

2LS

Block

800-VALACE2LS V.12A



Mechanic's manual

R. 14.10



HYDRAULICS



ACE

Take control

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IMPORTANT WARNING

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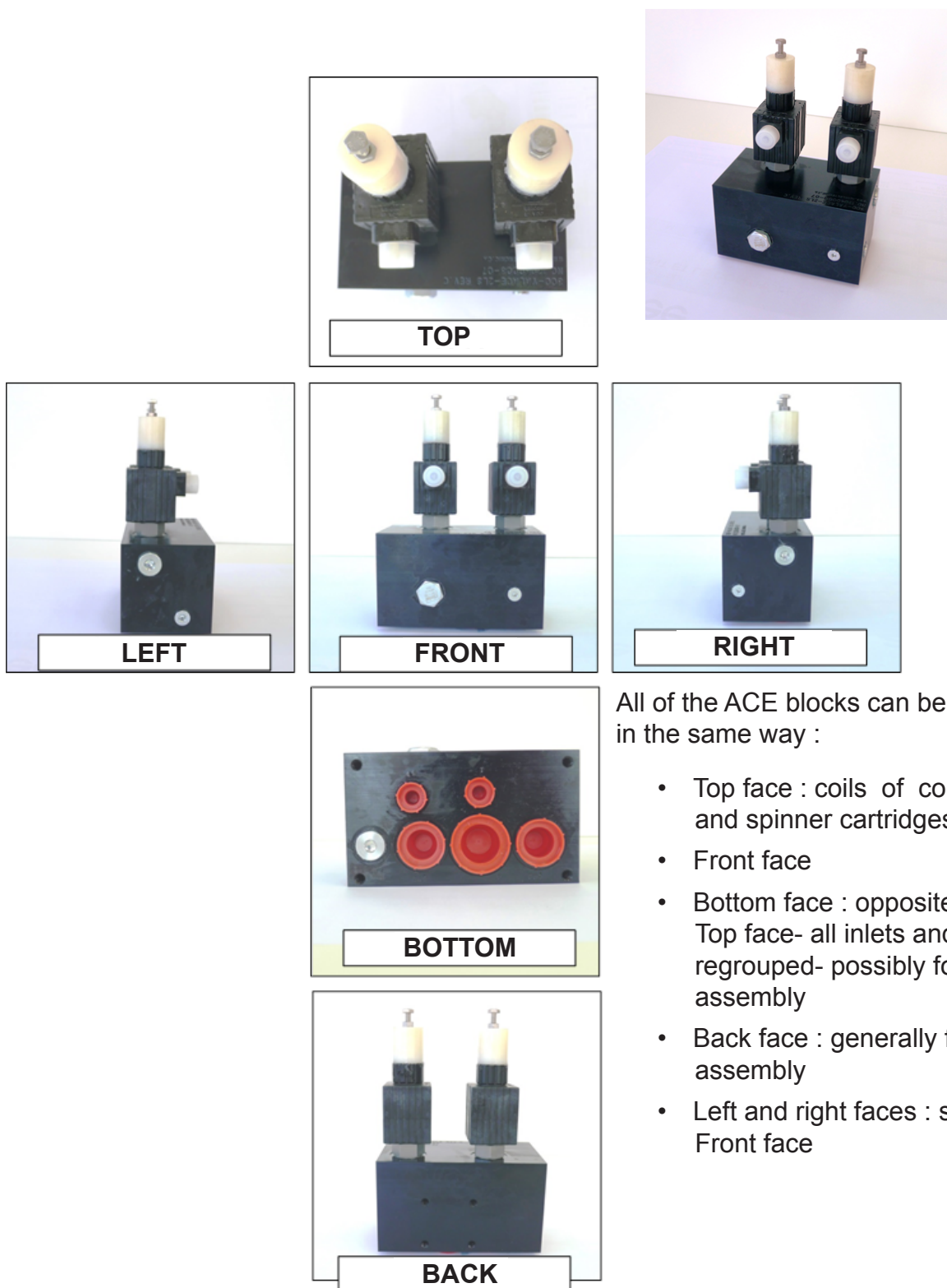
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FACE IDENTIFICATION



All of the ACE blocks can be identified in the same way :

- Top face : coils of conveyor and spinner cartridges
- Front face
- Bottom face : opposite from Top face- all inlets and outlets regrouped- possibly for assembly
- Back face : generally for assembly
- Left and right faces : seen from Front face

PRODUCT DESCRIPTION

The 2LS hydraulic distributor is a simple and lightweight spreader block that allows to operate a spreader's conveyor and spinner functions as well as its liquid option from a variable flow pump as its source of power.

