

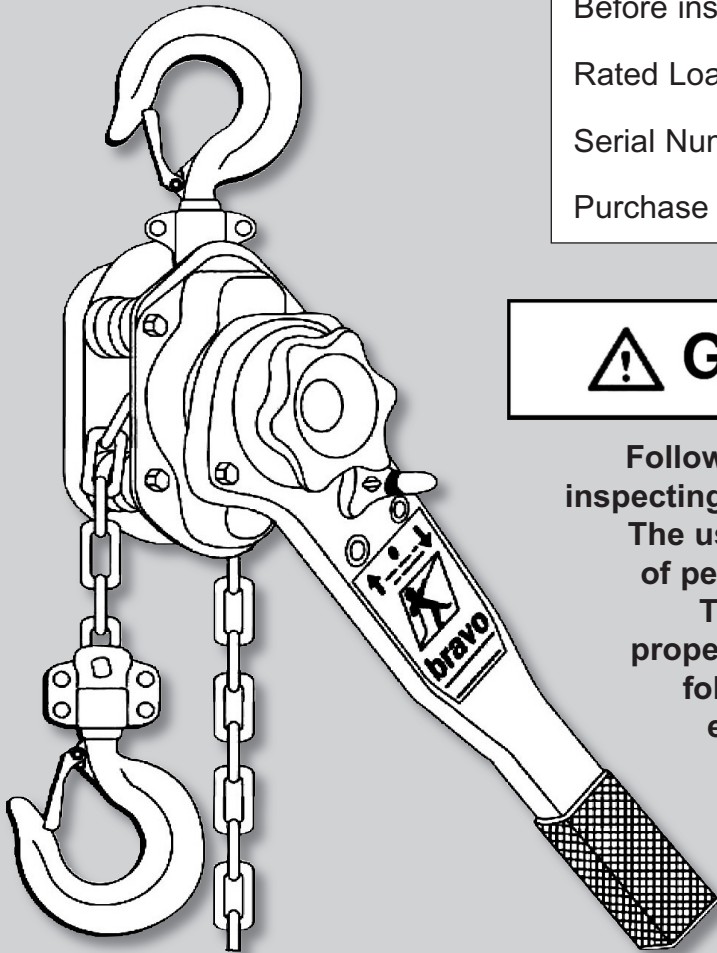
# bravo<sup>®</sup>

## Manual Lever Hoist

### Operation, Maintenance and Parts Manual

**Rated Loads: 1/4, 1/2, 3/4, 1, 1 1/2, 3t, 6t**

Meets or exceeds standards and requirements established by  
ANSI standards SME B30.16 and HST-2M



Before installing hoist, fill in the information below.

Rated Load: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

### **⚠ GENERAL WARNINGS**

Follow the instructions and warnings for inspecting, maintaining and operating this hoist.

The use of any hoist presents some risk of personal injury or property damage.

That risk is greatly increased if proper instruction and warnings are not followed. Before using this hoist, each operator should become thoroughly familiar with all warnings, instructions and recommendations in this manual.

**RETAIN THIS MANUAL  
FOR FUTURE REFERENCE AND USE.**

Forward this manual to operator.  
Failure to operate equipment as directed in manual  
may cause serious injury or death



WLL 500 lbs to 12,000 lbs

# bravo®

## Manual Lever Hoist

### Assembly and Operating Instructions

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# bravo<sup>®</sup> - Manual Lever Hoists

Rated Loads: 1/4, 1/2, 3/4, 1, 1 1/2, 3t, 6t

## IMPORTANT

This manual contains information describing inspection and repair procedures for the equipment described herein and is made available for qualified technicians only. To ensure proper safety, all persons involved in operation of this equipment must be properly trained and thoroughly familiar with the correct inspection and repair procedures. These persons shall also be familiar with all applicable ANSI standards (ASME B30.16 and HST-2M) and/or other federal, state, provincial and local standards which may apply.

### Explanation of Symbols used in this manual

Symbol	Code Word	Meaning	Possible consequence of non-compliance
	WARNING	IMMEDIATE or possibly imminent danger:	Fatal or serious injuries!
	CAUTION	Possibly dangerous situation:	Minor injuries to persons!
	NOTE	Possibly dangerous situation:	Damage to equipment or it's surroundings
	n/a	Instruction for documentation in writing (i.e record keeping)	n/a

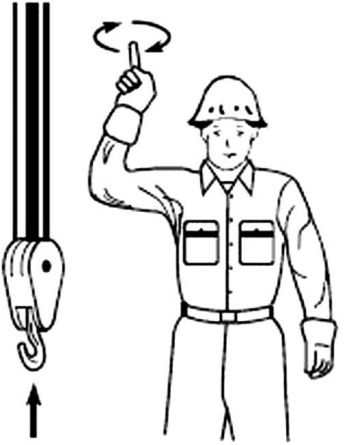
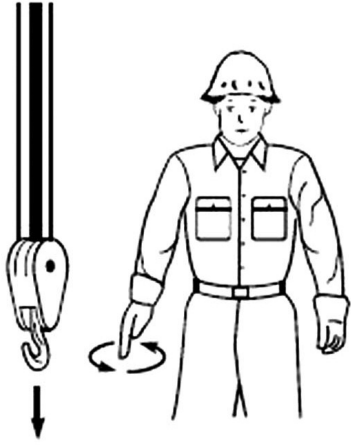
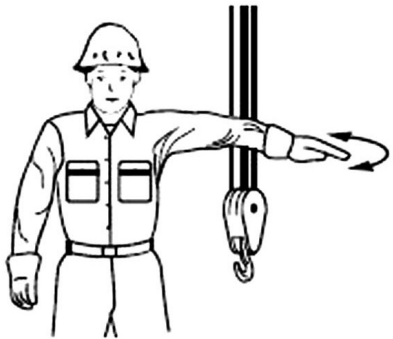
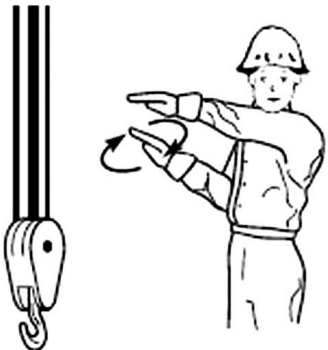
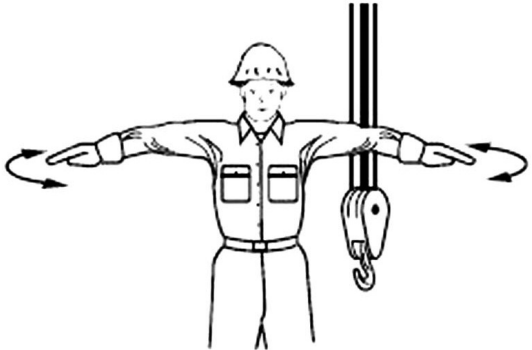


# GENERAL WARNING

READ THIS GENERAL WARNING FIRST

IN HOISTING OPERATIONS, SAFETY AND PROPER OPERATION IS A MATTER OF LIFE OR DEATH FOR RIGGERS, OPERATORS AND BY-STANDARDS. THIS WARNING IS YOUR SHARE OF DUTIES FOR ACHIEVING SAFETY.

## STANDARD HAND SIGNALS FOR CONTROLLING HOISTS

 <p><b>HOIST.</b> With forearm vertical, forefinger pointing up, move hand in small horizontal circle.</p>	 <p><b>LOWER.</b> With arm extended downward, forefinger pointing down, move hand in small horizontal circle.</p>	 <p><b>STOP.</b> Arm extended, palm down, move arm back and forth horizontally.</p>
 <p><b>MOVE SLOWLY.</b> Use one hand to give any motion signal and place other hand motionless in front of hand giving the motion signal. (<i>Hoist slowly</i> shown as example.)</p>	 <p><b>EMERGENCY STOP.</b> Both arms extended, palms down, move arms back and forth horizontally.</p>	



# GENERAL WARNING

## READ THIS GENERAL WARNING FIRST

**In hoisting operations, safety and proper operation is a matter of life or death for riggers, operators and by-standers.  
This warning is your share or duties for achieving safety.**

### YOUR DUTY TO UNDERSTAND AND COMPLY

1. It is the rigger's and the operator's responsibility, and their employer's responsibility, if they operate under an employer's control, to strictly conform to the following warnings. Be familiar with and understand hand signals.
2. It is imperative for safety and efficiency of the operations that this manual be read and FULLY UNDERSTOOD by the rigger and the operator the bravo®. ALL INSTRUCTIONS contained herein must be carefully and strictly FOLLOWED, including applicable guidelines for safe practice and be familiar with and understand hand signals.
3. Should you hand over a bravo®, under whatever conditions, to any party operating out of your control, you must join a clean copy of this manual and draw the other party's attention that strictly following all the instructions therein is a matter of life or death.
4. Before rigging and operating the bravo® hoist, the rigger and the operator must become aware of all the requirements of federal, state, provincial and local safety regulations not only applicable to the bravo® hoist but also the entire system and any component of it.
5. Never use the bravo® hoist for any job other than lifting materials according to the instructions of this manual.
6. Never lift people or loads near people or loads over people. Warn people of an approaching load.
7. Never use a bravo® hoist which has been modified.
8. Never load the bravo® hoist above its rated load.
  - a) minimize swing the load or load hook.
  - b) maintain firm footing when operating lifting equipment.
  - c) avoid sudden acceleration and deceleration.
  - d) concentrate on operating the hoists, and do not allow attention to be diverted while operating the equipment.
  - e) stop hoist in a controlled manner when the operator has doubt as to the safety of the operations. Lift operations shall resume only after safety concerns have been addressed.
  - f) lift the load block above the highest moveable obstruction under the hoist when the hoist not in use
9. Never apply an effort to the operating lever handle that will cause an overload situation (cheater bar, multiple people operating the lever, etc)
10. Never use the bravo® if the load is NOT free to move.

