

# PARTS, MAINTENANCE AND OPERATION MANUAL



**NRC INDUSTRIES INC.  
2430 PRINCIPALE  
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## QUICKSWAP

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For serial number(s):

QS-561  
QS-562  
QS-566  
QS-567  
QS-568  
QS-569  
QS-570  
QS-571  
QS-572



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## 1. Technical Specifications and Ratings

### 1.1. General Specifications

<i>General Specifications</i>	<i>Quick Swap Under-Lift</i>
Minimum Wheelbase	250"
Recommended Wheelbase	265" to 275"
Weight (without winch)	5,500 lbs.
Power elevation	S
Power extension	S
Power tilt	S
Removable	S

S=Standard

### 1.2. Hydraulic System (option)

<i>Hydraulic System</i>	<i>Quick Swap Under-Lift</i>
Direct Mount Hydraulic Pump	Simple, 17 GPM
Working Hydraulic Pressure	2800 PSI.

### 1.3. Axle-Lift Ratings

<i>Axle-Lift</i>	<i>Heavy Duty</i>
Axle-Lift Capacity (Retracted)	35,000 lbs.
Axle-Lift Capacity (Extended)	15,000 lbs.
Reach Fully Retracted	70"
Reach Fully Extended	109"

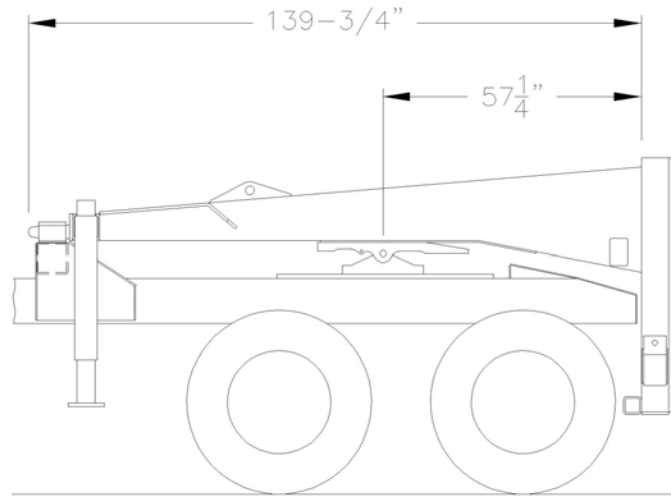
### 1.4. Winch Ratings (option)

<i>Winches and Cables</i>	<i>DP 20,000 lbs.</i>	<i>Ramsey 25,000 lbs.</i>
Winch Capacity	20,000 lbs.	25,000 lbs.
Winch Type	Planetary	Worm Gear
Wire Rope	5/8" X 200'	5/8" X 200'

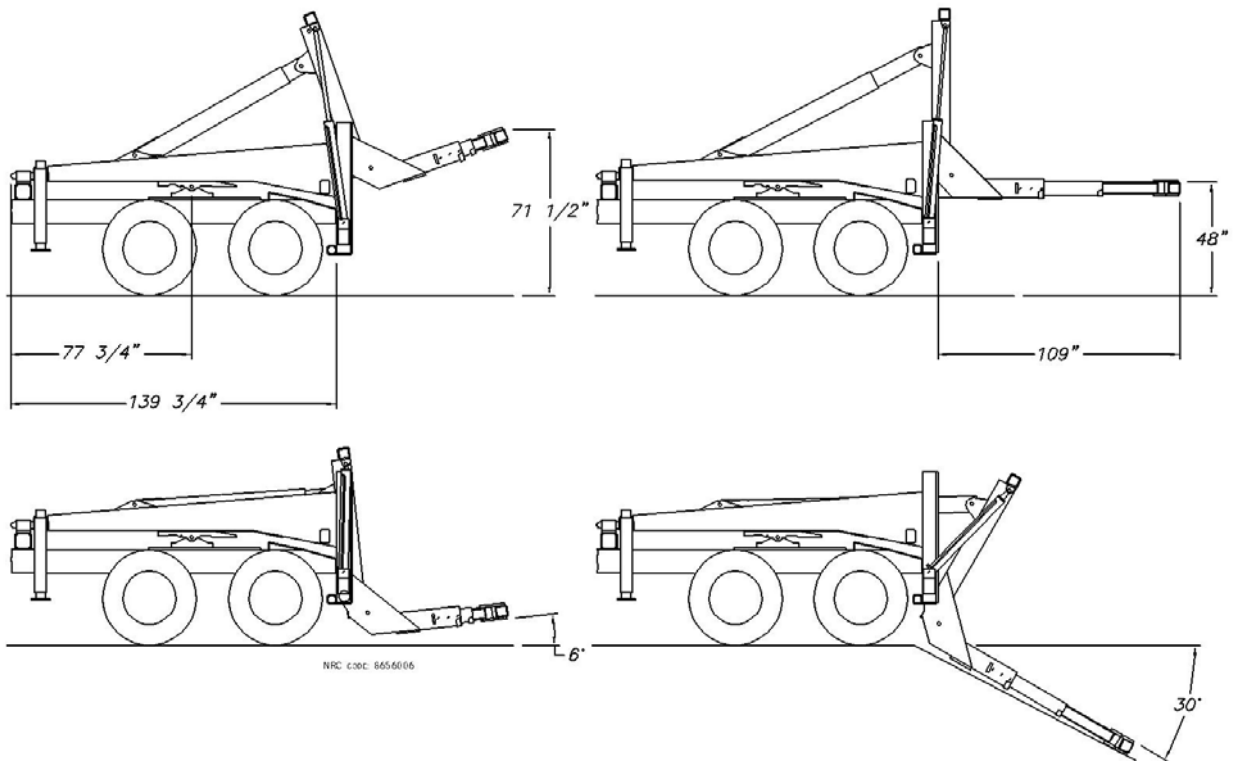
**NOTE:** THE WINCH AND UNDER-LIFT RATINGS ARE BASED ON THE STRUCTURAL CAPACITY OF STATIC STEEL.

## 1.5. Quick Swap Dimension

### 1.5.1. Quick Swap Under-lift Dimensions



### 1.5.2. Axle-Lift Dimensions

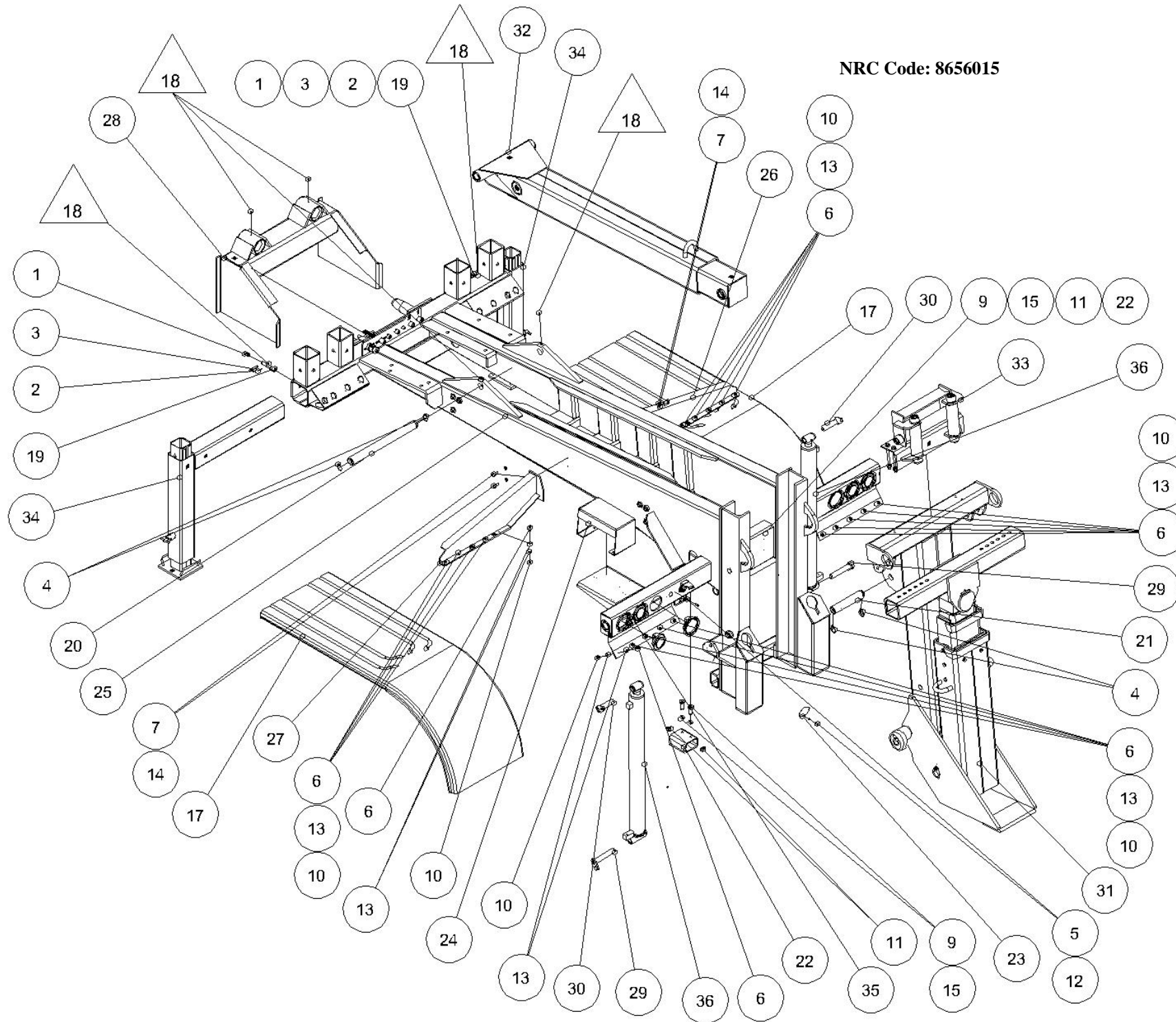


## 1.6. Installation

For the installation on a chassis, a DVD recorded at the factory is available on request

