SAIVS®
赛维思

Operation Instructions

HCR Series Double-Acting Hydraulic Cylinder

Please read these instructions carefully before operating. And keep instructions properly for future reference.

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These instructions contain warnings, precautions, operation practices, and troubleshooting for HCR series double-acting split hydraulic jack. These operation instructions are only for the reference of the end users.

I. Receiving Notice (Unpacking Inspection)

Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

II. Warnings and Precautions

Safety First

Please carefully read and understand the operation contents of these instructions before use and abide by these operation rules to prevent the personal injuries and equipment damages during operations of the equipment. ASIVS will not be liable for any damage arising from the incorrect operations.

Warning: It's prohibited to overload the jack. Firstly estimate the lifting weight before choice. Avoid the strong vibration of the jack during the handling and operations. It’s prohibited to drag the jack by connected high pressure hoses.

Warning: The working oil of the jack is supplied by the oil pump station and shall be free of water or other liquid. The system adopts YB-N32 wear-resistant hydraulic oil.

Notice: For a new or long-term unused jack, due to excessive air content in the jack chamber, the piston rod may have slight creepage symptom at the start of operations. In such case, reciprocate the jack under no-load condition for 2~3 times to bleed the air from the chambers. For a long-term unused jack, the seals may be subject to permanent deformation and aging so that the normal operations will be impaired when the jack is put into use again. When necessary, replace with new seals.

Warning: The opening pressure of the safety valve on the jack is properly regulated before the delivery. The user is prohibited to increase the pressure, in order to prevent damaging the jack.

Warning: During the lifting, the bottom face of the jack shall be paralleling with the

weight being lifted and shall be fixed securely on the support pad.

Warning: The bending radius shall be higher than 200mm for high pressure hoses (no matter these hoses are used or not) and it's prohibited to disassemble any hose under pressurized status.

Warning: During the disassembling and installation of quick couplings and high pressure hoses, operate strictly as per specified procedures, otherwise it will easily cause damages. At completion of use, disassemble the high pressure hoses, install dust caps to the connectors on both ends, and seal the external hose connectors on the jack by protective sleeve, in order to prevent the ingress of impurities from blocking the pipeline.

Warning: This series jack is not suitable for the operations in corrosive or high-temperature environments.

Warning: This series jack is of double-acting type with oil pressure retraction function. It's prohibited to supply oil to the rodless chamber or rod chamber by one hose, in order to prevent the expansion of cylinder from causing permanent damage or even danger.

Warning: The high pressure hoses passed the 105MPa (1050kgf/cm3) super-pressure test before the delivery. However, the hoses are vulnerable to ageing. To prevent accidents, the user shall check periodically, once every 6 months generally or once every 3 months in frequent cases. During the checking, test by 87.5Mpa (875kgf/cm2) pressure. Upon detection of burst, bulge, or leakage, timely replace. Generally, the service life shall not exceed 3 years for high pressure hoses.

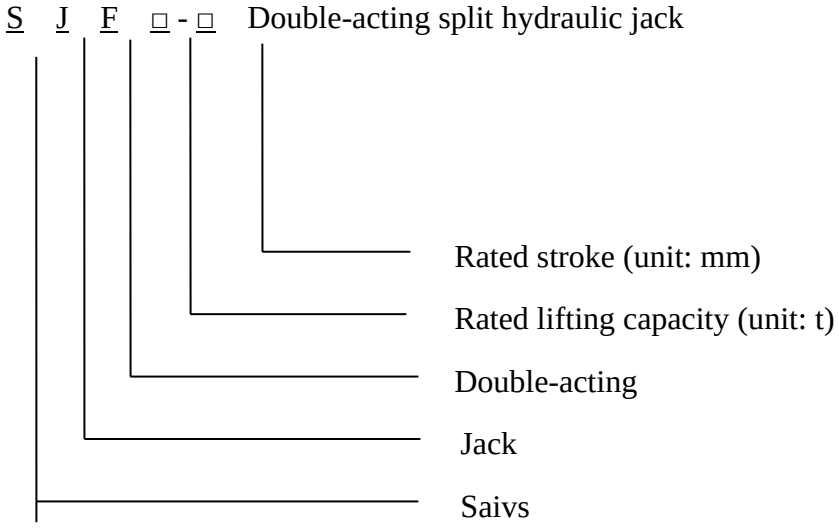
Notice: Fulfill the maintenance for the jack once every two years and replace all internal seals and retainer rings.

