



Read this Owner's Manual thoroughly before operating the equipment. Keep it with the equipment at all times. Replacements are available from Thern, Inc., PO Box 347, Winona, MN 55987, 507-454-2996. www.thern.com

IMPORTANT: Please record product information on page 2. This information is required when calling the factory for service.



Owner's Manual

For The
FVC-1000
Fire Vent Closure Winch

Two-Year Limited Warranty

Please record the following:

Date Purchased: _____

Model Number: _____

Serial Number: _____

This information is required when calling the factory for service.

Thern, Inc. warrants its products against defects in material or workmanship for two years from the date of purchase by the original using buyer, or if this date cannot be established, the date the product was sold by Thern, Inc. to the dealer. To make a claim under this warranty, contact the factory for an RGA number. The product must be returned, prepaid, directly to Thern, Inc., 5712 Industrial Park Road, Winona, Minnesota 55987. The following information must accompany the product: the RGA number, the date of purchase, the description of the claimed defect, and a complete explanation of the circumstances involved. If the product is found to be defective, it will be repaired or replaced free of charge, and Thern, Inc. will reimburse the shipping cost within the contiguous USA.

This warranty does not cover any damage due to accident, misuse, abuse, or negligence. Any alteration, repair or modification of the product outside the Thern, Inc. factory shall void this warranty. This warranty does not cover any costs for removal of our product, downtime, or any other incidental or consequential costs or damages resulting from the claimed defects. This warranty does not cover brake discs, wire rope or other wear components, as their life is subject to use conditions which vary between applications.

FACTORY AUTHORIZED REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY TO THE CONSUMER. THERN, INC. SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note: Thern, Inc. reserves the right to change the design or discontinue the production of any product without prior notice.

About This Manual

The Occupational Safety and Health Act of 1970 states that it is the employer's responsibility to provide a workplace free of hazard. To this end, all equipment should be installed, operated, and maintained in compliance with applicable trade, industrial, federal, state, and local regulations. It is the equipment owner's responsibility to obtain copies of these regulations and to determine the suitability of the equipment to its intended use.

This Owner's Manual, and warning labels attached to the equipment, are to serve as guidelines for hazard-free installation, operation, and maintenance. They should not be understood to prepare you for every possible situation.

The information contained in this manual is applicable only to the Thern Model FVC-1000 Winches. Do not use this manual as a source of information for any other equipment.

The following symbols are used for emphasis throughout this manual:

⚠WARNING

Failure to follow 'WARNING!' instructions may result in equipment damage, property damage, and/or serious personal injury.

⚠CAUTION

Failure to follow 'CAUTION!' instructions may result in equipment damage, property damage, and/or minor personal injury.

Important!

Failure to follow 'important!' instructions may result in poor performance of the equipment.

Suggestions for Safe Operation



⚠WARNING

DO the following:

Read and comply with the guidelines set forth in this Owner's Manual. Keep this manual, and all labels attached to the winch, readable and with the equipment at all times. Contact Thern, Inc. for replacements.

Check lubrication before use.

Install the wire rope securely to the winch drum.

Keep at least 4 wraps of wire rope wound on the drum at all times, to serve as anchor wraps. With less than 4 wraps on the drum the wire rope could come loose, causing the load to escape.

Keep hands away from the drum, gears, wire rope, and other moving parts of the equipment.

Keep all unnecessary personnel away from the winch while in operation. Keep out of the path of the load, and out of the path of a broken wire rope that might snap back and cause injury.

DO NOT do the following:

This product designed for closing and releasing fire vent doors. Do not use this product for any other purpose.

Do not use more than one winch to operate a single fire vent.

Do not use damaged or malfunctioning equipment. To do so could result in failure of the equipment.

Do not modify the equipment in any way. To do so could cause equipment failure.

Do not wrap the wire rope around building structures or other objects. This damages the wire rope and could cause the load to escape. Use approved rigging connectors to secure the wire rope to the load.

Do not operate the winch with guards removed or improperly installed.

Do not divert your attention from the operation. Stay alert to the possibility of accidents, and try to prevent them from happening.

1.1 Installing the Winch

Important!

- Inspect the winch immediately following installation according to the Instructions for Periodic Inspection. This will give you a record of the condition of the winch with which to compare future inspections.
- A qualified professional should inspect or design the foundation to insure that it will provide adequate support.
- Locate the winch so it will be visible during the entire operation.

⚠WARNING

Do not install the winch in an area defined as hazardous by the National Electric Code, unless installation in such an area has been thoroughly approved.

Do not install the winch near corrosive chemicals, flammable materials, explosives, or other elements that may damage the winch or injure the operator. Adequately protect the winch and the operator from such elements.

Position the winch so the operator can stand clear of the load, and out of the path of a broken wire rope that could snap back and cause injury.

Attach the winch to a rigid and level foundation that will support the winch and its load under all load conditions, including shock loading.

- 1.1.1 CONSULT APPLICABLE CODES AND REGULATIONS for specific rules on installing the equipment.
- 1.1.2 LOCATE THE WINCH in an area clear of traffic and other obstacles. Make sure the winch is accessible for maintenance and operation.
- 1.1.3 MAINTAIN A FLEET ANGLE up to 1 1/2 degrees for smooth drums and 2 degrees for grooved drums. The proper fleet angle minimizes wire rope damage by helping the wire rope wind uniformly onto the drum. See Figure 1.
- 1.1.4 FASTEN THE WINCH securely to the wall or a horizontal support structure. Use four 3/8 inch capscrews grade 5 or better to install the winch. See Figure 2.

TO COMPLY WITH LOCAL CODES, CONTACT A QUALIFIED PROFESSIONAL TO OBTAIN PROPER STRUCTURE OR FOUNDATION SPECIFICATIONS FOR THE MOUNTING OF THERN PRODUCTS.

Important!

- Use a sheave or roller guide to direct the wire rope to the drum whenever possible.
- Install sheaves and other equipment so they will remain fixed under all load conditions. Follow the recommendations of the equipment manufacturer.
- Use sheaves of proper diameter to minimize wear on the wire rope. Follow the recommendations of the sheave manufacturer.

