



Operating Manual

Black Jack

Hydra-Tech International
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PLEASE SIGN AFTER THE MANUAL HAS BEEN READ.

The BLACK JACK SYSTEM and its ancillary tool line is a result of years of research into the needs of industries which must Push, Pull, Press and Lift in the course of maintaining machinery.

Safety, Durability and User Friendly Ergonomics are the basis of the design philosophy underlying the BLACK JACK SYSTEM.

The components and materials used in the manufacture of this equipment are of the highest quality. However, the components of this system are machines, and machines must be operated and maintained properly to serve their purpose safely and reliably.

***This manual contains important information regarding the operation and maintenance of this equipment. The key material is found on pages: 1 through 13.

*The information contained on each of these pages is important, however, the information in **bold letters**, underlined, or otherwise highlighted has to do with Safe Operation and Maintenance of the equipment. Failure to understand it and to follow its direction could lead to serious personal injury, or death.*

Each individual operating this equipment should read the pages noted above, and sign a copy of the following certificate.

<p>Please Print</p> <p>Name of Company: _____</p> <p>Name of Employee: _____</p> <p>I certify that I have read the pages noted above, and understand their contents. I will operate the equipment in a safe and responsible manner.</p> <p>Signed: _____</p>
--

Do not operate, perform maintenance or repairs on this product until the relevant information contained within this document has been read, understood, and the individual taking such action has been deemed competent and approved for operating and/or performing service to the equipment.

Please contact Hydra-Tech International if you have questions or suggestions which could enhance the safe operation of this equipment.

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Black Jack Systems

A New Approach to Lifting and Maintenance Equipment

Black Jack Systems combine the lifting and power supply units into a single piece of equipment that is designed with maneuverability, ergonomics, and ease of use as core aspects.

Black Jack Systems are produced with two types of power inputs, come in a range of lifting capacities and stroke lengths to provide a range of selections that best meet the needs of the customer and operators of the equipment.

Black Jack Systems can be powered electrically or with compressed air and both options produce low levels of noise and offer a smooth lift to keep workplaces safe. To meet the needs of varying lift capacities and lift heights, Black Jack Systems range from 40 ton to 100 ton lift capacities and 13" (33cm) stroke length to 24" (61cm) stroke length.

For a precise lift and to maximize safety Black Jack Systems can also be complimented with a variety of accessories such as Load Holding Rings, Extensions, and Swivel Saddles.

For specific information on the varieties and features of the Black Jack Systems and what can best meet your needs, please contact Hydra-Tech International:

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Website: www.hydra-tech.net

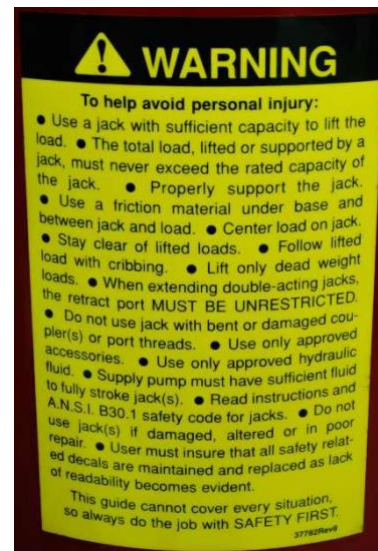
Email: sales@hydra-tech.net

Safety Precautions & General Instructions

1. Check the hydraulic oil level daily. The oil should fill at least to the high green marker on the dipstick found on the pump plate, with the Lifting Ram(s) fully retracted.
2. Oil that is milky has water in it and must be changed.
3. Change hydraulic oil twice a year. Use good grade hydraulic oil only. For extreme cold operating conditions, Arctic grade oil may be used. (See recommendations on page 15)



4. Keep all Black Jack System components clean. If high-pressure washers or compressed air are used, there is a risk of forcing dirt into piston wipers, oil tank breathers etc.
5. The handle should be in the middle or lowered positions for optimum balance and maneuverability when moving the Black Jack.
6. Lift the system only by the indicated positions.
7. **Never** tamper with the pressure relief valve fitted to the hydraulic line near the bottom cylinder. Trapped pressure could result and possibly burst the cylinder.



SCHEDULED MAINTENANCE HELPS PREVENT UNSCHEDULED BREAKDOWNS.

