OPERATION AND MAINTENANCE

QUICKSWAP

Model(s): Standard and With Tag Axle

Friday, August 22, 2025
Document number: 8923701 — Revision 1
Original Instructions

NRC-INDUSTRIES.COM

Serial number:





INTELLECTUAL PROPERTY NOTICE

Please send your comments and questions to:

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For any questions about the winches, you can contact the manufacturers directly:

DP Winch (TWG, Inc.)
PO Box 1130
Jenks, OK 74037-1130
Tel: (918) 298-8300
Fax: (918) 298-8301
Website: www.dovertwg.com

Ramsey Winch Company
PO Box 581510
Tulsa, OK 74158-1510
Tel: (918) 438-2760
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Website: www.ramsey.com

REVISION HISTORY

Revision	Date	Description
1	2025-08-22	Correction to 4.1.2.
0	2023-08-17	Initial release

CONTENTS

LIMITED WARRANTY

A. GENERAL PROVISIONS - THE WARRANTY DESCRIBED BELOW IS PROVIDED BY INDUSTRIES NRC INC, 2430 PRINCIPALE EST C.P. 160, ST-PAUL D'ABBOTSFORD, QUÉBEC, CANADA, J0E 1A0 ("INDUSTRIES NRC") TO THE ORIGINAL PURCHASER OF NEW TOWING AND RECOVERY EQUIPMENT ("EQUIPMENT") PURCHASED FROM INDUSTRIES NRC OR AUTHORIZED INDUSTRIES NRC DEALERS. UNDER THIS WARRANTY, INDUSTRIES NRC WILL REPAIR OR REPLACE, AT ITS OPTION, ANY PART COVERED UNDER THIS WARRANTY WHICH IS FOUND TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP DURING THE APPLICABLE WARRANTY TERM. WARRANTY SERVICE MUST BE PERFORMED BY A DEALER OR SALES SERVICE CENTRE AUTHORIZED BY INDUSTRIES NRC TO SELL AND/OR SERVICE THE EQUIPMENT (THE "AUTHORIZED DEALER"). THE AUTHORIZED DEALER WILL USE ONLY NEW OR REMANUFACTURED PARTS OR COMPONENTS FURNISHED OR APPROVED BY INDUSTRIES NRC. WARRANTY SERVICE WILL BE PERFORMED WITHOUT CHARGE TO THE PURCHASER FOR PARTS. HOWEVER, THIS WARRANTY DOES NOT OBLIGATE INDUSTRIES NRC TO BEAR THE COST OF LABOR OR TRANSPORTATION CHARGES IN CONNECTION WITH THE REPAIR OR REPLACEMENT OF ANY PARTS FOUND TO BE DEFECTIVE, NOR SHALL IT APPLY TO A PRODUCT UPON WHICH REPAIRS OR ALTERATIONS HAVE BEEN MADE UNLESS AUTHORIZED BY INDUSTRIES NRC. THE PURCHASER WILL BE RESPONSIBLE FOR SERVICE CALLS AND/OR TRANSPORTATION OF EQUIPMENT TO AND FROM THE AUTHORIZED DEALER'S PLACE OF BUSINESS (EXCEPT WHERE PROHIBITED BY LAW), FOR ANY PREMIUM CHARGED FOR OVERTIME LABOUR REQUESTED BY THE PURCHASER AND FOR ANY SERVICE AND/OR MAINTENANCE NOT DIRECTLY RELATED TO ANY DEFECT COVERED UNDER THIS WARRANTY. THIS WARRANTY IS TRANSFERABLE, PROVIDED AN AUTHORIZED INDUSTRIES NRC DEALER IS NOTIFIED OF THE OWNERSHIP CHANGE, AND INDUSTRIES NRC APPROVES THE TRANSFER.

B. WHAT IS WARRANTED - SUBJECT TO PARAGRAPH C, ALL PARTS, MANUFACTURED BY INDUSTRIES NRC, OF ANY NEW INDUSTRIES NRC EQUIPMENT, ARE WARRANTED FOR THE NUMBER OF MONTHS SPECIFIED BELOW. WARRANTY STATEMENTS COVERING COMPONENTS NOT MANUFACTURED BY NRC ARE FOUND WITH THE OPERATOR'S MANUALS DELIVERED WITH THE EQUIPMENT.

C. WHAT IS NOT WARRANTED - PURSUANT TO THE TERMS OF THIS WARRANTY, INDUSTRIES NRC IS NOT RESPONSIBLE FOR THE FOLLOWING: (1) USED EQUIPMENT (UNLESS IT IS SPECIFICALLY COVERED BY SEPARATE WARRANTY DOCUMENTS); (2) ANY EQUIPMENT THAT HAS BEEN ALTERED OR MODIFIED IN WAYS NOT APPROVED BY INDUSTRIES NRC, INCLUDING, BUT NOT LIMITED TO, HYDRAULIC PRESSURE SETTINGS ABOVE INDUSTRIES NRC SPECIFICATIONS; (3) DEPRECIATION OR DAMAGE CAUSED BY NORMAL WEAR, LACK OF REASONABLE AND PROPER MAINTENANCE, FAILURE TO FOLLOW OPERATING INSTRUCTIONS, MISUSE, LACK OF PROPER PROTECTION DURING STORAGE, VANDALISM, THE ELEMENTS OR COLLISION OR ACCIDENT; (4) THE EQUIPMENT IF USED FOR OVERHEAD LIFTING, CRANE WORK OR ANY OTHER UNAPPROVED ACTIVITY; (5) NORMAL MAINTENANCE PARTS AND/OR SERVICE.

D. SECURING WARRANTY SERVICE - TO SECURE WARRANTY SERVICE THE PURCHASER MUST, (1) REPORT THE EQUIPMENT DEFECT TO AN AUTHORIZED DEALER AND REQUEST WARRANTY SERVICE WITHIN THE APPLICABLE WARRANTY TERM; (2) PRESENT EVIDENCE OF THE WARRANTY START DATE TOGETHER WITH THE VALID PROOF OF PURCHASE; AND, (3) MAKE THE EQUIPMENT AVAILABLE TO AN AUTHORIZED DEALER OR SERVICE CENTRE WITHIN A REASONABLE PERIOD OF TIME.

E. NO IMPLIED WARRANTY, REPRESENTATION OR CONDITION - TO THE EXTENT PERMITTED BY LAW, NEITHER INDUSTRIES NRC NOR ANY COMPANY AFFILIATED WITH IT MAKES ANY WARRANTY, REPRESENTATION, CONDITION OR PROMISE, EXPRESS OR IMPLIED, VERBAL OR OTHERWISE, AS TO THE QUALITY, PERFORMANCE OR FREEDOM FROM DEFECT OF THE EQUIPMENT. NO IMPLIED OR STATUTORY CONDITIONS OR WARRANTIES OF MERCHANTABILITY OR FITNESS (WHETHER PURSUANT TO THE SALE OF GOODS ACT OR ANY OTHER STATUTE OF ANY PROVINCE/STATE OR OTHERWISE) ARE MADE.

F. EXCLUSIVE REMEDY - TO THE EXTENT PERMITTED BY LAW, THE PURCHASER'S EXCLUSIVE REMEDY IN CONNECTION WITH THE BREACH OR PERFORMANCE OF ANY WARRANTY ON THE EQUIPMENT ARE THOSE SET FORTH IN THIS WARRANTY. IN NO EVENT WILL AN AUTHORIZED DEALER, INDUSTRIES NRC OR ANY COMPANY AFFILIATED WITH INDUSTRIES NRC, BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OR INJURIES, INCLUDING BUT NOT LIMITED TO, LOSS OF PROFITS, RENTAL OF SUBSTITUTE EQUIPMENT, OTHER COMMERCIAL OR PERSONAL LOSS OR DAMAGES ARISING AS A RESULT OF A FUNDAMENTAL BREACH OR BREACH OF A FUNDAMENTAL TERM.

G. NO DEALER WARRANTY - EXCEPT FOR CONDITIONS OR WARRANTIES WHICH MAY NOT BE EXCLUDED BY LAW, THE SELLING DEALER MAKES NO WARRANTY OF ITS OWN ON ANY ITEM WARRANTED BY INDUSTRIES NRC, AND MAKES NO WARRANTY ON OTHER ITEMS UNLESS IT DELIVERS TO THE PURCHASER A SEPARATE WRITTEN WARRANTY DOCUMENT SPECIFICALLY WARRANTING THE ITEM. THE SELLING DEALER HAS NO AUTHORITY TO MAKE ANY REPRESENTATION OR PROMISE ON BEHALF OF INDUSTRIES NRC OR TO MODIFY THE TERMS OR LIMITATIONS OF THIS WARRANTY IN ANY WAY.

H. WARRANTY TERMS

EQUIPMENT	TERMS
TRUCK MOUNTED RECOVERY EQUIPMENT	12 MONTHS FROM "IN SERVICE" DATE. NO MORE THAN 24 MONTHS.
SLIDING SYSTEM COMPONENTS	10 YEARS FROM DATE OF MANUFACTURING.
TOWING ACCESSORIES MANUFACTURED BY INDUSTRIES NRC	12 MONTHS FROM DATE OF MANUFACTURING.
ACCESSORIES MANUFACTURED BY A THIRD PARTY	THIRD PARTY WARRANTY APPLIES.

WARRANTY REGISTRATION FORM

On the date of sale I have read the NRC Warranty Agreement, I understand its terms & conditions, and acknowledge receipt of my copy of the agreement.
PLEASE PRINT CLEARLY OR TYPE.

INFORMATION ON THE CHASSIS ON WHICH THE NRC UNIT IS INSTALLED																		
IMPERIAL (lbs,mi) ☐				METRIC (kg,km) ☐						Used ☐ New ☐								
GVWR :				FRONT						REAR								
MAKE :				MODEL						YEAR								
VEHICLE IDENTIFICATION NUMBER (CHASSIS)																	MILEAGE	

NRC UNIT
Date of Sale : _____

NRC Serial # _____
Axle-lift
Serial #_____

NRC Model # _____

Date of Delivery to Dealer :
_____

Dealer Name :
_____

Address : _____
_____

Postal / Zip code : _____

Dealer Signature :

Date : _____

First Puschaser's Name

Address : _____
_____
_____
_____

Postal / Zip code : _____

Purchaser's Company Title / Position
_____

Purchaser's Signature :

X _____

Date : _____

Primary Contact-Necessary for Warranty-Admin

Name : _____
Phone : _____

The following items are to be performed by dealer at the time of vehicle delivery. Customer to sign off each item as verification that it was performed.			
	Completed the NRC Warranty Registration Form		Explain required maintenance program to Customer
	Customer instructed on the safe and proper operation of the unit purchased.		
	Explain and demonstrate vehicle and Accessory operation to Customer.		Present completed Warranty registration. Copy to Customer & fax copy to NRC Warranty Deptartment.
	PRE-DELIVERY INSPECTION		Customer Signature

This Warranty is not valid until approved by NRC Industries and all items on this form completed.

LEGAL STANDARDS AND REQUIREMENTS

The NRC Quickswap featured in this manual meets the following legal standards and requirements:

CE

	CE	Rest of world
2006/42/CE	X	
2014/30/UE	X	
2014/53/UE	X	
768/2008/CE	X	

Harmonized standards

	CE	Rest of world
EN 82079-1	X	
EN ISO 12100	X	
EN 14492-1 (for the winches)	X	

Other standards

	CE	Rest of world
SAE J2512		X
SAE J706 (for the winches)		X
FMVSS/CMVSS 108 (Canada and USA)		X

ABOUT THIS MANUAL

This manual contains important information about how to safely operate and maintain your NRC Quickswap. Read it before operating the machine and retain it for future reference during the entire lifespan of the machine.

This manual contains the following chapters:

- Chapter 1 presents the Quickswap models, their components and their technical specifications.
- Chapter 2 provides safety information for operating, maintaining and troubleshooting the Quickswap.
- Chapter 3 provides installation information and procedures.
- Chapter 4 provides operating principles and procedures.
- Chapter 5 provides maintenance information and procedures.
- Chapter 6 provides troubleshooting information and procedures.
- Chapter 7 provides the operating method in case of an accident or equipment breakdown.
- Chapter 8 provides information about taking the Quickswap in and out of storage.
- Chapter 9 provides information for disassembling and disposing of the Quickswap.

Document conventions

The following conventions are used throughout this document:

> NOTE: We highly recommend that you read this manual in full before using your NRC equipment.

Disclaimer

This manual, including the equipment specifications, is subject to change without notice. Ensure that you have the latest version of this manual before using your equipment.

All ratings are based on structural factors only, not vehicle capacities or capabilities.

Applicable models and serial numbers

This manual is intended for use with the following models with serial numbers within the following ranges only:

- QS-001 to ...
- QT-001 to ...

WARNING MESSAGES

⚠ DANGER

DANGER - Immediate hazards or unsafe practices that will result in severe personal injury or death.

⚠ WARNING

WARNING - Hazards or unsafe practices that could result in severe personal injury or death.

⚠ CAUTION

CAUTION - Hazards or unsafe practices that could result in minor personal injury or equipment damage.

NOTICE

Indicates information that should be read to avoid equipment damage.

1 DESCRIPTION

The NRC Quickswap is tough, lightweight, and designed to provide you with superior towing capacity. When equipped with a winch and a recovery spade, it is versatile enough for use as a support recovery vehicle. It is especially designed to be affordable, profitable, efficient, and trouble-free.

This chapter describes the components and technical specifications of the Quickswap standard model and the Quickswap with tag axle.

1.1 Description of the vehicle and its components

Two Quickswap models are available: the Quickswap standard model (without a tag axle) and the Quickswap with the tag axle. The tag axle increases safety for operators by transferring some of the load from the rear axles to the front axle(s). More weight on the front axle(s) gives the operator more control over steering the vehicle. It also increases braking capacity and towing capacity.

Five underlift models are available and can be installed on the Quickswap model:

- HD-3: Heavy Duty – three-stage
- HDE-3: Heavy Duty Euro – three-stage
- SHD-3: Super Heavy Duty – three-stage
- LSHDE-3: Long Super Heavy Duty Euro – three-stage
- SSHD-4: Short Super Heavy Duty – four-stage

Options for the Quickswap are:

- 20,000 lb winch
- 25,000 lb winch
- Recovery roller guide
- Recovery spades
- Tunnel toolbox
- Light pylon
- Jack legs

Characteristics for the vehicle are presented in the following sections.

1.1.1 Chassis

The chassis supports all Quickswap components. Figure 1 shows a chassis for the Quickswap standard model, and Figure 2 shows a chassis for the Quickswap with tag axle.

