



PRODUCT RECOMMENDATION PROGRAM

ABSTRACT

An in-depth product evaluation of both the Come-Up Seal Slim 12 and the Solo seal 9.5 conducted by the International Four-Wheel Drive Trainers Association (I4WDTA)

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PRP Director

I4WDTA Product Recommendation Program Report



Product recommendation report: Come up Seal slim 12.5 and Solo Slim 9.5

The purpose of this report is to provide both Come up and the general public testing information from the International Four-Wheel Drive Trainers Associations Product Recommendation Program. The programs' purpose is to take and evaluate new industry products by selected I4WDTA trainers who work in the off-road driving and recovery industry as both Guides and instructors. This provides our industry partners with real world feedback from professional users under real world use in a variety of environments. The end state is to determine if the product is something our trainers would both use and recommend to their customers and as association as a whole.

Come up Winch Product descriptions:

The Seal Slim 12.5 winch (left) is a Severe duty winch rated to 12,500 lbs. Equipped with a heavy-duty wound motor rated at 5.0 HP 3,730W. It has a hardened steel, 3 stage planetary gear train. It comes with a built in two-way digital signal wireless remote control and wired water proof remote control. The winch line is 12 strand construction synthetic rope coated to prevent abrasion. The housings are aluminum die cast built to withstand the 2X the load rating of the winch. The brake is an Automatic full load cone brake system. The gear ratio is a 3-stage planetary 225:1. The winch can be mounted foot forward or down depending on the user's needs.

The Solo Slim (right) has all the same above except the gear ratio being 159:1. The Solo Rs 12.5 has same features except the option of a modular control box for remote location.



Seal Slim 12.5



Solo Slim 9.5



Solo 12.5 RS

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Evaluation details

Evaluation articles:

- 4 sample articles were utilized in this evaluation 3 provided by Come-up Winch
- 1 privately owned article.
- 3 Seal slim 12.5 and one Solo Slim 9.5

Each variant was evaluated in different locations in different environments. This allowed for varied types of terrain, seasonal weather conditions and other conditions each article would see while in use.

- West Virginia
- Texas
- Missouri

Vehicles: a variety of commercial vehicles such were used with weights ranging from 6-8000lbs

- Toyota Land cruiser 200 Series
- Toyota 4 Runner 5th gen
- Ford Ranger
- Range rover



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The I4WDTA instructors were asked to use the winches provided in normal everyday fashion as well as conduct recoveries during training under controlled conditions and any other time they may need to use their winch. The intent is capturing pertinent information during the recovery such as weather, type of recovery conducted, weather conditions and any noticeable issues found during the winching process.

Instructors were asked to provide their findings in the following areas.

- Ease of installation
- Product instructions
- Maintenance instructions
- Types of rigging: single line, double line, redirect, utilizing angles of 30-35 degrees.
- Any noticeable issues, failures, breakages, or safety issues.
- Durability
- Pros and cons of the Come-up winches provided
- If they would add this item to their normally used recovery equipment
- If they would recommend this product to their students/clients

Below is the summarization of the collected information in each category from all participating instructors over the course of the last 4-month period with one winch being used over a 12-month period the evaluation was being conducted.

Ease of Installation:

- It was determined by all participants that both variants are easily installed with general mechanical ability, basic and simple hand tools and will fit most of the winch bumpers currently on the market. Installation averaged 4-6 hours due to the need to reconfigure the winch to foot down configuration.
- The size of the control box does make it a challenge in regards to clearance on several of the installations on newer winch bumpers with low clearance from the grill.
- The winches came in a foot forward configuration. The majority of US commercial winch bumpers come in a foot down configuration. This may be of consideration for US sales eliminating the need to reconfigure the winch for foot down installation, less work for customers.
- Several instructors mentioned that there was too much line on the drum upon installation. The line was layered up to the point of almost touching the cross tubes. This could result in an issue when winching at an angle causing side load causing faster layering on one side and hitting the cross tubes either damaging the line or bending the cross tubes.
- It was noticed that the line mounting to the drum was remnant to the use of steel cable. The end of the line is run through a hole in the end of the drum then layered over itself. This caused concern of line breakage and line slipping when on its first layer.

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- It was also noted that the winch line did not have any labeling stating the working load limits or any other data for the end user to reference, this would be important information when doing recovery calculations for both commercial and professional use.
- The winches come with as steel hook and metal eyelet at the end of the winch line. These are not commonly used anymore and are typically removed by end users for either just an eyelet or closed rigging style attachment. The hook had a rating of 6.5 tons with is only half the capacity of the line and winch.