Air Powered Safety Precautions & General Instructions



Air Supply Requirements: Minimum 50 CFM (1.4 M³/min) & 80 PSI (5.5 bar) with 100 PSI (7 bar) maximum.

1. Inspect all air hoses for signs of wearing or damage.
2. Securely fasten the air hose to the air inlet bracket, with the valve in the closed position.
3. Put the directional control valve into the neutral position, in between Up and Down.
4. On the filter lubricator assembly, check to see if there is an adequate amount of lubricating fluid and that the filter is clean and intact.
5. Set the drip rate on the lubricator as follows:
 - a) Slowly open the air valve, allowing the flow of air through the motor.
 - b) Visually inspect the rate at which lubricating fluid is fed into the system and rotate the rate control valve till the lubricator drips once in approximately ten seconds.

Rate Control _____

Drip Point _____

Lubricating Fluid Container _____

See Page 16 for Recommended Fluids



Electrically Powered Safety Precautions & General Instructions

White Covered Motor - Electrical Supply: 115 volts, 1.5 HP, 15 Amps (North American)

Blue Visible Motor - Electrical Supply: 115 volts, 1.5 HP, 14.1 Amps (North American)
230 volts 1.5 HP, 7.82 amps (European)



- 1 . Do not tamper with electrical components.
- 2 . Do not open motor control box while the Jack is plugged in!

3. When cleaning the equipment take care to keep electrical components dry.

4. Check the brush indicator light prior to use, if the light is off the brushes are still functioning properly.

5. Visually inspect the attached power cord for damages prior to plugging in the Jack.



6. Ensure you are using an adequate power cord, refer to the table below.

7. If using a portable welder, ensure that the lifting equipment is unplugged prior to use. This prevents grounding through the motor on the jack.

Power Cord Recommendation

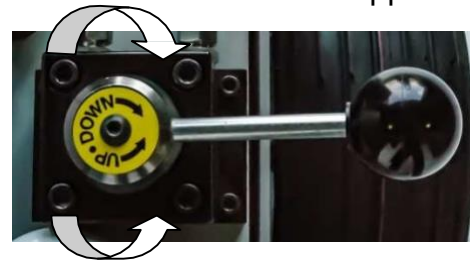
110V, Single Phase	20A circuit	30A circuit
25 feet	12 AWG	10 AWG
50 feet	8 AWG	6 AWG
75 feet	6 AWG	4 AWG
220V, Single Phase	20A circuit	30A circuit
25 feet	14 AWG	12 AWG
50 feet	12 AWG	10 AWG
75 feet	10 AWG	8 AWG

Important Load Raising & Lowering Instructions

1. **Do not lift loads that are not on a firm level surface.**
2. **Do not side load jacks.** The top surface of the Lifting Module saddle must be parallel to the jacking pad of the load to be lifted. If this is impossible, use a Swivel Saddle to compensate for up to 5° of side load.
3. Use a sturdy level base for jacking.



4. After Raising or Lowering the Load, release the pressure from lines by shutting off the pump. Then move the control valve handle from the advance or retract positions and leave in Neutral until the next use of the Jack. This allows trapped fluid to be returned to the tank.
5. If motor stops while lifting a load, move the control valve to neutral to release pressure then return to advance (up).



6. Test the load holding valve prior to each lift (See instructions on page 7).

NEVER HANDLE PRESSURIZED LINES OR FITTINGS WITH YOUR BARE HANDS!

Load Holding Valve Test Procedure

THE LOAD HOLDING VALVE MUST BE TESTED PRIOR TO EACH LIFT

In the unlikely event of a valve malfunction, the load could drop at an uncontrolled rate.

TEST PROCEDURE

- a. Raise the ram far enough to contact the load and lift it 2-3" (5-7.6cm) to take the weight of the load.
- b. Turn off the motor.
- c. Swing the valve to the retract position. After several minutes, check to ensure that there is no creeping down, confirming the load holding valve is functioning properly.
- d. If the valve does not hold, have the unit serviced.

Any time a hydraulic oil leak is detected, remove the unit from service and have it repaired and tested if necessary at an authorized facility.

Note: Please contact Hydra-Tech International for current information regarding authorized facilities.

