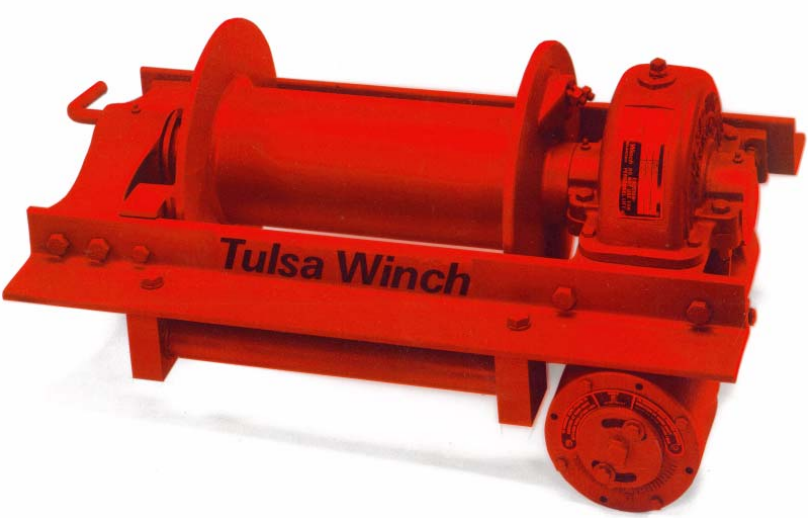
RUFNEK®



Installation, Operating & Maintenance Manual

Worm Gear Winch

TULSA WINCH®

This manual MUST be kept with the winch at all times. New winch operators MUST read and understand the contents fully.

WARNING

FAILURE TO HEED THE FOLLOWING WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH!

- Do not use to lift or move people. If your task involves moving or lifting people, you must use the proper equipment, not this winch.
- Winch operators must be trained in the proper, safe operation of the winch.
- Cable anchors on Tulsa Winches are not designed to hold the rated load of the winch. You must keep at least five (5) wraps of cable on the drum to insure that the cable doesn't come loose.
- Stay clear of suspended loads and of cable under tension. A broken cable or dropped load can cause serious injury or death.
- Make sure that all equipment, including the winch and cable, is maintained properly. Pay especially close attention to the clutch, making sure that it fully engages when shifted. Do not attempt to disengage the clutch when a load is on the winch.
- Winches not equipped with automatic worm brakes should never be used to lift loads.
- Avoid shock loads. This type of load imposes a strain on the winch many times the actual weight of the load and can cause failure of the cable or of the winch.

INTRODUCTION

Thank you for purchasing a new Tulsa Winch. We are proud of our products and are certain that they will perform your winch tasks properly. However, we do ask that you take a few minutes to read and thoroughly understand this booklet. Also, if you have new operators assigned to the winch, make sure that they read and understand it. Because of the large number of models we manufacture, we are unable to show parts lists for every model in this booklet. If you want or need parts lists, please write Tulsa Winch, 11135 S. James, Jenks, OK 74037. Or call (918) 298-8300 or fax us at (918) 298-8367. You may also go to our Web site at www.team-twg.com.

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GENERAL OPERATIONS

1. Be sure to read all safety instructions thoroughly. It is important that each operator is aware of the consequences of misuse or poor operating practices of this winch.

2. Tulsa Winch products are not to be used to lift, hoist, or move people. If your application requires moving persons, you must use the proper equipment for the task.

3. Cable anchors on Tulsa Winch products are not designed to hold the rated load of the winch. You must keep at least five (5) wraps of cable on the drum to insure that the cable does not come loose.

4. Personnel must stay clear of a suspended load or any line under load. A distance of 1-1/2 times the length of the cable should be maintained while the cable is under tension. Failure to heed this warning may result in serious injury or death.

5. Make sure that all equipment is maintained properly and regular systems checks are performed to insure your winch is working safely. Refer to the maintenance section of this manual for details on these procedures.

6. Avoid shock loads. This type of load imposes a strain on the winch many times the actual weight of the load and can cause failure of the cable or of the winch.

7. Always inspect cable before beginning job. Never allow cable to slide through hands while maintaining tension, use hand-over-hand method to keep cable tension while spooling. Always use leather gloves when handling cable.

WINCH BREAK IN

Winches, like any other kind of machinery, require a “break-in” to perform well and to maximize their life. The following guidelines should be used in the break-in of Tulsa Winches.