III. Overview

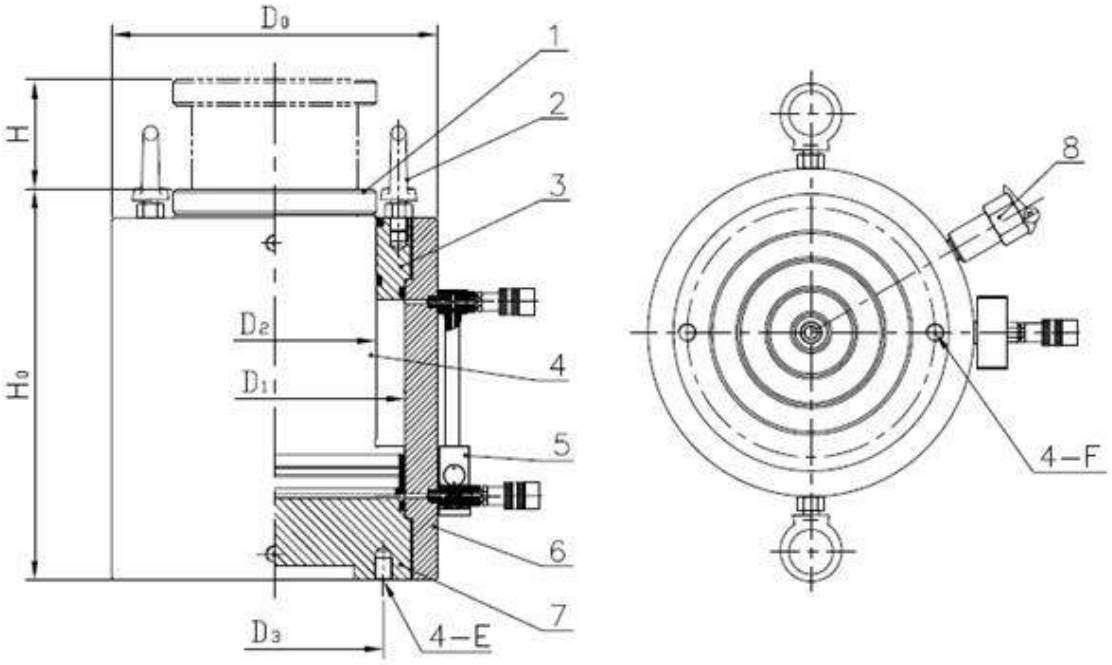
HCR series double-acting split hydraulic jack (hereafter referred to as jack) is a kind of high-tonnage hydraulic oil used together with our super-pressure oil pump station (hereafter referred to as oil pump station). It can realize the stretching, clamping, and correction functions in addition to the basic operations, including lifting, pushing, expanding, and squeezing. Featuring high output force, flexible lifting and lowering, compact shape, light weight, and remote operation capability, it can be used both vertically and in any orientation. At present, it's extensively applied in the engineering and other industries, including architecture, ship-building, metallurgy, mining, petrochemical industry, and railway. In recent years, it's also extensively applied in the foundation settlement tests and statically pressed piles.

The hydraulically controlled check valve and the safety valve can be installed for this series jack depending on the customers' demands. The hydraulically controlled check valve installed can realize the pressure maintaining function at stop. Namely, when the jack is stopped, the piston can stay at any required position under loaded condition and play the role of self-locking, positioning, and pressure maintaining within a certain period. If the safety valve is installed, when the pressure of the oil chamber in which the safety valve is installed exceeds the regulated pressure of the safety valve, the safety valve will open automatically to protect the jack.