## 2. Description of Components

### 2.1. Quick Swap Assembly

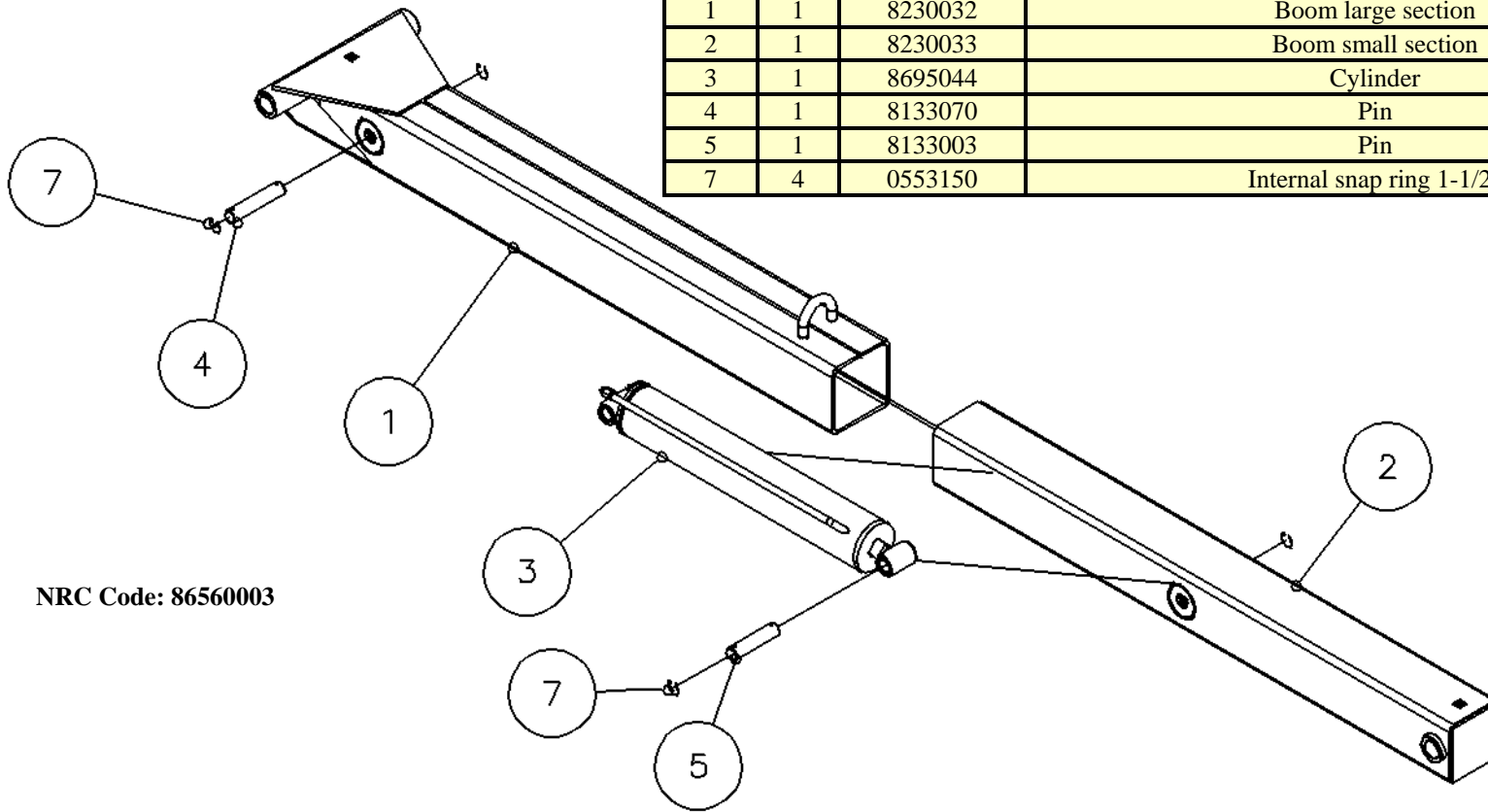


ITEM	QTY	NRC CODE	NAME	DESCRIPTION
1	2	0517103	BIG SPRING	-
2	2	0540232	ROLLED SPRING PIN	3/16" x 1 1/2" LG.
3	2	0540270	ROLLED SPRING PIN	3/8" x 3" LG.
4	4	0554200	EXTERNAL SNAP RING	Ø2"
5	2	0612423	CAP SCREW	1/4-20UNC x 3/4" (STAINLESS)
6	20	0612733	CAP SCREW	5/16-18UNC x 1" (S/S)
7	4	0613631	HEX CAP SCREW	1/2-13UNC X 1 1/4"
8	12	0614241	HEX CAP SCREW	5/8-11UNC X 1 1/2"
9	4	0614552	CAP SCREW	3/4-10UNC X 2"
10	20	0822129	HEX NYLON NUT	5/16-18UNC S/S
11	4	0828111	HEX NUT	3/4-10UNC
12	2	0911215	SPRING LOCK WASHER	1/4" (STAINLESS)
13	40	0911305	FLAT WASHER	5/16" S/S
14	4	0911611	SPRING LOCK WASHER	1/2"
15	4	0911901	FLAT WASHER	3/4"
16	12	0912001	FLAT WASHER	7/8"
17	2	1314001	80" HALFT FENDER	68.843" x 20.553" x 25"
18	6	1931203	ZERT	STRAIGHT 3/16 PRESS-FIT
19	2	8133041	LATCH PIN	-
20	1	8133129	PIN OF BOOM	-
21	1	8133130	AXLE-LIFT/BOOM PIN	-
22	2	8165085	QUICK-SWAP SUPPORT	-
23	1	8181617	CONNECTOR CAP	-
24	1	8183016	VALVE CONTROL COVER	-
25	1	8220017	QUICK-SWAP ASSEMBLY	QSS
26	1	8221001	RIGHT FENDER SUPPORT	-
27	1	8221006	LEFT FENDER SUPPORT	-
28	1	8222004	FRONT QUICK-SWAP ANCHOR	-
29	2	8270007	PIN	-
30	2	8270019	CYLINDER HEAD PIN	-
31	1	8650020	AXLE-LIFT	QSS
32	1	8656003	BOOM ASSEMBLY	QSS
33	1	8656017	ROLLER GUIDE	QSS
34	2	8656029	JACK LEG ASSEMBLY	QSS QSE
35	1	8681021	ELECTRICAL KIT	QSS
36	2	8695045	CYLINDER	Ø3 1/2" x 36 7/8"

## 2.2. Boom

### 2.2.1. Quick-Swap Under-lift Boom and Parts List Diagram

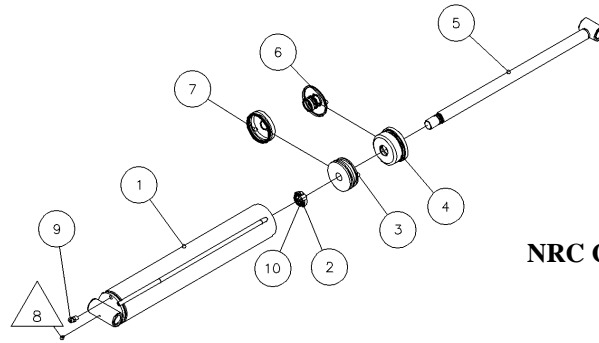
<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	8230032	Boom large section
2	1	8230033	Boom small section
3	1	8695044	Cylinder
4	1	8133070	Pin
5	1	8133003	Pin
7	4	0553150	Internal snap ring 1-1/2"



NRC Code: 86560003



2.2.2. Boom Cylinder

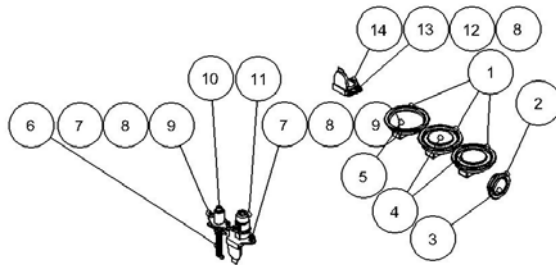


NRC Code: 8695044

**NOTE: Triangle balloons show greasing point.**

Item	Qty	Code	Name
1	1	8274012	Cylinder Tube
2	1	0834223	Hex Nylon Nut
3	1	8136041	Piston
4	1	8135001	Cylinder Head
5	1	8275028	Cylinder shaft
6-7	1	1202036	Seal kit
8	1	1931203	Zert (Straight 3/16" Press-Fit)
9	1	1831224	Hydraulic Adapter Straight
10	1	1831718	Hydraulic Adapter Straight

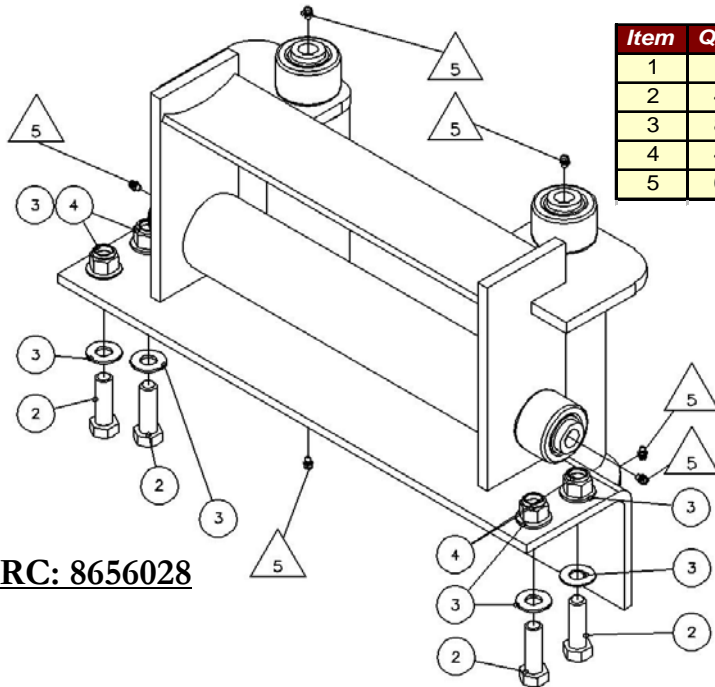
2.3. Electrical kit



**NRC: 8681021**

Item	Qty	Code	Name	Description
1	6	2552019	GROMMET	Ø4 1/4" x 7/8"
2	2	2552035	GROMMET	Ø2 1/2" x 7/8"
3	2	2552069	CLEARANCE MARKER LIGHT	FEU ROUGE, Ø2 1/2"
4	4	2552065	STOP & TURN LIGHT	FEU ROUGE, Ø4 1/4"
5	2	2552008	BACK-UP LIGHT	Ø4 1/4"
6	1	2540101	ELECTRIC PLUG	4 POLES; FIL 12-PLUS
7	4	0612433	CAP SCREW	1/4-20UNC x 1" (STAINLESS)
8	6	0911205	FLAT WASHER	1/4" (STAINLESS)
9	4	0821112	HEX NUT	1/4-20UNC (STAINLESS)
10	1	2540001	ELECTRIC SOCKET	4-POLES
11	1	2540901	SOCKET BOOT	PRISE 7 POLES; CAOUTCHOUC NOIR
12	2	0911215	SPRING LOCK WASHER	1/4" (STAINLESS)
13	2	0612423	CAP SCREW	1/4-20UNC x 3/4" (STAINLESS)
14	2	2540004	ELECTRIC SOCKET	7-POLES PLASTIQUE

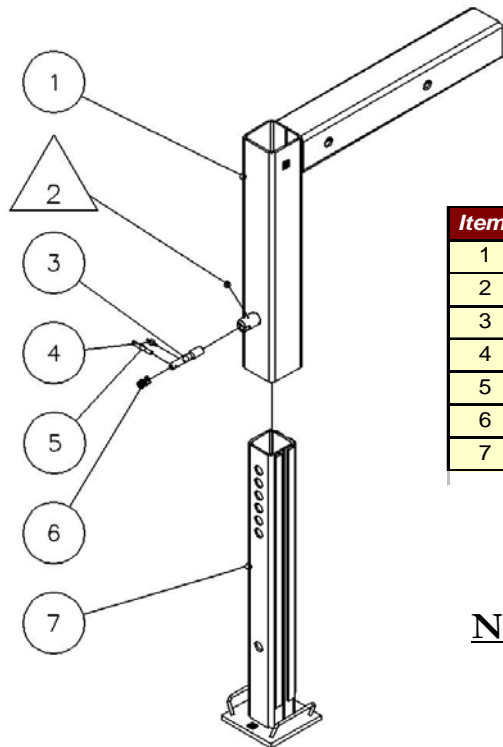
### 2.4. Roller Guide



Item	Qty	NRC code	Name	Description
1	1	8250001	ROLLER GUIDE	-
2	4	0614261	HEX CAP SCREW	5/8-11UNC X 2"
3	8	0911801	FLAT WASHER	5/8"
4	4	0827121	HEX NYLON NUT	5/8-11UNC
5	6	1931203	ZERT	STRAIGHT 3/16" PRESS-FIT