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Raising a Load

When lifting loads, stay as far back as possible. Never expose yourself to a live load. Mechanically support all loads after they are lifted.

1. Position the Black Jack under the jacking pad of the load to be lifted. The Jacking pad should be parallel to the top of the saddle. If it is not possible to position the saddle parallel to the jacking pad, a swivel saddle may be used to compensate for up to 5°.



2. Clean contact surfaces, including the top of the lifting rod, load holding rings, extensions and the saddle.
3. Move the valve control lever to the advance (raise) position.
4. Push the thumb toggle switch on the remote control pendant to ON (electric models), or open the air valve on air operated models.
5. Advance the plunger until it contacts the jacking point. Check to make sure it is correctly and safely positioned.
6. CHECK THE OPERATION OF THE LOAD HOLDING VALVE...See page 7.
7. Advance the plunger to lift the load, inserting the load holding rings *as you go*. **Load holding rings should only be installed when the jack is not moving and the load is deemed stable.** Begin *with the tallest rings*. Ensure that the rings are concave side up. (Note the up arrow decal on the rings)

**LOAD RING SEATING SURFACES MUST BE KEPT CLEAN TO MAXIMIZE CONTACT AREA FOR SAFETY AND TO AVOID DAMAGING THE RINGS.
(See pages 10 and 11 for more information on Load Holding Rings)**

8. When you have reached the maximum required lift height, insert the final load ring as required. Keep your fingers clear of the contacting faces! Ensure that the load rings are stacked with their open sides aligned. This configuration provides the highest column strength from the Load Holding Ring stack.

If the equipment to be lifted has a narrow jacking pad you will want to position the ram saddle to give maximum contact. The Load Holding Rings must face the same direction to give maximum load bearing capacity. If this exposes the ram plunger to welding or grinding sparks, an optional Spark Blanket should be used.

If your jacking pad is large enough, you can face the open side of the ring stack away from the area where you will be welding, grinding, etc. This helps protect the plunger from sparks and grit.

9. With the pump shut off, swing the control valve lever to retract (lower).

Jog the motor to retract the plunger **until the saddle is resting solidly on the top load ring**. Do not retract the plunger more than ¼" (0.65cm) past where the saddle contacts the load ring. The saddle locks the load rings together creating a mechanical column capable of safely supporting 2 times the rated capacity of the jack. Load holding rings do not replace certified stands. Load holding rings provide a mechanical column to support the load while a certified stand is positioned.

10. Release the pressure in the lines by shutting off the motor and swinging the control valve from the advance position to the retract position.

NEVER USE HYDRAULICS TO SUPPORT A LOAD!!
ALWAYS USE CERTIFIED STANDS.

LOAD HOLDING RINGS and load support devices

Hydraulic Jacks are a simple and reliable method of *lifting* loads. They are never to be used to sustain loads. Certified safety stands may be used to support a load.

The intended function of the load holding ring is to provide a mechanical support to allow the safer placement of appropriate load supporting equipment, such as a stand, and remove the risk associated with having a load on a column of hydraulic fluid.

NEVER WORK NEAR A LOAD THAT IS NOT PROPERLY SUPPORTED!

Correct installation of Load Holding Rings

1. Prior to performing the lift, ensure that the mating surfaces of the cylinder top, base ring and load rings are free of dirt.
2. Incrementally place load rings as the ram lifts the load, placing taller rings first and shorter rings last. **Install the rings when the jack is stopped, and the load is deemed stable – stay well back while the jack is lifting.**
3. Face the open side of the rings away from the work area to shield the cylinder rod from sparks and debris, keeping the open side of all rings in alignment with each other.
4. Retract the cylinder rod no more than $\frac{1}{4}$ " (0.65cm) after the load is at the correct height and the last ring has been placed, to ensure the load is being supported by the rings, and not the hydraulic cylinder.

Incorrect:



Correct:



NEVER USE HYDRAULICS TO SUPPORT A LOAD!!
ALWAYS USE CERTIFIED STANDS.