### YOUR DUTY TO INSPECT AND MAINTAIN

11. Keep this manual available at all times for easy reference whenever required. Extra copies are available from the supplier.
12. Carefully take notice of all the labels and nameplates fixed to the bravo® (see page 21). Never rig or operate the hoist if any label or nameplate, normally fixed on the hoist is obscured or missing. Tractel® will supply extra labels and nameplates on customer's request.
13. Every time the hoist is to be rigged or used, check that the hoist, load chain, hooks and other components of the system are complete and in good working condition, prior to proceeding.
14. A careful and regular inspection of the bravo® hoist, its load chain, hooks and other components of the installation is part of the safety requirements. If you have any questions, call Tractel®. (see page 16)
15. After each de-rigging and before re-rigging, the bravo® lever hoist must be inspected by a competent person familiar with the bravo® lever hoist and professionally trained for the purpose. (see point 16)
16. Do not use a hoist with twisted, kinked, damaged or worn load chain.
17. Discontinue use of a hoist that malfunctions or performs unusually and report such malfunctions.
18. Do not attempt to lengthen or repaired load chain.

### YOUR DUTY TO TRAIN AND CONTROL PEOPLE

19. An operator must not be assigned to a hosting job or to rigging for the job, if the person is not:
  - a) mentally or physically fit for that purpose
  - b) competent for the job to be performed
  - c) familiar with all application safety rules and requirements
  - d) trained for working under the above requirements
20. Never disassemble the bravo® by yourself or by your staff. Except for the operations described in this manual, the maintenance of the bravo® hoists, as well as disassembly and repair, must be exclusively done by qualified repairers authorized in writing by Tractel® Inc. for USA or Tractel® Ltd. for Canada. Bravo® spare parts in accordance with the serial number of each machine must be exclusively utilized. No substitutions are allowed.



21. Never let the bravo® hoist and other equipment of a system be managed or operated by a person other than those authorized and assigned to the job.
22. Training operators must be set up by a competent person of the user, or of its technical consultant. According to the working conditions, prior to putting the equipment into operation, contact Tractel® Inc. for the USA or Tractel® Ltd. for Canada. (see page 21)
23. Every job must be placed under the control of a person having the required competence and the authority for checking that all the instructions prescribed by this manual be regularly and efficiently carried out.

#### **YOUR DUTY OF SAFETY BEYOND THE BRAVO®**

As being only one piece of the system, the bravo® hoist can contribute to the required HOIST SAFETY, IF...

24. It is fitted on and with compatible equipment.
25. Other components meet the requirements of the applicable safety regulations and are of the proper quality, and assembled to form a safe system.
26. Every support is stable, sufficiently strong, according to the load either static and dynamic.
27. Supporting structure provides the required resistance to every load to be applied either static or dynamic, during operating the equipment.
28. All the requirements in strength and resistance are obtained with the necessary safety factor (see regulations and professional standards).
29. All the calculations, design and subsequent work necessary to the above requirements have been made by a competent person on the basis of proper technical information regarding the site.

#### **YOUR DUTY TO AVOID TAKING CHANCES**

30. Do not leave load supported by the hoist unattended unless specific precautions have been taken.
31. Should you decide that the bravo® hoist is no longer to be used, take precautions in disposing of it so that it cannot be used anymore.
32. Bravo® hoist **MUST NOT** be used in explosive atmosphere. It has not been designed for such an application.
33. Do not operate unless load is properly oriented with the hoist.
34. Protect the hoist load chain from weld splatter or other damaging contaminants.
35. Do not operate hoist when it is restricted from forming a straight line from hook to hook or in the direction of loading.
36. Do not use load chain as a sling or wrap chain around load.

37. Do not apply the load to the tip of the hook or to the hook latch.
38. Never operate a hoist unless load slings or other approved attachments are properly sized and seated in the hook saddle.
39. Do not apply load unless load chain is properly seated in the chain wheel or sprocket.
40. Do not operate beyond the limits of the load chain travel.
41. Do not pull chain stop into the body of the hoist.
42. Do not allow the load chain or hook to be touched by a live welding electrode or be used as a electrical or welding ground.
43. Do not use hoist for lifting loads that are not freely suspended, or loads that are guided, or are otherwise not free to move.
- 44) A load-limiting device shall not be used to measurement.
- 45) Gloves that interfere with the operation of the controls shall not be worn.
- 46) Obey any stop signal regardless of who gives it.

#### **FOR LIFTING PEOPLE OR OTHER APPLICATIONS CONTACT:**

**Tractel® Inc. for USA**

**or**

**Tractel® Ltd. for Canada**

#### **AN ULTIMATE RECOMMENDATION**

Never neglect means to improve safety. Due to the risks inherent in the use of lever hoists, the supplier strongly recommends that every\* bravo® lever hoist be fitted with an optional overload device when one is available. Ask your supplier for information on the optional overload device.

**In order to keep improving its products, Tractel® reserves its right to apply any modification at any time to the product described in this manual.**

The companies of The Tractel® Group and their appointed repairers will supply on request their documentation regarding other Tractel® products available: lifting and pulling machine and their accessories, site and facade access equipment, handling equipment, safety devices for load, personal fall protection equipment, load and tension indicators, etc.

**Go to [www.tractel.com](http://www.tractel.com)**

The Tractel® network can supply an after sales and periodic inspection service.

*\* Not available in the 1/4T and 1T models*





**Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in death, or serious injury. To avoid such a potentially hazardous situation, the operator shall:**

1. DO NOT lift or pull more than rated load for the hoist.
2. DO NOT operate a manufacturing or unusually performing hoist.
3. DO NOT operate the hoist until you have thoroughly read and understood this manual.
4. DO NOT operate a hoist which has been modified without the manufacturers approval or certification to be in conformity with applicable OSHA regulations.
5. DO NOT use damaged hoist or hoist that is not working properly.
6. DO NOT use hoist with twisted, kinked, damaged, or worn load chain.
7. DO NOT operate with any lever extension (cheater bar).
8. DO NOT use the hoist to lift, support, or transport people.
9. DO NOT lift loads over people and make sure all personnel remain clear of supported load.
10. DO NOT attempt to lengthen the load chain or repair damaged load chain.
11. Protect the hoist load chain from weld splatter or other damaging contaminants.
12. DO NOT operate a hoist when it is restricted from forming a straight line from hook to hook in the direction of loading.
13. DO NOT use load chain as a sling or wrap load chain around load.
14. DO NOT apply the load to the tip of the hook or to the hook latch.
15. DO NOT operate beyond the limits of the load chain travel.
16. DO NOT leave load supported by the hoist unattended unless specific precautions have been taken.
17. DO NOT allow the chain or hook to be used as an electrical or welding ground.
18. DO NOT allow the chain or hook to be touched by a live welding electrode.
19. DO NOT remove or obscure the warnings on the hoist.
20. DO NOT operate a hoist unless load slings or other approved single attachments are properly sized and seated in the hook saddle.
21. DO NOT operate a hoist unless all persons are and remain clear of the supported load.
22. Report malfunctions or unusual performances of a hoist, after it has been shut down until repaired.
23. DO NOT operate a hoist on which the safety placecards or decals are missing or illegible
24. Be familiar with operating controls, procedures and warnings.



**Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. To avoid such a potentially hazardous situation, the operator shall:**

1. Make sure the load is free to move and will clear all obstructions.
2. Avoid swinging the load or hook.
3. Avoid lever "fly-back" by keeping a firm grip on the lever until operating stroke is completed and lever is at rest.
4. Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
5. Use Tractel® parts when repairing the unit.
6. Lubricate load chain as recommended in this manual.
7. DO NOT allow your attention to be diverted from operating the hoist.
8. DO NOT adjust or repair the hoist unless a qualified person performed such adjustments or repairs.

## **GENERAL SAFETY INFORMATION**

### **ADVERSE ENVIRONMENTAL CONDITIONS**

Do not use the hoists in areas containing flammable vapors, liquids, gasses or any combustible dust or fibers. Do not use the hoist in highly corrosive, abrasive, and wet environments.