All Items and accessories included with the Seal slim 12.5R

Product instructions:

- The instructions are very well laid out and clear for user installation. Some verbiage could be cleaned up to use the proper terminology and rechecked for proper terminology.
- Instructions look good at first glance but upon close scrutiny they are written in foreign context.
- Question regarding ability to mount foot down, instructions state only for foot forward mounting?
- Instructions to clock gearbox were simplified compared to actual steps to do so.
- Instructions have nothing about mounting options or requirements. Customer left to figure that out. A novice may well be left not knowing how they could mount.
- Instructions did have very detailed guidelines on areas covered with good clear pictures, good slick sheet on how to link the blue tooth controller as well as trouble shooting guide.

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The Installation instruction, user manual and set up instructions.

Maintenance:

- Maintenance instructions are not very detailed for how to conduct maintenance but very detailed on what maintenance needs to be done. Mostly straight forward located on p. 16 and a chart on p. 17 of the User's Guide.
- A maintenance schedule is provided and description of what needs to be done to maintain the winch but not how to conduct the maintenance itself.

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Rigging and recovery

The use of various types of recoveries and rigging set ups were requested to be used to ensure a wide variety of use cases could be completed with each of the test samples. From the following recovery rigging set ups evaluators were asked to use the test samples in each configuration to see how their test samples worked in their working environment after repeated use.

Evaluators were asked to use their test samples by conducting a variety of recoveries. Recoveries were to range from self-recovery and the recovery of other vehicle platforms. The intent was to put each test sample through real world use scenarios that our evaluators find themselves doing while guiding or conducting training on proper use of recovery equipment and techniques.

The rigging set ups ranged from though a variety of single line, double line, redirect using pulley blocks and at a wide variety of angles to ensure that the winch would see realistic use cases. While 35 degrees is norm and recommended maximum angle to conduct a recovery, some evaluators conducted recoveries based on circumstances above 35 degrees.

Any noticeable issues, failures, breakages or safety issues.

Over the course of 3-4 months and more than 80 recoveries across 4 test samples the following were the observations that were reported by the evaluators.

Seal Slim 12.5:

- Three Evaluators reported that when using the winch in free spool to pull out line to conduct a recovery that the line was extremely hard to pull out. All of the evaluators are within the 95th percentile male height and weight ranges. See attached video.
- Evaluators tried several methods of accommodating for the difficulty in free spool. From taking the gear set cover off and spraying WD-40 into it, bumping the line out with the remote while in free spool and just seeing if it becomes easier to free spool after a number of recoveries or usage. No one attempt to address had any significant effect on the issue.
- All evaluators agreed that there is too much line on the drum. Potential issues from this range from sideloading to having to constantly re rig to keep the winch in its power band of the 1-2nd layers of line on the drum. Most evaluators ended up shortening the winch line or safe use.
- All evaluators except one opted to eliminate the metal hook due to its low rating and wanting use a full closed rigging set up.
- Evaluators reported that they would see a lot of rope material building up on the back side of the fairlead.
- During winching with one of the Seal Slim 12.5 winches saw two winch line breakages. These two were due in part of the winch mounting in the Rovern brand bumper. The winch was not

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in center line completely with the fair lead opening due to the additional length of the motor. The fleet angle from the winch to the back side of the fairlead opening was not directly in line. After review of the damages, it was determined these were the cause of the line damage resulting in the breakage.

- Three other instances of the line breaking were located at the end of the line that runs through the hole in the drum. The line is constricting down on the portion of the line running into the hole on the drum. The line is being flattened onto the sharp edge of the hole cutting the line.
- The chamfer on the back of the hawse fairlead provided seem to not have enough radius and causes a lot of winch line material build up from coming through the fairlead accelerating the wearing of the line.

Seal Slim 9.5

- One instructor had an instance where the line slipped off the drum while winching due to the way the line is installed on the drum. Between the silicon coating and the way, the line is installed on the drum this caused the line to continue to slide off when it was used on the first layer (11 wraps) during a recovery.

Durability and performance:

Over the course of 3-4 months of varied heavy use of 4 test samples during recovery operations the following was reported in regards to Durability and performance. It's of note that the winches were exposed to harder than normal winching operations such as steep grades used, longer than normal run times, heavy loads, repeated use. limited time in between recoveries and running higher in the power band width than normal.