Other equipments must be operated by another system. It is already indicated on trucks equipped with plows how to install a spreader.

This housing case, made of machined aluminum for this application, contains all necessary passages, cavities and connections. It sets itself on the Back face (4 holes) or on the Bottom face (4 holes).

This block is of an extreme simplicity, which limits its weight and risks of troubles.

COMPONENTS :

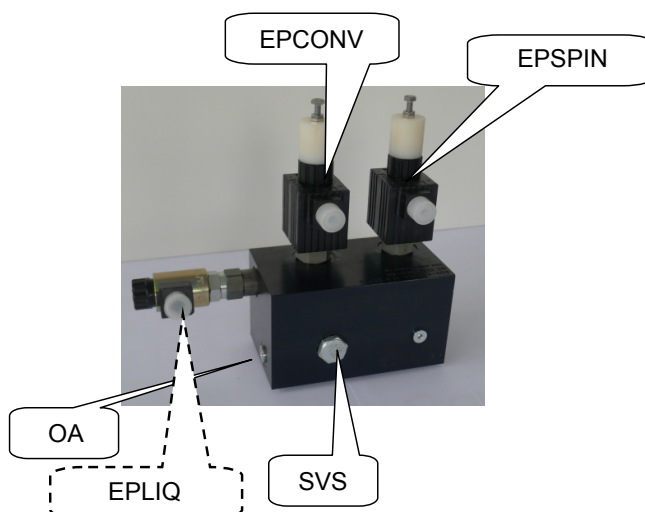
On the Top face :

- an EPCONV) electro-proportional cartridge to control the speed of the conveyor
- an EPSIN) electro-proportional cartridge identical to the previous one to control the speed of the spinner.

On the Left side (on the top left), an EPLIQ) cartridge to control the speed of the liquid pump (800-OOPR option, see Appendix C parts list).

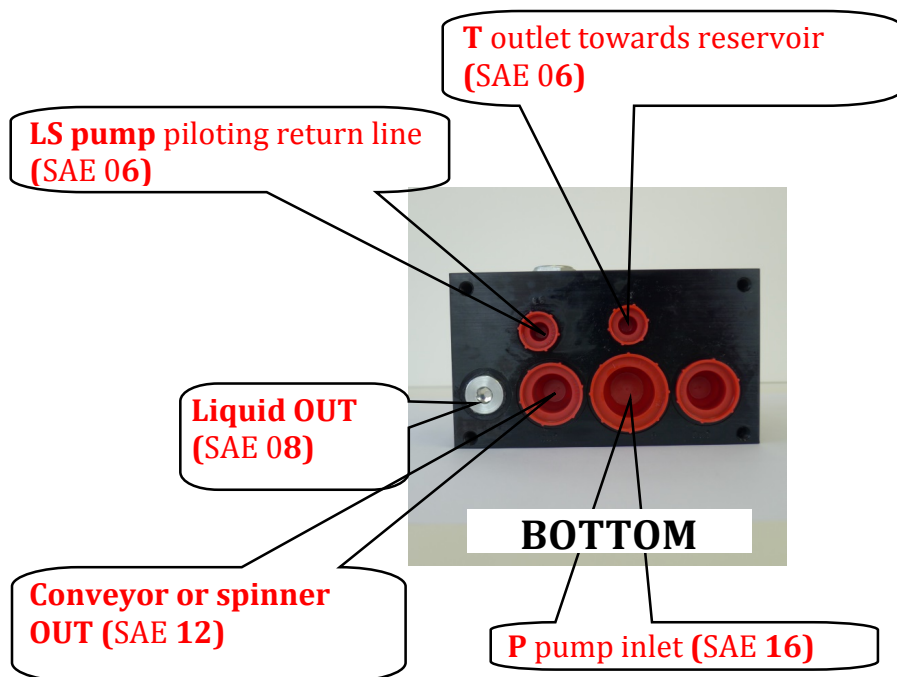
On the Front face :

- an SVS) circuit selector (shuttle valve) which allows the strongest pressure between two pipes to flow.