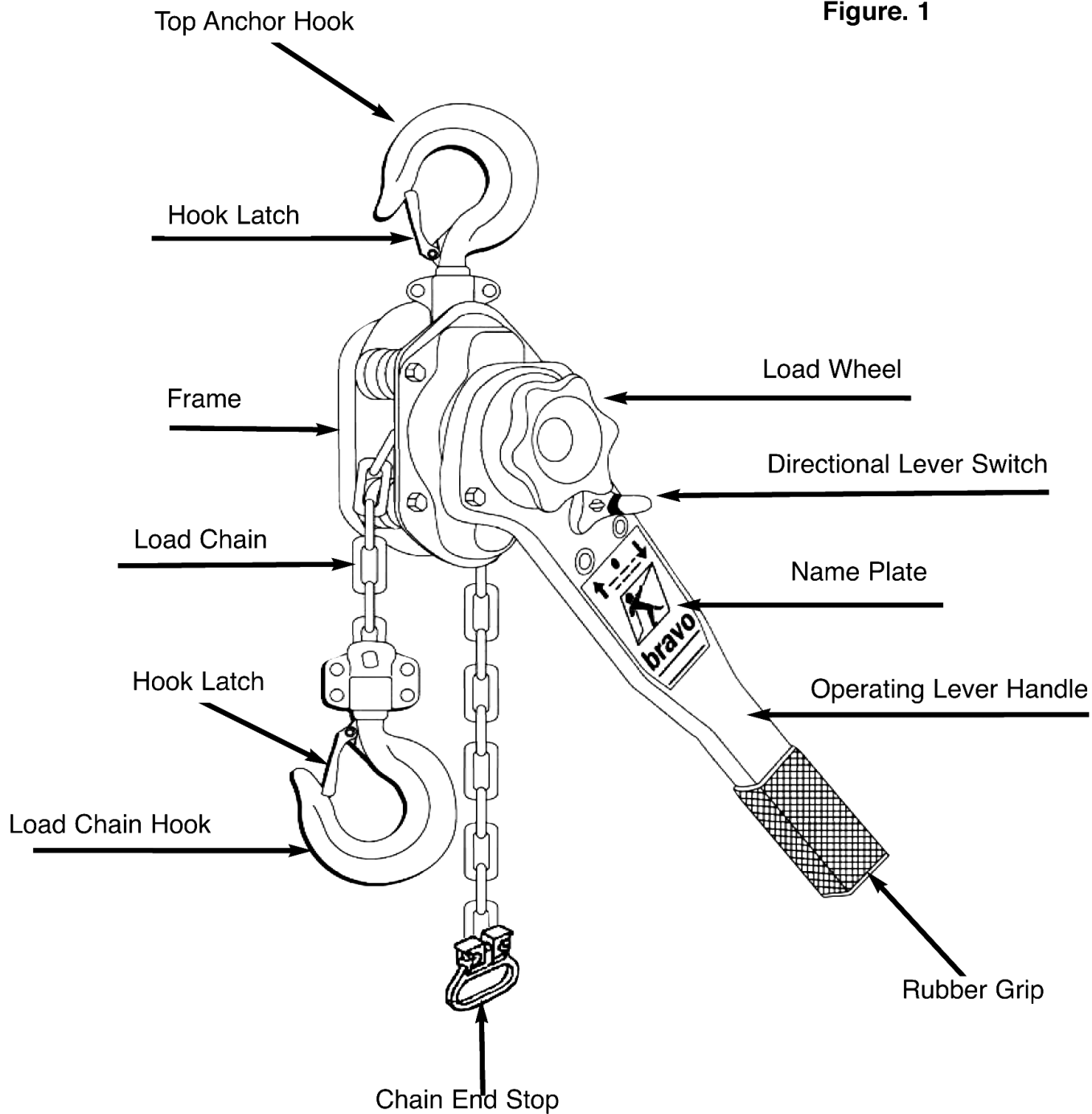
### **MOVING HAZARDOUS LOADS**

The hoists are not recommended for lifting materials that could cause widespread damage if dropped. The lifting or moving of materials that could explode or cause chemical or radioactive contamination requires fail-safe, redundant supporting devices that are not incorporated into these hoists.



**General Information**  
**2.1 Identification of Bravo® Parts**

**Figure. 1**





## 2.1 Bravo® Parts Description

The bravo® is a portable lever chain hoist for lifting, pulling and tensioning which is normally used on a fixed anchor point or with suspension trolleys. Information about anchor points and suspension trolleys can be obtained from Tractel® on request.

The bravo® is manufactured from high quality materials to provide a rugged tool. It is also lightweight, compact, portable and easy to install.

Bravo® is supplied with a standard 5 foot (1.5m) lift of ISO grade 50 or 80 (depending on rated load of unit) load chain. Additional lifts are available. An optional load limiting device is available (except for .25 t and 1t BRAVO) as well as a special corrosion resistant chain. Additional information can be obtained from TRACTEL® on request.

A serial number is marked on the nameplate of every hoist (see figures, page 21). Please refer to this number whenever inquiries are made regarding your device or parts for it.

The frame and covers of the bravo® manual lever chain hoist are made from stamped steel. Internal gears are made of high grade, heat treated steel. Top anchor hook and load chain hook are made from forged steel, utilizing hook latches. The hooks are equipped with measuring points to help determine the integrity of the hook throat opening.

At the time of manufacture, Bravo® lever manual chain hoists are built in accordance with the applicable ASME standards, B30.21, Manually Operated Lever Hoists. Copies of this standard can be obtained from ASME Order Department, 22 Law Drive, PO Box 2300, Fairfield, NJ 07007-2300 USA. See also ASME HST-3m.

This manual contains important information to help you properly install, operate and maintain your bravo® lever hoist.

**Please keep these instructions handy and available to anyone who intends to use this hoist.**

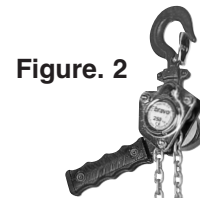


Figure. 2

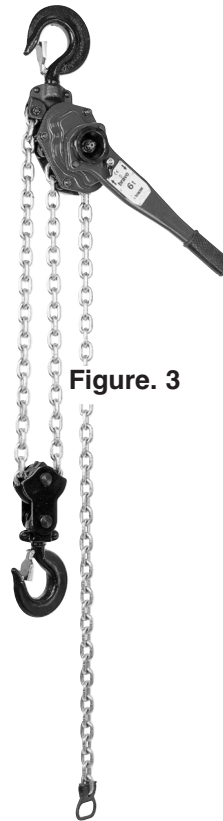


Figure. 3



Figure. 4

Table 2 Specifications

Rated Load	.25t	.5t	.75t	1t	1.5t	3t	6t
Falls	1	1	1	1	1	1	2
Load Chain	4x12 mm	5x15 mm	6x18 mm	6x18 mm	7x21 mm	10x30 mm	10x30 mm
Grade	50	50	50	50	80	80	80
Shipping Weight	5lbs. 2 kg	11 lbs. 5 kg	15 lbs. 7 kg	15 lbs. 7 kg	24 lbs. 11 kg	44 lbs. 20 kg	66 lbs. 30 kg



## 2.2 What is in the box

Each bravo® lever hoist is factory tested to ensure its conformity to applicable standards.

Each box contains:

A bravo® lever hoist

An instruction manual (this manual).

A CE declaration / Test certificate

## 2.3 Working Principle

The bravo® lever hoist works by manipulating an operating lever handle back and forth to raise (or tension) or lower (or slacken) chain to which a load is applied. The hoist utilizes a directional lever switch to determine the direction of chain travel.

Acting on a ratchet wheel are two pawls that control the load in conjunction with two disc brakes. This mechanism allows for positive load control.

Both the top anchor hook and the load chain hook come equipped with hook latches.

Both hooks have indicator marks that help determine whether or not the hooks have been subjected to forces greater than the rated load (except .25T).

The hoist is supplied with a directional lever switch that indicates Up, Down, and Neutral (Free Wheeling) positions.

## 2.4 Limits of Use

Do not use this hoist until you have read and understand the contents of this manual.

Always know the load you intend to move, and ensure that the intended load never exceeds the rated load of the hoist. Each hoist is marked with its rated capacity.

The bravo® hoist must be used in strict accordance with the instructions in this manual as well as the procedures as outlined in the various local, state, provincial and federal guidelines and laws.

## 2.5 Compliance with Standards

The bravo® manual chain lever hoist is built to the standards as outlined in AMSE B30.21 at the time of manufacture.

Employers are responsible for ensuring the bravo® is maintained, serviced and used in accordance with this manual and the applicable ASME standards. A copy of this manual must be made available to anyone who uses the hoist.

