

rev 1.1

# INSTALLATION GUIDE

## INSTALLATION VALVES



PV-SAE 3/4" – 1 1/4"

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### 1. GENERAL

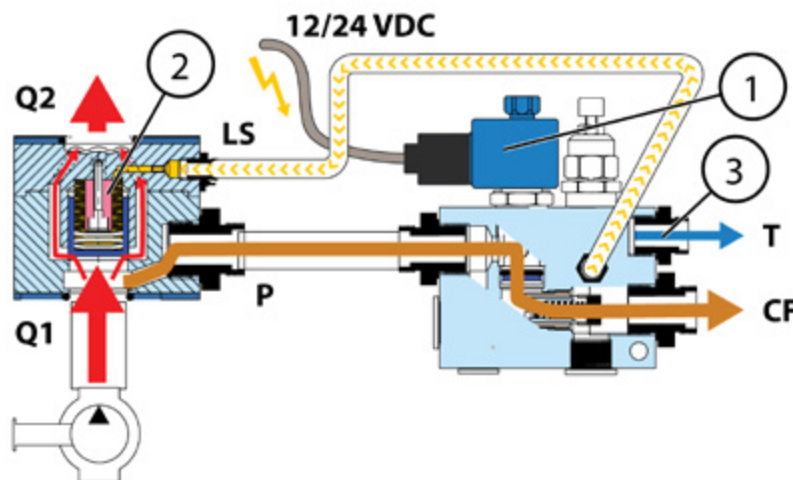
#### 1.1. APPLICATIONS

DYNASET Priority valves (PV-SAE) are designed to enable easy and reliable installation of DYNASET product to any type of hydraulic system.

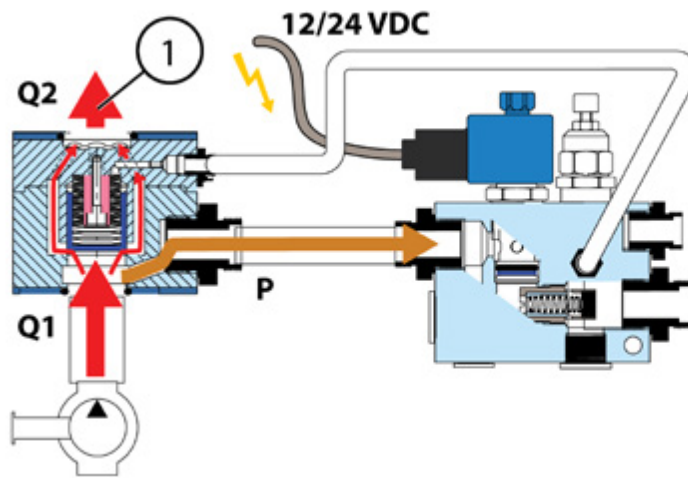
DYNASET PV-SAE enables you to operate your DYNASET unit simultaneously with other hydraulic equipment installed into the base machines hydraulic system. DYNASET PV-SAE ensures the prioritised and non-fluctuating hydraulic flow to your DYNASET unit.

The PV-SAE consists of PC-SAE pressure compensator and LS-valve block.

#### 1.2. OPERATING PRINCIPLE



1. When the solenoid valve is opened the prioritised control flow (CF) is directed to start the appliance.
2. The CF flow is controlled and stabilized by the LS-pressure to the corrected level.
3. The Pressure relief valve opens the flow to the tank line when the pressure raises too high. It protects the appliance from having too much pressure.



1. When the solenoid valve is closed the the CF flow to the appliance stops and the main flow (Q1) from the pump is not altered and the whole hydraulic flow is available to the rest of the system.

## 2. SAFETY


### ATTENTION!

Operator and maintenance personnel must act in compliance with the laws, regulations and recommendations issued by the local work safety authorities.


 **WARNING**

**HIGH PRESSURE OIL!**

Can cause severe injuries.  
Always wear appropriate clothing  
and safety equipment.




The pressure in hydraulic circuits is considerably high. Therefore the condition of your equipment are to be kept under constant observation. All couplings, valves and hoses are to be kept tight and clean. Leaks in the hydraulic system must be repaired immediately to avoid injuries caused by high pressure and oil blowouts.

 **WARNING**

**RISK OF BURNS!**

Parts of the unit, oil, and oil filler cap  
can be hotter than 80 °C!

Wear personal safety equipment!



### ATTENTION!

Before beginning any maintenance, repair or disassembly to the hydraulic system and DYNASET product, ensure that the hydraulic system is stopped and depressurized. Make sure that the system can not start accidentally.

### NOTE!

When carrying out any maintenance to the hydraulic system keep the components clean. This is to ensure safe, reliable and longlife operation of your equipment.

When working with the hydraulic system wear appropriate protective clothing, safety goggles, gloves, ear protection.