Figure 1 – Maintaining the Fleet Angle

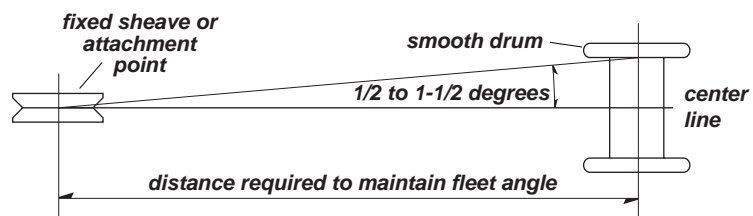
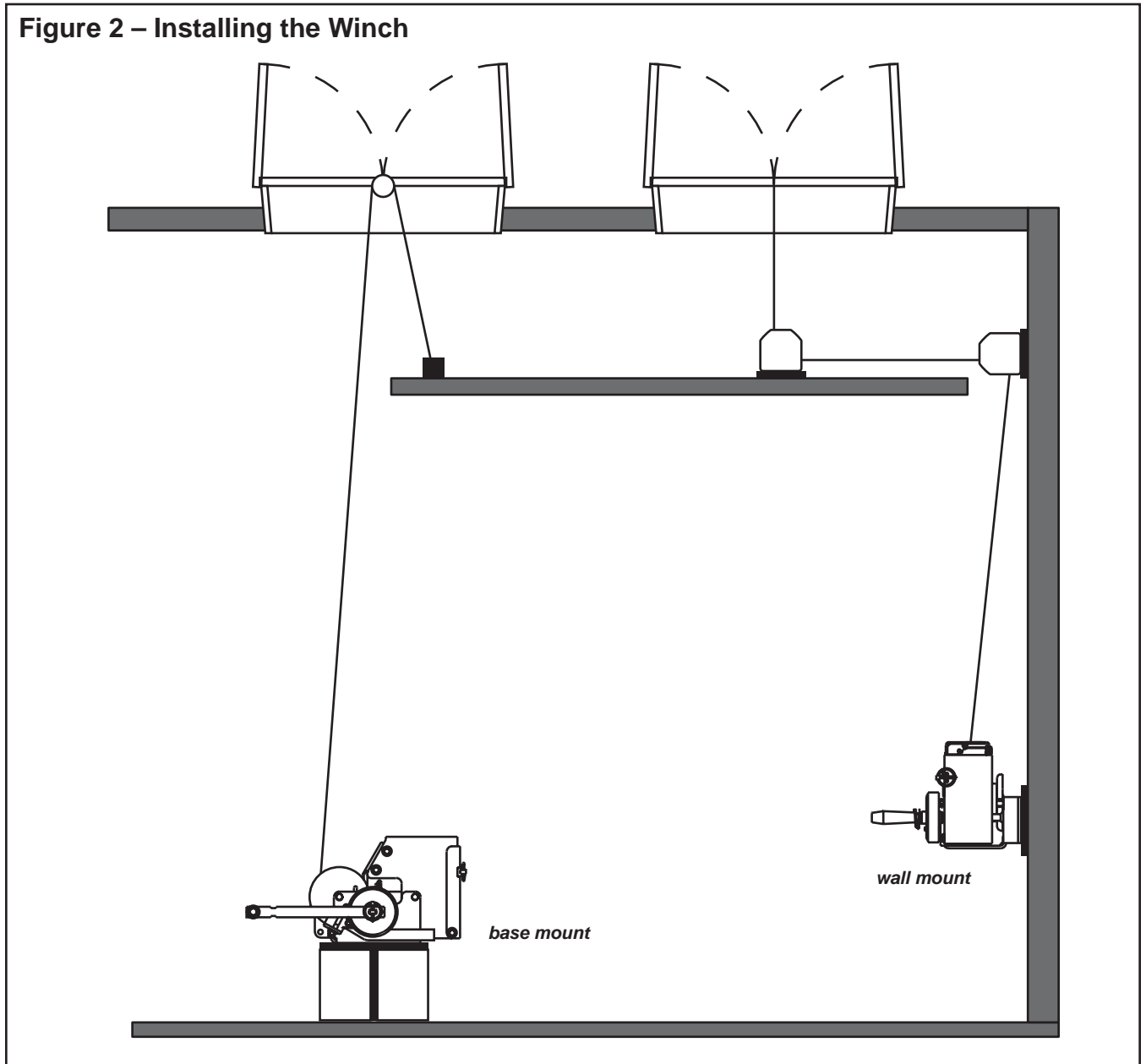


Figure 2 – Installing the Winch



1.2 Installing the Wire Rope

Important!

- Use wire rope and other rigging equipment rated for the size of the largest load you will be moving.
- Do not drag the wire rope through dirt or debris that could cause damage, or poor operation.
- Always wear protective clothing when handling wire rope.

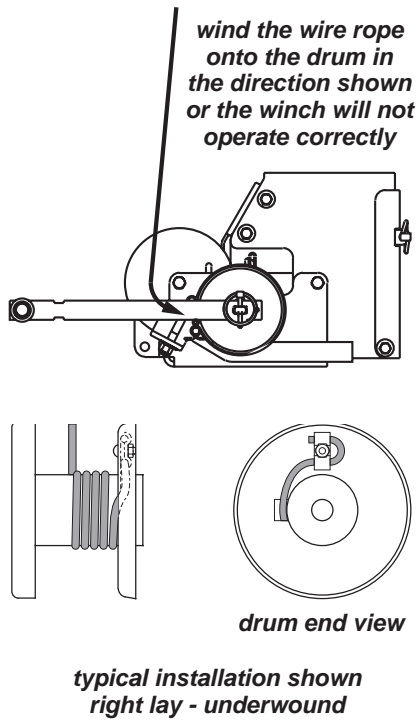
⚠WARNING

Install the wire rope so it is wound correctly as shown or the winch and brake will not work properly, and could allow the load to escape.

Install the wire rope securely to the winch drum. A poorly secured wire rope could come loose from its anchor and allow the load to escape.