**\*NOTE: If shipped without chain installed, the chain installer (see point 20, page 5) must ensure that all applicable testing is performed as outlined in ASME B30.21.**



## 3. Installation and Inspection

### 3.1 Unpacking

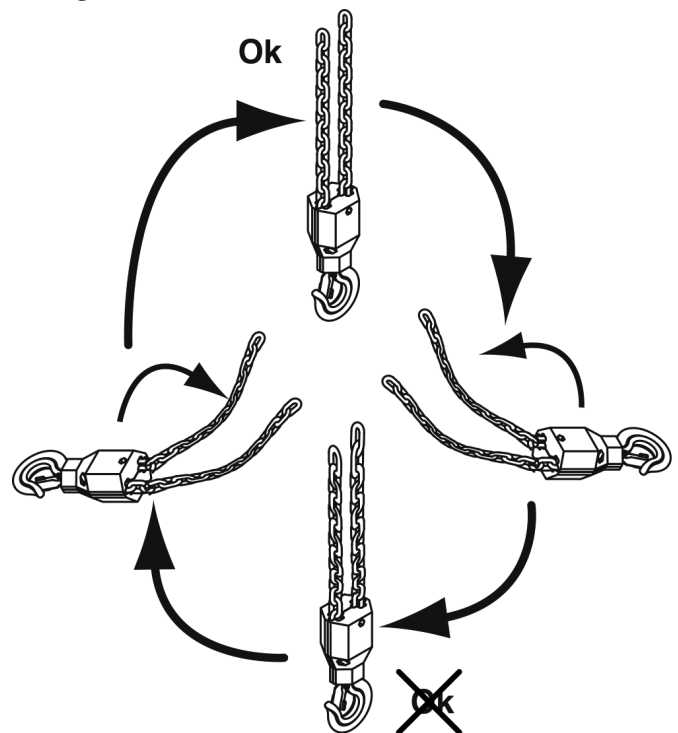
Unpack box and inspect the contents. Each box will contain a bravo® hoist, instruction manual and a test certificate. Carefully inspect the hoist looking for any damage that may have occurred during transport. Visually check for loose, missing or damaged parts. Shipping damage claims must be filed directly with the carrier. The hoist is shipped completely assembled and ready to use.\*

### 3.2 Checks Before Use

Before installing this or any hoist:

1. Determine the maximum load that will be applied and make sure it does not exceed the rated load of the hoist as identified on the hoist nameplate.
2. Ensure that all anchorages, slings or other parts of the entire suspension system are within the rated load of the hoist. If it is not, DO NOT ATTEMPT TO USE THE HOIST.
3. Make sure that the load is free to move.
4. Check that the chain is correctly fitted. (see table 5, page 17).
5. When using a 6 ton bravo® lever hoist with two falls of load chain, ensure there is no twisting of the load chain, and that the chain sprocket on the load chain hook rotates freely. (see figure 5 below)

Figure. 5



### 3.2 Checks Before Use (continued)

6. Ensuring that the bravo® is not subjected to an overload situation is the user's responsibility. Once these checks have been performed, and the hoist is attached to its anchor point, the following procedures must be followed prior to attempting to move a load.
7. Before applying a load, check that the up, down and neutral functions operate properly.
8. Check that the hoist is correctly attached to the anchor point, the load is applied to the saddle of the hook and that both hook latches close..
9. Check that the load chain has not become twisted during the installation.
10. When using a hoist with a push suspension trolley, without load, check that the trolley moves freely. If using a geared suspension trolley, without load, check the direction of movement by pulling on the hand chain of the geared trolley.
11. The area in which the hoist is installed must provide sufficient room for:
  - a. The operator to operate the hoist.
  - b. The operator and other personnel to stand clear of the load at all times.
  - c. Firm footing for the operator.
  - d. Clearance between the hoist frame and any object. The frame must be free to swivel on the top anchor hook.



**The user should check that: the hooks and hook latches are in good condition. The anchoring accessory of the load seats fully in the hook and does not prevent the latch from closing. The load on the hoist is free to align itself with the machine's anchor point. The load is free to move.**



**Attaching the hoist from an inadequate support may allow the hoist and load to fall and cause serious injury and/or property damage.**

**A designated person shall verify that the supporting structure has adequate strength and stability for all rated loads including necessary safety factor.**



**If not used as directed, lever hoist may cause serious injury. Use only as directed in the manual. Read, understand and follow all instructions before operating the bravo® lever hoist.**



**Malfunction of unit (shifting of load) or loss of footing may result in injury. Always have a firm and secure footing when using the bravo® lever hoist**

### 4) Hoist Operation

The hoist must be kept clean to assure proper operation. Before use, check to make certain the load chain is clean and lubricated, that there is no material in the lift wheel area, and that the operating lever handle operates freely.

- 1) DO NOT overload. Overload can cause immediate failure or cause damage resulting in future failure, even at less than rated load.
- 2) DO NOT use this hoist for lifting or people or for lifting or moving loads over people.
- 3) Stand clear of all loads and warn other people around you or nearby of your intention to move a load in their area.
- 4) DO NOT leave the hoist unattended with a load applied to it.
- 5) Read all warnings and instructions on the hoist and in this manual before use.
- 6) DO NOT hold the chain while operating the hoist.
- 7) Never operate the hoist when flammable material or vapors are present. Contact between metal parts may produce sparks that can cause a fire or explosion.
- 8) STAY ALERT! Watch what you are doing at all times and use common sense.
- 9) DO NOT use the hoist if you are tired, distracted or under the influence of drugs, alcohol or medication that may cause any diminished control.
- 10) ALWAYS wear gloves when you are manipulating or operating the bravo® lever hoist.

## 4.1 Lifting A Load

After verifying the integrity of the entire system, and when ready to lift the load, remove any slack in the chain. To do this, place the directional lever switch in the '0', or neutral position.

With no load on the hoist, turn the load wheel counter-clockwise which opens the brake; the chain is released.

Pull any slack chain through the hoist by grabbing the chain end stop (side opposite of the load chain hook) and slowly pull the chain through the hoist until the chain slack is removed.

(NOTICE: If it is not possible to turn the load wheel by hand, put the directional lever switch in the 'DOWN' position and operate the lever handle while exerting some force on the load chain hook side of the chain and the chain will be released.)

Attach the load chain hook to the load so that it is seated in the saddle of the hook and that the load is not bearing on the tip of the load chain hook. Make sure hook latch is properly closed.

Turn the load wheel clockwise; the brake is closed. The chain is engaged in the hoist.

Now move directional lever switch to 'UP' position and move the hoist operating lever handle back and forth to raise (or tension) the load.

When moving the operating lever handle back and forth, listen for a distinctive clicking sound. This clicking sound is the action of the pawls on the ratchet wheel. With the directional lever switch in the 'UP' position, moving the handle back and forth shortens the distance between the hooks.

While lifting (or tensioning) the load, ensure that the hoist frame is not in contact with anything that might prevent it from forming a straight line from the top anchor hook to the load chain hook.

While lifting the load, DO NOT move the load chain to the point where the chain load hook or chain sprocket of a 6 ton hoist jams into the hoist frame.

When lifting or pulling a load, move the load only enough to load the hoist, then check to be sure the attachments to the hooks and load are firmly seated and the hook latches are properly closed.

Continue use only after you are assured the load is free of all obstructions and that the load is free to move.

Always maintain positive control of the load at all times.



**Allowing the load to bear against the latch and/or hook tip can result in loss of load.**

The hoist has been designed for hand power only. NEVER use an extension on the operating lever handle (cheater bar). DO NOT motorize in any way. Required operating lever handle effort equals 57 lbs. (26 kg) on a .25t, 79 lbs (36 kg) on a .5t, 44 lbs. (20 kg) on a .75t, 57 lbs. (26 kg) on a 1t, 73 lbs. (33 kg) on a 1 1/2t, on a 3 t, and 75 lbs. (34 kg) on a 6t hoist will result in lifting or pulling rated load.

Do not exceed these values and do not allow more than 1 person to operate a single hoist. Any greater effort is an indication of either an overload condition or a incorrectly maintained or functioning hoist. Never leave a suspended or tensioned load unattended. Always ensure that the load is under positive control.

The bravo® hoist is fitted with alloy hooks (except 1/4 T) that will deform before they fail. See page 13 and 16 regarding hook inspection. If the hook latch does not remain seated against the inside of either hook, this is one indication, but not the only indication, that the hoist has been overloaded, and the hoist must be removed from service until it has been serviced and tested according to this manual and the applicable standards. (Figure. 6, page 13)

DO NOT USE



Figure. 6



**Never overload. If at any time the hook is opened to the point where the hook latch does not bridge the throat opening, STOP OPERATION immediately and remove the load. Overload has occurred and continued use may result in serious injury. Remove hoist from service and take corrective measures.**

**NOTE: This is NOT the only indication of overload. Read complete manual prior to operating the hoist.**



#### 4.2 Lowering A Load

To lower a load or release tension in a tensioned hoist, put the directional lever switch in the 'DOWN' position and operate the operating lever handle back and forth. This will lower (or release) the load.

If a hoist is suddenly relieved of its load (by lifting the load off of the hoist by some means, such as pulling down a wall), the brake will lock.