- Only one exhibited any mechanical failure. The heating up of the negative lug on the motor
- No examples of high motor temperatures were exhibited under heavy load and long duty cycles
- No reporting of any high amperage draws was reported under heavy load and long duty cycles
- No reported failures in regards to electrical components, controllers, control boxes.
- The winches all held weight with no issues from the cone brake system they utilize.
- The line speed exhibited by each winch was acceptable for use in both basic and advanced recovery operations.
- All but one winch exhibited heavy resistance during free spooling.

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Pros and Cons:

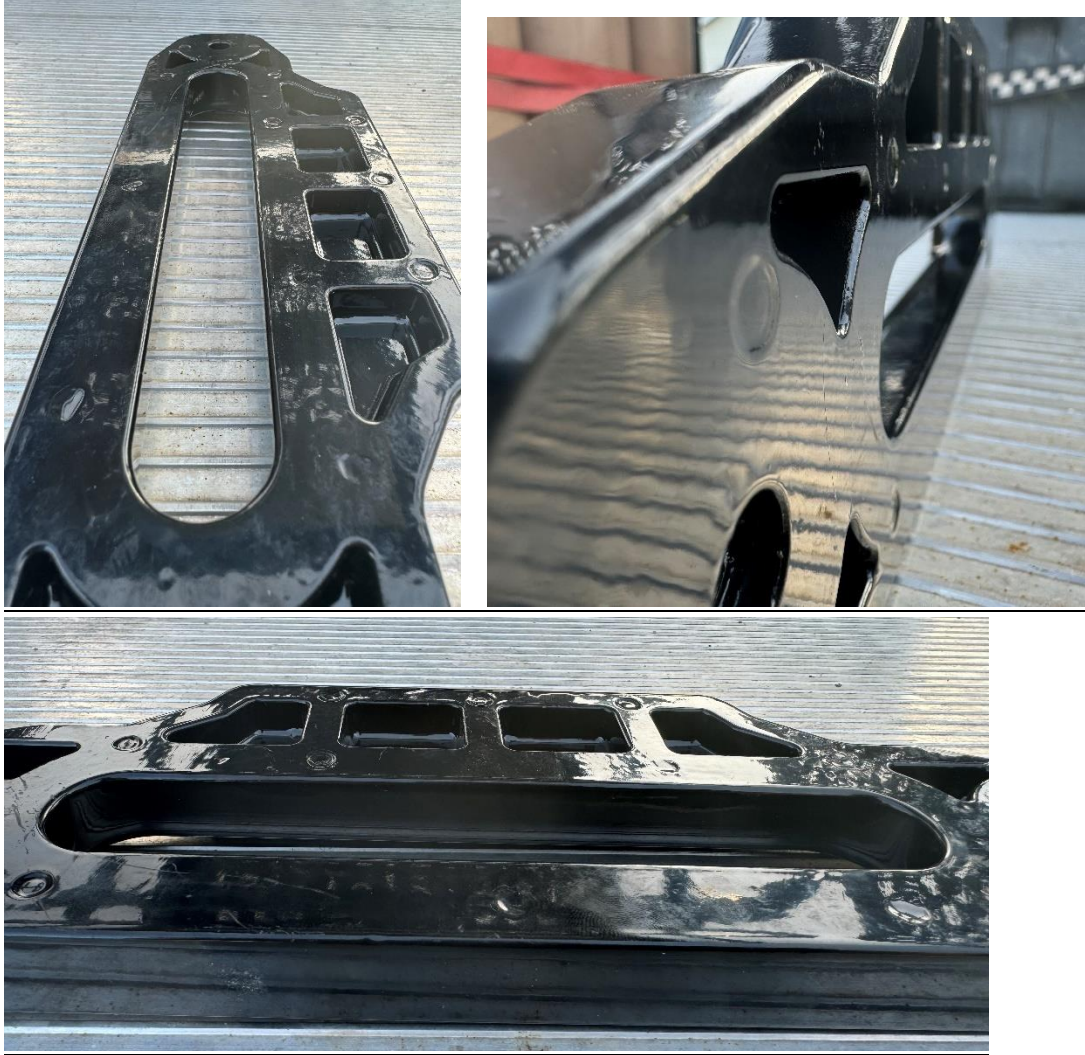
Pros:

- Winches all performed very well while used under heavy duty use conditions
- Only one winch reported any mechanical or electrical failures during testing
- No high amperage draws or overheating issues were reported.
- Installation is easy all required equipment is provided
- User instructions are detailed enough to make for an easy installation

Cons:

- Winch line is very difficult to free spool out
- Hawse fairlead back side showing to cause accelerated wear on the winchline
- Hawse fairlead openings are too small.
- Winchline installation method causes wear and cutting of the line on the drum.
- Too much line on the drum

Hawse Fairlead:



Prior to installation the minimal amount of radius on the back side where the fairlead is chamfered was noticed. Due to concern of line damage Two winch samples ran the Come up fairlead. A standard delrin roller fairlead and a Hawse pro roller fairlead were used by the other two instructors for comparison.