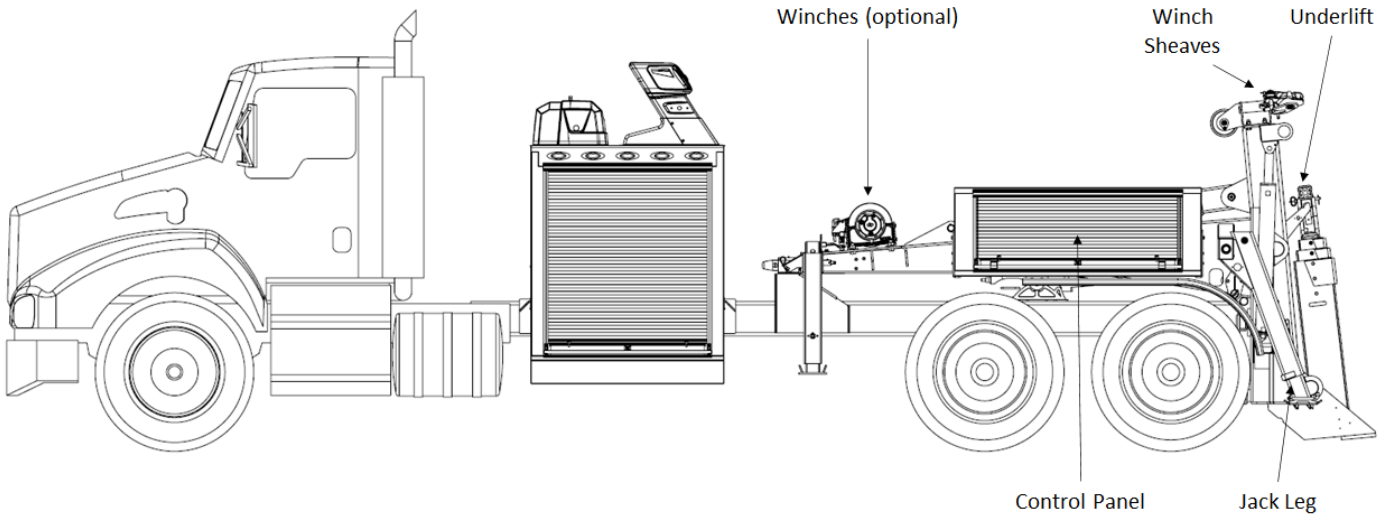


FIGURE 1 – CHASSIS OF QUICKSWAP - STANDARD MODEL

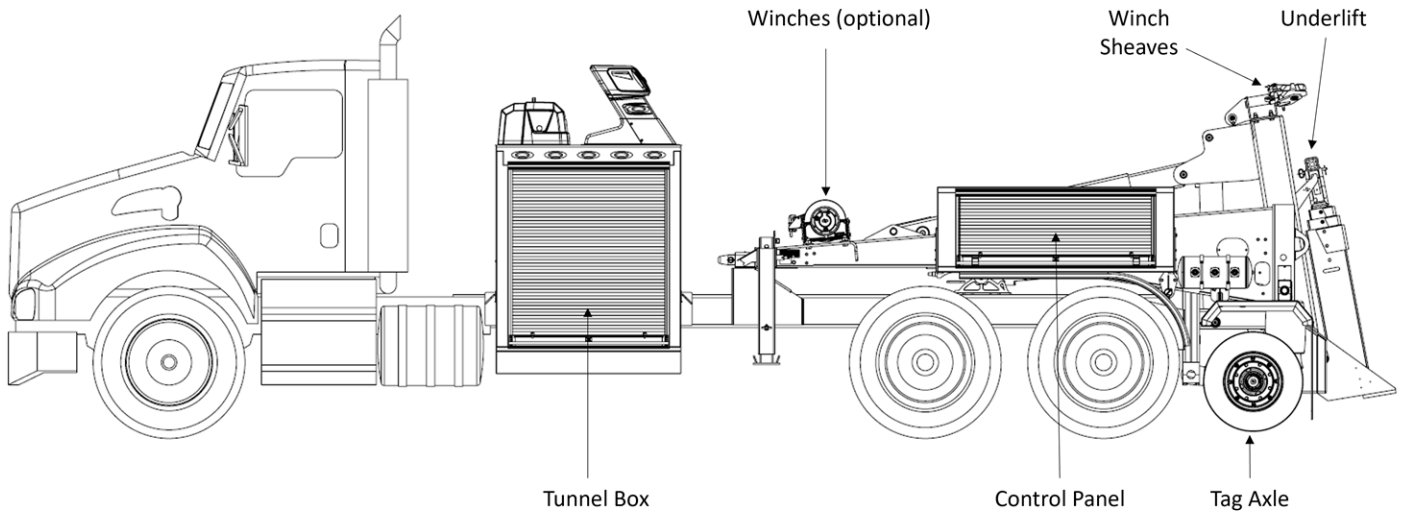


FIGURE 2 – CHASSIS OF QUICKSWAP - WITH TAG AXLE

1.1.2 Recovery spades (optional)

The Quickswap may have one recovery spade for the underlift, and two recovery spades for the jack legs.

1.1.3 Winch (optional)

The Quickswap may be equipped with one or two winches. Figure 2 shows the location of the winch.

1.1.4 Jack legs (optional)

The Quickswap has two jack legs: back-left and back-right. The jack legs are used to stabilize the Quickswap on the ground.

1.1.5 Underlift

The underlift has a vertical section, a horizontal telescopic stinger, and a T-bar. Figure 3 shows an underlift for the Quickswap standard model. The horizontal sections can be extended and

retracted to allow the T-bar to reach the vehicle to be towed. A stinger may have three or four sections.

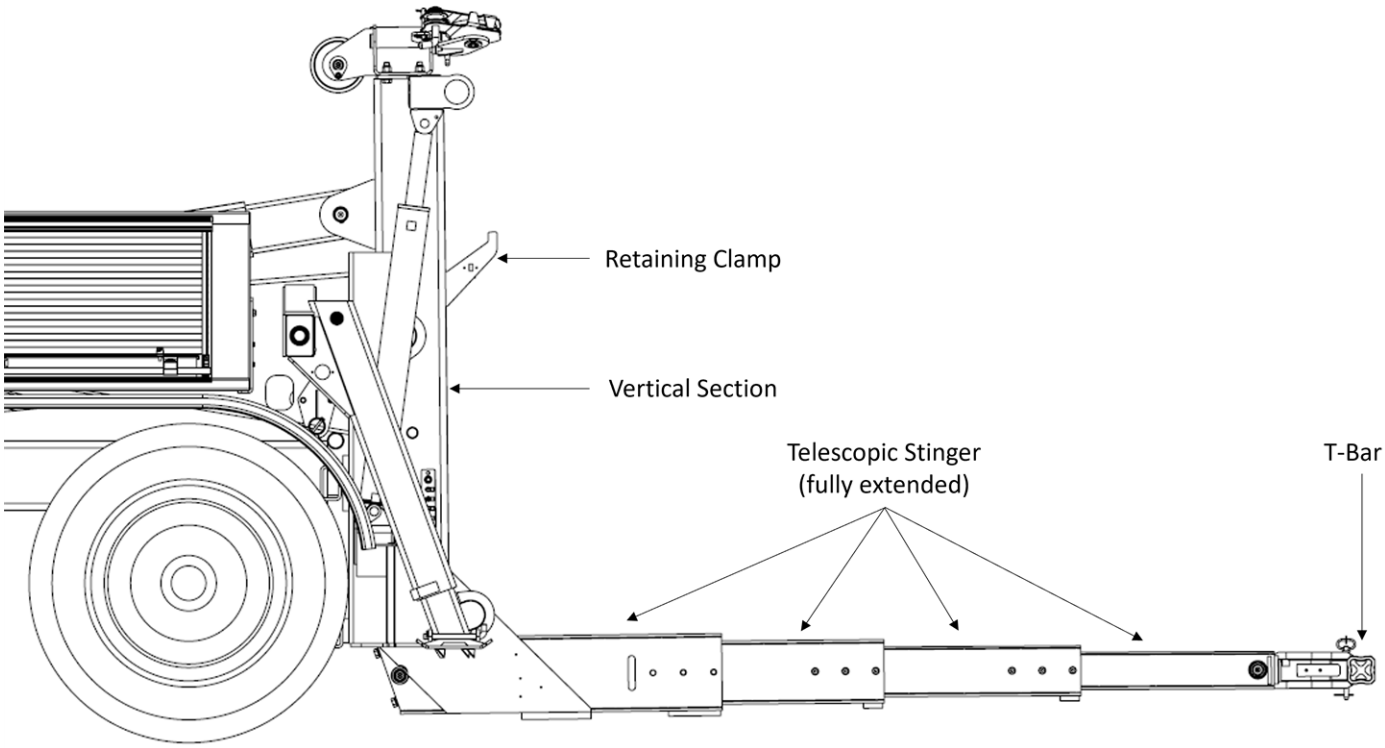


FIGURE 3 – UNDERLIFT (STANDARD MODEL)

1.1.6 Control panel

The Quickswap features a control panel on the driver's side.

The controls are proportional. This means that speed and power increase with the amount of pressure applied to the levers. Proportional controls allow you to use very slow speeds for greater precision and maximum control of the load.

> NOTE: Proportional hydraulic levers are available only on the control panel, not on the remote control.

Table 1 explains the elements of the control panel.

These introductory descriptions are not operating instructions; to know how to operate any component you must refer to the procedures in this manual.

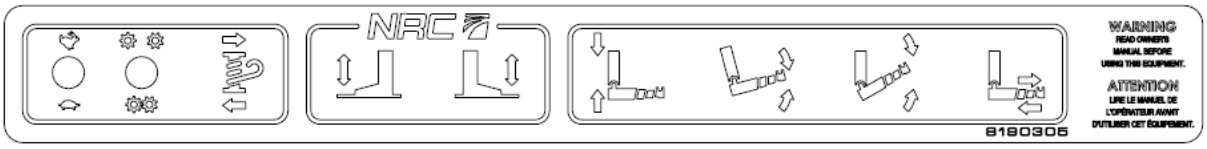


FIGURE 4 – CONTROL PANEL (STANDARD MODEL)

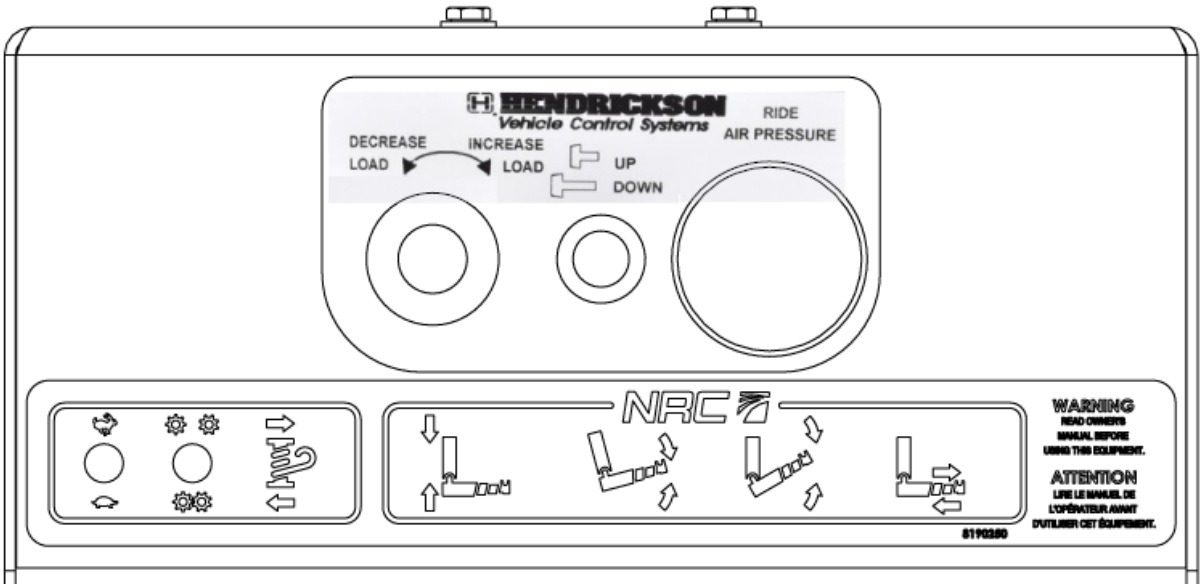
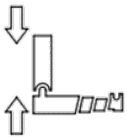
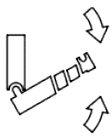
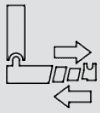


FIGURE 5 – CONTROL PANEL (WITH TAG AXLE)

TABLE 1 – CONTROL PANEL FUNCTIONS

Element	Description
	2 speed winch option only: High speed and low speed for the winches.
	Locks and unlocks the winch free spool.
	Winds and unwinds the winch cables.
	Jack legs option only: Moves the jack legs up and down.
	Moves the underlift up and down.
	Tilts the underlift upward and downward.
	Folds and unfolds the underlift stinger.
	Moves the underlift in and out.

1.1.7 Additional control elements for the tag axle

The Quickswap with the tag axle features the same control panel as described in Section 1.1.6 Control panel plus two additional elements:

- An up/down knob that is used for raising and lowering the wheels.
- A pressure regulator that is used for adjusting the amount of weight transferred to the front axle(s).

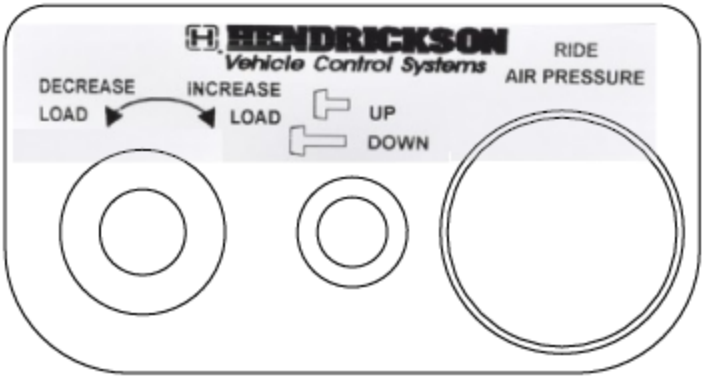


FIGURE 6 – CONTROL PANEL - WITH KNOB AND PRESSURE REGULATOR

1.1.8 Remote control (optional)

Your Quickswap may be equipped with a remote control with 6 to 10 function buttons. The remote control provides most of the functions that are available on the main control panel. The functions available vary on the client requirements.

Figure 7 shows a six-button remote control and Table 2 explains its functions.

These brief descriptions are not operating instructions; to learn how to operate the components, see the procedures in the relevant sections of this manual.