The brake will also lock if the lower load chain hook or chain end stop is pulled tightly against the frame. To unlock the brake, put the directional lever switch in the 'DOWN' position and pull on the operating lever handle sharply. This will release the brake.



**The directional lever switch must not be left in the 'O' (Neutral = Free Wheeling) position when a load is suspended on the hoist or if the hoist is loaded or under tension. DO NOT attempt to operate the load wheel while the hoist had a load applied to it.**

**Turing the load wheel with a load attached will allow the load to be released and may cause serious injury.**

#### 5) Removing the Hoist from Service

When taking the hoist out of service, ensure that any load is placed safely and securely on the ground and the load chain is slack enough to remove the load chain hook from the load.

Store the hoist in a dry and weatherproof location.

It is recommended that the hoist be stored hanging so that the load chain does not become tangled. Before storage, the load chain should be cleaned with a soft brush and lubricated with machine oil. Any hoist that has not been used within a period of 12 months must be checked as required by the Periodic Inspection.

All hoists that have been idle for less than 12 months should be examined as described in the 'Periodic Inspection' section.

Standby hoists must always be in operable condition and therefore should be inspected on the same interval as a hoist in service. For hoists subjected to abnormal conditions, these requirements should be adjusted accordingly.

## 6) Forbidden Practices

1. DO NOT wrap the load chain around a load and hook it back to itself as a choker chain sling.
2. DO NOT bring the load in contact with the hoist frame, load chain hook, bottom block or bottom assembly (6T).
3. Make sure the top anchor hook and load chain hook are in a straight line and the frame is free to swivel.
4. DO NOT operate the operating lever handle at excessive speed as this will lead to an uneven load movement. It is recommended to operate the operating lever handle in a steady movement to prevent any unnecessary jerking of the load.
5. DO NOT exceed the rated load shown on the nameplate.
6. DO NOT use to lift people or loads over people.
7. DO NOT use if the frame is in contact with any object.
8. DO NOT use if the unit is damaged or malfunctions.
9. DO NOT use an extension on operating lever handle. Use hand power only applied by one person.
10. DO NOT use if chain is twisted, kinked or damaged.
11. DO NOT use if the load is not able to move.
12. DO NOT unless hook latches are closed.
13. DO NOT use unless the brake function has been verified prior to each lift.
14. DO NOT use the hoist unless you have firm footing.
15. DO NOT attempt to "free chain" the hoist while a load is applied.
16. DO NOT apply load if bearing prevents equal loading on all load supporting chains.
17. DO NOT operate a hoist which has not been securely attached to a suitable support.
18. DO NOT lift loads that are not balanced and the holding action is Not secure, taking up slack carefully.
19. Avoid swinging the load or hook.
20. DO NOT allow your attention to be diverted from operating the hoist.
21. Avoid lever "fly-back" by keeping a firm grip on the operating lever handle until operating stroke is completed and lever is at rest.
22. Avoid impact with other objects.
23. Do not load the chain end stop.
24. DO NOT put your hand or fingers in the hoist.

## 7) Troubleshooting

Bravo® lever chain hoists are designed to operate trouble free when the operating lever handle stops properly and the lever is routinely maintained. However, from time to time certain problems may arise from unforeseen reasons. Qualified technicians best identify the causes of these troubles. The following list should provide answers to the most common problems associated with this product.

**Table 3**

Problem	Possible causes	Common Remedies
Hoist does not lift the load.	Hoist is overloaded Overload Protection needs adjustment.	Reduce the load until within the rated load of the hoist. Overload Protection needs adjustment.
Load does not stop immediately when handle stops.	Hoist is overloaded.	Reduce the load until within the rated load of the hoist.
	Brake is slipping.	Check for oil or wear on the friction brakes/brake adjustment
Load chain binds.	Damage to one of the following:	Inspect and replace as necessary.
	Load chain	
	Chain sprocket	
	Driving Shaft	
	Gears	
Twisted load chain		
Operating Lever Handle binds.	Damage to one of the following:	Inspect and replace as necessary.
	Load chain	
	Chain sprocket	
	Driving Shaft	
	Gears	
Hook latch does not open, close or seat properly.	Broken/damaged latch. Bent or twisted hook (Fig.7, page 16)	Inspect and replace as necessary.



**Do not use a hoist if there are any uncorrected problems. Failure to properly correct a malfunctioning hoist can cause injury or death.**

## 8) De-Rigging of the Hoist

Once job is finished, ensure the load has been set onto a stable foundation and that all tension is off of the load chain and that there is enough slack in the chain to allow for the load chain hook and the top anchor hook to be removed.

## 9) Inspections and Maintenance

### 9.1 Service Schedule

To ensure safe and satisfactory operation, the hoist must be regularly inspected by authorized and trained person (see page 5, point 20) who can recognize worn or damaged parts that could be hazardous.

Required intervals of inspection depend on the application of the hoist and depend on many factors. Inspection schedules should take into consideration the loads applied, working conditions (including dust, moisture, temperature, etc.) and any other factors which may deteriorate or damage the machinery. The following is a recommended maintenance schedule, but depending on each application these recommendations may require adjustment.

**Table 4**

Inspection Schedule		
Service	Frequent	Periodic
Normal	Monthly	Quarterly
Heavy	Weekly	Monthly
Severe	Daily	Weekly

#### Before starting maintenance:

- a) If a load is attached to the hoist, it shall be removed.
- b) Signs and barriers shall be used on the floor beneath the hoist where overhead maintenance work creates a hazard.

## 9.2 Frequent Inspection

For normal operation the bravo® should be inspected monthly, as well as throughout any operation for the following items. If any deficiencies are noticed the hoist must immediately be removed from operation until serviced by an authorized technician.

**Operation** - Check for visual or audible signs which may indicate a potential problem. Operate the operating lever handle and notice the "clicking" sound as well as the smoothness of operation. Pay attention to the movement of chain and be certain the load chain stops moving at the same time as the operating lever handle stops.

**Hooks** - Visually check for any signs of wear or damage including increased throat width, bent shanks, twisted hooks, cracks or any other defects. Check hook latches for proper operation.

**Chain** - Ensure there is no twisting, cuts, gouging, nicks, burns or any other damage in any chain sections.

**Lubrication** - The entire load chain should be lubricated each week for extended longevity. For severe or corrosive conditions more frequent lubrication may be necessary. Machine oil is recommended. The same lubricant should be applied to the hook and latch. Rust and abrasives may be removed by using an acid free solvent followed by a thorough lubrication.



**Do not use caustic substance to clean chain**

## 9.3 Periodic Inspection

Never disassemble the bravo® by yourself or by your staff. Except for the operations described in this manual, the maintenance of the bravo® hoists, as well as disassembly and repair, must be exclusively done by qualified repairers authorized in writing by Tractel® Inc. for USA or Tractel® Ltd. for Canada.

For normal service it is recommended that the bravo® be thoroughly inspected four times per year. Written records shall be kept on all periodic inspections to ensure continual evaluations of the hoists. A qualified technician must perform these inspections.

- 1) INSPECTION OF ALL ITEMS LISTED UNDER FREQUENT INSPECTION
- 2) Chain Sprocket - Inspect for any evidence of wear, damage, sharp edges, deformation or contaminants. Ensure the chain travels properly through the hoist without incident. If any problems are noticed, disassemble the unit and further inspect all gears, shafts, bearings, sheaves, chain parts, springs and covers. Replace or repair any component(s) as necessary.

3) Brake - Inspect for proper operation, ensuring the brake does not slip while holding a load. The hoist shall be capable of lifting 125% of the rated load without any movement when the operating lever handle is released. Check all surfaces for oil, wear, deformation, fracture or foreign objects. If any defects are noticed, disassemble and repair or replace parts as needed.

4) Hooks - Inspect both hooks for the following conditions:

- a) The hooks should rotate freely.
- b) Latches should be appropriately secured in place and open/close properly.
- c) Any signs of cracking (use of magnetic particle or dye penetrants are recommended).
- d) Any indications of deformation including:

### Throat Width

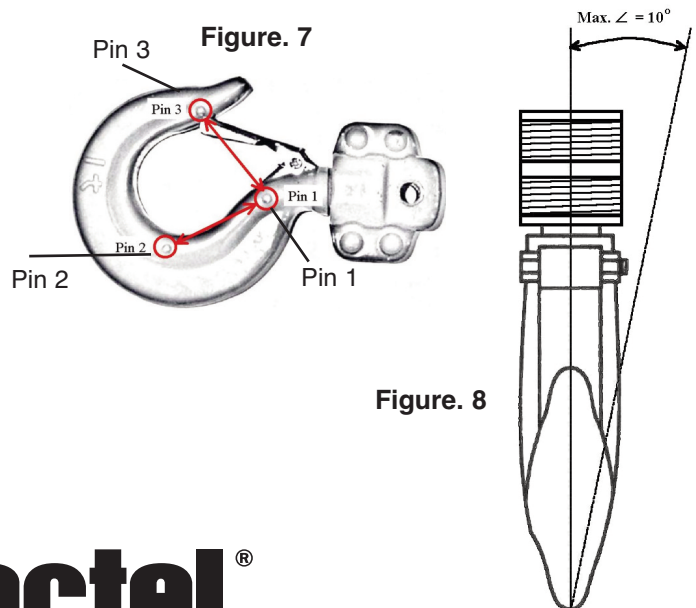
(1) Hooks (see figure 6, page 13) have elongation marks that are measured by comparing the distance between pins 1 and 2 and pins 1 and 3. The difference between these distances should be no more than 5 mm as shown in figure 7, page 16

(2) Hooks without indicator points hooks (see Fig. 12, page 19) are constructed of hardened steel; these do not possess elongation marks and the hook will not bend.