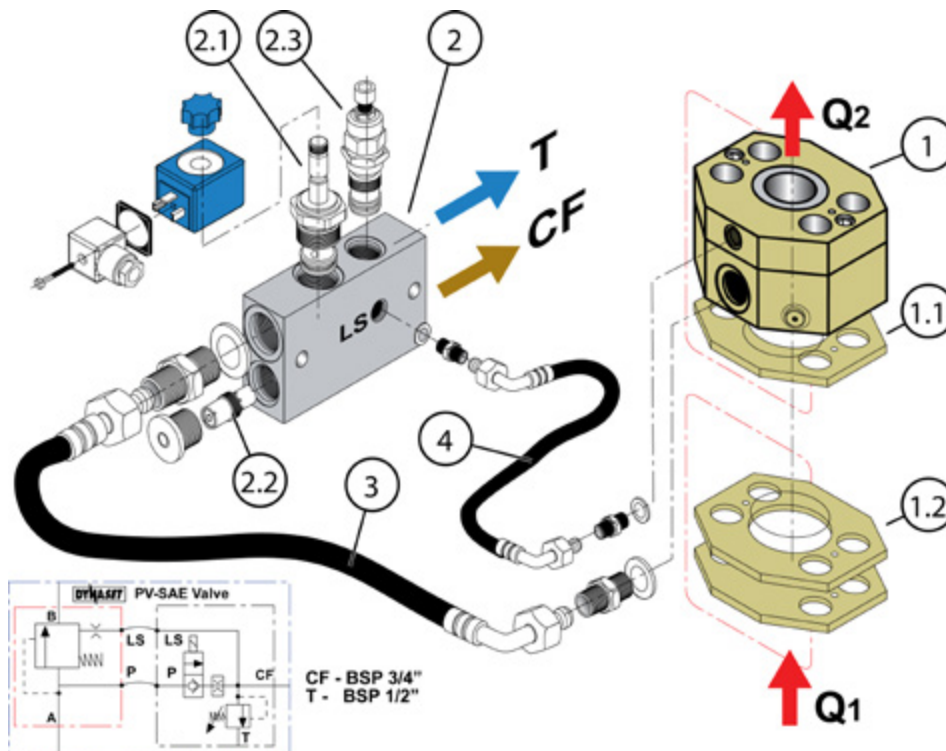
### 3. TECHNICAL SPECIFICATIONS

DYNASET PV-SAE has following components

1. PC-SAE Sandwich-mounted pressure compensator with SAE-flange specification
  - 1.1. PC-SAE includes one seal flange as standard.
  - 1.2. Optional Height adjustment kit
2. LS-VALVE that includes following components
  - 2.1. Solenoid valve 12/24V
  - 2.2. Flow limiting valve
  - 2.3. Pressure relief valve
3. Pressure line hose
4. LS-line hose

The PV-SAE comes in two main constructions

#### 3.1. CONSTRUCTION I

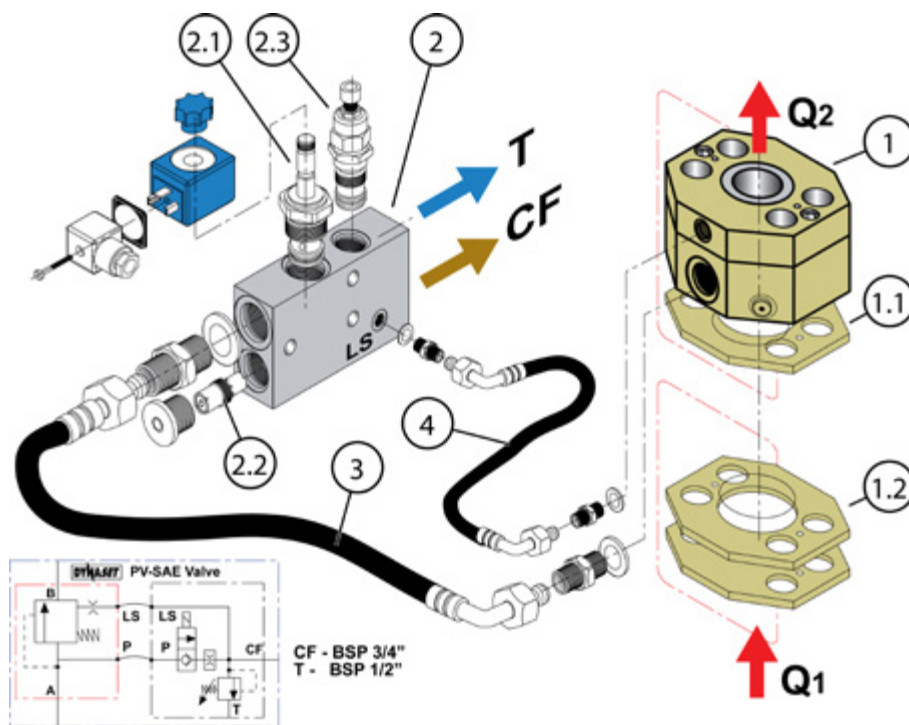


Model	PC-SAE	LSV	p max. bar (psi)	Q CF max.* l/min (gpm)
PV-SAE 3/4-40-xx lpm-12/24 V	3/4"	LSV 40	315 (4550)	35 (9.24)
PV-SAE 3/4-60-xx lpm-12/24 V	3/4"	LSV 60	315 (4550)	55 (14.52)
PV-SAE 1-40-xx lpm-12/24 V	1"	LSV 40	315 (4550)	35 (9.24)
PV-SAE 1-60-xx lpm-12/24 V	1"	LSV 60	315 (4550)	55 (14.52)
PV-SAE 1 1/4 - 40-xx lpm-12/24 V	1 1/4"	LSV 40	315 (4550)	35 (9.24)
PV-SAE 1 1/4-60-xx lpm-12/24 V	1 1/4"	LSV 60	315 (4550)	55 (14.52)

\*CF value is adjusted at the factory according to the customers specifications.

Hoses		PV-SAE -> LSV40	PV-SAE -> LSV60
Pressure Line	Size	R 5/8	R 5/8
	Length	800 (31.5)	800 (31.5)
LS- line	Size	R 1/4	R 1/4
	Length	1000 (39.4)	1000 (39.4)

### 3.2. CONSTRUCTION II



Model	PC-SAE	LSV	p max. bar (psi)	Q CF max.* l/min (gpm)
PV-SAE 3/4-95-xxx lpm-12/24 V	3/4"	LSV 95	350 (5100)	85 (22.44)
PV-SAE 1-95-xxx lpm-12/24 V	1"	LSV 95	350 (5100)	85 (22.44)
PV-SAE 1 1/4 - 95-xxx lpm-12/24 V	1 1/4"	LSV 95	350 (5100)	85 (22.44)
PV-SAE 3/4-150-xxx lpm-12/24 V	3/4"	LSV 150	350 (5100)	140 (36.96)
PV-SAE 1-150-xxx lpm-12/24 V	1"	LSV 150	350 (5100)	140 (36.96)
PV-SAE 1 1/4 - 150-xxx lpm-12/24 V	1 1/4"	LSV 150	350 (5100)	140 (36.96)

\*CF value is adjusted at the factory according to the customers specifications.

