

Winch Selection Guide

Winch Rating—Pulling capacity or the "rated maximum load" for a winch is determined by the maximum load a winch can pull with only the bottom layer of rope on the drum, an industry standard. Full capacity is retained on the bottom two layers. This rating does not include any friction factors, which will vary according to the specific applications.

Pulling vs. Lifting—Unless specifically indicated, the winches featured are designed for pulling only. Winches may not have all of the

features necessary for every lifting application. Winches rated for lifting are marked as such. Winches are not necessarily designed to meet hoisting applications. Refer to all ANSI/ASME requirements for specific applications. All of the winches featured are not to be used for lifting, supporting, or transporting people or loads over areas where people could be present.

Power—Most Dayton® electric and hydraulic winches have power "in" and "out". Some also have a clutch and/or freewheel feature.

Duty Cycle—Unless specified otherwise, most electric DC and AC powered winches cannot be operated continuously. To do this will overheat and damage the motor. The maximum normal duty cycle is 1 to 3 minutes ON, followed by a 20-minute cool-down period. For more frequent operation needs, refer to long cycle or longer duty rated electric units, and continuous duty rated hydraulic winches.

ROLLING WEIGHT

Rated Line Pull (RLP)*	Grade					
	10%	20%	40%	60%	80%	100%
1000 lb.	5025	3401	2155	1664	1422	1285
1500 lb.	7538	5102	3233	2496	2134	1928
2000 lb.	10,050	6803	4308	2816	2407	2175
2500 lb.	12,563	8503	5388	4160	3556	3213
3000 lb.	15,075	10,251	6428	4991	4268	3854
3500 lb.	17,588	11,905	7543	5824	4979	4499
4000 lb.	20,100	13,668	8643	6655	5690	5138
4500 lb.	22,613	15,306	9698	7488	6401	5784
5000 lb.	25,126	17,009	10,776	8320	7112	6427
6000 lb.	30,151	20,408	12,931	9983	8535	7712
9000 lb.	45,226	30,612	19,397	14,975	12,802	11,568

(*) Most winch ratings are based on the first layer of wire rope on the drum. You could experience a loss of up to 13% pulling capacity per layer of wire rope (see example below)

Rolling Weight—For safe, sure loading, find the column in the table that matches your percentage of slope or grade. Determine the slope by dividing the amount of your rise by ramp length. Match the slope with the nearest weight of what you may be pulling, always round up, and locate the corresponding winch Rated Line Pull (RLP)*. This guide includes 10% rolling friction. Some applications may require larger capacity winches than indicated.

To convert lbs. to kgs. multiply by 0.4536.

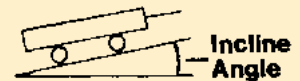
- A 10% grade is a rise of 1 foot in 10 feet
- Winches are not intended as a load securing device
- Secure load with appropriate tiedowns

ROLLING LOAD CAPACITY

Maximum Pull Capacities For Rolling Type Loads at Various Angles of Inclines

Percent Incline	Multiply by:	Percent Incline	Multiply by:
Level Surface	10.00	30 (17°)	2.61
5 (3°)	6.67	50 (26°)	1.86
10 (6°)	5.02	70 (35°)	1.53
20 (11°)	3.40	100 (45°)	1.29

To calculate the rolling load capacity of a winch (the amount of load that can be pulled up an incline), multiply the rated capacity, single or double line, by the factor shown in the chart at the left. Multiplication factor shown includes a 10% rolling friction factor; actual friction factors may vary.



Example of the effect of each layer of cable drum wind on Rated Line Pull (RLP) and rolling loads for No. 3VJ70. RLP-The weight the winch can pull perpendicular to the ground with a single line on the first layer of wire rope on drum.

No. 3VJ70	RLP (Lbs.)	10%	20%	40%	60%	80%	100%
1st layer	5000	25,126	17,007	10,776	8320	7112	6427
2nd layer	4231	21,260	14,390	9118	7040	6018	5438
3rd layer	3667	18,426	12,471	7902	6101	5216	4713
4th layer	3236	16,258	11,004	6972	5383	4602	4159
5th layer	2894	14,547	9846	6239	4817	4118	3721

When to Consider a Pulley Block—

If you need to offset the winch but retain a straight shot, a pulley block lets you, with a hook for mounting and a pulley for the wire rope. A pulley block also adds to the winch's pulling capacity: simply attach the pulley block's hook directly to the load and the winch's hook to a sturdy mount nearby.

Electrical Performance—To maintain electrical performance from a battery to the winch, it is recommended dropping 3 wire sizes for every doubling of the length of the standard wire harness.

Example: No. 6 to No. 3 or 2 gauge.



FEATURE EXPLANATION FOR CHARTS

- 1. Clutch Release**—Ability to control release of a load with a clutch instead of a winch motor.
- 2. Freewheel**—Ability to pull cable freely from the winch drum by hand under no load conditions.
- 3. Pulley Block**—For double line winch operation and pull redirection. Doubles pulling capacity of winch, but results in lower speed, lower amp draw, and longer run time.
- 4. Mechanical Brake**—Friction within the winch gears or separate friction brake device which automatically holds the load in position when the power switch is released.
- 5. Dynamic Brake**—Electromechanical stopping and holding of a motor that holds a load only when there is power connected to the winch.

TYPES OF GEARING

Planetary Gearing—Has a coaxial shaft capable of large reductions in a small space. Capable of handling high bearing loads.

Worm Gearing—Has right-angle shafting, requires only 2 gears, and is self locking. Generally provides high ratios.

Spur Gearing—A simple gear design using 2 or more parallel shafts with gears operating in the same plane. Produces less friction than worm or planetary gearing for greater efficiency. Requires a braking system.