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Another contributing factor to the rapid wearing of the winch line is the measurements of the opening on the Hawse fairlead. The width of opening is $7 \frac{1}{4}$ on a 9 inch drum. The difference in this opening to the drum is significant enough to cause a sharp angle when the line is at either end causing the winch line to drag over the radius of the back of the fairlead.

The vertical opening is 1 inch which is very small and when combined with the amount of line on the drum causes the same effect of a steep angle being created when the line wraps increase on the drum. When the line is on the 1-3 layer the angle of the winch line is more straight on with the opening of the fairlead. As the layers increase 4-5 on the underside of the drum the angle becomes greater and causes the line to drag across the back side of the fairlead where it has minimal radius causing excessive wear.

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Hawse Fairlead:



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Hawse Fairlead: As can be seen in the pictures above on winch 1, the excessive amount of line material showing from the backside of the fairlead. The majority of the buildup and wearing of the line is occurring on the inside of the back portion of the fairlead. This amount of wear was seen after 4-5 uses during recovery.

Winch 2:



Winch 2 was a winch that has been employed for long term use 11-12 months. It was observed early on the amount of wear on the winch line and it was replaced by a Hawse Pro roller fairlead. Notice the winchline material on the left of the fairlead.

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Hawse Fairlead:

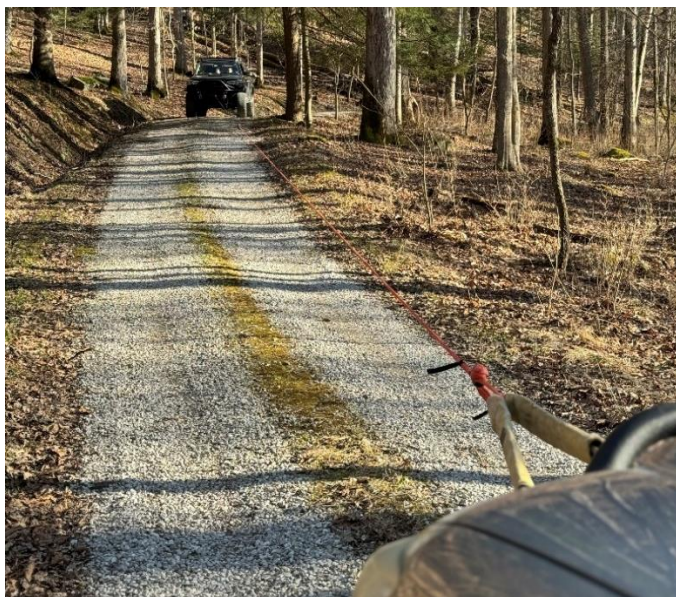


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Hawse Fairlead: After a substantial amount of heavy usage as seen above during training and testing with harsh angles and loads one of the evaluators using a roller fairlead reported wear on the winchline but no failures, breakages or issues other than the line coming loose at the connection point where the line goes through the drum. Minimal wear and tear using a roller fairlead.



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Hawse Fairlead: As seen above the other vehicle using a roller fairlead conducting typical self and second vehicle recoveries with angles under 35 degrees exhibited mild if any line damage or evidence of wear. The pictures below show the line post 22 recoveries conducted on the line using a Hawse Pro roller fairlead.



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Winch line:



Land Rover



4Runner

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Toyota Land Cruiser

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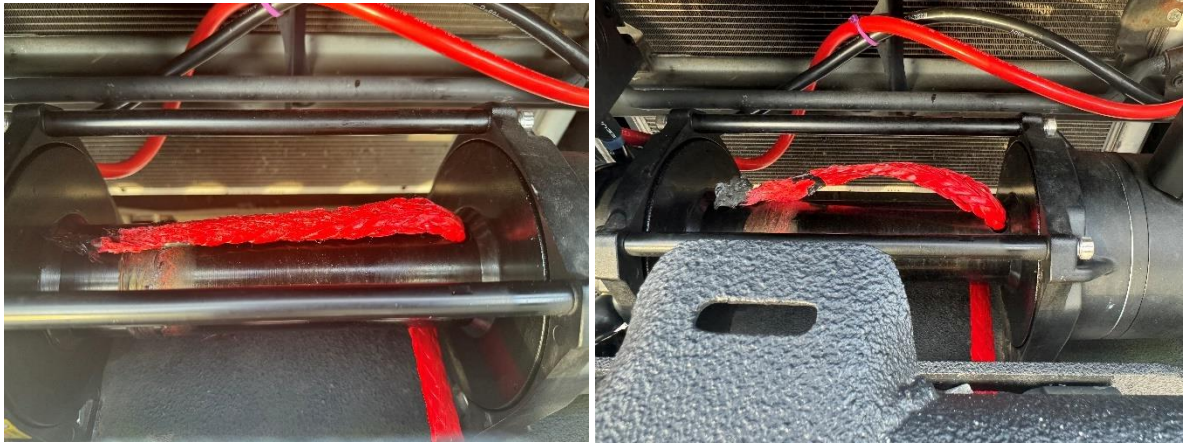
Winch Line: Upon installation of all of the winches it was noticed that amount of line on the drum 100+ feet. The amount of line installed is too much for the following reason.

1. This amount of line can easily layer over itself during side pulls and without enough room or space when pulling on to the 3-5th layers could cause damage to the winch line when making contact with the cross bars or damage the cross bars. A 25% free board is recommended.
2. The amount of line on the drum also drops the winching puling power by taking the motor out of its powerband when winching and typical users will use the winch all the way the through the layers causing more amperage draw and higher temperatures when winching.
3. The amount of line on the drum causes so much excess line to deal with when paying line out to get the line down to the first layer where the winch will be at 100% of its pulling capacity.
4. As seen on the hawse fairlead the winch line makes contact on the back of the fairlead at a steep angle when the line is drawn in and increasing with each additional layer causing damage to the line. See pictures below.
5. In the installation picture above, it shows damage present at installation on the Toyota land Cruiser. The damage appears to be from making on the crossbars and underside of the solenoid control box. The damage is due to too much winchline being installed on the drum. This amount of line on the drum does not allow for side loading and overlaying of the line and could cause winch line failures. The instructor reduced the amount of line down to 70 feet to conduct testing.



Example of the angles created when the line is on it 4-5 layer under load and receiving damage when running down the back side of the radius on the hawse fairlead.

Winch Line:



The winchline is installed on to the drum via an old method remnant of steel cable. The synthetic line is run through a hole in the drum and secured by a hex key bolt running into the hole. During testing all four winches have a failure due to this method of securing the line to the drum. One winch (ford Ranger) had a line come completely off during a recovery, the line came completely through the hole and off the drum. The was remedied by the re installation of the line using a constrictor knot.

All for winches had some degree of line damage due of the line doing through this hole in the drum and the line being laid over flat cutting the line on the sharp inner lip if the hole.

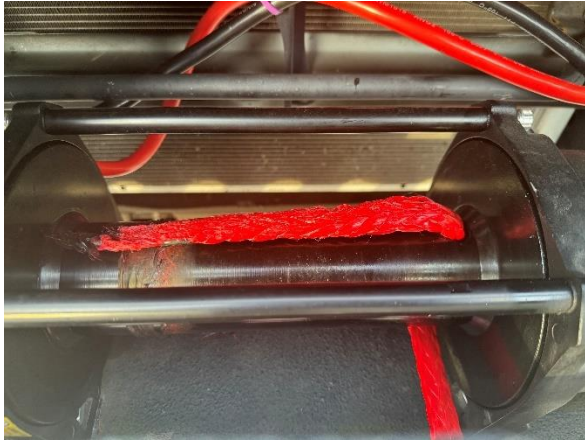
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Land Rover: The Land rover had several breaks and re-instalaltions to complete testing. The land rover saw some of the highest loads during testing ranging up to 11,000 LBS

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4Runner: Seen above is the start of damage on the line at the point where the line come out o fthe hole to start to lay across the drum. This is after 22 recoveries ranging from 6-7000lbs with moslty strait pulls using single line and double line pulls.

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Toyota Land Cruiser: the lines show a cut in one of the braids and fraying of others. The Toyota Land Cruiser has been installed the longest and been used for training classes doing demonstrations of rigging and recovery procedures over the course of 10-11 months. Minimal loads ranging from 4-6000lbs.