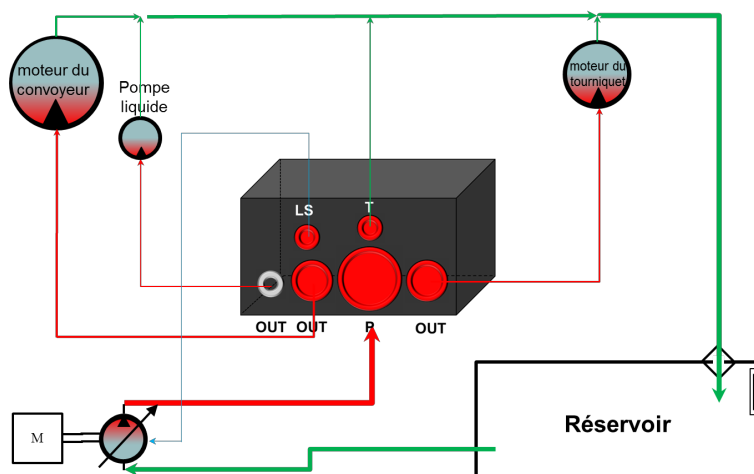


INLETS/OUTLETS

The inlets/outlets are all regrouped on the Bottom face, which limits the space necessary for connections.



PRINCIPLES OF OPERATION



This spreader block is conceived to optimise the use of a variable flow pump (piston pump in general). The circuit is flow-controlled by the working pressure (load sensing, LS for short).

In a typical LS system, the pump piloted by the LS piloting line (blue line) provides, at all times, the required flow by maintaining the adjustment pressure of 200 to 300 psi above what is required for the function.

When the spreader is not working, the piston pump provides an oil flow to maintain a pressure of 200 to 300 psi (oil splash). All the oil returns towards the pump via the LS piloting line.

The EPCONV) and EPSPIN) (and eventually EPLIQ)) spreading control cartridges are pressure-compensated for differences in pressure for the conveyor, the spinner, and eventually the liquid. Hence, when the spreader is put into function, the conveyor and/or spinner cartridges provide a measured oil flow proportional to the spreader controller's electrical signal. The hydraulic pressure between the cartridge and the conveyor and/or spinner's hydraulic motor goes through a machined conduct towards the SVS) circuit selector. It passes through the circuit selector, exits the block and returns to the pump via the LS piloting line. The LS pump's regulator being conceived to maintain a constant pressure differential between the P pump's inlet and its LS signal port's outlet, the pump's flow adjusts itself to maintain this differential, which depends on the conveyor and/or spinner cartridge's opening. The absolute pressure has no influence on the system until the system reaches its maximum pressure, which is adjusted on the pump's regulator (normally adjusted to 2500 psi).

The liquid's flow depends on the conveyor and/or spinner's pressure.

TECHNICAL SPECIFICATIONS

	METRIC	CDA - US
Valve 2LS Block dimensions (W x H x D)	17.8 x 10.1 x 10.1 cm	7" x 4" x 4"
Total dimensions (W x H x D) without EPLIQ	18.5 x 25.5 x 10.8 cm	7 1/4" x 10" x 4 1/8"
Weight	19.5 Kg	43 lbs.
Total dimensions (W x H x D) with EPLIQ	30.0 x 25.5 x 10.8 cm	12" x 10" x 4 1/8"
Spinner/conveyor flow		ΔP 150 ΔP 300
Liquid flow		14 GPM 20 GPM 0 to 10 GPM
Reserve pressure (according to pump's setting)		250-300 PSI
Maximum operating pressure		3000 PSI
Security pressure		2500 PSI
Orifice dimensions:		
- Pressurized inlet (P)	SAE 16	
- Reservoir return line (T)	SAE 06	
- Charge detection (LS)	SAE 06	
- Conveyor (OUT)	SAE 12	
- Spinner (OUT)	SAE 12	
- Liquid outlet (OUT)	SAE 08	
Oil type	See pump manufacturer's specifications	
Filtration oil purity	See pump manufacturer's specifications	
Coil current (conveyor and spinner)	12 VDC, 42 W, 3.54 A, 3.8 Ohms	
Liquid coil current	12 VDC, 22 W, 1.8 A, 3.7 Ohms	

RECOMMENDATIONS FOR PNEUMATIC LINES AND HYDRAULIC CONNECTIONS :

- All pneumatic lines must be cleaned before being installed.
- All connections going to valves motors, cylinders, etc. must conform to SAE 514 (O-ring boss) standard specifications.
- All pneumatic lines must meet or surpass the SAE100-R2AT standard.
- All pneumatic lines and connections should come from the same manufacturer.
- All connections should meet SAE-J514 (JIC 37o) standard specifications.