Twisting - Check for twisting of the hook by using the drawing in Figure 7. Discard if the hook is twisted over 10°.

5) Load Chain

Bravo® hoist is supplied with a case hardened load chain, grade 50, 80 or better suited to use on a manual lever hoist. See table 2, page 9 for the correct chain grade for each hoist.





**WARNING**

After an intensive period of use, the chain may show signs of elongation or wear which could damage the hoist or cause the chain to break. It is therefore recommended that the lifting chain is inspected regularly (Refer to table 4, page 15). The chain should be measured and must be replaced in the measurements are greater than those given in table 5, page 17.

It is also recommended that the wear of the chain guide and the load sprocket wheel is checked at a Tractel® approved service shop.

For taking measurements the chain must be cleaned with a solvent which is neither acid nor caustic (use a white spirit type solvent).

In addition, when each link on a total length of 11 links (Fig. 11) has been examined, the chain must be replaced if any of the following are found:

- Corroded or cracked links.
- Distorted or twisted links.
- Stretched or particularly worn links.
- Weld splatter.
- Gouges.

Lightly oil the load chain regularly with machine oil or equivalent.

**CAUTION**

**Lubricants must be handled and disposed of according to local, state, provincial and federal regulations.**

**NOTE : Systematically or repeatedly stopping and starting at the same place will cause more rapid wear of the links which stop on the load sprocket wheel.**



Check the wear at the articulation point:  
 $d_m$  = average diameter after wear.

$d_3/d_4$  : refer to Figure.9

$$d_m = \frac{d_3 + d_4}{2} < 0.9 d$$

Figure. 9

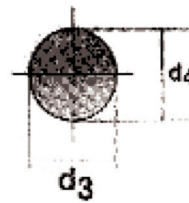


Figure.10

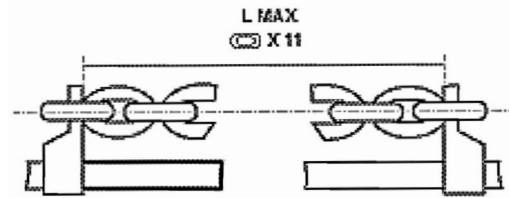
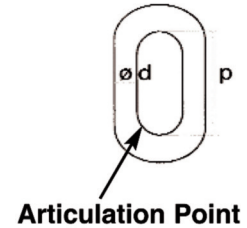


Figure. 11

Inspect the load chain for the following:

- There should be no twists throughout the entire length.
- Welds should be directed away from the chain sprocket on the main body of the hoist.
- The chain end stop should be correctly in place.
- Inspect chain for any stretching by measuring 11 link section (five link sections for 10 mm). The chain must be discarded if it has stretched more than 2.5%, as it may have been overloaded or has worn excessively. See Figure 11 for measuring procedure and Table 5 for allowable limits.
- Check each link for bending, twisting, pitting, weld crack, gouging or any other irregularities.

Table 5

D x P	Original Length		Maximum Allowed	
	in	mm	in	mm
4x12	5.197	132	5.354	136
5x15	6.496	165	6.693	170
6x18	7.795	198	8.031	204
7x21	9.094	231	9.37	238
10x30	5.906	150*	6.102	155*

\* Length of 10 mm chain based on 5 links



If any of these tests have failed, replace the entire chain before further use.

- 1) Fasteners - Check that all rivets, screws, nuts, cotter pins and any other fasteners belonging on the hoist are in place and are secure.
- 2) Labels and Nameplates - Check for legibility and presence (see page 8 and 21). Replace the labels and nameplates if necessary. Contact Tractel® to request new labels or nameplates
- 3) Supporting Structure - Inspect all supports for deformation or wear which may affect the ability to support further loading.

### 9.4 Lubrication

If possible or unless stated otherwise, always attempt to remove old lubricant before reassembly of any components with a new coating of lubrication. Use of thread lubricant or anti-seize compound is recommended for threaded shafts.

For gears, use of EP 1 grease is recommended for temperatures in the range of -20 to 50 F (-29° to 10° C). EP 2 grease is recommended for temperatures between 30° and 120° F (-1° to 49° C). The chain should be lubricated with SAE 50 to 90 EP oil.



**Do not use caustic substance to clean chain**

### 9.5 Testing

After any installation or repair, testing should be performed to ensure smooth operation and proper brake function. To test the hoist, first lift a light load and then carefully lift 125% of the rated load a few inches from the floor. Be sure the brake holds the loads in both tests securely before further lifting. No movement of the hook should occur for any load within the rated hoist capacity.

Any testing and maintenance should be performed by qualified persons and documented in writing. Refer to ASME B30.21 and HST-3M as well as other pertinent federal, state, and local regulations.

## 10) Maintenance.

### 10.1 Installing New Load Chain

- 1a) Remove the chain end link (position 25, page 22). Load chains and hand chains should be kept clean and free from any coating or deposit that will build up and change their dimensions or reduce flexibility. The cleaning process shall not damage these chains and any solution used in the cleaning process shall be acid free.
- b) Remove chain from the hoist
  - i) Remove the nut and bolt from the hook position.
  - ii) Remove and discard old load chain if necessary (the chain can be cut if desired).

For hoists with more than one fall:

Load chains articulate slowly under high bearing pressures and should be lubricated as specified by the hoist manufacturer. Hand chains are light loaded and normally need little or lubrication; however, the hoist manual should be reviewed for specific lubrication information.

- 2) Cut a new load chain according to the state of the art (in case of doubt call Tractel®, page 28) to the correct length. The length of chain required is equal to the desired lift times the number of falls the hoist requires.
- 3) Attach approximately 2 feet (1 m) of soft wire to one end of the new load chain.
- 4) Insert the wire into the entry side of the hoist, over the load sprocket, and through the inside of the guide roller.
- 5) Position the load chain so the welds are directed away from the chain sprocket.
- 6) Turn the load wheel to advance the chain through the sprocket.
- 7) Continue turning the load wheel clockwise until a couple of feet are exposed. Replace the chain end stop.
- 8) Install the load chain hook as described in the following section.(see page 19)
- 9) Continue to turn the load wheel counterclockwise until the hook is almost completely hoisted.
- 10) Check for any twisting of the chain. (see page 17)



**Only use chain that is recommended or supplier by Tractel® Inc. for USA**  
or  
**Tractel® Ltd. for Canada**



## 10.2 Installing a load chain hook

- 1) For models with one fall:
  - i) Insert the last link into the hook swivel.
  - ii) Secure with 10 mm bolt and nyloc nut supplied with hook.
- 2) For 6t models with two falls (see Figure 14):
  - a) While avoiding twisting, pass the dead end of chain through the idler sheave on the bottom block (position 31, page 22).
  - b) Secure the dead end to the top anchor hook with a bolt through the last link of chain.
  - c) Recheck that the chain is not twisted and that the link welds face away from the hoist body.

Figure. 12



Hook without indicator marks

Figure. 13



Hook with indicator marks

Figure. 14



6T Load Block



**Twisting of the load chain can cause jamming internally and cause the chain to break. Also, the load chain must be reeved properly to prevent the chain from coming off the load sheave. Either of these conditions may allow the load to drop.**

## 10.3 Brake Replacement

- 1) Remove the load wheel cover.
- 2) Remove the cotter pin from the castle nut.
- 3) Turn the castle nut counterclockwise to remove. Note that the nut is not tight!
- 4) Turn the load wheel counterclockwise to remove chain.
- 5) Remove and inspect/replace the ratchet wheel and both friction disks (see figs. 15 and 16, page 19).
- 6) Measure brake disc thickness. Replace if cracked, oily, damaged or measurements do not meet requirements listed below (see table 6).
- 6) Reverse procedure to reinstall.