IV. Model Description



V. Technical Specification



(Figure I)

1 - Saddle 2- Ring eyebolt 3 - Guide cap 4 - Piston rod 5. Hydraulic check valve 6-Cylinder 7-Base 8- Safety valve

Saivs also provides the customization service for non-standard hydraulic cylinders at the customer's demands.

Model	Tonnage	Stroke	Body height	Outside diameter	Cylinder bore diameter	Diameter of piston rod	Size of base mounting hole			Weight
							Bolt distribution circle	Bolt distribution circle	Bolt distribution circle	
			H0	§D0	§D1	§D2	§D3	E		
	ton	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)	(kg)
HCR50-50	50	50	188	140	100	70	70	4-M16	13	21.5
HCR50-100		100	238	140	100	70	70	4-M16	13	26
HCR50-150		150	288	140	100	70	70	4-M16	13	31
HCR50-200		200	338	140	100	70	70	4-M16	13	35
HCR50-300		300	438	140	100	70	70	4-M16	13	44
HCR100-50	100	50	216	188	140	100	100	4-M20	16	42
HCR100-100		100	266	188	140	100	100	4-M20	16	49
HCR100-150		150	316	188	140	100	100	4-M20	16	56
HCR100-200		200	366	188	140	100	100	4-M20	16	63
HCR100-300		300	466	188	140	100	100	4-M20	16	70
HCR150-50	150	50	224	215	165	112	130	4-M20	16	44

HCR150-100		100	274	215	165	112	130	4-M20	16	57
HCR150-150		150	324	215	165	112	130	4-M20	16	70
HCR150-200		200	374	215	165	112	130	4-M20	16	83
HCR150-300		300	474	215	165	112	130	4-M20	16	109
HCR200-100	200	100	296	268	200	150	160	4-M24	24	109
HCR200-150		150	346	268	200	150	160	4-M24	24	121
HCR200-200		200	396	268	200	150	160	4-M24	24	132
HCR200-300		300	496	268	200	150	160	4-M24	24	155
HCR300-100	320	100	327	320	245	180	220	4-M24	24	180
HCR300-200		200	427	320	245	180	220	4-M24	24	220
HCR300-300		300	527	320	245	180	220	4-M24	24	260
HCR400-100	400	100	355	370	275	220	240	4-M24	24	255
HCR400-200		200	455	370	275	220	240	4-M24	24	310
HCR400-300		300	555	370	275	220	240	4-M24	24	375
HCR500-100	500	100	375	420	310	250	280	4-M24	24	326
HCR500-200		200	475	420	310	250	280	4-M24	24	394
HCR500-300		300	575	420	310	250	280	4-M24	24	462
HCR600-100	630	100	436	475	350	280	300	4-M24	24	542
HCR600-200		200	536	475	350	280	300	4-M24	24	634
HCR600-300		300	636	475	350	280	300	4-M24	24	726
HCR800-100	800	100	477	550	400	320	380	4-M24	24	796
HCR800-200		200	577	550	400	320	380	4-M24	24	944
HCR800-300		300	677	550	400	320	380	4-M24	24	1092

Note:

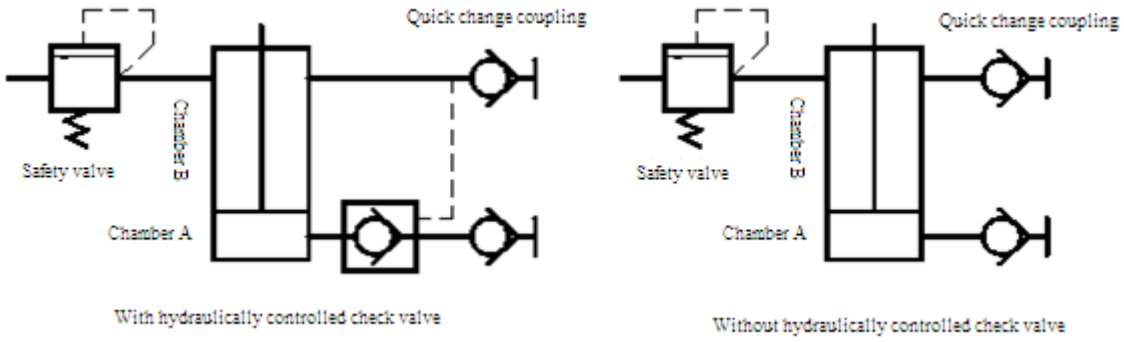
1. The locations and sizes of the base mounting threaded holes of the jack are customizable depending on actual condition.
2. The safety valve and the hydraulically controlled check valve can be installed for all jack models depending on the customers' demands.

VI. Working Principle and Hydraulic System

1. Working Principle

HCR series double-acting split hydraulic jack means: Lifted and lowered hydraulically, the jack is separated from and connected by high pressure hoses with the pump. It's a device that converts the pressure energy of oil to mechanical energy. As shown in Figure II, if the pressure oil flows into chamber A, the piston rod is extended to realize diversified operations by corresponding tools. If the pressure oil flows into chamber B, the piston rod is retracted.

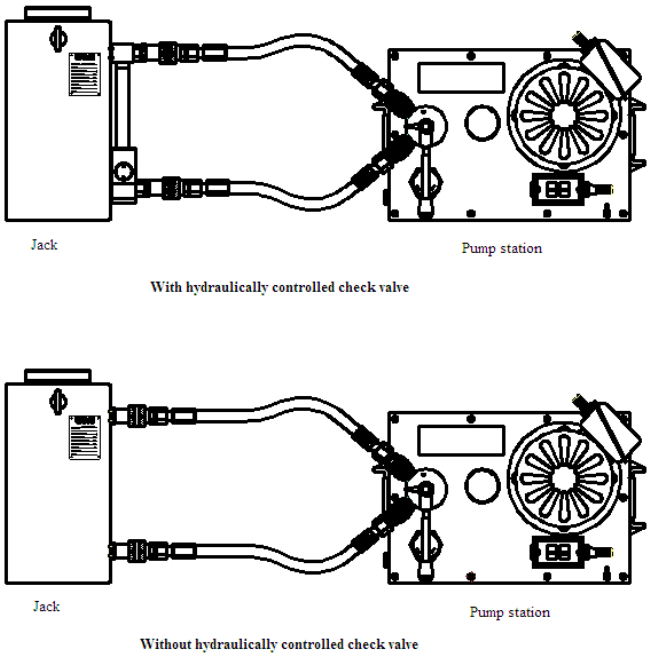
2. Hydraulic System Diagram



(Figure II)

VII. Operation Method

1. Firstly connect the oil pump station to the jack by high pressure hoses with quick couplings. The connection method is shown in Figure (III) below.



(Figure III)

2. The connection method for quick couplings is shown in figure (IV) below: Directly connect the male connector with the female connector axially to the end and then tighten the sleeve. To detach the quick coupling, unscrew the sleeve, pull out the female (male) connector axially, and install the dust caps.

