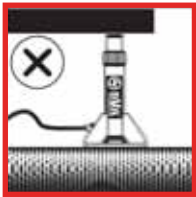




Safety Instructions

Industry Safety Standards

General

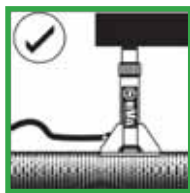


Do not override the factory setting of relief valves. Always use a gauge to check system pressure.

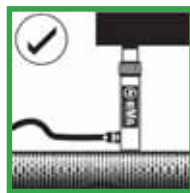
Safety Instructions

- Read and understand all printed materials provided with and on this cylinder
- Do not exceed rated capacities
- Use only on hard level surface capable of sustaining the load
- Do not connect actuators to pumps with higher pressure ratings
- Always inspect hoses and connections for damage prior to use
- Keep hands and feet clear of work area
- LIFTING DEVICE ONLY! Immediately after lifting, support the load with appropriate means
- Use only manufacturer approved hydraulic fluid
- A flow-restricting component shall not be present between the relief valve and the tank
- No alterations shall be made to this cylinder
- Failure to meet these markings may result in injury and/or property damage
- Each double-acting cylinder shall be fitted with a relief valve on the retract circuit, which bleeds off the smaller effective area of the cylinder

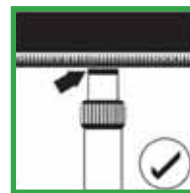
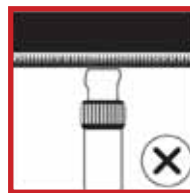
Cylinders



Provide a solid support for the entire cylinder base area. Use cylinder base attachment for more stability.



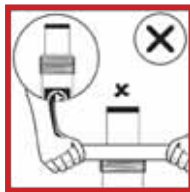
The entire cylinder saddle must be in contact with the load. Movement of the cylinder must be parallel with the movement of the load.



Do not use cylinder without saddle. This will cause plunger to "mushroom" Saddles distribute load evenly on the plunger.



As with jacks, never place any part of your body under the load. Load must be on cribbing before venturing under.

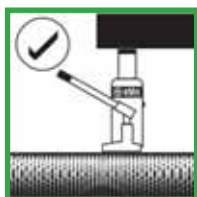
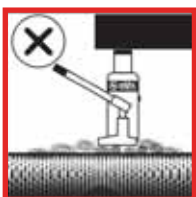


Always protect cylinder threads for use with attachments.

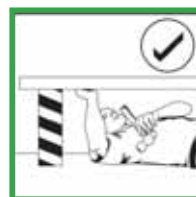


Keep hydraulic equipment away from open fire and temperatures above 150°F (65°C).

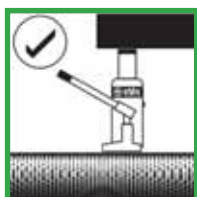
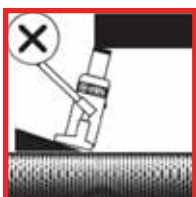
Jacks



Provide a level and solid support for the entire jack base area.



Never place any part of your body under the load. Ensure the load is solidly supported before venturing under.



The entire jack saddle must be in contact with load. Movement of the load must be in the same direction as jack plunger.



Remove the jack handle when not in use.

80% Rule

Good industry practice recommends not exceeding 80% of maximum rated capacities.

- Use only on hard, level surfaces capable of sustaining the load.
- Immediately after lifting, support the load with appropriate means
- Failure to meet these warnings may result in personal injury as well as property damage.

Hydraulic Pump Safety Instructions

- READ AND UNDERSTAND ALL WARNINGS, INSTRUCTIONS AND OWNER'S MANUAL INFORMATION BEFORE ATTEMPTING TO USE THIS EQUIPMENT
- Burst hazard exists if hose or connection pressure exceeds rated pressure.
- Do not exceed the rated capacity of this device. Monitor pressure and load at all times.
- Verify load with calibrated load cell and indicator, accurate pressure gauge or equivalent devices.
- Inspect hoses and connections for damage prior to use. Never attempt to grasp a leaking pressurized hose.
- Release the hydraulic pressure before disconnecting hoses or couplers, and before servicing the pump or accessory.
- Immediately after lifting, support the load with appropriate means. Never rely on hydraulic pressure to support a load.
- Wear protective clothing and eye protection that meets ANSI Z87.1 and OSHA standards when operating this equipment.
- Ensure that the chosen application is stable to work on and around.
- Do not subject the pump and its components to shock loads.
- Do not connect to applications which can return more oil to the reservoir than the pump reservoir can hold.
- Ensure that the rated pressure of all applications and fittings is equal to or greater than the rated pressure of this pump.
- Keep hydraulic equipment away from flames and heat.
- No alterations shall be made to this device.
- Failure to meet these warnings may result in personal injury as well as property damage.

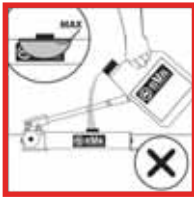
Pumps



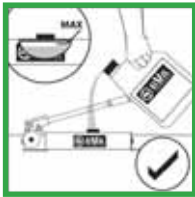
Do not use handle extender. Hand pumps should be easy to operate when used correctly.



Close release valve finger tight. Using force will damage the valve.



Fill pump only to recommended level. Fill only when connected cylinder is fully retracted.



