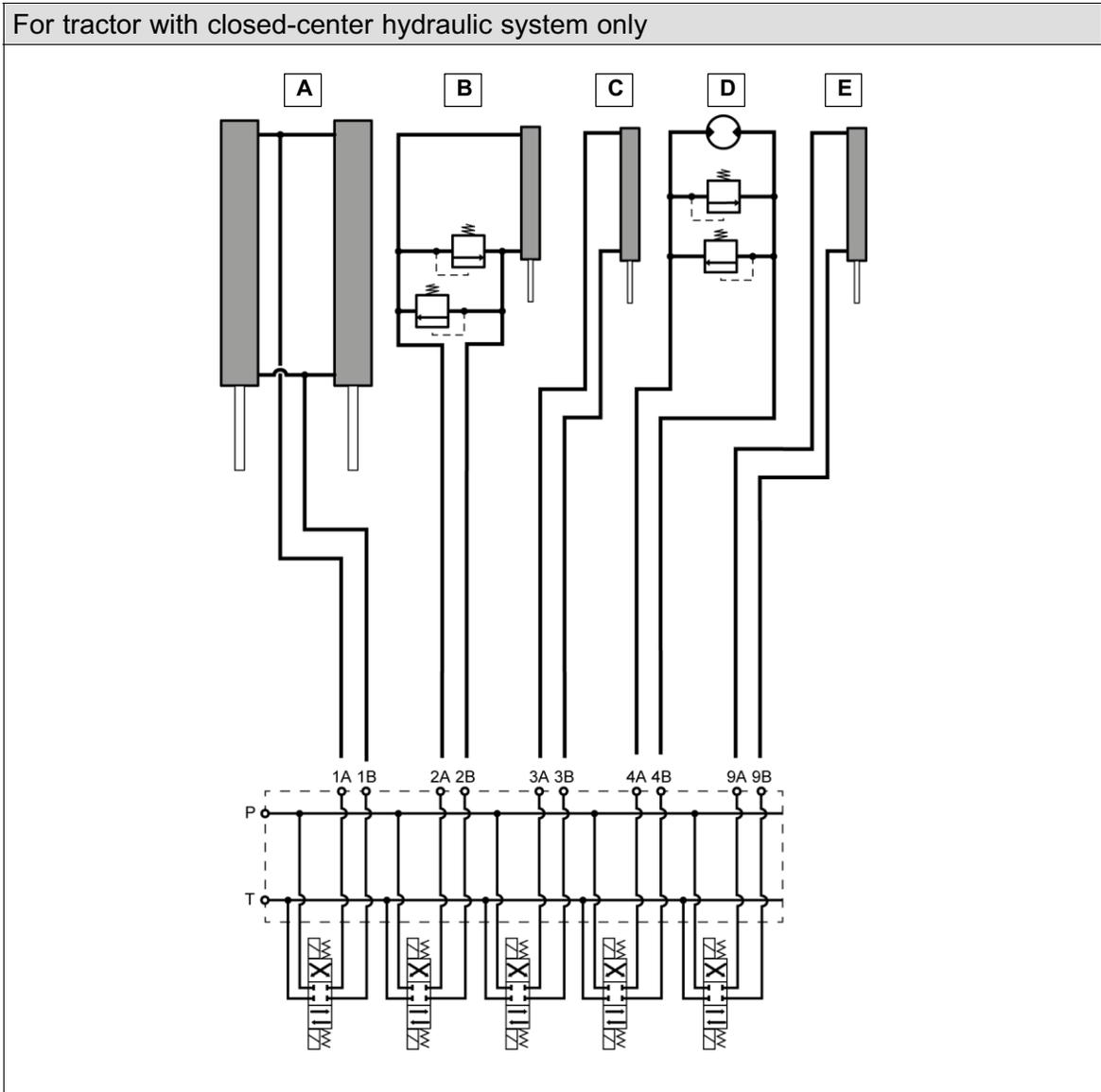
A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Housing articulation cylinder
C	Nozzle articulation cylinder		



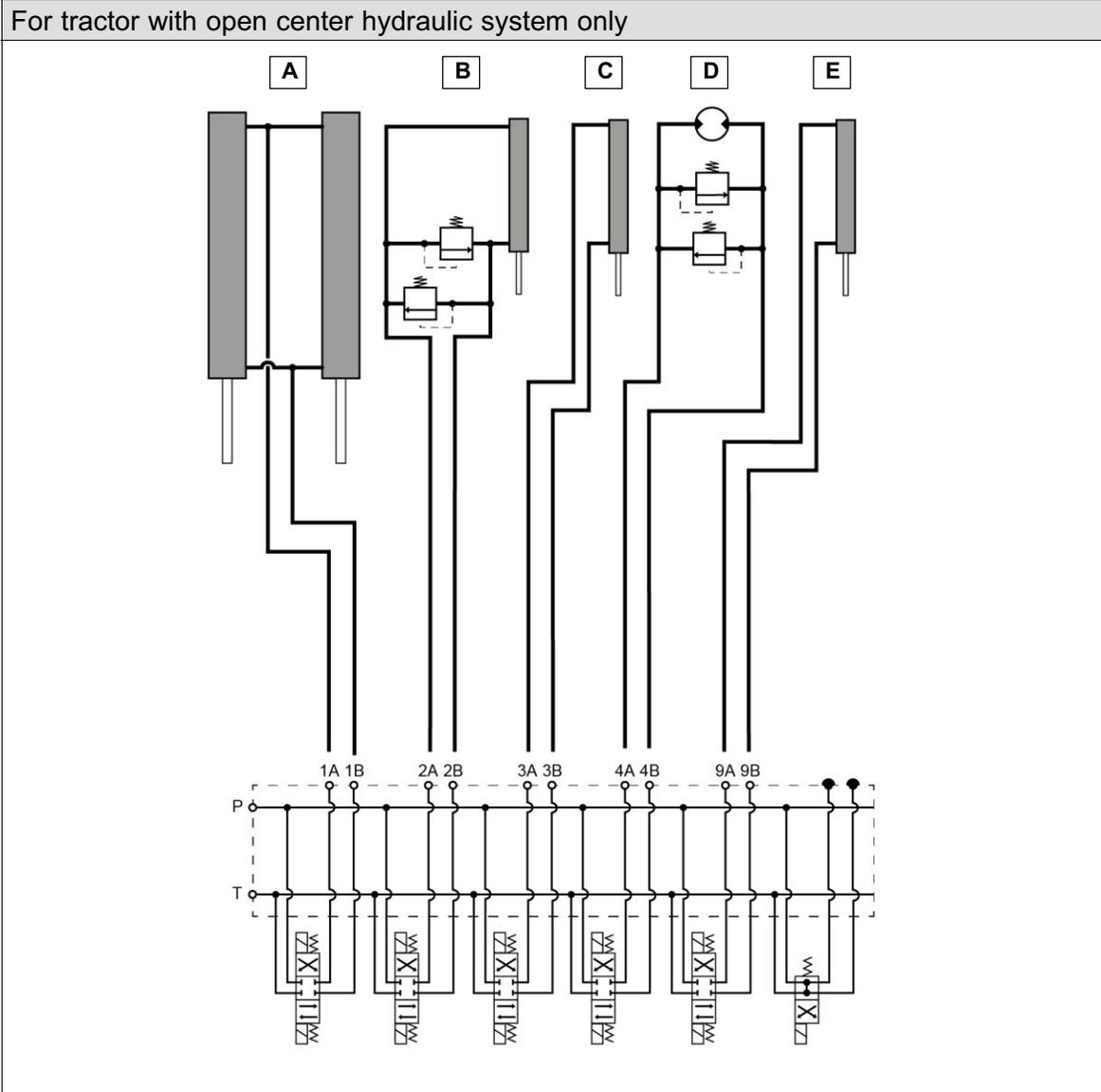
Legend:

A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Housing articulation cylinder
C	Nozzle articulation cylinder		

9.1.5 5 Functions - Lagoon pump with HD undercarriage

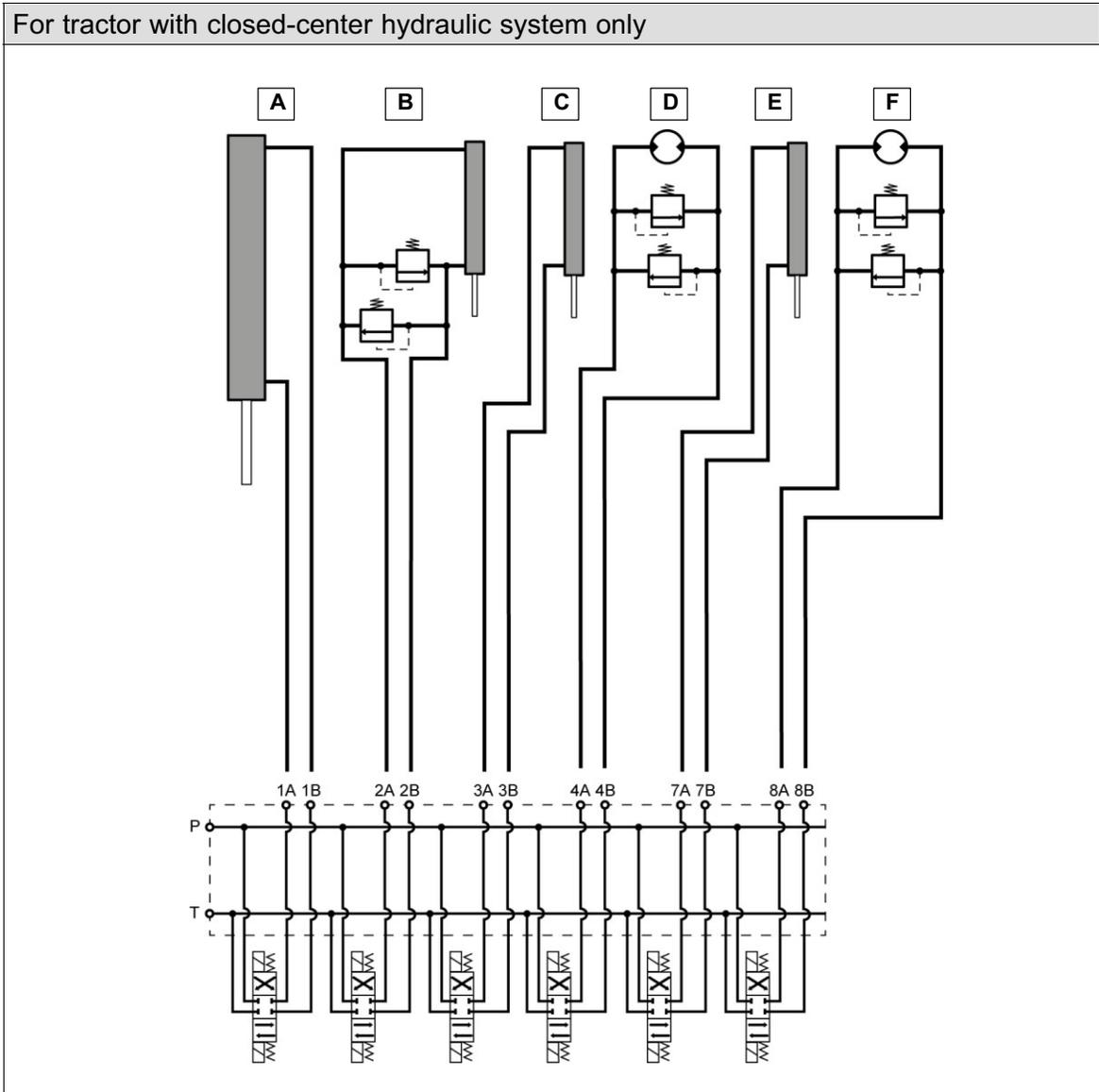


Legend:			
A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Housing articulation cylinder
C	Nozzle articulation cylinder		



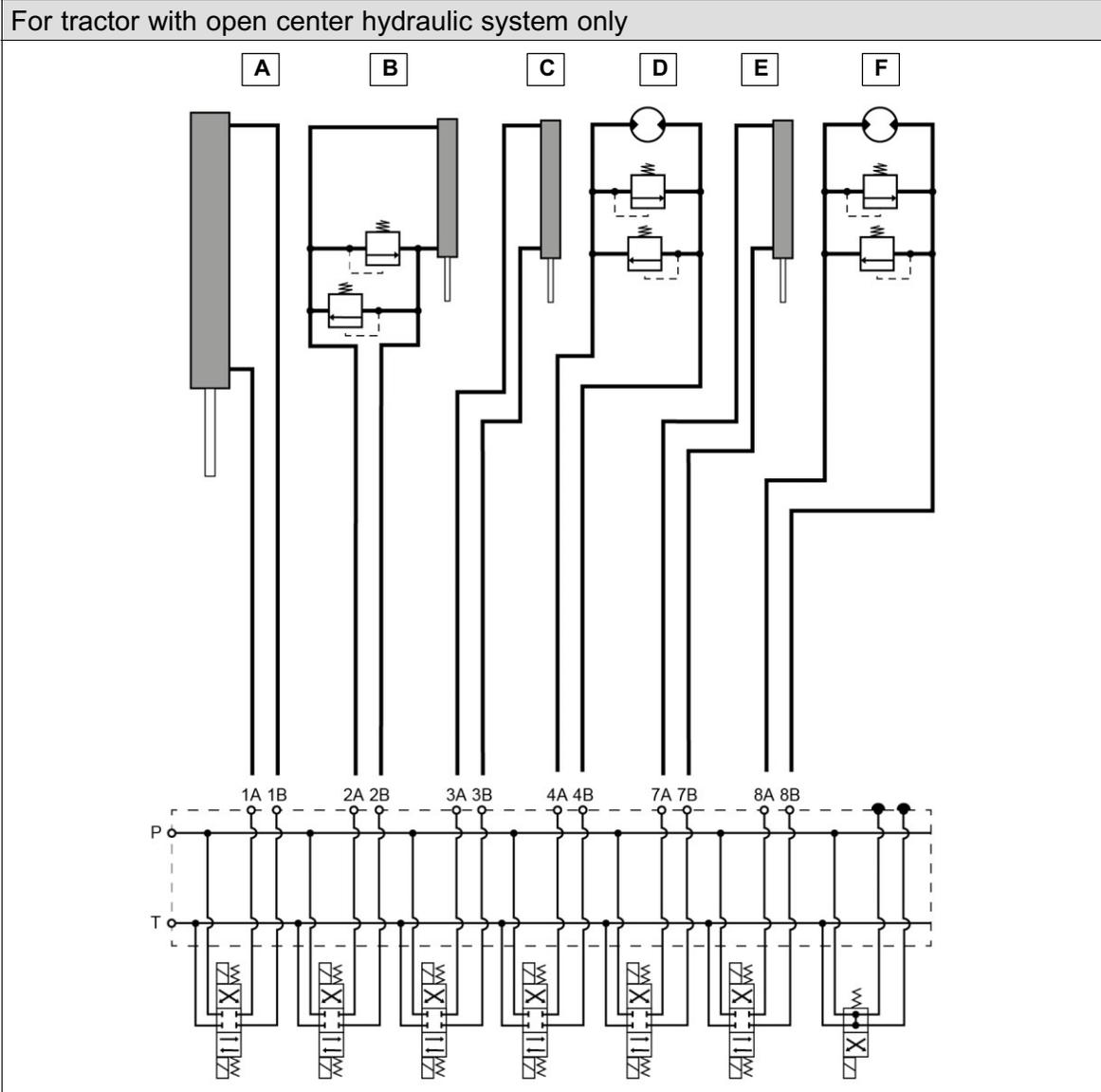
Legend:	
A	Undercarriage cylinder
B	Directional valve cylinder
C	Nozzle articulation cylinder
D	Nozzle hydraulic motor
E	Housing articulation cylinder