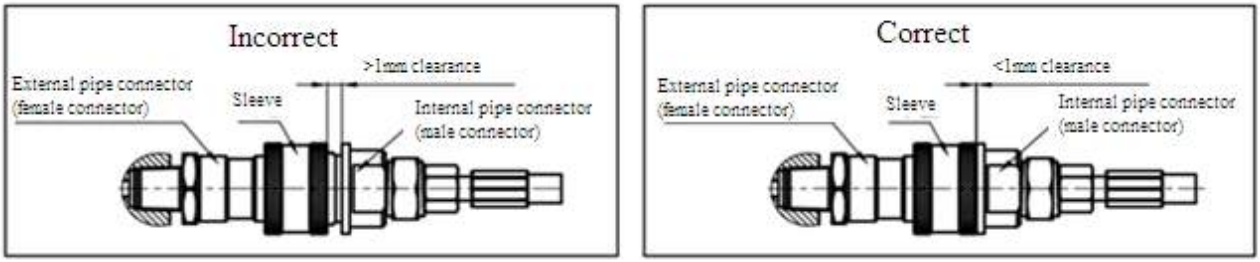


Figure (IV)

Warning: Ensure the complete engagement while connecting the quick coupling, in order to ensure that the check valve in the connector is opened to prevent oil line blockage. Otherwise, the check valve in the connected coupling can't open to cause obstructed oil line.

Notice: Ensure to apply the force axially during the disassembling and assembling, in order to prevent damaging O-rings or blocking the external hose connectors.

Notice: Keep clean the hose connectors against the ingress of impurities into pipeline, otherwise it will lead to pipeline leakage or blockage.

Notice: Do not loosen any high pressure oil hose during the running of pump.

3. Determine the gravity center of weight to be lifted and select the force application point of the jack. Meanwhile, the hardness of the ground shall be taken into consideration to determine the necessity of cushioning with tough wood boards, in order to prevent the rollover danger during lifting.
4. The pump station can be started when all preparations are fulfilled (Please refer to the operation instructions of the super-pressure oil pump station for the debugging of the pump station). However, apply the load only when the oil pump station is running normally and reaches the working state. In such case, operate the handle of directional control valve to the connector connected to the chamber A of jack (See Figure II) so that the piston rod is extended to realize the lifting. To retract the piston rod, operate the handle to the connector connected to the chamber B of jack.
5. After a weight is lifted by the jack, timely support the weight securely by supports and never use the cylinder as the supports, in order to prevent the rollover danger due to pressure maintaining failure. If the long-term support of the weight by this jack is required, please select the self-locking jack with hydraulically controlled check valve.

6. If the simultaneous use of multiple jacks is required for lifting, besides the correct placement of the jacks, use a multi-lifting distributor valve, ensure the uniform load among the jacks, and maintain the synchronized lifting speed. In addition, the possible sinkage of the ground due to non-uniform weight must be taken into consideration to prevent the inclination of lifted weight from causing danger.
7. Completion: Operate the directional control valve of electric pump to neutral position, timely cut off the power supply, and disassemble the high pressure hoses and install the dust caps.

VIII. Troubleshooting

Problem	Possible malfunction cause
The cylinder can’t advance	Opened relief valve of pump
	Incompletely tightened connectors
	Low oil level in pump
	Pump malfunction
	Load beyond carrying capacity of cylinder
	Leakage of cylinder seals
Advancement of cylinder only for one segment	Low oil level in pump
	Incompletely tightened connectors
	Obstructed motion of cylinder piston
Sudden advancement of cylinder	Air content in hydraulic system
	Obstructed motion of cylinder piston
Low advancement speed of cylinder	Connection leakage
	Incompletely tightened connectors
	Pump malfunction
Advancement of cylinder without pressure holding	Pump malfunction
	Connection leakage
	Incorrect system settings
	Leakage of cylinder seals
Oil leakage of cylinder.	Wear or damage of seals
	Internal damage of cylinder
	Loose connection
Reversing failure or slow reversing speed of cylinder	Incompletely tightened connectors
	Excessive oil in pump oil tank
	Obstructed flow due to undersized hose
	Damage or insufficient elasticity of compression spring (if equipped)
	Internal damage of cylinder
Oil leakage of external relief valve	Incompletely tightened connectors
	Obstructed oil return pipeline

Note:

1. **Our company reserves the modification right for these operation instructions of this hydraulic cylinder without further notice.**
2. **For more detailed information, please contact our company.**

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