

NABRICO

DF-3 Manual Winch Owner's Manual

OM-DF3-001-G

NABRICO

Owner's Manual Manual Upright Winch MODEL # DF-3

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IMPORTANT!

Prior to installing and operating the winch, please read this manual thoroughly and carefully. Keep this manual and all other instructions accessible at all times.

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 for the equipment owner's intended use.

Although this manual will help you become familiar with the basic operation of the winch, it is by no means a substitute for proper training by your company in the safe use of winches, barge rigging and other marine equipment. This manual suggests methods of operation, but ultimately, the owners and operators of the equipment are responsible for determining whether a particular method of operation is safe and appropriate for the equipment being operated. Only individuals trained in the proper use of winches, barge rigging and other marine equipment should operate these winches.

The typical operating environment of barge and towboat winches often includes very high forces, and the potential hazards associated with these high forces should not be underestimated. Improper installation or incorrect or unsafe use could result in injury or death to persons or cause equipment failure or damage.

Suggested Information for Safe Operation:

- DO NOT apply tension to the winch unless there are at least three complete wraps of rope on the drum.
- DO NOT operate the winch unless you have a firm stance on a non-slippery surface.
- DO NOT wrap the wire rope around the load. This will damage the wire rope and could cause the load to escape. The use of rigging connectors to secure the wire rope to the load is strongly recommended.
- Keep fingers, loose clothing and any foreign objects away while operating the winch.
- DO NOT divert attention away while operating the equipment. Stay alert to the possibility of accidents and try to prevent them from happening.
- During operation of the winch, always remain to the side of the winch while in operation.
- Never operate the winch from the front or when bystanders are in front of it.
- Operators and bystanders should stay clear of any load and the wire rope while the winch is operating.
- Avoid shock loads by starting and stopping the equipment smoothly. Shock loads can over load the equipment which may cause damage.
- Under no circumstances, should any winch be used to move, raise or lower a person(s) or equipment.

Inspect the winch carefully at least once a month for loose fasteners, worn gears and pawls, cracked welds, and other damaged parts. If any worn, cracked or damaged parts are found, stop use immediately and remove winch from service until all appropriate repairs are completely made.



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DF-3 Hand Winch Features & Specifications

- Revolutionary new high load release dog system.
- High load release brake with secondary anti-backlash drag brake that is activated automatically with the release of the dog.
- High load release brake is a multi-disc system that incorporates all stainless steel moving parts.
- Fastest acting and most powerful brake available.
- 4 bolt hub removable handwheel.
- New simpler heavy duty ratchet assembly with no springs or levers.
- Totally enclosed drive train with the smallest deck foot print in the industry.
- Minimal maintenance.
- Easy to repair.
- All stainless steel and silicon bronze fasteners including separator rods.
- 3-ply conveyor belt covers (damage and corrosion-resistant).
- Saltwater package standard with 3-step paint system.
- Galvanized coating available.
- Heaviest winch in its class.
- True right and left hand models for use in pairs.

MODEL	MOUNT	HOLDING DOG & OR BRAKE	LINE PULL @ FIRST LAYER		DRUM CAPACITIES (FT.)				WEIGHT	DIMENSIONAL DATA		
			HANDWHEEL ONE MAN	RATCHET W/ STANDARD EXTENSION ONE MAN	5/8	3/4	7/8	1		W	L	H
DF-3-20/30	RIGHT OR LEFT	30 TONS	14000	14000	233	141	123	67	1109	18 5/8	22	35 1/2
DF-3-40	RIGHT OR LEFT	40 TONS	14000	14000	285	173	150	83	1567	19 1/2	23 1/4	43 1/2

1.1 INSTALLATION OF WINCH

NOTICE

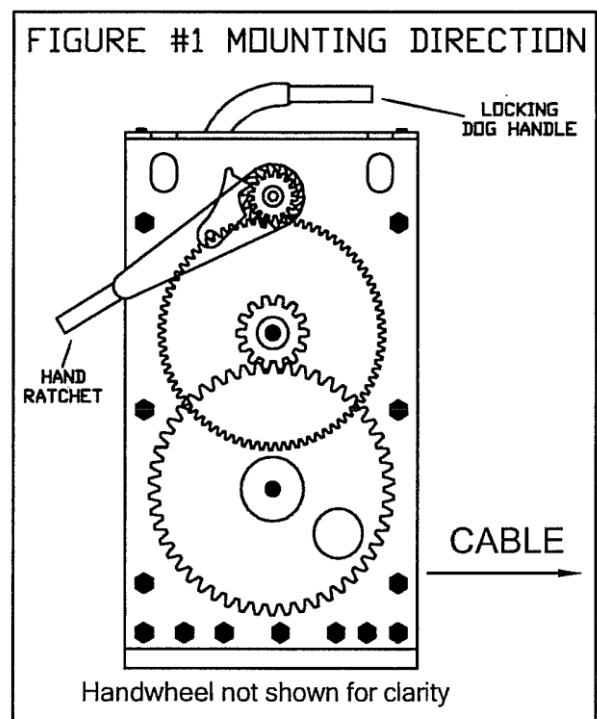
It is the responsibility of the customer, not the winch manufacturer, to properly locate and install the winch with regard to the safety of those operating the machinery.

CAUTION

Install the winch in an area where there is ample room to operate the unit without the operator becoming entangled in the cable, lines, chains, winch mechanisms, or other nearby equipment.

- 1.1.1 All winches must be installed on a flat, rigid, and non-slippery surface. Deck and structure must be strong enough to withstand the weight and holding capacity of the winch, and the forces likely to occur during operation. A qualified and trained professional should inspect or design the foundation to insure that it will provide adequate support.
 - 1.1.2 Locate the winch in a suitable area free of traffic and obstacles. The winch should also be visible during entire operation. The winch needs to be accessible for proper lubrication, maintenance, and operation at all times.
 - 1.1.3 Mounting direction must be in line with the desired direction of cable pull. The front of the winch must face in the direction from which the cable is reeled (see fig. 1). The winch drum, when properly used, will reel the wire rope onto the bottom of the drum.
- If the direction of the wire rope is not indicated on the winch, determine as follows:

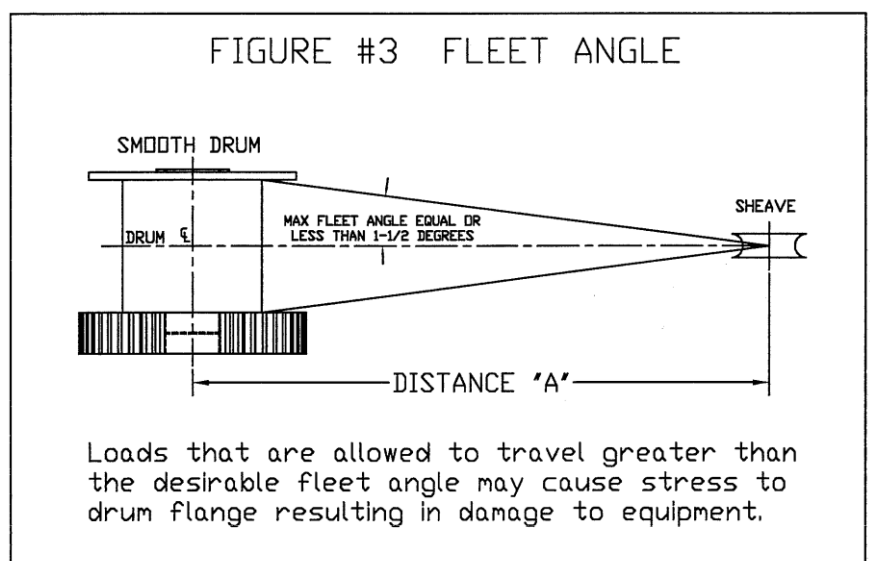
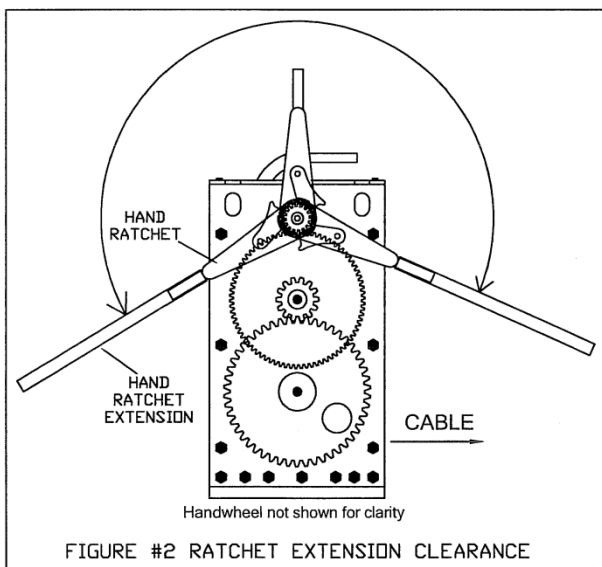
Engage the locking dog and disengage the rake system. Rotate the winch drum using either the hand wheel or hand ratchet. The only direction allowed for the drum to rotate is the reeling in of the wire rope which should be spooling onto the drum from the bottom.



- 1.1.4** Check to ensure that there is enough clearance between winch drum and mounting surface. Check to make sure there is enough clearance for proper operation of the hand ratchet and ratchet extension. With the ratchet extension on the hand ratchet, rotate the handle back and forth checking for clearance issues (see fig. 2).
- 1.1.5** Maintain a fleet angle no greater than 1-1/2 degrees from winch drum to lead sheave (see fig. 3). The proper fleet helps to minimize wire rope damage by assisting the wire rope to wind uniformly onto the drum.
- 1.1.6** Using sufficient tack welds, secure the base bars to the deck or doubler plate. This will prevent the winch from becoming misaligned from heat distortion during the application of the seal weld.
- 1.1.7** Next apply a seal weld to the base bars to permanently secure the winch. The seal weld will prevent corrosion from occurring between the winch and mounting surface.
- 1.1.8** Inspect the winch immediately following installation. This inspection will give a good starting record of the winch condition so that future inspections can be compared.

CAUTION

Remember that the weld has to be strong enough to withstand loads equal to or greater than the capacity of the winch.



1.2 INSTALLATION OF WIRE ROPE

(Refer to the operation section of this manual if unclear on how to operate the winch.)

- 1.2.1 To install wire rope, rotate the drum of the winch so that the U-bolt nuts are easily accessed through the round cut out located on the side of the winch (see fig. 4a).
- 1.2.2 Using a standard socket wrench with an extension, loosen the nuts.
- 1.2.3 If installing wire rope on a new winch, remove and discard the u-bolt spacer pipe. If replacing worn out wire rope, remove the wire rope from the U-bolt and dispose of properly.

CAUTION

Remember to always wear the proper protective equipment when handling the wire rope.

- 1.2.4 Insert the new wire rope end under the winch drum and through the U-bolt from the front of the winch so that approximately 3 to 4 inches extend through the U-bolt (see fig. 4b).

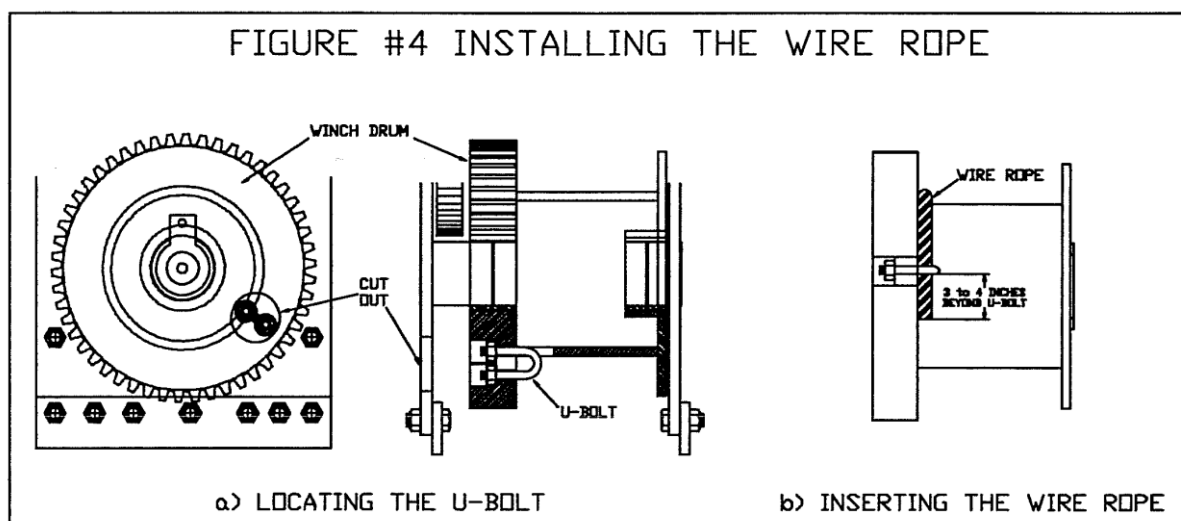
NOTICE

Breaking strength of new wire rope should be a least 3 times greater than the largest load placed on the winch. This minimum value may be greater depending on type of load and the method of moving the load.

- 1.2.5 Tighten the U-bolt nuts evenly to secure the wire rope to the winch drum. The U-bolt will act as a vice keeping the wire rope in place as the rest of the rope is reeled onto the winch.

CAUTION

The U-bolt nuts must be retightened periodically to insure that the wire rope end is held in place snugly against the drum flange. Over time and usage the rope will "crush" down at the U-bolt creating the possibility that the rope end will escape.



- 1.2.6 Wind the wire rope onto the drum by operating the winch. Maintain tension on the wire rope to insure that the first coil lays snugly against the drum flange and each successive coil is snug against the previous coil. Make sure that the wire rope is being reeled in from the bottom on the winch drum.
- 1.2.7 Continue wrapping the wire rope until there are at least 3 to 4 complete wraps on the winch drum. These wraps serve as an anchor and must remain on the drum at all times.