9.1.6 6 Functions (version A) - Articulated pump



Legend:

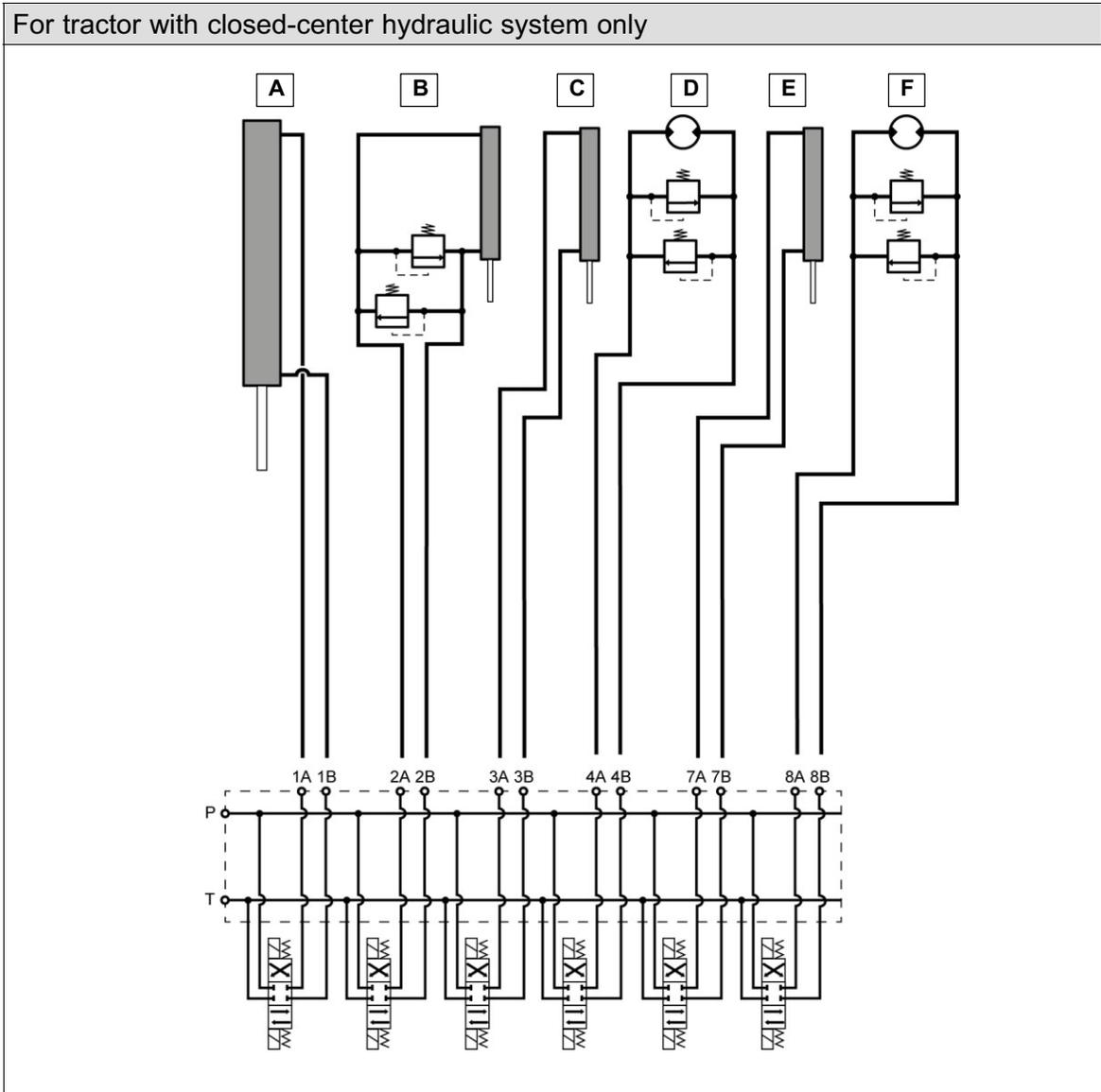
A	Articulation cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Loading pipe articulation cylinder
C	Nozzle articulation cylinder	F	Loading pipe hydraulic motor



Legend:

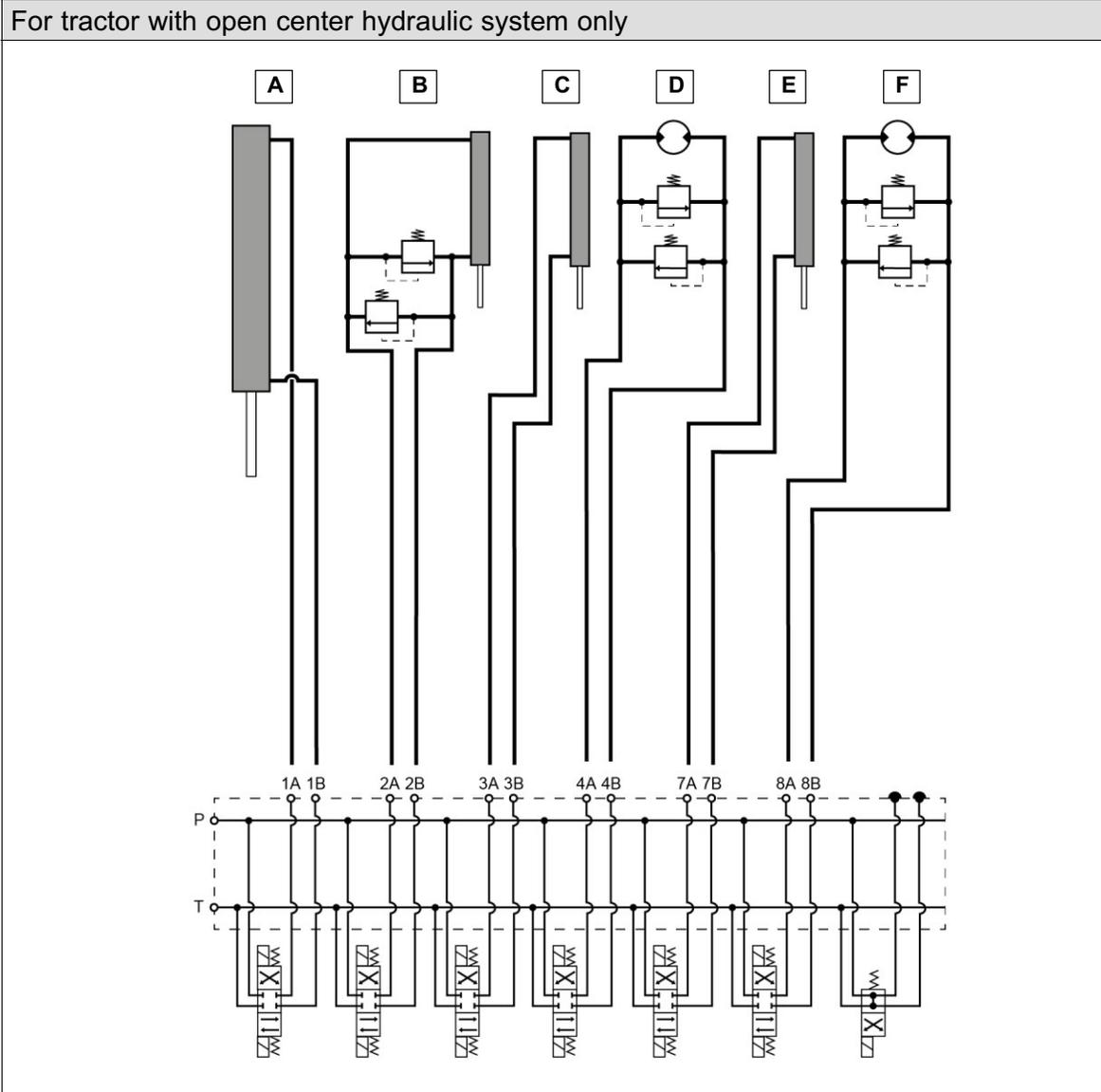
A	Articulation cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Loading pipe articulation cylinder
C	Nozzle articulation cylinder	F	Loading pipe hydraulic motor

9.1.7 6 Functions (version A) - Lagoon pump with standard undercarriage



Legend:

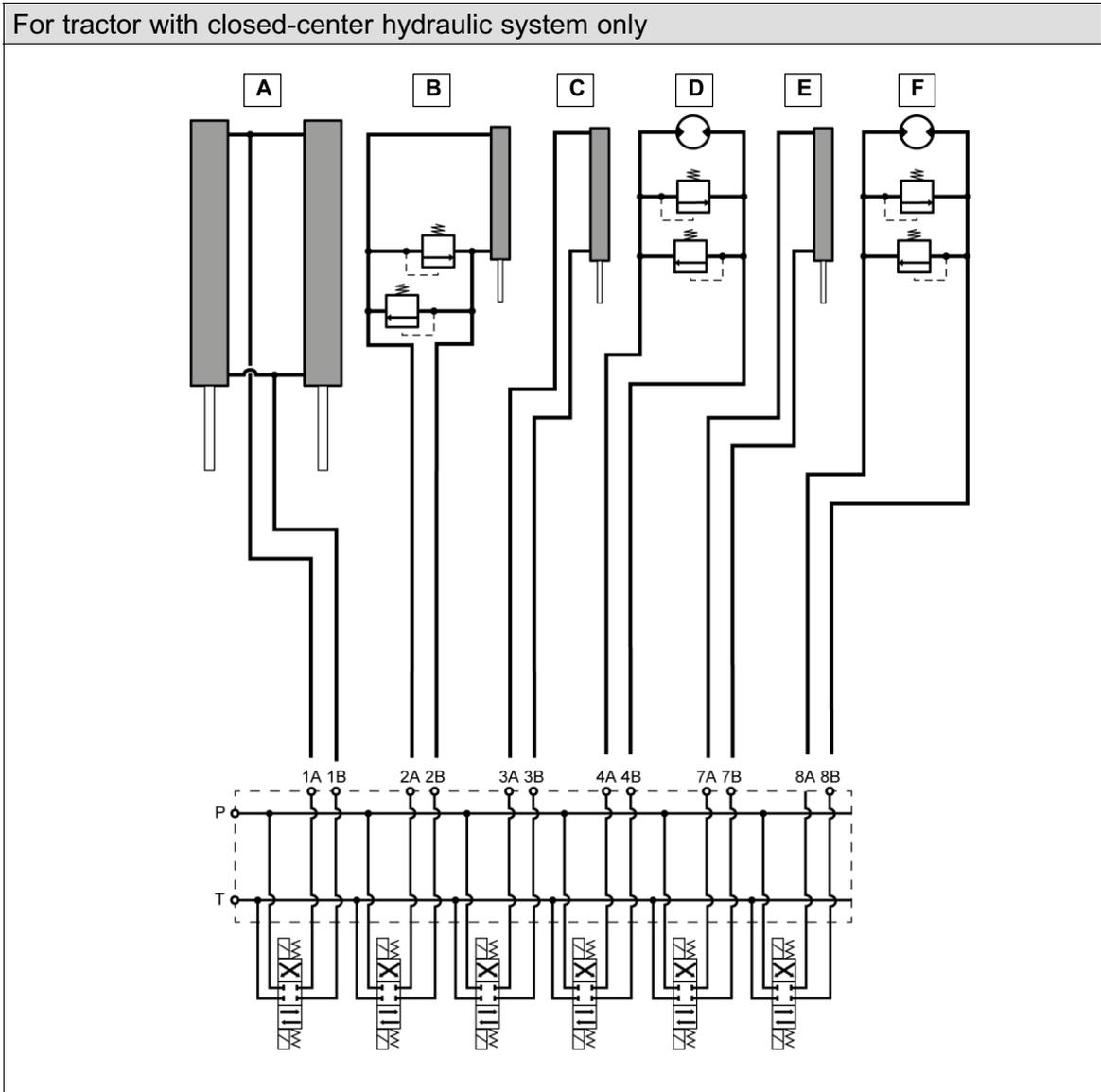
A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Loading pipe articulation cylinder
C	Nozzle articulation cylinder	F	Loading pipe hydraulic motor



Legend:

A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Loading pipe articulation cylinder
C	Nozzle articulation cylinder	F	Loading pipe hydraulic motor