**NRC: 8656028**

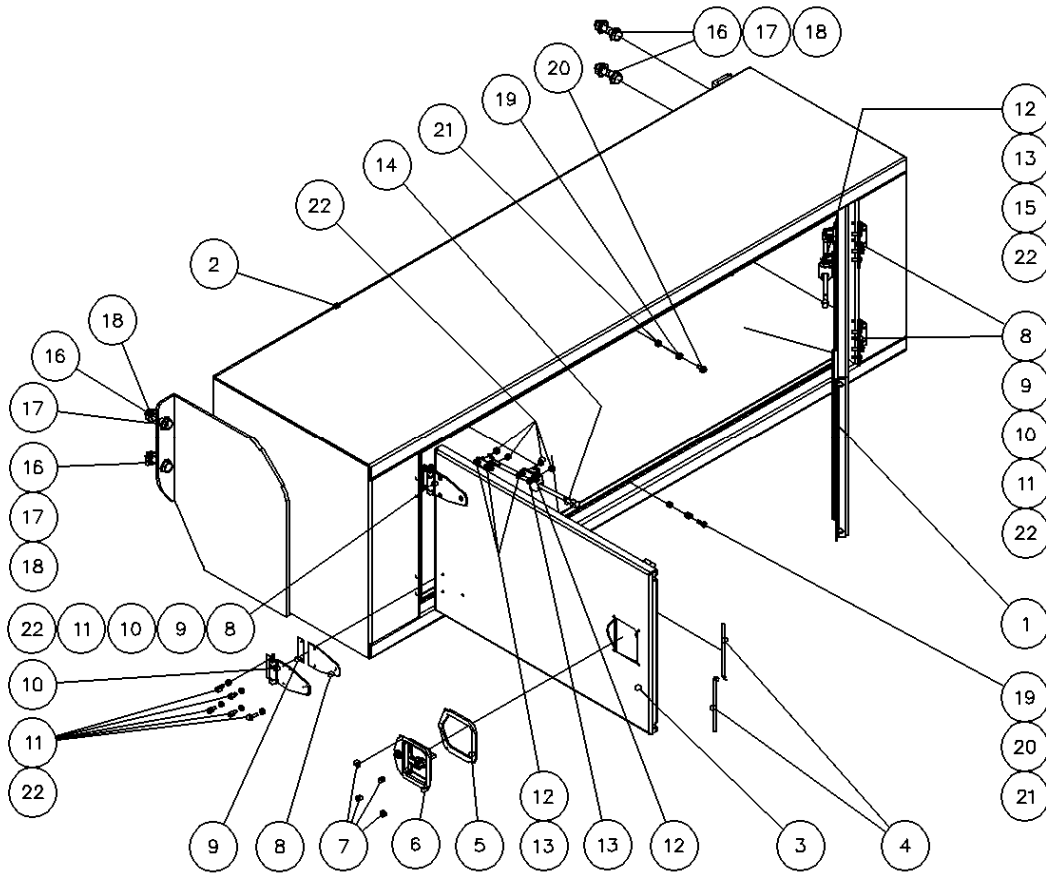
### 2.5. Jack Leg



Item	Qty	Code	Name	Description
1	1	8221004	INTERMEDIATE JACK LEG	-
2	1	1931203	ZERT	STRAIGHT 3/16 PRESS-FIT
3	1	8133041	LATCH PIN	ø1" x 4 3/4"
4	1	0540232	ROLLED SPRING PIN	3/16"DIA x 1 1/2" LG.
5	1	0540270	ROLLED SPRING PIN	3/8"DIA x 3" LG.
6	1	0517103	BIG SPRING	-
7	1	8236038	PARKING JACK LEG	-

**NRC: 8656029**

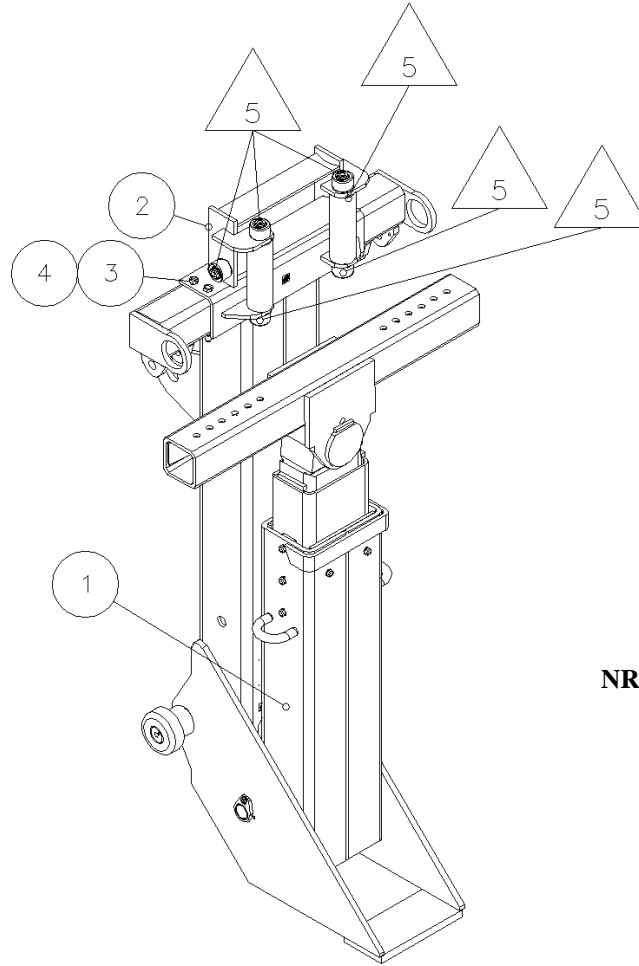
## 2.6. Tool Box



Item	Qty	NRC code	Name	Description
1	1	7216035	BACK DOOR	-
2	1	7216037	TOOL BOX	-
3	1	7216036	FRONT DOOR	-
4	2	0522207-03	DOOR LATCH ROD	1/4" DIA x 6 3/16" LG
5	1	0514907	HANDLE DOOR GASKET	0.188"
6	1	0522101	DOOR LATCH	PADDLE TYPE
7	4	0503202	POP RIVET	∅3/16" (STAINLESS)
8	4	0514909	GASKET	RUBBER
9	4	0514910	GASKET	RUBBER
10	4	0520004	HINGE	4.55"
11	20	0771670	MACHINE SCREW HEX SOCKET	1/4-20UNC X 3/4" INOX
12	8	0911201	FLAT WASHER	1/4"
13	8	0612431	CAP SCREW	1/4-20UNC x 1"
14	1	0522801	DOOR STOP	11"; AJUSTABLE TENSION, 15lbs
15	1	0522801-05	DOOR STOP	11"; AJUSTABLE TENSION, 15lbs
16	4	0911803	FLAT WASHER	5/8" (F436)
17	4	0614281	CAP SCREW	5/8-11UNC X 2 1/2"
18	4	0827141	FLANGE HEX LOCK NUT	5/8-11UNC
19	2	0821112	HEX NUT	1/4-20UNC (STAINLESS)
20	2	0612423	CAP SCREW	1/4-20UNC x 3/4" (STAINLESS)
21	2	0821129	HEX NYLON NUT	1/4-20UNC (STAINLESS)
22	28	0821121	HEX NYLON NUT	1/4-20UNC

## 2.7. Axle-Lift

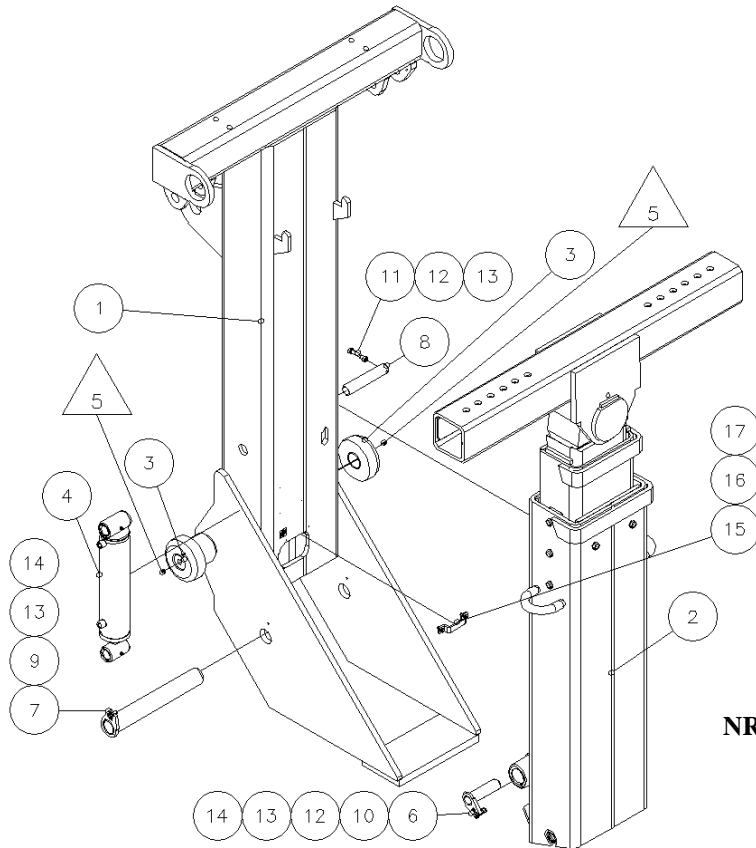
### 2.7.1. Axle Lift and Roller Guide



**NRC Code: 8650021**

<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	8650020	Axle-Lift
2	1	8250001	Roller Guide
3	4	0614401	Cap Screw 5/8"-11UNC x 7"
4	4	0827121	Nylon Hex Nut 5/8"-11UNC
5	6	1931203	Grease Nipple (Zert) Straight 3/16" Press-Fit

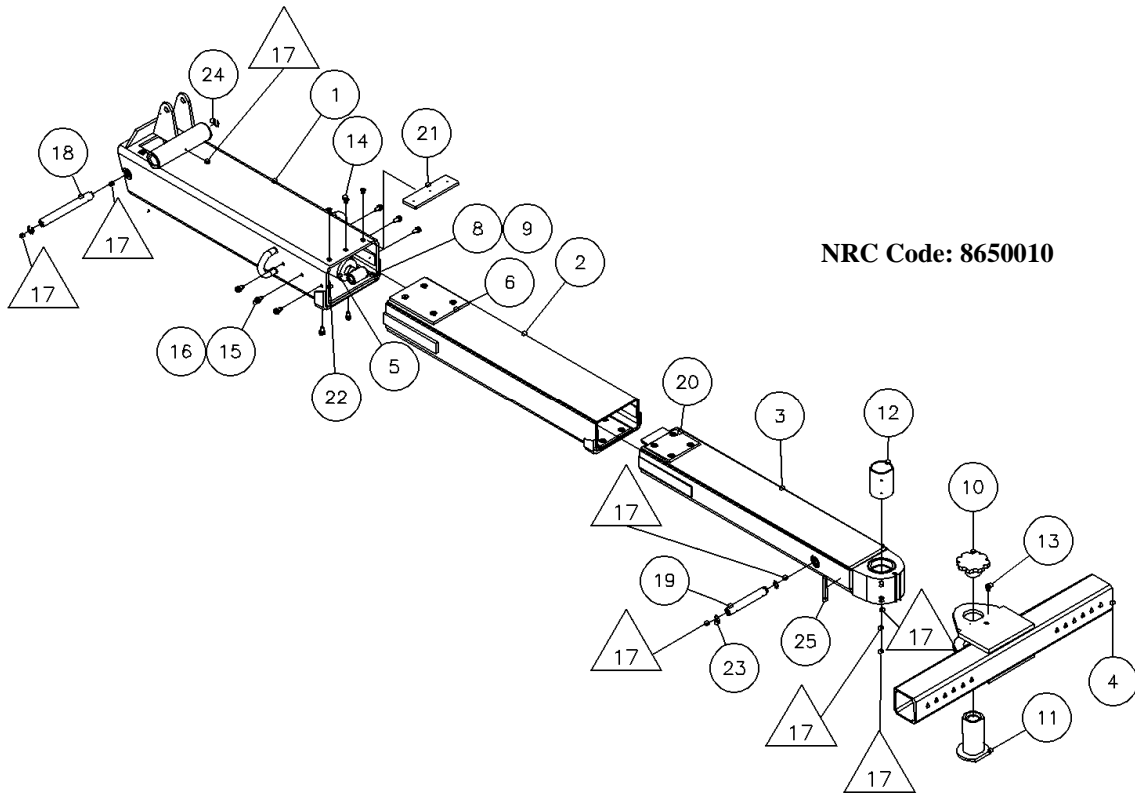
2.7.2. Axle Lift and Parts List Diagram



NRC Code: 8650020

<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	8213024	Axle-Lift Vertical Section
2	1	8650010	Horizontal Section
3	2	8690023	Roller and Bushing Assembly
4	1	8695009	Cylinder
5	2	1931203	Zert (Straight 3/16" Press-Fit)
6	1	8270001	Axle-Lift Pin for Lever Cylinder
7	1	8270002	Axle-Lift Hinge Pin
8	1	8133058	Pin
9	1	0613031	Cap Screw
10	1	0613051	Cap Screw
11	1	0613091	Cap Screw
12	2	0823111	Hex Nut
13	3	0911411	Spring Lock Washer
14	2	0911401	Flat Washer
15	2	0612421	Cap Screw
16	2	0911211	Spring Lock Washer
17	1	8154188	Hydraulic Hose Guide