- 1.2.1 PURCHASE THE PROPER WIRE ROPE for your application. Keep the following in mind when selecting a wire rope. Contact a reputable wire rope supplier for help.
 - a BREAKING STRENGTH of new wire rope should be at least 5 times greater than the largest load placed on the winch. This is a minimum value and will vary depending on installation and application conditions.
 - b WIRE ROPE LAY must agree with the winding direction of the drum to help insure proper winding.
 - c WE RECOMMEND 7 x 19 galvanized aircraft cable.
- 1.2.2 INSTALL THE WIRE ROPE using the flange clip anchor. See Figure 3.
 - a WIND THE END OF THE WIRE ROPE around the drum in the proper direction as shown, or the winch will not operate correctly.
 - b PULL THE END OF THE WIRE ROPE through the hole in the flange.
 - c INSERT THE CARRIAGE BOLT, loop the wire rope around the bolt, and install the clip so the wire rope is held by the curves of the clip.
 - d INSTALL THE JAM NUT and tighten it until the wire rope is flattened against the drum flange.
- 1.2.3 TURN THE HANDLE CLOCKWISE to wind wire rope onto the drum. If wire rope unwinds from the drum when the handle is rotated clockwise, the wire rope is installed incorrectly. **Install the wire rope correctly before continuing.**
- 1.2.4 WIND FOUR FULL WRAPS of wire rope onto the drum by operating the winch while holding the wire rope taught. **These wraps serve as anchor wraps. Keep the number of anchor wraps to a minimum. Excessive anchor wraps may recoil off the drum when the fire vent is released.**

Figure 3 – Flange Clip Anchor



2.1 General Theory of Operation

Important!

- Limit nonuniform winding by keeping tension on the wire rope and by maintaining the proper fleet angle.
- It is your responsibility to detect and account for different factors affecting the condition and performance of the equipment.

- 2.1.1 THE FORCE REQUIRED to seal the fire vent must not exceed the load rating of the winch.
- 2.1.2 THIS EQUIPMENT CAN develop forces that will exceed the load rating. Inspect the equipment regularly for damage according to the instructions contained in this manual.
- 2.1.3 PERFORMANCE RATINGS of the equipment are affected by the amount of wire rope wound on the drum and the way in which it is wound.
- a DRUM CAPACITY depends on how tightly and evenly the wire rope is wound on the drum. Actual drum capacities are usually 25-30% less than values shown in performance tables, due to loose winding and overlapping.
 - b HANDLE FORCE REQUIRED the load increases with each additional layer of wire rope wound onto the drum. Line speed also increases with each additional layer of wire rope wound onto the drum.
 - c LOAD RATING represents the maximum pull that can be placed on new equipment. Load ratings are assigned values for specific amounts of load travel or wire rope accumulation. The load rating decreases as layers of wire rope accumulate on the drum.
- 2.1.4 DUTY RATINGS refer to the type of use the equipment is subject to. Consider the following when determining duty rating.
- a ENVIRONMENT: harsh environments include hot, cold, dirty, wet, corrosive, or explosive surroundings. **Protect the equipment from harsh environments when possible.**
 - b MAINTENANCE: poor maintenance, meaning poor cleaning, lubrication, or inspection, leads to poor operation and possible damage of the equipment. **Minimize poor maintenance by carefully following the instructions contained in this manual.**
 - c LOADING: severe loading includes shock loading and moving loads that exceed the load rating of the equipment. **Avoid shock loads, and do not exceed the load rating of the equipment.**
 - d FREQUENCY OF OPERATION: frequent operation increases wear and shortens the life span of gears, bearings, and other components. **Increase maintenance of the equipment if used frequently.**

CONTACT THE FACTORY FOR MORE INFORMATION.

2.2 Preparing for Operation

Important!

- Obey a stop signal from anyone.
- Maintain tension on the wire rope to keep it tightly and evenly wound on the drum.
- If the fire vent is not visible during operation, get help from another person.
- Remove the winch handle when the winch is not in use, to help avoid unauthorized use.

- 2.2.1 CONSIDER THE OPERATION. Do not begin until you are sure you can perform the entire operation without hazard.
- 2.2.2 INSPECT ALL COMPONENTS of the system.
- a INSPECT THE WINCH and other equipment according to the Instructions for Frequent Inspection.
 - b OPERATORS must be in good health, alert, and thoroughly trained in operating the equipment, and properly clothed (no loose clothing, hard hat and safety glasses required).
 - c THE FIRE VENT must be clear of other objects and free to open.
- 2.2.3 KNOW YOUR LOAD and make sure you do not exceed the load rating of the winch or other equipment in the system.
- 2.2.4 REPLACE NYLON CABLE TIE with customer supplied fusible link. See item 49 on page 17.

2.3 Close and Set the Fire Vent

⚠WARNING

Handle may spin when released. Do not release handle unless fire event is held securely by ratchet or brake.

Make sure the ratchet is in the ratchet engaged position before adjusting the band brake.

- 2.3.1 ENGAGE THE RATCHET by moving the ratchet spring to the RATCHET ENGAGED position.
- 2.3.2 INSTALL THE HANDLE by sliding the handle onto the input shaft and securing it in place with the lynch pin.
- 2.3.3 CLOSE THE FIRE VENT by rotating the handle clockwise to wind wire rope onto the winch drum. If the wire rope unwinds from the drum when the handle is rotated clockwise, the wire rope is installed incorrectly. **Install the wire rope correctly before continuing.**
- 2.3.4 OBSERVE THE WIRE ROPE as it winds onto the drum. If it becomes loose, uneven, or overlapped, stop the operation and rewind the wire rope before continuing. **Continued operation with overlapped or uneven wire rope can damage the wire rope and shorten its life.**
- 2.3.5 INSTALL THE ETL (ELECTRO-THERMAL LINK) when the fire vent is fully closed and sealed. The ETL is installed between the guard cover and the spring inside the access panel.
- 2.3.6 ADJUST BRAKE TENSION by loosening or tightening the band brake adjusted nut. Adjust the band brake to create 4-4.318 inches of tension in the spring, measured from hook to hook.

- 2.3.7 DISENGAGE THE RATCHET by moving the ratchet spring to the RATCHET DISENGAGED position and turning the handle clockwise slowly until the ratchet disengages completely. **If you feel pressure in the handle, do not let it go. Do not let go of the handle until the fire vent is held securely by the band brake.**
- 2.3.8 READJUST BRAKE TENSION as necessary by repeating the above steps until the fire vent is held securely closed. **Always engage the ratchet before adjusting the band brake.**
- 2.3.9 REMOVE THE HANDLE and slide it into the slot in the guard for storage. **Make sure the ratchet is in the RATCHET DISENGAGED position.**

2.4 Testing the Fire Vent

⚠WARNING

Remove the handle before testing fire vent operation. The handle will spin if attached to the winch.