LOAD HOLDING RINGS and load support devices (continued)

With regard to Load Holding Rings, HYDRA-TECH International Corporation states the following:

The HYDRA-TECH Lift Module / Load Holding Ring column will support a load at least 2 times the rated capacity of the Lift Module when all of the following requirements are met:

- a) **The Lift Module is positioned on a flat, horizontal surface** with at minimum, sufficient load bearing capacity to support 2 times the rated capacity of the Lift Module without settling or subsiding, and is;
- b) **Fitted with Load Holding Rings correctly positioned** and on which the mating surfaces are free from debris and the cylinder rod is lowered 1/4" (0.65cm) from supporting the load, and is;
- c) **Loaded in a manner which does not exert a side load or bending moment** on the Cylinder / Load Holding Ring column, and is;
- d) **Not subjected to external, lateral forces** such as side winds against the supported load, impact from other machines, etc.;

No other claim expressed or implied of any kind, including suitability for any particular application or use is made by HYDRA-TECH, or may be made on behalf of HYDRA-TECH by it's agents or representatives.

NEVER USE HYDRAULICS TO SUPPORT A LOAD!!
ALWAYS USE CERTIFIED STANDS.

Optional Extensions **PLEASE READ CAREFULLY!**

Cylinder Rod Extensions are available in various heights, and are rated for the maximum lifting capacity of the jack only under the following circumstances:

1. THERE IS NO SIDE LOADING. The optional Swivel Saddle will compensate for up to 5□ of side load and is mandatory with 12" (30.5cm) and 20" (50.8cm) total extension configurations.
2. THE MAXIMUM EXTENSION OF UP TO 20" (50.8cm) CONSISTING OF 1 BASE EXTENSION AND 1 ALUMINUM EXTENSION ADAPTER, I.E. NOT SEVERAL EXTENSIONS STACKED.

NOTE: ONLY ONE EXTENSION, IN COMBINATION WITH A SINGLE BASE, SHOULD EVER BE USED AT A TIME. DO NOT STACK EXTENSIONS!

Less than the above circumstances will reduce the capacity of the extensions. *Combinations of negative circumstances such as those outlined below will cause exponential reductions in capacity.*

Examples:

Side Loading

A wind blowing against the side of a machine being lifted such as a boxcar, or the use of an unstable or non-parallel jacking base will cause side loading. Side loading greatly reduces the capacity of the extension.

Extension Length

An 8" (20.3cm) extension stack is less resistant to side loading than a 4" (10cm) extension.

IMPORTANT

Every lift must be set up with maximum safety in mind. The lifting saddle should be positioned to start as close to the jacking pad as possible. The Black Jack System should be placed on a base, to enable the operator to complete the lift using as little ram stroke, or using the shortest extension possible.

This is the safest approach and should be used if there is any doubt about the total load to be lifted, or the possibility of side loading the ram or extensions.

Lowering a Load

Before Beginning

1. If there is any possibility that someone may have added oil to the reservoir, check to make certain that the tank will have sufficient capacity to accept the oil from the cylinder. This will mean the dip stick will have to show oil up to the green high mark. If there is any doubt, open the dip stick port on the tank, and monitor the oil level as the ram retracts; to be sure there is room in the tank.

To Lower the Load

2. Place the control valve lever in the advance (raise) position. With the remote control, extend the ram sufficiently to remove the Load Holding Rings. The Load Holding Rings should be stacked on the handle bracket beginning with the shorter rings at the bottom, and moving to the taller rings at the top.
3. Rotate the control valve to the retract (lower) position. Start the Pump to retract the ram.
4. Important: When the ram is fully retracted, stop the motor and rotate the control valve to advance. Jog the motor to advance the ram slightly (approximately 1/8" (0.3cm)). This eliminates pressure buildup in the ram during storage.

Swing the control valve lever to the retract position and to the advance position to bleed all the pressure from the lines. This will ensure that there will be no pressure locked in the topside of the ram or the hoses.

Preventative Maintenance

Daily Checklist:

1. Fully stroke the lifting plunger.
2. Visually inspect for bent or damaged components, hoses or fittings, and hydraulic leaks etc.
3. Tighten loose bolts and fittings as required.

REMOVE FROM SERVICE IF DAMAGE, CRACKS, BENT COMPONENTS OR HYDRAULIC LEAKS ARE FOUND.

General Level 1 Maintenance:

Recommended every 12 months depending on usage.