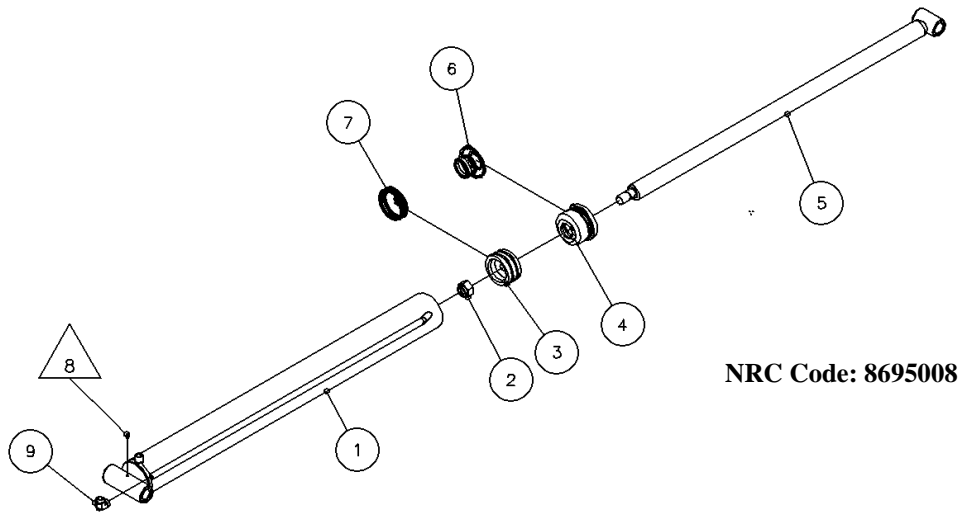
2.7.3. Heavy Duty Axle-Lift Horizontal Section and Parts List



NRC Code: 8650010

<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	8213002	Axle-Lift Large Section
2	1	8213003	Axle-Lift Medium Section
3	1	8213004	Axle-Lift Small Section
4	1	8213005	T-Bar
5	1	8695008	Extension Cylinder
6	1	8185073	Teflon Pad
8	1	8185072	Teflon Pad
9	2	8101231	Teflon Pad Anchor
10	1	8188001	T-Bar Pin Bolt
11	1	8133158	T-Bar Pin Nut
12	1	8145009	Brass Bushing
13	1	0623600	Custom Cylindrical Bolt
14	3	0633610	Hex Socket Cap Screw
15	8	0613621	Hex Bolt
16	8	0911611	Spring Lock Washer
17	8	1931203	Zert (Straight 3/16" Press-Fit)
18	1	8133060	Pin
19	1	8133061	Pin
20	2	8185014	Teflon Pad
21	1	8101418	Spacer
22	2	8101419	Spacer
23	2	0554125	Exterior Snap Ring
24	2	0553125	Interior Snap Ring
25	2	8168029	Stopper

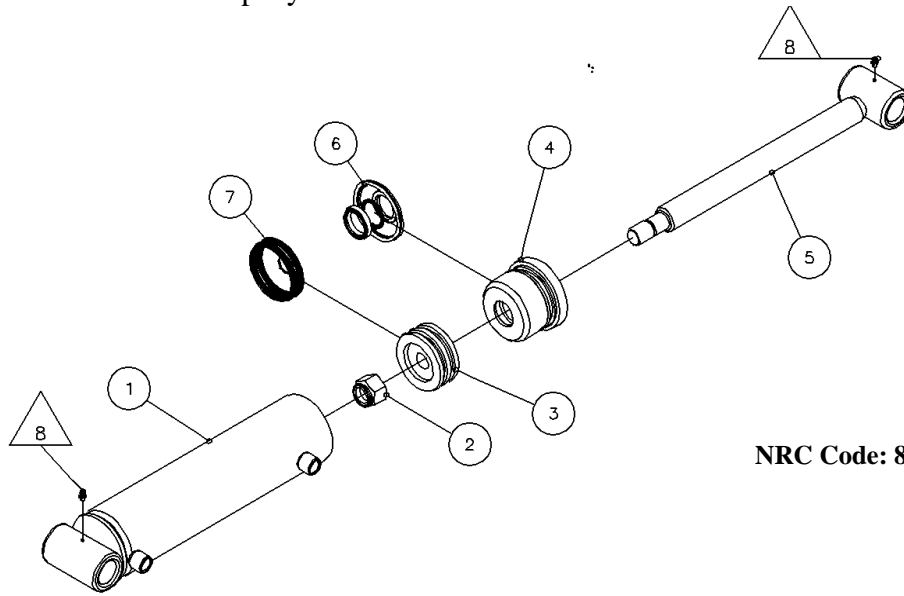
2.7.4. Axle-Lift Extension Cylinder



NRC Code: 8695008

<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	8274009	Cylinder Tube
2	1	0830225	Hex Nylon Nut
3	1	8136021	Piston
4	1	8135021	Cylinder Head
5	1	8275008	Cylinder shaft
6-7	1	1202007	Seal kit
8	1	1931203	Zert (Straight 3/16" Press-Fit)
9	1	1821410	Hydraulic Adapter Straight

2.7.5. Axle-Lift Fold Up Cylinder

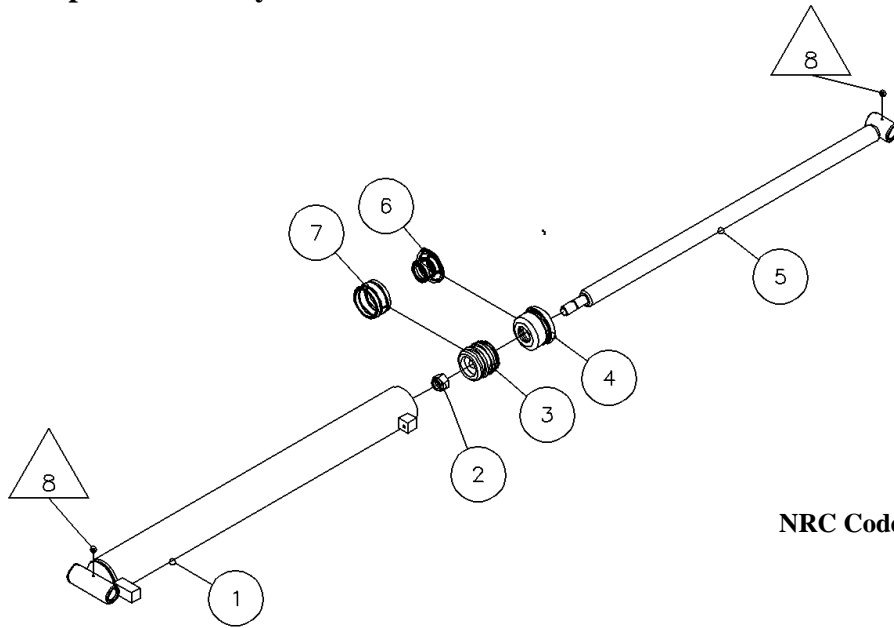


**NRC Code: 8695009**

<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	8274010	Cylinder Tube
2	1	0829220	Hex Nylon Nut
3	1	8136014	Piston
4	1	8135013	Cylinder Head
5	1	8275009	Cylinder shaft
6-7	1	1202004	Seal kit
8	2	1931203	Zert (Straight 3/16" Press-Fit)



## 2.8. Quick Swap Elevation Cylinder



NRC Code: 8695045

<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	8274052	Cylinder Tube
2	1	0830225	Hex Nylon Nut
3	1	8136019	Piston
4	1	8135021	Cylinder Head
5	1	8275046	Cylinder shaft
6-7	1	1202014	Seal kit
8	2	1931203	Zert (Straight 3/16" Press-Fit)

## 2.9. Winches

DP 20BHX4X6G-004 (NRC code: 3420027)

Specifications: Weight 355 lbs.  
Air Clutch Release

<i>DP 20,000 lbs. Winch Performance</i>			
<u>Layer</u>	<u>Ø5/8" Cable Cap.</u>	<u>Line Pull</u>	<u>Line Speed (fpm)</u>
1	30	20,000 lbs.	28
2	67	16,600 lbs.	34
3	110	14,200 lbs.	40
4	159	12,400 lbs.	46
5	214	11,000 lbs.	52

The rated line pulls are for the winch only. Consult the wire rope manufacturer for wire rope ratings.

Line speed is based on 20 GPM Flow Rate at 2550 PSI. max.

Cable capacities are in accordance with SAE J706, **with the exception of the last wrap.** (actual capacities are usually up to 10% greater than those shown.)

Source: DP Manufacturing, Inc.

Ramsey 120564-G (F.O.R.S) H800-R (NRC code: 3420033)

Specifications: Gear Reduction 40:1  
Shipping Weight 330 lbs.

<i>Ramsey H-800 Winch Performance</i>			
<u>Layer</u>	<u>Ø5/8" Cable Cap.</u>	<u>Line Pull</u>	<u>Line Speed (fpm)</u>
1	35 ft.	25,000 lbs.	18
2	75 ft.	20,800 lbs.	22
3	125 ft.	17,900 lbs.	26
4	180 ft.	15,600 lbs.	29
5	240 ft.	13,900 lbs.	33

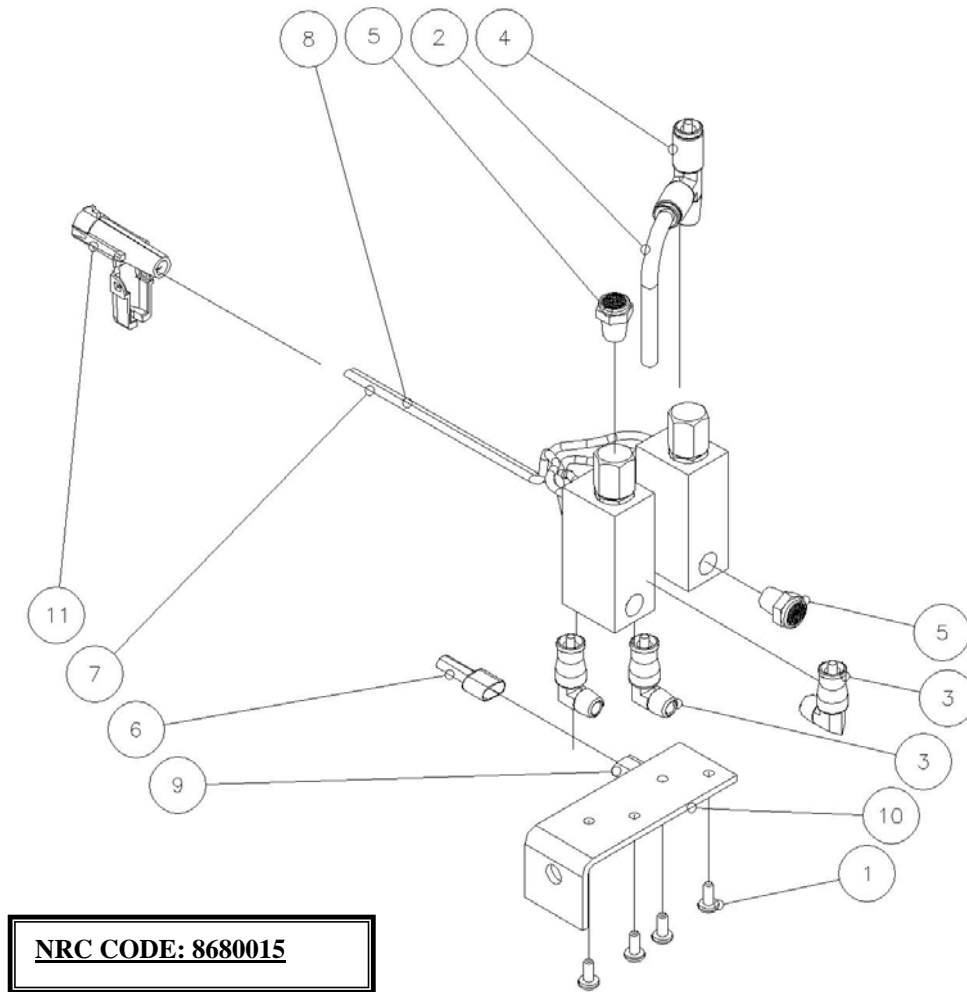
The rated line pulls are for the winch only. Consult the wire rope manufacturer for wire rope ratings.