INSTALLATION AND CONFIGURATION

PLANNING

Determine whether you need to install an enclosure or a protective box. Choose where to install the 2LS block in order to allow ease of access for inspections and maintenance.

You must anticipate the necessary space to connect the hydraulic tubes on the bottom.

You must also anticipate access to components and to the OA orifice for maintenance.

IMPORTANT PRECAUTIONS:

The spreader block is not very heavy but it is always preferable to use lift and support tools to keep it in place until it is solidly attached to the vehicle



EXECUTION

This valve offers two assembly surfaces : the Bottom face and the Back face. Choose the most appropriate one and drill or perforate the holes with the corresponding pattern (see appendices A2, page 13 or A3, page 14).

Note : The holes of the threaded fasteners in the housing case have 5/16 NC by 1/2 threads. It is recommended to leave a cleaning space between the valve's case and the truck's assembly surface by adding a stainless steel spacer (for example, 3/8 SS nuts).

Hook up the cleaned and properly dimensioned pneumatic lines to their respective orifices (see diagram on page 7).

MAINTENANCE

The only recommended regular maintenance for this valve is to make sure that all the coils are detachable from their respective cartridges.

Separate both components, then clean and reassemble them with anticorrosive grease.

If the 2LS valve is equipped with an EPLIQ) cartridge (liquid function or other), cover it with a drop of silicone before setup to prevent the manual activation from rusting, which could prevent you from using this precious diagnostic tool.

Note: Press with a 7/64 allen key to activate this function.

DIAGNOSIS AND TROUBLESHOOTING

ESSENTIAL PRELIMINARY VERIFICATIONS

When you have an operation malfunction, start by verifying and correcting if needed the following :

- PV1.** Make sure no mechanical element blocks the conveyor or spinner.
- PV2.** Make sure the hydraulic oil level is normal.
- PV3.** Make sure the hydraulic pump's drive shaft is connected as it should be and that it can turn freely when the motor is running. Particularly for automatic transmissions, verify that the PTO is engaged. Make sure that the VD06 and VD10 levers function normally and return to their neutral position.
- PV4.** Proceed to a visual inspection of the pneumatic lines and all of the hydraulic system's components to detect oil leaks.
- PV5.** Make sure the electronic spreader is fed with 12 VDC current and that it is properly grounded.

For troubleshooting, see appendix D on page 17.

REPAIR SERVICES

Customer Service can be reached during regular business hours (8am to 5pm EST) either by phone at 416-907-0915 or by email at acesupportdesk@gmail.com. For an up-to-date list of authorized field repair and service depots, visit www.aceelectronic.ca.

WARRANTY

Accent Electronic Controls Inc. (ACE) warrants to the buyers of electronic products and accessories manufactured by ACE that they are free of defects in material and workmanship. ACE's sole obligation under this warranty is to repair or replace, at ACE's option, any products or parts thereof, which under normal use and proper maintenance have proven defective in material or workmanship.

No claim under this warranty will be valid unless the claimant notifies ACE in writing within a reasonable time of the discovery of such defects, but under no circumstances later than twelve (12) months from the date of shipment of such product by ACE.

As requested by ACE, products or parts for which a warranty claim is made must be returned prepaid to the factory or a designated repair depot.

