

MAINTENANCE AND OPERATIONS MANUAL



**NRC INDUSTRIES INC.
2430 PRINCIPALE
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HTTP://WWW.NRC-INDUSTRIES.COM**

FOR MODELS:

30CS
40CS
50CS

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1. Technical specifications and ratings

1.1. General specifications

<i>General Specifications</i>	<i>30CS</i>	<i>40CS</i>	<i>50CS</i>
Capacity	30 Ton	40 Ton	50 Ton
Boom Structural Rating Fully Retracted	60,000 lbs	80,000 lbs	100,000 lbs
Boom Structural Rating Fully Extended (2 stage)	30,000 lbs	40,000 lbs	51,000 lbs
Boom Structural Rating Fully Extended (3 stage)	-	21,000 lbs.	26,000 lbs.
Reach Past Tailgate (2 stage)	178"	195"	200"
Reach Past Tailgate (3 stage)	-	282"	284"
Maximum Working Height (2 stage)	295"	326"	303"
Maximum Working Height (3 stage)	-	412"	370"
Boom range of elevation	0-60°	0-63°	0-49°
Average Wrecker Weight	38,000 lbs	40,000 lbs	45,000 lbs
Approximate Tool Boxes Volume	65 ft	65 ft ³	65 ft ³
Composite Body Volume each		67,5 ft	67,5 ft

1.2. Hydraulic system

<i>Hydraulic System</i>	<i>30CS</i>	<i>40CS</i>	<i>50CS</i>
Pump	Tandem, 14.5 GPM	Tandem, 14.5 GPM	Tandem, 14.5 GPM
Working Pressure	3000 psi	3000 psi	3000 psi
Slide Cylinder Stroke	79 3/4"	98 7/8"	98 7/8"
Boom Elevation Cylinder	Dual Ø5"	Dual ø6 1/2"	Dual ø6 1/2"

1.3. Winch ratings

<i>Winches and cables</i>	<i>30CS</i>	<i>40CS</i>	<i>50CS</i>
Winch Capacity	30,000 lbs	40,000 lbs	50,000 lbs
Winch Type	Planetary	Planetary	Planetary
Cable Tensionner	Air	Air	Air
Cable	5/8" x 200'	3/4" x 200'	3/4" x 200'

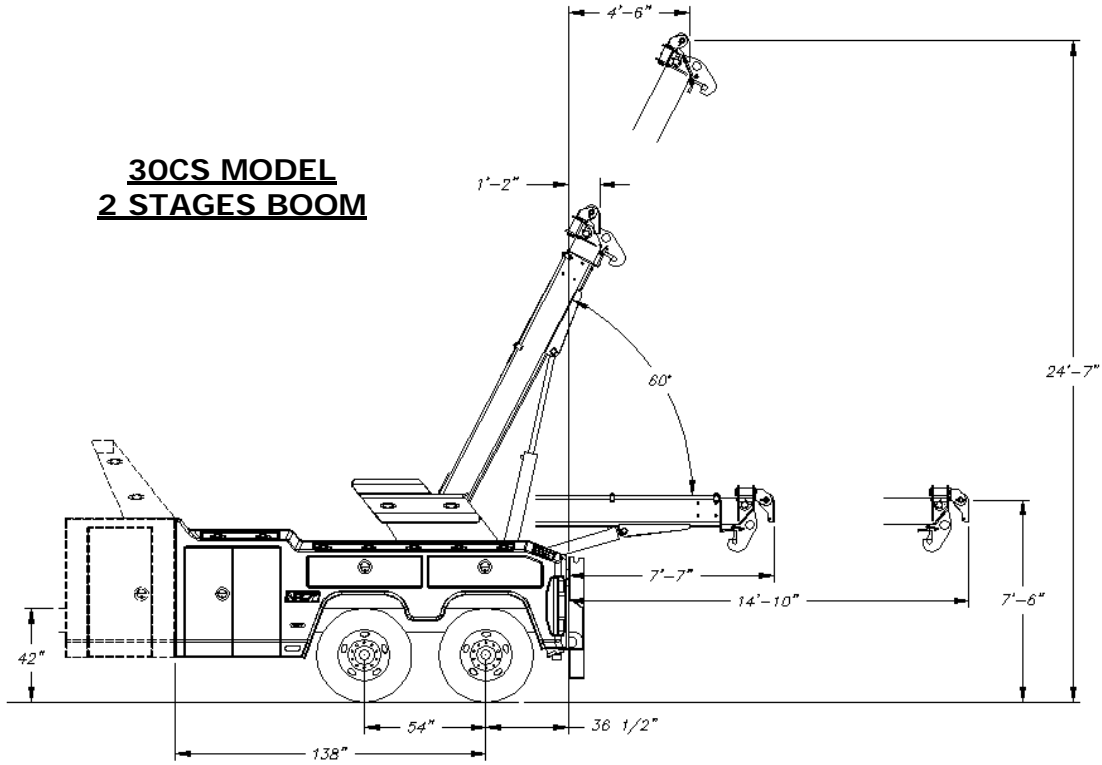
1.4. Axle-lift ratings

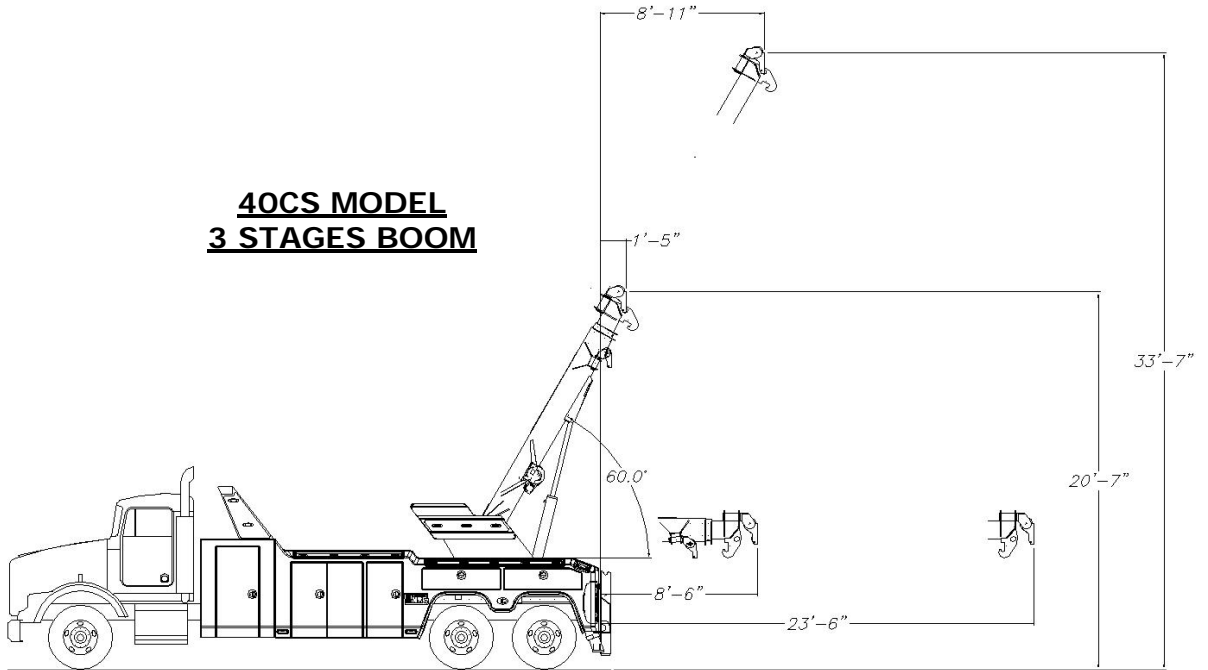
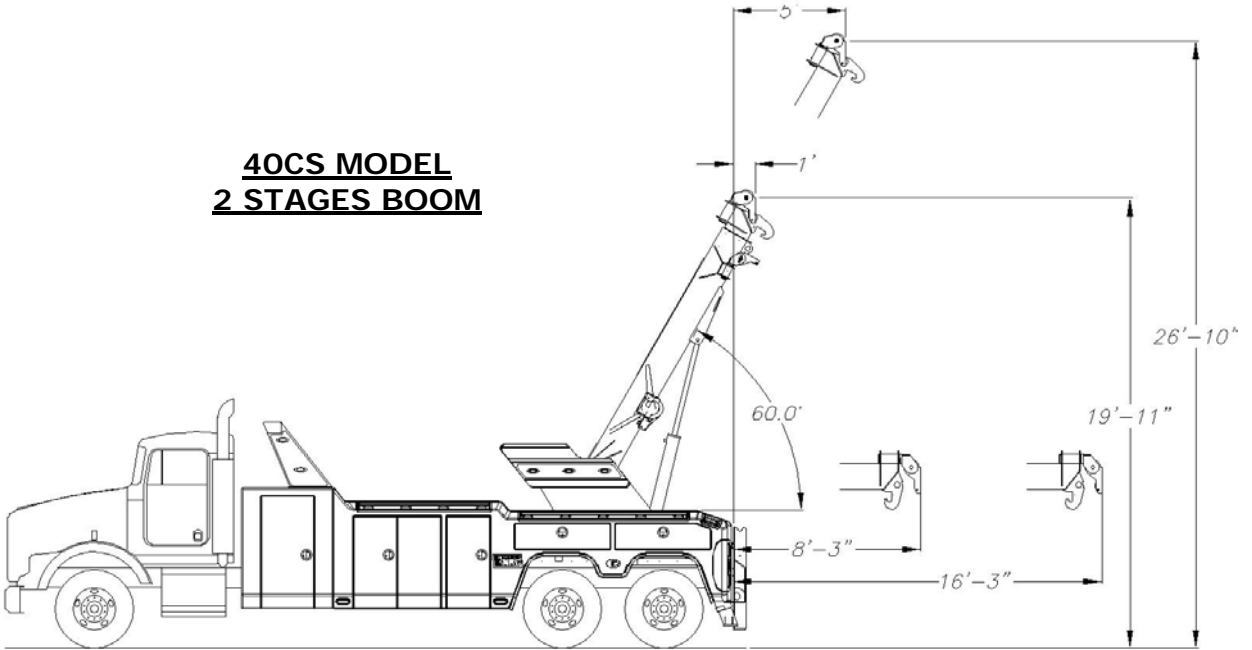
<i>Axle-Lift</i>	<i>Heavy Duty Axle-Lift</i>	<i>Super Heavy Duty (3 Sections)</i>	<i>Super Heavy Duty (4 sections)</i>
Axle-Lift Capacity (Retracted)	35,000 lbs	50,000 lbs	50,000 lbs
Axle-Lift Capacity (Extended)	15,000 lbs	20,000 lbs	18,000 lbs
Reach Fully Retracted	73"	86"	76"
Reach Fully Extended	111"	136"	150"

1.5. Chassis specifications

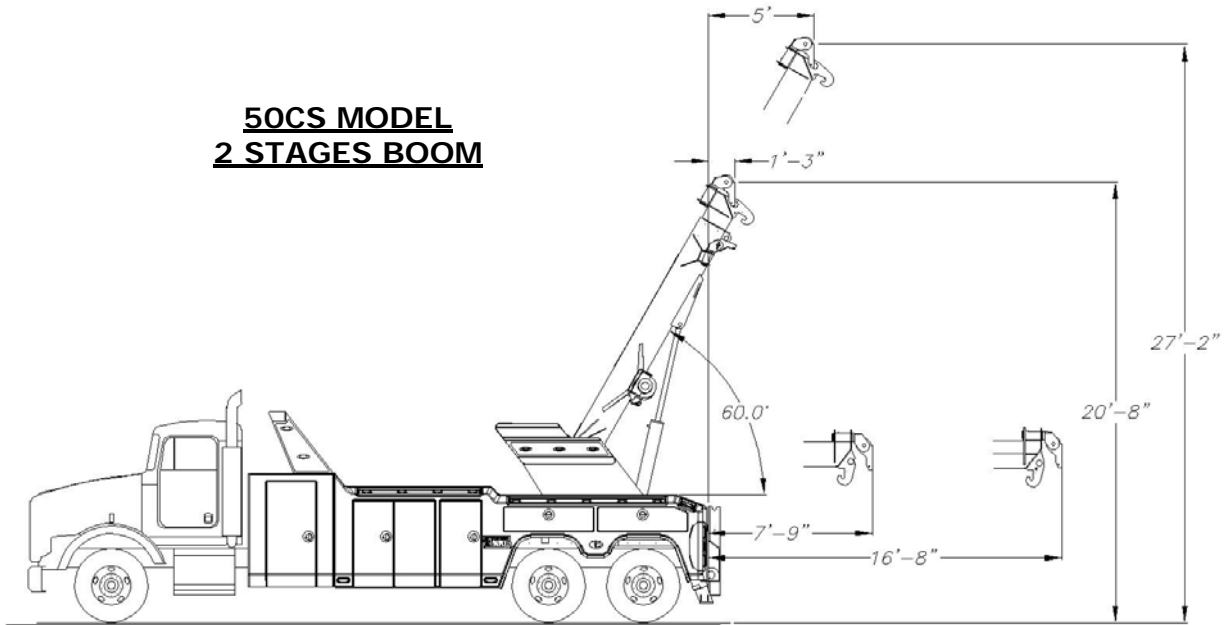
<i>Chassis Specification</i>	<i>30CS</i>	<i>40CS</i>	<i>50CS</i>
Front Axle	14,600 lbs	16,000 lbs	18,000 lbs
Rear Axle	40,000 lbs	40,000 lbs	40,000 lbs (46,000 lbs recommended)
Minimum G.V.W.R	54,000 lbs	56,000 lbs	58,000 lbs