Line speed is based on 30 GPM Flow Rate.

Cable capacities are in accordance with SAE J706, **with the exception of the last wrap.** (Actual capacities are usually up to 10% greater than those shown.)

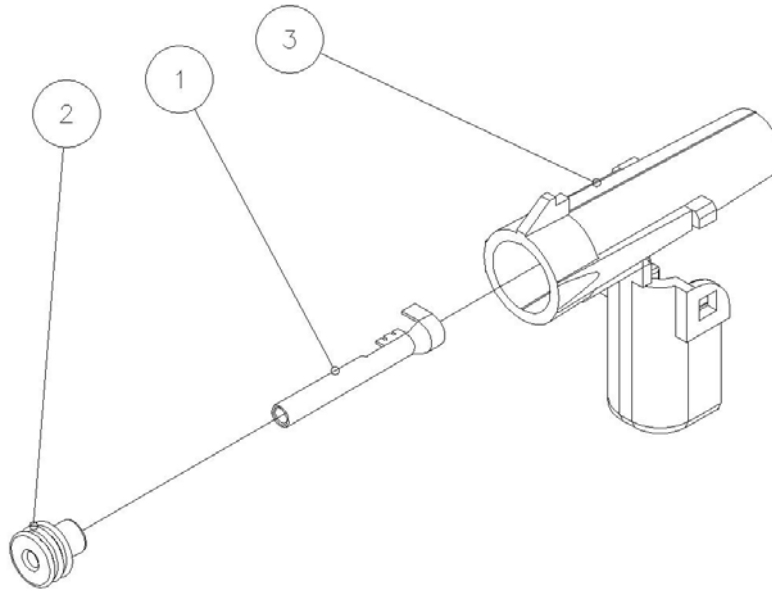
Source: Ramsey Winch Company Parts and Operators Manual.

2.9.1. Air Clutch Solenoid (12V) for Ramsey 25000 Winches with Parts List



<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>	<i>Description</i>
1	4	0727425	MACHINE SCREW SQUARE SOCKET	#8-32UNC X 3/8"
2	1	2110400-01	PNEUMATIC HOSE 4	PLASTIQUE NOIR/SAE J844D TYPE-3B
3	3	2221404-PC	PNEUMATIC ADAPTER 90D	RPC-N2-T4
4	1	2251404-PC	PNEUMATIC ADAPTER TEE	RPT-T4-N2-T4
5	2	2329001	BREATHER VENT	Ø/8"-27 NPT
6	1	2502903-X01	CONDUIT INSTALLED BY HOT	Ø1/2" x 1" LG
7	1	2512001	SOLENOID SWITCH	153JJ2XGM-12VDC
8	1	2512002	SOLENOID SWITCH	154JJ2XGM-12VDC
9	1	2542011	RING TERMINAL	FIL 12-10; VIS 8-10
10	1	8101246	SOLENOID BRACKET	-
11	1	8681008	(F-V) 1 FUNCTION ASSEMBLED GM PLUG	-

2.9.2. (F-V) 1 Function assembled gm plug

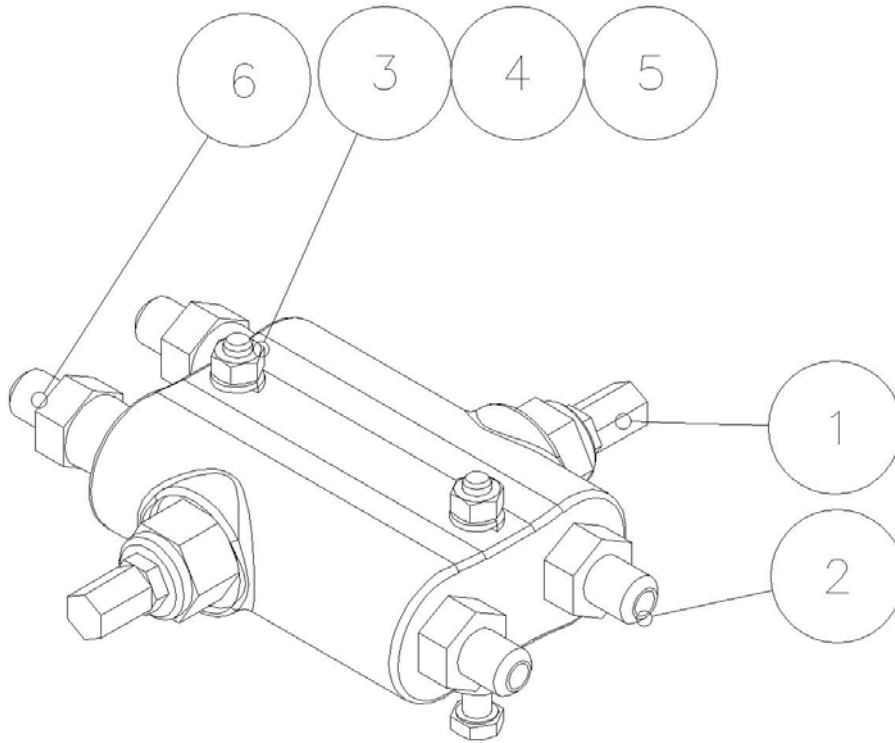


**NRC CODE: 8681008**

<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>	<i>Description</i>
1	1	2543301	OEM TERMINAL FEMALE	20-18 GA
2	1	2543401	CABLE SEAL	18-20 GA ; VERT
3	1	2543701	CONNECTOR	1 CAVITÉ, FEMELLE

**2.10. Caution Valve**

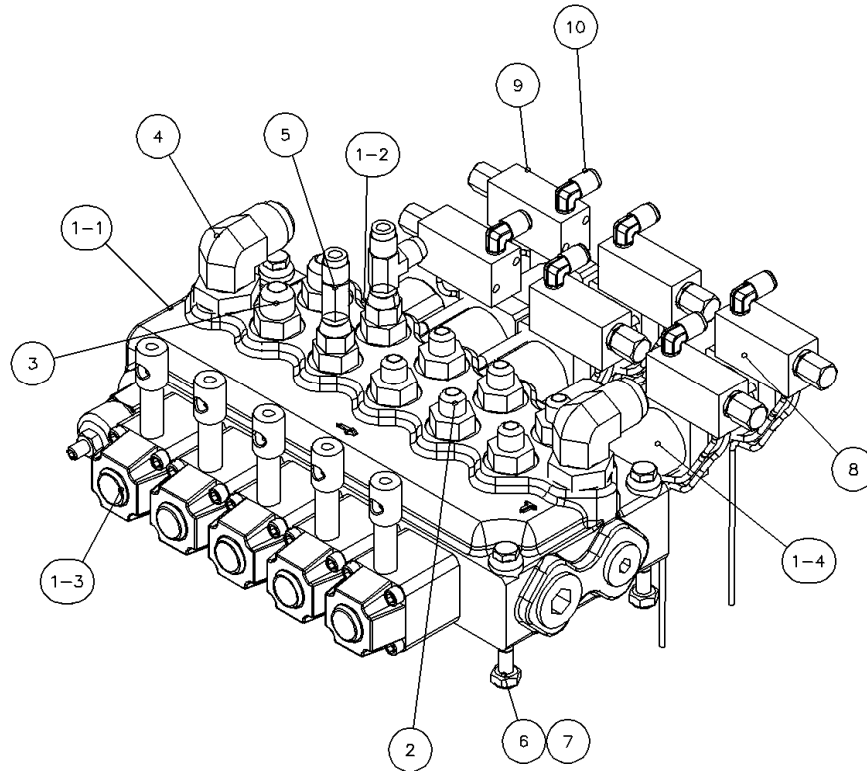
2.10.1. Caution Valve and Parts List



**NRC CODE: 8684014**

<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>	<i>Description</i>
1	1	3460406	CUSHING VALVE	30 GPM
2	2	1831232	HYD ADAPTER STRAIGHT	RHD-N8-J6
3	2	0612811	CAP SCREW	5/16-18UNC x 3"
4	2	0822111	HEX NUT	5/16-18UNC
5	2	0911311	SPRING LOCK WASHER	5/16"
6	2	8189016	MODIFIED HYD ADAPTER STRAIGHT	-

Hydraulic Valve

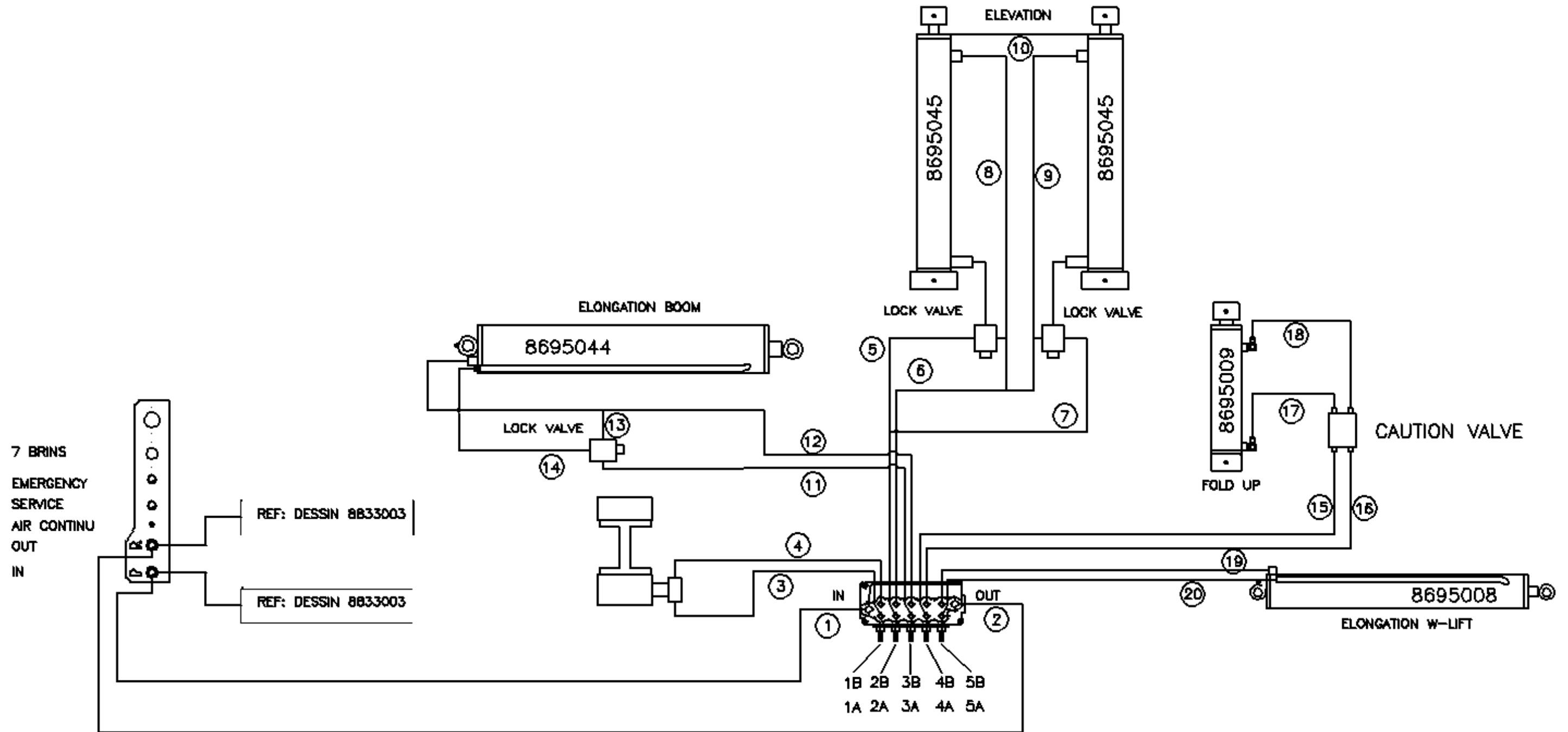


<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	3460008-95	5 Spools For DP Winch and Remote Control 6 Buttons
1-1	1	3460006	5 Spools Valve
1-2	2	3463023	Cap
1-3	5	3461006	Lever Pivot Box
1-4	3	3463024	Pneumatic Pilot
2	8	1834128	Hyd Adaptor Straight
3	2	1834130	Hyd Adaptor Straight
4	2	1824136	Hyd Adapter 90D
5	2	1852406	Hyd Adapter Tee
6	3	0612821	Cap Screw
7	3	0822121	Hex Nylon Nut
8	6	2231202	Pneumatic Adapter Straight
9	6	2512001	Solenoid Switch
10	6	2221404-PC	Pneumatic 90D Fitting
N/S	5	3461008-91	Control Lever
N/S	5	3467001	Bellows