**The brake assembly must be free of oil and foreign objects to ensure safe operations.**

Figure. 15

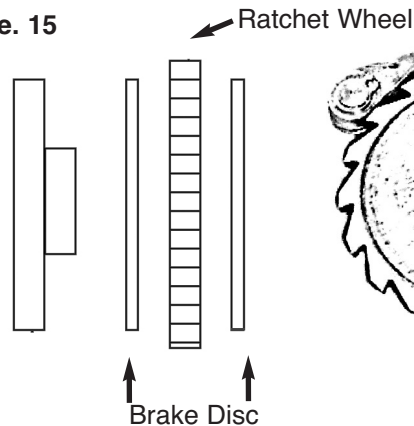


Figure. 16

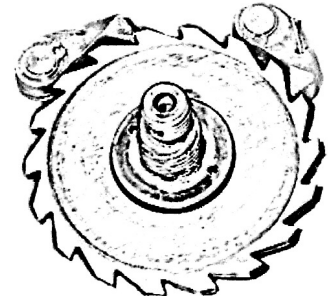
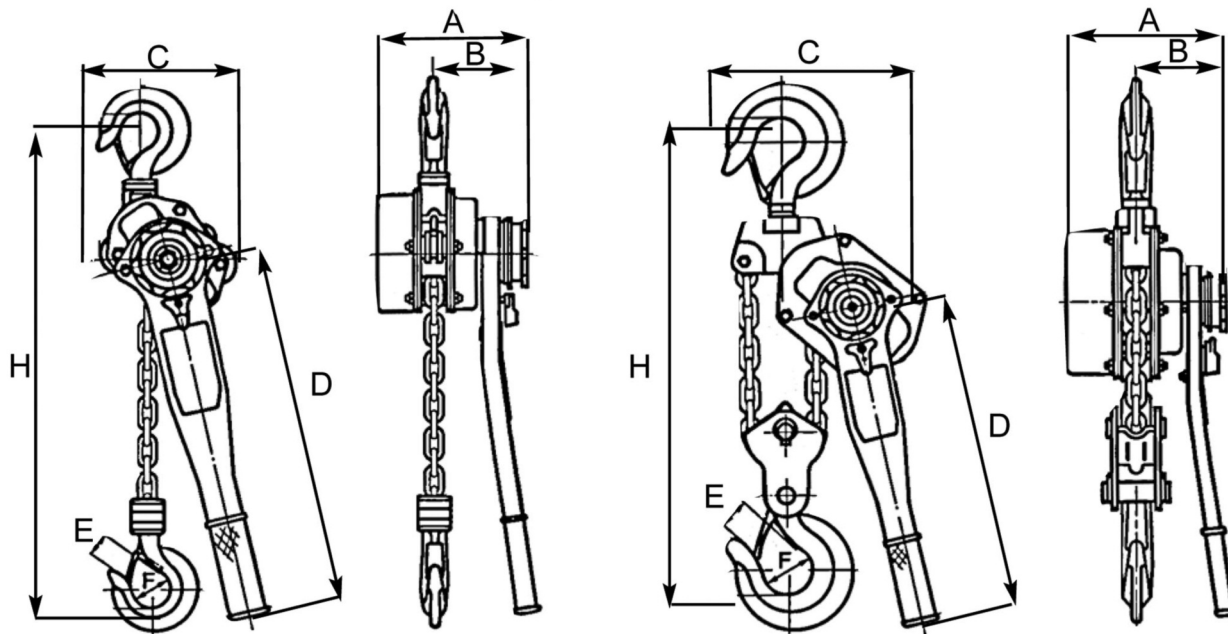


Table 6 BRAVO		
WLL (t)	nominal thickness mm	mini thickness mm
0,5	3	2
0,75	2,5	2
1,5	2,5	2
3	2,5	2
6	2,5	2

**11) Technical Data**  
**1/4 , 1/2 , 3/4 , 1 , 1 1/2 , 3t and 6t**

**Figure. 17**



Capacity	lbs (daN/kg)	500 (250)	1,000 (500)	1,500 (750) *	3,000 (1,500)	6,000 (3,000)	12,000 (6,000)
Standard lift	ft. (m)	5 (1.5)	5 (1.5)	5 (1.5)	5 (1.5)	5 (1.5)	5 (1.5)
Number of falls of chain		1	1	1	1	1	2
Effort to lift maximum load	lbs (daN/kg)	57 (26)	79 (36)	44 (20)	49 (22)	88 (40)	71 (32)
Weight	lbs (kg)	4 (2)	11 (5)	15 (7)	24 (11)	44 (20)	66 (30)
Chain dimensions	mm	4 x 12	5 x 15	6x18	7x21	10x30	10x30
Dimensions	A in. (mm)	3.6 (91)	4.3 (110)	5.5 (139)	7.0 (174)	7.9 (200)	7.9 (200)
	B	2.8 (70)	3.1 (80)	3.3 (84)	4.3 (108)	4.5 (115)	4.5 (115)
	C	2.8 (71)	4.8 (122)	6.0 (153)	6.3 (160)	7.3 (185)	9.1 (230)
	D	6.2 (157)	9 (228)	11.4 (290)	16.1 (410)	16.1 (410)	16.1 (410)
	E	0.8 (21)	0.9 (23)	0.9 (23)	1.2 (30)	1.5 (38)	1.6 (40)
	F	1.1 (28)	1.4 (35)	1.5 (37)	1.8 (45)	2.2 (55)	2.6 (65)
	H min.	9.2 (233)	12 (305)	11.9 (303)	14.4 (365)	19.1 (485)	23.6 (600)

\* The 1t has all the same dimensions at the .75t - except it weighs 1lbs. more. The Capacity is 2000 (1000), weight 16 (7.5) and effort lift maximum load 57 (26).

## 12) Nameplates and Labels

Figure. 18



Located on the hoist lever

Figure. 19



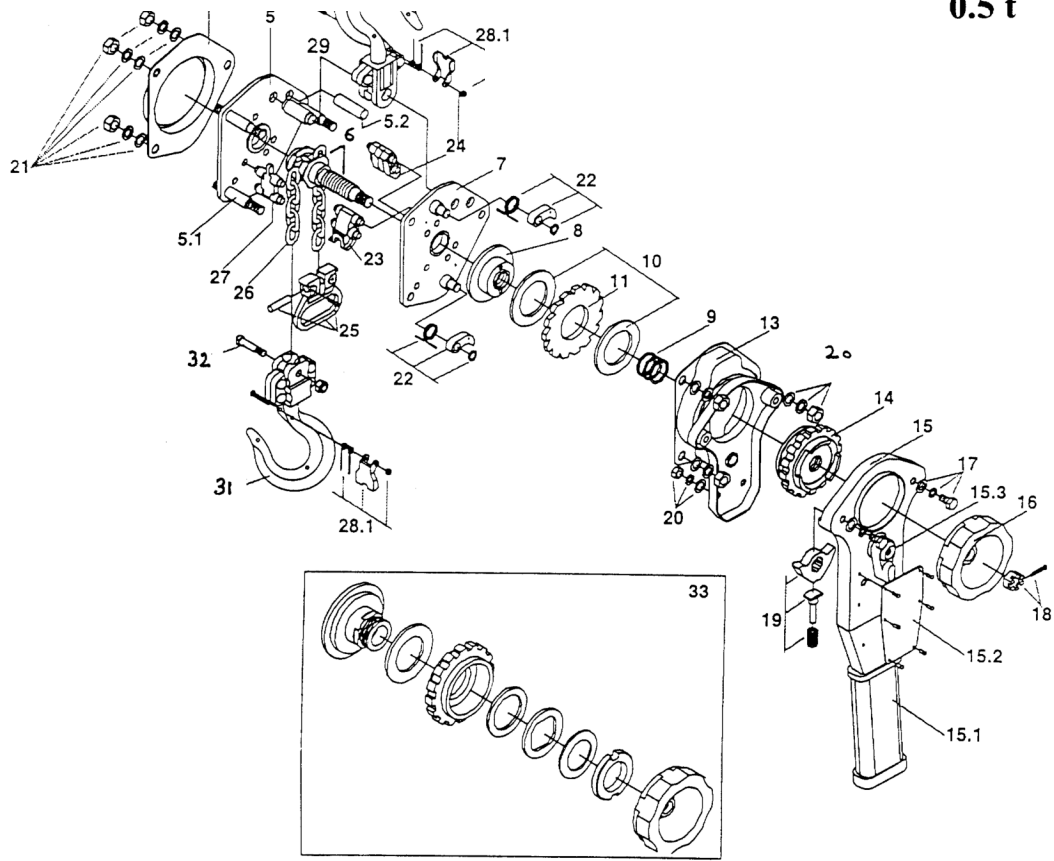
Located on hoist lever and on hoist box where applicable