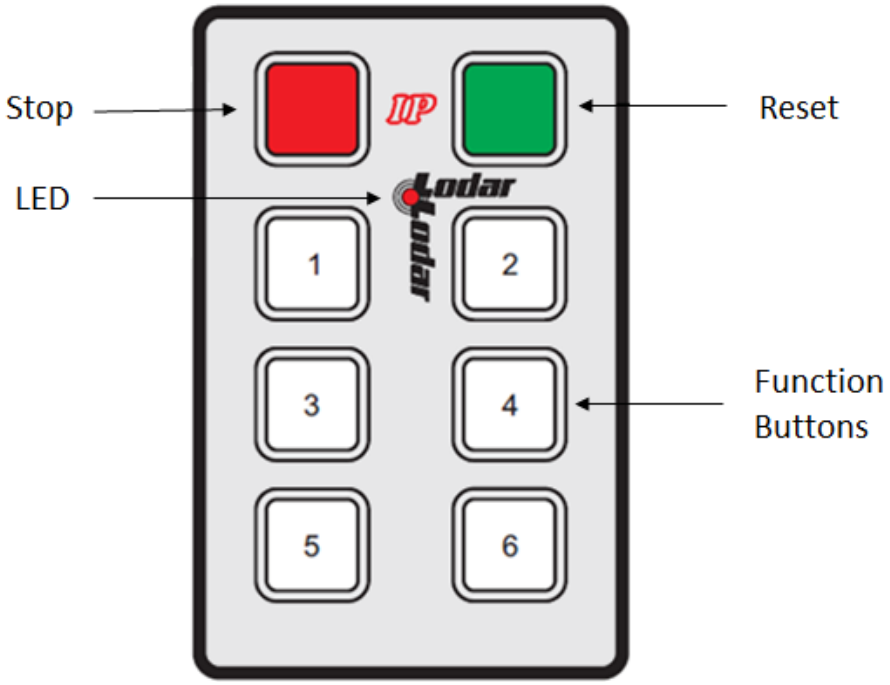


FIGURE 7 – REMOTE CONTROL (SIX FUNCTION BUTTONS SHOWN)

TABLE 2 – REMOTE CONTROL FUNCTIONS

Element	Description
Stop button	Switches off the receiver and the keypad function buttons.
Reset button	Activates the receiver and the keypad function buttons.
LED	Blinks quickly: the transmitter and receiver are active. On: the transmitter button has been pressed and the remote control is transmitting information. Flashes slowly: batteries are low and a button has been pressed.
Function buttons	As specified by the client.

1.1.9 Hydraulic and pneumatic system

The standard and with tag axle models feature a hydraulic system that provides and distributes the hydraulic power for the operation of the underlift, winches, hydraulic fixed-flow gear pump, directional monoblock control valve, air piloted hydraulic actuators, hydraulic cartridge type lock valves and winch motor.

1.1.10 Electrical system

The standard and with tag axle models feature an electrical system that includes a main electrical panel with breakers and relays that distribute the electrical power to the air-piloted hydraulic valves and lighting.

1.2 Technical specifications

Technical specifications of the components of both Quickswap models, and technical specifications and requirements of the tractor chassis are listed in the following sections.

⚠ DANGER

Failure to comply with the requirements presented in this section may result in improper tractor behaviour and could cause serious injuries and even death.

1.2.1 General specifications

⚠ DANGER

Installation of tires of larger sizes does not increase axle capacity, but will reduce brake performance.

TABLE 3 – GENERAL SPECIFICATIONS (IN METRIC [IMPERIAL])

Element	HD, HDE	SHD, SSHD-4 , LSHD-3
Basic weight	3,640 kg [8,090 lb]	
Lift rating – Retracted	15,900 kg [35,000 lb]	23,400 kg [50,000 lb]
Lift rating – Extended	6,830 kg [15,000 lb]	9,000 kg [20,000 lb]
Reach – Retracted	1,854 mm [73"]	2,184 mm [86"]
Reach – Extended	2,838 mm [111.75"]	3,448 mm [135.75"]
Tow rating	36,288 kg [80,000 lb]	40,824 kg [90,000 lb]
Tilt angle	Up: 6 ° Down: 25 °	Up: 6 ° Down: 25 °
Height	1,219 mm [48"]	1,143 mm [45"]
Fifth wheel height	1320.8 mm – 1346.2 mm [52" – 53"]	
Wheel bolt pattern (With tag axle model only)	Number of bolts: 8 Bolt circle: 275 mm [10.827"] Hub bore diameter: 221.2 mm [8.709"] Bolt hole diameter: 24.8 mm [0.975"]	

1.2.2 Chassis

The tractor onto which you mount a Quickswap assembly must meet the specifications described in Table 4, Figure 8, Figure 9, Figure 10, Figure 11, and Table 5.

TABLE 4 – SPECIFICATIONS OF THE TRACTOR CHASSIS (IN METRIC [IMPERIAL])

Element	HD, HDE	SHD, SSHD-4, LSHD-3
Wheelbase (minimum)	6,350 mm [250"]	6,985 mm [275"]
Cab to rearmost axle	3,607 mm [142"]	
Tandem axle spread	1,329–1,398 mm [52–55"]	
Frame RBM[1] (min. per rail)	240 kN-m [2,125,000 lb-in]	291 kN-m [2,575,000 lb-in]
Frame	Double frame (recommended): 273 mm x 9.5 mm with 250.8 mm x 6.35 mm [10 3/4" x 3/8" with 9 7/8" x ¼ "] or equivalent Single frame (acceptable): 295.3 mm x 9.5 mm [11 5/8" x 3/8"]	
Front axle	Minimum: 12,000 lb Recommended: 14,000 lb	
Rear axle	Minimum: 38,000 lb Recommended: 40,000 lb or more	

[1]Resisting Bending Moment

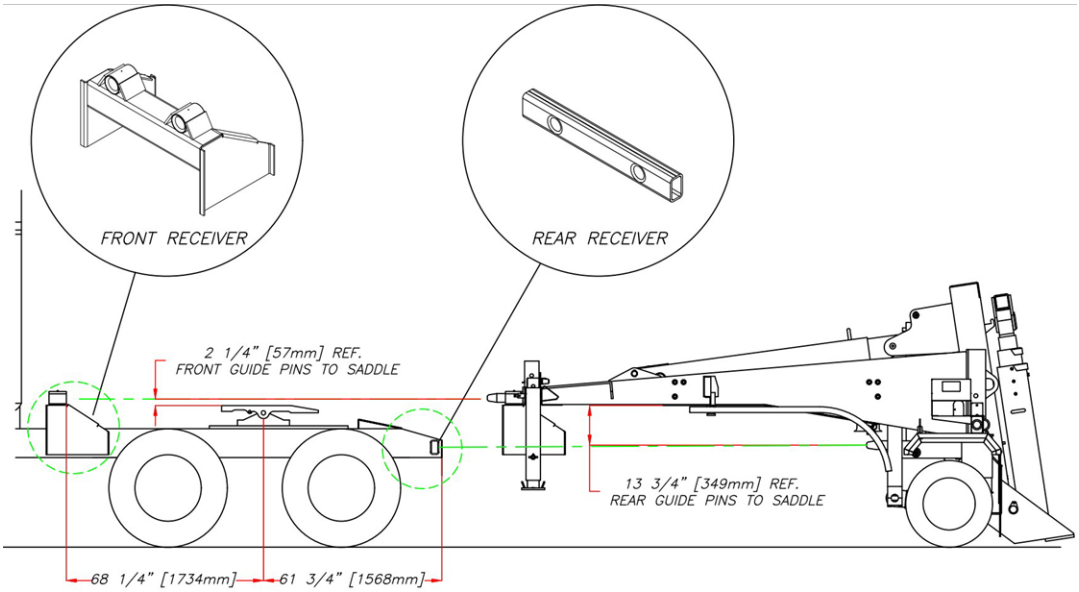


FIGURE 8 – TRACTOR CHASSIS RECEIVER'S REQUIREMENTS

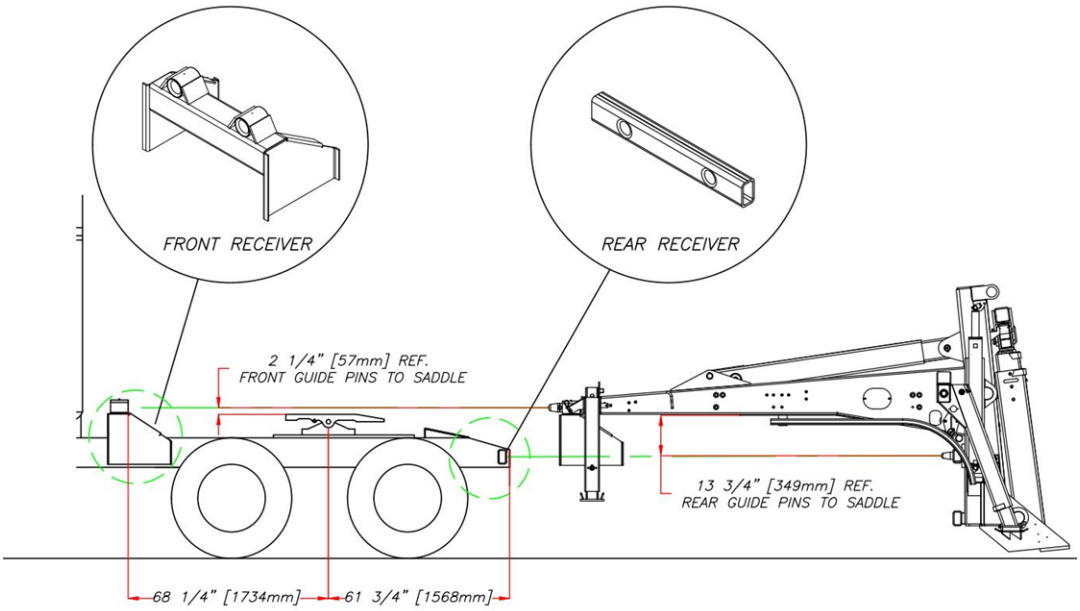


FIGURE 9 – TRACTOR CHASSIS RECEIVER'S REQUIREMENTS - QUICKSWAP WITH JACK LEGS AND RECEIVERS

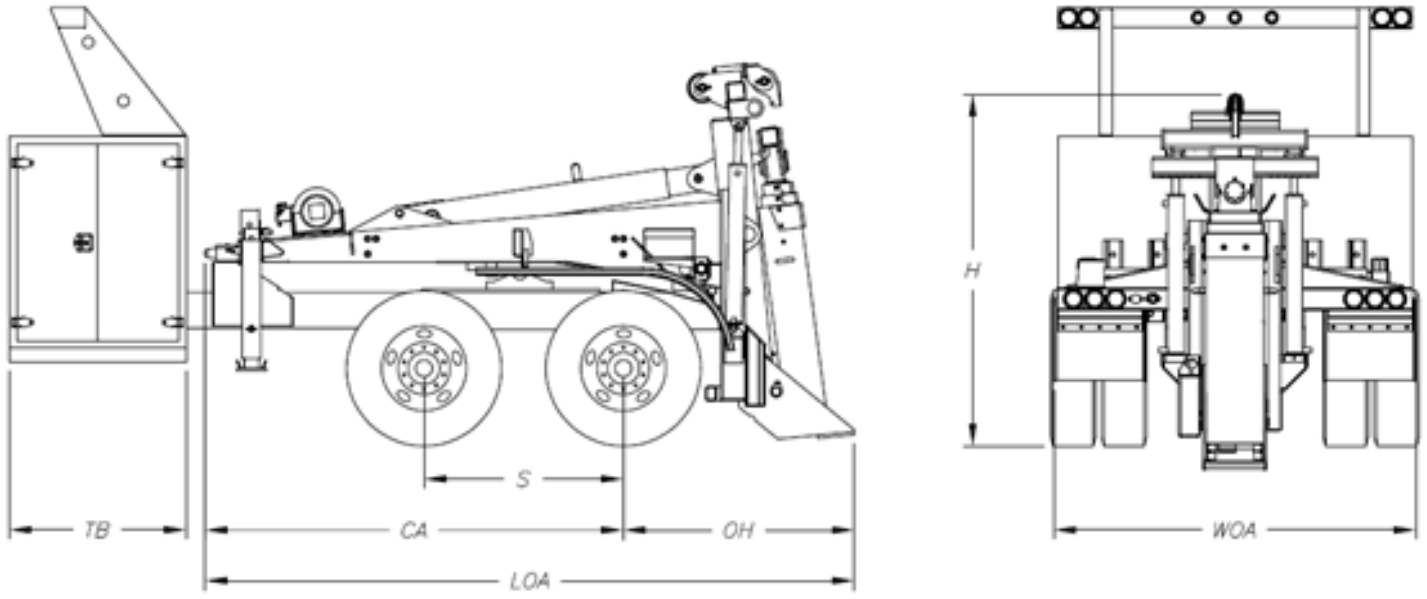


FIGURE 10 – CHASSIS DIMENSIONS - STANDARD MODEL

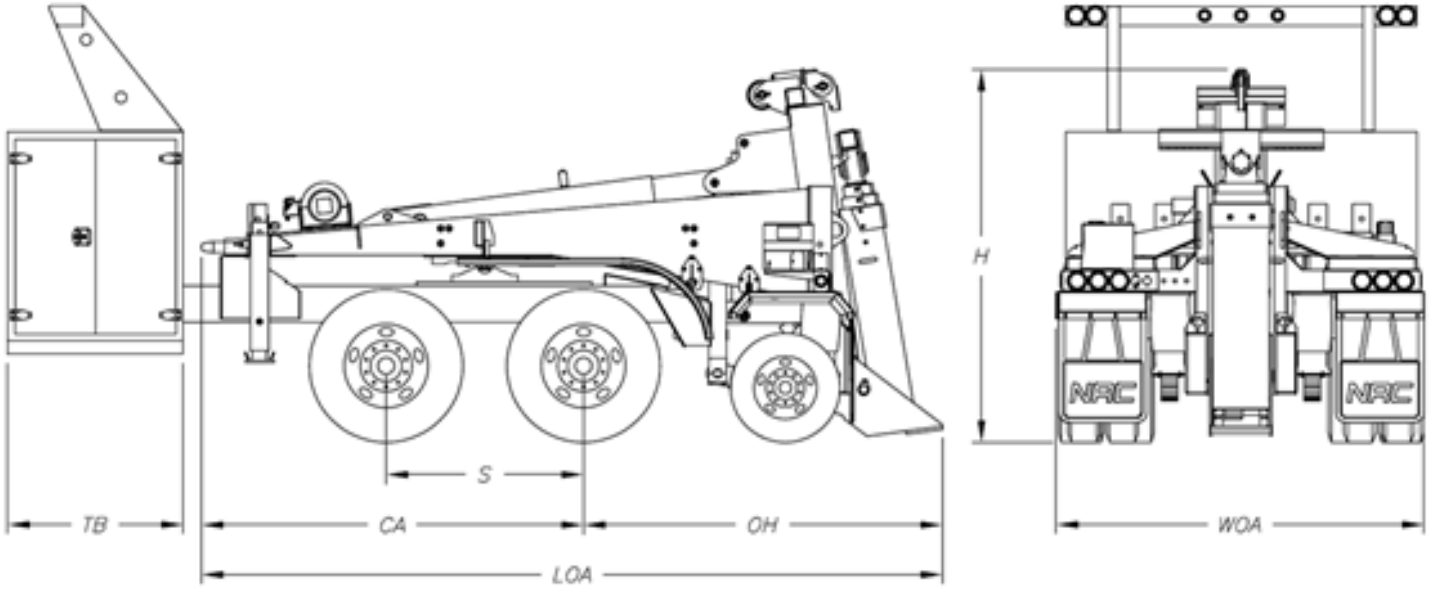


FIGURE 11 – CHASSIS DIMENSIONS - WITH TAG AXLE

TABLE 5 – DIMENSIONS OF THE CHASSIS (IN MM [IN])

Dimension Code	Standard Model	With Tag Axle
S	1,372 [54]	1,372 [54]
CA[1]	2,880 [113]	2,654 [104]
OH[2]	1,590 [63]	2,495 [98]
LOA	4,469 [176]	5,150 [203]
K	609–1830 [24–72][3]	609–1830 [24–72][4]
H	2,413 [95]	2,413 [95]
WOA	2,494 [98]	2,558 [101]

1.2.3 Hydraulic system

TABLE 6 – SPECIFICATIONS OF THE HYDRAULIC SYSTEM (IN METRIC [IMPERIAL])

Element	Value for all models
Operating pressure	207 bar [3,000 psi]
Pump flow	64 l/min [17 USG/min]
Tank volume	53 l [14 USG]

1.2.4 Winch (optional)

NOTE: See also the manual provided by the winch manufacturer for more information.