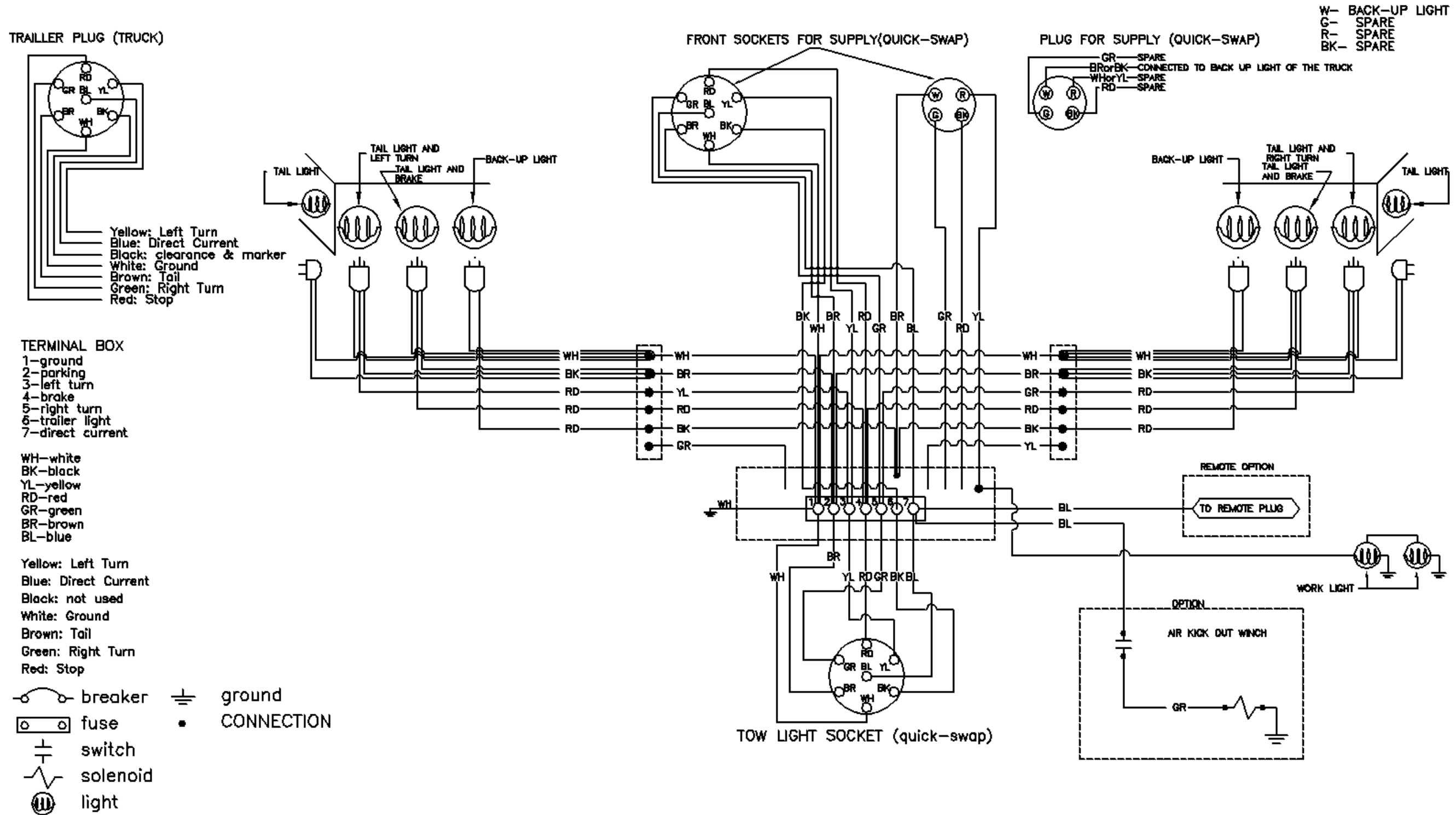
N/S: Not Shown

2.11. Control Equipment

2.11.1. Hydraulic Diagrams



2.11.2. Electrical Diagrams





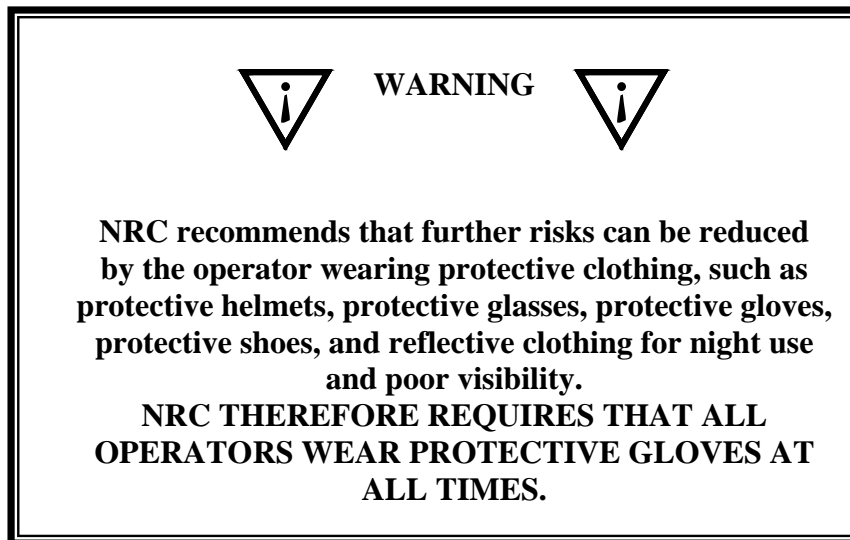
### 3. Operation

**WARNING** Before each use of the Quick-Swap, the operator must check if main hydraulic hoses, 7 and 4 electric prongs plugs, are properly plugged and the fifth wheel correctly locked.

**WARNING:** To prevent damage to the P.T.O. or transmission, we highly recommend to install a relief valve with bypass directly on the pump. This valve will protect the P.T.O. and transmission if somebody engages the P.T.O. while the hydraulic lines from the truck are not connected to the Quick-Swap. This relief valve will protect the system for a short period of time only. As soon you hear the hydraulic system work hard, stop it immediately or it could result in oil overheat and damage to the pump.

#### 3.1. Lifting Precautions

Before using the equipment, become familiarised with the controls and their layout..  
**NRC recommends the fitting of emergency beacons to ALL vehicles fitted with their recovery equipment and compliance with any local law regarding road flares and additional safety lighting.**

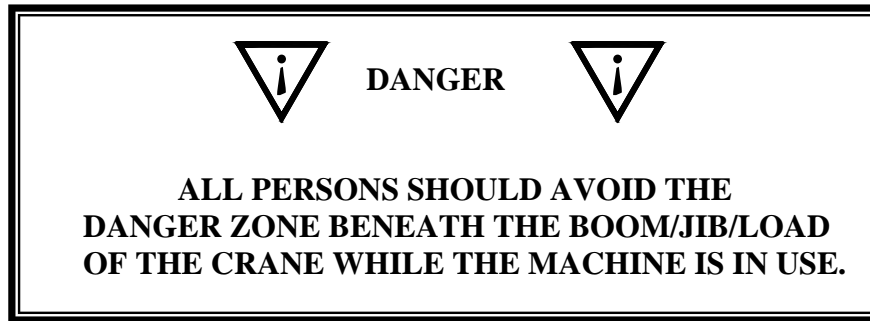


All lever controls are non-functional when the Power Take Off is not engaged, a warning light in the cab warns the driver/operator not to drive the vehicle with the Power Take Off engaged. All operators are advised to check that the P.T.O. is disengaged both visually and manually before driving the vehicle.

NRC recommends that when the vehicles are operated by the roadside or in any danger zone, the operator should keep himself away from any traffic danger to ensure maximum safety of operation.

**The engine of the host vehicle should be stopped and the P.T.O. disengaged at all times when the vehicle is not in use.**

**Areas under any lifting device should be considered a DANGER ZONE and all persons should be kept as far away as possible from these danger zones while the machinery is in operation.**



**NRC Industries requires that a danger zone of at least 150 feet be set up around the vehicle and any load it may be pulling or lifting, and that persons other than the trained operator should be kept out of this danger zone at all times during the operation of the machine. IN ADDITION, ALL PERSONS (INCLUDING OPERATOR) SHOULD BE KEPT OUT OF THE DANGER ZONE IN LINE WITH ANY WINCH CABLE FOR A DISTANCE OF AT LEAST 250 FEET. ALL WIRES AND ROPES SHOULD BE INSPECTED REGULARLY AND REPLACED IF FOUND TO BE WORN OR DAMAGED.**

A “drawing in” hazard exists where the winch cables pass through the fairlead at the end of the boom and where the winch cables wind onto the boom. **Operators should not enter or place their hands into these danger zones while the machine is in use.**

Instructions for the winches state that persons should keep clear of the winch ropes while they are moving. While the relatively low speed of the winches will keep any risks to a minimum, **all persons are advised not to enter the danger zones around the winches while they are in operation.**

**Applying a load to the vehicle by means other than that described in the operator’s manual is expressly forbidden. The vehicles are designed to have loads suspended from the boom/winch cables only. Any lateral or vertical force applied to the boom is expressly forbidden and may cause damage to the vehicle and its operators.**

**NRC recommends that the front receiver, front pins, fifth wheel and rear spacer are inspected on a regular basis by an official NRC distributor. Any observed structural cracking should initiate immediate termination of vehicle use until integral safety of the unit can be checked and verified by a NRC distributor.**

**NRC recommends that hydraulic systems on all NRC models should be checked by a NRC distributor at least once a year.**

### **3.2. Procedures for Operating the Axle-Lift**

**WARNING:** Special care should be taken by the operator when installing the NRC Bus Adapter onto the axle-lift as some parts of the bus adapter are heavy. Correct stance/position by the operator while lifting these parts is advised.

1. Start the truck engine with the P.T.O. disengaged. Depress clutch and engage the P.T.O. to give hydraulic power to the system.
2. Freespool the winch by operating the switch near the control levers (it may be necessary to move the winch lever in and out to allow the dog clutches to disengage freely).
3. Extend the axle-lift arm a few inches to allow it to clear its retaining clamp. Lower the arm completely.
4. Lower and extend the axle-lift arm in the position desired.
5. Choose the attachments needed and put them into position on the T-bar.
6. At this time, it is possible to position the truck closer to the vehicle to be towed, in order to enable the axle-lift arm to reach the chosen lifting point.
7. At this stage, on vehicles equipped with a remote control, the operator can use either the remote control to operate the axle-lift arm or the control levers situated on the body of the vehicle. It is best to use the most convenient of the two.
8. It is very important to choose a strong lifting point on the vehicle to be lifted and towed that is both strong enough and has enough clearance for the axle-lift arm throughout the entire lifting arc of the axle-lift arm. Failure to do this may cause damage to the vehicle being towed and could cause an accident.
9. Lift the vehicle high enough to attach the safety chains and tensioner that hold the vehicle in place on the axle-lift T-bar.
10. Install the long safety chains that run from the anchor points on the top of the axle-lift vertical section, through the two guides on either side at the middle of the main section of the axle-lift arm. Attach these chains either to the axle or the chassis of the vehicle being towed.
11. Adjust the height of the axle-lift arm for safe lifting and towing.
12. Shorten the axle-lift arm to reduce the amount of overhang and weight that the truck is bearing. The shorter the distance between the back of the truck and the vehicle being towed, the better. Remember to leave enough space for a 70 degree turn between the two vehicles to ensure that the corners do not touch while executing turns. Failure to leave enough space may result in damage to one or both of the vehicles.
13. Re-engage the winch (by reversing procedure 2 above) and tighten the cable after attaching the hook to a suitable point. Never tighten the cable to its maximum capacity as this could cause damage to the winch, the cable or parts of the boom and axle-lift.
14. Disengage the P.T.O. and drive away carefully.