WARNING
In order for the winch to attain its full holding capacity, 3 to 4 complete wraps of the wire rope must be on the winch drum at all times. Also, make sure the rope is installed securely to the drum. A poorly secured wire rope could come loose from its anchor and allow the load to escape.

NOTICE
Drum capacity depends on how tightly and evenly the wire rope is wound on the drum. Actual drum capacities are usually 25% to 30% less than values given in performance tables when the wire rope is loosely wound and overlapping. Also, line speed will increase with each additional layer of wire rope that is wound onto the drum.

2.1 OPERATING THE WINCH

The DF-3 Manual Upright Winch is operated by using either the hand wheel or hand ratchet system. The winch is also equipped with a disc braking system, locking dog and anti-backlash friction band. The following operating instructions will help you become familiar with these basic operating components of the winch. These instructions are not a substitute for proper training by your company in the safe use of winches, barge rigging, and other marine equipment.

2.1.1 Hand Wheel Operation

- 2.1.1.1 Normally the winch is shipped with the handwheel not mounted to the winch. Upon receiving the winch, attach the handwheel to the handwheel hub using the 4 bolts and lock washers that are included. Refer to the parts breakdown drawings located in the appendix for location of the winch components.
- 2.1.1.2 After installing the handwheel, use it to turn the winch drum in either a clockwise or counter-clockwise motion. The drum rotation, which is the same as the handwheel rotation, will spool wire rope onto or off the bottom of the winch drum. If the winch drum will not rotate freely refer to operation instructions for the brake and dog systems to ensure that nothing is locked down.

WARNING

Do not use the handwheel as a brake or anchor for a load.
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- 2.1.1.3 The handwheel assembly is equipped with a speed handle that can be used for faster operation.
- 2.1.1.4 When operating the winch, always maintain tension on the wire rope to keep it tightly and evenly wound on the winch drum.

NOTICE

Breaking-in of the winch occurs during the first 10 hours of normal operation. During break-in, mating surfaces become polished and clearances increase. This is desired for efficient operation of the bearings and gears.
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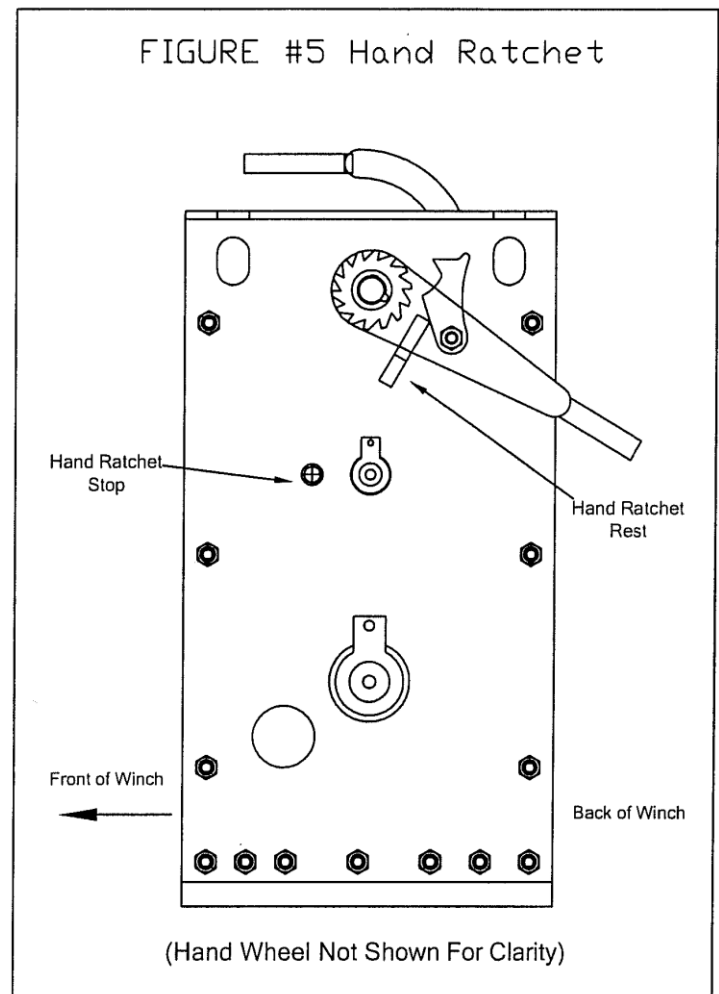
2.1.2 Hand Ratchet Operation

- 2.1.2.1** The winch is equipped with a gravity operated hand ratchet system for use when additional wire rope tightening is needed. The hand ratchet is located on the hand wheel hub and should always be in rest position when not being used (see fig. 5).
- 2.1.2.2** To use the hand ratchet, lift the ratchet handle off of the ratchet rest. This will allow the ratchet pawl to engage thus creating a simple lever that can be used to apply tension to the wire rope. With the hand ratchet in use, the only allowable direction the winch drum will turn is in a motion that reels the wire rope onto the winch drum.

WARNING

Do not engage the hand ratchet while the winch gears are turning. Do not stand on or within the travel area of the hand ratchet. Serious injury or even death to personnel may result.

- 2.1.2.3** Rotate the hand ratchet handle around to the front of the winch and then reverse direction which will allow the ratchet pawl to disengage from its gear. The ratchet can now be rotated back to a desirable location to repeat the tightening until the proper wire rope tension is achieved.
- 2.1.2.4** The winch also comes equipped with a ratchet extension pipe that can be used to apply an even greater amount of tension to the wire rope. The extension pipe fits onto the ratchet handle and should always be removed and secured when not being used.
- 2.1.2.5** Upon completion of using the hand ratchet, return it to its resting position with the handle positioned to the back of the winch.



2.1.3 Locking Dog and Anti-Backlash Friction Band Operation

The manual winch uses a combination locking dog and anti-backlash friction band assembly to secure the wire rope that is either being loaded or unloaded under tension. The locking dog prevents the load from releasing while tension is being applied to the wire rope. The anti-backlash friction band is used to control the release of the rope under tension. This controlled release is necessary to avoid excessive payout speeds that could result in line backlashing or rope fouling on the drum.

2.1.3.1 To engage the locking dog, position the dog release handle in the forward position (see fig.6a).

While the handle is in this position the locking dog is free to interact with the dog gear. This position of the handle also disengages the anti-backlash friction band.

2.1.3.2 To disengage the locking dog, pull the dog release handle towards the back of the winch (see fig. 6b). As the locking dog is lifted out of the dog gear, the release handle will engage the anti-backlash friction band.

2.1.3.3 Using the dog release handle, the operator can now safely control the wire rope pay out speed and relieve tension.

CAUTION

The anti-backlash friction band is not a substitute for securing a load. It is to only be used to assist the operator in disengaging the locking dog and controlling wire rope pay out speeds.