Use only genuine BVA hydraulic oil. The wrong fluid can destroy your seals and pump and will render your warranty null and void.



Electric Pump Safety Instructions

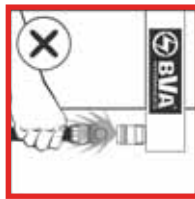
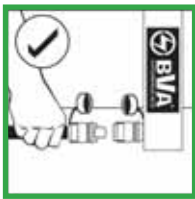
TO AVOID ELECTROCUTION HAZARD:

- Owner/Operator must read, understand and follow all printed material provided with this device before use.
- Connect ONLY to properly grounded electrical source. Connect to GFI outlet ONLY! For use in dry locations.
- Avoid the use of extension cords. If used, extension cord lengths up to 7 meter shall be SJT-14X3 or heavier. For cords up to 15 meter, use SJT-12X3 or heavier.
- For extension cord lengths up to 30 meter, use SJT-10X3 or heavier. NEVER use a 3 prong adapter.
- Do not operate this device in an explosive atmosphere or in the presence of conductive liquids.

Hoses and Couplers



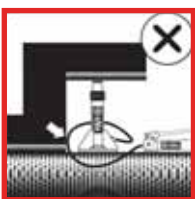
Clean both coupler parts before connecting. Use dust caps when coupler parts are not connected.



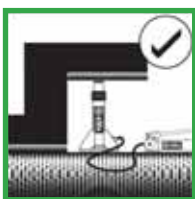
Detach cylinder only when fully retracted or use shut-off valves or safety valves to lock-in cylinder pressure.



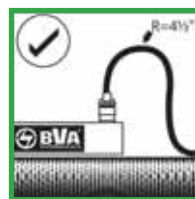
Don't lift hydraulic equipment by the hoses.



Keep hoses away from the area beneath loads.



Do not kink hoses. Bending radius should be at least 4 1/2". Do not drive over or drop heavy objects on the hoses.





Maintaining Your Equipment

Ensure a longer life span of your equipment

Hydraulic Fluids

- Use only BVA Hydraulic Oil P/N's; HV155 or HV685 for pumps and cylinders.

Air Line Lubricants

- Use Class 1 Turbine Oil (ISO VG32) for Air Line Lubricant

Hydraulic and Pneumatic Filtration

- Hydraulic fluid must be kept clean, cool and free of water.
- Use Hydraulic Filtration to provide fluid which meets ISO 17/15/12 cleanliness levels.
- Air Line Filtration for solid particulate contamination removal: Use BVA P/N; FRL-145, 5uM Pneumatic Filter.
- Air Line Water Removal; Use BVA P/N; AD-145, Ambient Dryer.

Proper Operation of Equipment

- Refer to individual Product Owner's Manuals and BVA Catalogs for general information, specifications, safety, set up, operation, maintenance, trouble shooting, storage and warnings for all BVA products.

Formulas

Key to Measurements			
Weight:		Length	
1 pound (lb.)	=0.4536 kg	1 in	=25.4 mm
1 kg	=2.205 lbs	1 mm	=0.039 in
1 ton (short, US)	=2,000 lbs	1 in ²	=6.452 cm ²
1 ton (metric)	=2,205 lbs	1 cm ²	=0.155 in ²
Volume:		Pressure:	
1 in ³	=16.387 cm ³	1 psi (lb/in ²)	=0.69 bar
1 cm ³	=0.061 in ³	1 bar	=14.5 psi
1 liter	=61.02 in ³	1 kPa	=0.145 psi
	=0.264 gal(US)		
1 gal (US, liquid)	=3.785 liter	Temperature:	
	=231 in ³	0°F	=(0°C x 1.8) + 32
	=3,785 cm ³	0°C	=(0°F - 32) ÷ 1.8

Cylinder Plunger Speed

Formula → $V = \frac{A}{Q} \times 60$

$Cylinder\ Plunger\ Speed\ (sec/cm^2) = \frac{Cylinder\ Effective\ Area\ (cm^2)}{Pump\ Flow\ Rate\ (cm^3/min)} \times \frac{60\ (sec)}{1\ (min)}$

Force

Formula → $F = P \times A$

$Force\ (kg) = Hydraulic\ Working\ Pressure\ (kg/cm^2) \times Cylinder\ Effective\ Area\ (cm^2)$

Cylinder Oil Capacity

Formula → $C = A \times L$

$Oil\ Capacity\ (cm^3) = Cylinder\ Effective\ Area\ (cm^2) \times Cylinder\ Stroke\ (cm)$

1/4" Hose Oil Capacity

Formula → $C = \frac{Internal\ Diameter\ (mm^2)}{4} \times \pi \times Length\ of\ Hose\ (m)$

$Oil\ Capacity\ (cm^3) = 33 \times Length\ of\ Hose\ (m)$

3/8" Hose Oil Capacity

Formula → $C = \frac{Internal\ Diameter\ (mm^2)}{4} \times \pi \times Length\ of\ Hose\ (m)$

$Oil\ Capacity\ (cm^3) = 72 \times Length\ of\ Hose\ (m)$

Cylinder Effective Area

Formula → $A = \pi \times \frac{D^2}{4}$

$Cylinder\ Effective\ Area = \pi \times \frac{(Cylinder\ Bore\ Diameter)^2}{4}$

$\pi = 3.14159265359$