### 3.3. Procedures for Operating Winches

#### Winches for Quick Swap Under-Lift

#### Ramsey H-800 Series winches

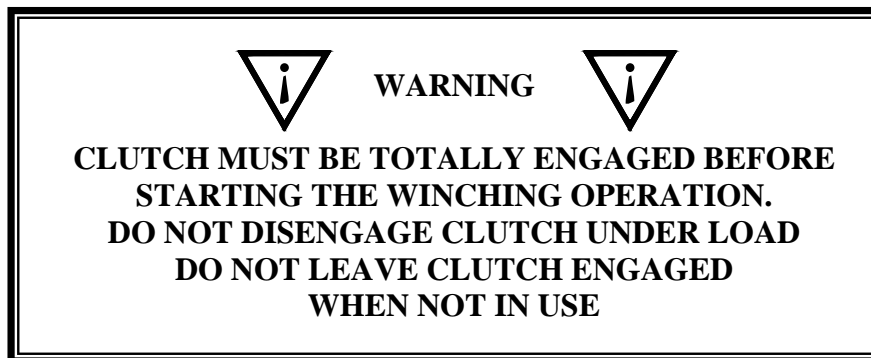
#### Techniques of Operation

**Note:** 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 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 there is a cable pileup 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 for a neat lay of the cable.

- The Dow-Lok clutch provides free spooling and clutch engagement with the cable drum. With the clutch disengaged, the cable can be freespoiled off the drum. For winching in the load, the clutch must be fully engaged with the drum.
- The Dow-Lok clutch is latched into either the engaged, “IN”, position or the disengaged “OUT” position, by a pin at the bottom of the shifter handle which fits into the latching slots.
- To Unlatch Clutch: Run in the reverse direction (reel out) until the load is off the cable. Grasp the handle firmly, and while pushing on the top of the handle with the thumb for leverage, lift until the pin clears the latching slots.
- To Disengage Clutch: Unlatch and push handle to “OUT” position and fully insert the pin into the latching slots. **DO NOT ATTEMPT TO DISENGAGE THE CLUTCH WHILE THERE IS A LOAD ON THE WINCH.**
- To Engage Clutch: Unlatch and pull the handle towards the “IN” position as far as it will go. In order to attain full engagement, internal elements of the clutch must be aligned. This alignment will take place when the cable drum, or the cable drum shaft turns a maximum of ¼ turns. The clutch will then automatically spring into engagement and the pin will drop into “IN” slots when this alignment takes place.

**DO NOT ATTEMPT TO LIFT A LOAD UNLESS THE PIN IS FULLY INSERTED INTO THE “IN” SLOTS. KEEP CLEAR OF THE SPRING LOADED HANDLE DURING THE AUTOMATIC ENGAGEMENT.**



Source: Ramsey Model H-800 Series Operating, Service and Maintenance Manual

### **3.4. Mounting a Quick Swap to a Carrier Chassis**

#### Procedures for mounting a Quick Swap (any model) to a carrier chassis

1. The Quick Swap unit should be placed on a level section of the ground, resting on its parking legs at the front, and underlift at the rear. The upper part of the fenders should be parallel to the ground.
2. Slowly back the carrier chassis truck under Quick Swap until the king pin is securely attached to the catch. Make sure the guide pins are in their sockets.
3. Attach all hydraulic hoses to their appropriate connectors.
4. Make sure that the unit is properly resting on the rear resting points which should be adjusted to be parallel to the carrier chassis.

#### Procedures for removing a Quick Swap (any model) from a carrier chassis

1. On a level surface, lower the parking legs and underlift to the ground until they fully support the weight of the Quick Swap unit.
2. Disconnect all hydraulic hoses from their connectors.
3. Disable locking device from the catch on the carrier chassis.
4. Slowly drive carrier chassis truck out from under the Quick Swap.

## 4. Maintenance

### 4.1. General maintenance of parts

Regular maintenance can prevent problems and damage to equipment. For more information refer to the lubrication charts on the following pages.

1. Check and lubricate the cables.
2. Check the oil level of the winches and grease them with the zert lubricators.
3. Change the oil filter element after the first six (6) months and then every year.
4. Lubricate the axle-lift by applying a waterproof grease all around the inner tubing.
5. Lubricate every component that has a zert lubricator.  
**To localize every zert, look for triangle balloons in “description of components” section.**
6. For the bolts securing the front receiver to the chassis we recommend to inspect it the first month and then once every three (3) months.
7. It is recommended to inspect the equipment after each use to be certain that the equipment is in good condition for the next job.

**NOTE:** Keep in mind that regular maintenance of the equipment will keep it in good condition for a long time and will avoid costly repairs.

## 4.2. Lubrication Charts

### 4.2.1. Lubrication Interval

PARTS	TYPE OF LUBRICANT	INTERVAL
wire ropes	cable lubricant	4 to 6 months
winches	oil SAE 90W	check twice a year
oil tank	oil grade 32	the level should be 3” from the top of the tank
axle–lift’s plate	waterproof grease	monthly
lubricators (zert)	waterproof grease	monthly
axle–lift (zert)	waterproof grease	every week
valves	antifreeze white grease	once a year

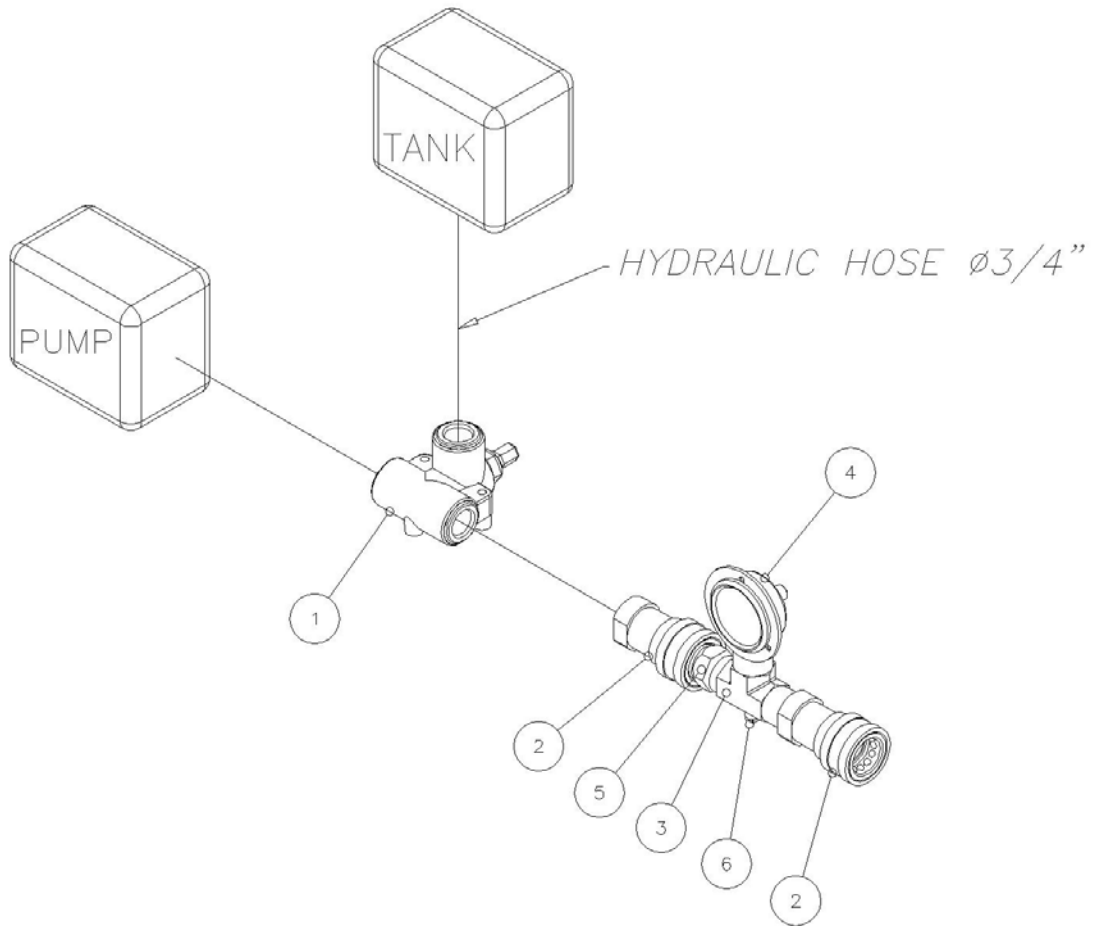
### **4.3. Hydraulic Pressure Adjustment**

1. Use a pressure gauge calibrated from 0 to 5000 PSI and install it on a tee fitting between the hose and the quick coupler directly on the hose that come from the pump (pressure adjustment kit sold separately; part number: 8684038).
2. You should have 2 reliefs valves to adjust on a Quick-Swap. The first one is located on the pump at the out port and must be equipped with a return bypass to the tank and the other one on the main valve bank. Both must be released by unscrewing the adjustment set screw (it is very important to do this before to engage the P.T.O.).
3. The first relief valve to adjust is the one located on the pump. The hose that the pressure gauge is installed on must be disconnected from the Quick-Swap. Engage the P.T.O., let the engine run idle and screw the adjustment device to obtain 2800 to 2900 PSI and lock it. Stop the engine as soon as this procedure is done.
4. Release the pressure in the hose and connect it to the Quick-Swap, start the engine and engage the P.T.O.. Pull the lever that control the boom extension and after the boom is completely retracted maintain it while adjusting the set screw clockwise to obtain 2800 PSI and lock it.

Remove the pressure gauge and it is all setted..



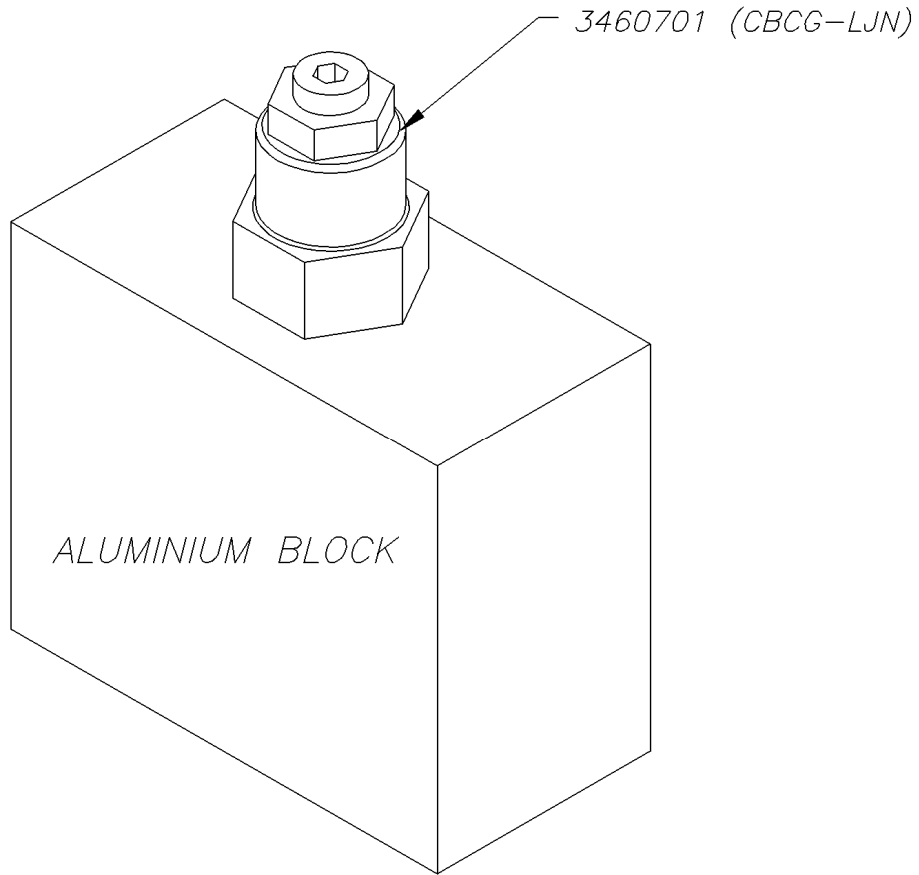
**4.4. Security Relief Valve; part number 8684038**