[1]The CA and OH values for the Quickswap with jack legs model will vary based on the rear receiver position. The ideal rear receiver position for weight distribution and handling of the towing vehicle is 1,568 mm [61 3/4"] from the centre of the tractors' fifth wheel (see Figure 9).

[2]Idem as #2

[3]In 100-mm [4-inch] increments

[4]In 100-mm [4-inch] increments

TABLE 7 – SPECIFICATIONS OF THE 20,000 LB WINCH (IN METRIC [IMPERIAL])

Element		Specification				
Winch capacity		89 kN [20,000 lb]				
Winch type		Standard: Single-speed planetary Option: Two-speed planetary				
Wire rope						
Recommended		16 mm x 61 m [5/8" x 200'] 6X36 IWRC EIPS				
Working load limit		5,260 kg [11,600 lb]				
Breaking load limit		18,680 kg [41,200 lb]				
Layer of cable		1	2	3	4	5
Rated line pull per layer Low speed	kg lb	9,070 [20,000]	7,660 [16,900]	6,660 [14,700]	5,890 [13,000]	5,260 [11,600]
Cable capacity	m ft	10 35	25 85	41 135	59 195	80 265
Line speed (at 15 GPM) Low speed	MPM FPM	7.9 26	9.1 30	10.6 35	11.8 39	13.4 44

TABLE 8 – SPECIFICATIONS OF THE 25,000 LB WINCH (IN METRIC [IMPERIAL])

Element		Specification				
Winch capacity		11,330 kg [25,000 lb.]				
Wire rope						
Recommended		15.9 mm x 22.9 m [5/8” x 75’] 6X36 IWRC EIPS				
Working load limit		5,275 kg [11,600 lb.]				
Breaking load limit		18,725 kg [41,200 lb.]				
Layer of cable*		1	2	3	4	5
Rated line pull per layer Low speed**	kg lb.	11,330 25,000	9,570 21,100	8,250 18,200	7,300 16,100	6,530 14,400
Cable capacity	m ft.	9 31	20 67	33 110	48 158	64 211
Line speed (at 15 GPM) Low speed	MPM FPM	6.7 22	7.9 26	9.1 30	10.3 34	11.5 38

*These specifications are based on the recommended 5/8” wire rope.

**Winch performance in high speed yields line speeds 2x those charted above and line pulls 1/2x those charted above.

1.2.5 Underlift

Underlift specifications for the Quickswap standard model are presented in Figure 12 and Table 9. Specifications for the Quickswap with tag axle are presented in Figure 13 and Table 10.

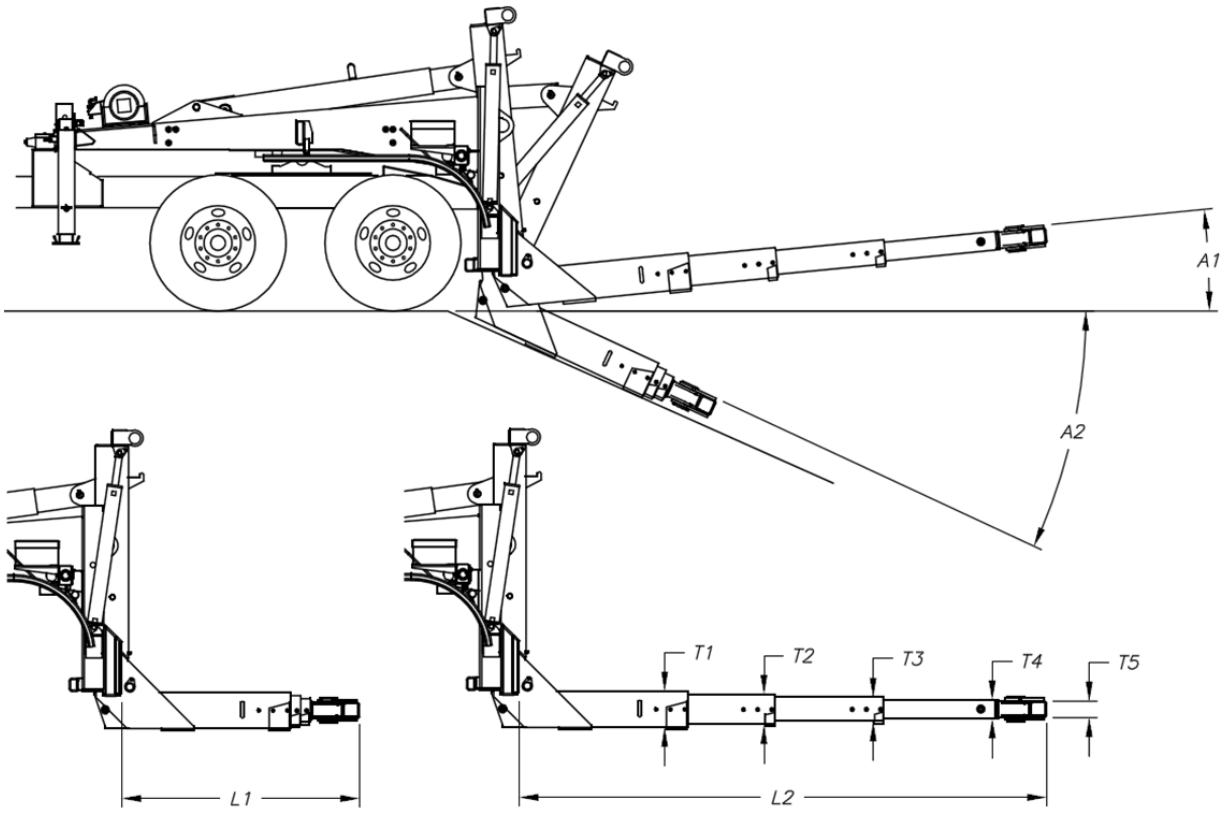


FIGURE 12 – UNDERLIFT ANGLE AND LENGTH - STANDARD MODEL

TABLE 9 – UNDERLIFT DIMENSIONS AND CAPACITY - STANDARD MODEL (IN METRIC [IMPERIAL])

Dimension	HD	HDE	SHD	SSHD-4	LSHD-3
A1 (raised)	6°	6°	6°	6°	6°
A2 (lowered)	25°	25°	25°	25°	25°
L1 (retracted)	1,530 mm [60.25"]	1,750 mm [68.875"]	1,841 mm [72.5"]	1,574 mm [62"]	2,032 mm [80"]
L2 (extended)	2,501 mm [98.5"]	3,518 mm [138.5"]	3,117 mm [122.75"]	3,480 mm [137"]	4,089 mm [161"]
Towing capacity	356 kN [80,000 lb]	356 kN [80,000 lb]	400 kN [90,000 lb]	356 kN [80,000 lb]	400 kN [90,000 lb]
Lifting capacity when extended	67 kN [15,000 lb]	71 kN [16,000 lb]	89 kN [20,000 lb]	102 kN [23,000 lb]	89 kN [20,000 lb]
Lifting capacity when retracted	156 kN [35,000 lb]	156 kN [35,000 lb]	222 kN [50,000 lb]	311 kN [70,000 lb]	222 kN [50,000 lb]

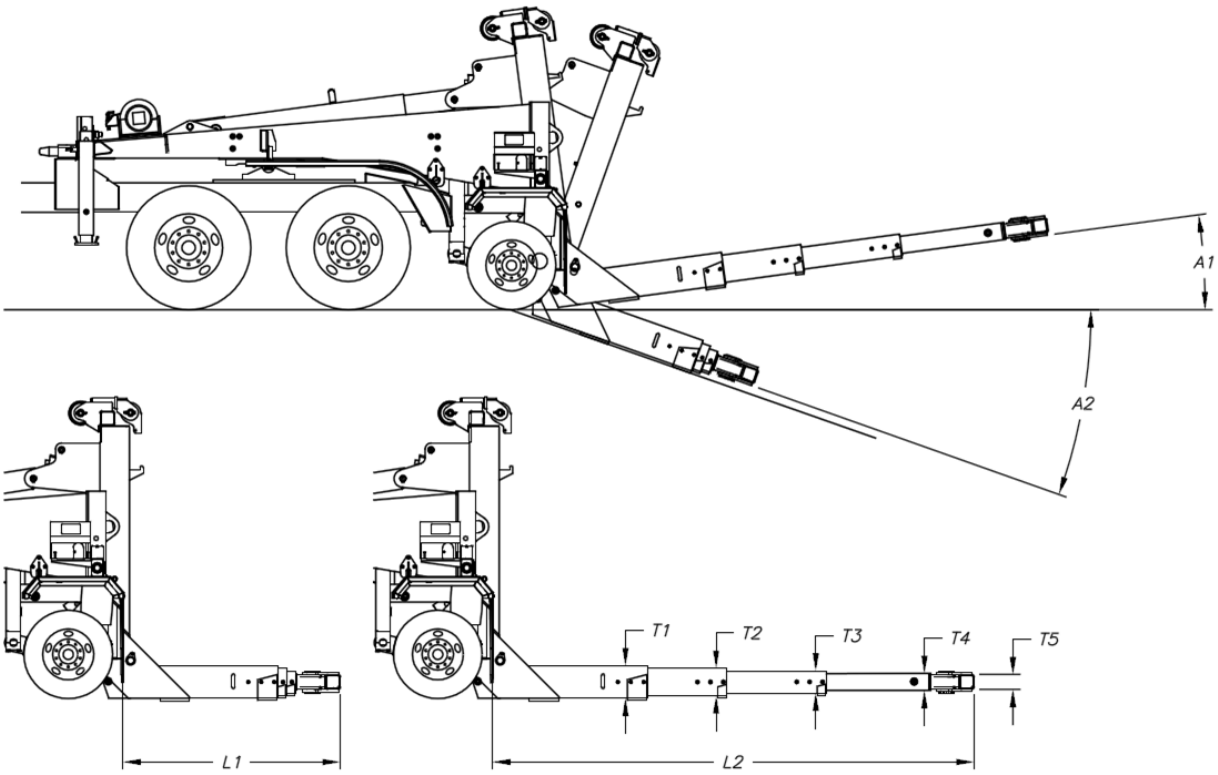


FIGURE 13 – UNDERLIFT ANGLE AND LENGTH - WITH TAG AXLE

TABLE 10 – UNDERLIFT DIMENSIONS AND CAPACITY- WITH TAG AXLE (IN METRIC [IMPERIAL])

Dimension	HD	HDE	SHD	SSHD-4	LSHD-3
A1 (raised)	8°	8°	8°	8°	8°
A2 (lowered)	20°	20°	20°	20°	20°
L1 (retracted)	1,530 mm [60.25"]	1,750 mm [68.875"]	1,841 mm [72.5"]	1,574 mm [62"]	2,032 mm [80"]
L2 (extended)	2,501 mm [98.5"]	3,518 mm [138.5"]	3,117 mm [122.75"]	3,480 mm [137"]	4,089 mm [161"]
Towing capacity	356 kN [80,000 lb]	356 kN [80,000 lb]	400 kN [90,000 lb]	356 kN [80,000 lb]	400 kN [90,000 lb]
Lifting capacity when extended	67 kN [15,000 lb]	71 kN [16,000 lb]	89 kN [20,000 lb]	102 kN [23,000 lb]	89 kN [20,000 lb]
Lifting capacity when retracted	156 kN [35,000 lb]	156 kN [35,000 lb]	222 kN [50,000 lb]	311 kN [70,000 lb]	222 kN [50,000 lb]

2 SAFETY

2.1 General

⚠ DANGER

Safety must be your top priority when operating and maintaining this equipment. Improper use of this equipment is dangerous. Failure to comply with the safety guidelines in this manual can cause accidents that may result in material damage, injury or even death.

Should you find that this manual contains insufficient or unclear information about equipment operation and maintenance, please contact your nearest NRC distributor for more details (see the Authorized distributors and service providers section).

2.2 Safety labels

Ensure that all DANGER, WARNING, CAUTION and other labels and lifting capacity charts are legible and properly placed. Clean and replace them as needed.

2.3 Intended use

NRC Industries equipment is intended for use only by trained and qualified operators who have carefully read and understood the contents of this manual.

This product was designed to recover and tow vehicles that do not exceed its lift or tow ratings.

This manual explains how to properly use the towing equipment. However, you should also refer to the towing recommendations from the vehicle manufacturer or a certified towing manual to learn about recovery procedures for the vehicle to be towed.

⚠ DANGER

This equipment was not designed for lifting persons and must never be used for that purpose.

The NRC tag axle equipment must be considered as a trailer. Consequently, before moving the vehicle, the driver needs to push the emergency button in the dashboard to make sure the tag axle brake system is properly activated.

2.4 NRC responsibilities

IMPORTANT: NRC Industries Inc. rejects any claim that may result from the incorrect or unlawful application of its equipment.

NRC recommends that the front receiver, front pins, mounting plates, fifth wheel and rear spacer be inspected at every use, and every year by an official NRC distributor. Should a visual inspection identify any cracks or structural damage, immediately discontinue use until the equipment is deemed safe.

NRC recommends that the hydraulic system on any Quickswap model be checked at least once a year, ONLY by an NRC distributor.

The Quickswap must not be modified without prior authorization from NRC Industries. Any unauthorized modifications may void the warranty.

2.5 Supervisory responsibilities

A full understanding of this manual is essential to safely operate and maintain this equipment. Ensure that all operators carefully read and understand this manual before allowing them to operate or maintain the equipment or any of its parts. Once operators have read and understood the manual, have them sign the Operator record at the end of this manual.

Equipment manufactured by NRC Industries is intended for use by towing and recovery professionals, and not unqualified or untrained individuals. The equipment should not be loaned or rented to anyone lacking the required skills.

NRC recommends fitting ALL tow trucks with beacons or other lights to signal their presence and comply with local regulations.

2.6 Operator responsibilities

Read and understand this manual before attempting to operate or maintain your equipment. Read all the warning labels and exercise good judgment and common sense while using the equipment.

Never operate this equipment under the influence of drugs or alcohol.

EMERGENCIES: Use the emergency stop to immediately stop the machine.