Hoses			PV-SAE -> LSV95	PV-SAE -> LSV150
Pressure Line	Size		R 5/8	R 3/4
	Length	mm (in)	800 (31.5)	800 (31.5)
LS- line	Size		R 1/4	R 1/4
	Length	mm (in)	1000 (39.4)	1000 (39.4)

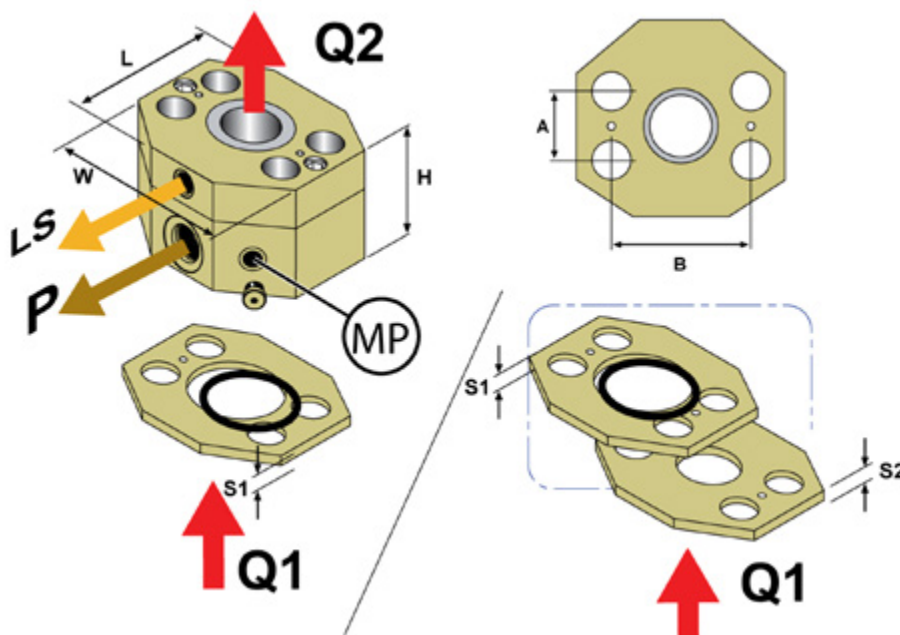
### 3.3. LS-VALVE

Measurements and detailed installation information about LS-valve can be found from the LS-Valve installation guide provided with PV-SAE installation guide.

### 3.4. PC-SAE

			PC-SAE 3/4"	PC-SAE 1"	PC-SAE 1 1/4"
Opening pressure		<b>bar (psi)</b>	13,5 (200)	14 (203)	17,5 (254)
Pressure max.		<b>bar (psi)</b>	350 (5100)	350 (5100)	350 (5100)
Flow max.	Q1 - Q2	<b>l/min (gpm)</b>	200 (52.8)	350 (92.4)	450 (118.8)
Flow max.	Q1 - P	<b>l/min (gpm)</b>	70 (18.48)	100 (26.4)	145 (38.28)
Pressure drop at max. flow	Q1 - Q2 (open)	<b>bar (psi)</b>	2,9 (42)	2,8 (41)	3 (44)
	Q1 - P	<b>bar (psi)</b>	3 (41)	3 (41)	3,5 (51)
SAE-flange	3000-6000 psi		SAE 3/4"	SAE 1"	SAE 1 1/4"

		PC-SAE 3/4"	PC-SAE 1"	PC-SAE 1 1/4"
A	mm (in)	23 (0.9)	27,2 (1.1)	31,5 (1.2)
B	mm (in)	49 (1.9)	55,6 (2.2)	63,5 (2.5)
L	mm (in)	68 (2.7)	73 (2.9)	89 (3.5)
W	mm (in)	67,5 (2.7)	82 (3.2)	95 (3.7)
H	mm (in)	63 (2.5)	65 (2.6)	72 (2.8)
P(CF)		BSP 3/4"	BSP 3/4"	BSP 3/4"
LS		BSP 1/8"	BSP 1/8"	BSP 1/8"
MP		BSP 1/4"	BSP 1/4"	BSP 1/4"
S1	mm (in)	3 (0.1)	3 (0.1)	3 (0.1)
S2	mm (in)	6 (0.2)	6 (0.2)	6 (0.2)





## 4. INSTALLATION

### 4.1. INSTALLATION TO DIFFERENT HYDRAULIC SYSTEMS

The PV-SAE can be installed to various hydraulic systems. Most common systems are listed below.

- Open centre hydraulic system with a Load Sensing variable displacement pump
- Closed centre hydraulic system with a Load Sensing variable displacement pump
- Hydraulic system with a fixed displacement pump

The PV-SAE can be installed to almost any hydraulic system. In need of more information about installing the PV-SAE to a different hydraulic system than listed above please take contact to DYNASET for more information.