Use extreme care when first spooling cable onto the winch. DO NOT run the winch at high speeds when performing this operation. Make sure that the cable is unrolled in a line (to prevent kinks) and SLOWLY inhaul the winch to install the cable.

DO NOT exceed one half rated load or one half rated linespeed for the first thirty minutes of operation. This will insure that the worm and gear have an opportunity to wear in properly. Periodically, check the gearbox for temperature rises and allow the winch to cool down between pulls. Worm gear winches are designed and intended for intermittent duty application only; using them in extremely long pulls may generate excessive heat and shorten the life of the winch.

WINCH OPERATION

To familiarize yourself with the winch, run it for a few minutes to understand the controls and the “feel” of the winch. Pay particular attention to the controls and how they operate. If the winch has air controls on the brake or clutch, or both, operate them to see how they work and the direction of activation of the controls. If the winch is hydraulically powered, make sure you understand which way the winch will rotate when the control lever is moved.

Always make sure that all people are clear of the load and of the cable area before beginning a winching operation. A broken cable can fly in any direction.

If you are using a mechanically powered winch, learn to pay close attention to the truck engine to sense possible overload

The typical winch operating cycle consists of the following steps:

1. Disengaging the winch drum clutch and pulling off enough cable to allow hooking the load. If the winch is equipped with a manually operated drum rake, use it to keep the cable from “birds nesting” while being pulled off. DO NOT get into the habit of powering off cable; all this does is shorten the life of the winch, especially the winch brake.

   Note: The drum brake is for free-spooling cable only. It is not intended to be a load-holding brake and must not be used as such

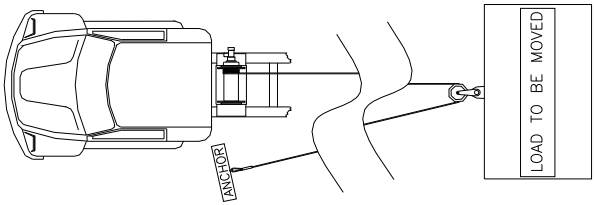
2. After hooking to the load, engage the drum clutch and release the drum brake, if the winch is so equipped. Make sure the clutch is fully engaged.

3. Begin winching the load slowly, watching carefully to insure that the load is moving normally and that no one is in the immediate area of the load or of the cable.

4. When the load is positioned where you want it, stop the winch. If the load is suspended, the automatic worm brake will hold it until you are ready to lower it.

USING A SNATCH BLOCK

By using a snatch block you have effectively cut the load on the winch in half. A snatch block should be used any time you have a concern about the ability of the winch or cable to move a load. The following illustration shows one way to rig such a block



CABLE CONSIDERATIONS

As the number of layers of cable on a winch increases, the rated capacity of the winch goes down. If you are operating at near the top of the drum flanges, the effective rating of the winch is about half of what it is on the first layer. You should therefore, only keep as much cable on the winch as you need for your job.

Never use larger or smaller cable on your winch than is recommended for it. The use of larger cable will not allow you to pull larger loads and may, in fact, break easier than the proper size cable. The use of smaller cable may overheat the winch due to increased running time with more cable.

The following chart shows the recommended cable sizes for Tulsa Winches:

CABLE CONSIDERATIONS (Continued)

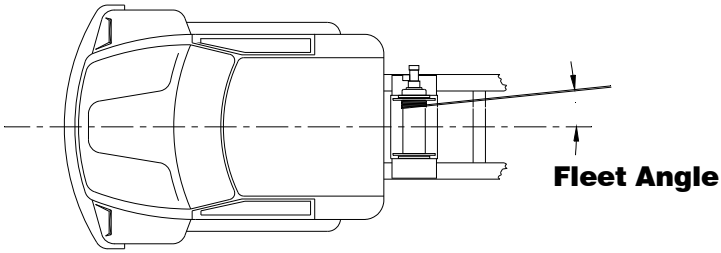
Winch Model	Cable Size
938	7/16”
1138 or RN10W	7/16”
1000	7/16”
1200	1/2”
10 or RN15W	1/2”
12	1/2”
18	5/8”
18G	5/8”
19	5/8”
23 or RN20W	5/8”
24	3/4”
34 or RN30W	3/4”
64 or RN45W	7/8”
70 or RN65W	1”
75	1”
80 or RN100W	1”

Consult your local cable supplier for recommendation on the best type of cable and hardware to use in your specific application.