Keep away from the spinning drum and input shaft when fire vent is released during testing.

- 2.4.1 MAKE SURE THE HANDLE is removed from the winch or stored in the guard frame.
- 2.4.2 MAKE SURE THE RATCHET is in the RATCHET DISENGAGED position.
- 2.4.3 OPEN THE ACCESS PANEL on the back of the winch by removing the lynch pin and pulling the panel down.
- 2.4.4 RELEASE THE FIRE VENT by standing clear of the winch and pulling down on the test handle to release tension in the band brake. **Keep away from the spinning drum and input shaft during the test operation.**
- 2.4.5 VERIFY THE FIRE VENT OPENS FULLY when the test arm is pushed down and the brake is released. If the fire vent fails to open, engage the ratchet and loosen the band brake by turning the adjusting nut counterclockwise 1/4 turn. Continue to adjust the brake until the fire vent springs open properly when the brake is released with the test arm.
- 2.4.6 RESET THE FIRE VENT by following the instructions to CLOSE and SET the fire vent.

3.1 Cleaning the Winch

Important!

Increase the frequency of maintenance procedures if the winch is:

- Operated frequently.
- Used to move heavy loads.
- Operated in wet, dirty, hot, or cold surroundings.

Clean the winch to remove dirt and help prevent rust and corrosion.

- 3.1.1 CLEAN THE WINCH every 6 months or whenever it is dirty.
- a WIPE ALL EQUIPMENT to remove dirt and grease.
 - b LEAVE A LIGHT FILM of oil on all surfaces to protect them against rust and corrosion.
 - c WIPE OFF excessive amounts of oil to avoid the accumulation of dirt.
- 3.1.2 REMOVE ALL UNNECESSARY OBJECTS from the area surrounding the winch.

3.2 Lubricating the Winch

Important!

- Make sure lubricant has a temperature rating appropriate for the ambient temperatures of the operation.

- 3.2.1 CONSULT MANUFACTURER'S RECOMMENDATIONS for specific information on lubricating the wire rope and other equipment.
- 3.2.2 LUBRICATE WINCH BEARINGS AND SHAFTS at least every 6 months.
- a APPLY 2 TO 3 DROPS of SAE 30 non-detergent oil to bearings and shafts at all friction points.
 - b ROTATE THE DRUM several times to allow the oil to penetrate, and wipe off excess oil to avoid accumulation of dirt.
- 3.2.3 LUBRICATE WINCH GEARS at least every 10 hours of operation.
- a APPLY A LIGHT FILM of open gear lubricant to the gear teeth on all gears.
 - b USE SPRAYON 201 or equivalent open gear lube. For dirty conditions use a dry lubricant such as dry graphite or Moly.
- 3.2.4 LUBRICATE THE WIRE ROPE by following the wire rope manufacturer's recommendations.

3.3 Inspecting the Equipment

Important!

- Start an inspection program as soon as you put the winch into use.
- Appoint a qualified person to be responsible for regularly inspecting the equipment.
- Keep written records of inspection. This allows comparison with comments from previous inspections so you can see changes in condition or performance.

⚠WARNING

Do not use damaged or malfunctioning equipment. Place an “OUT OF ORDER” sign on the winch. Do not use the winch until the sign is removed by a qualified maintenance person who has completely corrected the problem.

3.4.1 CONSULT APPLICABLE CODES AND REGULATIONS for specific rules on inspecting the winch and other equipment.

3.4.2 CONSULT MANUFACTURER’S RECOMMENDATIONS for information on inspecting the wire rope and other equipment.

3.4.3 Instructions for Frequent Inspection

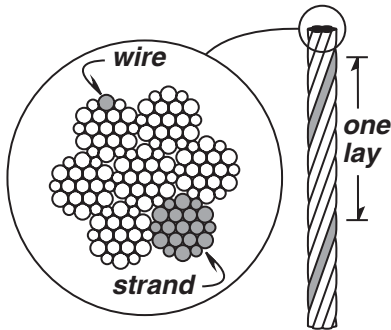
- a VISUALLY INSPECT the entire winch and all other equipment involved in the operation.
 - Check all equipment for cracks, dents, bending, rust, wear, corrosion and other damage.
 - Make sure the wire rope is installed correctly and anchored securely to the drum.
 - Make sure the winch is properly lubricated.
 - Make sure mounting fasteners are tightened securely.
 - Make sure the foundation is in good condition, and capable of supporting the winch under all load conditions.
 - Listen for unusual noises, and look for signs of damage as you operate the winch.

Completely correct all problems before continuing. Use the Troubleshooting Chart to help determine the cause of certain problems. See Table 2.

Perform periodic inspections:

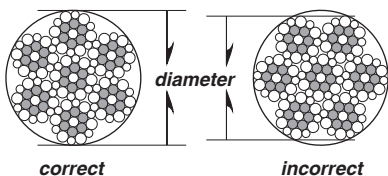
- Every 6 months.
- Whenever you return the winch to service from storage.
- Whenever you notice damage or poor operation in a frequent inspection.
- Whenever you have, or think you may have, overloaded or shock loaded the winch.

Figure 4 – Broken Wires



Wire rope assembly must be replaced if more than 6 wires are broken in one lay, or if more than 3 wires are broken in one strand in one lay.

Figure 5 – Rope Diameter



The wire rope assembly must be replaced if the diameter measures less than the minimum diameter at any point.

wire rope diameter	minimum diameter
1/8 in	7/64 in (.1094 in)
3/16 in	11/64 in (.1719 in)
1/4 in	15/64 in (.2344 in)