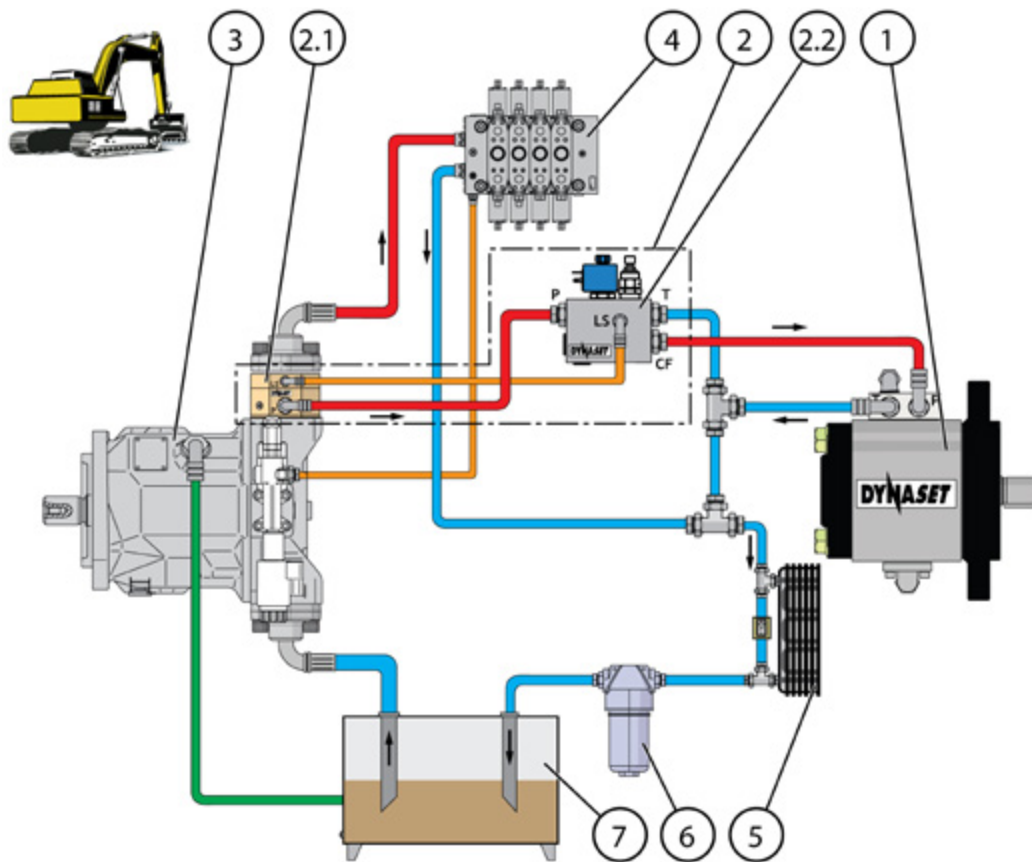
If you are unsure of the hydraulic system, please contact the manufacturer of your base machine.

Next three paragraphs describe the most common hydraulic systems in more detail.

### OPEN CENTRE HYDRAULIC SYSTEM WITH LOAD SENSING VARIABLE DISPLACEMENT PUMP

In open centre hydraulic system the flow is returned to tank through the control valves open centre; that is, when the control valve is centered. It provides an open return path to tank and the fluid is not pumped into a high pressure. In variable-displacement pump, the flow rate and output pressure adjusts automatically based on the load of the hydraulic system.

Placement of the PV-SAE in described system:



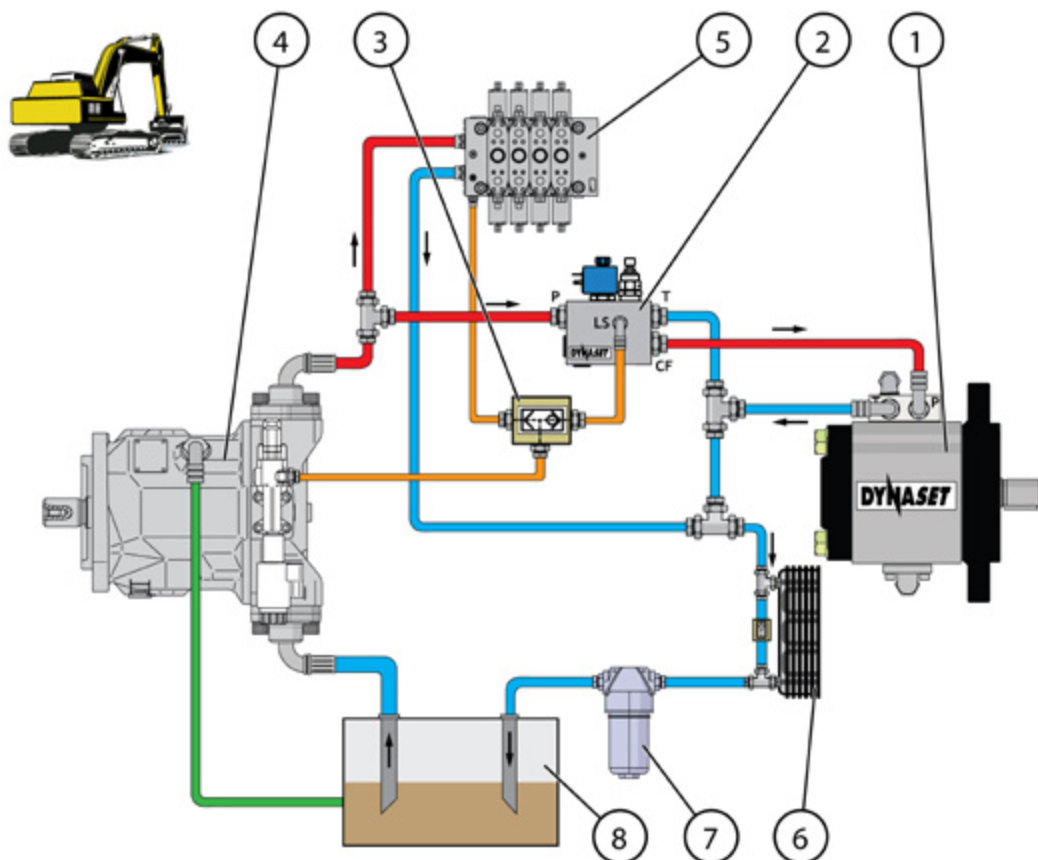
- |  |   |
|--|---|
| 1. DYNASET hydraulic equipment               | 4. Open centre directional control valves |
| 2. DYNASET Priority valve PV-SAE             | 5. Oil cooler                             |
| 2.1. DYNASET PC-SAE pressure compensator     | 6. Oil filter                             |
| 2.2. DYNASET LSV Load Sensing valve          | 7. Oil tank                               |
| 3. Base machine's variable displacement pump |   |

### CLOSED CENTRE HYDRAULIC SYSTEM WITH LOAD SENSING VARIABLE DISPLACEMENT PUMP

In a closed centre hydraulic system the oil flow is stopped from the pump when control valve is centered. The pump can rest when the oil is not required to operate a function. In variable-displacement pump, the flow rate and output pressure adjusts automatically based on the load of the hydraulic system.