WARNING: CABLE ANCHORS ON TULSA WINCHES ARE NOT DESIGNED TO HOLD THE RATED LOAD OF THE WINCH. YOU MUST KEEP AT LEAST 5 WRAPS OF CABLE ON THE DRUM TO INSURE THAT THE CABLE DOES NOT COME LOOSE.

THE IMPORTANCE OF A PROPER FLEET ANGLE

Maintaining the proper fleet angle is important to the success of your winching operation, the life of your winch and the life of the cable you are using. The fleet angle can best be described by the following illustration.

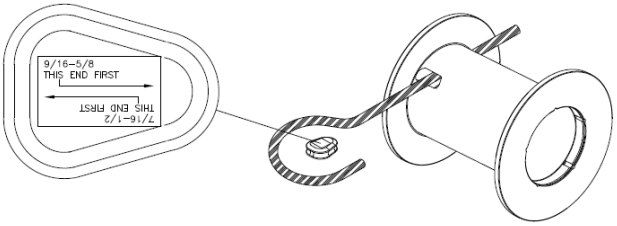


The fleet angle should be kept as small as possible to insure proper spooling and to maximize cable and winch life. To promote even cable spooling, keep the fleet angle below three degrees. Whenever possible, spool through a block at the back of the truck body. Never pull directly against the flange of the winch cable drum as this may cause the cable or the winch to break.

If you are using a front mounted winch for vehicle recovery, use a snatch block to avoid pulling sideways on the winch. If your winch is equipped with a four way roller and you absolutely must pull against a side roller, do so only for as long as is necessary and carefully watch the cable on the drum. It will pile up on one side of the drum and you must insure that it doesn't jump over the drum flange. When you are finished using the winch in a manner where the cable does not spool evenly, disengage the clutch and pay out the uneven cable. Then slowly re-spool the cable, making sure that it lays evenly.

CABLE INSTALLATION

To install the cable wedge anchor, first consult the wire rope manufacturer for recommendations on how to prepare the end of the wire rope. Thread the prepared end of wire rope through the smaller side of the opening of the cable drum wedge pocket. Pull through enough cable to loop it back around and insert the end back into the wedge pocket to about 3/4 depth of the pocket. Install the wedge in the loop then pull the slack out of the loop with the working line. The wedge will slip into the pocket and secure the wire rope into the drum.



To install the u-bolt clamp style of anchor, first prepare the end of the cable as recommended by the wire rope manufacturer. Pass the wire rope through the u-bolt so that the end extends approximately 2x the diameter of the cable. Tighten the clamp evenly until the wire rope begins to deform slightly under the u-bolt and the cable is held securely.

When using the ferrule wedge anchor the cable must be 6 strand. First, make sure the cable end is cut clean and square. Insert the cable through the ferrule and spread the strands to insert the wedge halves over the core of the wire rope. Position individual strands into proper grooves around the wedge halves and tap the wedges until they are flush with the strand ends. Slide the ferrule back over the wedge and drive the wedge into the ferrule with a hammer and short pipe which fits inside the strands and over the core.

WARNING: CABLE ANCHORS ON TULSA WINCHES ARE NOT DESIGNED TO HOLD THE RATED LOAD OF THE WINCH. YOU MUST KEEP AT LEAST 5 WRAPS OF CABLE ON THE DRUM TO INSURE THAT THE CABLE DOES NOT COME LOOSE.

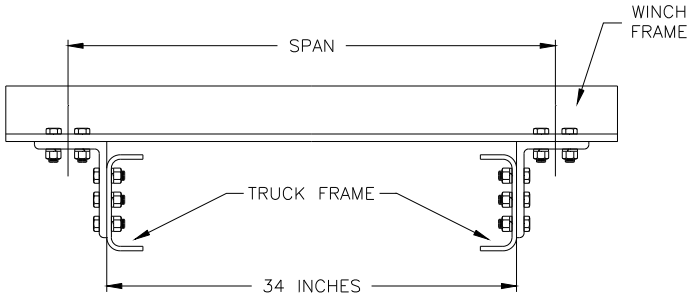
WINCH MOUNTING

You must make sure that your winch is securely mounted in order for it to function properly and to insure safe operation. The mount must be flat to insure proper alignment between the gearbox side, the drum, and the clutch

A rule of thumb to use when selecting capscrews to mount the winch is to use the same size and number of capscrews to fasten the winch to its mount as we use to fasten the gearbox and end bracket to the winch frames. Winches must never be fastened directly to the frame of a truck; mounting brackets as shown below should be used. The mounting span of the winch is very important; you should make sure that the mounting span is as close to the values shown in the chart below as possible.