2.6.1 Wear protective clothing

Always wear protective gloves.

Wear a hard hat and safety footwear when walking on the Quickswap deck.

Wear long sleeves, bright-coloured clothing with reflective strips, work gloves, and safety boots.

Wear safety goggles.

2.6.2 Follow safety rules

Before driving the vehicle, check that the power take-off (PTO) is disengaged:

- The control levers should no longer be functional.
- The warning light in the cab should be off.

Never tow a vehicle that has people inside.

Never exceed equipment or chassis ratings. This could cause injury and/or damage the equipment.

If the equipment controls are too near traffic or a potential hazard, use the remote control and keep your distance.

When the vehicle is not in use, ensure that the PTO is disengaged.

Inspect the cables regularly and replace any worn or damaged ones.

2.6.3 Avoid danger zones

The area underneath the lifting device is a DANGER ZONE and must never be entered.

To avoid getting wrapped or tangled, keep away from the places where:

- The winch cables pass though the fairlead at the end of the boom.
- The winch cables wind onto the boom.

Always keep clear of winches and cables. Although the relatively low speed of the winches will keep any risks to a minimum, stay away from cables at all times — regardless of whether they are moving or stationary, taut or loose. Never step over a cable or chain, whether it is taut or not.

2.6.4 Set up a safety perimeter

Always set up a safety perimeter at least 45 m (150’) in diameter around the equipment and any load or vehicle. Do not allow anyone to enter this danger zone when you are using the equipment.

In addition, do not allow anyone within 75 m (250’) of a winch cable.

3 INSTALLATION

See the Quickswap installation manual for more information on installation.

4 OPERATION

This chapter describes how to operate your Quickswap, which involves using many functions and components simultaneously. To take advantage of all the capabilities of your Quickswap, you must first understand the general operating principles.

4.1 Operating principles

⚠ DANGER

Your Quickswap is a powerful machine. Always think about what you are about to do before operating the equipment and ensure that you apply general vehicle equilibrium and stability principles as described in this section. Lifting a load that exceeds the specified lifting capacities can damage the equipment or cause it to tip over.

FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN THE EQUIPMENT TIPPING OVER, WHICH CAN CAUSE PROPERTY DAMAGE, INJURIES OR EVEN DEATH.

The general principles to understand before operating the machine are as follows:

1. Any weight applied to the tow truck behind the rear axle will bear directly on this rear axle. The rear axle also bears some weight transferred from the front axle. Therefore, for a given load on the underlift, the pressure exerted on the ground by the rear axle will be greater than that the pressure from the load alone.
2. The more the underlift is extended so that the load is further away from the tow truck, the greater will be the load transfer from the front to rear.
3. The more winch cable you unwind, the more pulling force you have to tow the vehicle.
4. You can use pulleys to increase the winch capacity.

4.1.1 Calculating the load on each axle

You can calculate the load on each axle of the tow truck. Generally speaking, if you tow another vehicle with the underlift fully extended, the maximum load will be on the rear axle, and very little load on the front axle.

> IMPORTANT: Make sure the load on each axle does not exceed the axle capacity and meets the local regulations. The combined weight of the tow truck and towed vehicle must not exceed the gross vehicle weight rating.

To calculate the residual load on the front axle, or to calculate the total load on the rear axle group, you need to know the following, which are also illustrated in Figure 14:

A. Empty weight at the front axle. This value varies for each vehicle; you must weigh your own vehicle to know this exact value.
B. Empty weight at the rear axle. This value varies for each vehicle; you must weigh your own vehicle to know this exact value.
C. Distance from the T-bar to the centre of the tandem axle[1]. You need to measure this.
D. Distance between the front axle and the rear tandem axle (or wheelbase).
E. Load on the underlift.

> IMPORTANT: This section show calculations for the Quickswap standard model. The calculations for the model with tag axle are beyond the scope of this manual. Please contact your NRC distributor for information on how to calculate this.

[1] If the rear axle group is composed of a single drive axle and a liftable pusher axle, this calculation does not apply. Contact your NRC representative for more details.

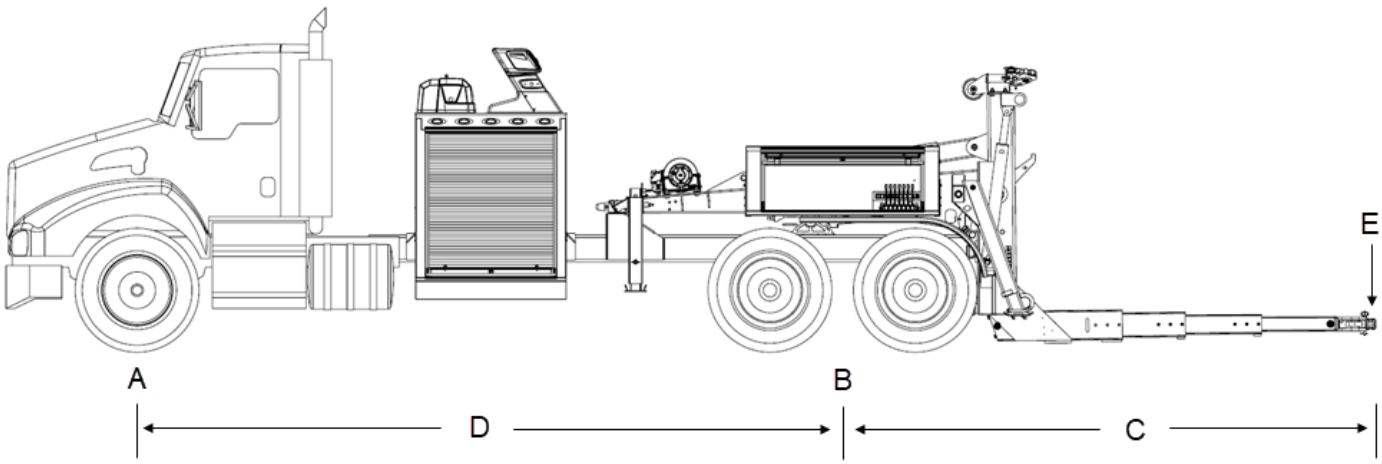


FIGURE 14 – AXLE LOAD CALCULATIONS

On the front axle

Use the following formula to calculate the residual load on the front axle (RLFA)[1]:

$$\frac{E \times C}{D} = F$$

$$RLFA = A - F$$

For example, if you have the following values:

A. 12,000 lb.
B. 15,000 lb.
C. 100"
D. 300"
E. 15,000 lb.

You will get the following residual load on the front axle:

[1]Source: *Les Dépanneuses: équipement de base, utilisation, lois, normes et règlements*, Sainte-Foy, Québec: Publication du Québec, 1996 (in French).

F = (E x C) / D = (15,000 x 100") / 300" = 5,000 lb.

RLFA = A - F = 12,000 - 5,000 = **7,000 lb**.

On the rear axle

Use the following formula to calculate the residual load on the front axle (RLFA)[1]:

$$\frac{E \times C}{D} = F$$

$$RLFA = A - F$$

For example, if you have the following values:

A. 12,000 lb.
B. 15,000 lb.
C. 100"
D. 300"
E. 15,000 lb.

You will get the following residual load on the front axle:

F = (E x C) / D = (15,000 x 100") / 300" = 5,000 lb.

RLFA = A - F = 12,000 - 5,000 = **7,000 lb**.

4.1.2 Maximizing the pulling capacity of the winch

Winches have more pulling force when more cable is unwound. To maximize the pulling force, unwind the cable so that only one layer remains on the winch drum. This will give you the maximum pulling force. Refer to 1.2.4 on the winch specifications to see how the pulling force varies depending on how many layers of cable remain on the drum.

[1]Source: *Les Dépanneuses: équipement de base, utilisation, lois, normes et règlements*, Sainte-Foy, Québec: Publication du Québec, 1996 (in French).

4.1.3 Increasing winch capacity with pulleys

If you need to pull a load that exceeds the safe working limit of the wire or synthetic rope, you can reduce line tension and increase pulling capacity using blocks. Use a running block tackle and an anchor to pull the load as shown in Figure 15 to double the pulling force. You need to factor in veer angle and friction loss in the blocks, which can be up to 10% for poorly-maintained/lubricated blocks.

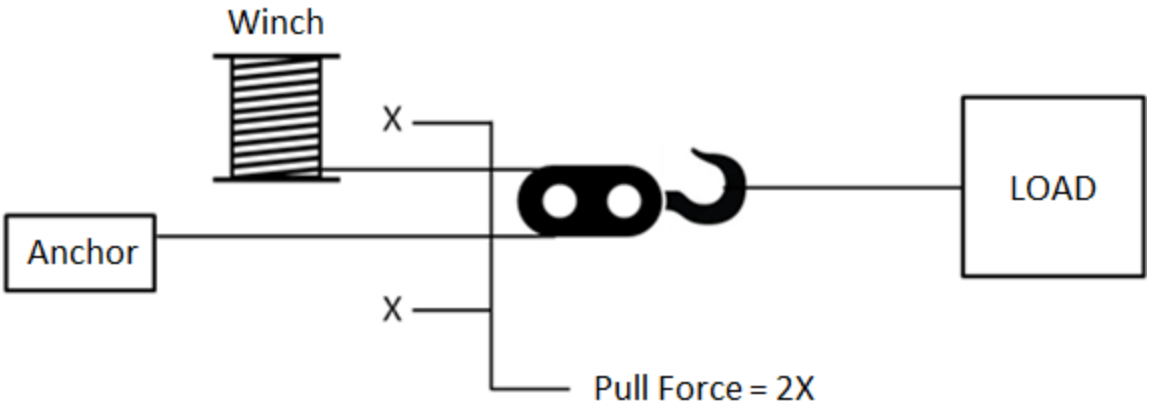


FIGURE 15 – CALCULATING INCREASED WINCH CAPACITY

You can calculate the total winch-pulley-anchor capacity using this formula:

Winch-pulley-anchor pull force = 90% of (2 × X)

Where X = winch capacity

For X = 20,000 lb.
Total pull force = 90% of (2 × 20,000 lb.) = 36,000 lb.

4.2 Preparing the vehicle for optimal performance

Position the Quickswap on a flat, solid surface with the rear as close as possible to the load.

Lifting a heavy load places significant weight on each jack leg. Ensure that the ground is solid enough to prevent the jack legs from sinking.

⚠ DANGER

Risk of tipping the equipment. Ensure that ONLY the jack leg feet touch the ground. If any other jack leg parts touch the ground, the equipment will be unstable.

4.3 Safety guidelines

Before operating the Quickswap, ensure that:

- You fully understand all the safety rules in Chapter 2 Safety.
- You are familiar with the Quickswap and you have positioned it for optimal and safe operation (see Section 4.4 Familiarizing yourself with the equipment).
- The truck is properly levelled and stabilized (see Section 4.6 Stabilizing the vehicle using the recovery spade).

If for any reason you need to immediately stop all operations, press the emergency stop button located on the control panel.

> NOTE: Before restarting the engine, pull the emergency stop button to put it in the Up position.

4.4 Familiarizing yourself with the equipment

Before using the equipment, open the control panel and examine the controls and their layout. The controls are proportional, which means that the further the control levers are moved, the more the control speed increases. Proportional controls allow you to use very slow speeds for greater precision and maximum control of the load.

After familiarizing yourself with the equipment, we recommend running the engine at low speed (600–800 rpm).

4.5 Common operating procedures

This section explains procedures for starting the engine, arriving at the job site, and leaving the job site.

4.5.1 Engaging the power take-off

Engaging the Power Take Off (PTO) renders all lever controls functional. When the PTO is engaged, a warning light in the cab reminds you not to drive the Quickswap towing truck. Before driving the truck, check that the PTO warning light is off, meaning that the PTO switch is disengaged.

⚠ DANGER

Stop the truck engine and disengage the PTO whenever the truck is not in use. Never drive while the PTO is engaged. It could damage the hydraulic pump.

To avoid mechanical components wearing or breaking prematurely, never engage the PTO without having pressed down the clutch pedal or having put the transmission into neutral.

⚠ DANGER

The area under the lifting unit is DANGEROUS. Stay as far away as possible from the danger zone while the machine is operating.

The truck may be equipped with a pneumatic PTO or an electric PTO. Read whichever following sections correspond to your PTO type.

4.5.2 Engaging a pneumatic PTO

Quickswap towing units with a manual transmission generally come with a pneumatic PTO similar to the one shown in Figure 16.

FIGURE 16 – PNEUMATIC PTO CONTROL

1. Make sure that the PTO is disengaged.
2. Start the truck engine, put the transmission into neutral, and put on the parking brake.
3. While pressing the clutch pedal down, pull the red lock-valve knob on the PTO control and move the lever to the **IN** position. This should turn on a red light on the switch and an orange light on the control panel.
4. Release the clutch pedal.
5. Set RPM as required, referring to the label on the truck.

The control panel is automatically turned ON when you engage the PTO. If the control panel is OFF, the emergency stop button has been pressed. To correct this, pull the emergency stop button out completely.

4.5.3 Disengaging a pneumatic PTO

To disengage a pneumatic PTO:

1. Hold the clutch pedal down.
2. Pull the red lock-valve knob on the pneumatic control and push the lever to the **OUT** position. This should turn off the red light on the switch as well as the orange light on the control panel.
3. Release the clutch.

4.5.4 Engaging an electric PTO

Trucks with an automatic transmission or without a pneumatic circuit generally come with an electric control to activate the PTO. This control might be similar to the one shown in Figure 17, or it might be a programmed button on the truck's dashboard.

FIGURE 17 – ELECTRIC PTO CONTROL

If your truck has a manual transmission, use the same steps as given above for the pneumatic control. If it has an automatic transmission, proceed as follows to engage the electric PTO:

1. Make sure that the PTO is disengaged.
2. Start the engine of the truck, put the transmission into neutral, and put on the parking brake.
3. Press the electrical control or button to engage the PTO.

The control panel is automatically turned ON when you engage the PTO. If the control panel is OFF, the emergency stop button has been pressed. To correct this, pull the emergency stop button out completely.

4.5.5 Disengaging an electric PTO

To disengage an electric PTO:

1. Press the clutch (manual transmission) and hold it down.
2. Press the electrical control or button to disengage the PTO.
3. Release the clutch (manual transmission).

4.5.6 Upon arrival at the job site

Before operating the Quickswap on a job site:

1. Position the Quickswap for optimal and safe operation.
2. Stabilize the Quickswap (see Section 4.6 Stabilizing the vehicle using the recovery spade).

4.5.7 Before leaving the job site

After the job is finished, you must prepare the Quickswap for safe travel as follows:

1. Store the underlift.
2. Lock the winch into storage position. See Section 4.9.4 Locking the winch into storage position
3. Disengage the PTO. See Section 4.5.3 Disengaging a pneumatic PTO or Section 4.5.5 Disengaging an electric PTO.

4.6 Stabilizing the vehicle using the recovery spade

When recovering a heavy vehicle, you can use the recovery spade for the underlift to stabilize the Quickswap, as follows:

1. Go to the control panel.
2. For greater control, or if you are on a slippery surface, install the recovery spade at the bottom of the underlift.