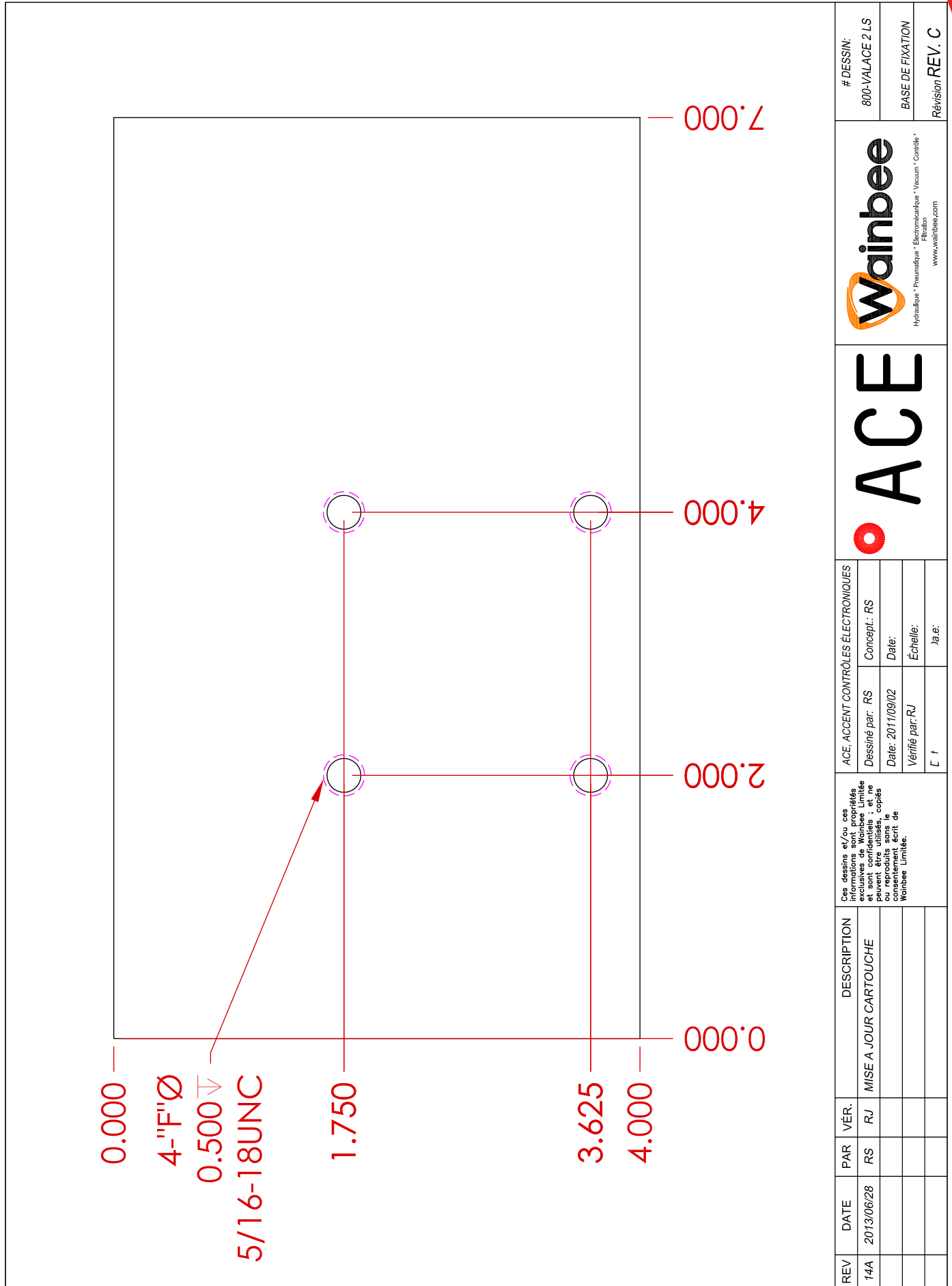
The risk of loss or damage of any returned product or part thereof will be born by the buyer.

For approved warranty claims, ACE will cover the transport costs to return the equipment to the claimant. ACE is not liable in any way nor will bear any costs related to :