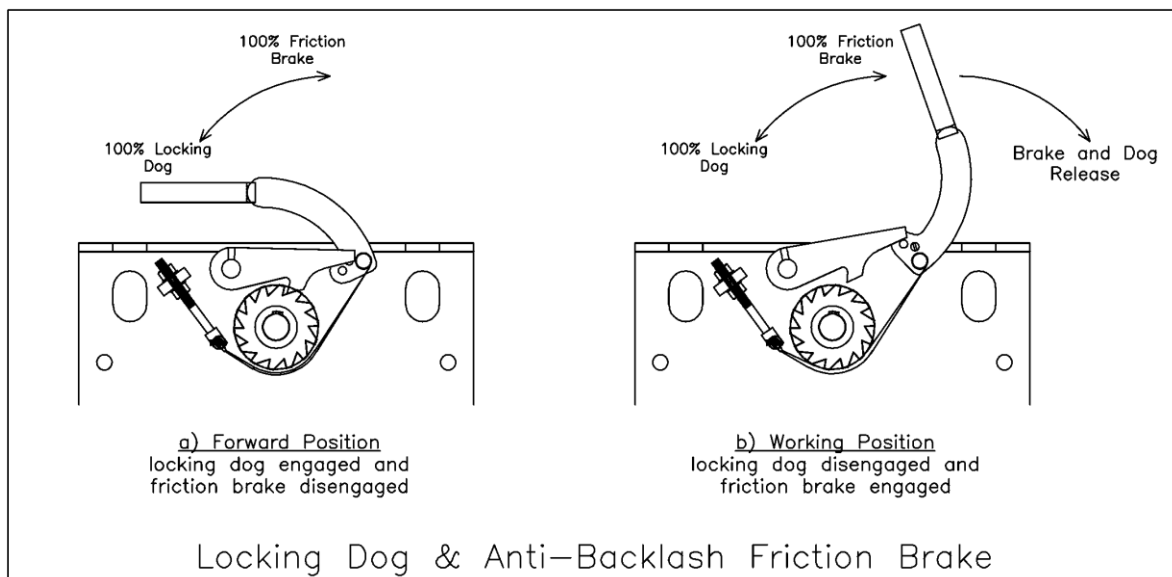


FIGURE 6

- 2.1.3.4** The dog release handle can also be positioned so that both the locking dog and friction band are disengaged completely. This is accomplished by pulling the release handle as far back as possible (see fig. 6b).

2.1.4 Disc Brake Operation

The winch uses a multi-disc braking system to secure the loads placed on it. The brake system is designed to hold loads equal to that of the winch capacity.

CAUTION
Under no circumstances should loads of greater value than winch capacity be placed on the brake system or winch. To do so could cause equipment failure and damage or personal injury.

- 2.1.4.1** To engage the disc braking system, simply turn the brake handle clockwise. This allows the handle shaft to screw into the brake housing thus clamping down the brake components. Continue turning the handle until it becomes snug. The brake should now be set and ready to maintain tension.
- 2.1.4.2** To disengage the disc braking system, simply turn the brake handle counter-clockwise. The handle can be turned until it is in the fully open position. The brake should now be off and the winch is ready to be loaded or unloaded.

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3.1 EQUIPMENT INSPECTION

NOTICE

An inspection program should be started as soon as any equipment is put into service. A qualified person should be appointed the responsibility of regular inspecting the equipment. Written records of inspections are recommended by the manufacturer.

3.1.1 Frequent Inspection

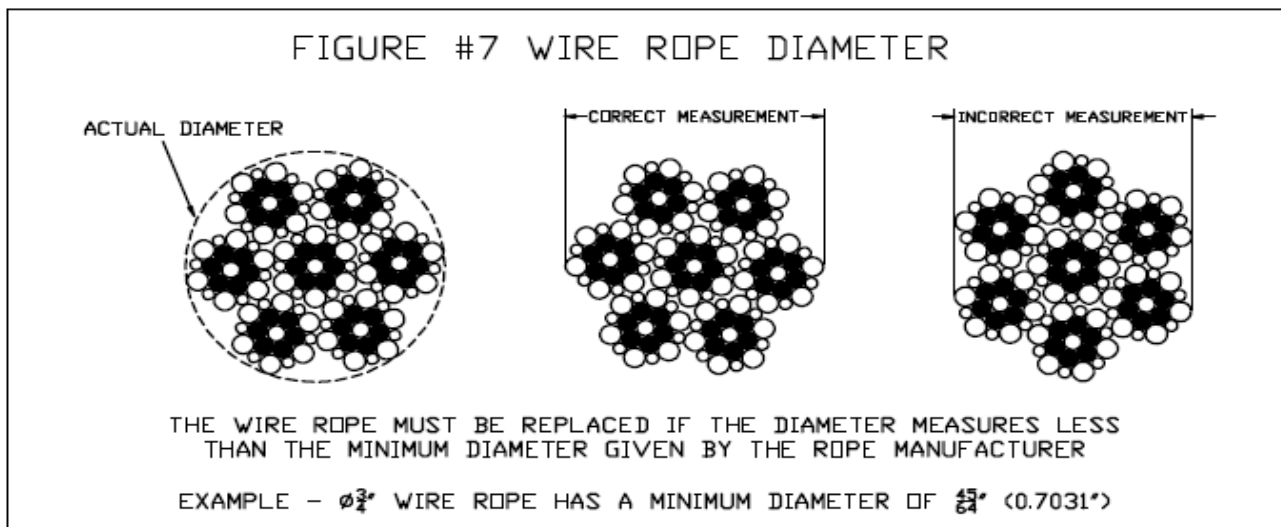
- 3.1.1.1 Visually inspect the equipment before each use. Check the equipment for cracks, bending, wear, rust, corrosion, and any other damage. If any problems are discovered, stop use immediately and remove the equipment from service until all appropriate repairs are completely performed.
- 3.1.1.2 **Ensure that equipment is properly lubricated.**
- 3.1.1.3 Check to ensure that the foundation is in good condition. Make sure that mounting fasteners and other hardware are tightened securely.
- 3.1.1.4 Ensure that the wire rope is installed correctly and anchored securely to the drum. Also, check to make sure the wire rope is in good condition.

3.1.2 Periodic Inspection

- 3.1.2.1 Periodic inspections should occur every 6 months, whenever equipment is returned to service from storage, if a frequent inspection discovers any damage or poor operation, or any case where the winch may have been over loaded or operationally abused.
- 3.1.2.2 Visually inspect the equipment checking the finish for wear, flaking, or other damage as listed in the frequent inspection plan. Disassembly is recommended in order to properly inspect individual components.
- 3.1.2.3 Check the winch drum by moving it with your hands. Check for excessive movement that may be the result of worn or loose gears, bearings, or shafts. Some play is normal while excessive play may be the result of overloading.

3.1.3 Wire Rope Inspection

- 3.1.3.1 Wire rope inspection should be conducted as per the manufacture's recommendations or accepted industry standards.
- 3.1.3.2 Inspect the entire length of wire cable for bent or crushed areas, broken or cut wires, corrosion, and other damage.
- 3.1.3.3 Inspect end connections and fittings for corrosion, kinking, crushing, or other damage.
- 3.1.3.4 Check the wire rope diameter for signs of decreased area (see fig. 7). Diameter decrease may be signs of wear and internal degradation in the wire rope. Generally, ropes are manufactured larger than nominal diameter. When placed in service for the first time, diameter can reduce slightly. Minimum diameter specifications can be obtained from the rope manufacturer.