All capscrews used to mount the winch should be Grade 8 or better and should be carefully tightened to the proper torque value for their size. All moving parts used to drive mechanical winches should be secure and guards used, if they are in accessible locations. If the winch being mounted is hydraulically driven, make sure the system is clean and that all components function properly, especially the relief valve.

WINCH MOUNTING (Continued)



Model	Max. Span (Inches)	No. of Capscrews	Size Capscrews
938	22	8	1/2"
1138 or RN10W	27	8	1/2"
1000	25	8	1/2"
1200	25	8	1/2"
10 or RN15W	26	8	3/4"
12	27	8	3/4"
18	34	8	3/4"
18G	32	8	3/4"
19	31	8	3/4"
23 or RN20W	31	8	3/4"
24	30	8	1”
34 or RN30W	35	8	1”
64 or RN45W	40	8 or 12	1 1/8” – 1”
70 or RN65W	34	8 or 16	1 3/8” – 1”
80 or RN100W	44	8 or 16	1 3/4” – 1 1/4””

WINCH MAINTENANCE

A winch, like any other type of machinery, needs to have regular maintenance if it is to perform properly, give lasting value, and provide safe winching. Good maintenance consists of two parts, a daily inspection and a periodic servicing.

Daily

Each day, or after one hour of winch use, the following items should be inspected and adjusted, if necessary:

1. If the winch is mechanically driven, check all drive components for alignment and tight mounting. If it is hydraulically driven, check for leaks and the proper fluid level in the hydraulic reservoir.

2. Check the cable for excessive wear, for broken strands, and lubrication

3. Check the automatic worm brake for proper adjustment and adjust it if necessary.

4. Check the drum clutch to make sure it is fully engaging when shifted in. Make adjustments if necessary.

Weekly

Once a week, or every 10 hours of operation, the following tasks should be performed for proper maintenance of your winch.

1. Lube all bushings which are equipped with grease zerks with a good quality lithium-based chassis lube.

2. Inspect the oil level in the winch gearbox and add lubricant if necessary.

3. Lubricate the cable based on your wire rope supplier’s recommendations.

4. If the winch is equipped with a shoe-type brake, inspect the shoes and drum for wear and replace if necessary.

WINCH MAINTENANCE (Continued)

Bi-Annually

Every six months, the gearbox should be drained and filled with new, clean gear lubricant. All Tulsa worm gear winches are filled at the factory with EP140 gear lube, which is ideal for most working conditions. If the ambient temperatures where your winch will be working will not exceed 30 degrees F., you can use EP90; likewise, if the temperature will always be over 100 degrees F., you probably should use EP250.

The following chart shows the oil capacities for Tulsa Winches:

Winch Model	Oil Capacities (pints)
938	1 1/2
1138 or RN10W	1 1/2
1000	2
1200	2
10 or RN15W	3
12	3
18	6
18G	6
19	6
23 or RN20W	6
24	6
34 or RN30W	6
64 or RN45W	10
70 or RN65W	10
75	10
80 or RN100W	15

Some Tulsa winches may have been modified to be mounted in other than the normal attitude, which is with the worm horizontal and below the level of the output shaft. If your winch is mounted in another attitude, there may be a special plug which determined the oil level required in your winch. If you have any questions, please contact the factory.

AUTOMATIC WORM BRAKES

Most Tulsa winches are equipped with an automatic worm brake to hold suspended loads. If your winch is not equipped with one, it is intended for pulling loads only. If you wish to lift and suspend loads with your winch, it can be retrofitted with an automatic worm brake. Please consult the factory for details.

The worm brake is an important safety feature of your winch and must be maintained properly. There are two types of worm brakes used on Tulsa Winches:

1. Automotive-style shoe brakes.
2. Multiple-disc wet brakes.

Each of these worm brakes is designed to operate in the same manner. As a load is hauled in, the brake is released and the load is moved or raised. As the load is stopped, the brake engages and prevents it from falling. When the operator begins to pay out cable to lower the load, he must overcome the drag of the brake to lower the load.