3.4.4 Instructions for Periodic Inspection

- a OPEN THE FIRE VENT to release tension from the winch and wire rope by following the procedure for testing the fire vent.
- b VISUALLY INSPECT the winch and all other equipment.
 - Check the finish for wear, flaking, or other damage.
 - Check all equipment for cracks, dents, bending, rust, wear, corrosion and other damage. If the winch was overloaded, or if you notice cracks or other signs of overloading and damage, consider using magnetic or chemical crack detecting procedures. **DO NOT CONTINUE TO USE DAMAGED OR OVERLOADED EQUIPMENT OR WIRE ROPE.**
 - Check all fasteners for stripped threads, wear, bending, and other damage.
 - Check the foundation for cracks, corrosion or other damage.
 - Make sure the winch is lubricated properly.
 - Make sure all labels and plates are readable, firmly attached, free of damage and clean. Replacements are available from the factory.
 - Check the entire length of wire rope for bent wires, crushed areas, broken or cut wires, corrosion, and other damage. Carefully inspect areas that pass over sheaves or through roller guides.
 - Note the location and concentration of broken wires. Replace wire rope if more than 6 wires are broken in one lay, or more than 3 wires are broken in one strand in one lay. See Figure 4.
 - Make sure connecting devices are securely attached to the wire rope, and the wire rope where they are attached is not frayed, corroded, broken, or otherwise damaged.
 - Make sure the wire rope is securely anchored to the drum and inspect the flange clip for signs of wear or distortion.
 - Make sure the ratchet engages and disengages completely.
 - Measure the diameter of the wire rope, especially in areas where wear is noticeable. Replace the wire rope if the diameter measures below the minimum diameter at any point. See Figure 5.
 - Check for excessive drum movement indicating worn or loose gears, bearings, or shafts.
 - Disassemble the winch if necessary. Inspect gears, bearings, spring pins, and shafts for wear, corrosion, distortion, and other damage.
- c MONITOR WINCH PERFORMANCE as winch is operated.
 - Listen for unusual noises, and look for signs of damage as you operate the winch.
 - Make sure the wire rope winds evenly and tightly onto the drum. If it is loose or uneven, rewind it before continuing.
 - Observe the rotating drum; look for signs of loose or misaligned bearings.

Completely correct all problems before continuing. Use the troubleshooting chart to help determine the cause of certain problems. See Table 2.

Table 1 – Inspection Checklist		<i>checked boxes indicate damage or problem in need of repair</i>	
	damages		problems
general	<input type="checkbox"/> finish weathered, flaking, otherwise damaged	<input type="checkbox"/>	winch jerks or hesitates during operation
	<input type="checkbox"/> parts cracked, bent, rusted, worn, otherwise damaged	<input type="checkbox"/>	unusual noises, other signs of malfunction
fasteners	<input type="checkbox"/> stripped threads, bent, worn, otherwise damaged	<input type="checkbox"/>	loose, not tightened to the proper torque
gears	<input type="checkbox"/> excessively worn, cracked, corroded, otherwise damaged	<input type="checkbox"/>	loose or improperly lubricated
brake	<input type="checkbox"/> brake corroded, cracked, worn, otherwise damaged	<input type="checkbox"/>	brake does not operate properly
drum	<input type="checkbox"/> anchor hole worn, distorted, otherwise damaged	<input type="checkbox"/>	excessive movement or backlash
wire rope	<input type="checkbox"/> bent, crushed, otherwise damaged	<input type="checkbox"/>	wire rope loosely or unevenly wound
	<input type="checkbox"/> broken wires, see Figure 4 replace if more than 6 wires in one lay, or 3 wires in one strand in one lay, are broken		number per strand = number per lay =
	<input type="checkbox"/> diameter reduced, see Figure 5 replace if diameter is excessively worn		diameter =
end connections	<input type="checkbox"/> corroded, rusted, worn, otherwise damaged	<input type="checkbox"/>	not securely attached
labels and plates	<input type="checkbox"/> dirty, illegible, otherwise damaged	<input type="checkbox"/>	loosely attached or missing
comments	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>		
authorized signature	_____		date _____

Table 2 – Troubleshooting Chart		
<p>Contact the factory for detailed instructions on re-sealing the gearbox if you are required to disassemble the gearbox for any reason. Disassembly of the gearbox before contacting Thern, Inc. voids all warranties.</p>		
problem	cause	correction
handle turns, drum doesn't turn	<ul style="list-style-type: none"> • loose or broken spring pins or shafts • loose, stripped or broken gears or keys 	inspect winch and repair as necessary inspect gears and repair as necessary
handle turns hard or not at all	<ul style="list-style-type: none"> • spring pins loose or broken on winch • brake band too tight or locked • gears or bearings broken or locked 	inspect winch and repair as necessary inspect brake, adjust or repair as necessary inspect and repair as necessary
brake does not operate properly	<ul style="list-style-type: none"> • brake worn or damaged • brake hub damaged or broken 	inspect and replace as necessary inspect and repair as necessary
excessively worn gears or bearings	<ul style="list-style-type: none"> • excessive overloading • poor lubrication of gears or bearings 	inspect installation and correct as necessary inspect and lubricate as necessary
overheating	<ul style="list-style-type: none"> • operated too long without rest • poor lubrication • bearing seized up 	allow to cool inspect and lubricate as necessary inspect and replace as necessary
unusual noises		
high pitched squeak	• poor lubrication	inspect and lubricate as necessary
grinding noise	• contaminated lubrication	drain, clean and lubricate the winch
	• dirt in winch gears	inspect and clean as necessary
	• broken gears or bearings	inspect and replace as necessary
rattling noise	• loose bolts, set screws or other fasteners	tighten all bolts and other fasteners

3.4 Repairing the Winch

Important!

- It is your responsibility to determine when to replace parts. When considering whether to continue using a part or to replace it, remember that replacing it is the best way to avoid further equipment damage.
- Replace spring pins and retaining rings when you disassemble the winch for repair or replacement.
- Appoint a qualified person to be responsible for all repairs to the equipment.

- 3.4.1 GET FACTORY AUTHORIZATION for all repairs. Unauthorized repairs will void the warranty, and may lead to damage or failure of the winch.
- 3.4.2 REPLACE DAMAGED OR POORLY OPERATING PARTS with Thern repair parts.
- 3.4.3 REFINISH AREAS where the paint is worn or flaking. A good finish helps to protect against corrosion and environmental damage.
- a REMOVE THE FINISH from damaged areas, down to the bare metal.
 - b CLEAN THE AREA thoroughly.
 - c REPAINT with a high quality primer and finishing coat.
- 3.4.4 TO ORDER REPAIR PARTS, contact your local dealer. Include the following information when ordering:
- model number
 - **serial number** (or code number)
 - part number
 - date purchased, and from whom
 - description of what happened, or what is wrong
 - your name and return address

4.1 Transporting the Winch

Important!

- Keep a record of what you ship, and when you send it.