1.6. Wrecker dimensions

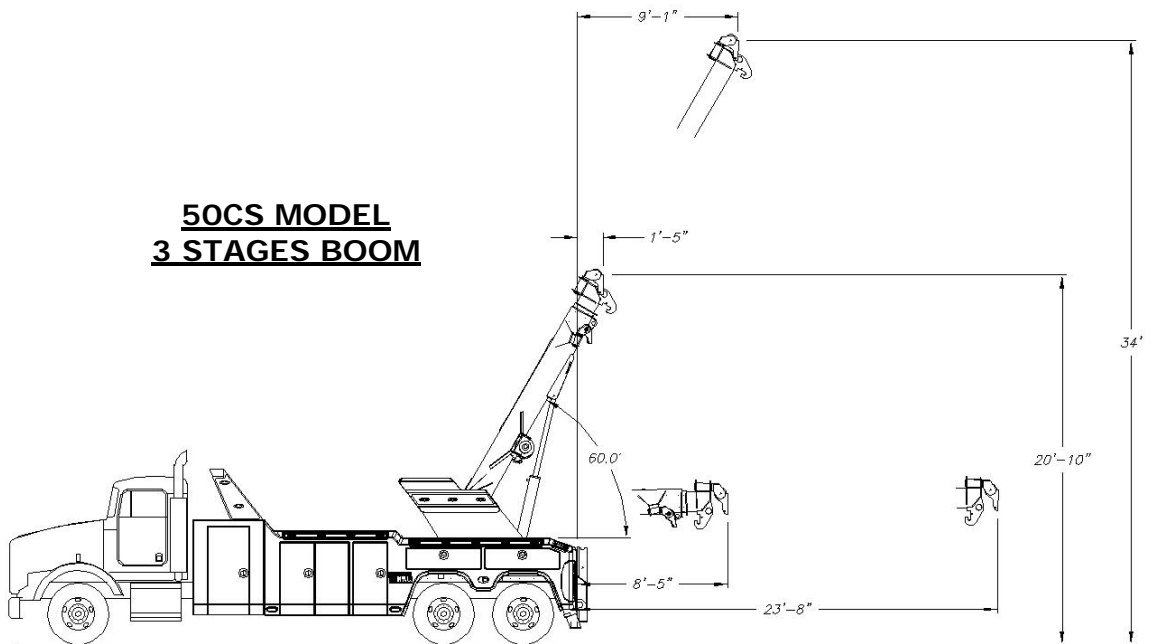




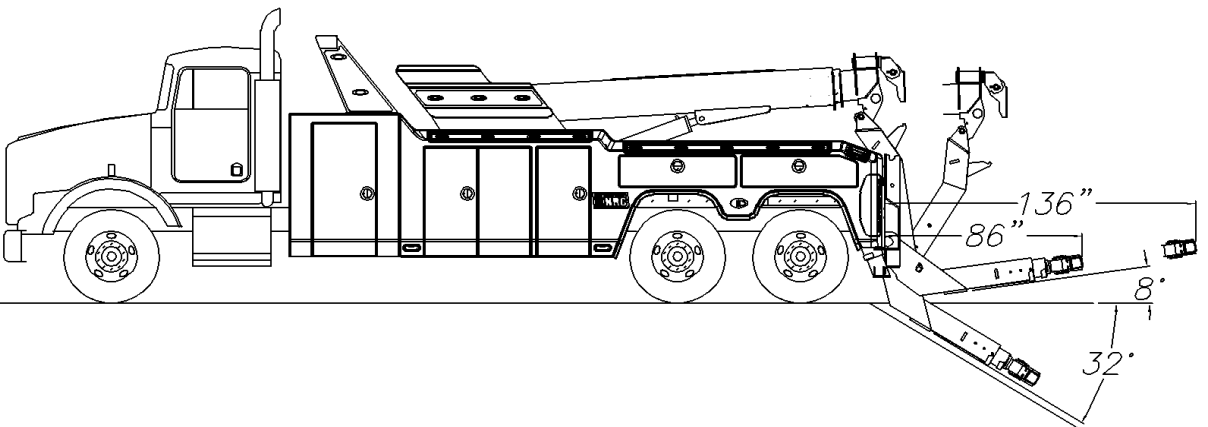
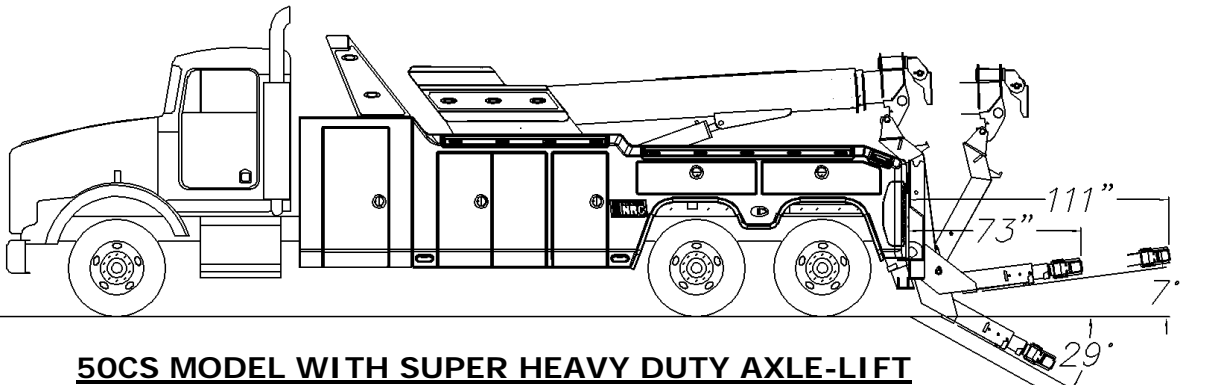
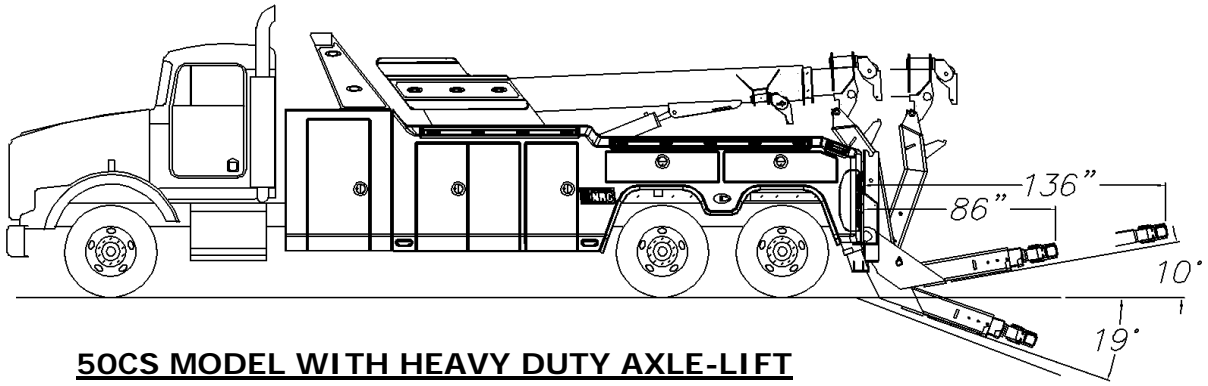
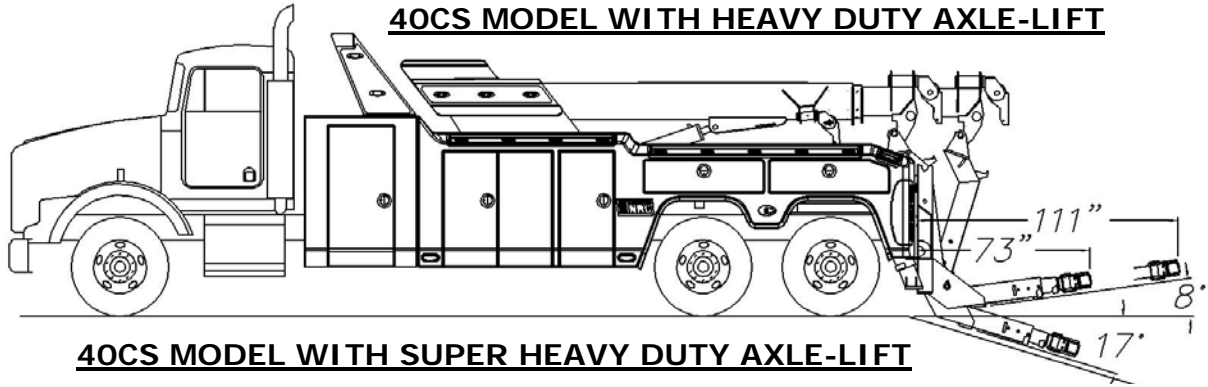
50CS MODEL
2 STAGES BOOM



50CS MODEL
3 STAGES BOOM

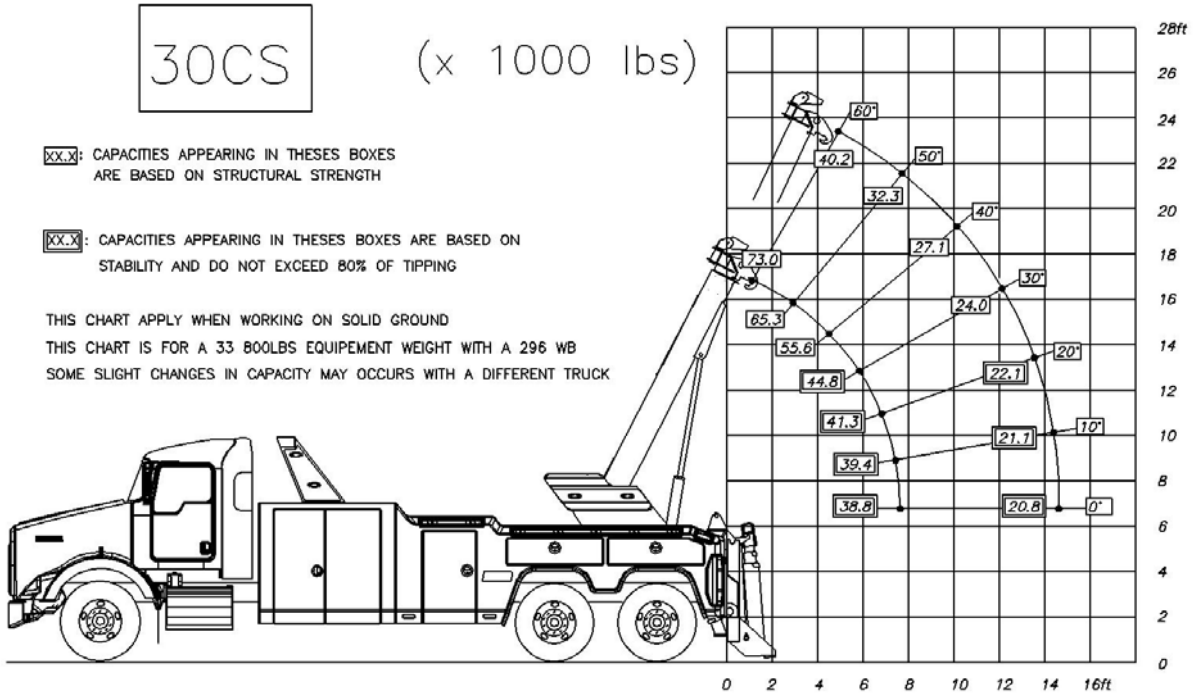


1.7. Axle-lift dimensions

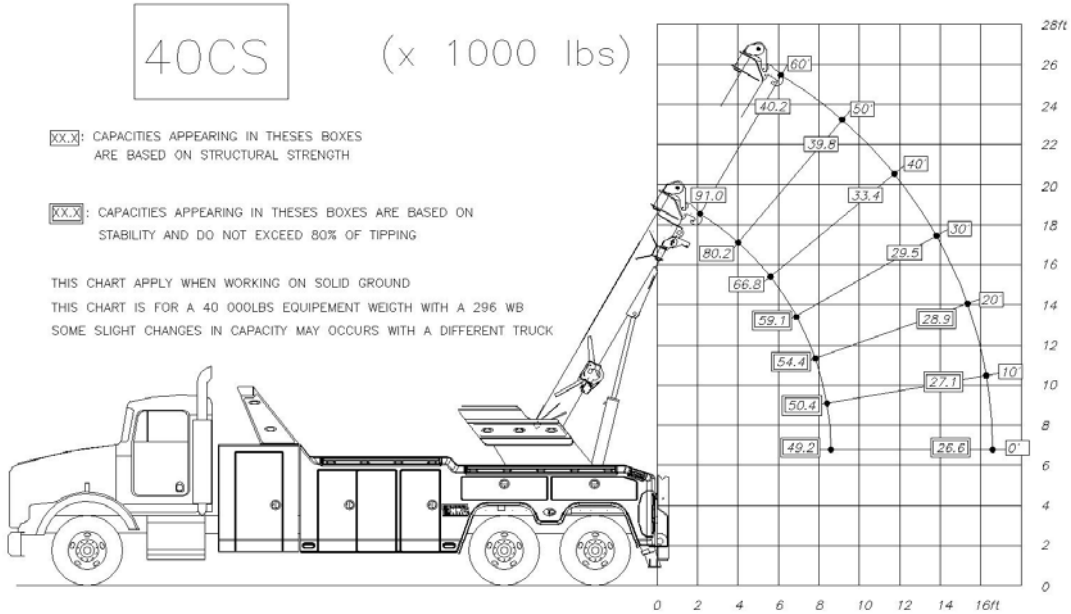


1.8. Boom Ratings Diagram

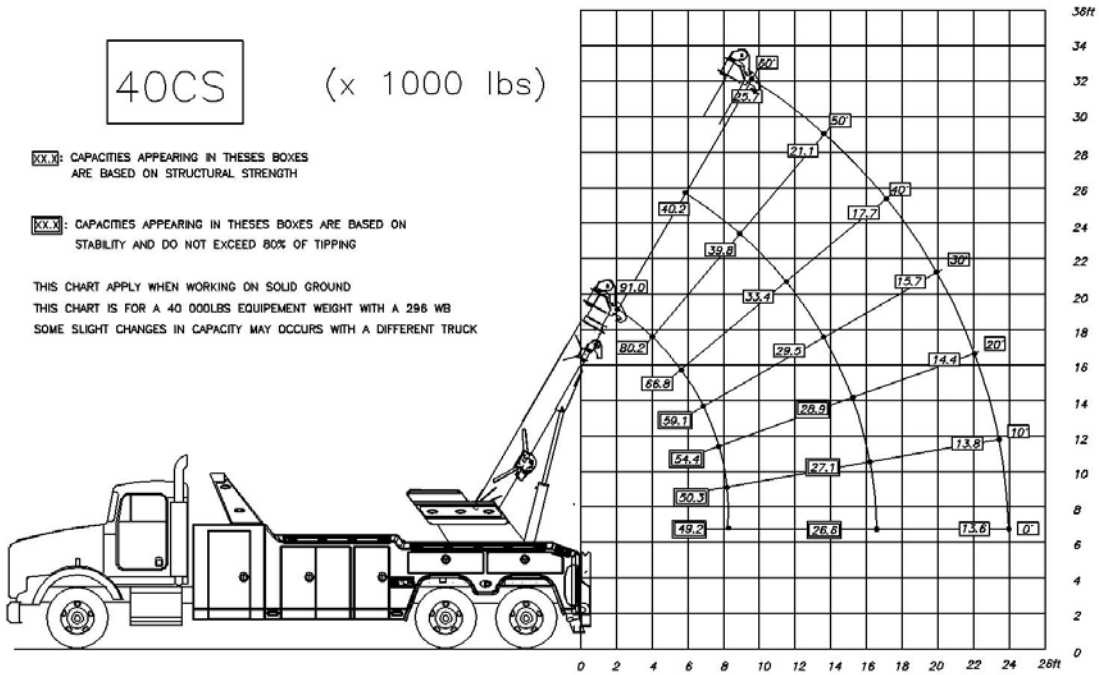
1.8.1. Diagrams show ratings for 2-stages booms behind the trucks at various angles of elevation.



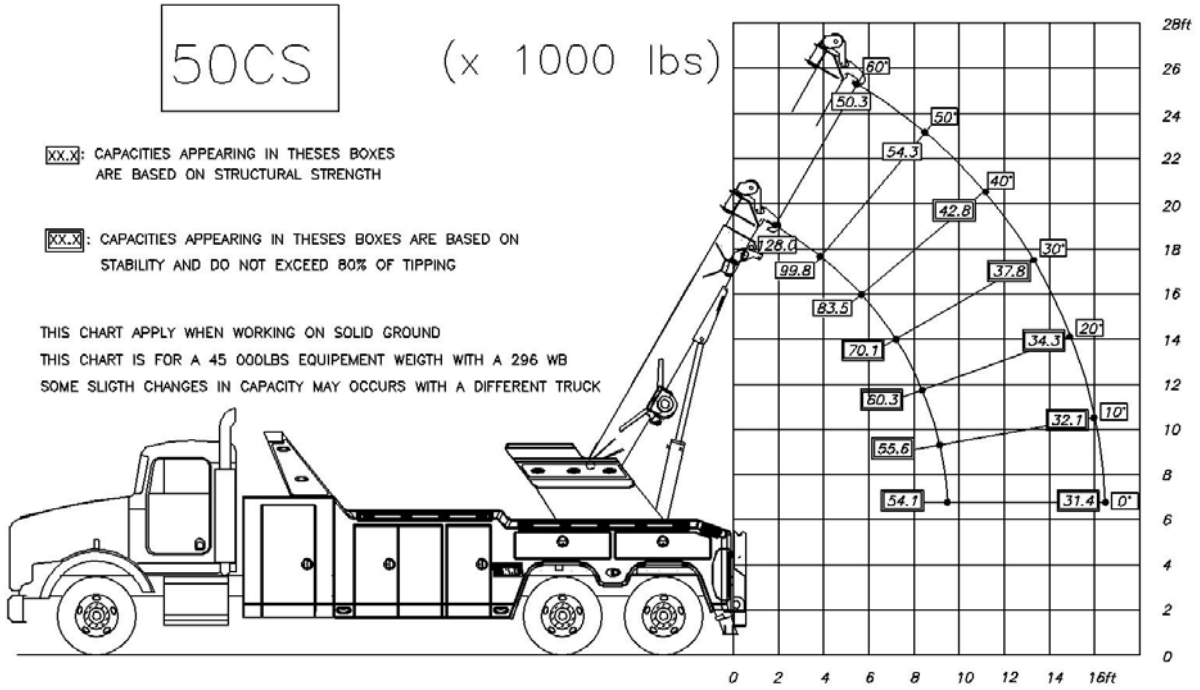
1.8.2. Diagrams show ratings for 2-stages booms behind the trucks at various angles of elevation.