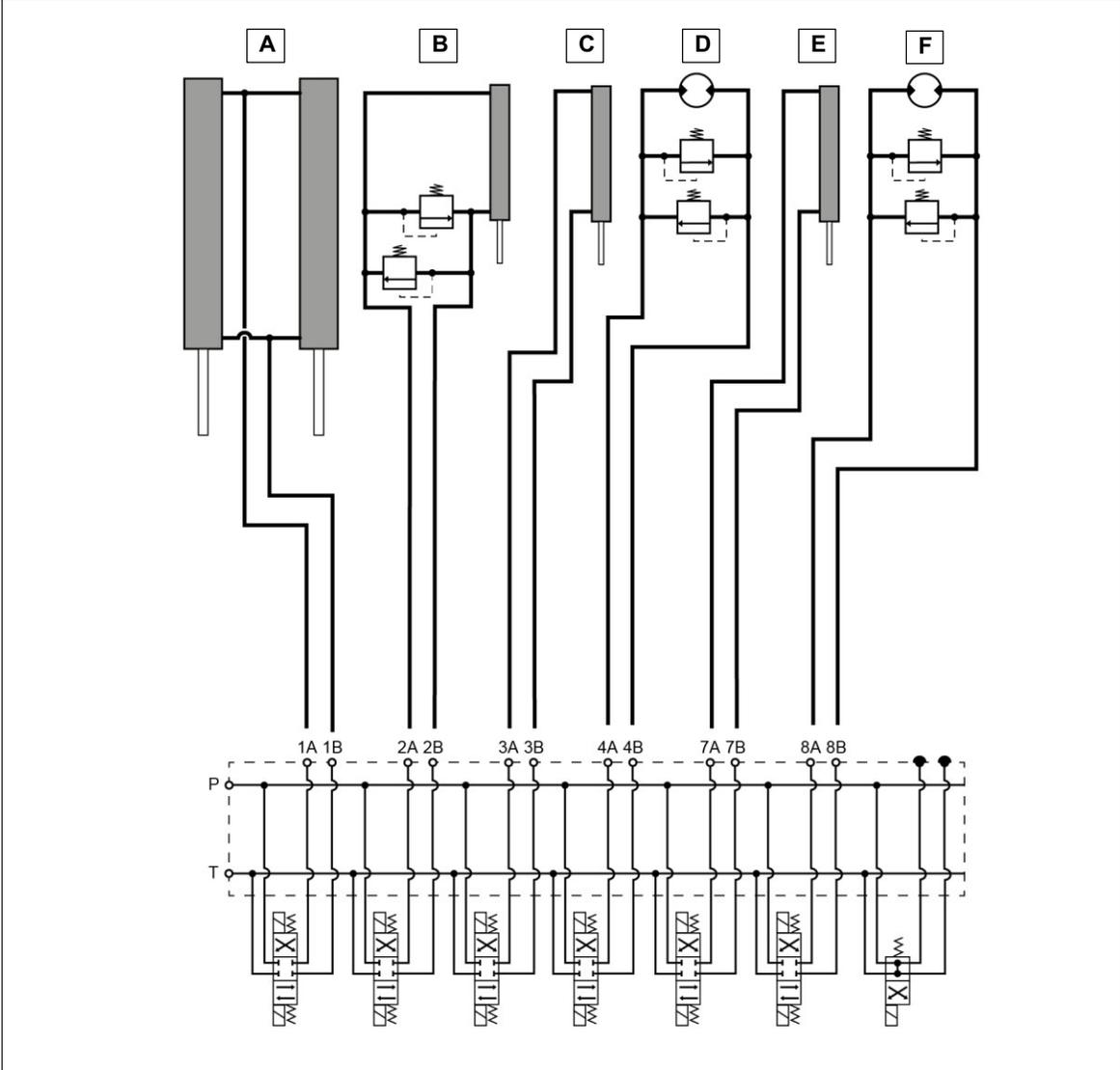
9.1.8 6 Functions (version A) - Lagoon pump with HD undercarriage



Legend:

A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Loading pipe articulation cylinder
C	Nozzle articulation cylinder	F	Loading pipe hydraulic motor

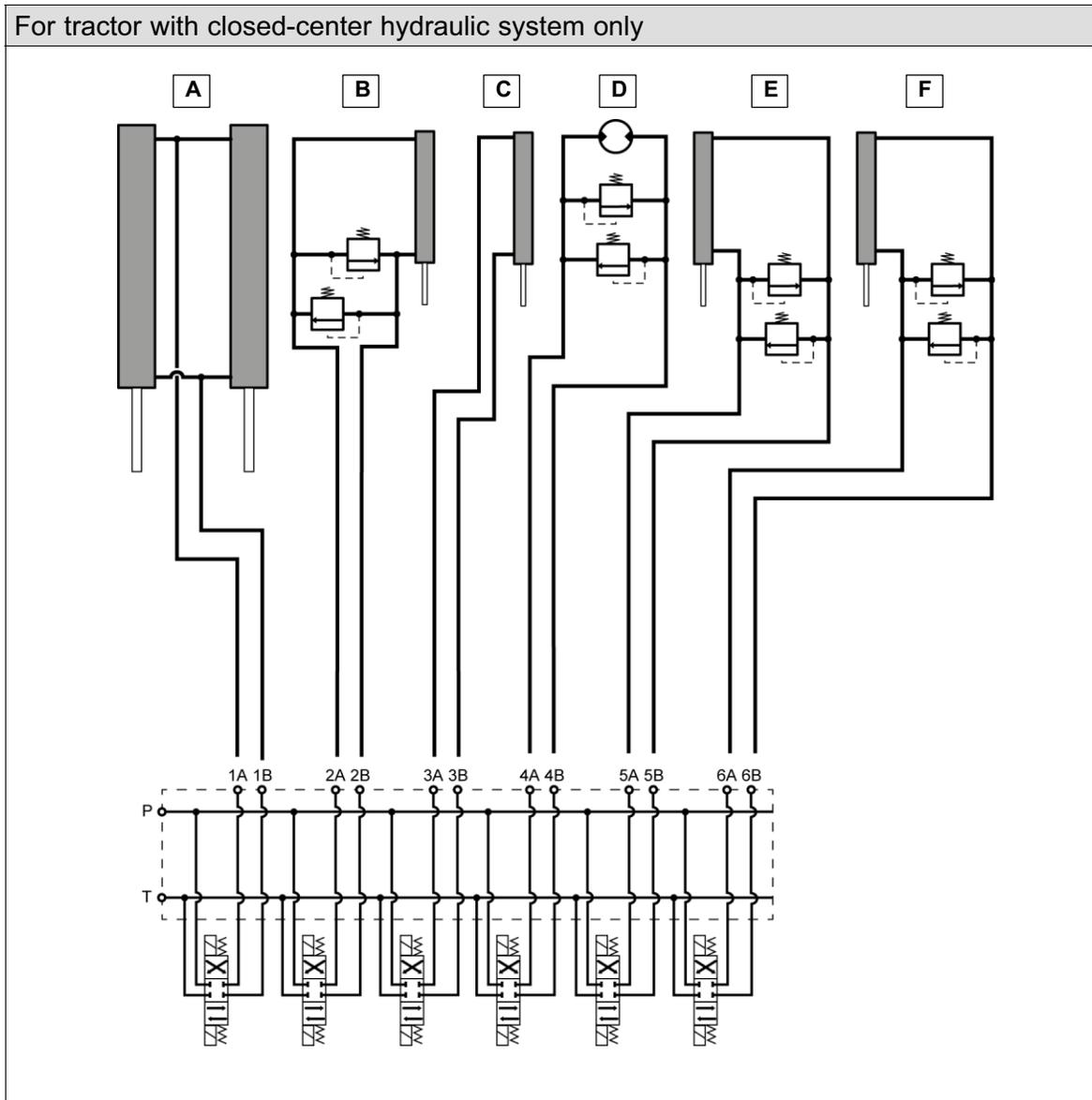
For tractor with open center hydraulic system only



Legend:

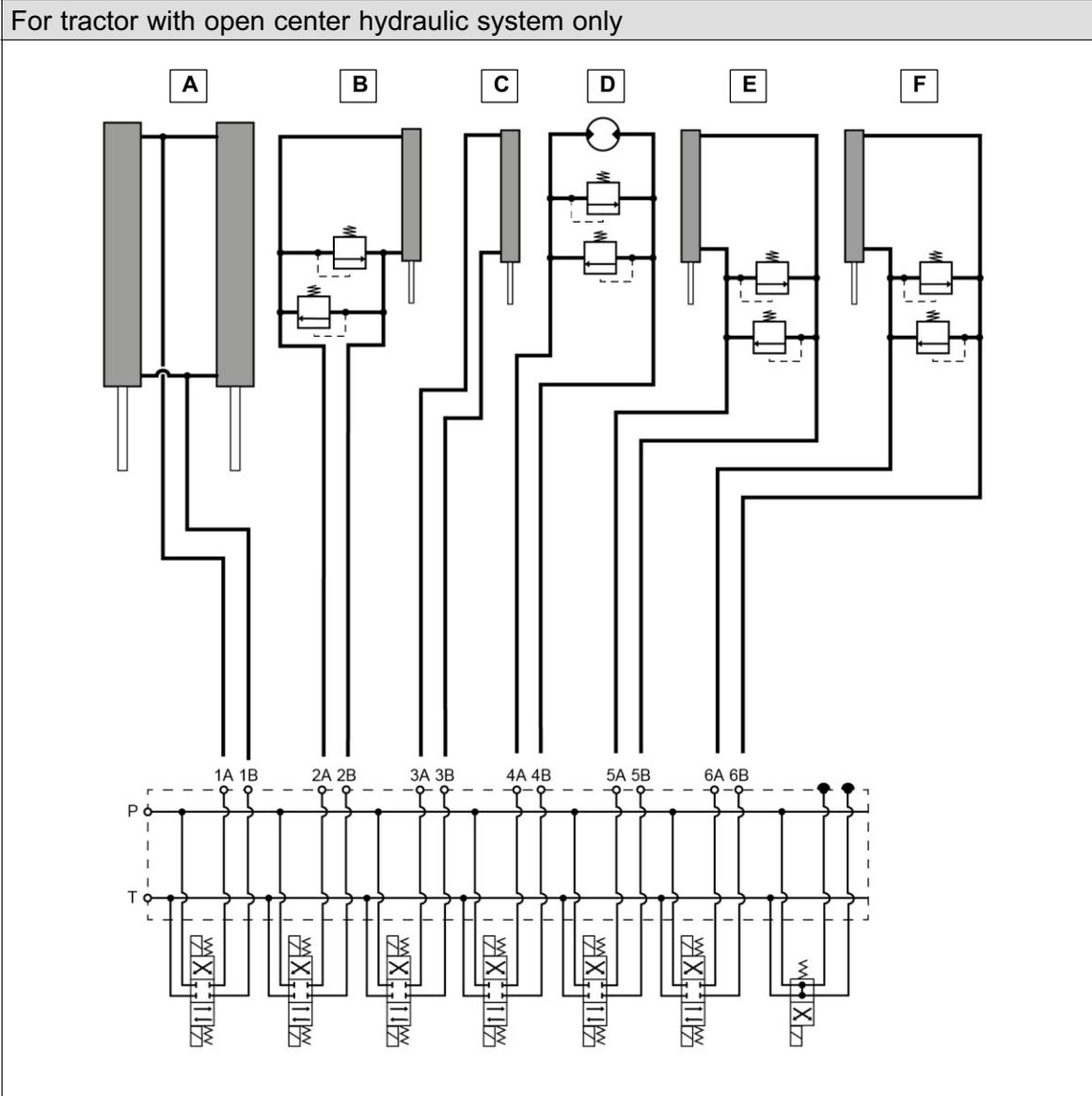
A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Loading pipe articulation cylinder
C	Nozzle articulation cylinder	F	Loading pipe hydraulic motor

9.1.9 6 Functions (version B) - Lagoon pump with HD undercarriage and stabilizer wheels



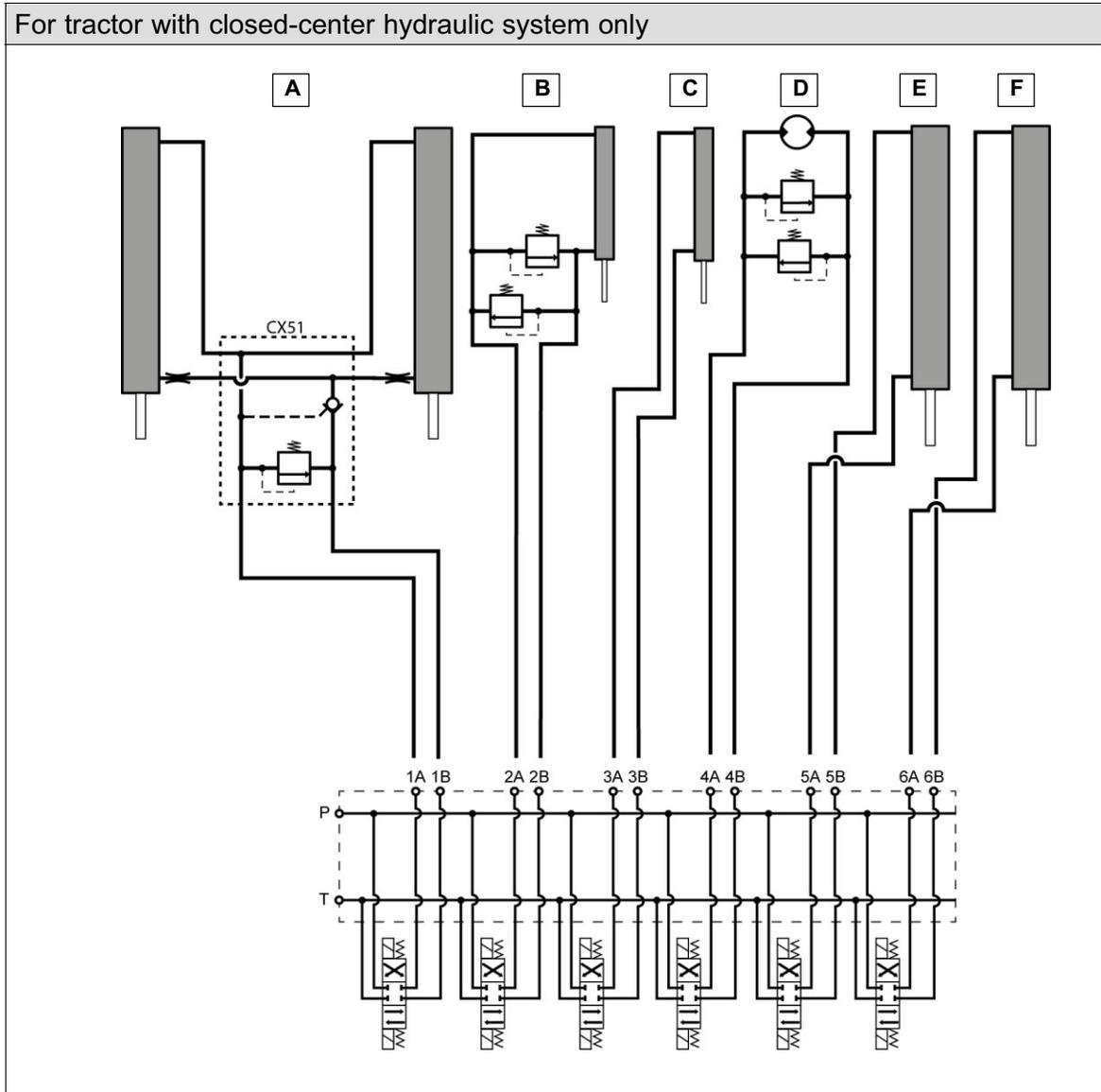
Legend:

A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Right wheel cylinder
C	Nozzle articulation cylinder	F	Left wheel cylinder



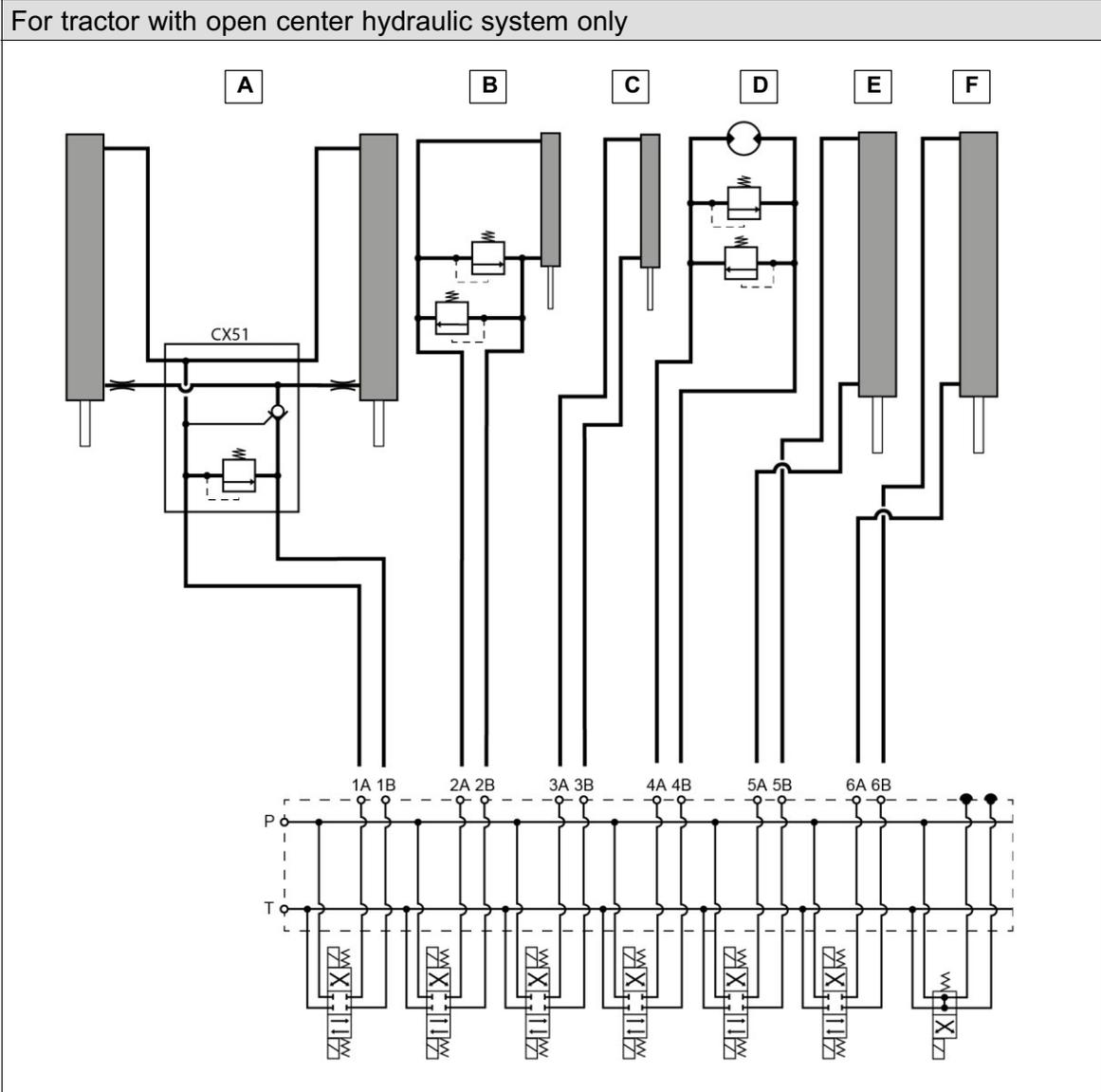
Legend:			
A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Right wheel cylinder
C	Nozzle articulation cylinder	F	Left wheel cylinder

9.1.10 6 Functions (version B) - Lagoon pump with multipurpose undercarriage



Legend:

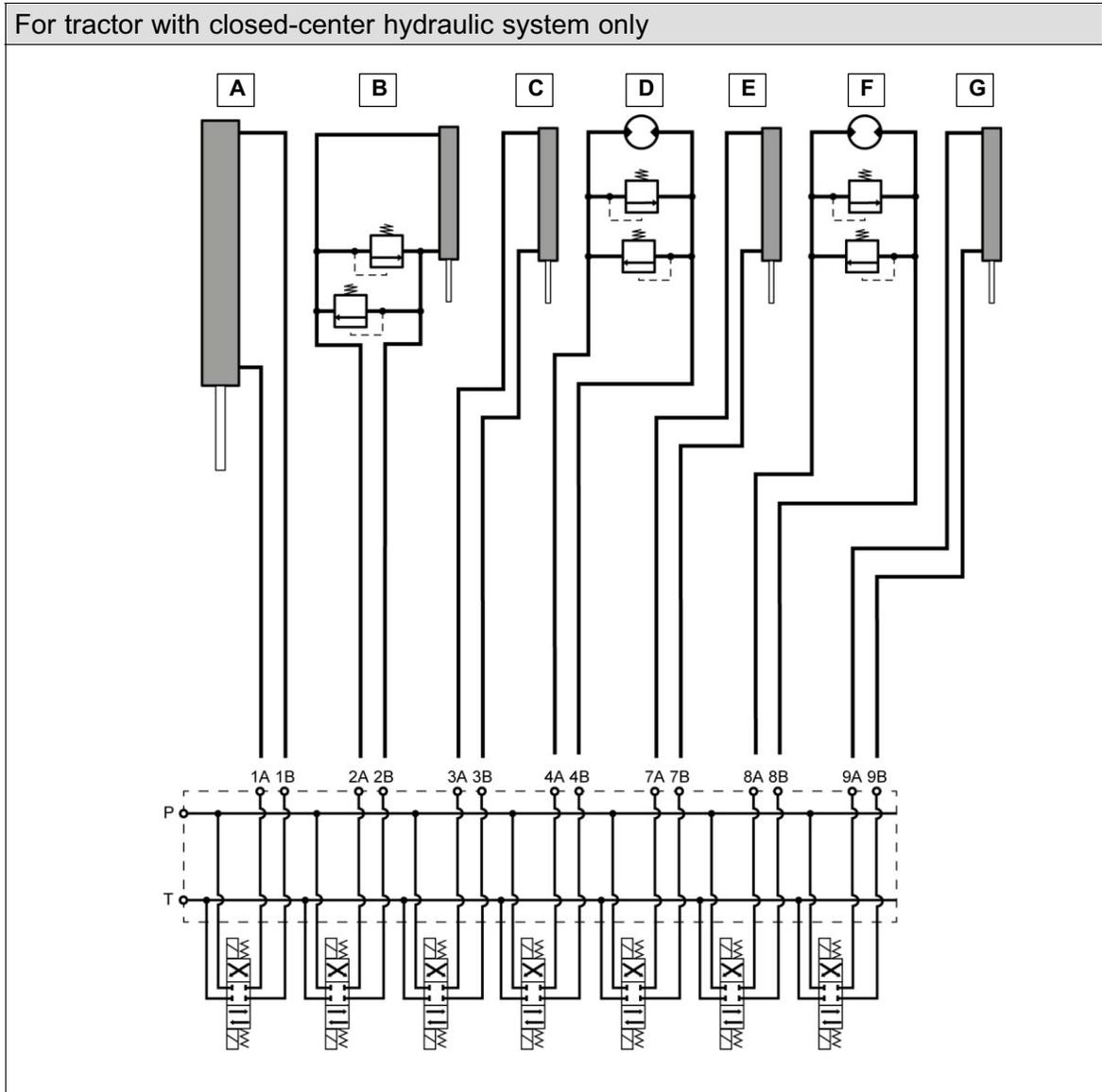
A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Right wheel cylinder
C	Nozzle articulation cylinder	F	Left wheel cylinder



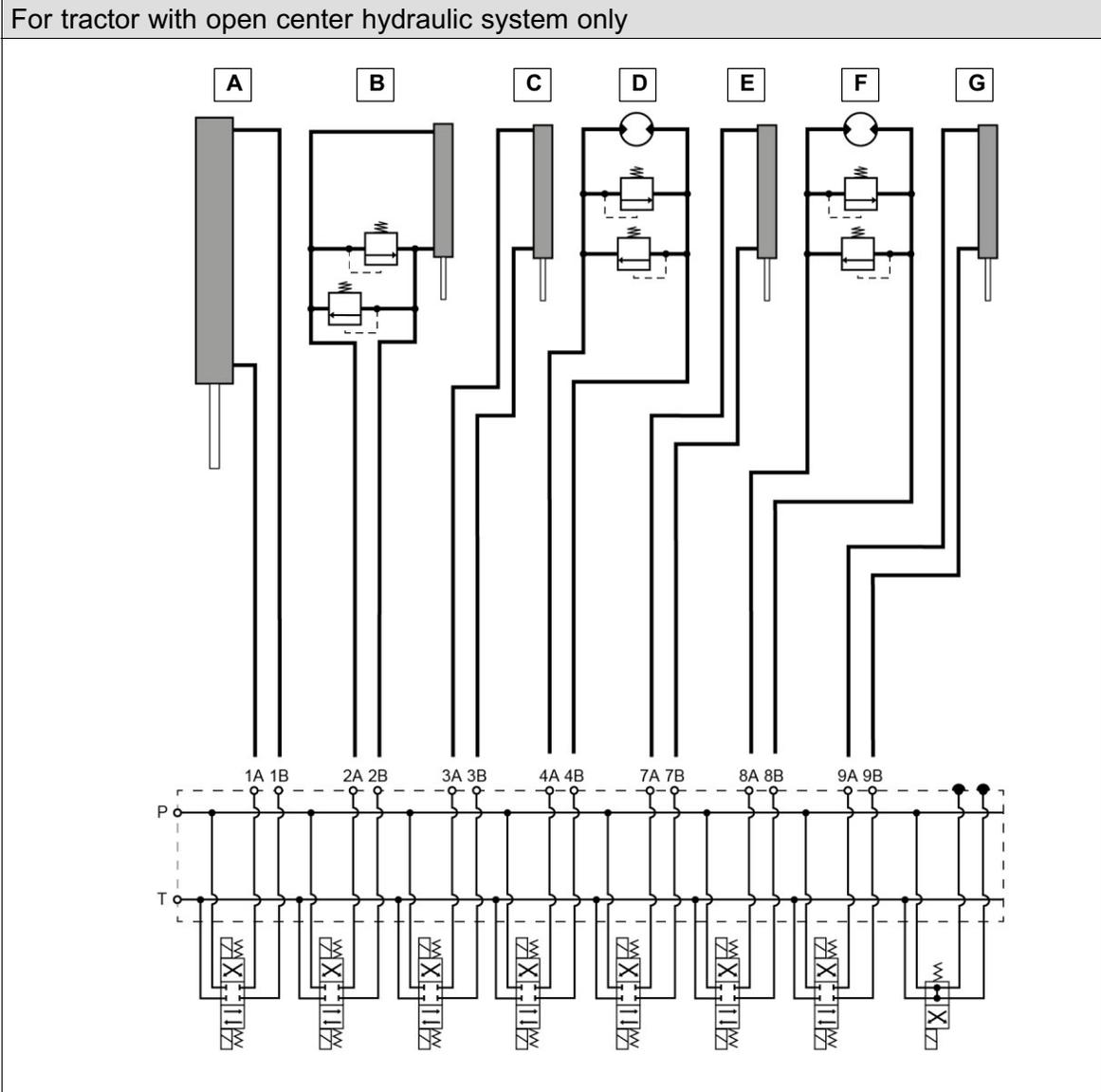
Legend:

A	Undercarriage cylinder	D	Nozzle hydraulic motor
B	Directional valve cylinder	E	Right wheel cylinder
C	Nozzle articulation cylinder	F	Left wheel cylinder