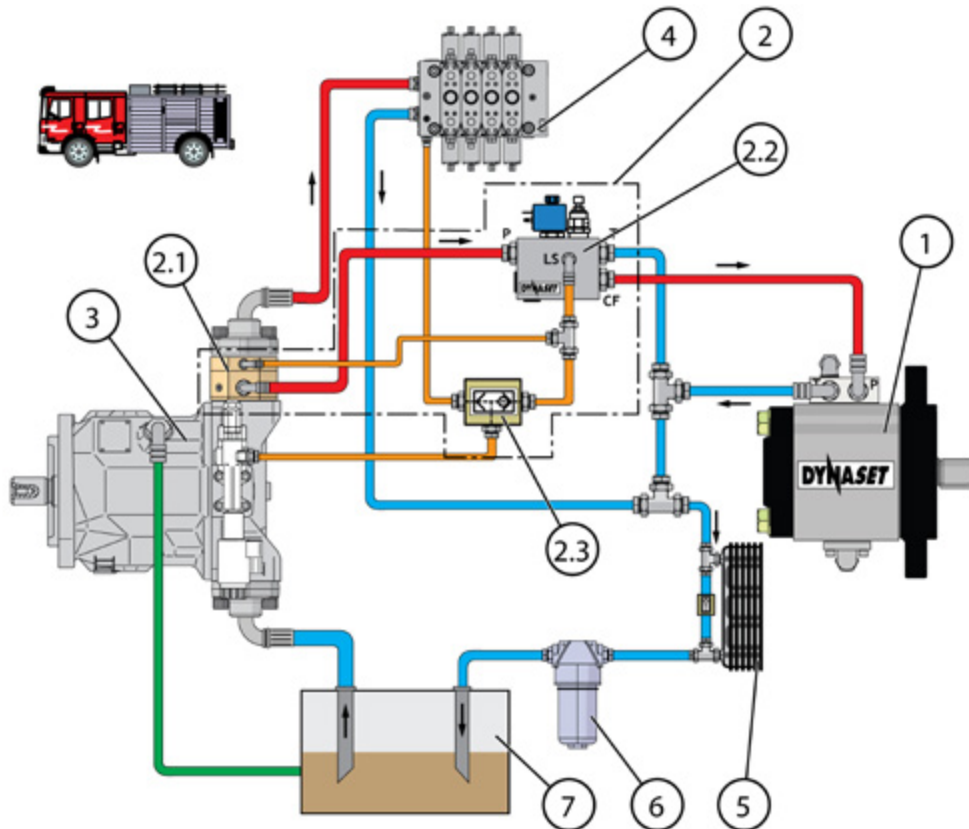
It is recommended to install DYNASET product to a closed centre hydraulic system of an excavator without the pressure compensator (PC-SAE), using only a LS-valve of required capacity. Installed to a closed centre hydraulic system of a modern excavator, pressure compensator may cause certain deceleration of machine's movements and functions when the prioritised flow to the DYNASET product is on.

Placement of the PV-SAE in described system:



- |  |   |
|--|---|
| 1. DYNASET hydraulic equipment               | 5. Closed centre directional control valves |
| 2. DYNASET LSV Load Sensing valve            | 6. Oil cooler                               |
| 3. DYNASET Shuttle valve                     | 7. Oil filter                               |
| 4. Base machine's variable displacement pump | 8. Oil tank                                 |

For other base machine's closed centre hydraulic systems (e.g. fire trucks) the installation of DYNASET product can be made with the complete PV-SAE valve.