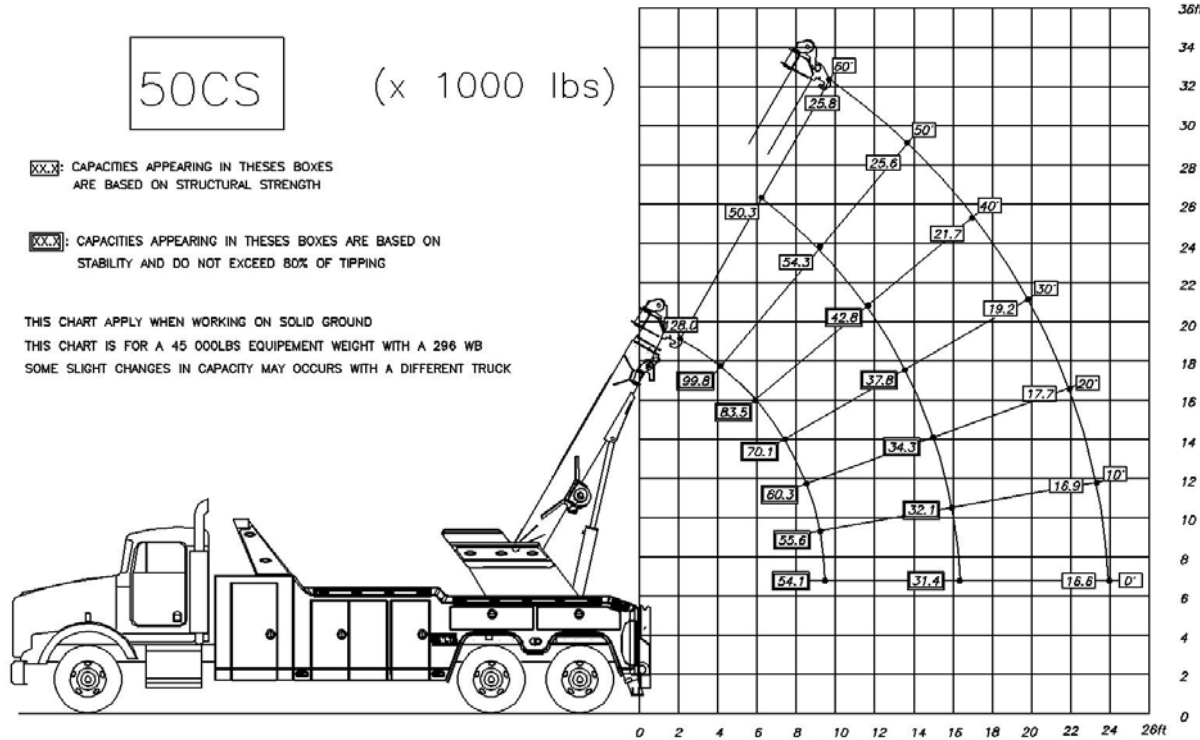
1.8.3. Diagrams show ratings for 3-stages booms behind the trucks at various angles of elevation.



1.8.4. Diagrams show ratings for 2-stages booms behind the trucks at various angles of elevation.



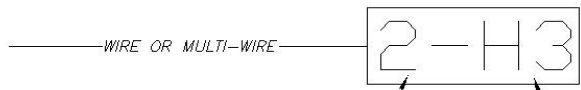
1.8.5. Diagrams show ratings for 3-stages booms behind the trucks at various angles of elevation.



2. Control equipment

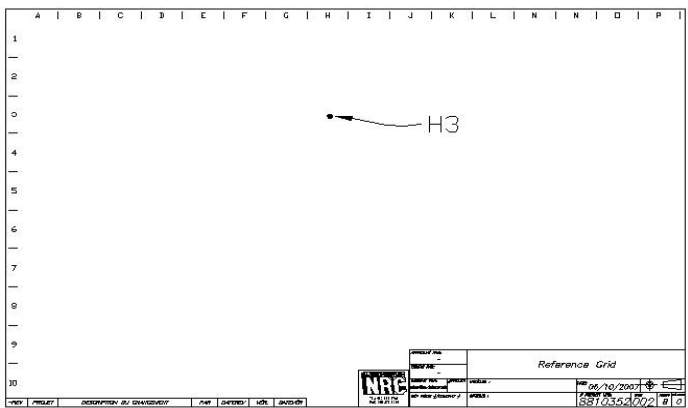
2.1.1. Electrical diagrams (Reference)

1 THESE ELECTRICAL DRAWING USE A GRID SYSTEM FOR REFERENCE

2 EXAMPLE : 

3 Reference page number — REFERENCE — H ON TOP
— 3 ON THE SIDE

4

5 

6


7

8 Reference page number

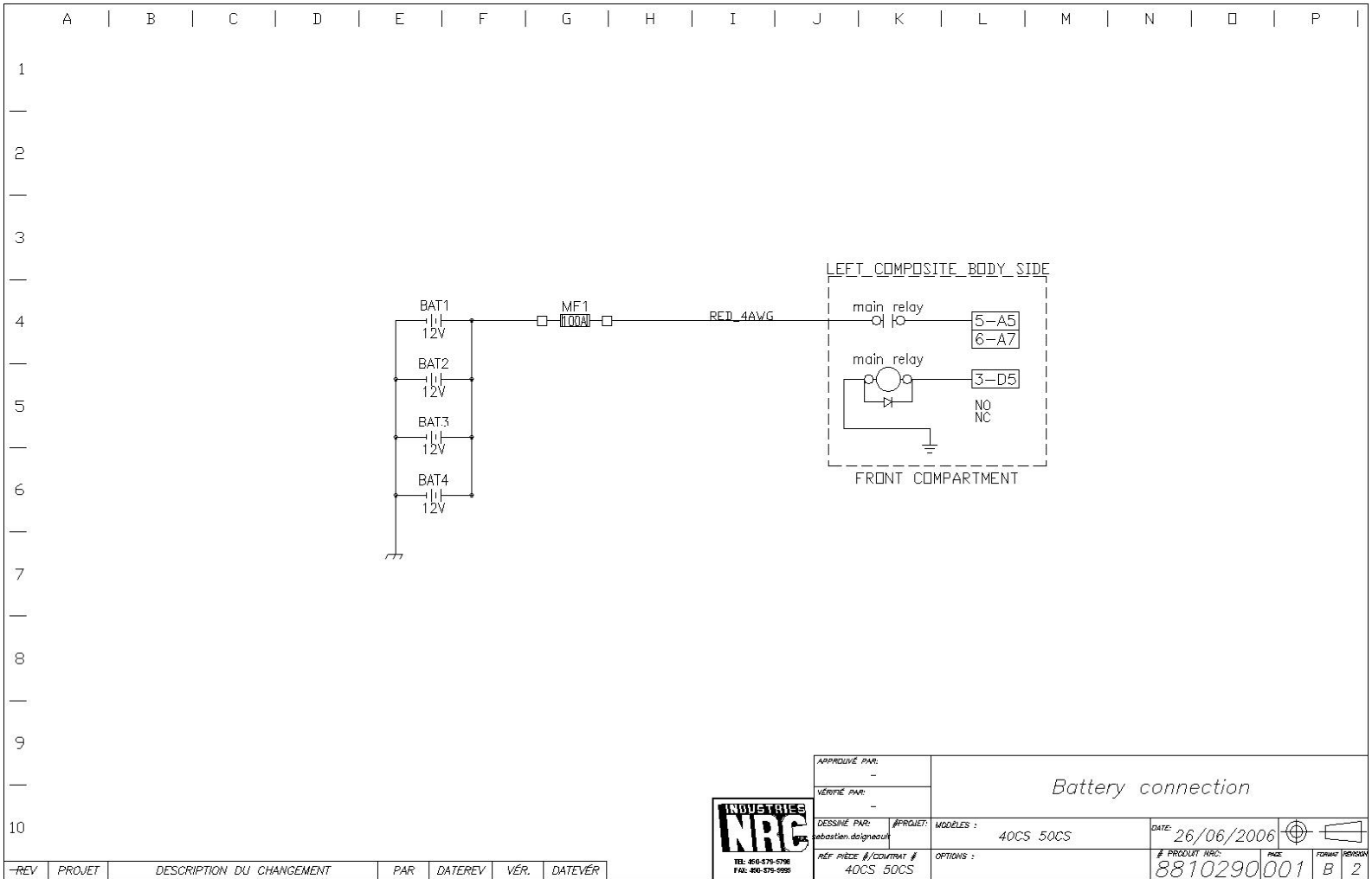
9

10

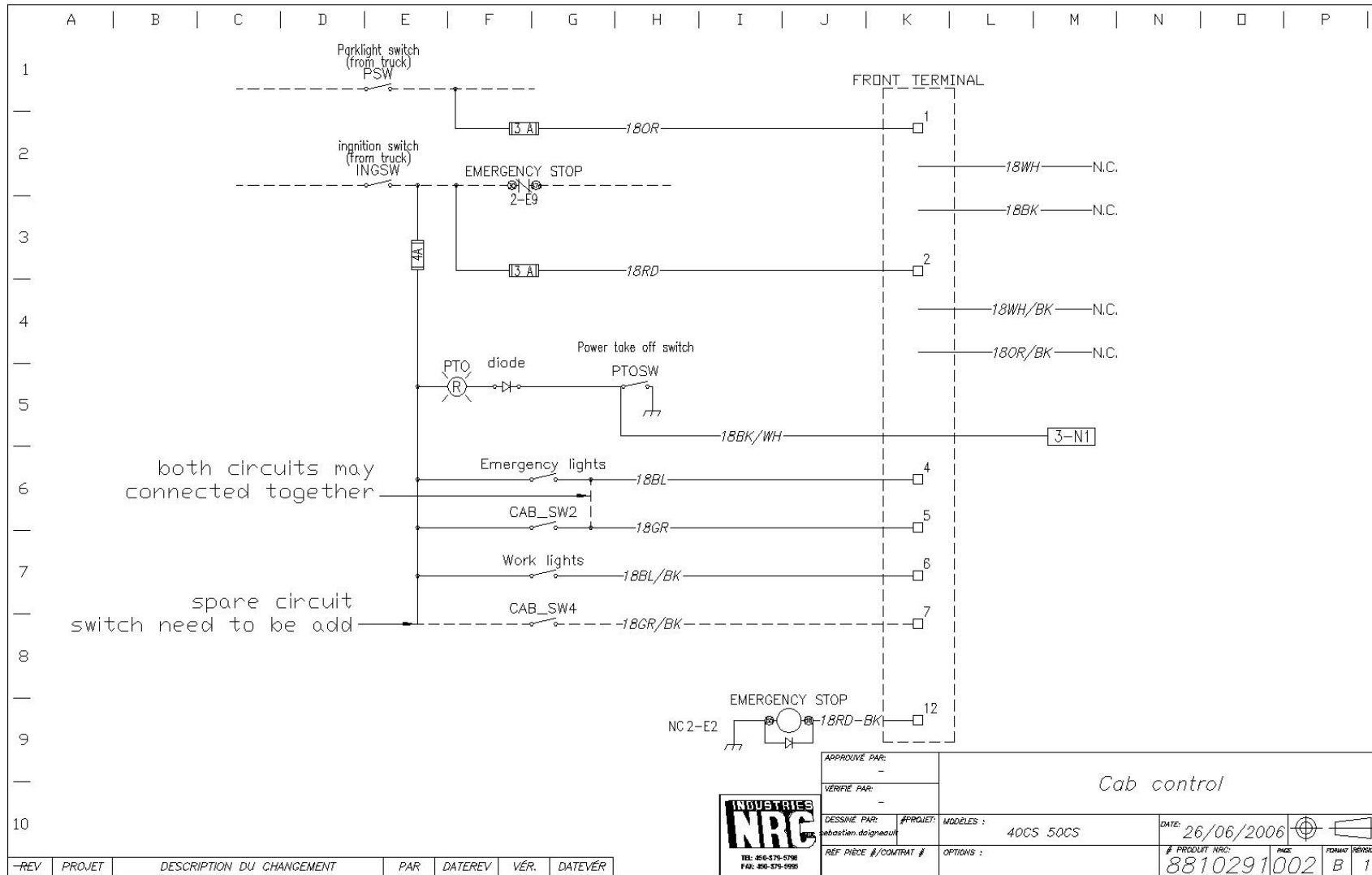
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INDUSTRIES NRC		Reference Grid		DATE: 06/10/2007			
APPROUVÉ PAR:		DESSINÉ PAR:	sebastien.doligeaux	MOODES :		# PRODUIT NRC:	8810352002
VÉRIFIÉ PAR:		PROJET:		OPTIONS :		PAGE	B 0
		REF. PIÈCE #/CONTRAT #				FORMAT	