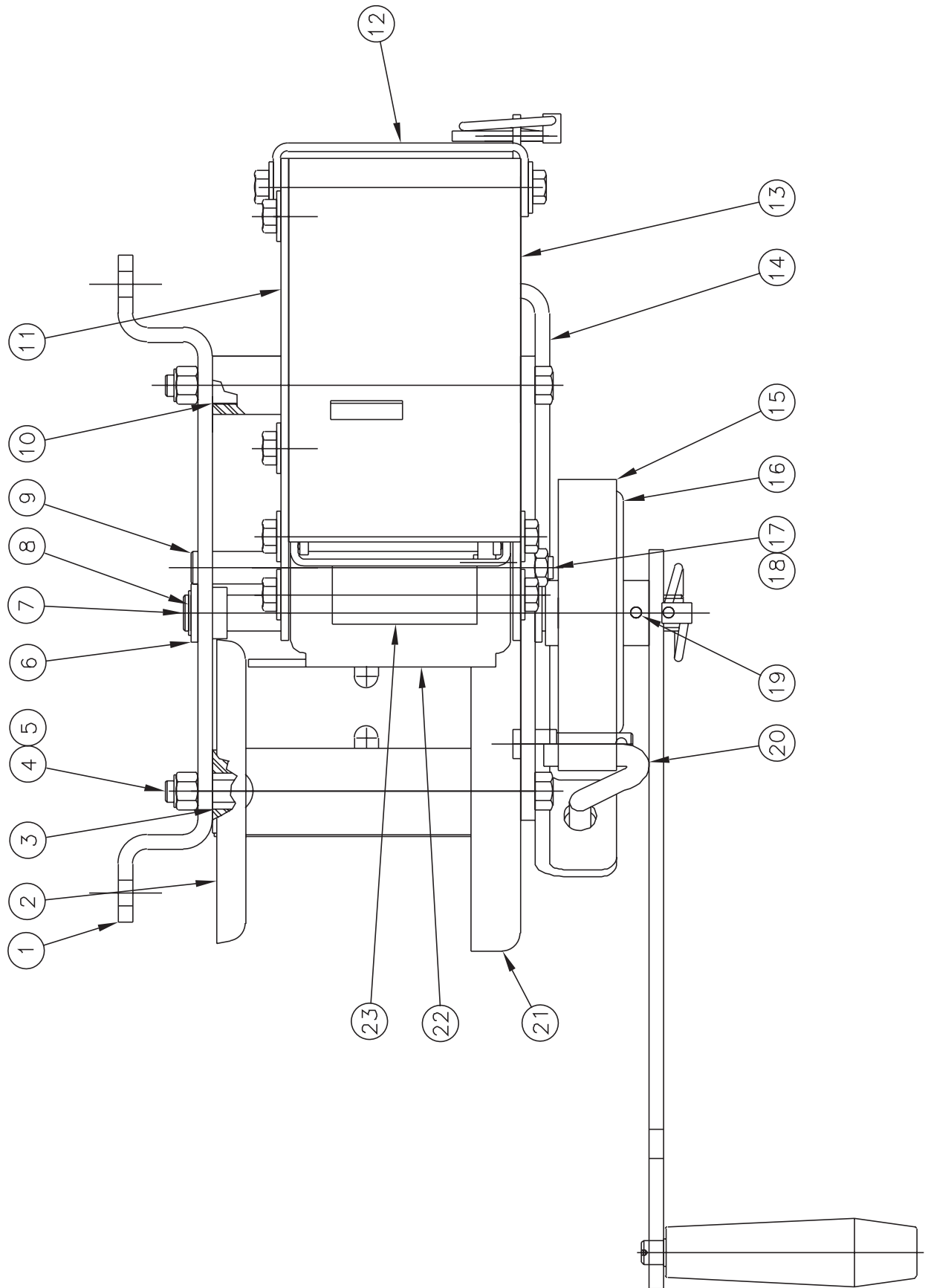
- 4.1.1 REMOVE THE BREATHER PLUG(S) and install a sealed oil plug(s) to prevent the loss of lubrication during shipment.
- 4.1.2 PACK THE WINCH in an upright position for transport, using the original packaging materials, if possible.
 - a FASTEN THE WINCH to a wooden base using lag bolts, to keep it from moving during transport.
 - b SEAL THE WINCH in plastic with a desiccant to help protect it from rust, corrosion, and other damage.
 - c CONSTRUCT WOODEN SIDES and top to enclose the winch in a solid protective crate.
 - d PACK LOOSE PARTS in small boxes or ship separately.
- 4.1.3 INSPECT THE WINCH according to the Instructions for Periodic Inspection before installing it in a new location.

4.2 Storing the Winch

- 4.2.1 LUBRICATE THE WINCH as necessary, and make sure the breather plug(s) is clean and properly installed. Add a rust preventative for long term storage.
- 4.2.2 SEAL THE WINCH in plastic with a desiccant to help protect it from rust, corrosion, and other damage.
- 4.2.3 STORE THE WINCH upright, in a cool clean place away from corrosive chemicals and moisture.
- 4.2.4 ROTATE THE DRUM PERIODICALLY to keep bearing and gear surfaces from becoming lacquered.
- 4.2.5 INSPECT THE WINCH according to the Instructions for Periodic Inspection before installing it for operation.
- 4.2.6 LUBRICATE THE WINCH PROPERLY prior to operation. See Section 3.3 Lubricating the Winch.