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3.2 EQUIPMENT LUBRICATION

- 3.2.1** All grease fittings and external gearing should be lubricated using Nabrico's suggested lubricants or similar.
- 3.2.2** Drive shaft and drum shaft grease fittings should be lubricated at least once a month under normal conditions and at least once a day under adverse conditions. Lubricate while gears are rotating slowly.
- 3.2.3** Drive gear teeth should be coated at least once a month. Application with an aerosol can is recommended for uniform coverage. Graphite or other dry type lubricant should be used instead of gear grease when the winch is subjected to large amounts of foreign material such as coal dust. Always keep gear teeth as free of foreign material as possible.

RECOMMENDED LUBRICANT FOR USE WITH NABRICO DECK MACHINERY	
HYDRAULIC OIL (OPEN LOOP)	MOBIL DTE-26M
SPUR, HELICAL GEARS	MOBILGEAR632
PLANETARY REDUCERS	MOBILUBE HD 80W 90
ALL WORM GEARS (INCLUDING CONE DRIVE)	MOBILE 600W SUPER CYLINDER OIL
	MIL-L-15019C SYMBOL 6135
	MOBILE SCH-634 SYNTHETIC LUBRICANT
OPEN GEARING (SPRAY CAN)	MOBILTAC E
	LUBRIPLATE OPEN GEAR SHEILDING
GREASE FITTINGS	MOBILAX EP #2
	LUBRIPLATE MARINE LUBE "A"
PRESERVATIVE TREATMENT	MOBILARMA 524

Note: Lubricant Manufacturers shown are not exclusive recommendations. Consult your lubricant source for more detailed information about oil selection.

3.3 CLEANING AND STORAGE

3.3.1 Cleaning the Equipment

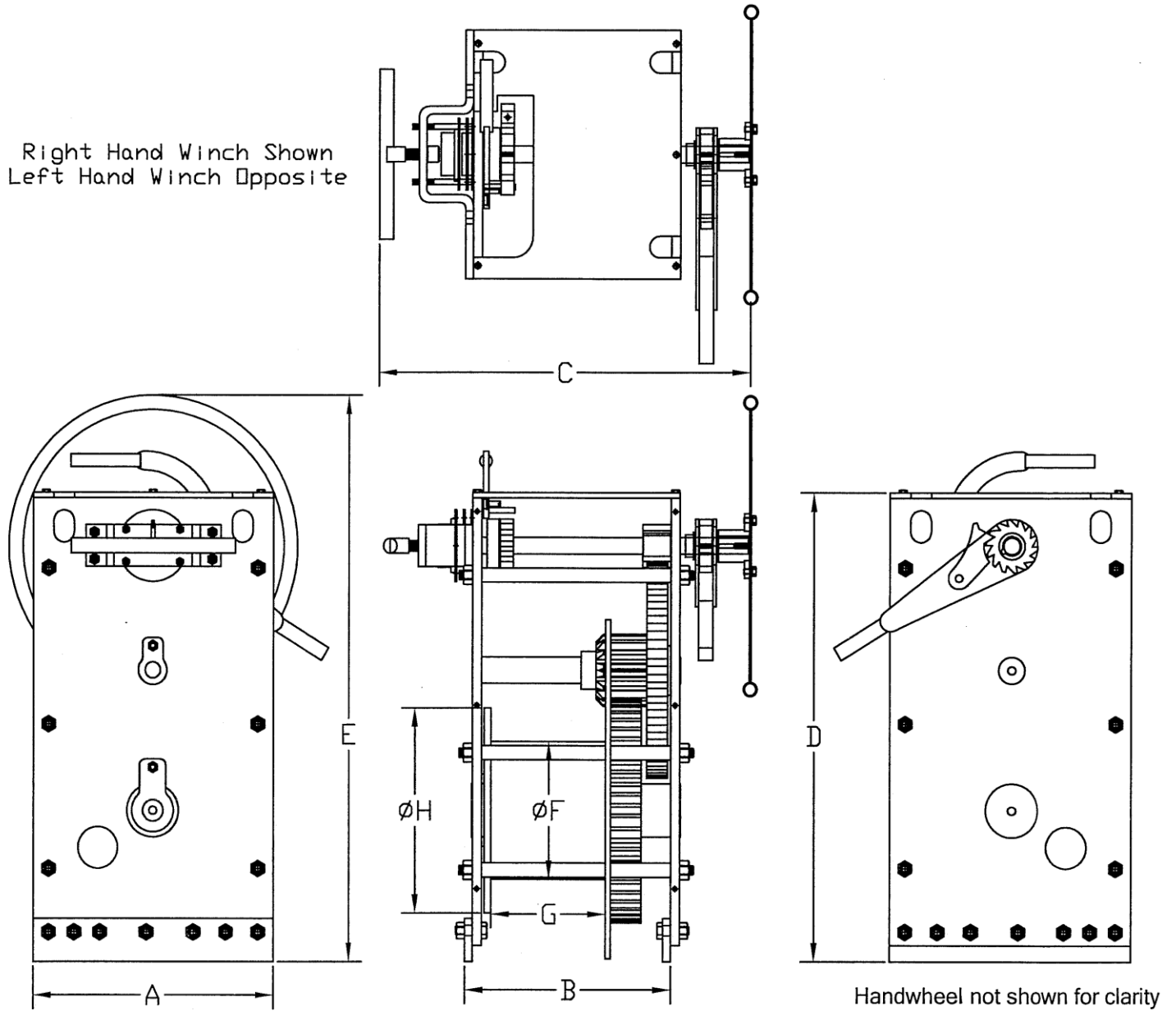
- 3.3.1.1 The equipment should be regularly cleaned to remove dirt and to help prevent rust and corrosion.
- 3.3.1.2 When cleaning, be sure to leave a light film of oil on all surfaces to protect them against the weather. Wipe off excessive amounts of oil to avoid the accumulation of dirt.
- 3.3.1.3 Remove all unnecessary objects from the area surrounding the equipment to prevent hazardous situations from occurring.