2.1.1.1. Battery connection



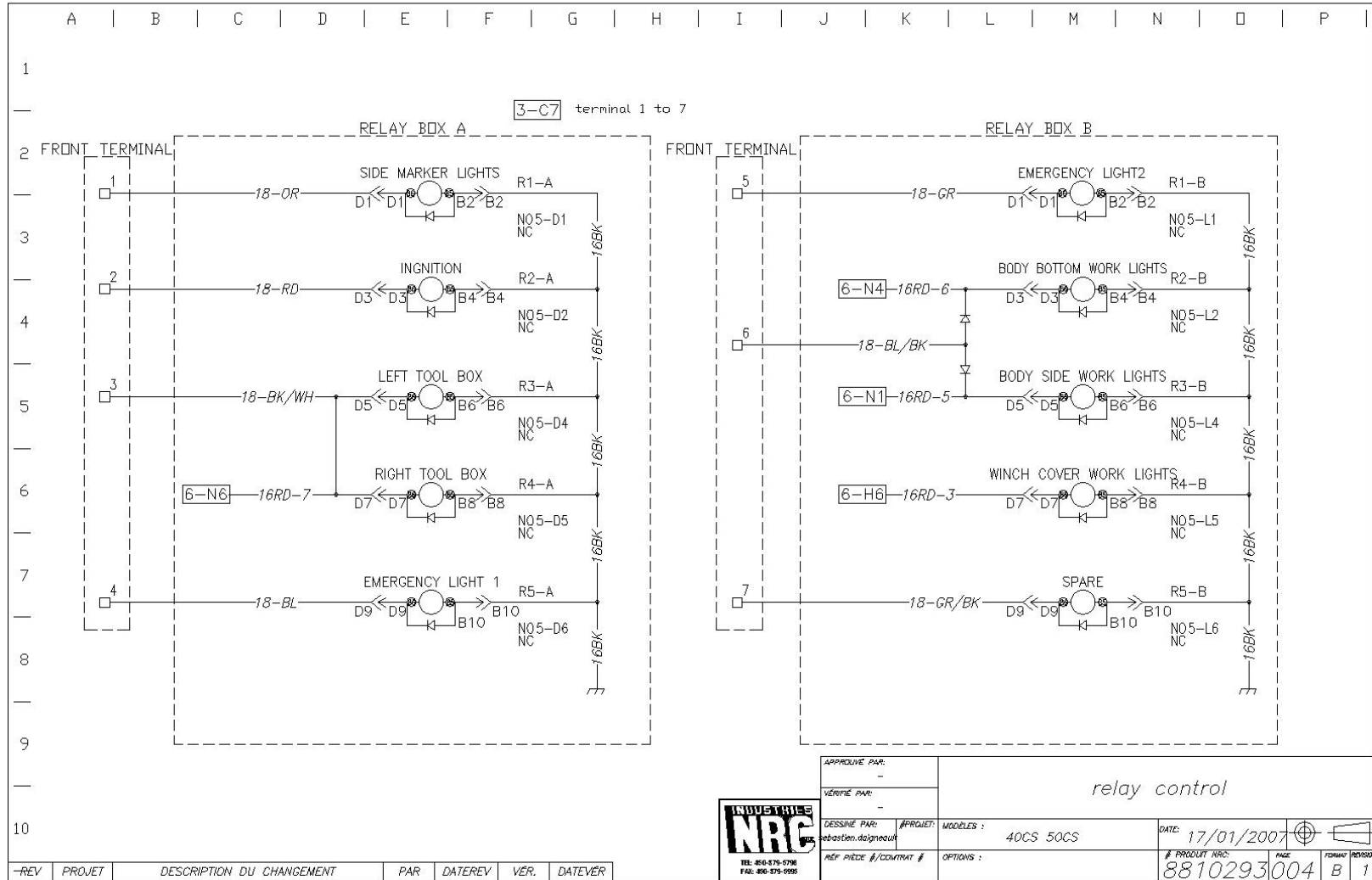
2.1.1.2. Cab control



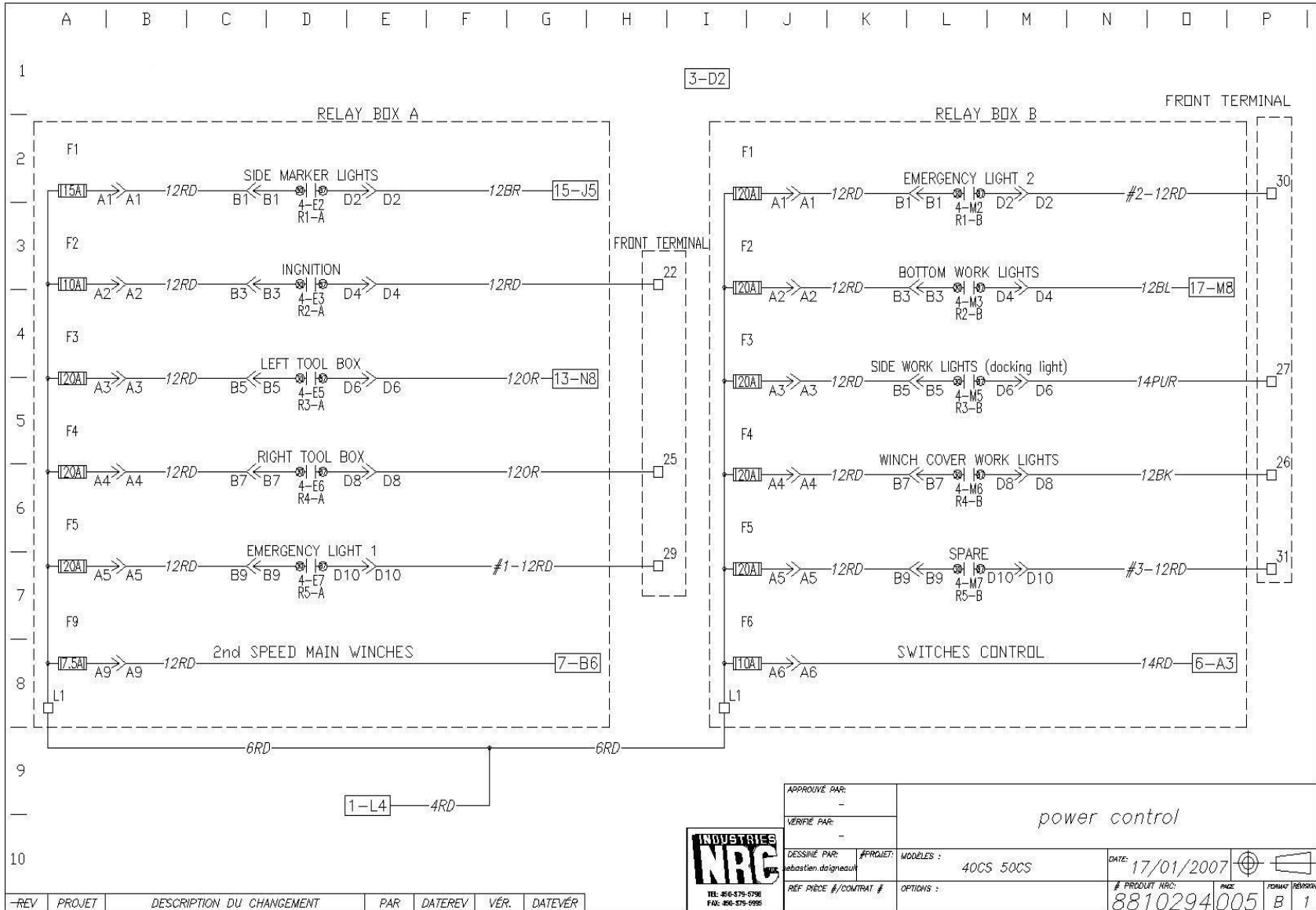
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VERIFIE PAR: -			
DESSINE PAR: sebastien.doigneau	#PROJET: 40CS 50CS	DATE: 26/06/2006	
REF PIECE #/CONTRAT #	OPTIONS :	# PRODUIT NRC: 8810291002	PIECE: B 1

-REV	PROJET	DESCRIPTION DU CHANGEMENT	PAR	DATE/REV	VER.	DATE/VER

2.1.1.3. Relay control



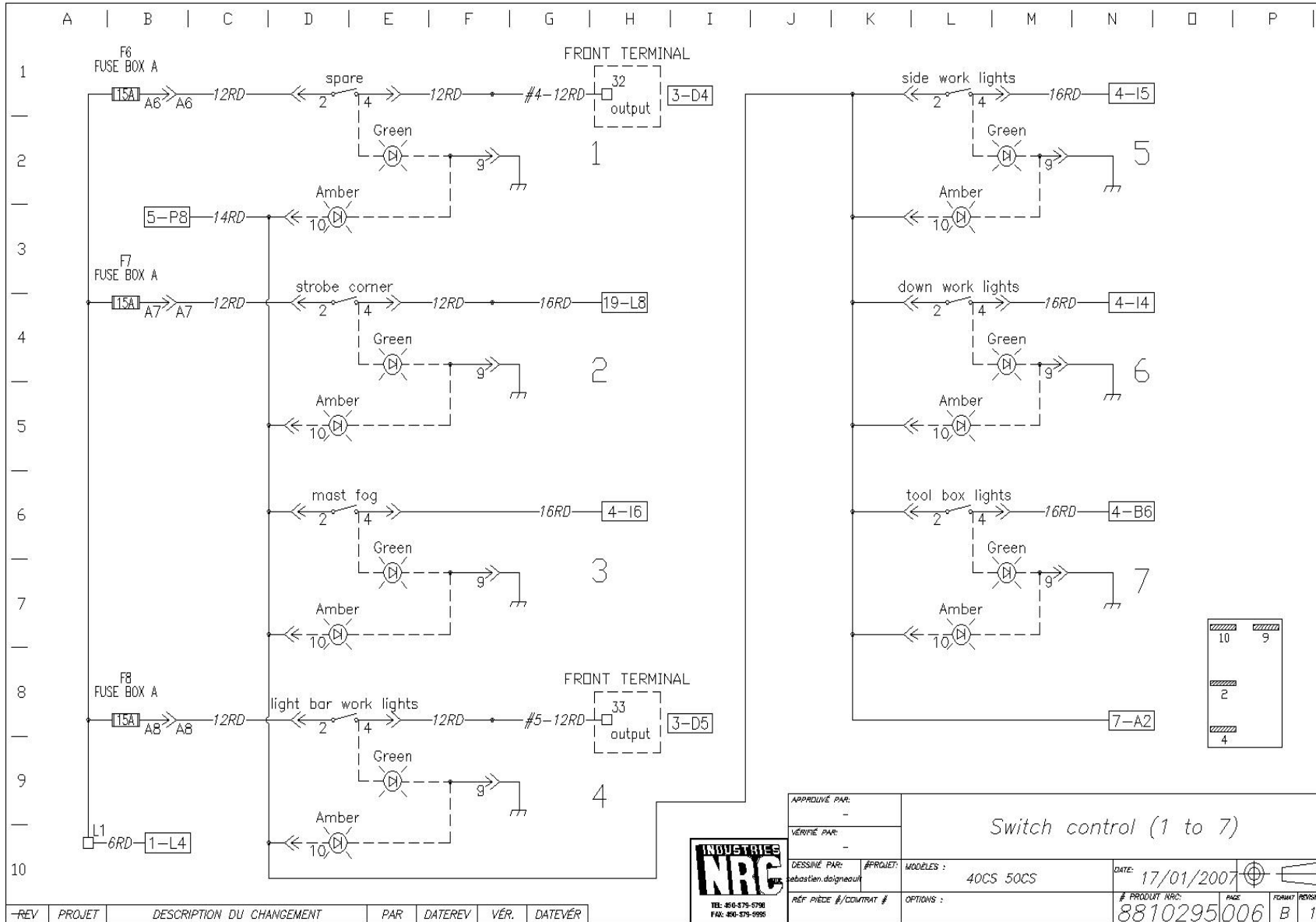
2.1.1.4. Power control



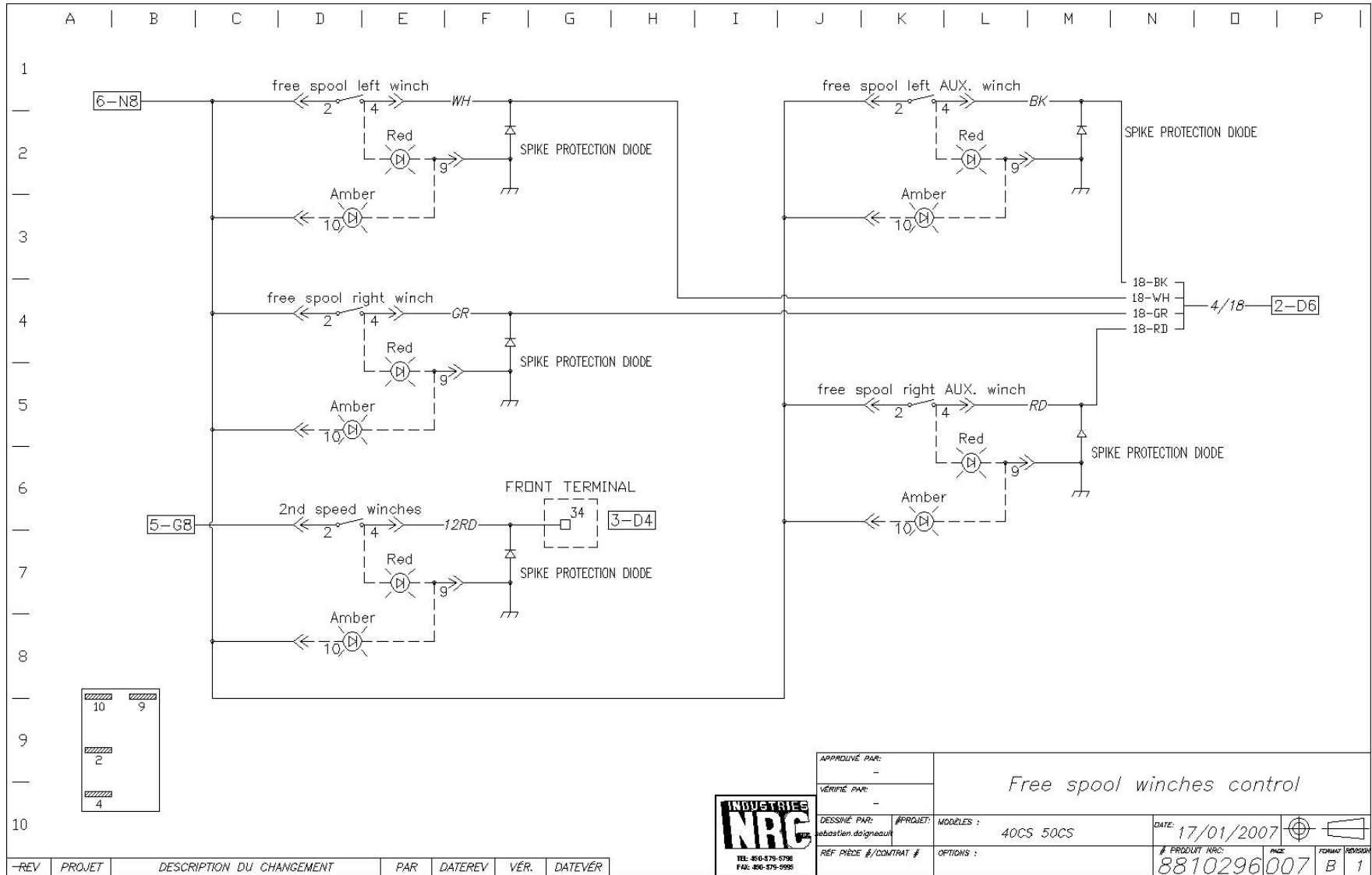
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VERIFIE PAR:			
DESSINE PAR:	sebastien.dolgneux	PROJET:	power control
REF. PIÈCE #/CONTRAT #	MODELES :	DATE:	17/01/2007
	40CS 50CS	# PRODUIT NRC:	8810294005
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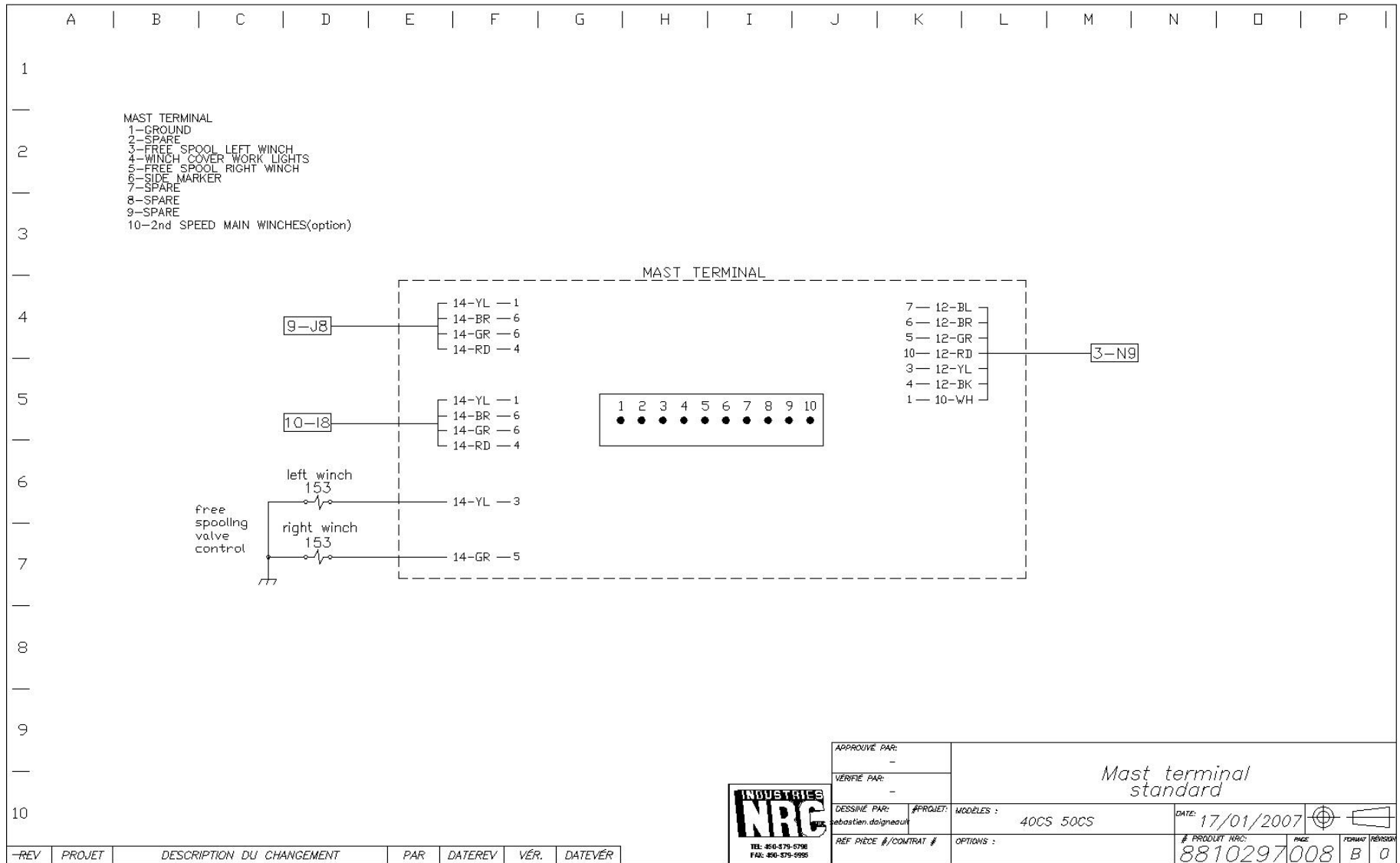
2.1.1.5. Switch control (1 to 7)