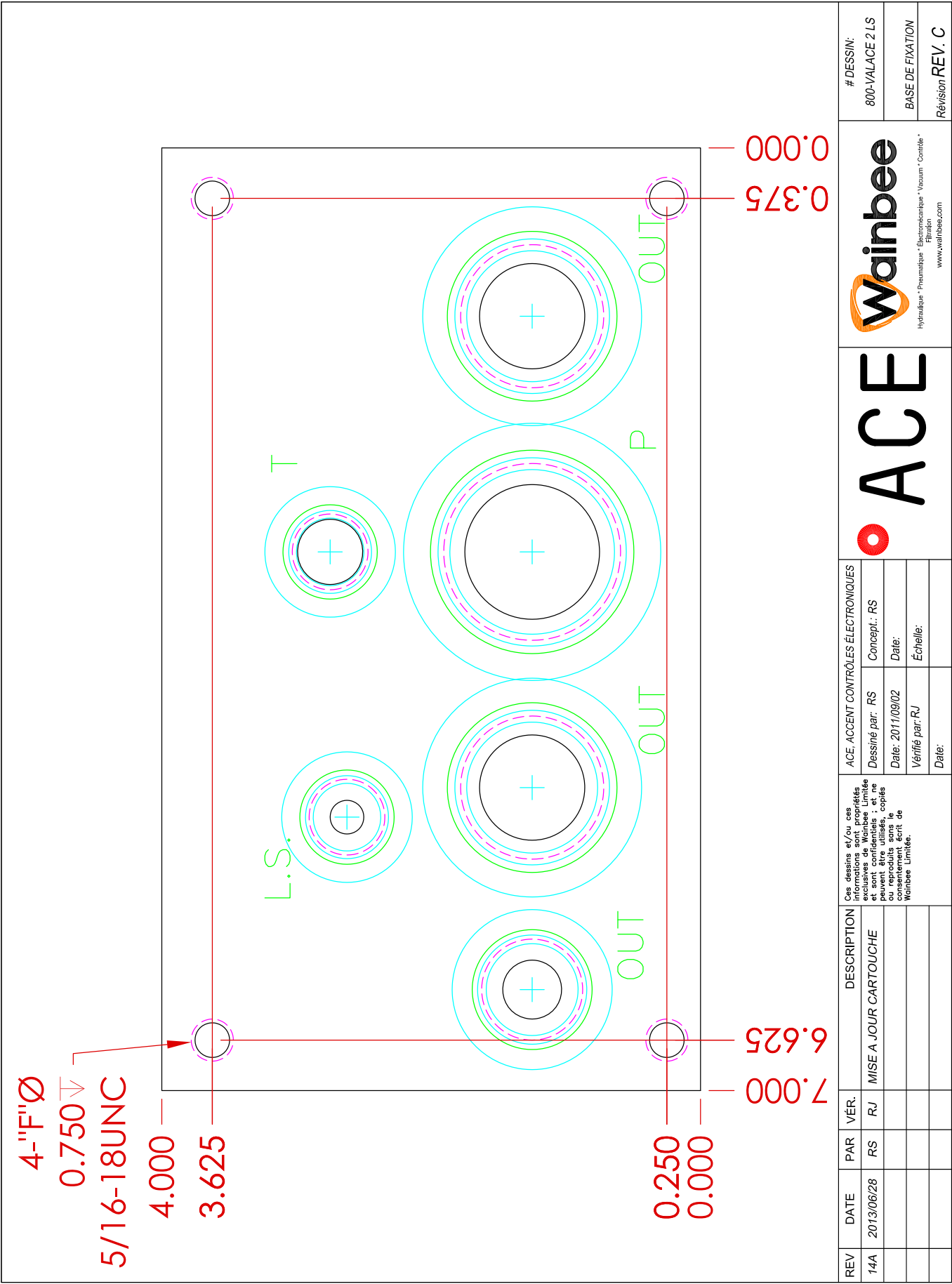
- wear and tear, abuse, misuse, overloading or alterations
- transportation charges or costs of installation, replacement, field repair or other charges related to returning products to ACE or its designated repair depots
- any liability for direct, indirect or consequential damage or delay

No employee or representative of ACE is authorized to change any warranty in any way or grant any other warranty unless such is made in writing and signed by any officer of ACE.