<i>Item</i>	<i>Qty</i>	<i>Code</i>	<i>Name</i>
1	1	3460054	Safety Valve
2	1	1941112	Female Coupler
3	1	N/A	Adaptor (NPT)
4	1	1925002	Pressure gauge (0 to 5000 PSI)
5	1	1941012	Male Coupler
6	1	1611040	Drain

**4.5. Procedure to adjust a pressure cartridge CBCG-LJN**

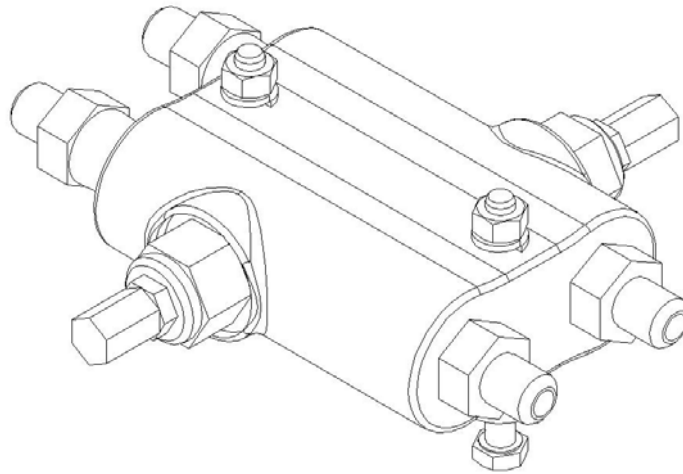
1. Loose the nut that locks the set screw on the cartridge.
2. Turn the set screw counter clockwise until it stops.
3. Place the allen key on an easy position to count how many turns you will set the screw.
4. Turn the set screw clockwise 1 and 3/4 of a turn and maintain the screw at this position while you tight the locking nut on the set screw.



#### **4.6. Caution Valve Adjustment**

1. Make sure that the axle-lift is completely retracted before adjusting the caution valve. If the axle-lift can be folded up when it is retracted it means that the caution valve is correctly adjusted.
2. Unscrew the locking device. Make sure to choose the appropriate caution valve.
3. Turn the adjusting device on the caution valve no more than  $\frac{1}{4}$  turn.
4. Pull the fold up lever control. If you can't fold up the axle-lift, repeat steps 2 and 3 until the axle-lift folds up correctly.
5. Re-attach the locking device.

#### Caution Valve



## 4.7. Component Disassembly

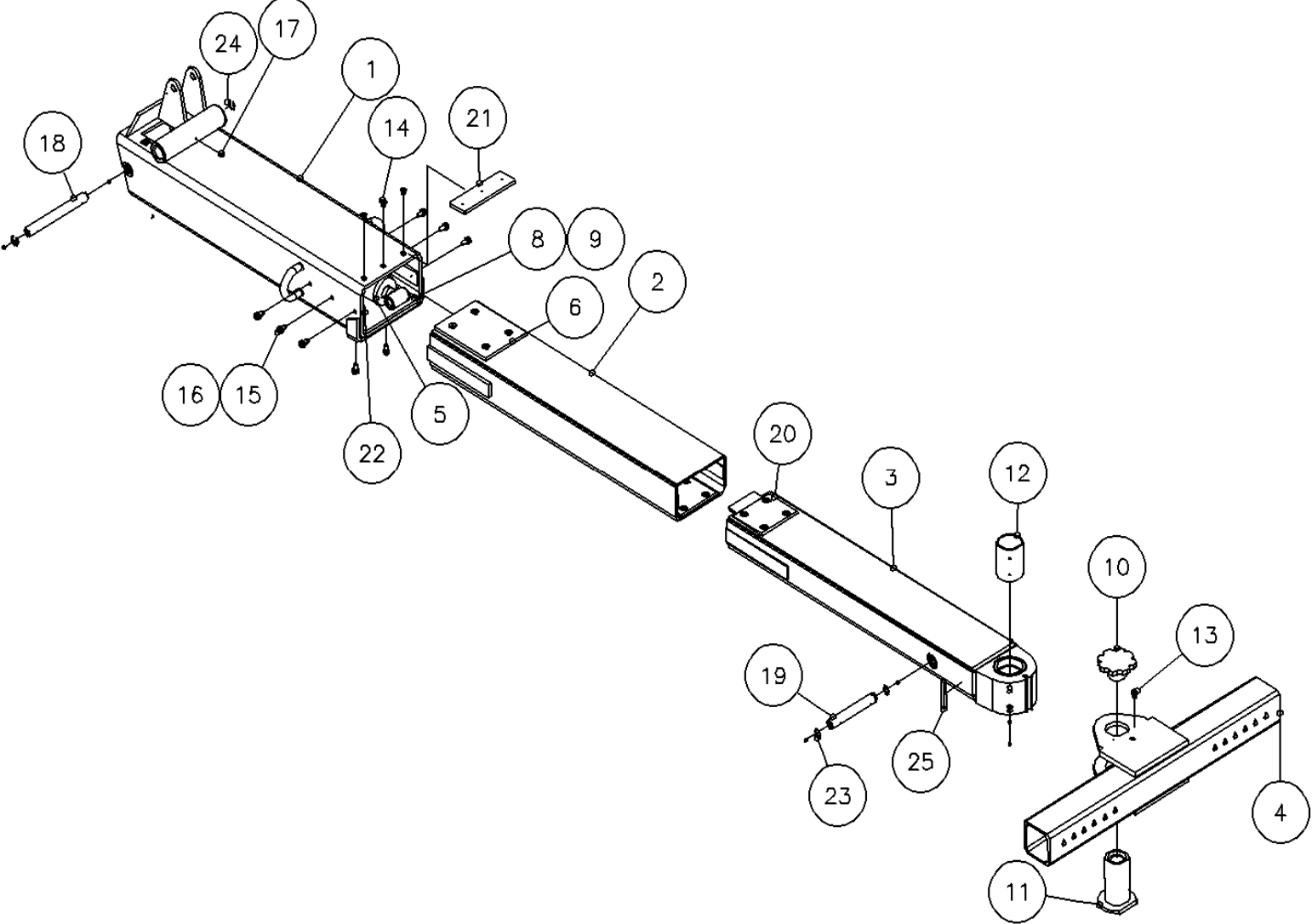
### 4.7.1. Axle-Lift Disassembly

(Refer to the drawing on next page)

1. Remove the axle-lift "T"-Bar (4-10-11-13).
2. Remove the spacer bolts and the nylon slide pad from the big section (8-9-21-22). It'll may be necessary to extend the cylinder while you pull on the spacer.
3. Extend the cylinder just enough to clear the pin on the smaller section (19), and remove the nylon slide pad and the spacers.
4. Disengage the P.T.O., release the pressure in the hydraulic line by pulling and pushing the control levers that fold and unfold and extend and retract the axle-lift.
5. Disconnect the hydraulic hoses from the cylinder.
6. Remove the pin from the big section (18).
7. Remove the two smallest sections from the main section (2-3).
8. To remove the smallest section, remove the two stoppers (25) and pull back the smallest section through the other one and remove all nylon pads and spacers (6-20).
9. The nylon slide pads between the smallest sections must be well adjusted. The thickness can change from 3/16" to 1/4" (if 1/4" is too thick, make it thinner). **Do not leave any slack on the nylon slide pads otherwise they could come out.**
10. Reverse these procedures to reassemble. **Do not forget to weld the stoppers (25) back on at the same location.**
12. If the axle-lift was disassembled for cylinder problems, remove both pins (from the biggest section and smallest section).

**NOTE:** See Chapter 2: For Axle-Lift Horizontal Section diagram.

4.7.2. Drawing for Axle-Lift Disassembly



## 5. Troubleshooting

### 5.1. Winches

<i>Ramsey H-800 Series Winch Troubleshooting</i>		
<i>Condition</i>	<i>Possible Cause</i>	<i>Correction</i>
Clutch Inoperative or Binds	1. Dry or rusted shaft 2. Bent yoke or linkage	1. Clean and lubricate 2. Replace yoke or shaft assembly
Clutch Handle won't Latch	1. Debris in clutch	1. Clean and lubricate
Oil Leaks from Housing	1. Seal damaged or worn 2. Too much oil 3. Damaged gasket	1. Replace seal 2. Drain excess oil 3. Replace gasket
Load Drifts Down	1. Safety brake has become worn 2. Safety brake out of adjustment	1. Replace brake disc 2. Turn adjusting bolt clock-wise ¼ turn or until load does not drift
Winch Runs Too Slow	1. Hydraulic motor worn out 2. Low flow rate	1. Replace the motor 2. Check flow rate
Cable Drum will not free Spool	1. Winch not mounted squarely, causing end bearings to bind drum.	1. Check mounting
Cable 'Birdnests' when Clutch is Disengaged	1. Brake disc worn	1. Replace discs
Hydraulic Fluid Leaks from hole in Motor Adapter	1. Damaged motor shaft seal	1. Replace seal

Source: Ramsey Model H-800 Series Operating, Service and Maintenance Manual

<i>Troubleshooting</i>	
<i>Condition</i>	<i>Possible Causes; Solutions</i>
Tilt boom extends on its own  Elevation cylinders lower on their own	1. Holding valves not properly adjusted; adjust holding valve 2. Rubber or silicone particles in hydraulic fluid are wedged in holding valves or cartridges; tighten adjustment screw fully and fully unwind before re-adjusting the valve. 3. Faulty cartridge; replace cartridge 4. Oil bypass in cylinder; remove inlet pipe from the holding valve that leads to the cylinder and plug off this pipe. Undo the outlet pipe that comes from the cylinder and put the loose end into a container or a bucket. Raise the test load, and check to see if any oil is flowing past the piston head and into the outlet pipe. If no oil is seen coming out of the cylinder, there is a a holding valve problem. If oil does come out of the cylinder and/or the boom starts to come down, the seal is damaged or worn and will need to be replaced.
Oil leaks	1. Check all hydraulic lines for oil leaks 2. Check all hydraulic connections for oil leaks due to possible over-tightening.

## 6. Supplier Information

NRC Industries inc  
2430 Principale  
JOE 1A0  
CANADA

Tel: (450) 379-5796  
Fax: (450) 379-5995

Winches : **DP Manufacturing, Inc.**  
PO Box 471710  
Tulsa, OK 74147

Tel: (918) 250-2450, 1-800-dp Winch  
Fax: (918) 250-0690

Website: [www.dpwinch.com](http://www.dpwinch.com)

**Ramsey Winch Company**  
PO Box 581510  
Tulsa, OK 74158-1510

Tel: (918) 438-2760  
Fax: (918) 438-6688

**Tulsa Winch Incorporated**  
PO Box 471710  
Tulsa, OK 74147

## 7. Maintenance Records

<u>Description of Work Done</u>	<u>Location</u>	<u>Date</u>



## **8. Warranty Offered by NRC Industries**

All new equipment built by NRC Industries Inc. has a one (1) year warranty against all defects in material or workmanship and under normal use of service. This only concerns the parts manufactured by NRC Industries Inc.

NRC Industries offers a five (5) year warranty on the Sliding System.

Our warranty covers the replacement of all defective parts and labour. This is only for the repairs done at our plant. For repairs outside our plant NRC Industries will supply all replacement parts at no cost and allow a certain amount of money for labour upon agreement between both parties.

If any damage occurs, due to a lack of lubrication or mishandling of the equipment, NRC Industries reserves the right to refuse to apply the warranty. NRC Industries will be the sole judge of these issues.

NRC Industries is not responsible for body or truck frame damage that may result from the use of the underlift.

NRC Industries reserves the right to make any changes that they judge necessary without notice.

NRC Industries Inc.  
2430 Principale  
St-Paul d'Abbotsford (Quebec)

## 9. Appendix A

### 9.1. Notes

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**9.2. Operator's Logbook**

I hereby certify that I have read this entire manual and that I understand the instructions given for safety, operation, and maintenance for the NRC Quick Swap Models.

<u>Operator's Name</u>	<u>Date</u>