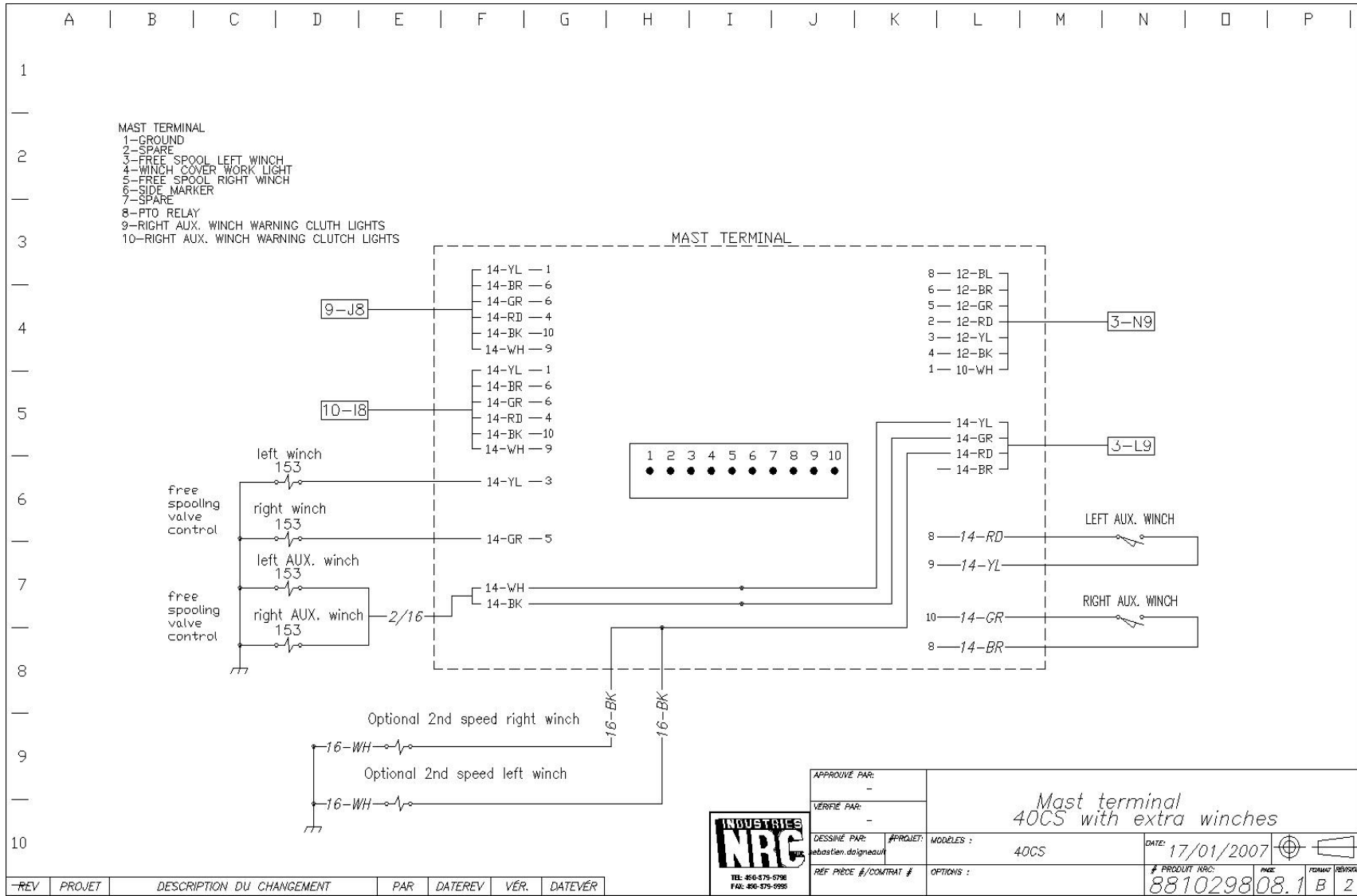
2.1.1.6. Free spool winches control



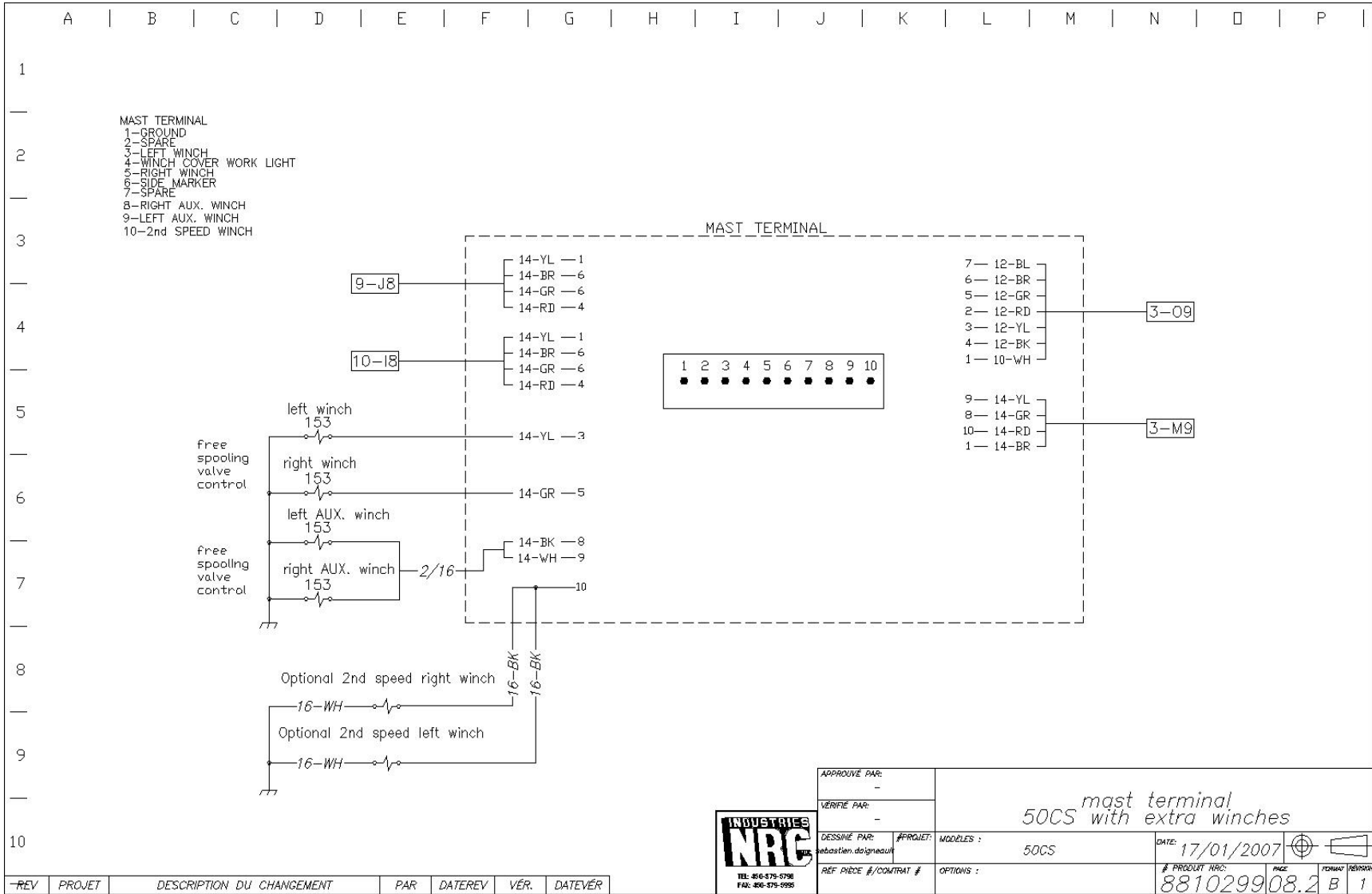
2.1.1.7. Mast terminal standard



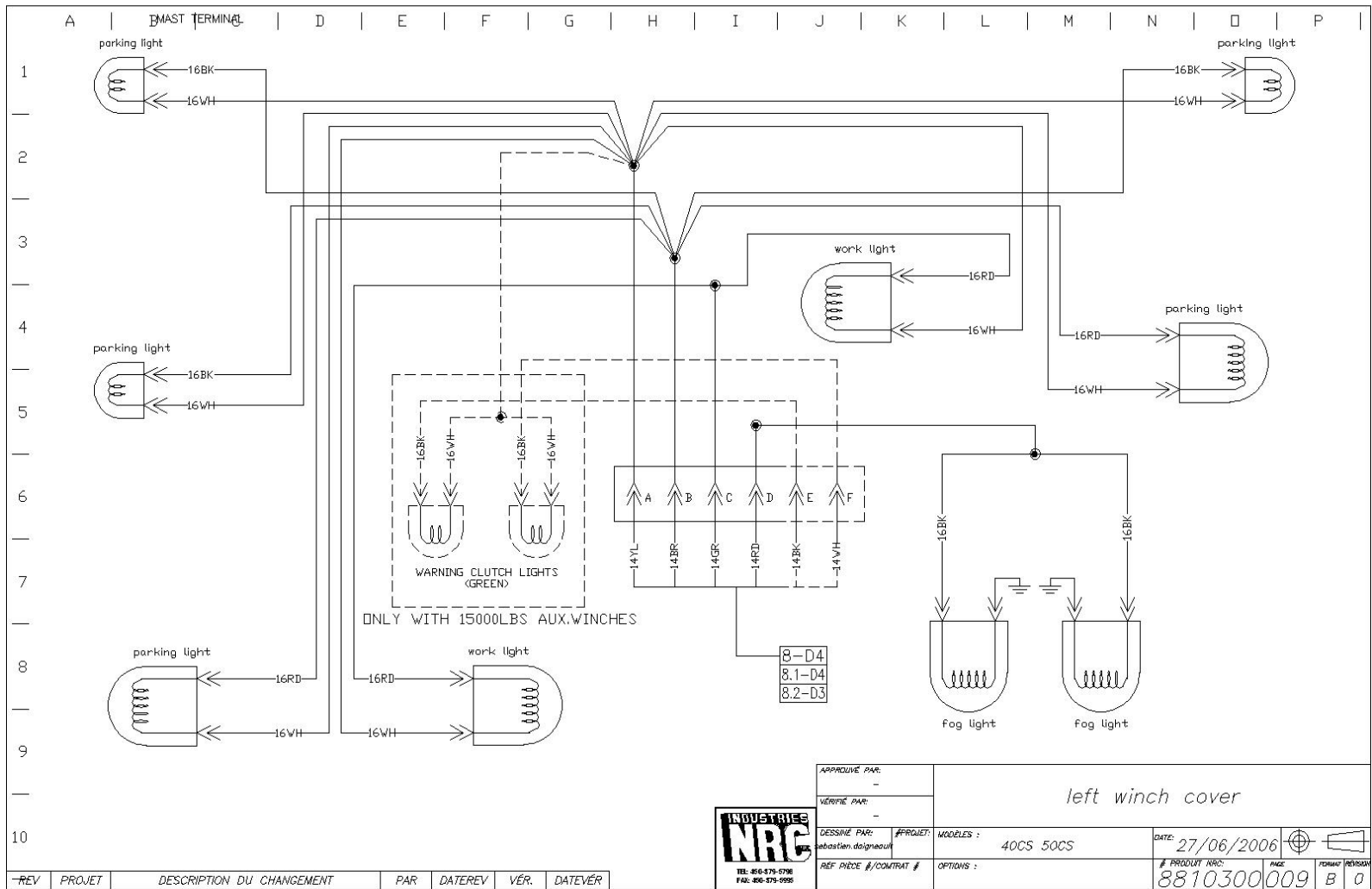
2.1.1.8. Mast terminal 40CS with extra winches



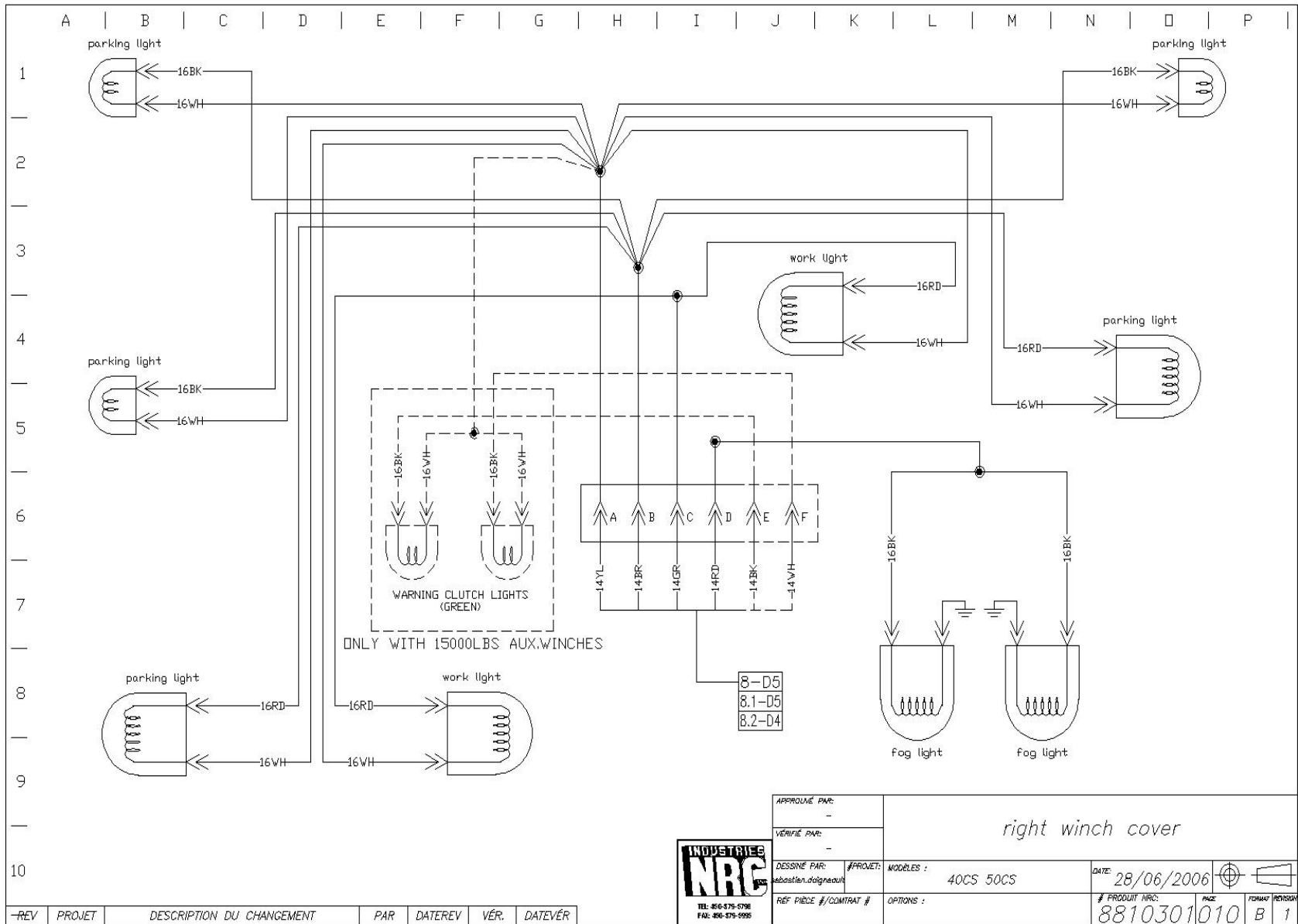
2.1.1.9. Mast terminal 50CS with extra winches