3.3.2 Storing the Equipment

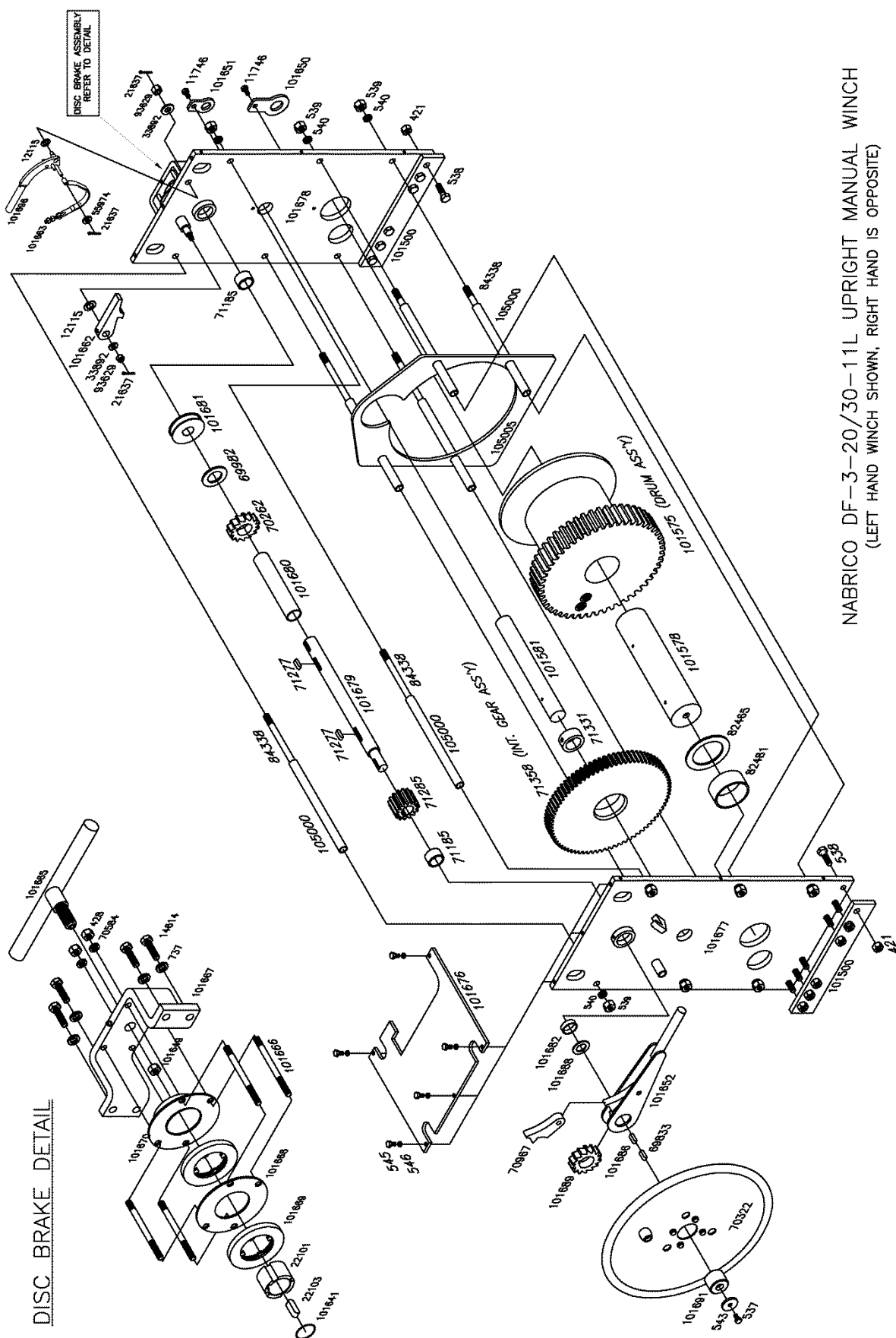
- 3.3.2.1 Lubricate the equipment as necessary to help prevent rust and corrosion during storage. Add a rust preventive for long term storage.
- 3.3.2.2 Seal the equipment in plastic if possible to help prevent, corrosion and other damage.
- 3.3.2.3 Store the equipment upright in a cool clean place away from corrosive chemicals and moisture.
- 3.3.2.4 Rotate the drum periodically to keep bearing and gear surfaces from becoming lacquered.

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A.1 Dimensional



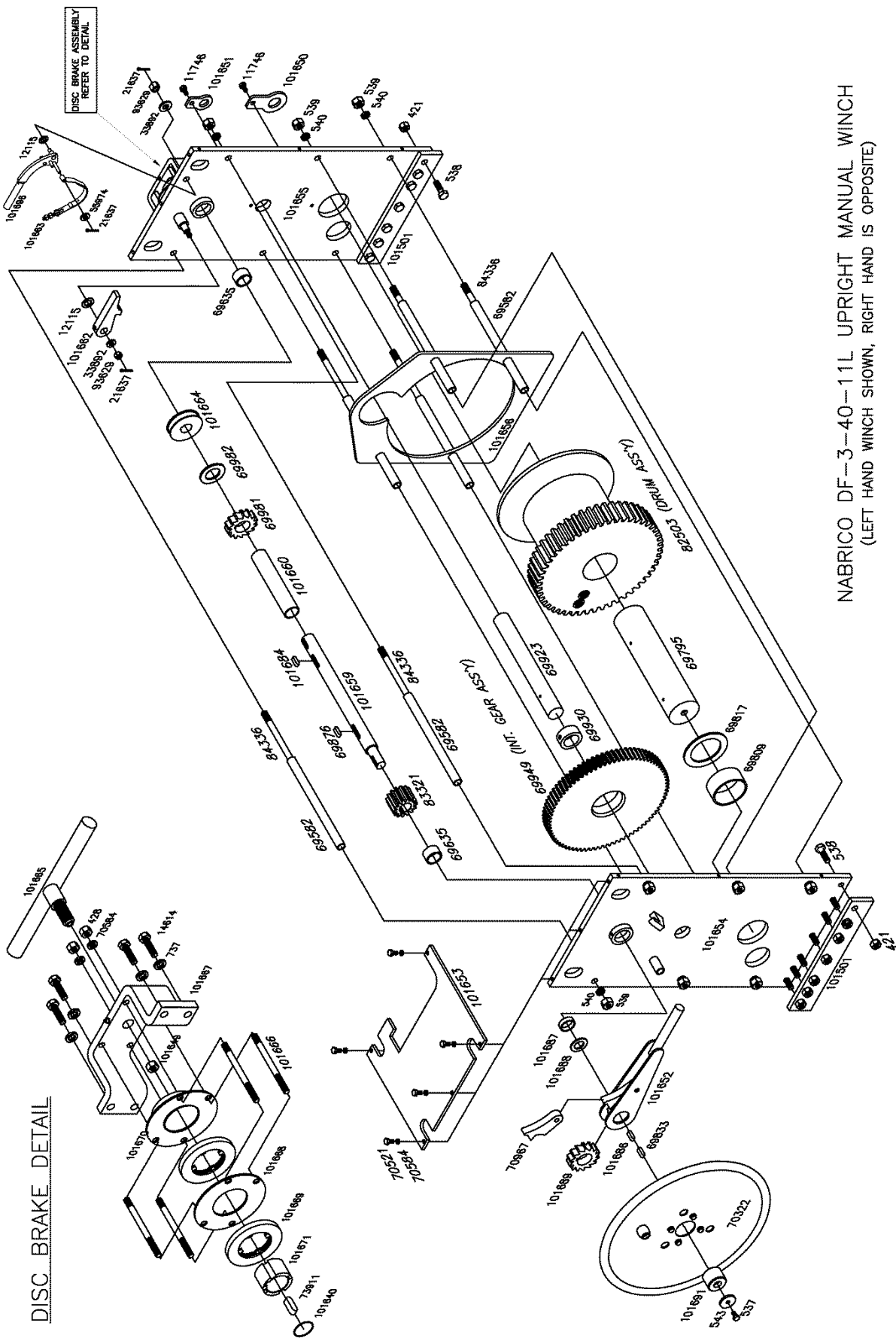
DF-3 Winch	Part Number	Length 'A'	Width 'B'	Overall Width 'C'	Height 'D'	Overall Height 'E'	Drum Dia. 'F'	Drum Width 'G'	Flange Dia. 'H'	Weight
20/30 Ton	94241 (RH) 94242 (LH)	22'	19 $\frac{3}{8}$ '	33 $\frac{1}{2}$ '	35 $\frac{1}{2}$ '	44 $\frac{9}{16}$ '	10 $\frac{3}{4}$ '	11'	16'	1065 lbs
40 Ton	94237 (RH) 94238 (LH)	23 $\frac{1}{4}$ '	20 $\frac{1}{8}$ '	36 $\frac{1}{16}$ '	43 $\frac{1}{2}$ '	52 $\frac{9}{16}$ '	12 $\frac{3}{4}$ '	11 $\frac{1}{4}$ '	19'	1525 lbs