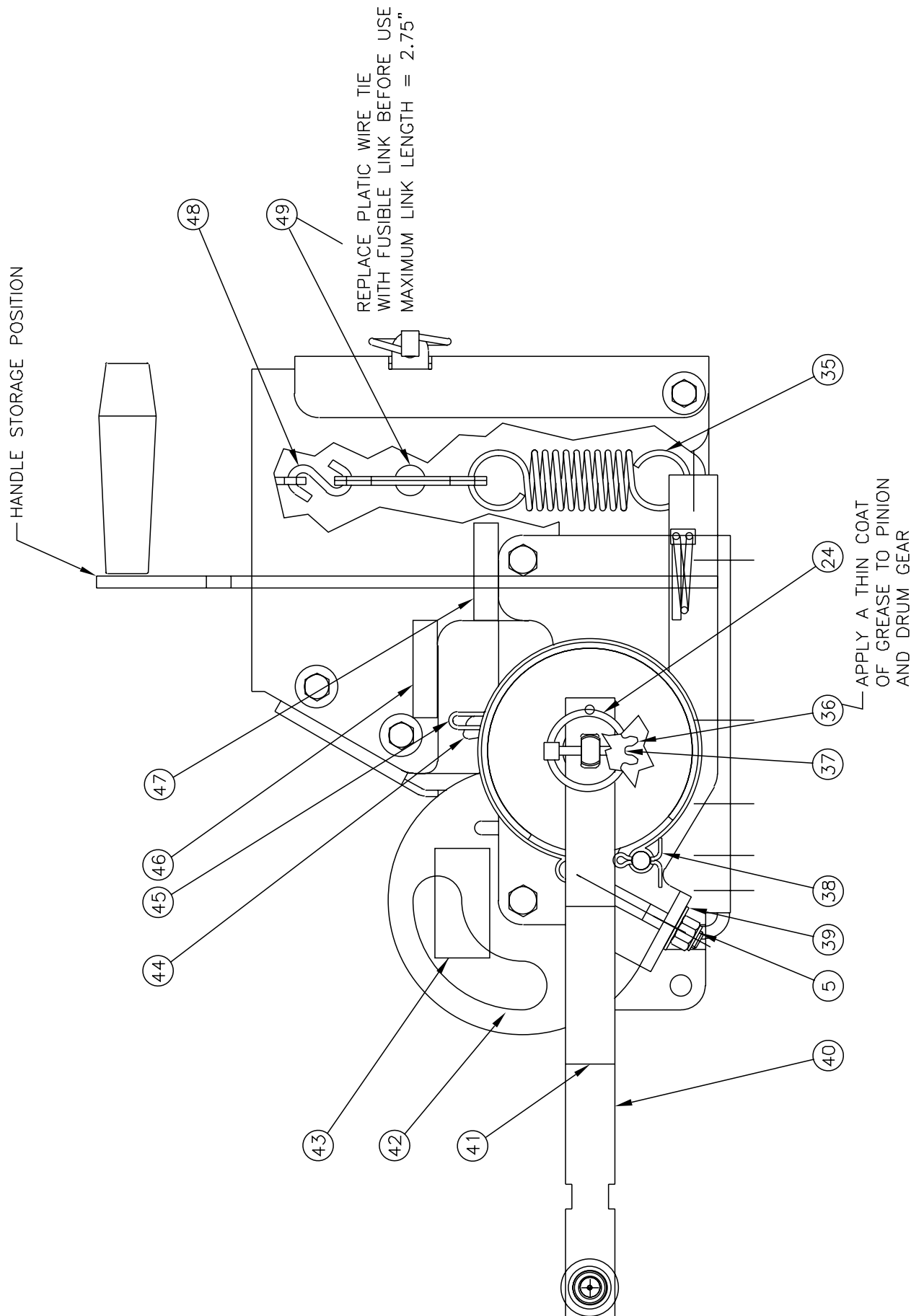
Model FVC-1000 Winches

item	description	part number	qty.
1	FRAME WELDMENT	SC4003	1
2	DRUM ASSEMBLY	B2365BLK	1
3	DRUM SPACER	A1145	1
4	CAPSCR HEXHD .375 X 6.500	A5039	2
5	HEX NUT .375	A3113	3
6	FLANGE BEARING	A1003	2
7	COUNTER SHAFT	SA5786	1
8	RETAINING RING .625	A4136	1
9	RATCHET PIN	SA5785	1
10	FRAME SPACER	SC5784	1
11	GUARD BACK	SC4074	1
12	GUARD DOOR	SC4075	1
13	GUARD FRONT	SD3768	1
14	BRAKE HANDLE	SC4072	1
15	BRAKE BAND	SB5543	1
16	BRAKE DRUM WELDMENT	SB5544	1
17	HEX JAM NUT .375	A3330	1
18	WASHER .375	A3939	1
19	GROOVE PIN .188 X 1.125	A4524	1
20	HOOK BOLT	A7956	1
21	GEAR GUARD	B1066BLK	1
22	GUARD SPACER	SC4073	1
23	WARNING LABEL HANDS AWAY	A2659	1
24	LYNCH PIN .188 X 1.562	A7693	2
25	FLT WASHER .312	A2924	12
26	HXHEAD CAPSCREW .312 X .750	A3032	6
27	TIE DOWN	A1013	1
28	HEX NUT .250SST	A3331	1
29	CARIGBOLT .250 X .500 SST	A3333	1
30	HXHEAD CAPSCREW .312 X .100	A3028	2
31	HEX NUT NYLK .312	A2927	2
32	WARNING LABEL	A8019	1
33	WARNING LABEL REMOVE HANDLE	A8026	1
34	MODEL / OPERATING LABEL	A8017	1
35	EXTENSION SPRING	A7913	1
36	PINION	A1008	1
37	GROOVE PIN .188 X 1.375	A4851	1
38	COTTER PIN .156 X 1.00	A3059	1
39	FLAT WASHER .375	A3114	1
40	HANDLE ASSEMBLY	B4187	1
41	WARNING LABEL HANDLE	A8025	1
42	WINDING DIRECTION LABEL	A8029	1
43	WARNING LABEL ADJUST BRAKE	A8024	1
44	RATCHET PAWL	A1047	1
45	TORSIONAL SPRING	B1145	1
46	LABEL DISENGAGED	A8028	1
47	LABEL ENGAGED	A8027	1
48	S-HOOK 1.00 X .162	A7975	1
49	FUSIBLE LINK (SUPPLIED BY CUSTOMER)	-	1
50	SPACER	A8111	1