2.1.1.10. Left winch cover

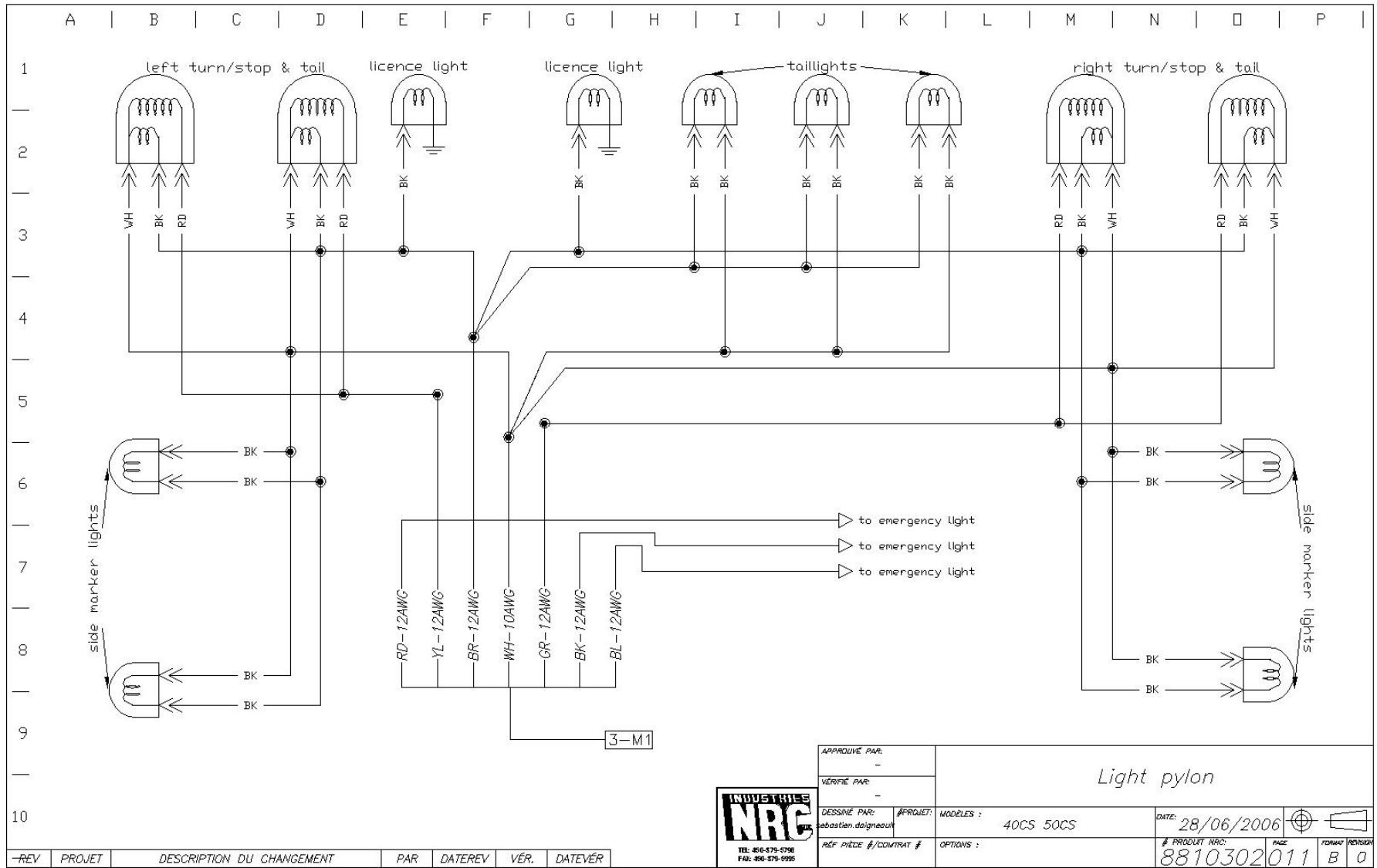


2.1.1.11. Right winch cover

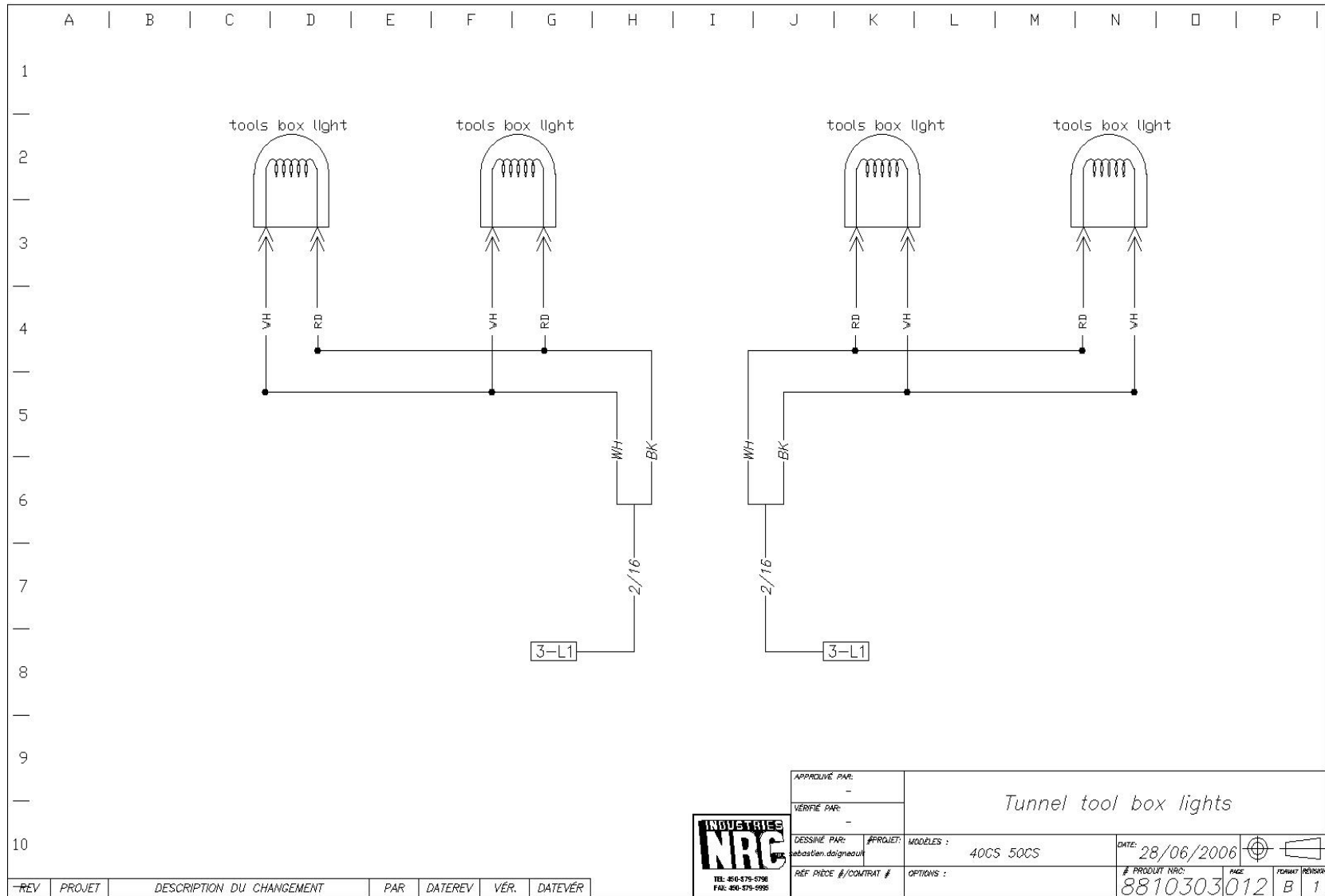


REV	PROJET	DESCRIPTION DU CHANGEMENT	PAR	DATE/REV	VÉR.	DATE/VÉR

2.1.1.12. Light pylon



2.1.1.13. Tunnel tool box lights

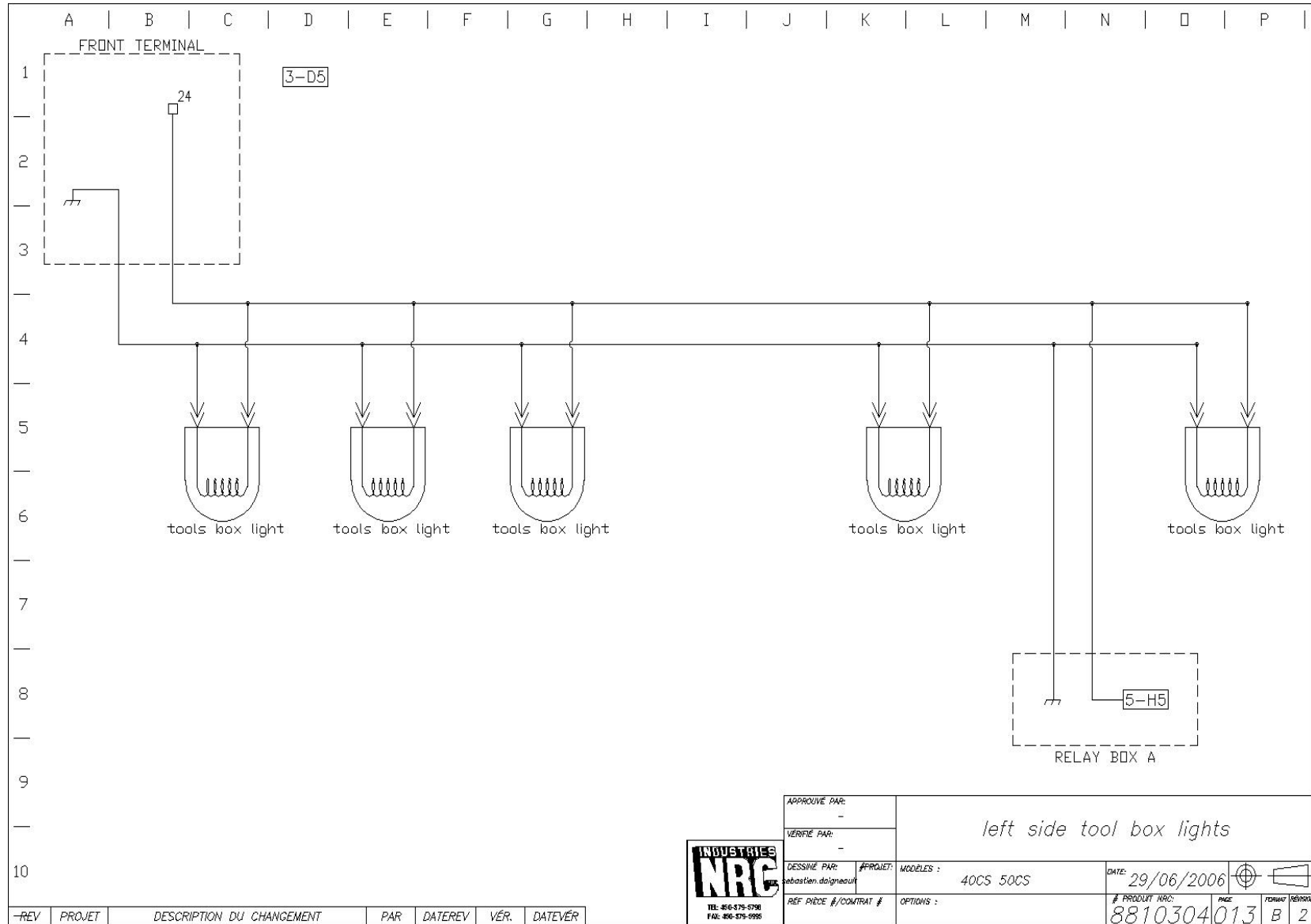


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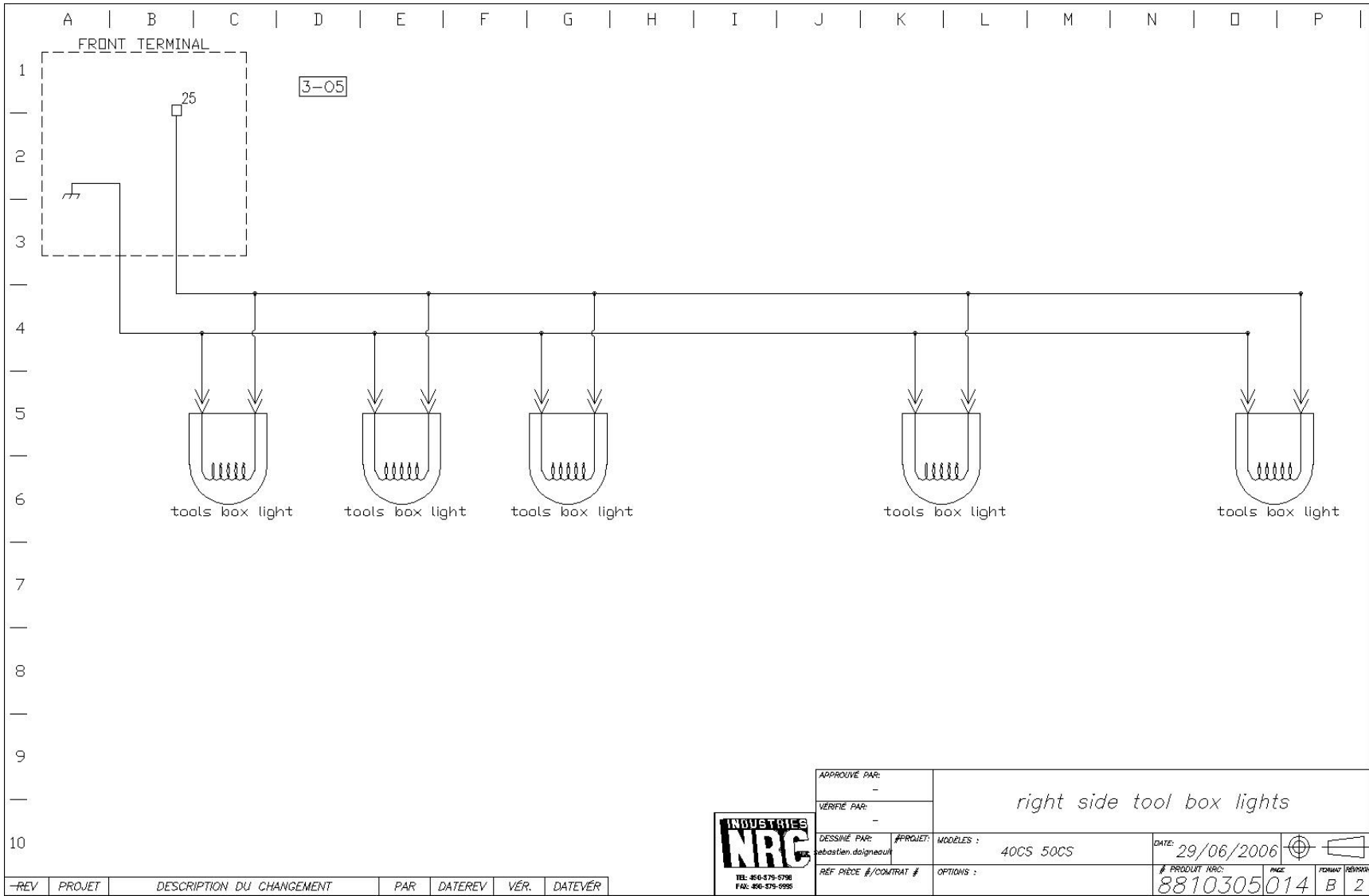