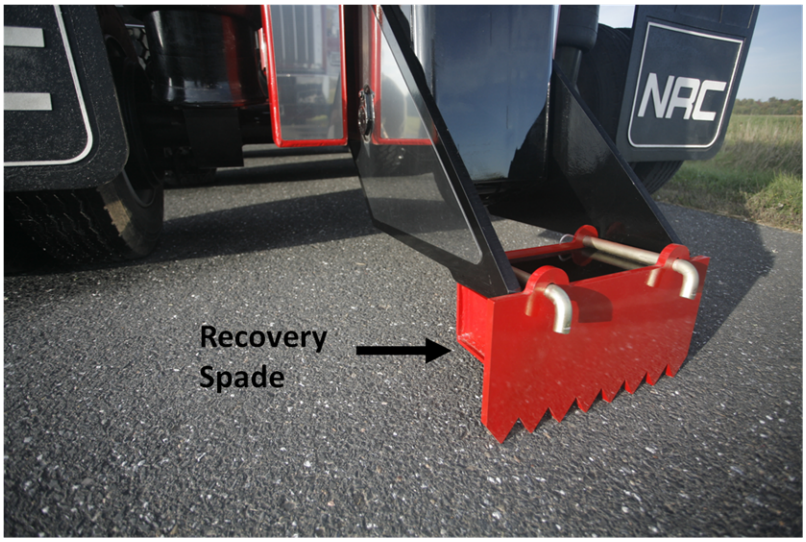


FIGURE 18 – RECOVERY SPADE

3. Using the levers, lower the underlift to the ground without jacking up the truck.
4. Once the job is complete, use the levers on the control panel to raise the underlift into its travelling position.

4.7 Using the jack legs

The following sections explain how to use the jack legs to stabilize your Quickswap and how to store them after the job is finished.

You will need to stabilize the equipment to prevent the back suspension from getting stuck on the ground during lifting or winching and for providing a better ground grip.

4.7.1 Stabilizing the Quickswap using the jack legs

Proceed as follows to stabilize your Quickswap using the jack legs.

1. For more grip, install the recovery spades onto each jack leg. Lock them in place using the locking pin.

   NOTE: The recovery spades are stored in toolboxes on each side of the equipment.

2. Lower both jack legs at the same time, just enough to get both rear wheels off the ground.

⚠ DANGER

Make sure you see the jack leg being lowered to ensure it does not hit any people or objects.

⚠ WARNING

Make sure that ONLY the jack leg feet touch the ground. If any other part of the jack leg touches the ground, it will compromise the stability of your Quickswap. If this is the case, move the equipment to more level ground and try again.

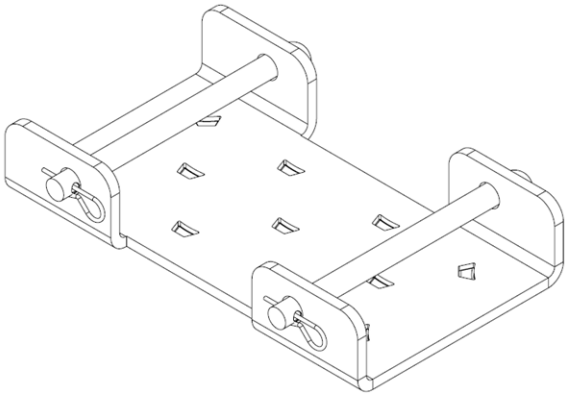


FIGURE 19 – RECOVERY SPADE

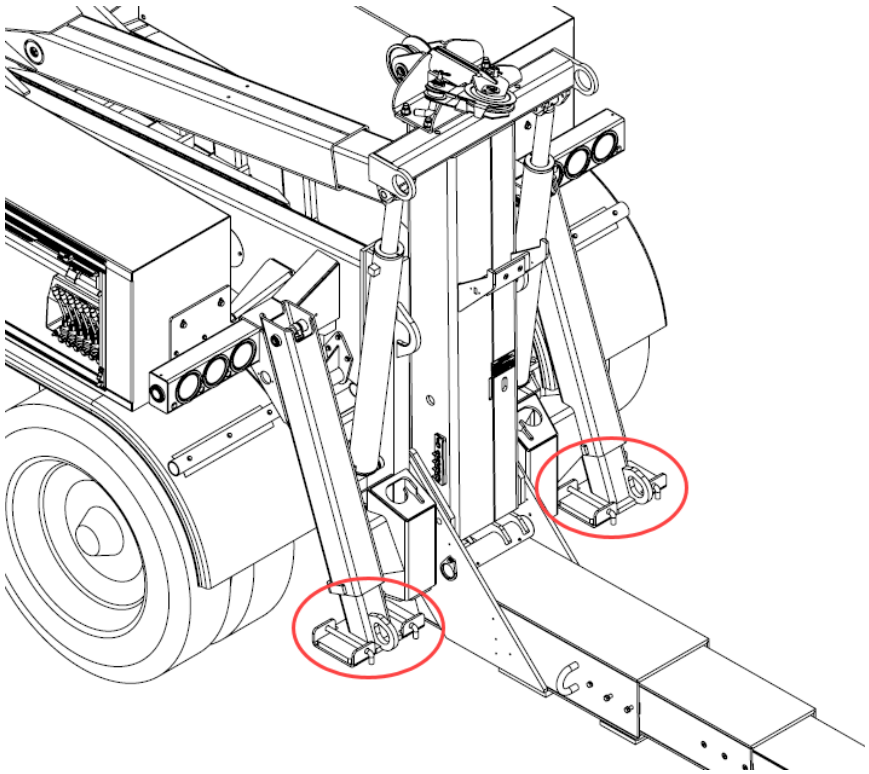


FIGURE 20 – LOCATION OF RECOVERY SPADES ON JACK LEGS

4.7.2 Storing the jack legs

Once the job is complete, you need to store the jack legs in their travelling position as follows:

1. Using the levers on the driver's side, simultaneously raise both jack legs completely.
2. If you used recovery spades, remove the locking pin holding on each recovery spade. Remove the recovery spade and put the locking pin back in place. Store the recovery spades in the toolboxes located on each side of your Quickswap.
3. Using the levers on the driver's side, fully retract both jack legs simultaneously.

4.8 Using the underlift to tow a vehicle

The underlift is used to tow another vehicle.

⚠ WARNING

If you are using the NRC Bus Adapter (an optional towing attachment) take special care when installing it onto the underlift, as some parts of the bus adapter are heavy. Position yourself correctly while lifting heavy objects.

1. Disengage all winches. See Section 4.9.2 Disengaging and engaging the winch.

   NOTE: This will prevent damaging or breaking winches or cables when operating the underlift.

2. Extend the underlift stinger a few inches to allow it to clear its retaining clamp.
3. Fold the underlift stinger completely, using the fold lever.
4. Lower and extend the underlift stinger into the desired position.
5. Choose a lifting point on the vehicle to be towed: it must be strong enough as well as having enough clearance for the underlift stinger to be able to move freely.

   ⚠ WARNING

   A poorly chosen lifting point may result in damage to the vehicle being towed and could cause an accident.

6. If needed, carefully back up the truck closer to the vehicle to be towed, in order to enable the underlift stinger to reach the chosen lifting point.

   NOTE: At this stage, you can use the remote control to operate the underlift stinger. Alternatively, use the control panel levers.

7. Choose the towing attachments needed and put them into position on the T-bar.
8. Lift the vehicle high enough to attach the safety chains and tensioner to hold the vehicle in place on the T-bar.
9. Using the tilt control, adjust the stinger tilt angle to allow for sufficient clearance of the bumper, oil pan or any other component. Be careful to not over-tighten the chains when tilting.
10. Install the long safety chains (attached to anchor points on the back of the towing unit) through the two guides on either side of the middle of the main section of the underlift stinger. Attach the chains either to the axle or to the chassis of the vehicle being towed.
11. Adjust the height of the underlift arm for safe lifting and towing.
12. Shorten the underlift stinger to the minimum, leaving enough clearance for a 70-degree turn. The shorter the distance between the back of the truck and the vehicle being towed, the better. It decreases weight transferred from the front to the rear axle, improving manoeuvrability of the truck.

⚠ WARNING

You must leave enough space for a 70-degree turn between the two vehicles to ensure that they do not touch when turning. Failure to leave enough space may result in damage to one or both vehicles.

13. Re-engage the winch(es) (see Section 4.9.2 Disengaging and engaging the winch), attach the hooks to a suitable point, and then gently tighten the cables. Never tighten the cables to their maximum capacity as this could cause damage to the winches, the cables or parts of the underlift.
14. Prepare the vehicle to be towed as follows:
    a. Install the tow lights.
    b. Connect the air supply and the brake pilot line to the vehicle to be towed. Test the brake.
    c. Remove and secure the drive shaft of any drive axle on the ground.

NOTE: For more detailed information on how to tow the vehicle, refer to its owner's manual or towing guide.

The Quickswap is ready to tow the vehicle. Before leaving the job site, refer to Section 4.5.7 Before leaving the job site.

NOTE: Make sure you comply with local regulations regarding size and weight, or any other special requirements or procedures, before you proceed with towing the disabled vehicle.

4.9 Using the winch

A Quickswap may have one or two winches for pulling loads or other vehicles.

You can operate the winches using the winch levers and switches on the control panel.

You will need to disengage the winches for operations such as using the underlift.

⚠ DANGER

When the winches are engaged, do not operate the underlift or do anything else that would over-extend the winch cables or put too much pressure on them. Damage to cables, winches and sheave heads could occur, as could injury or even death.

The best way to learn how to operate a winch is to perform test runs before actually using it to lift loads. Plan the test in advance. Remember to be aware of what you **SEE AND HEAR**. It is important to learn the sounds of a light steady pull, a heavy pull, and sounds caused by the load jerking or shifting. Gain confidence in operating a winch and it will become second nature.

The uneven spooling of cable, while pulling a load, is not a problem unless the cable piles up on one end of the drum. If this happens, reverse the winch to relieve the load, and move the anchor point closer to the center of the vehicle. After the job is done, unspool and rewind the cable neatly.

NOTE: See also the manual provided by the winch manufacturer for more information.

4.9.1 Recommended break-in procedure

Before using your Quickswap for the first time or installing new cables, we recommend fully unwinding the cables, leaving only five turns on the winch drum and making three complete pulls at approximately half the capacity. This will break in the cable fibres and extend the life of both the cable and the winch.

4.9.2 Disengaging and engaging the winch

Each winch has its own lever on the control panel and on the remote control.

Use the control panel to disengage or engage a winch. Switch the corresponding winch lever up and down several times to release the pressure on the clutch and fully disengage the winch.

NOTE: After engaging the winch, wait at least five seconds before using it to ensure that the air clutch is properly engaged.

⚠ DANGER

Never disengage a winch that is under load.

4.9.3 Winding and unwinding the winch cable

Once a winch is properly engaged, push its control lever up or down to wind or unwind the cable.

You can increase the winding and unwinding speed of the main winch cable by activating the high-speed function on the control panel. Adjust the speed control function to operate at low speed when working under load.

⚠ CAUTION

For safer operation, it is recommended to never leave the equipment on the high speed option. Always put it back on low speed after each operation.

4.9.4 Locking the winch into storage position

1. Engage each winch.
2. Wind the winch cable in fully.

NOTICE

Do not over-wind the cable and cause the hook to exert tension on the pulley. This could result in severe damage.

4.10 Using the tag axle to transfer load

The purpose of the tag axle is to transfer some of the load from the rear axles to the front axle(s). More weight on the front axle(s) gives you more control over steering.

To increase/decrease the amount of weight to be carried by the tag axle, proceed as follows:

1. Once the vehicle is ready to pull the load, lower the tag axle wheels using the up/down knob of the tag axle wheels. Select “Down” until the wheels reach the ground.
2. Use the pressure regulator to increase/decrease the amount of weight to be carried by the tag axle. Refer to the Table 11 for the appropriate pressure adjustment for the load.

NOTE: Use this table as a guideline only. You must increase the pressure slowly. When you need to lower the pressure, first go below the wanted pressure and then increase the pressure to the required value.

When the wheels are not in use, use the up/down knob to raise them. NRC recommends keeping the wheels at least 6" off the ground when they are not in use.

TABLE 11 - PRESSURE ADJUSTMENTS OF THE TAG AXLE

Load (kg [lb])	Pressure
1,179 [2,600]	5
1,542 [3,400]	10
2,053 [4,525]	15
2,631 [5,800]	20
3,198 [7,050]	25
3,720 [8,200]	30
4,309 [9,500]	35
4,853 [10,700]	40
5,420 [11,950]	45
6,010 [13,250]	50
6,611 [14,575]	55
7,235 [15,950]	60
7,847 [17,300]	65

4.11 Using the remote control

The remote control is used to control the vehicle from a distance, so you can move around to better see what you are doing and remain safe during operation.

NOTE: Proportional hydraulic levers are available only on the control panel, not on the remote control.

4.11.1 Pairing the remote control with the receiver

To pair the remote control with the receiver, proceed as follows:

1. Switch OFF or disconnect the power to the receiver.
2. Switch ON or reconnect the power to the receiver. This opens a 20-second window in the receiver processor. If you are looking at the receiver's printed circuit board, which is located on the front panel of the Quickswap body, you will see the fault LED flashing.
3. During these 20 seconds, press and hold the remote control Reset button for five seconds. When the transmitter and remote control are paired, the fault LED is illuminated continuously.

4.11.2 Operating the remote control

1. Push and hold the green button of the remote control.
2. Start using the remote control.

Note that each remote control is built and programmed according to your requirements.

5 MAINTENANCE

Regular maintenance can prevent problems and damage to equipment. This chapter contains safety guidelines, maintenance procedures and the recommended maintenance schedule for your Quickswap.

NOTE: See the winch manufacturer manual for more details about winch maintenance.

5.1 Safety guidelines

When performing maintenance on your Quickswap, underlift, boom or winches, always:

- Ensure that you fully understand all the safety rules described in Chapter 2 Safety.
- Wear protective clothing (goggles, gloves, footwear, etc.)
- Watch out for moving parts.
- Watch out for hot components.
- When working under the vehicle, apply the parking brake and use wheel chocks.
- When lifting the vehicle, use approved and certified equipment that is in good condition.

For winch safety guidelines, see the winch manufacturer manual.

5.2 General maintenance

NOTE: Remember that regular maintenance will keep your Quickswap in good condition, extend its lifespan and reduce the risk of damage and breakage.

5.2.1 For the Quickswap

Description	After			Every					
	Each use	1 mth	6 mths	1 day	2 wks	1 mth	3 mths	6 mths	1 yr
Inspect the general condition of the wire cables and see that they are properly and tightly wound.	X								
Look for oil leaks from cylinders or hoses.	X								
Inspect all anchors and D-rings for cracks, deformations, etc.	X								
Inspect the bolts securing the front/rear receivers to the chassis. Make sure they are tight and in good condition.		X					X		
Change the oil filter.			X						X

5.2.2 For the tag axle

Description	After			Every					
	Each use	1 mth	6 mths	1 day	2 wks	1 mth	3 mths	6 mths	1 yr
Check the oil and refill to the correct level if needed.	X								
Check the brake shoes and readjust the proximity from the drum if needed.	X								
Check the axle's alignment guide block and ensure it is securely fixed.	X								

5.2.3 Winch maintenance

See the winch manufacturer manual.