9.1.11 7 Functions (version A)- Articulated pump



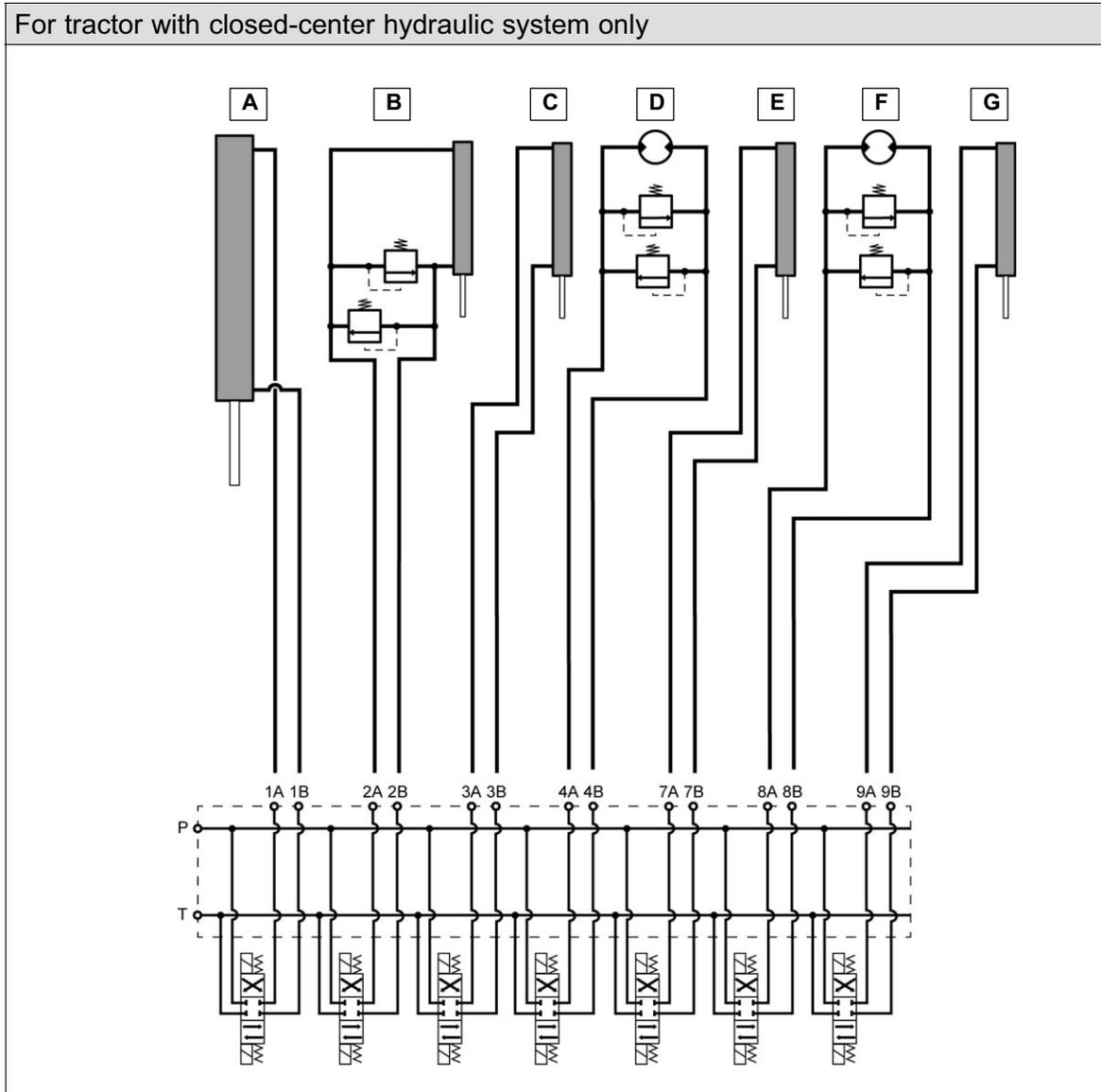
Legend:			
A	Articulation cylinder	E	Loading pipe articulation cylinder
B	Directional valve cylinder	F	Loading pipe hydraulic motor
C	Nozzle articulation cylinder	G	Housing articulation cylinder
D	Nozzle hydraulic motor		



Legend:

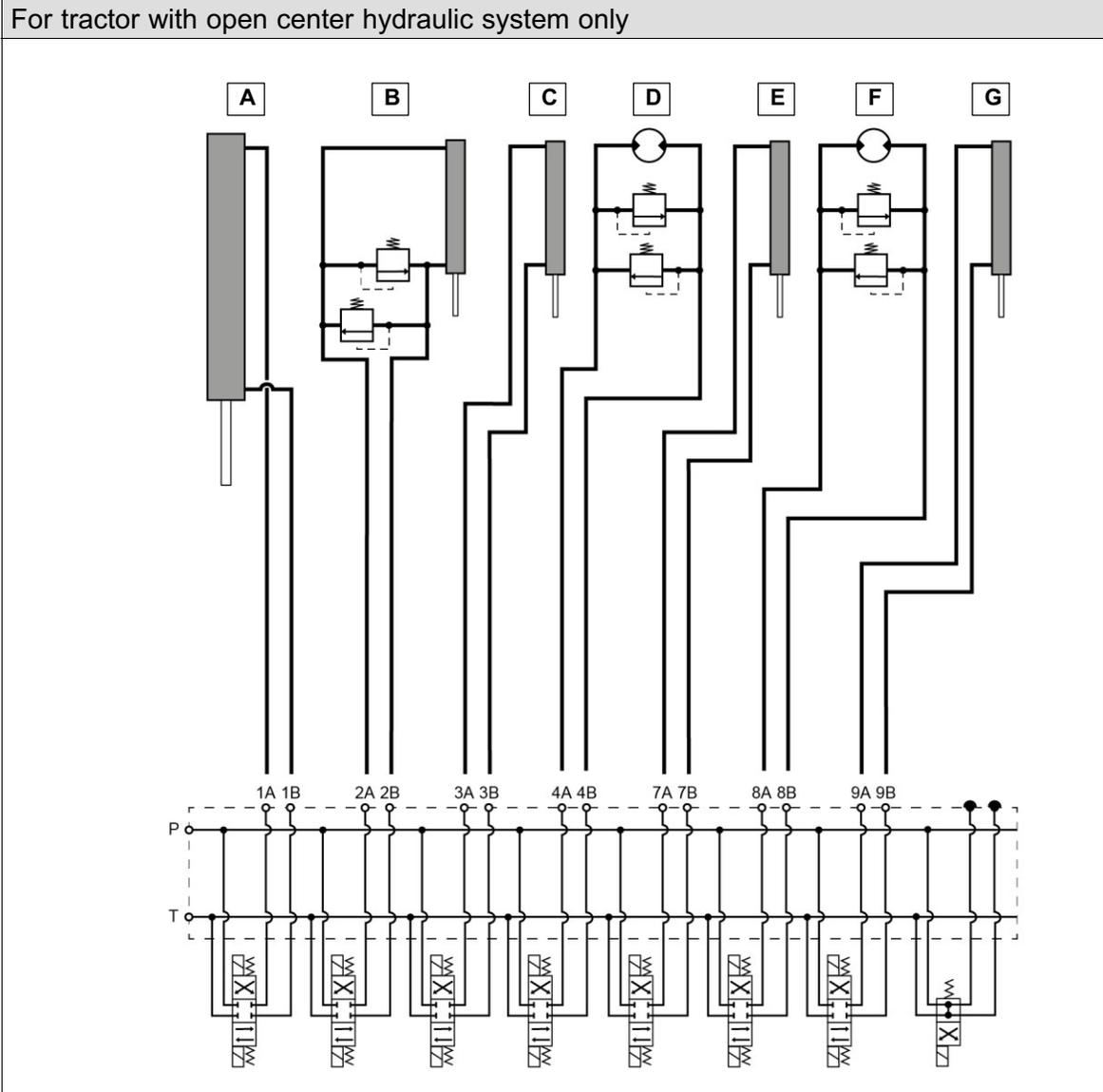
A	Articulation cylinder	E	Loading pipe articulation cylinder
B	Directional valve cylinder	F	Loading pipe hydraulic motor
C	Nozzle articulation cylinder	G	Housing articulation cylinder
D	Nozzle hydraulic motor		

9.1.12 7 Functions (version A) - Lagoon pump with standard undercarriage



Legend:

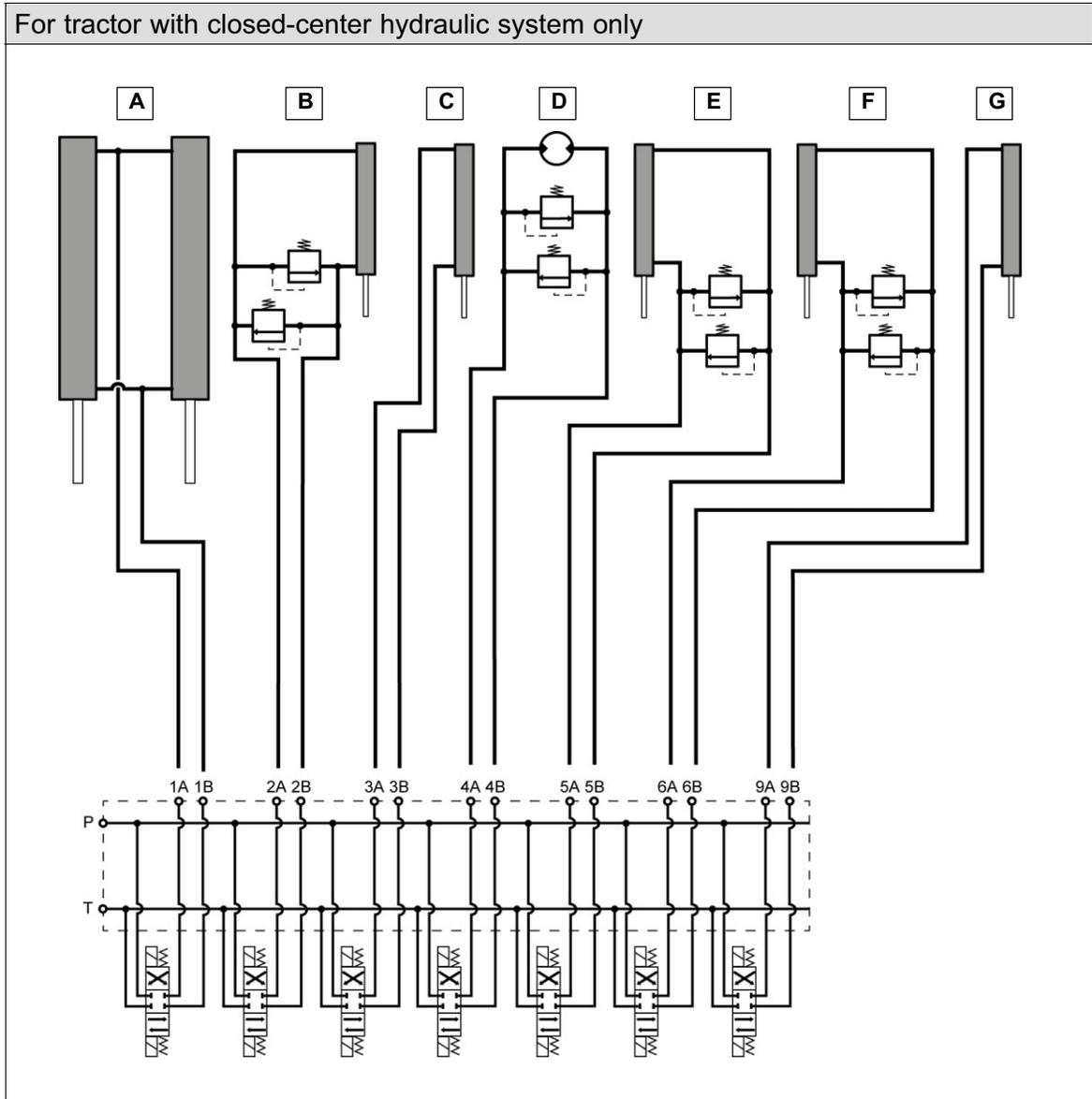
A	Undercarriage cylinder	E	Loading pipe articulation cylinder
B	Directional valve cylinder	F	Loading pipe hydraulic motor
C	Nozzle articulation cylinder	G	Housing articulation cylinder
D	Nozzle hydraulic motor		



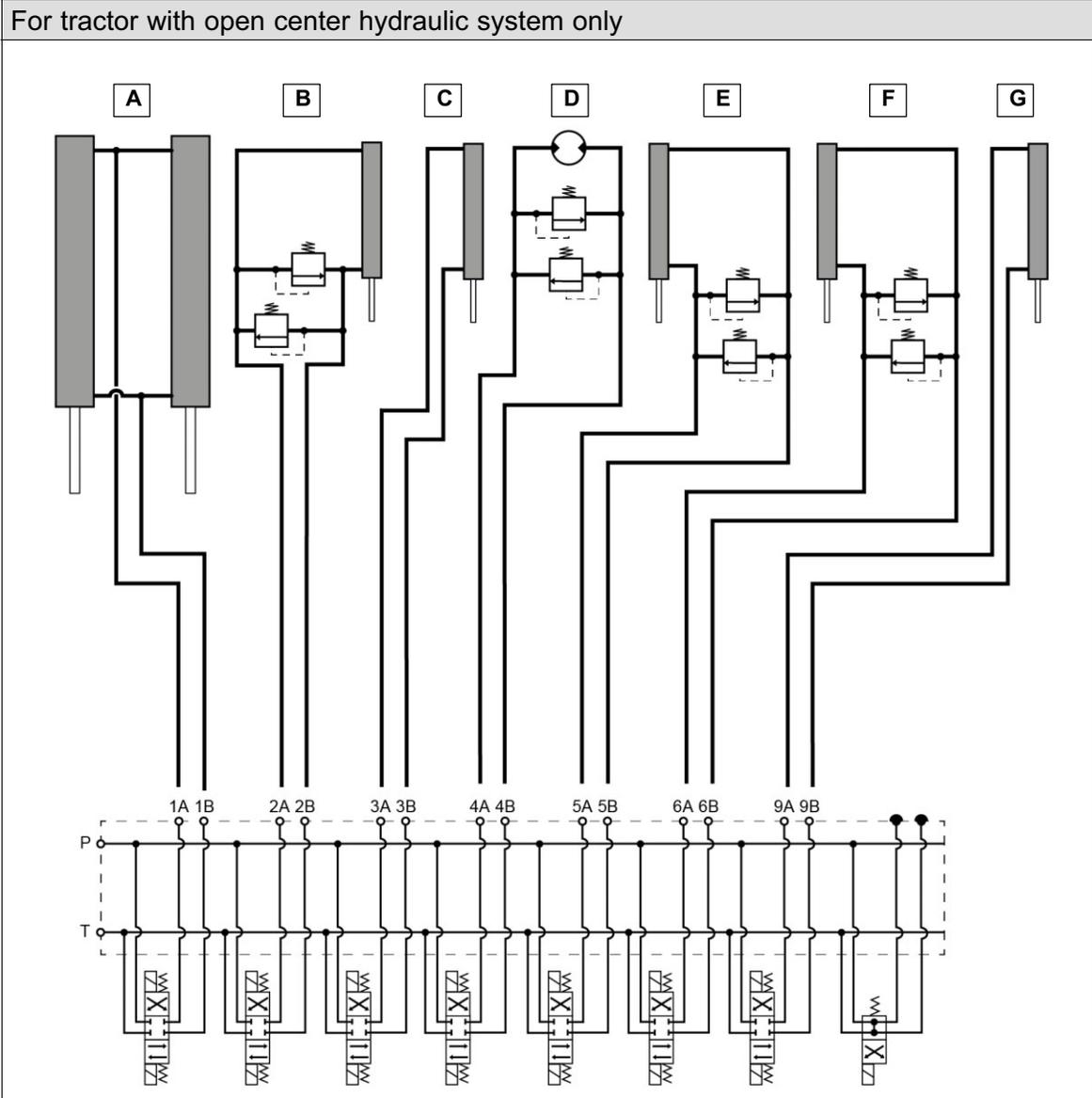
Legend:

A	Undercarriage cylinder	E	Loading pipe articulation cylinder
B	Directional valve cylinder	F	Loading pipe hydraulic motor
C	Nozzle articulation cylinder	G	Housing articulation cylinder
D	Nozzle hydraulic motor		

9.1.13 7 Functions (version B) - Lagoon pump with HD undercarriage and stabilizer wheels

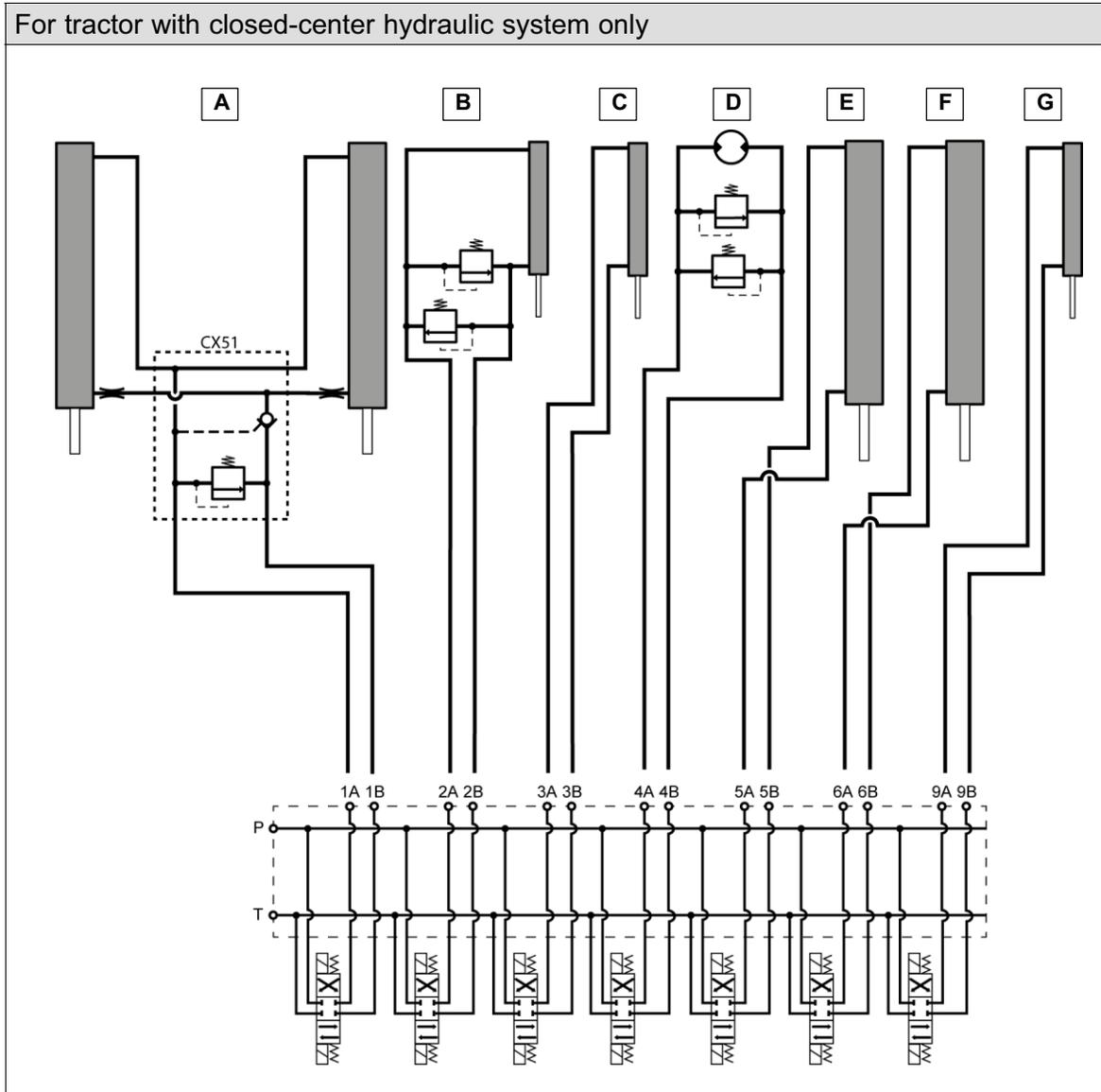


Legend:	
A	Undercarriage cylinder
B	Directional valve cylinder
C	Nozzle articulation cylinder
D	Nozzle hydraulic motor
E	Right wheel cylinder
F	Left wheel cylinder
G	Housing articulation cylinder

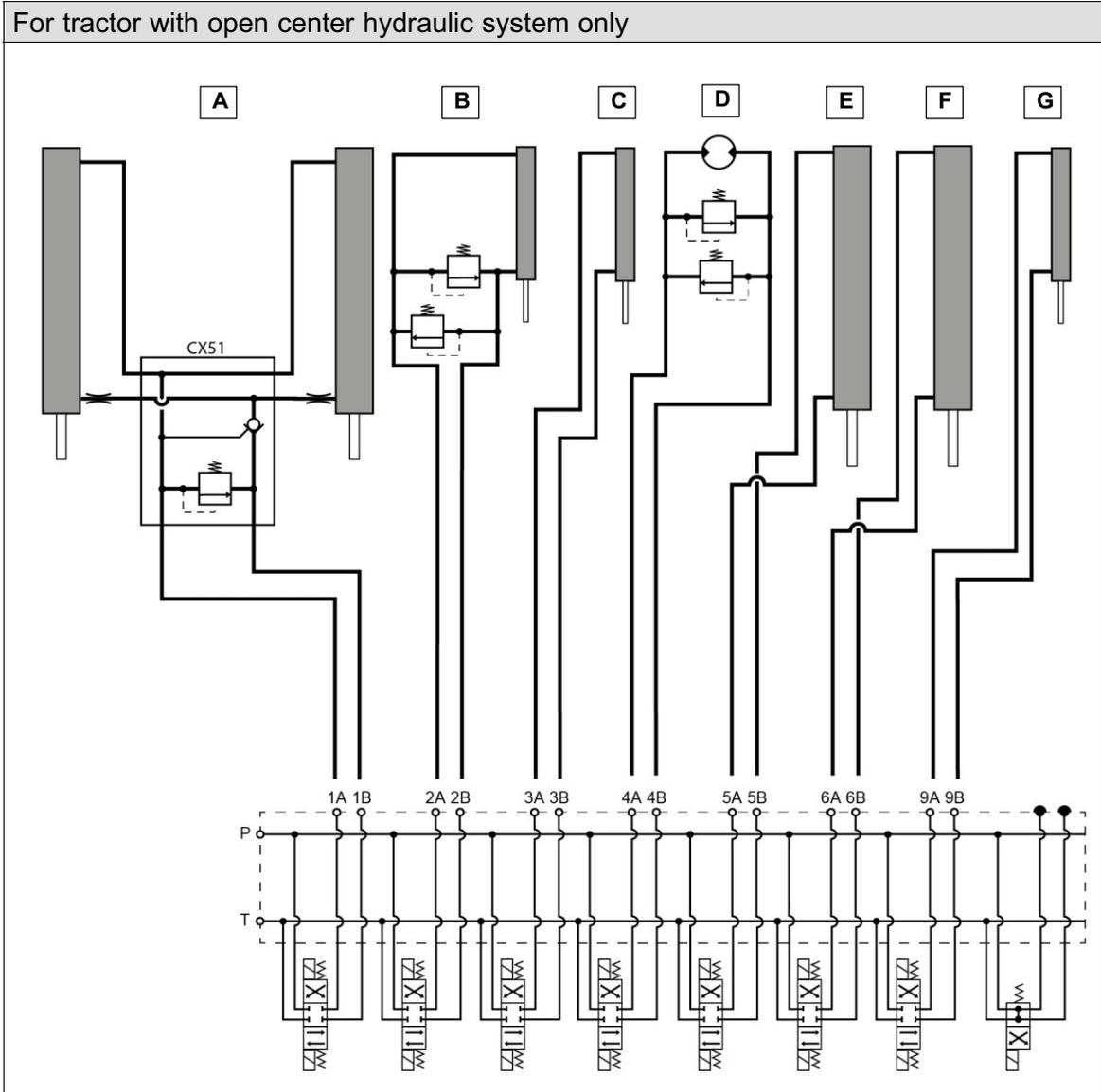


Legend:	
A	Undercarriage cylinder
B	Directional valve cylinder
C	Nozzle articulation cylinder
D	Nozzle hydraulic motor
E	Right wheel cylinder
F	Left wheel cylinder
G	Housing articulation cylinder

9.1.14 7 Functions (version B) - Lagoon pump with multipurpose undercarriage



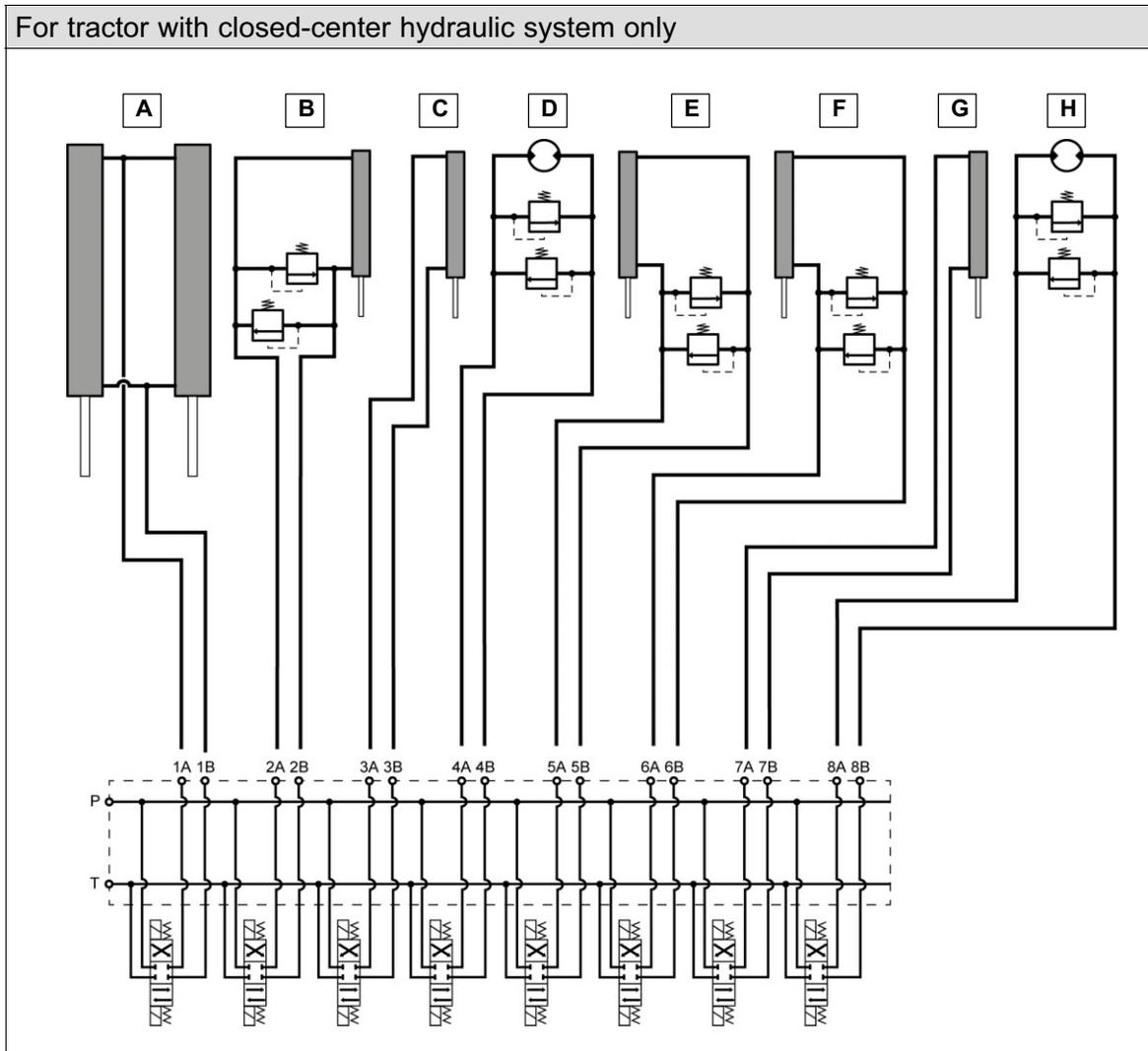
Legend:			
A	Undercarriage cylinder	E	Right wheel cylinder
B	Directional valve cylinder	F	Left wheel cylinder
C	Nozzle articulation cylinder	G	Housing articulation cylinder
D	Nozzle hydraulic motor		



Legend:

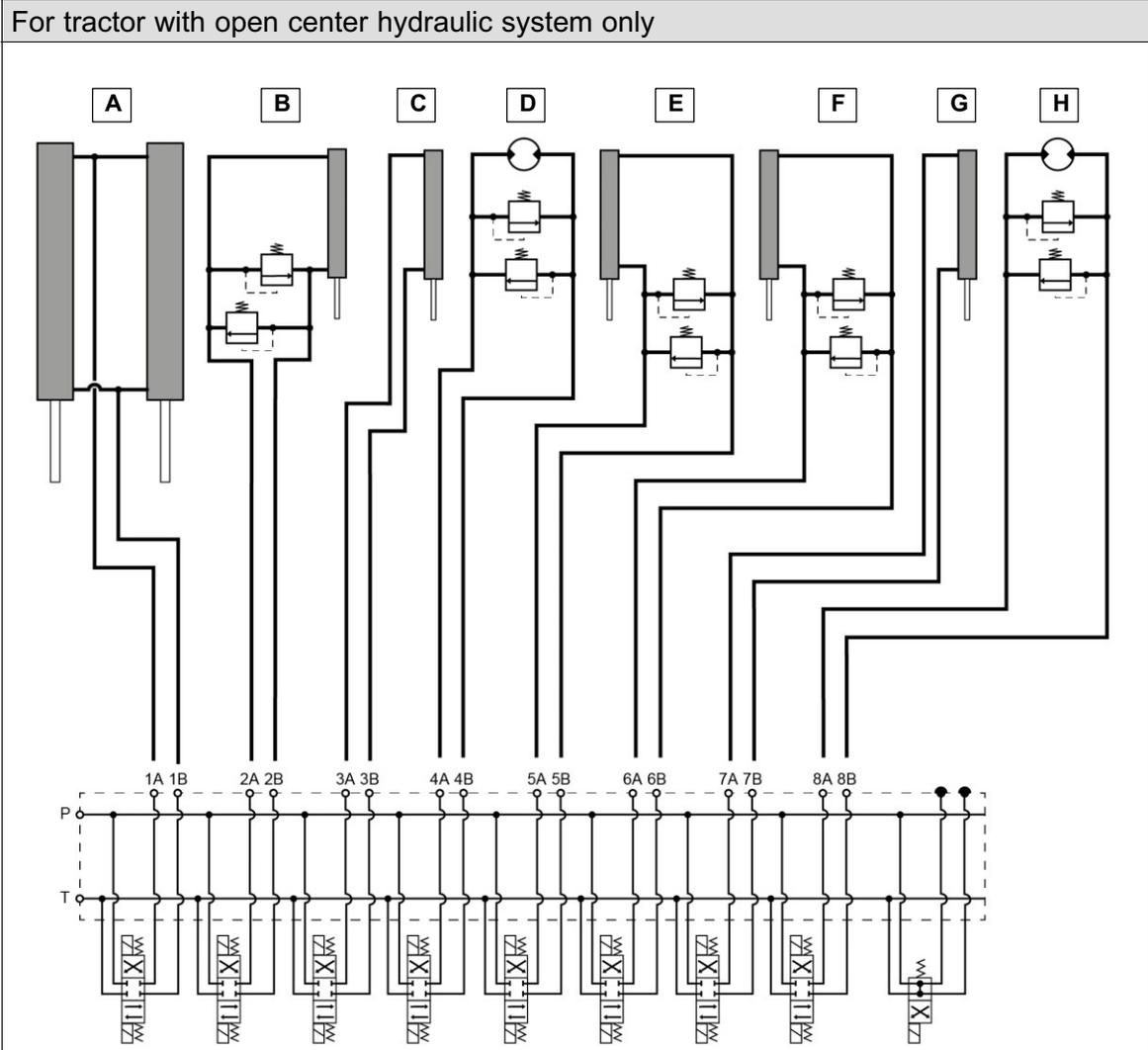
A	Undercarriage cylinder	E	Right wheel cylinder
B	Directional valve cylinder	F	Left wheel cylinder
C	Nozzle articulation cylinder	G	Housing articulation cylinder
D	Nozzle hydraulic motor		

9.1.15 8 Functions (version A) - Lagoon pump with HD undercarriage and stabilizer wheels



Legend:

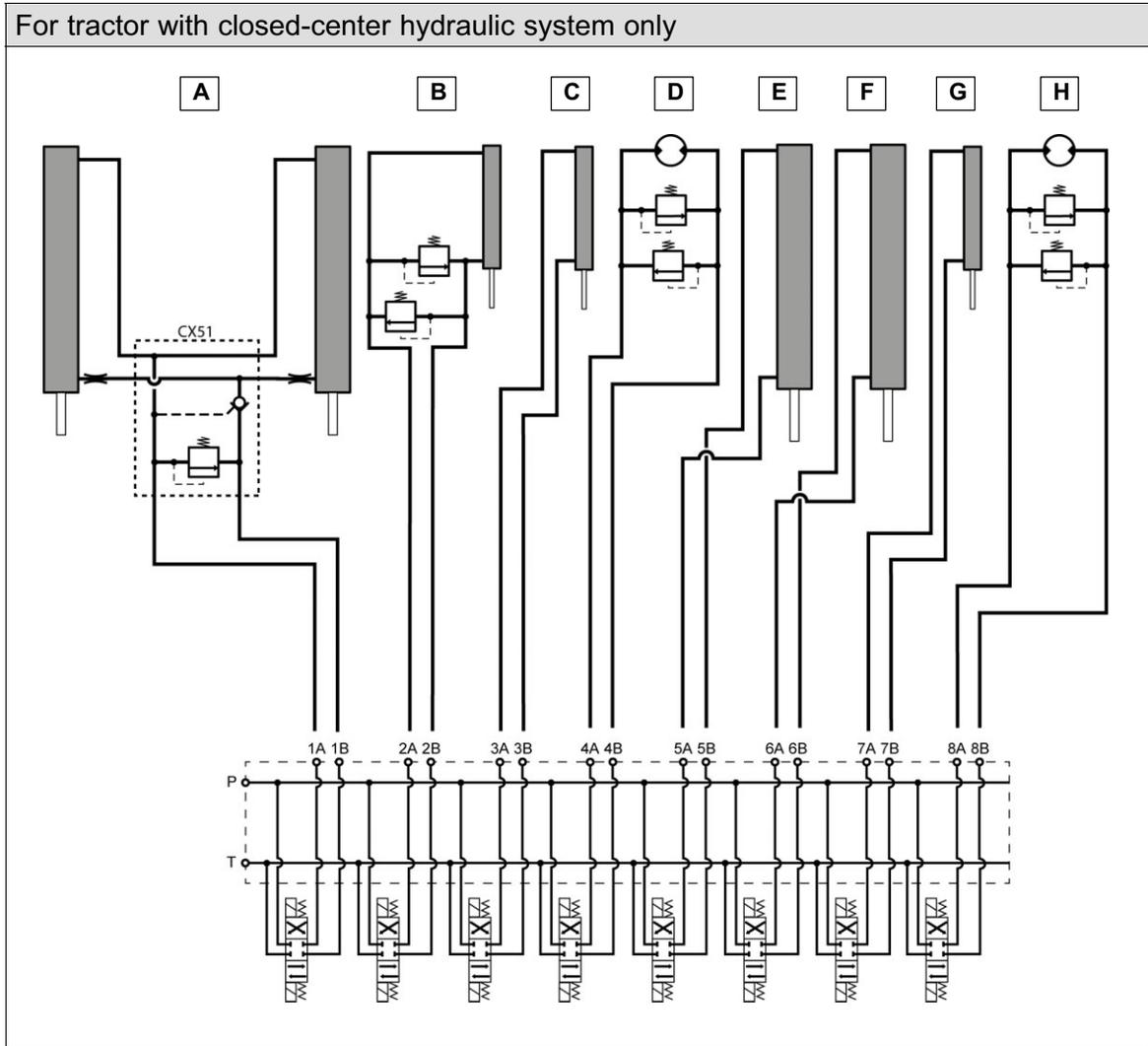
A	Undercarriage cylinder	E	Right wheel cylinder
B	Directional valve cylinder	F	Left wheel cylinder
C	Nozzle articulation cylinder	G	Loading pipe articulation cylinder
D	Nozzle hydraulic motor	H	Loading pipe hydraulic motor



Legend:

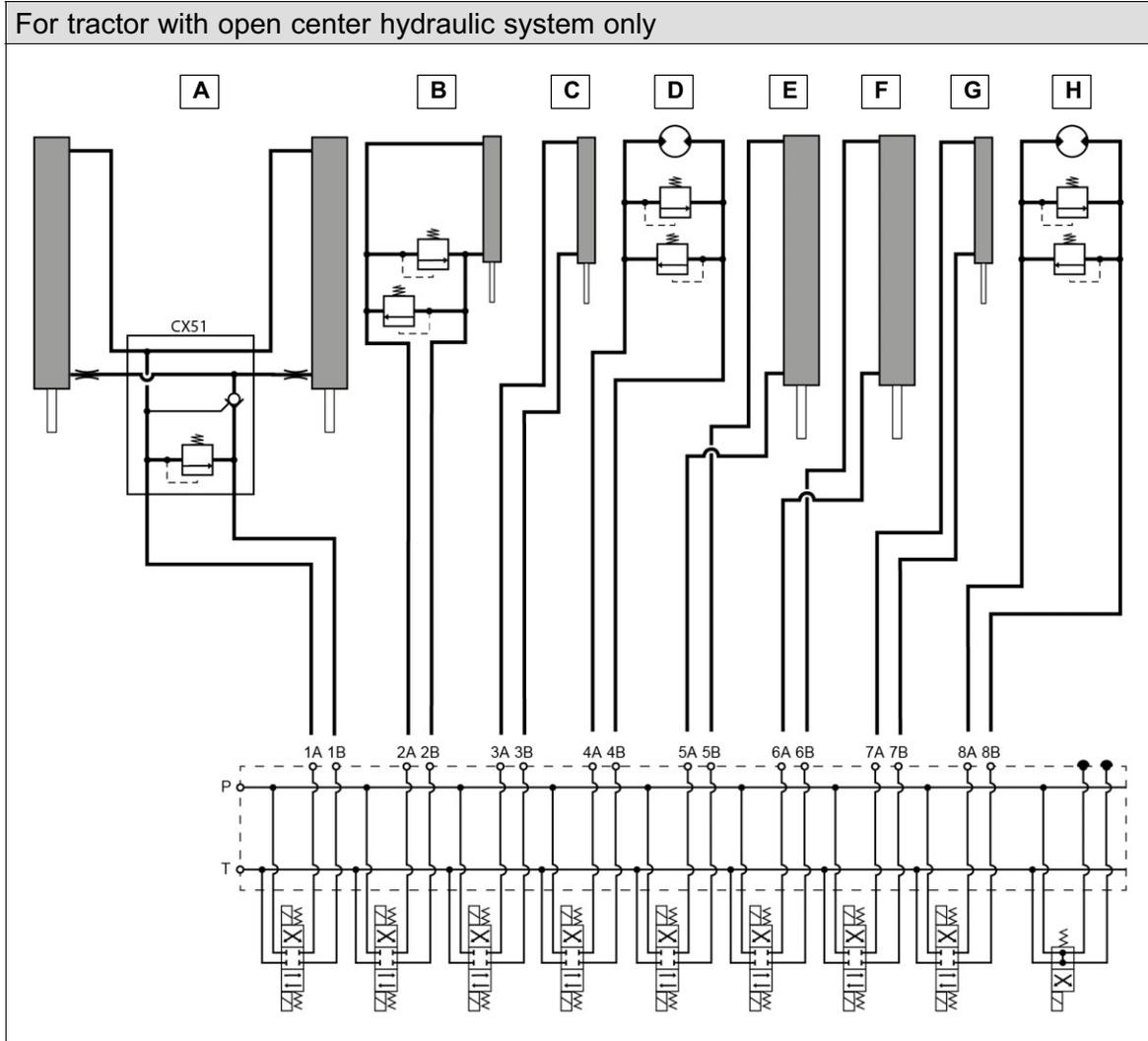
A	Undercarriage cylinder	E	Right wheel cylinder
B	Directional valve cylinder	F	Left wheel cylinder
C	Nozzle articulation cylinder	G	Loading pipe articulation cylinder
D	Nozzle hydraulic motor	H	Loading pipe hydraulic motor

9.1.16 8 Functions (version A) - Lagoon pump with multipurpose undercarriage



Legend:

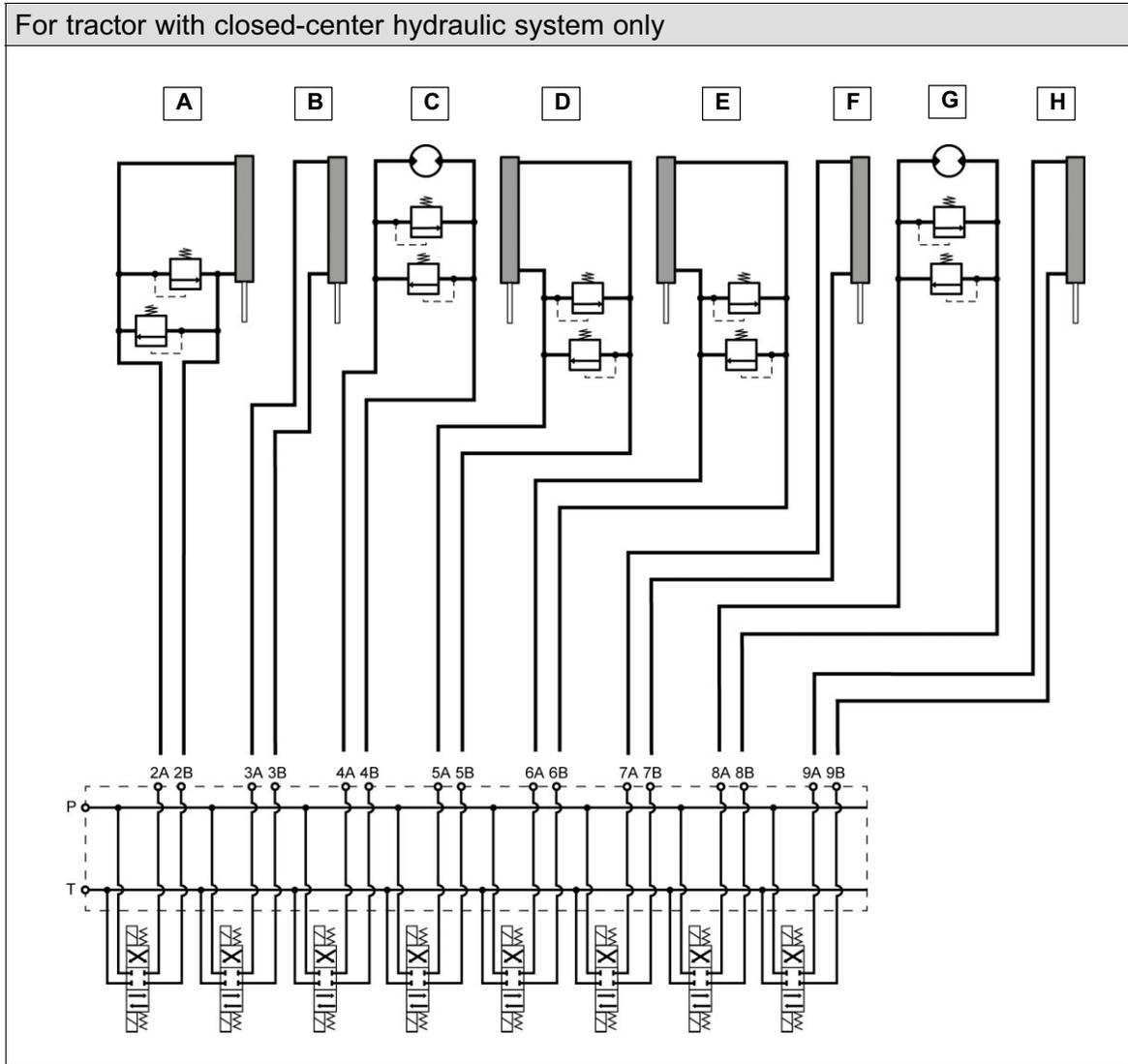
A	Undercarriage cylinder	E	Right wheel cylinder
B	Directional valve cylinder	F	Left wheel cylinder
C	Nozzle articulation cylinder	G	Loading pipe articulation cylinder
D	Nozzle hydraulic motor	H	Loading pipe hydraulic motor