APPROUVÉ PAR: -	<i>Tunnel tool box lights</i>			DATE: 28/06/2006	
VÉRIFIÉ PAR: -					
DESSINÉ PAR: sebastien.daigneaur	#PROJET:	MODÈLES : 40CS 50CS	# PRODUIT NRC:	PAGE	FORMAT RÉVISION
REF. PIÈCE #/CONTRAT #	OPTIONS :		8810303012	B	1

2.1.1.14. Left side tool box lights



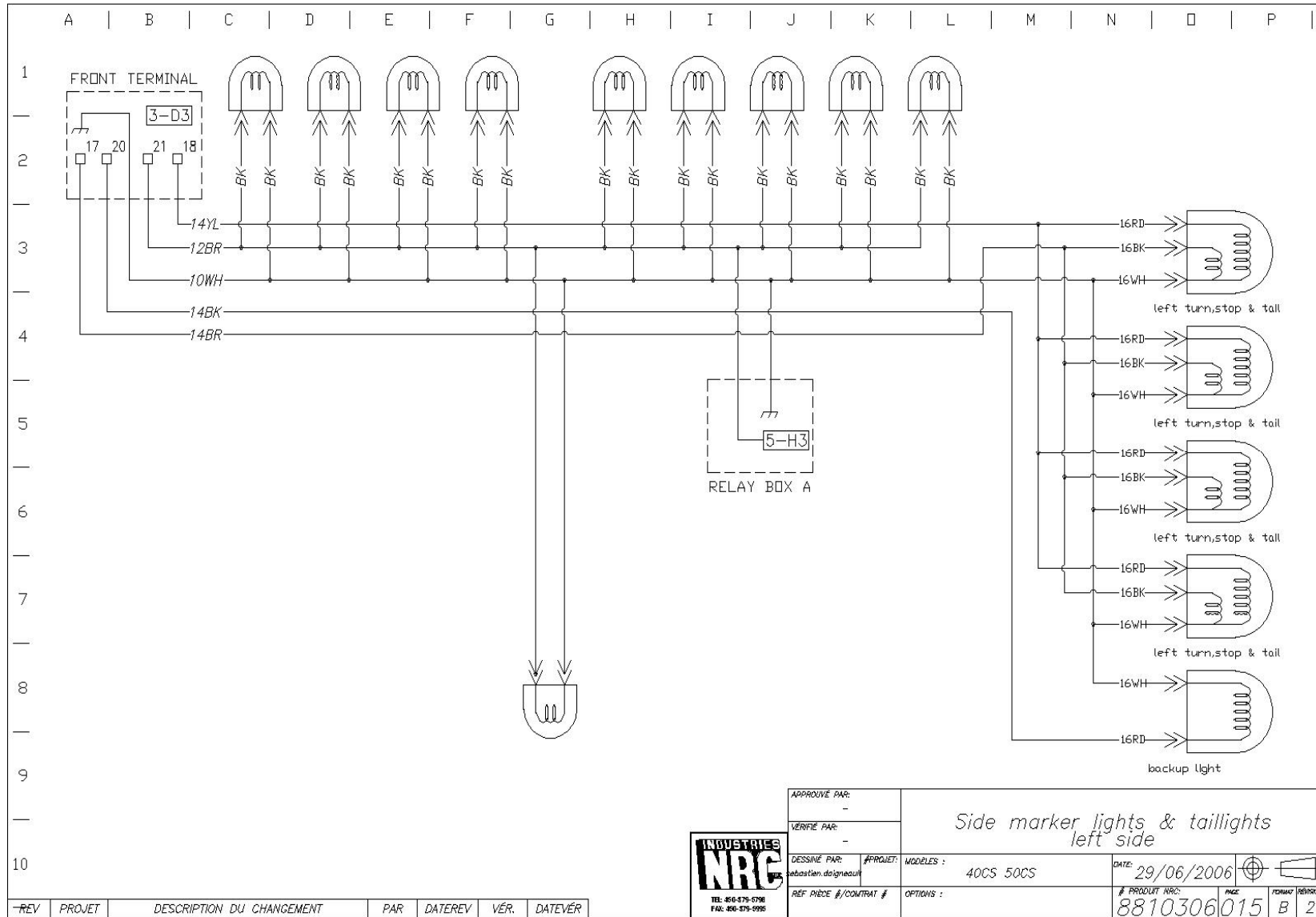
2.1.1.15. *Right side tool box lights*



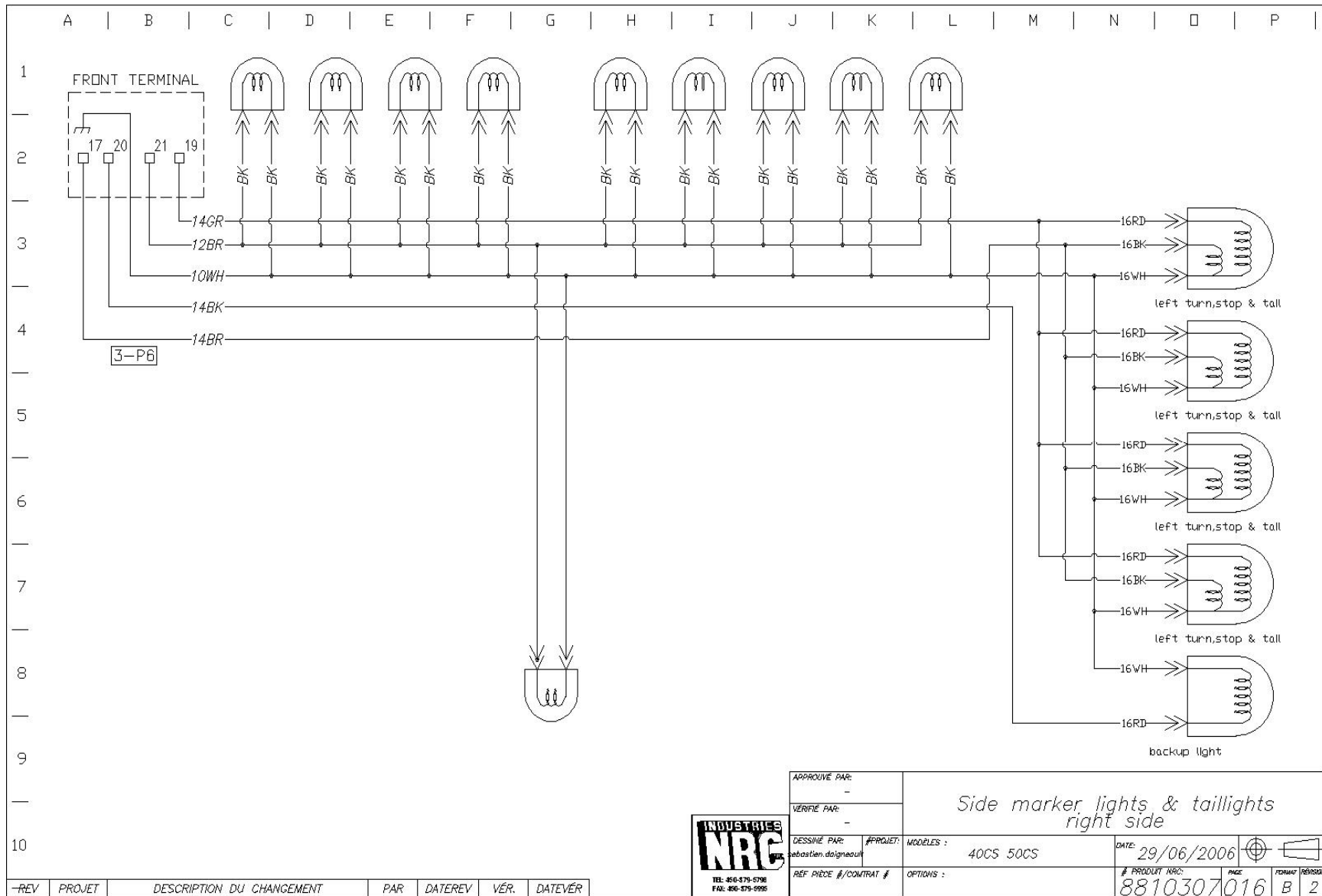
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REF PIÈCE #/CONTRAT #		OPTIONS :		# PRODUIT NRC: 8810305014	PAGE: B 2

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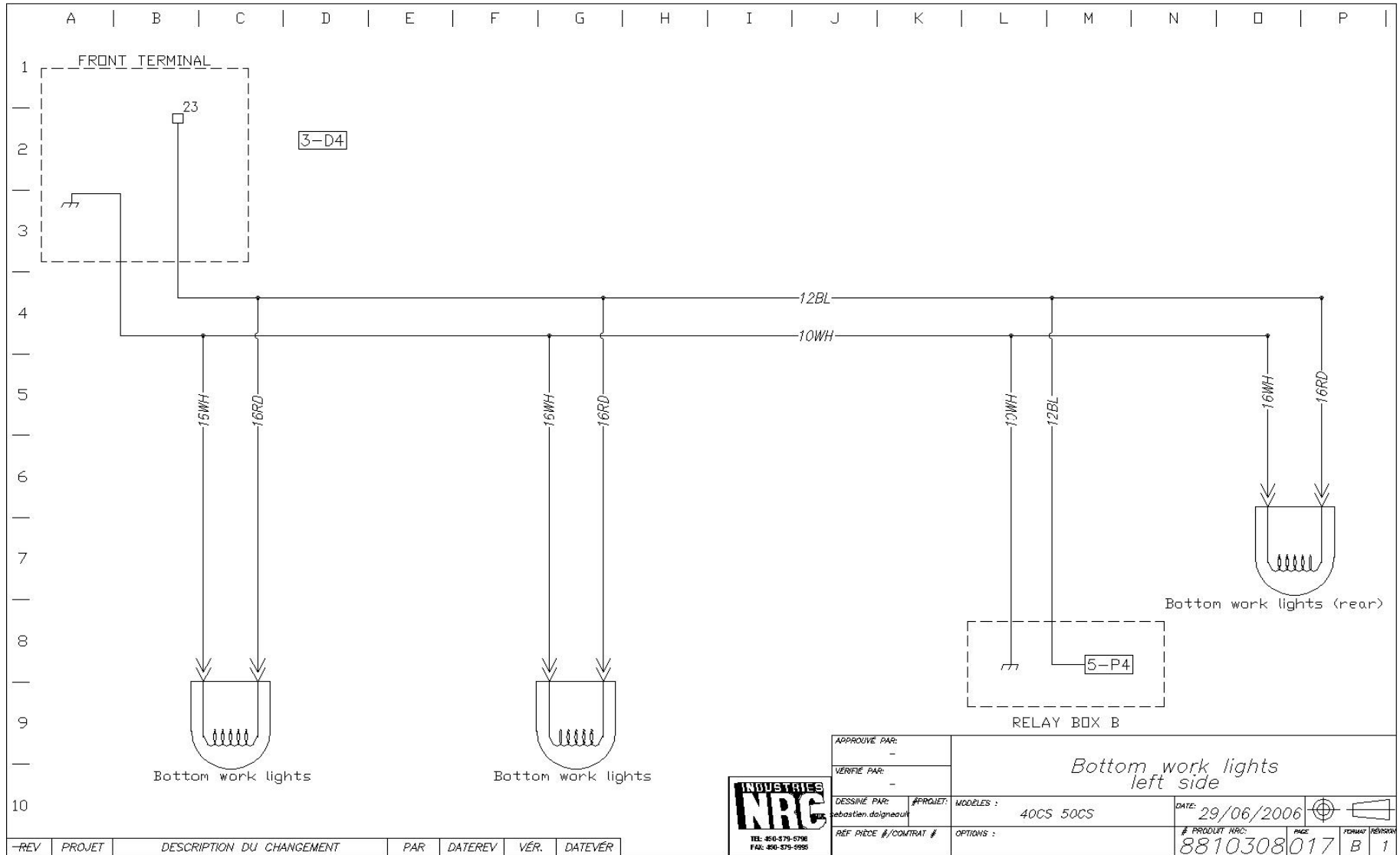
2.1.1.16. Side marker lights and taillights left side



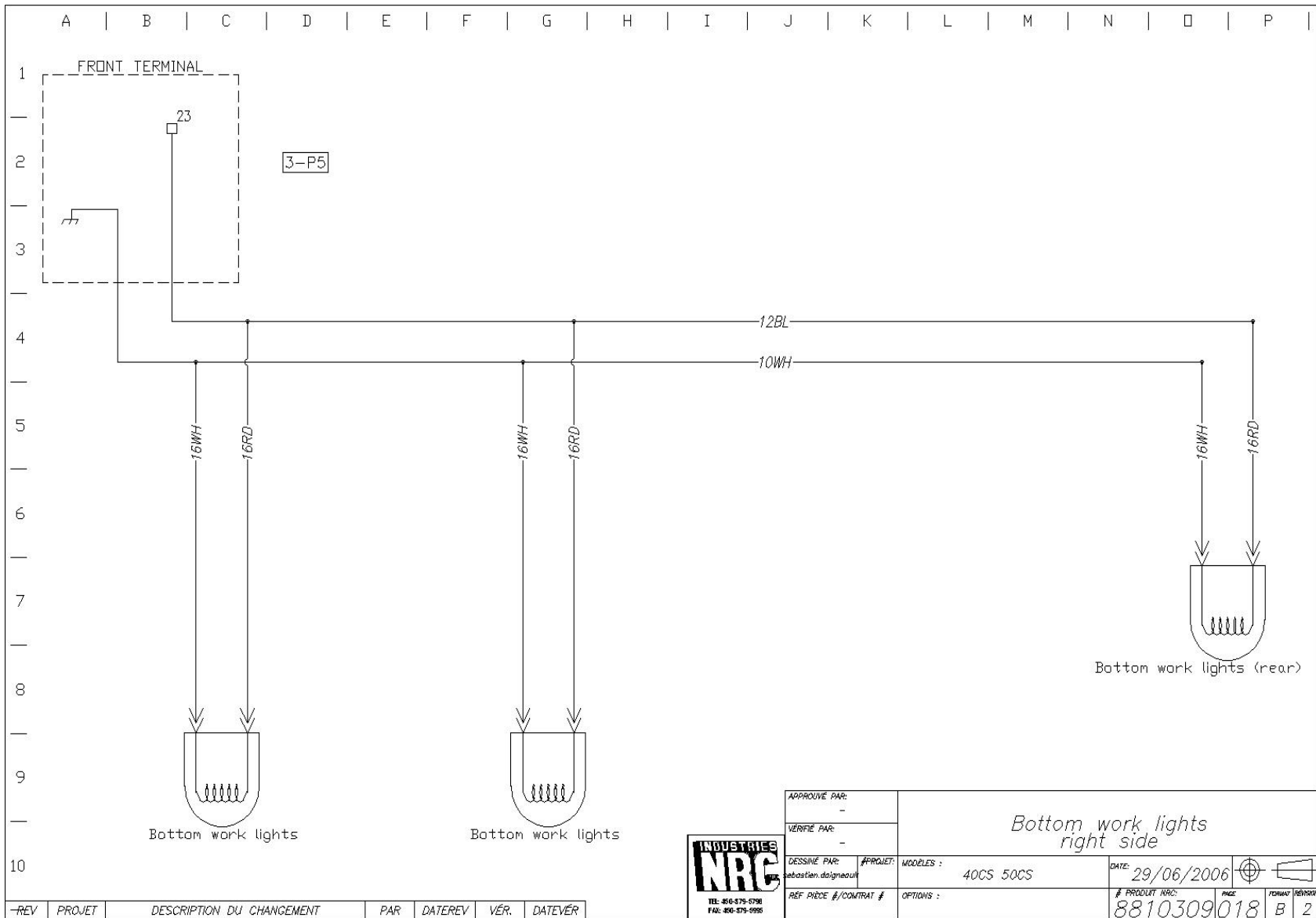
2.1.1.17. Side marker lights and taillights right side