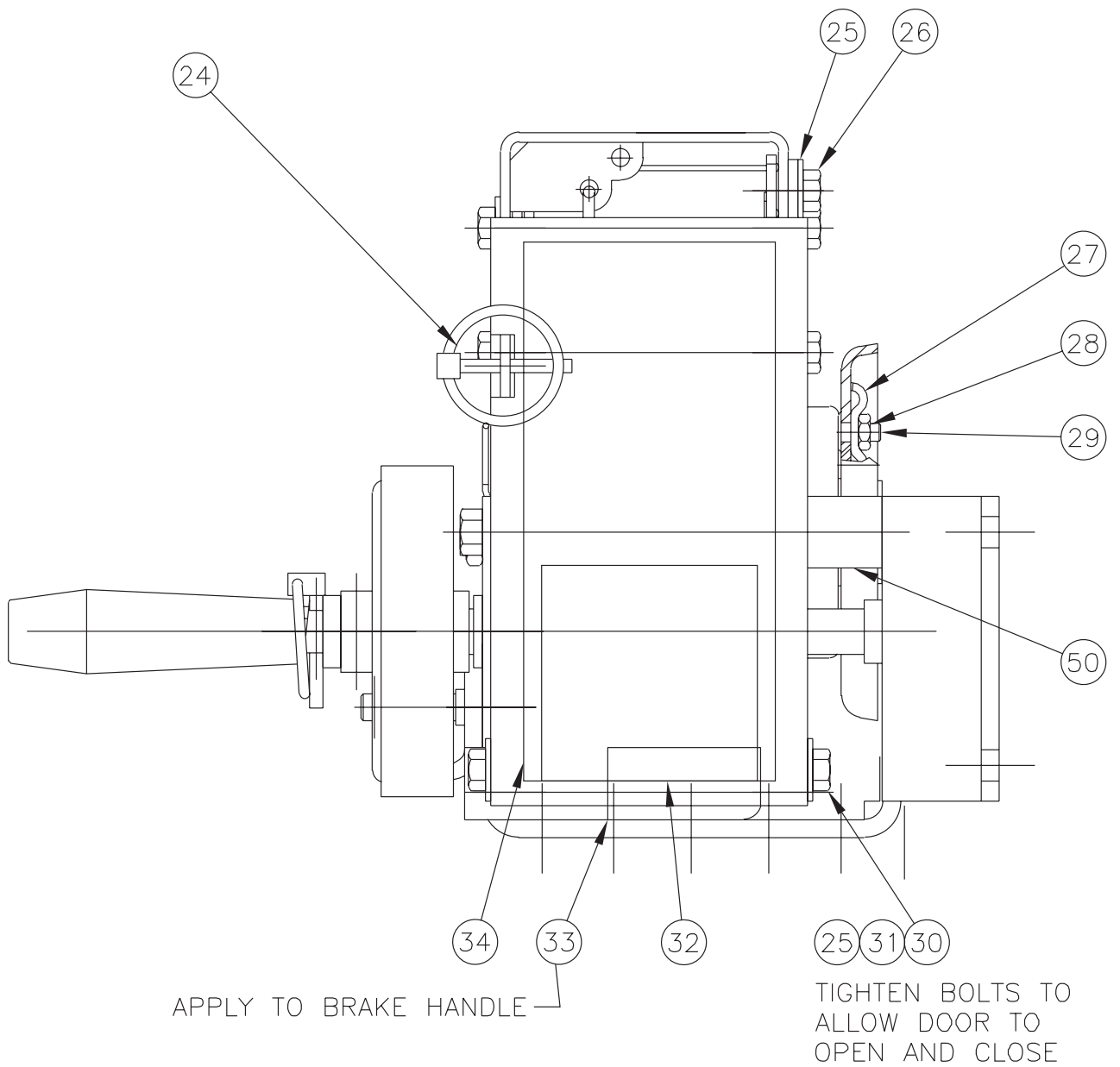
Model FVC-1000 Winches

item	description	part number	qty.
1	FRAME WELDMENT	SC4003	1
2	DRUM ASSEMBLY	B2365BLK	1
3	DRUM SPACER	A1145	1
4	CAPSCR HEXHD .375 X 6.500	A5039	2
5	HEX NUT .375	A3113	3
6	FLANGE BEARING	A1003	2
7	COUNTER SHAFT	SA5786	1
8	RETAINING RING .625	A4136	1
9	RATCHET PIN	SA5785	1
10	FRAME SPACER	SC5784	1
11	GUARD BACK	SC4074	1
12	GUARD DOOR	SC4075	1
13	GUARD FRONT	SD3768	1
14	BRAKE HANDLE	SC4072	1
15	BRAKE BAND	SB5543	1
16	BRAKE DRUM WELDMENT	SB5544	1
17	HEX JAM NUT .375	A3330	1
18	WASHER .375	A3939	1
19	GROOVE PIN .188 X 1.125	A4524	1
20	HOOK BOLT	A7956	1
21	GEAR GUARD	B1066BLK	1
22	GUARD SPACER	SC4073	1
23	WARNING LABEL HANDS AWAY	A2659	1
24	LYNCH PIN .188 X 1.562	A7693	2
25	FLT WASHER .312	A2924	12
26	HXHEAD CAPSCREW .312 X .750	A3032	6
27	TIE DOWN	A1013	1
28	HEX NUT .250SST	A3331	1
29	CARIGBOLT .250 X .500 SST	A3333	1
30	HXHEAD CAPSCREW .312 X .100	A3028	2
31	HEX NUT NYLK .312	A2927	2
32	WARNING LABEL	A8019	1
33	WARNING LABEL REMOVE HANDLE	A8026	1
34	MODEL / OPERATING LABEL	A8017	1
35	EXTENSION SPRING	A7913	1
36	PINION	A1008	1
37	GROOVE PIN .188 X 1.375	A4851	1
38	COTTER PIN .156 X 1.00	A3059	1
39	FLAT WASHER .375	A3114	1
40	HANDLE ASSEMBLY	B4187	1
41	WARNING LABEL HANDLE	A8025	1
42	WINDING DIRECTION LABEL	A8029	1
43	WARNING LABEL ADJUST BRAKE	A8024	1
44	RATCHET PAWL	A1047	1
45	TORSIONAL SPRING	B1145	1
46	LABEL DISENGAGED	A8028	1
47	LABEL ENGAGED	A8027	1
48	S-HOOK 1.00 X .162	A7975	1
49	FUSIBLE LINK (SUPPLIED BY CUSTOMER)	-	1
50	SPACER	A8111	1



Model FVC-1000 Winches

item	description	part number	qty.
1	FRAME WELDMENT	SC4003	1
2	DRUM ASSEMBLY	B2365BLK	1
3	DRUM SPACER	A1145	1
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5	HEX NUT .375	A3113	3
6	FLANGE BEARING	A1003	2
7	COUNTER SHAFT	SA5786	1
8	RETAINING RING .625	A4136	1
9	RATCHET PIN	SA5785	1
10	FRAME SPACER	SC5784	1
11	GUARD BACK	SC4074	1
12	GUARD DOOR	SC4075	1
13	GUARD FRONT	SD3768	1
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50	SPACER	A8111	1



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