



SURFACE VEHICLE STANDARD	J706™	NOV2017
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Rating of Winches		

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1. **Scope**—This SAE Standard applies only to new winches which are primarily designed for intermittent pulls and lifts and whose configuration and condition are the same as when they were shipped by the manufacturer. They are not intended to be used in any manner for the movement of personnel. They may be driven by any power source recommended by the manufacturer and will be capable of being powered in either direction. They will be equipped with an automatic safety brake system to control a load when lowering under power and positively hold a load when power is not being delivered to the winch. A hydraulic flow control valve or similar device may be used in the brake system to control a load when lowering under power. A clutch to release the drum for “free-spooling” may be provided and will be designed not to disengage itself under load. A drag brake may be provided to control “free-spooling,” but will not be relied on to control or hold a load. Power sources, such as hydraulic motors, even though they may be supplied or recommended by the winch manufacturer, are not considered a part of the winch so far as this document is concerned, except to whatever extent they are a part of the brake system.
2. **References**—There are no referenced publications specified herein.
3. **Definitions**
 - 3.1 **Free-Spool**—The operation of unspooling wire rope from a drum by pulling on the free end of the rope while the winch is stationary. The drum is disconnected (declutched) from its powertrain during this operation.
 - 3.2 **Wrap**—A single coil of wire rope wound on a drum.
 - 3.3 **Layer**—All wraps of the same diameter between drum flanges.
 - 3.4 **Freeboard**—The amount of drum flange that extends radially past the top wire rope layer of a full drum.
 - 3.5 **Full Drum**—A drum containing the maximum permissible number of layers as defined in 5.5.
 - 3.6 **Rated Load**—The load that produces the maximum rated line pull on the first layer.
4. **General Specifications**
 - 4.1 **Name Plate**—A name plate containing the following information will be permanently attached to a major winch component in a location on the winch that is both conspicuous and protected.

4.1.1 MANUFACTURER'S NAME

4.1.2 MANUFACTURER'S MODEL DESIGNATION

4.1.3 RATED LINE PULL

“L” layer, (full drum) pounds¹
First layer (pounds)

4.1.4 RATED INPUT SPEED AT RATED LINE PULL (RPM)

4.1.5 DUTY CYCLE RATING (FEET OR °F)

4.1.6 MAXIMUM RECOMMENDED WIRE ROPE DIAMETER (INCHES)

4.1.7 A warning that winches covered by this specification are not intended to be used in any manner for the movement or lifting of personnel.

4.2 Safety Brake System—The safety brake system will be capable of automatically and continuously holding rated load when power is not being delivered to the winch. When lowering a load under power, it will operate automatically and have adequate thermal capacity to control rated load at rated speed for a distance of 50 ft without appreciable loss of effectiveness due to temperature rise. Any loss—other than that due to normal wear—is expected to return when the brake cools. Adjusting means, automatic or manual, will be provided to compensate for wear of friction materials. When raising a load, the safety brake will automatically release and not generate an appreciable amount of heat.

4.3 Drum Release Clutch—The clutch, if provided, will be a positive-engagement type; friction-type clutches are not acceptable. Automatically applied means such as springs, detents, or angled jaw faces will be provided to insure that the clutch will not slip out of engagement under load.

4.4 Drum Drag Brake—A drum drag brake will be provided if a drum release clutch is not provided. Its purpose is to prevent the drum from overrunning the wire rope when “free-spooling,” and it will not be relied on to control or hold a load.

4.5 Drum Diameter—The drum diameter will be at least eight times the maximum recommended wire rope diameter.

5. Published Data—The manufacturer's literature will contain, as a minimum, the information in 5.1 through 5.8.

5.1 Duty Cycle Rating (feet or °F)—The duty cycle rating is the total number of feet of wire rope travel at rated line speed and one-half rated line pull to achieve a temperature rise from 100 °F to 250 °F, or, if the temperature stabilizes below 250 °F, the duty cycle is the stabilization temperature. (See 6.2 for the procedure to establish the duty cycle rating).

5.2 Starting Input Torque (pound-feet)—The starting input torque is the torque at the winch input shaft required to start rated load upward from a suspended position.

5.3 Running Input Torque (pound-feet)—The running input torque is the torque at the winch input shaft required to maintain upward movement of rated load.

1. Letters on this line to be approximately 50% larger than letters on the “first layer” line. Use the value of “L” calculated from 5.5 for the maximum recommended wire rope diameter.