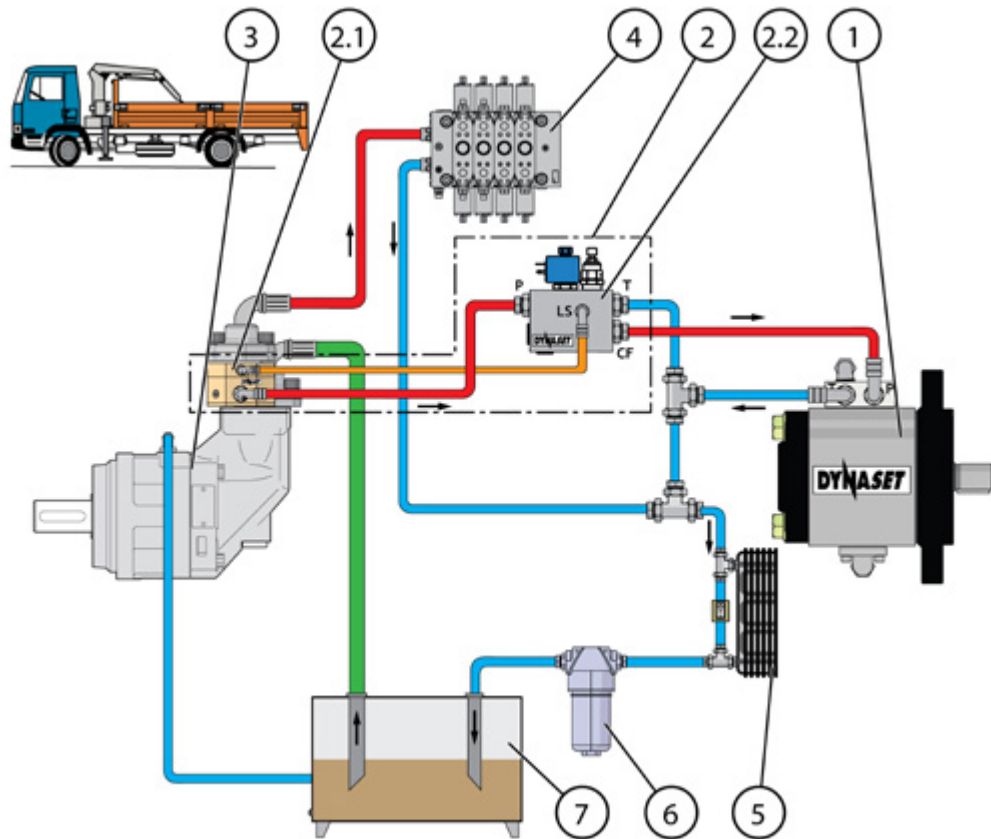


- |  |   |
|--|---|
| 1. DYNASET hydraulic equipment               | 5. Open centre directional control valves |
| 2. DYNASET Priority valve PV-SAE             | 6. Oil cooler                             |
| 2.1. DYNASET PC-SAE pressure compensator     | 7. Oil filter                             |
| 2.2. DYNASET LSV Load Sensing valve          | 8. Oil tank                               |
| 2.3. Shutle valve                            |   |
| 4. Base machine's variable displacement pump |   |

### HYDRAULIC SYSTEM WITH FIXED DISPLACEMENT PUMP

In hydraulic system which has the fixed displacement pump, the oil flow from the pump is fixed. Every stroke of the hydraulic motor moves the same amount of oil. The output flow is function of the motor's rpm and pump's displacement.

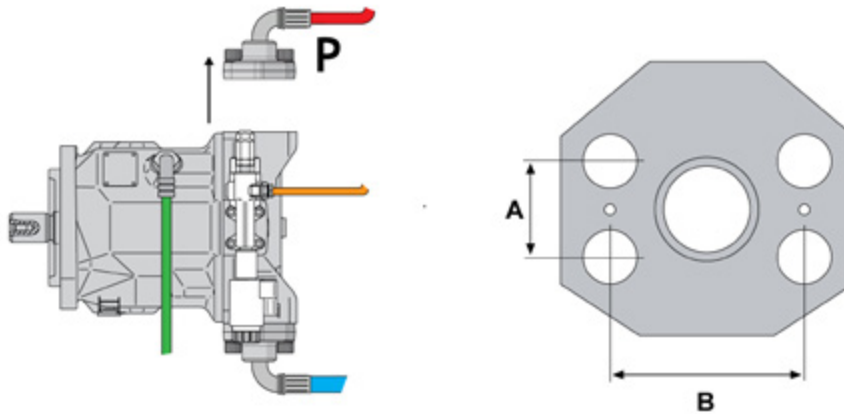
Placement of the PV-SAE in described system:



- |   |   |
|---|---|
| 1. DYNASET hydraulic equipment            | 4. Open centre directional control valves |
| 2. DYNASET Priority valve PV-SAE          | 5. Oil cooler                             |
| 2.1. DYNASET PC-SAE pressure compensator  | 6. Oil filter                             |
| 2.2. DYNASET LSV Load Sensing valve       | 7. Oli tank                               |
| 3. Base machine's fixed displacement pump |   |

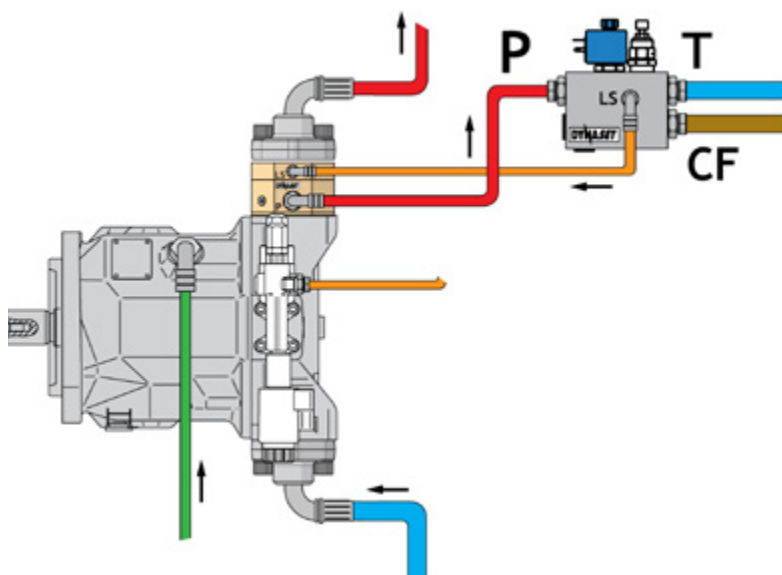
### 4.2. INSTALLATION THE PV-SAE

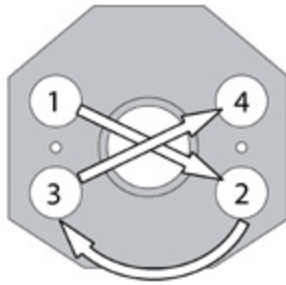
1. Detach the pressure line flange from the hydraulic pump.
2. Measure the A and B measurements and choose correct PC-SAE flange size from the table below.