1. Clean unit
2. Inspect for leaks
3. Check for any loose bolts & tighten as required
4. Check for any cracks on the equipment
5. Replace damaged or missing safety decals
6. Inspect hydraulic lines for damage
7. Check for any loose fittings and tighten as required
8. Check condition of air connection quick coupler or electrical cord

PREVENTATIVE MAINTENANCE IS A REQUIREMENT FOR EQUIPMENT AND MACHINERY.

LIFTING DEVICES CAPABLE OF LIFTING OVER 2,000 KG (4,409LBS) ARE REQUIRED TO HAVE TO LOAD RATING ON THE EQUIPMENT

Storing:

To reduce potential wear and keep the Black Jack in best form it is recommended that the equipment be stored in a dry, covered location, where it is protected from the elements and potential environmental hazards. When the Black Jack is being stored it should be in the fully retracted (lowered) position and any pressure within the hydraulic hoses should be removed by moving the traversing direction valve left and right.

Repair:

Any repairs should be done by Hydra-Tech International or an approved service centre.

Recommended Hydraulic Fluids & Lubricating Fluids

(For ambient temperatures from -20°F / -29°C to 12QOF)

Power Team AW46
Exxon Unavis Extra
Texaco Rando HDAZ

Notes:

Alternate fluids may be used if they have the following characteristics:

- Pour point -45°F / -43°C, viscosity 150 SUS@ 1000f
- Viscosity 45 SUS @ 210°F / 99°C
- Viscosity index 150, and anti-corrosion, anti-foam, anti-oxidant, anti-rust, anti-wear and demulsifier additives

For air powered units the recommended lubricating fluid for the air motor is:

F442 Turbine Oil

STANDARD WARRANTY

1. **WARRANTY POLICY.** Subject to those terms and conditions contained herein, Seller warrants that all Seller products conform in all material respects to the description identified in the quotation, proposal or offer made by Seller to Buyer for the sale of its products (collectively, "**Quotation**") and will be free from defects in material and workmanship for two (2) years from the date of shipment to Buyer (except for spare parts which Seller warrants for one (1) year from the date of shipment to Buyer). Products manufactured by manufacturers other than Seller and/or its affiliates ("**Other Manufacturer's Products**") supplied by Seller to Buyer are not warranted by Seller. Other Manufacturer's Products may be warranted separately by their respective manufacturers and Seller shall, to the extent possible, assign to Buyer whatever rights Seller may obtain under any such warranties.

THE FOREGOING REPRESENTS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SELLER TO BUYER AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW (INCLUDING BY STATUTE) OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

2. **WARRANTY REMEDIES.** Buyer's sole and exclusive remedy for Seller's breach of the foregoing warranties during the warranty period shall be, at Seller's sole discretion, the repair and/or replacement of any defective products (or component parts thereof) pursuant to the terms of and conditioned upon Buyer's compliance with the procedure identified in Section 5 hereof.
3. **LIMITATION OF DAMAGES. SELLER SHALL HAVE NO LIABILITY TO BUYER OR ANY END USER OF PRODUCTS OR SERVICES WITH RESPECT TO THE SALE OF PRODUCTS OR PROVISION OF SERVICES UNDER THE QUOTATION FOR LOST PROFITS OR FOR SPECIAL, CONSEQUENTIAL, EXEMPLARY, OR INCIDENTAL DAMAGES OF ANY KIND WHETHER ARISING IN CONTRACT, TORT, PRODUCT LIABILITY, STRICT LIABILITY OR OTHERWISE, EVEN IF SELLER WAS ADVISED OF THE POSSIBILITY OF SUCH LOST PROFITS OR DAMAGES. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY DAMAGES WHATSOEVER IN EXCESS OF THE TOTAL PRICE PAID BY BUYER FOR PRODUCTS AND/OR SERVICES REFERENCED IN THE QUOTATION.**
4. **INAPPLICABILITY OF, AND VOIDING OF THE WARRANTY.** This Standard Warranty does not cover defects in Seller products which are not defects in material and workmanship and may be attributed to other causes including but not limited to failure to operate and/or maintain Seller products in accordance with the applicable Seller installation and/or operator's manuals, owner's manuals, maintenance manuals, manufacturer's recommendations, and any other manuals, guidelines or recommendations of Seller concerning the maintenance and operation of Seller products that may be communicated to Buyer from time to time, side-pulling of load, shock loading, excessive jogging, eccentric loading, overloading, accidental occurrence, improper repair, improper handling or storage of products, chemical exposure and/or abnormal operating conditions not identified to and expressly and specifically accepted by Seller in writing prior to Seller's issuance of a Quotation, or any other cause that in Seller's sole discretion is not attributable to defects in material and workmanship. Failure of products to meet published performance specification due to abnormal operating conditions beyond Seller's knowledge or control shall not be considered defects in either workmanship and/or material.