NABRICO DF-3-20/30-11L UPRIGHT MANUAL WINCH
(LEFT HAND WINCH SHOWN, RIGHT HAND IS OPPOSITE)

DF-3-20/30-11 UPRIGHT MANUAL WINCH PARTS LIST		
PART DESCRIPTION	QNT'Y	PART #'s
Key (Handwheel Hub) 3/8" x 1-3/4"	1	69833
Spacer Washer	1	69982
Locking Dog Gear	1	70262
Handwheel Assembly with Speed Handle	1	70322
Ratchet Locking Dog	1	70967
Key (Drive Pinion) 3/8" x 2-1/2"	1	71277
Key (Locking Gear & Friction Drum)	1	
Drive Pinion	1	71285
Intermediate Shaft Collar	1	71331
Intermediate Gear Assembly	1	71358
Drum Washer	1	82465
Drum Pipe Spacer	1	82481
Separator Rod (SS)	6	84338
Base Bar	2	101500
Drum Assembly	1	101575
Drum Shaft	1	101578
Intermediate Shaft	1	101581
Keeper Plate (BIG)	1	101650
Keeper Plate (small)	1	101651
Locking Dog w/ Bronze Bushing	1	101662
Friction Band Assembly (includes fasteners)	1	101663
Top Plate	1	101676
Drive Shaft	1	101679
Pipe Spacer (Drive Shaft)	1	101680
Friction Drum	1	101681
Pipe Spacer (Ratchet)	1	101682
Key (Ratchet Gear) 1/2" x 1-5/8"	1	101686
Ratchet Gear	1	101689
Handwheel Hub Insert (SS)	1	101691
Pipe Separator	6	105000
Guard Plate	1	105005
Miscellaneous Parts Not Shown in Parts Breakdown Drawing		
Cover Mounting Stud 3/8" x 1-1/2"	10	549
Brass Wing Nut 3/8"	10	550
Ratchet Handle Extension	1	70327
Protective Rubber Cover	2	80223
Cable Clamp w/ Fasteners	1	82562
BUSHINGS	QNT'Y	PART #'s
Drive Shaft Bushing	2	71185
Drum Assembly Bushing	2	71226
Intermediate Gear Assembly Bushing	1	71382

ADDITIONAL PARTS LIST		
FASTENERS & ETC.	QNT'Y	PART #'s
Hex Nut (SS) 3/4-10 UNC	12	421
Hex Head Bolt (SS) 1/2-13 UNC x 2"	1	537
Hex Head Bolt (SS) 3/4-10 UNC x 2-1/2"	12	538
Hex Nut (SS) 7/8-9 UNC	12	539
Lock Washer (SS) 7/8"	12	540
Washer (SS) 9/16" ID x 2-1/2" OD	1	543
Hex Head Bolt (SS) 3/8-16 UNC x 1"	5	545
Lock Washer (SS) 3/8"	5	546
Hex Head Bolt (Zinc PL) 5/8-11 UNC x 1"	2	11746
Flat Washer (SS) 7/8"	2	12115
Cotter Pin (SS) 1/8" x 1-1/4"	3	21637
Flat Washer (Brass) 5/8"	2	33892
Flat Washer (SS) 1/2"	1	55974
Slotted Hex Nut (Bronze) 5/8-11 UNC	2	93629
Large Flat Washer (SS)	1	101688
HAND SPECIFIC PARTS	QNT'Y	PART #'s
Right Hand Winch		
Side Plate Assembly (Handwheel Side)	1	101694
Side Plate Assembly (Disc Brake Side)	1	101695
Locking Dog Handle Assembly	1	101696
Hand Ratchet Assembly	1	101698
Left Hand Winch		
Hand Ratchet Assembly	1	101652
Locking Dog Handle Assembly	1	101661
Side Plate Assembly (Handwheel Side)	1	101677
Side Plate Assembly (Disc Brake Side)	1	101678
DISC BRAKE PARTS	QNT'Y	PART #'s
Hex Nut (SS) 1/2-13 UNC	4	428
Lock Washer (SS) 5/8"	4	737
Hex Head Bolt (SS) 5/8-11 UNC x 2"	4	14614
Brake Disc Guide Sleeve	1	22101
Key (Guide Sleeve) 3/8" x 1-3/4"	1	22103
Lock Washer (SS) 1/2"	4	70584
Quad Ring Seal	1	101641
Nylon Insert Half Hex Nut (SS) 1-8 UNC	1	101649
Brake Handle Assembly	1	101665
Threaded Rod	4	101666
Disc Brake Housing	1	101667
Engaging Plate	1	101668
Brake Disc	2	101669
Engaging Cap Assembly	1	101670



DF-3-40-11 UPRIGHT MANUAL WINCH PARTS LIST		
PART DESCRIPTION	QNT'Y	PART #'s
Pipe Separator	6	69582
Drum Shaft	1	69795
Drum Pipe Spacer	1	69809
Drum Washer	1	69817
Key (Handwheel Hub) 3/8" x 1-3/4"	1	69833
Key (Drive Pinion) 1/2" x 2-3/4"	1	69876
Intermediate Shaft	1	69923
Intermediate Shaft Collar	1	69930
Intermediate Gear Assembly	1	69949
Locking Dog Gear	1	69981
Spacer Washer	1	69982
Handwheel Assembly with Speed Handle	1	70322
Ratchet Locking Dog	1	70967
Drum Assembly	1	82503
Drive Pinion	1	83321
Separator Rod (SS)	6	84336
Base Bar	2	101501
Keeper Plate (BIG)	1	101650
Keeper Plate (small)	1	101651
Top Plate	1	101653
Guard Plate	1	101656
Drive Shaft	1	101659
Pipe Spacer (Drive Shaft)	1	101660
Locking Dog w/ Bronze Bushing	1	101662
Friction Band Assembly (includes fasteners)	1	101663
Friction Drum	1	101664
Key (Locking Gear & Friction Drum)	1	101684
Key (Ratchet Gear) 1/2" x 1-5/8"	1	101686
Pipe Spacer (Ratchet)	1	101687
Ratchet Gear	1	101689
Handwheel Hub Insert (SS)	1	101691
Miscellaneous Parts Not Shown in Parts Breakdown Drawing		
Cover Mounting Stud 3/8" x 1-1/2"	10	549
Brass Wing Nut 3/8"	10	550
Protective Rubber Cover	2	80243
Ratchet Handle Extension	1	70327
Cable Clamp w/ Fasteners	1	82570
BUSHINGS	QNT'Y	PART #'s
Drive Shaft Bushing	2	69635
Intermediate Gear Assembly Bushing	1	69973
Drum Assembly Bushing	2	82511