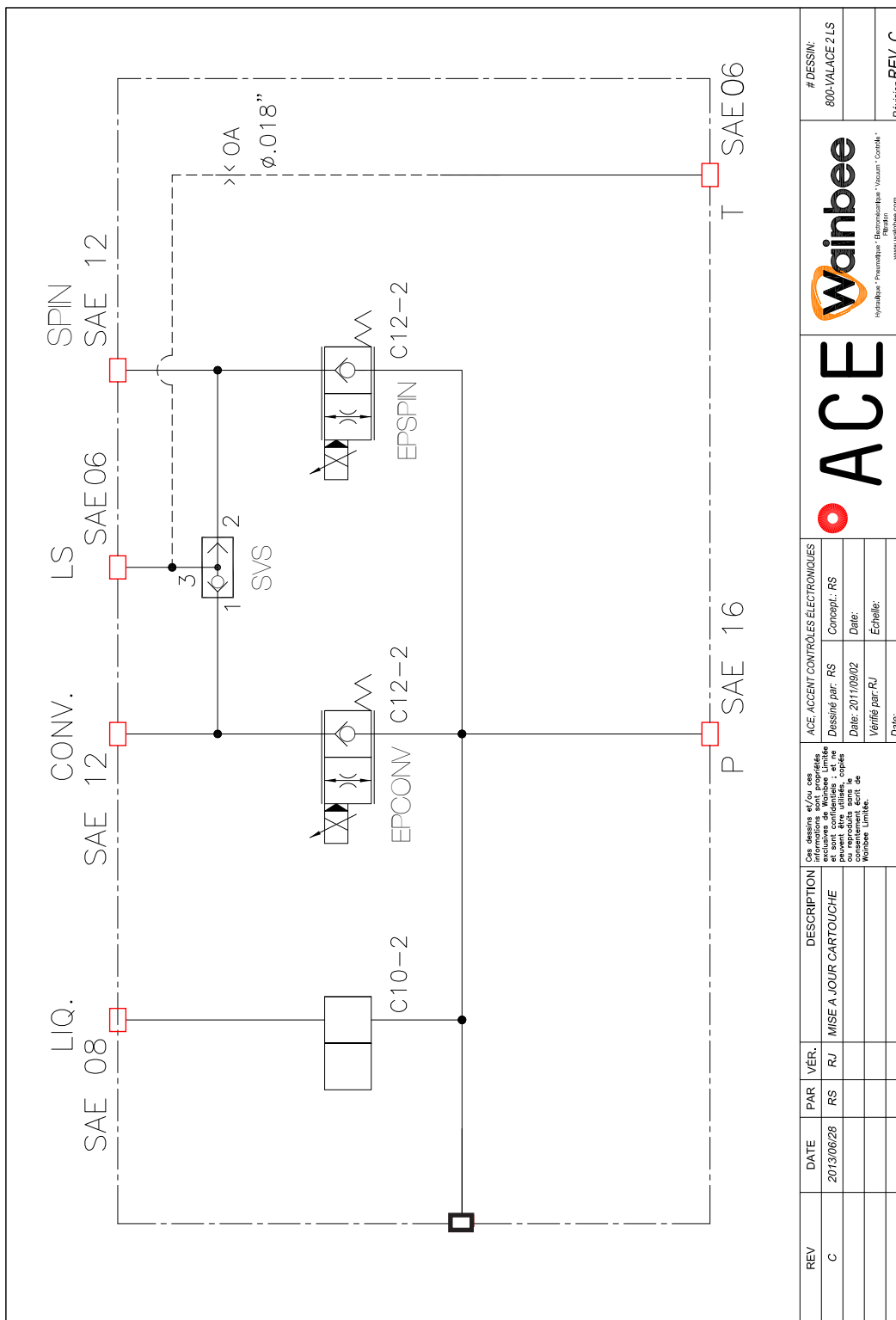
APPENDIX A1: ASSEMBLY TEMPLATE ON BACK FACE



APPENDIX A2: ASSEMBLY TEMPLATE ON BOTTOM FACE



APPENDIX B: HYDRAULIC DIAGRAM



APPENDIX C: PARTS LIST

Reference	PIECE NO.	Photo	Descriptions
800-VALACE2LS			DUAL FUNCTION ELECTRO-PROPORTIONAL SPREADER BLOCK FOR LOAD SENSING VARIABLE FLOW PUMP
	3/8		1/4-16 X 1" HEX BOLT SS
			1/4-16 HEX NUT SS
	135-CAPUCHON		END CAP FOR SOLENOIDS
EPCONV & EPSPIN	700-PAHEA0EH		ELEC. COIL PK 42W
	700-PASPABBCA		PK ELECTRO-PROPORTIONAL CARTRIDGE
SVS	700-PAVLAOAB		CIRCUIT SELECTOR VALVE
EPLIQ	700-D14E-30W		ELEC. COIL SD 20V 30W (LIQUID)
	700-PFC10-RC		ELECTRO-PROPORTIONAL CARTRIDGE FOR LIQUID
EPLIQ	800-OOPR (Option)		ELECTRO-PROPORTIONAL CARTRIDGE VALVE SET FOR AUXILIARY LIQUID FUNCTION COMMAND
800-VALACE2LS with 800-OOPR option			DUAL FUNCTION ELECTRO-PROPORTIONAL SPREADER BLOCK FOR LOAD SENSING VARIABLE FLOW PUMP WITH AUXILIARY FUNCTION FOR LIQUID (OPTIONAL)

APPENDIX D : TROUBLESHOOTING

BLOC 800-VALACE2LS TROUBLES (1)