Modification of Seller products and/or incorporation of Other Manufacturer's Products into Seller products by individuals and/or organizations other than Seller shall void this Standard Warranty.

Buyer's failure to pay in full when due for the products and services provided for in a Quotation shall void this Standard Warranty.

5. **WARRANTY PROCEDURE.** To obtain warranty remedies pursuant to this Standard Warranty, Buyer must strictly adhere to the following procedure. Buyer's failure to comply with the terms of this procedure shall void this Standard Warranty.

- (a) Buyer shall, within seventy-two (72) hours of any claimed non-conformance or defect in Seller products, notify Seller's Warranty Administrator in writing of the alleged non-conformance or defect.
- (b) Seller shall, within a reasonable time, advise Buyer of its intention to initially accept or deny the warranty claim pursuant to the terms of this Standard Warranty. If Seller elects to initially accept the warranty claim, it shall advise Buyer of its intention to replace, repair, or otherwise further inspect the allegedly nonconforming or defective products (or component parts thereof) ("**Initial Acceptance**").
 - (i) **Replacement of allegedly nonconforming or defective products.** Should Seller provide Initial Acceptance of Buyer's warranty claim and elect to replace the allegedly nonconforming or defective products (or component parts thereof), or should Seller elect to provide Initial Acceptance of Buyer's warranty claim through notification to Buyer that Seller elects to inspect the allegedly nonconforming or defective products (or component parts thereof) and then subsequently elect to replace the allegedly nonconforming or defective products (or component parts thereof), Seller shall within a reasonable time, ship new, comparable, replacement products to Buyer F.C.A. Seller's plant, warehouse or dock, as defined by Incoterms 2010, via the lowest cost method available.
 - (ii) **Repair of allegedly nonconforming or defective products.** Should Seller provide Initial Acceptance of Buyer's warranty claim and elect to repair and/or permit the repair of the allegedly nonconforming or defective products (or component parts thereof) by approved third parties, or should Seller elect to provide Initial Acceptance of Buyer's warranty claim through notification to Buyer that Seller elects to inspect the allegedly nonconforming or defective products (or component parts thereof) and then subsequently elects to repair the allegedly nonconforming or defective products, Seller shall, unless otherwise agreed in writing by the Warranty Administrator, pay only those direct labor costs incurred to effectuate the repair and the cost of Seller replacement products consumed during said repair provided that the costs for all products and/or services are approved in advance in writing by Seller's Warranty Administrator.
 - (iii) **Inspection of allegedly nonconforming or defective products.** Should Seller provide Initial Acceptance of Buyer's warranty claim through notification to Buyer that Seller elects to inspect the allegedly nonconforming or defective products (or component parts thereof) and then subsequently determine that the alleged nonconformity or defect is not covered under this Standard Warranty, Seller shall bill Buyer, and Buyer shall pay Seller any and all costs associated

- (iv) with the performance of inspection of allegedly nonconforming or defective products.

6. **WAIVER. BUYER HEREBY WAIVES ANY CLAIM THAT THE EXCLUSIONS OR LIMITATIONS IDENTIFIED HEREIN DEPRIVE IT OF AN ADEQUATE REMEDY. BUYER SHALL BE ENTITLED TO NO OTHER REMEDY OTHER THAN THOSE IDENTIFIED IN SECTION 2 HEREOF WITH RESPECT TO THE PROVISION OF PRODUCTS AND/OR SERVICES BY SELLER REGARDLESS OF THE FORM OF CLAIM OR CAUSE OF ACTION, WHETHER BASED IN CONTRACT, TORT INCLUDING NEGLIGENCE, STRICT LIABILITY OR OTHERWISE.**