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Winch Line Hook:



The metal hook included with the winch has a labeled rating of 6.5 tons. The issues with this item being included with the winch is that it is the most underrated item in the system and would be a potential failure point in the rigging. The winch is rated to 12,500 lbs and the line is rated to 21,600 lbs. During testing the winch saw recoveries with loads up to 11,000lbs. Due to the hook being rated to half the pulling capacity of the winch and less than 1/3 the load rating of the line it would be recommended to eliminate this from the equation to eliminate the risk of a failure during recovery.

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Conclusion:

After 3-4 months of in-depth evaluation of the Come-up series of winches. The Seal Slim 9500, 12,500 and Solo 12,500 the following is concluded.

All winches tested were easily installed, came with all required items needed for installation and operations instructions and written materials were well put together with minor recommendations to change on the maintenance instructions.

The performance and durability of the winches were reported as very high with only one reported overheating or high amperage draw. It was reported that even under heavy use the winches had no issues with loads seen during the evaluation process. All evaluators reported positive comments on the winch's operations and performance in the field as a very solid, durable and well performing winches. The Blue tooth winch controller had no reported issues during the evaluation process and seemed to work well for all evaluators.

During the evaluation the following point of concern were found across all of the winches.

1. Very hard to pull out winch line in free spool.
2. Too much winch line on the drum causing line damage and potential for winch damage.
3. The winchline installation to the drum causing line damage and breaking.
4. Hawse fairlead issues, too narrow from drum size, small radius on the backside causing winchline damage
5. The recovery hook being too underrated when compared to Winch and winch line capacities

Recommendations:

1. Identify the issues and correct the hard to pull out line via internal examination
2. Reduce the amount of line on the drum
3. Change the winch line installation method to the drum. (Constrictor Knot method)
4. Correct radius and centerline issues on the Hawse fairlead
5. Change or eliminate the recovery hook from the system.

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Due to all of these issues being a contributing and compounding factor to winch line damage and breaking as well as underrated WLL on the hook in the system. These Issues raise a safety concern for use in winching operations during off-road recovery. Given these items of concern the International Four-Wheel Drive Trainers Association cannot recommend this product in its current configuration at this time. The fact that the issues can be mitigated easily with no major design changes to the Winch itself and if the recommended changes were made then the I4WDTA would be more than happy to recommend these products for use by our trainers their students and clients.

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Come-up winch follow up Product recommendation program update.

Upon Come Up winches review and response to some requested changes posed by the I4WDTA Product Recommendation program. Come Up winch has looked at the I4WDTAs evaluation and recommendation on their product and have clarified and remedied some of the identified issues and have proposed to adopt some of the changes recommended by the I4WDTA.

Mitigated issues: Hook working load limit

(Information provided by Come -up winches)

COMEUP Sling Hook Part number 88247

The COMEUP Sling Hook is rated with a WLL of 3.15T. The WLL is calculated by dividing the Minimum Breaking Strength (MBS) of 12.6T (27,778 lbs.) by a safety factor of 4. The safety factor of 4 is defined by the hook manufacturer. The MBS of COMEUP hook is rated at 222% of the Slim 12.5 winch and 293% of Solo 9.5 winch pulling capacity. The COMEUP Sling Hook is appropriate for use with any winch with a pulling capacity up to 12,500 lbs.

This clarification of the WLL of the Hook provides a high degree of confidence in the equipment and is no longer viewed as an issue on the Come-up winch for safe recovery operations.

Proposed adoption of recommended changes to the Come-up winches:

Come-up has agreed to adopt some of the following recommended changes from the I4WDTA.

(See attached Letter from Come-up)

- 1. Rope Length Adjustment:** The rope length will be reduced to prevent contact with the winch tie-bar, thereby minimizing the risk of rope damage.
- 2. Constrictor Knot Installation:** We will adopt the Constrictor Knot Method for rope installation, ensuring a more secure and reliable attachment.
- 3. Enhanced Free Spooling:** Improvements will be made to facilitate easier free spooling and effortless pulling out of the winch rope.

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Recommendation:

Based on the remedied concern of the WLL of the recovery hook and the adoption of the recommended changes on Come-ups winch models in the SOLO, SLIM and DV line. The International Four-Wheel Drive Training Association is proud to certify that Come-up winch products in this report have gone through thorough examination, practical application in a variety of environments by our certified trainers administering real world relevant evaluation methods.

The Come-up Winch's SOLO, SLIM, DV product lines with these enhancements are recommended for use by our certified trainers, students and clients for safe use in off road recreational recovery.

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