NO TROUBLE

COMMAND	P ^{N1}	LS ^{N1}	CONV
Neutral	350**	0	0
With controller CONVEYOR 100%	CONV+350	CONV	800-1500

TESTS ON A SPREADER IN TROUBLE

	COMMAND	OBSERVATION	POSSIBLE CAUSES	PROCEDURE
TEST CONV	Manually CONVEYOR 100%	Conveyor active	Electrical	Apply CE01 to CE04 (page 18)
		Conveyor inactive	Mechanical or hydraulic	Apply CM01 (page 18) AND CH01 to CH05 (page 19)
TEST SPIN	Manually SPINNER 100%	Spinner active	Electrical	Apply CE01 to CE04
		Spinner	Mechanical or hydraulic	Apply CM01 AND CH01 to CH05
TEST LIQ	Manually CONVEYOR 100% Manually LIQUID 100%	Conveyor active Liquid active	Electrical	Maintain the conveyor active and apply the following steps: CE01 to CE03 to LIQUID. Warning: different coil for liquid
		Conveyor active Liquid active	Mechanical or hydraulic	Maintain the conveyor active and apply the following steps: CM01, CH01 to CE04 to LIQUID Warning: different cartridge for liquid
TEST PUMP	Put a 3000 psi manometer on the pump's outlet that supplies the 2LS valve. Let run without activating the spreader	The manometer shows between 200 and 350	Major trouble	Contact ACE service
		The manometer does not show between 200 and 300	LS lign - Pumps compensator wrongly adjusted or pump is in trouble	Verify LS lign Verify pump

BLOC 800-VALACE2LS TROUBLES (2)

CONVEYOR ELECTRICAL TROUBLES

The conveyor becomes active with the manual command

POSSIBLE CAUSES	VERIFICATIONS	TREATMENT
CE01 Controller input	Verify connection (12VDC & GND)	
CE02 Solenoid cable	Verify cable, if LED is turns on, if current good (12 VDC)	Replace if needed #910-CABDORDAS2
CE03 Coil (CONV or SPIN) LIQ coil	Test with the other identical coil or measure resistance (3,8 ohms) Mesurer resistance (3.7 ohms)	Replace if needed #700-PAHEAOEH #700-M19-12D
CE04 Cartridge (CONV or SPIN) LIQ Cartridge	Remove and clean. Test with the other identical cartridge Remove and clean.	Replace if needed #700-PASPABBCA #700-PFC10-RC

CONVEYOR MECHANICAL TROUBLES

The conveyor remains inactive even with the manual command

POSSIBLE CAUSES	VERIFICATIONS	TREATMENT
CM01 Mechanical blockage of the conveyor	Mechanical obstruction of the CONV, adjustment of the CONV belt too tight Breakage of the CONV motor and of the reductor	Repair
The circuit heats when the conveyor is on		
CM02 Mechanical trouble of the conveyor	Abnormal friction, adjustment of the CONV belt too tight	Repair

BLOC 800-VALACE2LS TROUBLES (3)

CONVEYOR HYDRAULIC TROUBLES

Controller CONV 100% Inactive conveyor

	POSSIBLE CAUSES	VERIFICATIONS	TREATMENT
CH01	CONV hydraulic loss	Visual	CONV. motor leak Leak in the circuit between the CONV outlet of the spreader block and the CONV motor (ex. leak in a selector valve)
CH02	SVS does not close air-tight (this creates a leak towards the reservoir through the conveyor or spinner's motor)		Remove and clean SVS. Replace if needed #700-PAVLAOAB
CH03	Pump's compensator wrongly adjusted or in trouble	Pump pressure - LS pressure close to 0 (compensator wrongly adjusted)	TEST PUMP (See page 19)
CH04	EPCONV cartridge in trouble	Test using EPSPIN cartridge	Remove and clean Replace if needed #700-PASPABBCA

Controller CONV 100% Inactive conveyor or insufficient power

CH05	OA orifice absent	Verify presence of OA orifice	Replace if needed #700-ORI-0180
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When spreader is stopped, the hydraulic system remains pressurized

SH01	Obstructed OA orifice	The pump remains at a pressure greater than 350**	Remove and clean OA. Replace OA if needed #700-ORI-0180. <i>It is possible to run the system for 30 seconds without OA in order to clean the passage of the orifice (Be careful of accidents)</i>
SH02	EPCONV does not close air-tight	Pump pressure between 350** and 2200	Remove and clean EPCONV. Replace if needed #700-PASPABBCA