ADDITIONAL PARTS LIST		
FASTENERS & ETC.	QNT'Y	PART #'s
Hex Nut (SS) 3/4-10 UNC	14	421
Hex Head Bolt (SS) 1/2-13 UNC x 2"	1	537
Hex Head Bolt (SS) 3/4-10 UNC x 2-1/2"	14	538
Hex Nut (SS) 7/8-9 UNC	12	539
Lock Washer (SS) 7/8"	12	540
Washer (SS) 9/16" ID x 2-1/2" OD	1	543
Hex Head Bolt (Zinc PL) 5/8-11 UNC x 1"	2	11746
Flat Washer (SS) 7/8"	2	12115
Cotter Pin (SS) 1/8" x 1-1/4"	3	21637
Flat Washer (Brass) 5/8"	2	33892
Flat Washer (SS) 1/2"	1	55974
Hex Head Bolt (SS) 1/2-13 UNC x 1"	5	70521
Lock Washer (SS) 1/2"	5	70584
Slotted Hex Nut (Bronze) 5/8-11 UNC	2	93629
Flat Washer	1	101688
HAND SPECIFIC PARTS	QNT'Y	PART #'s
Right Hand Winch		
Locking Dog Handle Assembly	1	101661
Hand Ratchet Assembly	1	101698
Side Plate Assembly (Handwheel Side)	1	101699
Side Plate Assembly (Disc Brake Side)	1	101707
Left Hand Winch		
Hand Ratchet Assembly	1	101652
Side Plate Assembly (Handwheel Side)	1	101654
Side Plate Assembly (Disc Brake Side)	1	101655
Locking Dog Handle Assembly	1	101696
DISC BRAKE PARTS	QNT'Y	PART #'s
Hex Nut (SS) 1/2-13 UNC	4	428
Lock Washer (SS) 5/8"	4	737
Hex Head Bolt (SS) 5/8-11 UNC x 2"	4	14614
Lock Washer (SS) 1/2"	4	70584
Key (Guide Sleeve) 1/2" x 1-3/4"	1	73911
Quad Ring Seal	1	101640
Nylon Insert Half Hex Nut (SS) 1-8 UNC	1	101649
Brake Handle Assembly	1	101665
Threaded Rod	4	101666
Disc Brake Housing	1	101667
Engaging Plate	1	101668
Brake Disc	2	101669
Engaging Cap Assembly	1	101670
Brake Disc Guide Sleeve	1	101671



PRODUCT WARRANTY

NABRICO warrants that all NABRICO products shall be free from defects in material and workmanship during the Warranty Period (as herein defined); provided, however that NABRICO's warranty hereunder shall not apply to any equipment, material, or component that is not manufactured by NABRICO, and NABRICO makes no expressed or implied warranty that any such equipment, material, or component is free from manufacturer or supplier defects. To the extent permitted, NABRICO agrees to transfer and assign to a Buyer or End User any warranties extended by the manufacturer or supplier of such equipment, material or components. NABRICO shall have no obligation or responsibility to repair or replace any defective NABRICO product if a notice of defect is not reported in writing to NABRICO within 180 days from the date of shipment of any NABRICO Winch Products and 90 days from the date of shipment of any other NABRICO Products (such 180 day and 90 day periods are hereinafter referred to as "Warranty Period").

In the event Buyer or End User timely notifies NABRICO in writing of any claim of defect covered by this warranty, NABRICO shall correct the nonconforming work by making repairs or replacements, at NABRICO's option and at NABRICO's expense, if NABRICO's examination shall disclose to its satisfaction that all or a portion of the NABRICO Product is defective. However, this warranty is conditional upon compliance by the Buyer or End User with the loading, use, and handling in accordance with good commercial practices of the trade, and NABRICO shall not be responsible for defects caused by misleading, overheating, improper cleaning, misapplication, physical abuse or from normal wear and tear. This warranty is void where any NABRICO Product has been altered or repaired by anyone other than NABRICO or its authorized agent.

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PRODUCT NOTICES

Proprietary Information. The information and sketches shown in this catalog are proprietary to Nabrico. Duplication, reproduction, or manufacture from data contained herein is strictly prohibited.

Usage Warnings. All NABRICO Products must be correctly sized, properly located, and installed to serve their intended functions and it is the responsibility of Buyer or End User to insure such action is taken. Please note and consider the following warnings: Improper installation can result in failure of a NABRICO Product. NABRICO Products that have failed because of overloads, or which have been dislodged from foundations, or have fractures and/or deformations should be repaired or replaced immediately. Loads to bitts must be applied to the posts between the base and the midpoint in a horizontal or downward direction. Properly placed chocks will prevent line chafing. Kevels should be installed horizontally on foundation bases of sufficient size, and forces to kevels must be direct to the trunk and not the horns. Horns will fail when exposed to direct loads. And, NABRICO Products are not designed for use to lift a vessel.

Dimensions. All dimensions shown in this catalog are in feet and inches. Weights are in English pounds. Capacities are in short tons of 2,000 pounds. Please note that dimensions and weights are nominal and are subject to standard variations. Maximum test pressure on hatches, doors, and enclosures is 2 PSI unless advise in writing by NABRICO of a higher allowance. Product details and specifications are subject to change without notice.

NABRICO

1250 GATEWAY DRIVE
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WINCHES

ELECTRIC
HYDRAULIC
MANUAL

HATCHES

WATERTIGHT
TWIST LOCK
QUICK ACTING

BITTS

DOUBLE BITT
SINGLE BITT
THRU-DECK BITT

CAPSTANS

HYDRAULIC
ELECTRIC
CUSTOMIZABLE

DOORS

6 DOG MANUAL
QUICK ACTING
4 DOG MANUAL

KEVELS

KEVEL CHOCK
KEVEL
THRU-DECK KEVEL

SIGNS

WARNING
CUT-OFF
OIL POLLUTION

CHOCKS

CAST STEEL
BUTTON
ROLLER BUTTON

BARGE CRANES

ELECTRIC OPERATION
MANUAL OPERATION

OIL TANKS

300 GALLON
600 GALLON
CUSTOM SIZES

OCEAN DOMES

MILD STEEL
STAINLESS STEEL

SUCTION BELLMOUTHS

6" SIZE
8" SIZE
10" SIZE