In order for the brake to operate properly, it must be set to engage in the payout mode. To check this, run the winch for one minute under no load in both directions at low speeds. If there is evidence of heat build-up in the payout direction, the brake is installed properly. If the heat rise occurs in the inhaul direction, the brake is installed backward and must be changed.

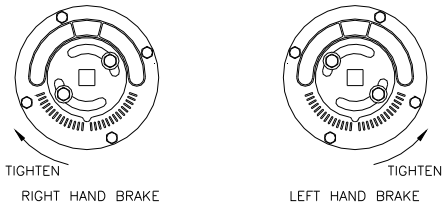
Most winches are set up to spool over the drum to the load. You can check your model code to determine this. If the winch is set up in this manner and you decide to spool the cable under the drum, you must reverse the direction of brake engagement.

The most common brake for Tulsa winches is the automotive-style shoe brake. This brake uses two shoes in a brake drum to hold winch loads. Models 10 through 34 with shoe brakes have a reversible cam; the 64, 70, and 80 require installation of a new cam to change the direction of braking.

AUTOMATIC WORM BRAKES (Continued)

The following illustration shows the end cover of the typical shoe brake and how to adjust it

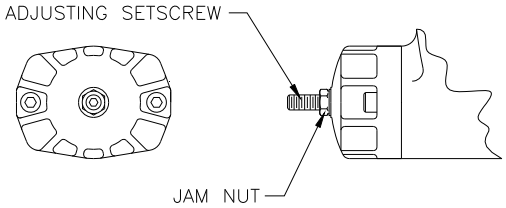
Adjustable Shoe Brake



To tighten the brake, loosen the two capscrews in the slotted holes and rotate the brake in the direction shown. If the brake on a Model 10 through 34 needs to be reversed, remove those same two capscrews, rotate the cam 60 degrees in the loosening direction, and reinstall the capscrews in the new set of holes which have just been revealed. After adjustment, be sure to re-tighten the cam capscrews securely.

The Models 938, 1138, 1060, 1242, RN10W and 1754 are equipped with an adjustable, multiple disc oil brake.

Adjustable Multiple Disk Oil Brake



This brake is adjusted by loosening the jam nut and turning the setscrew inward.

Some versions of the Models 10 through 80 are equipped with a non-adjustable multiple disc oil brake. These winches can be identified by the warning on the cover

Non-Adjustable Multi Disk Oil Brake

Caution During Removal!
Spring Loaded Cover

These brakes require no regular adjustment. The direction of braking for all multiple disc brakes can be changed by removing the cam clutch, turning it over, and re-installing it. For detailed service instructions, contact your Tulsa Winch distributor or the factory

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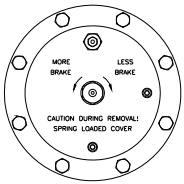
Some versions of the Models 10 through 80 are equipped with an adjustable multiple disc oil brake. These winches can be identified by the hex adjuster located in the center of cover.

Adjustable Multi Disk Oil Brake



This style of brake can be adjusted by turning hex adjuster counter-clockwise to increase brake and clockwise to decrease brake. The direction of braking for all multiple disc brakes can be changed by removing the cam clutch, turning it over, and re-installing it. For detailed service instructions, contact your Tulsa Winch distributor or the factory.

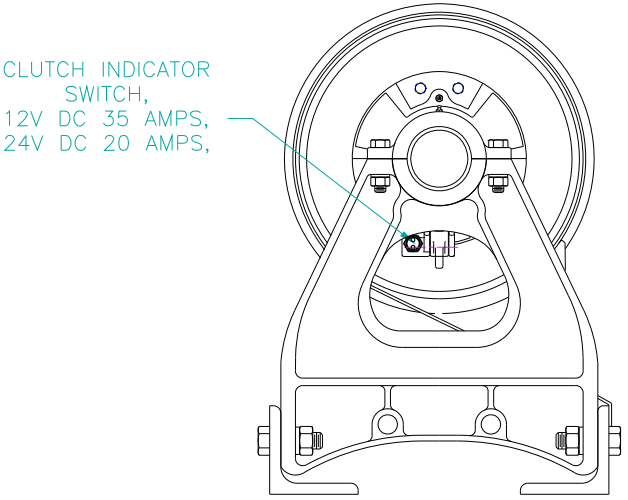
BRAKE ADJUSTMENT

In general, worm brakes on Tulsa winches should only be adjusted enough to hold the load you are currently working with. Over adjustment will result in excessive heat generation and brake wear. The most positive way to insure proper brake adjustment is to lift a test load just barely off the ground, jog the winch out, and see if the brake holds. If it doesn't, tighten the brake slightly and try it again. If the brake is tightened completely and the load still drifts, the brake must be serviced. DO NOT use the winch to lift loads with a worn brake.