5.2.4 Winch cable tensioner

Check all the indicators for the cable tensioner for all winches. To maintain adequate tension on the cable, it should read approximately 72 psi. Adjust the pneumatic pressure using the integrated regulator when necessary.

5.2.5 Steel cables maintenance

Steel cables must be regularly inspected to ensure safe operation. When a cable is degraded, deformed or bent, you must replace it. See the ISO 4309:2017 standard for the criteria for inspection, maintenance and disposal of steel cables.

The cable dimensions vary based on the winch model. Figure 21 below illustrates the location of the winch equipped with steel cables on both Quickswap models. For equipment sold in North America, the table below shows the cables used for each winch model.

IMPORTANT: NRC only supplies steel cables for equipment sold in North America (NRC does not supply steel cables where Standard 14492 is applicable). When NRC does not supply the winch cable, the distributor must select the appropriate cable for their winch model.

TABLE 12 – STEEL CABLES FOR THE DIFFERENT WINCH MODELS (NORTH AMERICA ONLY)

Description	Length (ft.)	Cable Specification
Steel cable for the Ramsey RPH 20000 winch	200	16 mm (5/8") 6X36 (WS) EIPS1960 IWRC
Steel cable for the Ramsey RPH 25000 winch	200	16 mm (5/8") 6X36 (WS) EIPS1960 IWRC

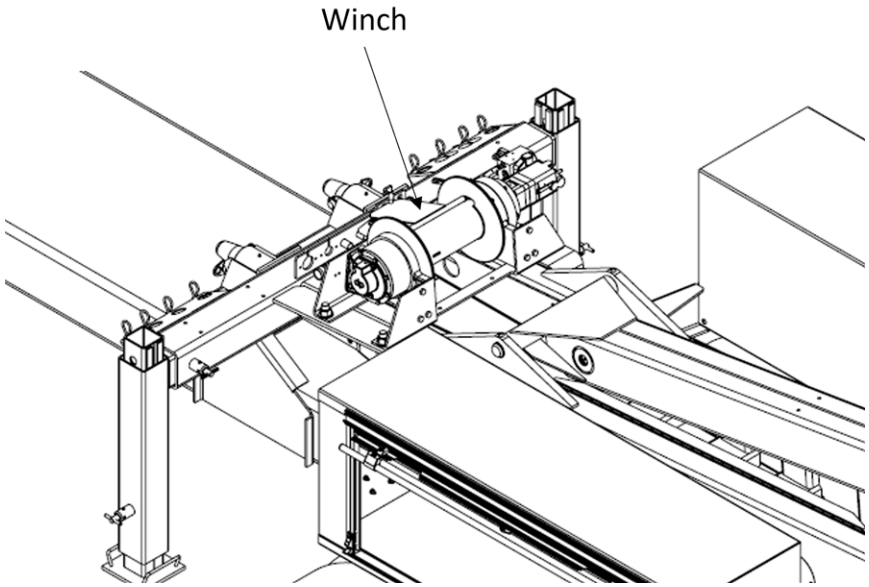


FIGURE 21 – LOCATION OF WINCH EQUIPPED WITH STEEL CABLES

5.3 Lubrication

This section details the lubrication points and schedule for the various parts of your Quickswap. Make sure to use the oil recommended by the manufacturer of each component.

NOTE: Look for lubrication stickers located just beside each grease fitting (zert).

TABLE 13 - LUBRICATION SCHEDULE - QUICKSWAP

Description	Lubricant type	After	Every				
		6 mths	1 wk	1 mth	3 mths	6 mths	1 yr
Underlift grease fittings	Waterproof grease		X				
Oil tank Keep the level at 3" from the top of the tank.	Hydrex MV36		X				
Underlift plates	Waterproof grease			X			
All other grease fittings	Waterproof grease			X			
Boom plates & outriggers	Waterproof grease				X		
Cables Lubricate once every four to six months.	Cable lubricant					X	

Description	Lubricant type	After	Every				
		6 mths	1 wk	1 mth	3 mths	6 mths	1 yr
Winch oil level Remove the plug on the side of the winch gearbox and insert your finger. If you cannot touch the oil, the oil level is too low and you should add oil.	Oil SAE 90EP See winch manual for proper oil according to your temperature range.					X	
Winch grease fittings	Waterproof grease	X					X
Valves	Antifreeze white grease						X

TABLE 14 - LUBRICATION SCHEDULE - TAG AXLE

Description	Lubricant type	After	Every				
		6 mths	1 wk	1 mth	3 mths	6 mths	1 yr
Alignment block	Grease				X		
Axle	Oil						X

TABLE 15 - LUBRICATION POINTS - UNDERLIFT

Name (number of lubrication points)	Type	Location / Note
T-Bar pivot point (4)	Grease fitting	Near the T-bar.
Extension (2)	Grease fitting	Near the T-bar, on the side of the last extension.
Sliding surfaces of each extension	Slide	Extend the underlift completely. Lubricate each sliding surface (4) of every extension. Move the underlift in and out a couple of times to spread the grease evenly on all surfaces.
Main fold pivot (2)	Grease fitting	Underlift base (pivot).
Fold up cylinder (2)	Grease fitting	One at the base of the vertical arm of the underlift.
Extension cylinder (1)	Grease fitting	One in the middle of the vertical arm of the underlift.
Underlift roller (2)	Grease fitting	One roller on each side of the underlift that goes inside the rail guide.
Wheel-lift and underlift brackets	Grease fitting	They are stored in one of the toolboxes on the towing unit.

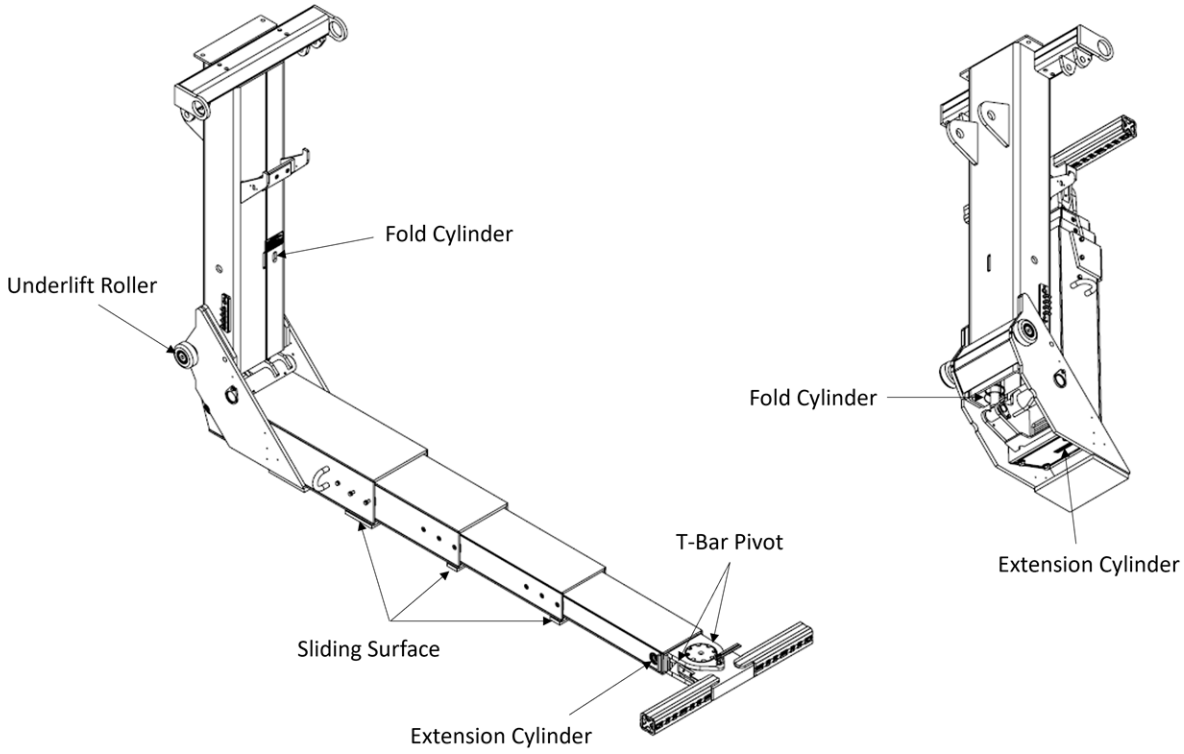


FIGURE 22 - UNDERLIFT LUBRICATION POINTS

TABLE 16 - LUBRICATION POINTS - BODY AND JACK LEGS

Name (number of lubrication points)	Type	Location / Note
Jack leg cylinder (4)	Grease fitting	At the top of the jack legs
Main anchor (4)	Grease fitting	In front of the winch

TABLE 17 - LUBRICATION POINTS - BOOM AND WINCH

Name (number of lubrication points)	Type	Location / Note
Pivot of the boom up-and-down cylinder (3)	Grease fitting	At the base of the boom cylinder pivot.
Boom extension cylinder (2 per extension)	Grease fitting	At the base of each boom extension.
Winch pulley (2)	Grease fitting	Top of the underlift vertical section.
Winch	Grease fitting	See winch manufacturer manual.

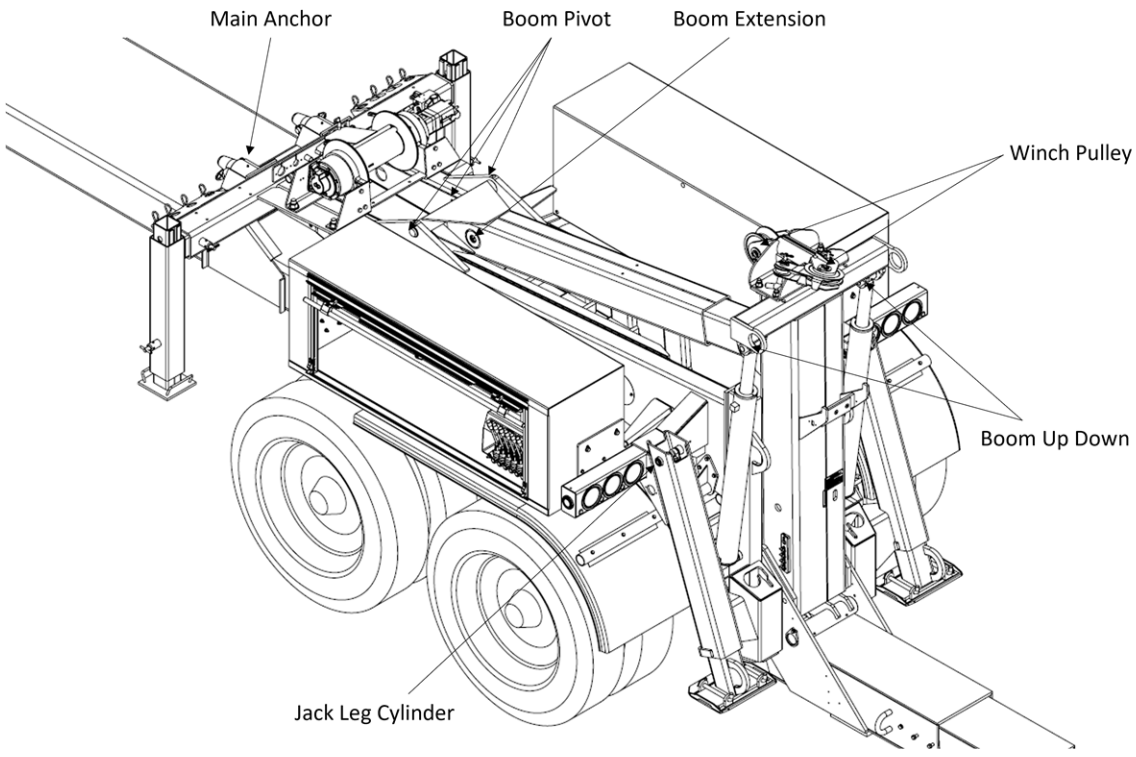


FIGURE 23 - BOOM AND WINCH LUBRICATION POINTS

5.4 Pressure adjustment

You may need to adjust pressure to correct one of the following problems:

- Lack of hydraulic power or slow operation of the Quickswap
- Quickswap cannot support the load

Before performing any pressure adjustment, first verify the dial located on the winch tensioner air-line. The dial should indicate a pressure of approximately 6.2 bar [90 psi] in order to maintain correct pressure for the cable. If the pressure is not correct, adjust it by turning the knob next to the dial. If this does not solve the problem, adjust pressure for one of the following:

- Adjust the hydraulic pressure, as explained in Section 5.4.1 Adjusting the hydraulic pressure (main relief).
- Adjust the pressure relief valve, as explained in Section 5.4.2 Adjusting the pressure relief valves (CBCG-LJN).
- Adjust the underlift cushioning valve, as explained in Section 5.4.3 Adjusting the underlift cushioning valve.

5.4.1 Adjusting the hydraulic pressure (main relief)

The Quickswap towing assembly has a single hydraulic system. The maximum pressure needs to be verified and adjusted to 2500 psi (210 bar).

1. Make sure all hydraulic hoses are properly connected to the Quickswap assembly.
2. Start the engine and set the throttle to between 600 and 800 rpm.

   NOTE: This will ensure appropriate reading of the pressure gauge.

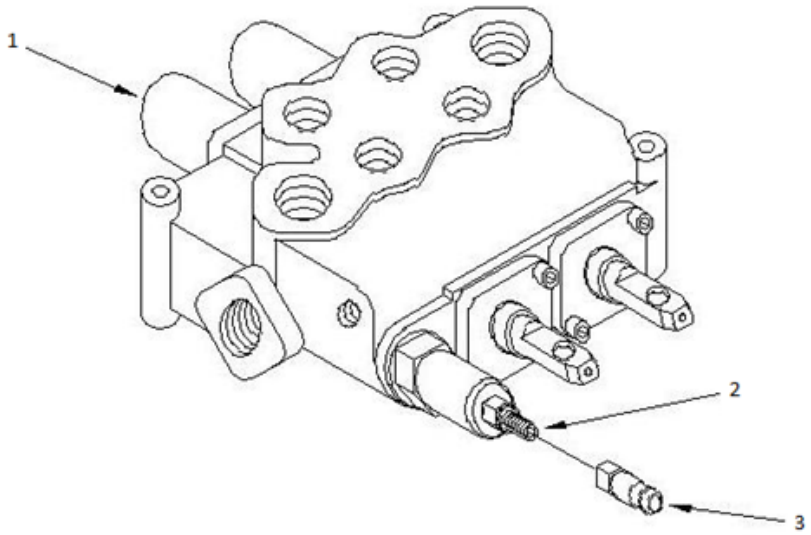
3. Engage the power take off (PTO).
4. Check for leaks in hydraulic pressure/return hoses.