Legend:

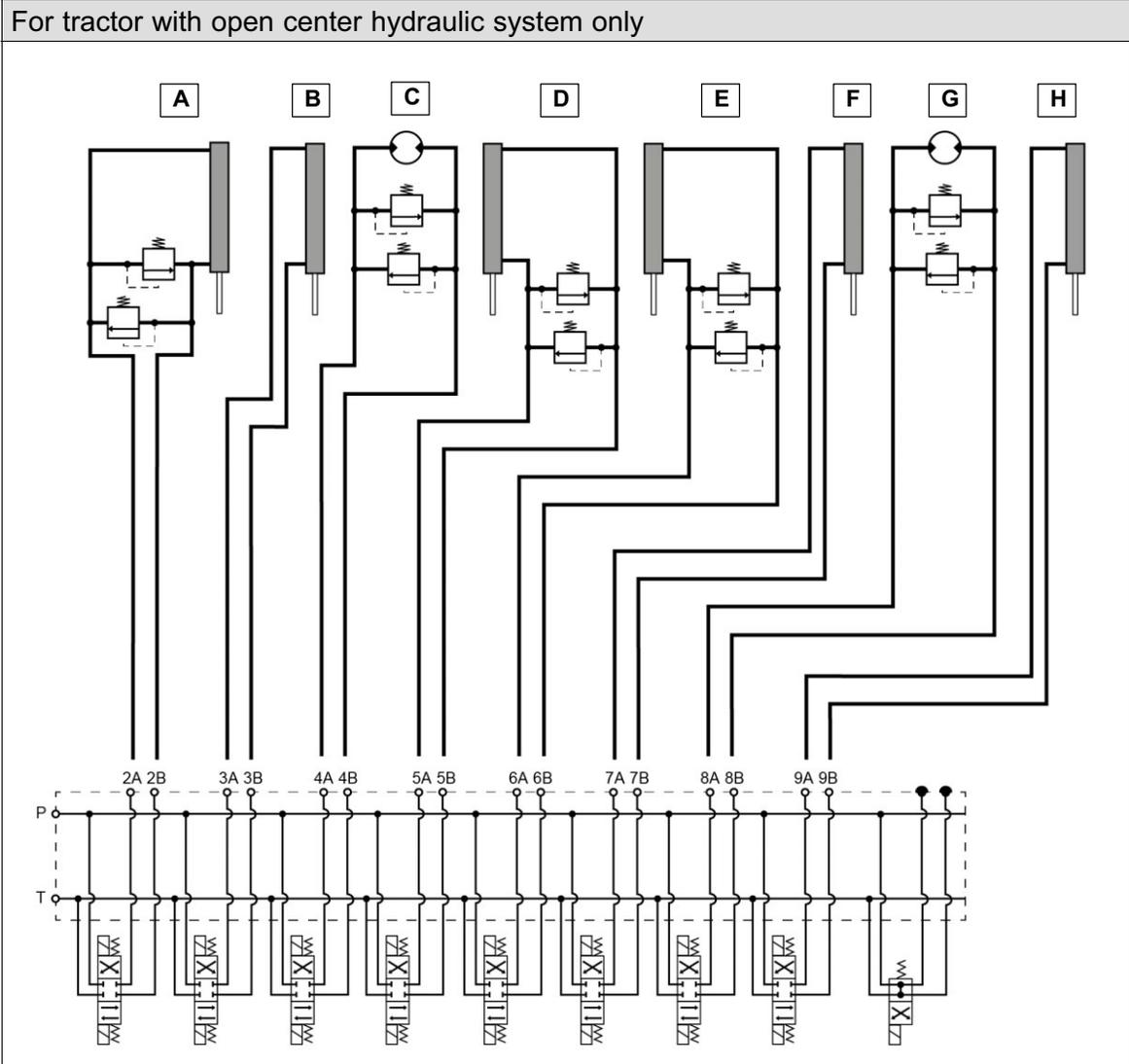
A	Undercarriage cylinder	E	Right wheel cylinder
B	Directional valve cylinder	F	Left wheel cylinder
C	Nozzle articulation cylinder	G	Loading pipe articulation cylinder
D	Nozzle hydraulic motor	H	Loading pipe hydraulic motor

9.1.17 8 Functions (version B) - Lagoon pump with HD undercarriage and stabilizer wheels



Legend:

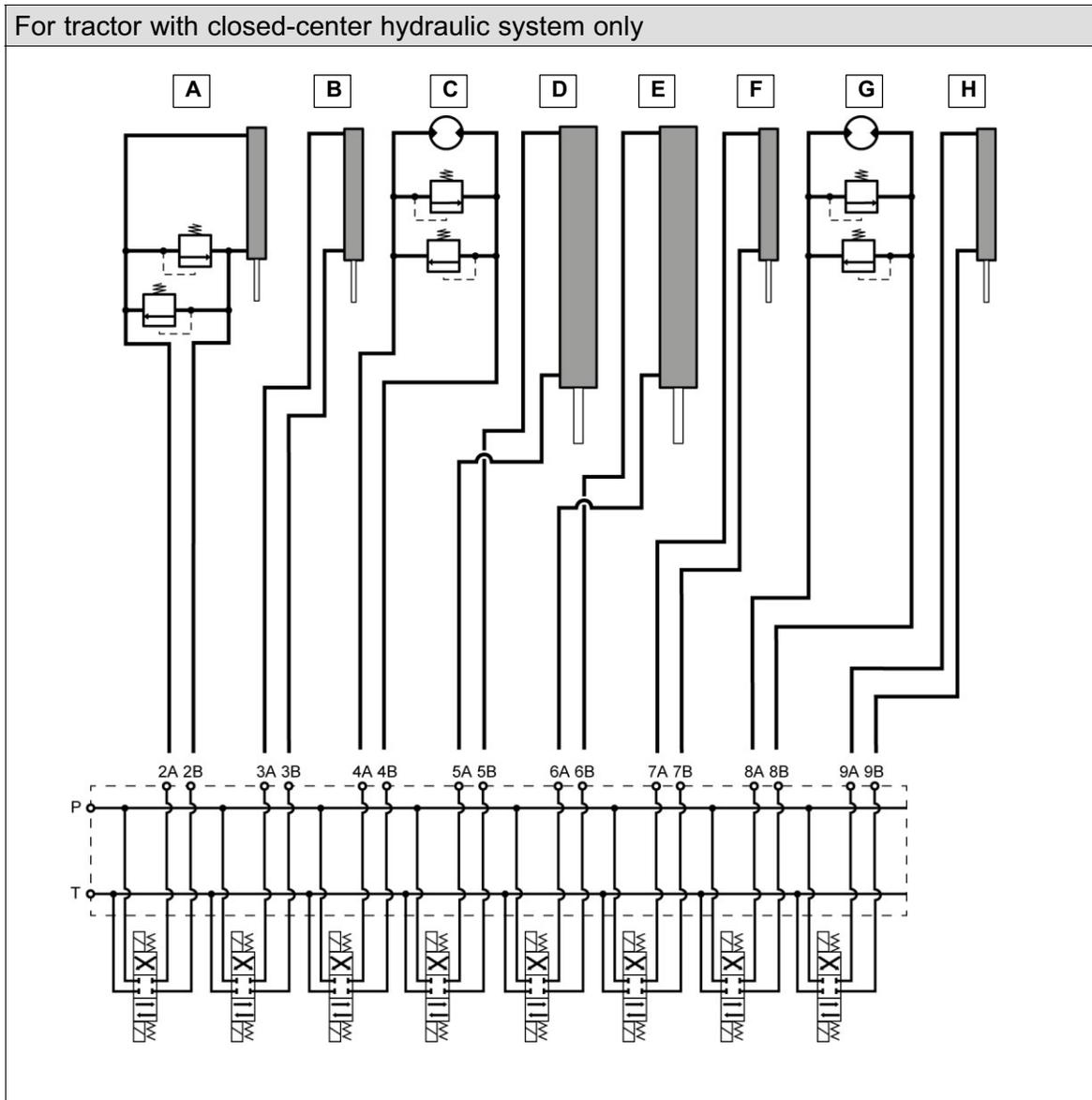
A	Directional valve cylinder	E	Left wheel cylinder
B	Nozzle articulation cylinder	F	Loading pipe articulation cylinder
C	Nozzle hydraulic motor	G	Loading pipe hydraulic motor
D	Right wheel cylinder	H	Housing articulation cylinder



Legend:

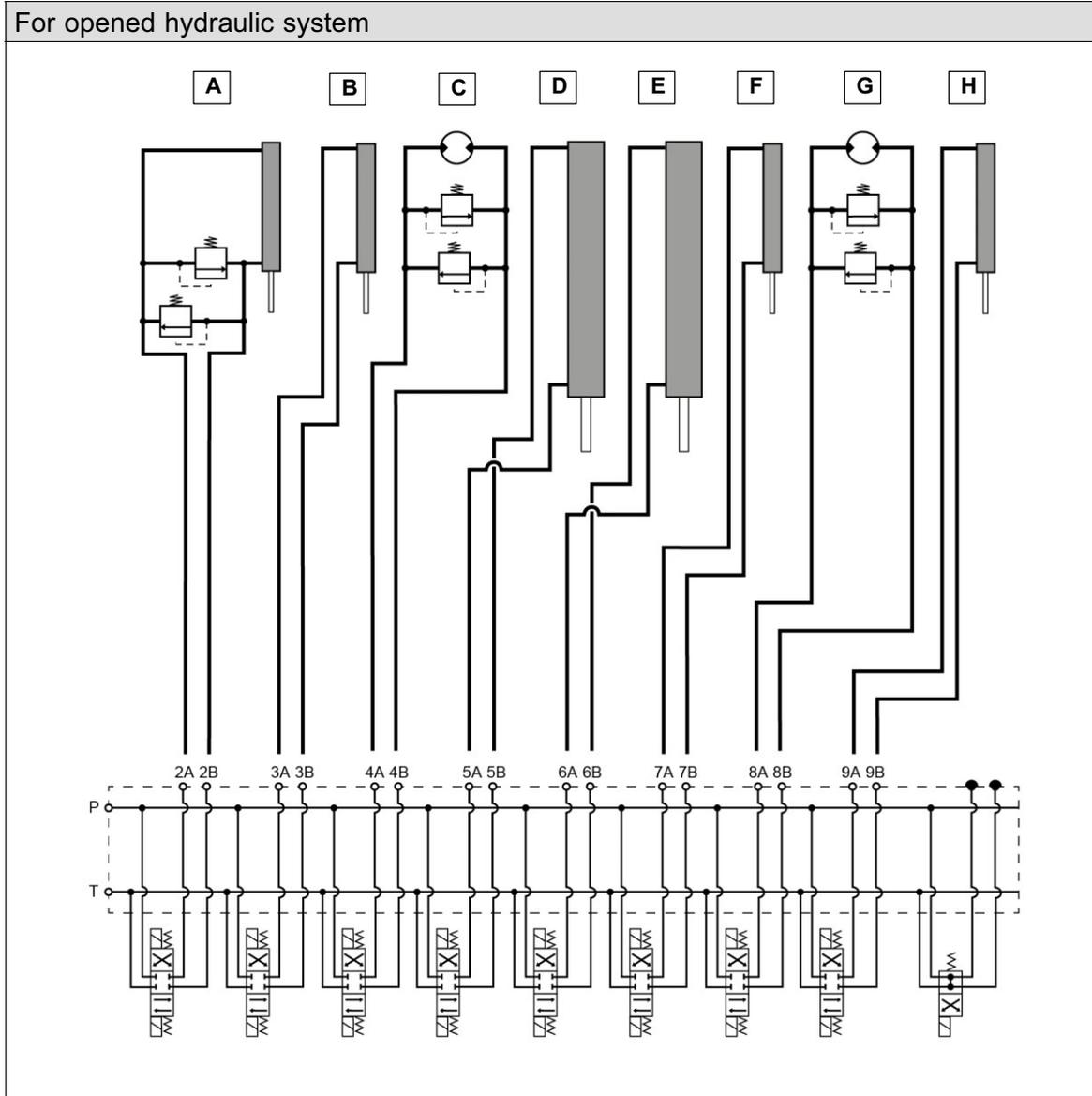
A	Directional valve cylinder	E	Left wheel cylinder
B	Nozzle articulation cylinder	F	Loading pipe articulation cylinder
C	Nozzle hydraulic motor	G	Loading pipe hydraulic motor
D	Right wheel cylinder	H	Housing articulation cylinder

9.1.18 8 Functions (version B) - Lagoon pump with multipurpose undercarriage



Legend:

A	Directional valve cylinder	E	Left wheel cylinder
B	Nozzle articulation cylinder	F	Loading pipe articulation cylinder
C	Nozzle hydraulic motor	G	Loading pipe hydraulic motor
D	Right wheel cylinder	H	Housing articulation cylinder



Legend:			
A	Directional valve cylinder	E	Left wheel cylinder
B	Nozzle articulation cylinder	F	Loading pipe articulation cylinder
C	Nozzle hydraulic motor	G	Loading pipe hydraulic motor
D	Right wheel cylinder	H	Housing articulation cylinder

9.2 Directories

Abbreviations

Term	Explanation
∅	Diameter
@	at
EC	European Community
CW	clockwise
CCW	counterclockwise
fax	facsimile
Inc.	Incorporated
NC	national coarse
QC	Quebec
USA	United States of America
SAE	Society of Automotive Engineers
WWW	World Wide Web

Units

Unit	Explanation
A	Amp (current)
cm	centimeter
°	Degrees (angles)
°C	Degrees Celsius/ Centigrade
°F	degree Fahrenheit
DC	direct current
ft	foot
Ft-lb	foot-pound
gal	gallon
gpm	gallons per minute
Hz	hertz
" (in)	Inch (= 25.4 mm)
kg	Kilogram
lb	pound
m	Meter
min	Minute
Nm	Newton per meter
psi	pounds per square inch
s	Second
min	Minute
mm	Millimeter
cm	centimeter
V	Volt (voltage)



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