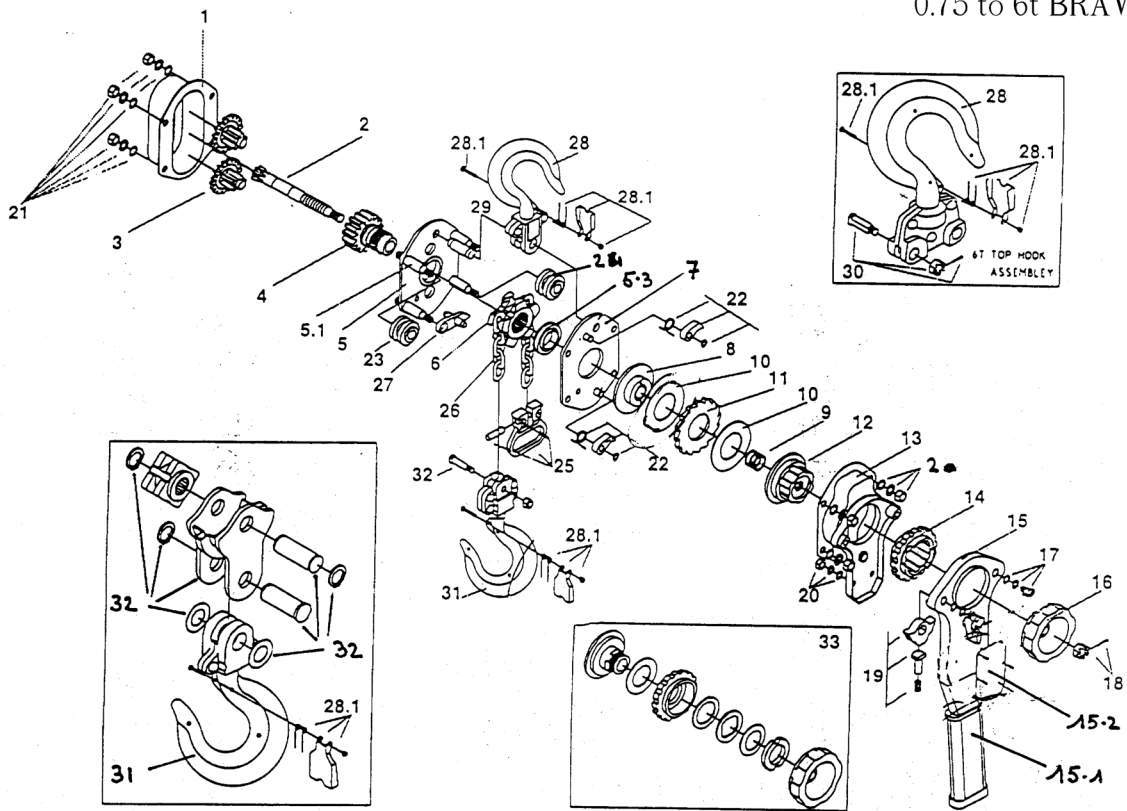
Do Not remove or obscure the safety labels, plates or tags furnished on the hoist.

# 13) Expanded View

0.5 t




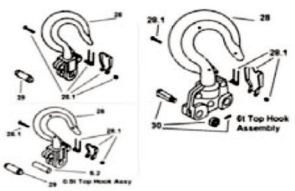
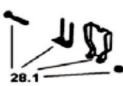
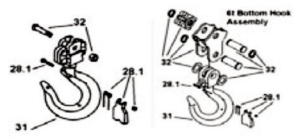
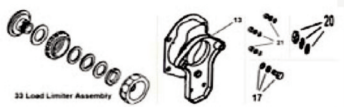


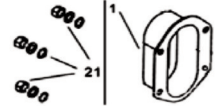


0.75 to 6t BRAVO



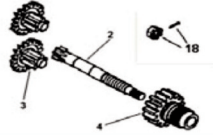

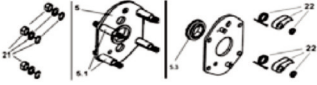


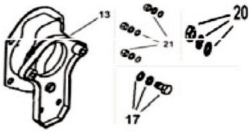
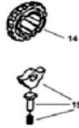
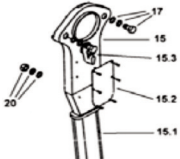
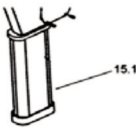

## 14) Spare Parts List

Note: All parts listed correspond with the **Exploded View** pictures and their position numbers on page 22.

Description	0.5t Code No.	0.75t Code No.	1t Code No.	1,5t Code No.	3t Code No.	6t Code No.	Position No.
<b>Load Wheel Kit</b> 	22732	22742	26472	22752	22752	22752	16,18
<b>Chain Guide Kit</b> 	22762	22772	26482	22782	22792	22792	23,24,27
<b>Chain Stop Kit</b> 	8262	8272	8272	8282	8292	8292	25
<b>Top Hook Kit</b> 	22802	22812	26492	22822	22832	22842	5.2, 28, 28.1, 29, 30
<b>Safety Catch Kit</b> 	22852	22862	26502	22872	22882	22892	28.1
<b>Bottom Hook Kit</b> 	22902	22912	26512	22922	22932	22942	28.1, 31, 32
<b>Load Limiter Kit</b> 	13912	13922	N/A	13932	13942	13942	13, 17, 20, 21, 33
<b>Load Limiter Handwheel</b> 	99902	99912	N/A	99922	99922	99922	13, 17, 20, 21, 33
<b>Brake Disc Kit</b> 	7452	2102	2102	2502	3102	3102	10
<b>Side Cover Kit</b> 	22462	22472	22472	22482	22492	22492	1, 21

## 15) Spare Parts List

Note: All parts listed correspond with the **Exploded View** pictures and their position numbers on page 22.

Gear Kit		22502	26402	22512	22522	22522	2,3,4,18	
Bearing Kit		N/A	N/A	N/A	22532	22542	5.3	
Side Plate Kit		22552	22562	26412	22572	22582	5, 5.1, 5.3, 21, 22	
Chain Sprocket Kit		7322	2062	26422	18462	18472	6	
Brake Kit		22592	22602	22602	22612	22622	8,9,10,11,12,22	
Brake Cover Kit		22632	22642	26432	22652	22662	13, 17, 20, 21	
Change over Wheel Kit		22672	22682	26442	22692	22702	14,19	
Handle Kit		50002	50012	50022	50032	50042	15, 15.1, 15.2, 15.3, 17, 20	
Rubber Grip Kit		7712	7712	26542	2692	2692	15.1	
Label Kit		50062	50072	50082	50092	50102	50112	15.2



## 16) Overload Device

To protect against severe overload, a load limiter device is available from Tractel® Inc/Ltd. for the bravo®.

Some bravo® lever hoists may be fitted with an integral overload device.

The following information should be read, understood and followed in conjunction with all the information contained in this manual.

The load limiter device consists of the components shown in the exploded parts view on hoists supplied from Tractel® with a load limiter.

The load limiter device (clutch) has been calibrated at the time of manufacture to slip at approximately 130% - 160% of the rated load.

Re-Calibration should not be required if the hoist is used as intended, re-Adjustment requires special tools available from Tractel®.

Complete overload kits are available from Tractel®.

- Do Not use the load limiter device to measure the maximum load to be lifted. It is an overload protective device only.
- Do Not remove the load limiter label

Hoist fitted with load limiter are marked as follows:

- A Tag on the chain end stop
- An "L" is stamped on the nameplate

An load limiter kits includes:

- The Load Limiter
- A label
- Instructions for Installation

## 17) Warranty

- (1) Tractel® Inc for USA, Tractel® Ltd. for Canada warrants its equipment to be free from defects in material and workmanship under normal use and service.
- (2) Our obligation under this warranty is limited to repairing or replacing, at our option, any part of the unit, which proves examination to our satisfaction to be defective in material or workmanship, if the item in question is returned through a Tractel® distributor, transportation prepaid, within one (1) year from the equipment is sold to the original purchaser. Return shipment must be prepaid.
- (3) Any parts proved to be defective upon our inspection will be repaired or replaced at no cost for the parts themselves.
- (4) The obligation under this warranty does not include labor or travelling costs, or consequential damages of any kind.
- (5) Any defect in this equipment must immediately be brought to attention of the distributor from whom the unit was purchased. The distributor will make arrangements with the factory for repairs or replacement of parts within the terms of this warranty.



**Installation to be done by a Tractel®  
trained repairer only!**

18) Service Log

<b>INSPECTION AND MAINTENANCE SHEET</b>						
Date	Supervisor	Reason for inspection	Inspection/ Check performed	Repair	Evaluation of risks	Corrective actions



# Available from Tractel®

## Material Handling Equipment

Tractel®, offers a complete line of material handling products, including the **BRAVO®** & **TRALIFT®** chain hoists, **GRIPHOIST®** / **TIRFOR®** wire rope hoists, **PIONEER®** pallet trucks, **DYNAFOR®** load indicating devices, and much more.

For more information or specifications on any one of these products, please contact a customer service representative.



## Height Safety Products

Tractel®, offers a complete fall protection system, from full body harnesses and lanyards to patented devices such as the **Travsafe®** lifeline system, the **Blocfor®** Self-retracting lifeline and the **Stopfor®** rope grabs. Our equipment is engineered and manufactured to meet and exceed the highest standards in the industry.



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



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*As we are dedicated to continuous improvement of our products, the Tractel® Group reserves the right to modify the specifications of the equipment described in this manual. As a result, illustrations may not represent exactly the product you receive: components and/or design may differ.*