5. Unscrew the locking device (No. 3 in Figure 24) on the valve, pull the underlift lever in, and turn the adjusting device (No. 2 in Figure 24) until the pressure reaches 2800 psi on the pressure gauge.

> NOTE: Pulling in the underlift lever when it is at its limit puts the hydraulic pressure at its maximum. This way, you can adjust the maximum pressure using the adjusting device. Using another control lever in this way would also work.

6. Put the locking device back in place.

> NOTE: The pressure gauge is normally located in the control compartment on driver's side. If there is no pressure gauge, use a removable pressure gauge on one valve bank function.



1. Cap
2. Adjusting device
3. Locking device

FIGURE 24 – ADJUSTING THE HYDRAULIC PRESSURE

5.4.2 Adjusting the pressure relief valves (CBCG-LJN)

There are two pressure cartridges on the Quickswap. They each need a different adjustment.

- One is used to control the pressure of the boom's up/down cylinder. It is located on the lift cylinder at the bottom of the boom. Adjustment required: 1¾ turns.
- One is used to control the pressure of the boom's in/out cylinder. It is located inside the boom. Adjustment required: ¾ of a turn.

NOTICE

Do not turn the adjusting screw of the relief valve while operating a hydraulic control, as this may permanently damage the valve.

1. Loosen the jam nut.

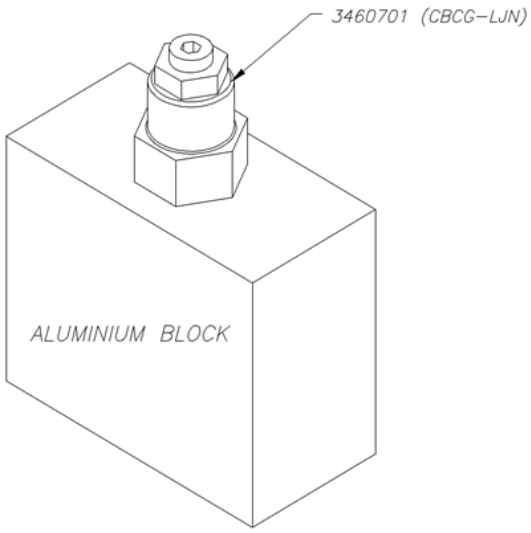


FIGURE 25 – ADJUSTING THE PRESSURE RELIEF VALVE (CBCG-LJN)

2. Turn the set screw counter-clockwise until it stops.

3. Turn the set screw clockwise to the appropriate setting (described above) and keep the screw in this position while you tighten the jam nut.

> NOTE: Position the Allen key so you can easily count how many turns you make when setting the screw.

5.4.3 Adjusting the underlift cushioning valve

The underlift cushioning valve is located inside the top rear section of the frame, under the aluminium cover. Should you have problems folding or unfolding the underlift, you may have to adjust the valve. The **B+A** cartridge controls the folding, and the **C+D** cartridge controls the unfolding. Both cartridges need to be set to 2,000 psi (138 bar). Ensure that the hoses are as shown in the following figure.

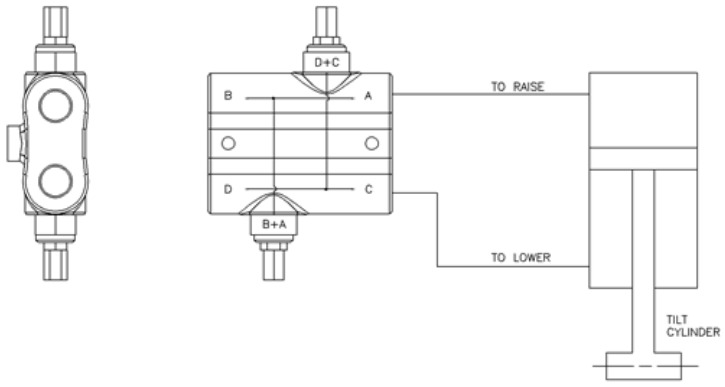


FIGURE 26 – ADJUSTING THE UNDERLIFT CUSHIONING VALVE

1. Completely unfold the underlift.
2. Completely retract the underlift (extension).
3. Try folding the underlift. If it can be folded easily, the cushioning valve is correctly adjusted. If not, continue to the next step.

4. Unscrew the locknut.

> NOTE: Make sure to choose the appropriate cushioning valve.

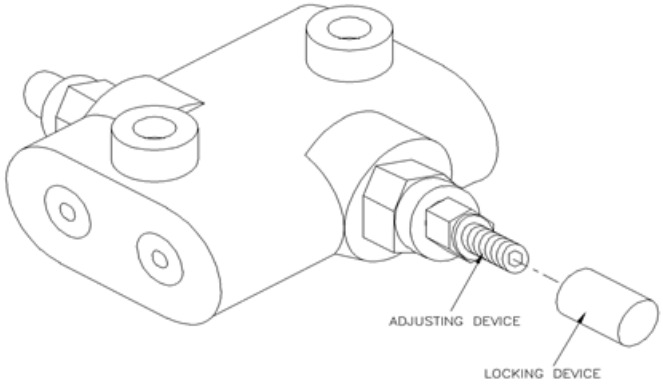


FIGURE 27 – ADJUSTING THE CUSHIONING VALVE

5. Turn the adjusting screw no more than ¼ turn at a time.

NOTICE

Do not turn the adjusting screw of the relief valve while operating a hydraulic control, as this may permanently damage the valve.

6. Try folding up the underlift. If it still lacks power, repeat Step 5 until the underlift folds correctly. Do not apply excessive pressure; use the minimum required to fold it correctly.
7. Tighten the locknut.

6 TROUBLESHOOTING

This chapter provides a summary of the most common problems, their main causes and solutions. The following sections provide detailed procedures for some of the solutions.

> NOTE: Only distributors are authorized to perform repairs that involve replacing parts.

6.1 Troubleshooting common problems

The following tables cover problems that you can solve on your own. If your problem is not listed or you cannot resolve it yourself, contact your distributor.

The list of authorized distributors and service providers is attached.

Table 18 covers problems for the Quickswap standard model. Table 19 covers problems for the Quickswap with tag axle.

TABLE 18 - TROUBLESHOOTING - QUICKSWAP STANDARD MODEL

Problem	Causes	Solutions
The winches cannot be engaged	The air pressure is too low	Check for an air leak or a bent hose.
The winches cannot be disengaged	The solenoid has no power	Using a multimeter, see whether the solenoid wiring is carrying a current.
	The air pressure is too low	Check for an air leak or a bent hose.
	The winch solenoid is faulty	Replace the solenoid. Follow the air line to locate the solenoid, which is near the winch.
	Cylinder plunger may be broken or bent	Replace the cylinder.
The Quickswap lacks power and runs too slowly	The hydraulic pump is faulty	Check and adjust the hydraulic pressure (see Section 5.4.1 Adjusting the hydraulic pressure (main relief)).
The winch cable stops too quickly or too slowly in free spool mode (disengaged)	The air pressure on the cable tensioner is too low or too high	Increase or decrease the air pressure on the cable tensioner. This is a trial and error adjustment. Keep adjusting the air pressure of the cable clamp balloon until you find the right setting.

Problem	Causes	Solutions
The underlift is difficult to fold or unfold	The cushioning valve is not adjusted properly	Adjust the cushioning valve (see Section 5.4.3 Adjusting the underlift cushioning valve).
One or more underlift extensions have trouble retracting	The hydraulic pressure is too low	Check and adjust the hydraulic pressure (see Section 5.4.1 Adjusting the hydraulic pressure (main relief)).
	The spool on the valve bank is not completing its stroke	Check the neighbouring spool and ensure that the spool completes its stroke. If the spool does not complete its full stroke, something is preventing it from moving freely. Remove the obstruction.
	The wear pads are not in place or sufficiently lubricated	Ensure that all wear pads are in place and well lubricated.
	One or more underlift sections are bent	Use a straight edge to see whether all the underlift sections are straight. If one is bent, have it repaired. You can also remove the steel spacers one by one and see whether that makes a difference.
	The IN/OUT cylinder is diverted	Completely retract the cylinder. Disconnect the very bottom hose from the tail board. Remove the male quick coupler from the hose and put the open end of the hose in a pail. Start the hydraulic system and pull the lever to retract it again, even if it is already retracted. If oil comes out of the hose in the pail, something is wrong with the cylinder. Have it repaired.

Problem	Causes	Solutions
The remote control won't control the equipment	The remote control battery is dead	For a 6-, 10-, or 16-button remote control, replace the battery.
	The antenna on the remote control receiver is broken	Replace the antenna. It is located on the right side of the body near the winch.
The boom lowers on its own	The holding valves are not adjusted properly	Adjust the holding valves.
	Rubber or silicone particles in the hydraulic fluid are stuck in the holding valves or cartridges	Fully lower the boom. Loosen the nut that locks the set screw on the cartridge. Turn the set screw clockwise until it stops. This opens the valve completely. Fully retract and extend the boom several times. This flushes the cartridge and may release the particles. Adjust the cartridge (see Section 5.4.2 Adjusting the pressure relief valves (CBCG-LJN)). Try the boom again to see whether the problem is solved.
	The cartridge is faulty	Adjust the cartridge (see Section 5.4.2 Adjusting the pressure relief valves (CBCG-LJN)).
	The boom cylinder is faulty	Check the boom cylinder and have it repaired or rebuilt (see Section 6.2 Checking the boom cylinder).
Oil leaks	Oil leak from hydraulic line	Check all hydraulic lines for oil leaks. Repair any leak found.
	Oil leak due to connection being too tight or too loose	Check all hydraulic connections for oil leaks due to possible over-tightening or under-tightening. Tighten or loosen the connection.

Problem	Causes	Solutions
The boom extends by itself with a load on the underlift or retracts by itself with a load on the winch cables	There is an external oil leak	Repair any external oil leaks.
	The counterbalance valve is not adjusted properly	Adjust the cartridge (see Section 5.4.2 Adjusting the pressure relief valves (CBCG-LJN)).
	The boom cylinder is faulty	Check the boom cylinder and have it repaired or rebuilt (see Section 6.2 Checking the boom cylinder).

TABLE 19 - TROUBLESHOOTING - QUICKSWAP WITH TAG AXLE

Problem	Causes	Solutions
The brake stays applied or does not apply	Trailer brake arm is activated	Deactivate the trailer brake arm.
	Brake shoes are worn out	Replace the brake shoes.
Axle suspension does not work properly	Supply and brake air lines are interchanged	Reconnect pneumatic air lines correctly.
	Air pressure too low	Verify air coming from the truck. Check for an air leak. Check for a blown air bag.
Wheel block as soon as you apply brakes	Incorrect air suspension adjustment	Verify air suspension adjustment and increase it. Refer to Section 4.10 Using the tag axle to transfer load for this procedure.

6.2 Checking the boom cylinder

You need to check the boom cylinder if the boom:

- Retracts by itself when pulling a (heavy) load with the winches.
- Extends by itself when lifting a load on the underlift. The underlift tilts down when the boom extends.

The problem might be due to a leaking piston, damaged seal or broken cartridge in the lock valve block.

The following troubleshooting procedure isolates a boom cylinder and checks it for leaks. If you push oil onto one side of a cylinder and the other side is vented, no oil should leak unless there is a broken piston, damaged seal or broken cartridge.

NOTE: You will need a load (e.g. another vehicle) for this procedure.

1. Lower the underlift completely.
2. Choose a lifting point on the vehicle to be towed. It must be both strong enough and have enough clearance for the underlift to move.

⚠ DANGER

Using a poor lifting point may damage the towed vehicle and Quickswap or even cause a serious accident.

3. Use the safety chains and tensioner to hold the vehicle in place on the underlift's T-bar.
4. Fully retract the boom and keep it retracted using a winch cable hooked to the D-ring on your Quickswap.
5. Stop the hydraulic system.
6. Put a cap on the ends of each hose. This prevents the oil from leaving the cylinder through the hoses.
7. Start the hydraulic system.

8. Disengage the winch that is keeping the boom retracted. If the boom does not stay retracted, the cylinder has to be rebuilt or replaced.

7 ACCIDENT OR BREAKDOWN PROCEDURE

This section explains what to do in case of an accident or equipment failure. Your goal is to safely stabilize the equipment and either perform the necessary repairs on site or bring it to a repair location.

Refer to this manual for all operation, maintenance and repair procedures. If in doubt, do not hesitate to contact your distributor. See the list of Authorized distributors and service providers.

7.1 Hydraulic failure

In the event of a hydraulic failure, the hydraulic pressures required for normal operation are not reached in the circuits. The hydraulic pump or PTO may be the cause.

⚠ WARNING

The hydraulic failure must be repaired before performing other towing operations.

To troubleshoot a hydraulic failure:

1. If the PTO works normally, check whether the hydraulic pump is operating normally. If the hydraulic pump is not working normally, see Pump Failure below.

When the correct operating pressures are reached, stabilize the equipment safely.

7.2 Pump failure

7.3 Truck failure

In the event of a vehicle breakdown, you will not be able to operate the equipment. Have the equipment moved to a safe place to make the necessary repairs on the truck.

7.4 Underlift stinger failure

In the event of an underlift stinger failure in which the stinger can no longer be extended or retracted, the most probable cause is a bent cylinder. Remove the underlift and have it repaired.

8 STORAGE

Proper storage is important to prevent premature wear and tear on your machine. Ideally, it should be stored in a dry, covered area.

When storing your Quickswap:

1. Immobilize the machine in a dry and stable location.
2. As per Section 5.3 Lubrication, lubricate all parts.
3. Position the parts so that the cylinders are fully retracted.
4. Lubricate any exposed cylinder rods.
5. Disconnect the electrical power supply to avoid depleting the batteries.

When taking your Quickswap out of storage:

1. Clean and lubricate all parts.
2. Replace the high-pressure and return filters on the hydraulic reservoir.
3. Check the oil level and pressure.
4. Connect the electrical power supply.

9 DISASSEMBLY AND DISPOSAL

When the equipment reaches the end of its lifespan, dispose of its various parts in an environmentally friendly manner.

Before disassembling the machine, drain all fluids and remove the battery for recycling.

Comply with all effective regulations, including the RoHS Directive for electrical components, when disassembling the machine and disposing of the following parts:

- Electrical components;
- Rubber hydraulic hoses;
- Painted parts;
- Metal;
- Composite materials.

To protect both you and the environment, we recommend having a specialized company disassemble your machine.

AUTHORIZED DISTRIBUTORS AND SERVICE PROVIDERS

Please visit our website for the list of authorized distributors and service providers, or scan the QR code below.

https://nrc-industries.com/nrc-dealer/

LOGBOOK

Your logbook, which must be kept with your equipment, should contain the following information.

Logbook						
Date	Routine	Maintenance/ Frequency (Flushing, Greasing, Tightening…)	Other Tasks (Inspections, Disassembly, Repairs…)	Name and Title	Number of Hours of Operation	Observations (Part Numbers…)

OPERATOR RECORD

Operator Name	Date

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