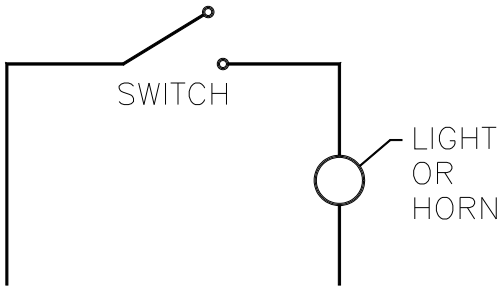
If the input to the winch is accessible and a torque wrench can be put on it, the brake can set with this torque wrench. The following table shows the torque values for all models based on rated linepull.

Winch Model	Brake Torque (Lb/Ft)
938	3
1138 or RN10W	3
1000	3
1200	4
10 or RN15W	32
12	32
18	50
18G	50
19	50
23 or RN20W	50
24	70
34	70
64	120
70	140
75	140
80	185

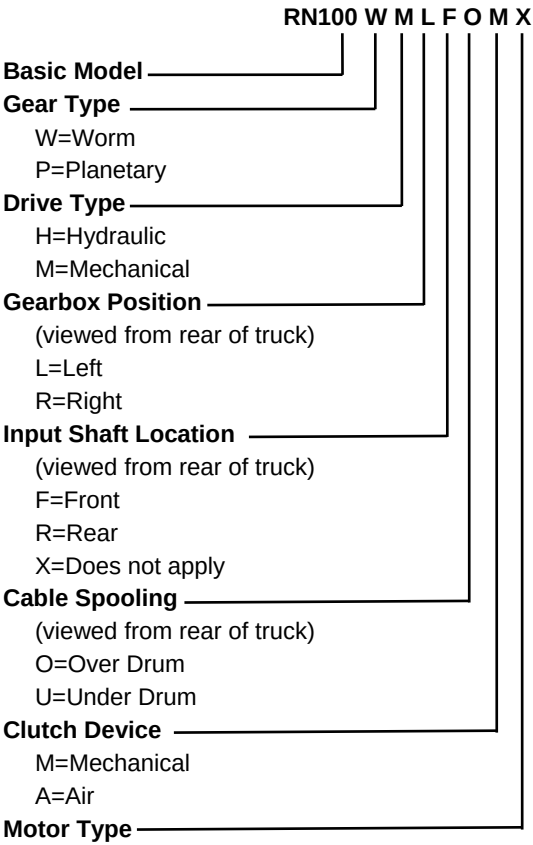
DRUM CLUTCH POSITION INDICATOR



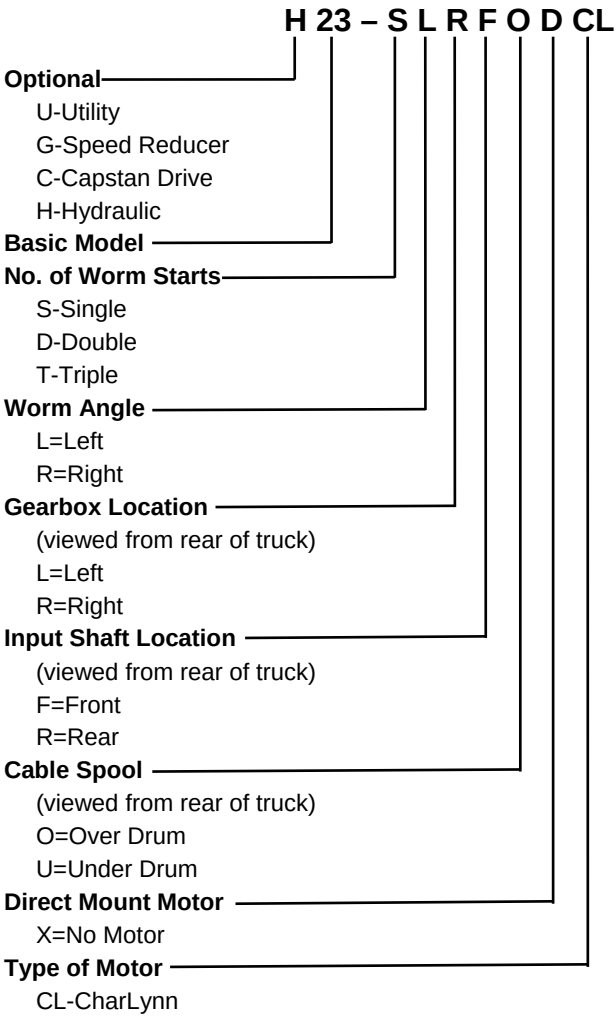
The clutch position indicator operates in a normally open position. When properly installed, as pictured in the circuit a warning light or horn will indicate when the drum clutch is disengaged