PUMP FLANGE MEASUREMENTS				PC-SAE MEASUREMENTS		
A mm(in)	B mm(in)	SAE		A mm(in)	B mm(in)	PC-SAE
22,2 (0.9)	47,6 (1.9)	3000 psi	->	23 (0.9)	49 (1.9)	3/4"
23,8 (0.9)	50,8 (2)	6000 psi	->	23 (0.9)	49 (1.9)	3/4"
26,2 (1)	52,4 (2.1)	3000 psi	->	27,2 (1.1)	55,6 (2.2)	1"
27,8 (1.1)	57,4 (2.3)	6000 psi	->	27,2 (1.1)	55,6 (2.2)	1"
30,2 (1.2)	58,7 (2.3)	3000 psi	->	31,5 (1.2)	63,5 (2.5)	1 1/4"
31,7 (1.2)	66,7 (2.6)	6000 psi	->	31,5 (1.2)	63,5 (2.5)	1 1/4"

3. After ensuring the right size of the PC-SAE, install the PV-SAE to the hydraulic system.





4. Tighten the screws according to the picture above. Tight them in two sequence. First tight them all to the 1/2 of the needed torque value. Second time tighten them to the recommended torque value.

TORQUE NM (LB. FT)	SIZE	
40 (29)	M10	UNC/UNF3/8
75 (55)	M12	UNC/UNF 7/16
100 (74)	M14	UNC/UNF 1/2

5. Install the LS-valve with the instructions in the LS-valve installation guide.

**! NOTE!**

If the pump is in tight place and the PC-SAE can't be installed to it the PC-SAE can be installed to the pressure line with a compatible flange. A hose installation kit designed for this sort of installation is available by request for open centre systems.

### 4.3. HYDRAULIC FLUIDS

Wide range of standard hydraulic fluids can be used with the DYNASET hydraulic equipment. Depending on the operating temperature, following mineral hydraulic oils are recommended:

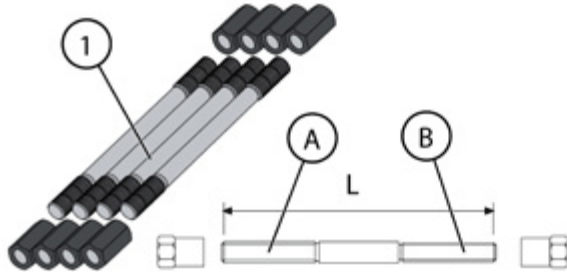
MINERAL HYDRAULIC OIL	OPERATION TEMPERATURE UP TO
ISO VG 32S	60 °C (140 °F)
ISO VG 46S	70 °C (158 °F)
ISO VG 68S	80 °C (176 °F)

Synthetic and bio oils can also be used if their viscosity characteristics and lubricating efficiency are corresponding to the mineral oils.

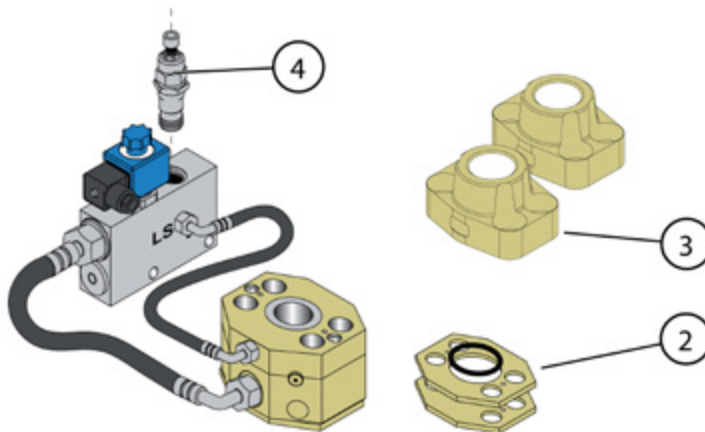
Automatic transmission fluids and even engine oils can be used, provided that they are allowed to be used in the hydraulic system of your base machine.

Hydraulic fluid change interval is according to the base machine's maintenance instructions. To use special hydraulic fluid with DYNASET equipment, please contact nearest DYNASET representative for an advice.

### 5. SPARE PARTS



	A = METRIC THREAD	B = IMPERIAL THREAD	L
Torque Nm(lb. ft)	Size	Size	mm (in)
40 (29)	M10	UNC/UNF 3/8	170 (6.69)
40 (29)	M10	UNC/UNF3/8	180 (7.09)
75 (55)	M12	UNC/UNF 7/16	170 (6.69)
100 (74)	M14	UNC/UNF 1/2	190 (7.48)



	POS.	PART NO.	DESIGNATION	DETAILS
<b>PV-SAE</b>	1	V100105590	PV-SAE 3/4"	Screw set
	1	V100105600	PV-SAE 1"	Screw set
	1	V100105610	PV-SAE1 1/4"	Screw set
	2	V100410510	PC-SAE 3/4"	Height adjustment kit*
	2	V100413510	PC-SAE 1"	Height adjustment kit*
	2	V100415510	PC-SAE1 1/4"	Height adjustment kit*
	3	V100415505	PC-SAE 3/4"	Hose installation kit*
	3	V100413500	PC-SAE 1"	Hose installation kit*
	3	V100415500	PC-SAE 1 1/4"	Hose installation kit*
	4	V100113101	LSV40	Pressure relief valve
	4	V100113104	LSV60	Pressure relief valve
	4	V100113102	LSV95	Pressure relief valve
	4	V100113103	LSV150	Pressure relief valve

\*For optional installations.



## 6. MANUFACTURERS LIMITED WARRANTY

### 1. Warranty coverage

All hydraulic accessories manufactured by DYNASET OY are subject to the terms and conditions of this limited warranty. Products are warranted to the original purchaser to be free from defects in materials or workmanship. Exclusions from warranty are explained in item Exclusions from warranty.

### 2. Beginning of warranty period

Warranty period begins from the delivery date of the product. Delivery is considered to be done on the date when installation has been accomplished or purchaser has taken the product in use. Product is considered as taken in use at the date when DYNASET OY has delivered the product to purchaser, unless separately agreed otherwise by written agreement.