WINCH MODEL CODES



WINCH MODEL CODES

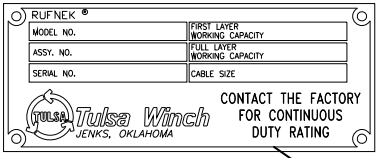


ALL Tulsa Winches have the serial number, and assembly number stamped both on the identification tag and on the housing. Please take a few minutes to record these numbers for future use. The assembly number will be required when ordering parts.

MODEL: _____

SERIAL NO:_____

ASSEMBLY NO:_____



Stamped
Serial Number

NOTES

TULSA WINCH LIMITED WARRANTY

Effective 1/1/2005
Supersedes All Prior Warranties

Seller warrants that each article sold under this order shall at the time of shipment (i) conform to applicable specifications, and (ii) be free from defects in material and workmanship during normal and ordinary use and service (the "Warranty").

Buyer's exclusive remedy and Seller's sole obligation under this Warranty shall be, at Seller's option, to repair or replace any article or part thereof which has proven to be defective, or to refund the purchase price of such article or part thereof.

This Warranty shall expire one (1) year from the date the article is first shipped by Seller. Notice of claimed breach of this Warranty must be given by Buyer to Seller within the applicable period. Such notice shall include an explanation of the claimed warranty defect and proof of date of purchase of the article or part thereof for which warranty coverage is sought. No allowances shall be made by Seller for any transportation, labor charges, parts, "in and out" costs, adjustments or repairs, or any other work, unless such items are authorized in writing and in advance by Seller. Nor shall Seller have any obligation to repair or replace items which by their nature are expendable.

If an article is claimed to be defective in material or workmanship, or not to conform to the applicable specifications, Seller will either examine the article at Buyer's site or issue shipping instructions for return to Seller. This Warranty shall not extend to any articles or parts thereof which have been installed, used, or serviced otherwise than in conformity with Seller's applicable specifications, manuals, bulletins, or instructions, or which shall have been subjected to improper installation, operation, or usage, misapplication, neglect, overloading, or employment for other than normal and ordinary use and service.

This Warranty shall not apply to any articles or parts thereof furnished by Seller to Buyer's specifications and/or furnished by Buyer or acquired from others at Buyer's request.

SELLER MAKES NO EXPRESS WARRANTIES AND NO IMPLIED WARRANTIES OF ANY KIND, OTHER THAN THE WARRANTY EXPRESSLY SET FORTH ABOVE. SUCH WARRANTY IS EXCLUSIVE AND IS MADE AND ACCEPTED IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedies for this Warranty shall be only those expressly set forth above, to the exclusion of any and all other remedies of whatsoever kind. The limited remedies set forth above shall be deemed exclusive, even though they may fail their essential purpose. No agreement varying or extending the foregoing Warranty, remedies, exclusions, or limitations shall be effective unless in a writing signed by an executive officer of Seller and Buyer. This Warranty is non transferable.

Under no circumstances shall Seller be liable (i) for any damage or loss to any property other than the warranted article or part thereof, or (ii) for any special, indirect, incidental, or consequential damage or loss, even though such expenses, damages, or losses may be foreseeable.

The foregoing limitations on Seller's liability in the event of breach of warranty shall also be the absolute limit of Seller's liability in the event of Seller's negligence in manufacture, installation, or otherwise, with regard to the articles covered by this Warranty, and at the expiration of the Warranty period as above stated, all such liabilities shall terminate.