### 3. Warranty period

Warranty period is twenty four (24) months based on maximum of 2000 hours usage during this time period. In cases where the system is provided complete with certain special components (e.g. drive unit), those components are considered as a subject to their manufacturer's warranty.

### 4. Warranty procedures

Immediately upon identifying a problem which purchaser believes to be a failure subject to the product's limited warranty, purchaser must contact primary to the seller of the product. Contact must be made as soon as possible, latest thirty (30) days after the problem was identified. Seller and/or manufacturer technical staff determines the nature of the problem primarily by phone or e-mail. Purchaser commits to give necessary information and to perform routine diagnostic procedures in order to determine the nature of the problem and necessary procedures.

### 5. Warranty repairs

If the product is found to be defective during the warranty period, DYNASET OY will, at its option, either repair the product, author it to be repaired at its authorized workshop or exchange the defective product. If the product must be repaired elsewhere than premises of DYNASET OY or authorized workshop, all costs excluded from this warranty (traveling and waiting hours, daily allowance, traveling expenses and uninstallation/reinstallation costs) will be charged from the purchaser.

If the problem is not covered by this limited warranty, DYNASET OY has the right to charge purchaser of troubleshooting and repairing.

### 6. Delivery terms of warranty repair

If the product is found possible to be defective under this limited warranty and it needs to be repaired, DYNASET OY gives Warranty Return Number (WRN). Items being returned must be shipped, at the purchaser's cost, adequately packed for shipment, to the DYNASET OY or to other location authored by DYNASET OY.

Shipment documents must contain:

Purchaser's name and contact information

Receipt of original purchase

WRN code

Problem description

### 7. Warranty of repaired product

Warranty period of the product repaired under this limited warranty continues to the end of original warranty period.

### 8. Exclusions from warranty

This warranty shall not apply to:

- Failures due to normal wear and tear, improper installation, misuse, abuse, negligence, purchaser selection of improper product to intended use, accident, improper filtration of hydraulic oil or intake water or lack of maintenance.
- Cost of maintenance, adjustments, installation or startup.
- Coating, hydraulic oil, quick couplings and interconnection hoses (internal or external to system assemblies).
- Products altered or modified in a manner not authorized by DYNASET OY in writing.
- Products which have been repaired during warranty period by others than DYNASET OY or its authorized workshop.
- Costs of any other damage or loss, whether direct, indirect, incidental, special or consequential, arising out of the use of, or the inability to use, the product.
- Telephone or other communications expense.
- Product that is used in exceptional conditions, considered to cause excessive wear and tear.
- Faults caused by nature phenomenon's like flood, thunder, etc.

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## 7. PRODUCT DISPOSAL

Dispose and recycle all the DYNASET products and their packaging environmentally responsible way.

Do not dispose used oils, electrical components, batteries or any other hazardous waste with normal waste. They are harmful for the environment and can be recycled for re-use.

Contact your local waste recycling facility for more information about recycling hazardous waste.

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### NOTE!

**Always act according to the waste legislation, regulations and recommendations in waste disposal and waste recycling issued by your local authorities.**

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## 8. DECLARATION OF CONFORMITY

We hereby declare that the design and manufacture of the product stated below are in conformity with the provisions of the European Parliament and Councils on the harmonization of the laws of Member States on the safety of machine's.

**Machine directive 2006/42/EC**

**LVD directive 2006/95/EC**

**EMC directive 2004/108/EC**

Applied conformity standards:

**CEN EN ISO 4413: EN ISO 4413:2010** Hydraulic fluid power - General rules and safety requirements for systems and their components.

**EN60204-1** Safety of machinery – Electrical equipment of machine's.

Manufacturer: **DYNASET Oy**  
Menotie 3, FI-33470 Ylöjärvi, Finland

Product group: INSTALLATION VALVES

Product: PV-SAE priority valves

If the device has been modified by someone other than the manufacturer or without the manufacturer's permission, this declaration is not valid.



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R&D Manager  
Ylöjärvi, Suomi, 1.12.2015



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#### ELECTRICITY

HG Hydraulic Generator  
HGV POWER BOX Variable Hydraulic Generator System  
HGV Variable Hydraulic Generator System  
HWG Hydraulic Welding Generator  
HGG Hydraulic Ground Power Generator



#### HIGH PRESSURE WATER

HPW Hydraulic High Pressure Water Pump  
HPW Hydraulic Power Washer  
KPL High Pressure Street Washing Unit  
HPW-DUST High Pressure Dust Suppression System  
PPL High Pressure Pipe Cleaning Unit  
HPW-FIRE High Pressure Firefighting System  
FP Fire Fighting Piercing Kit  
HDF Hydraulic Drilling Fluid Pump  
JPL High Pressure Bin Washing System  
HSP Hydraulic Submersible Pump



#### COMPRESSED AIR

HK Hydraulic Piston Compressor  
HKL Hydraulic Rotary Vane Compressor  
HKR Hydraulic Screw Compressor



#### MAGNET POWER

HMG PRO Hydraulic Magnet Generator  
MAG Lift Magnet  
HMAG PRO Hydraulic Magnet



#### VIBRATION

HVB Hydraulic Vibra  
HVD Hydraulic Directional Vibra  
HRC Hydraulic Reversal Cylinder



#### POWER BOOSTING

HPI Hydraulic Pressure Intensifier  
HPI-C Hydraulic Pressure Intensifier for Cylinder



#### KNOW-HOW

Hydraulic Power Take-off (PTO)  
Hydraulic Power Unit Technology  
De-Icing Technology  
Installation Valves  
HHK Hydraulic Grinder  
HV/HVY Hydraulic Winch / Winch Unit

[www.DYNASET.com](http://www.DYNASET.com)