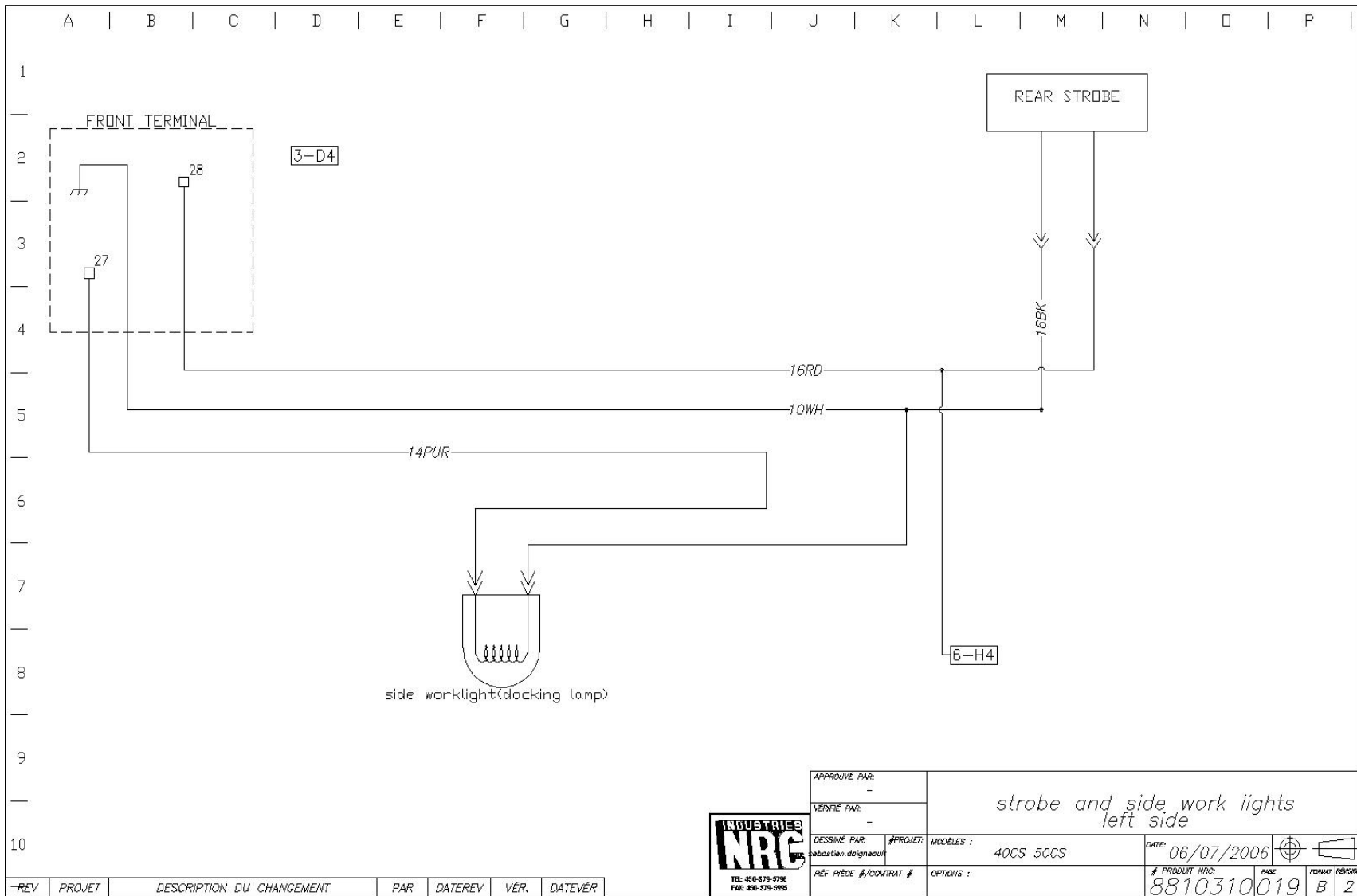
2.1.1.18. Bottom work lights left side



2.1.1.19. Bottom work lights right side



2.1.1.20. Strobe and side work lights left side

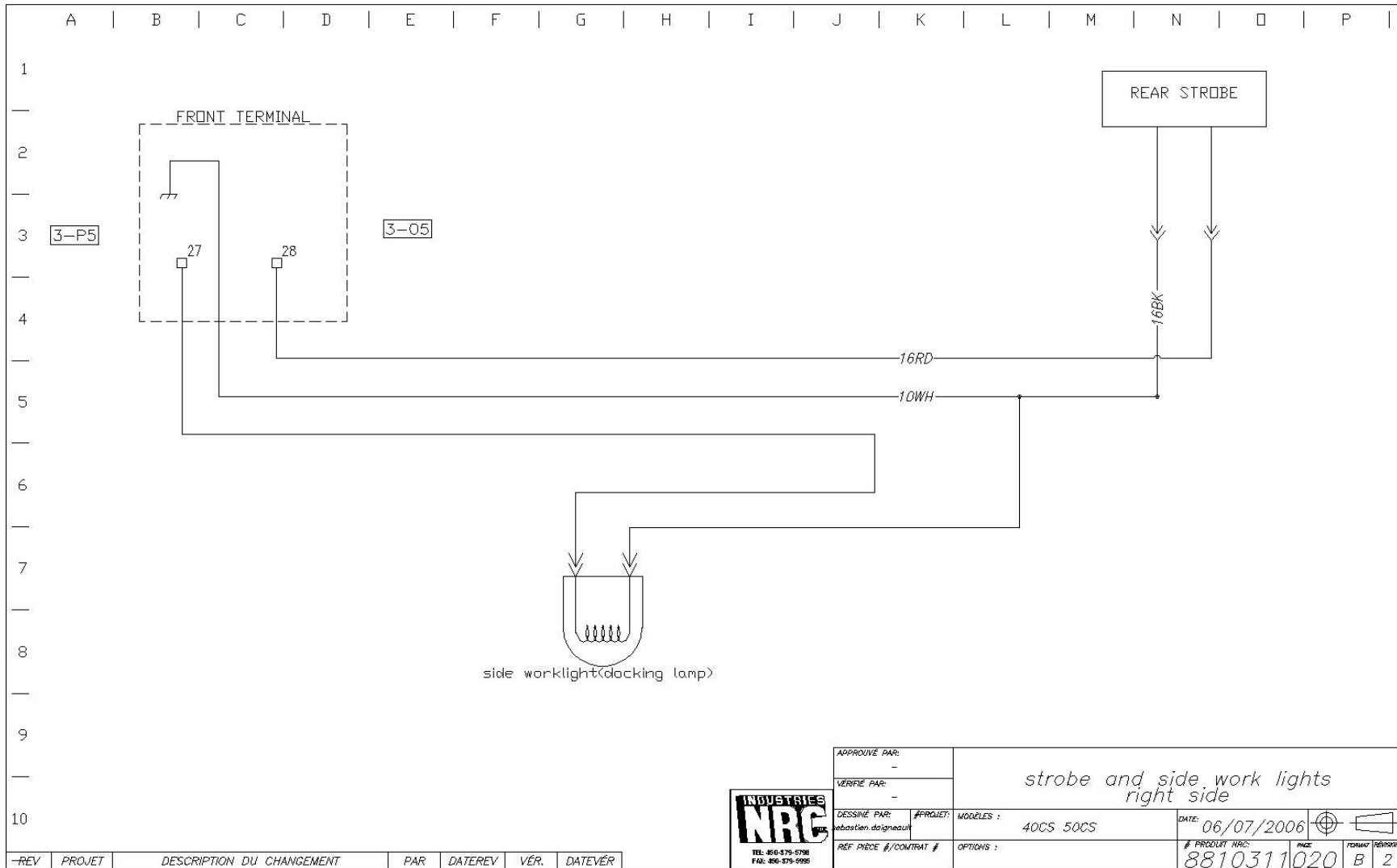


APPROUVÉ PAR:	-	<i>strobe and side work lights left side</i>	
VÉRIFIÉ PAR:	-		
DESSINÉ PAR:	sebastien.daigneourt	#PROJET:	MODELES : 40CS 50CS
REF PIECE #/CONTRAT #		DATE:	06/07/2006
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		FORMAT:	REV001
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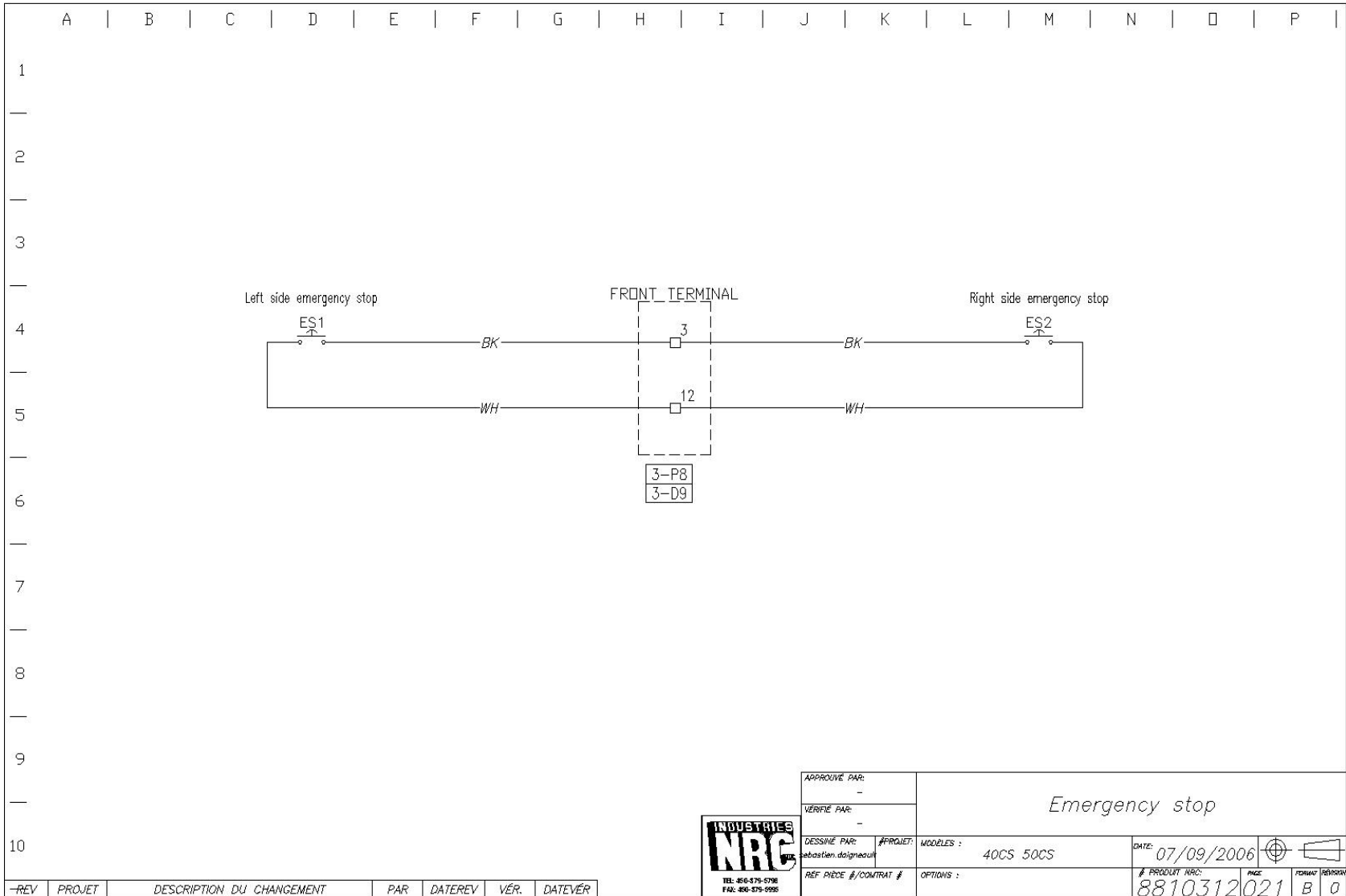
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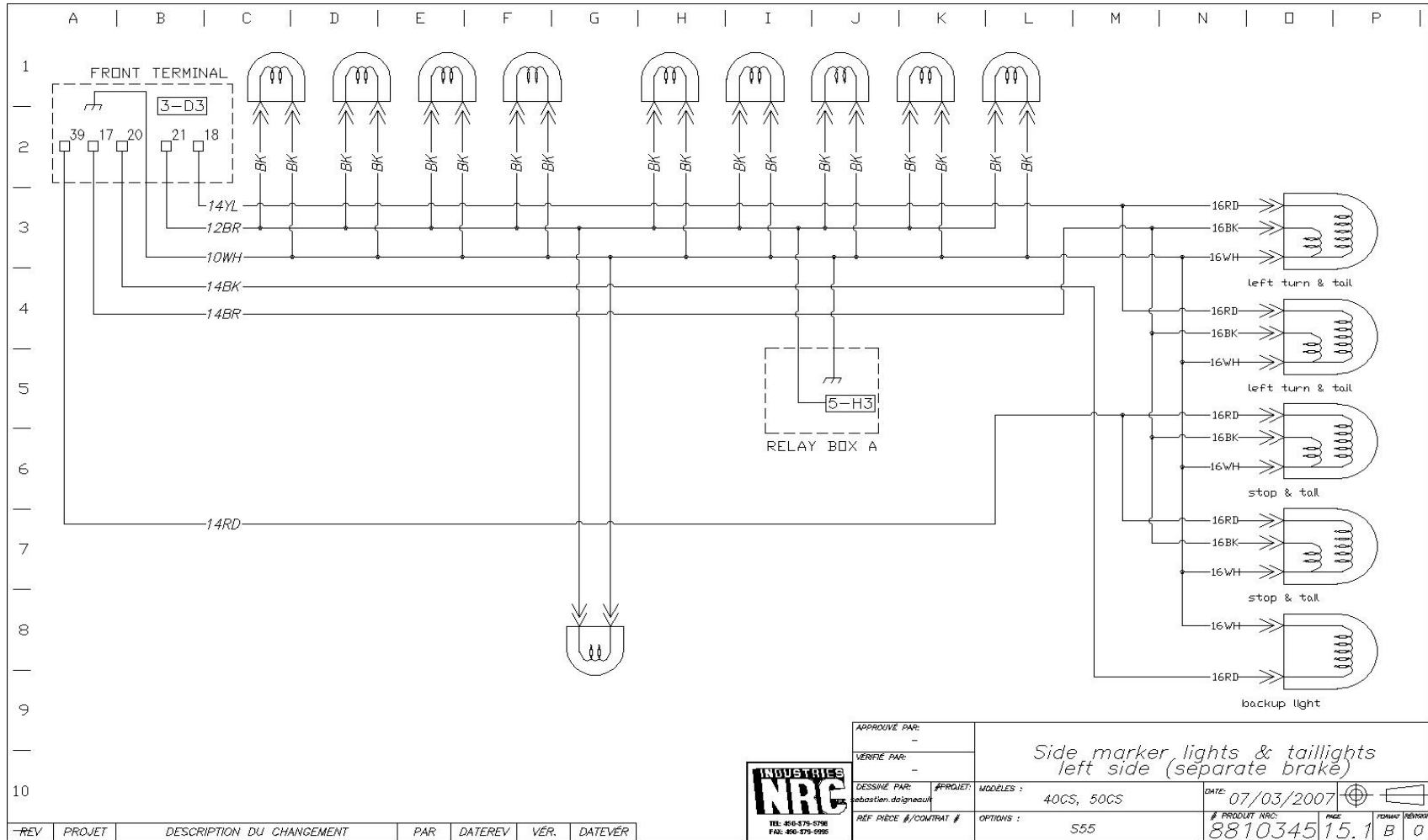
2.1.1.21. Strobe and side work lights right side



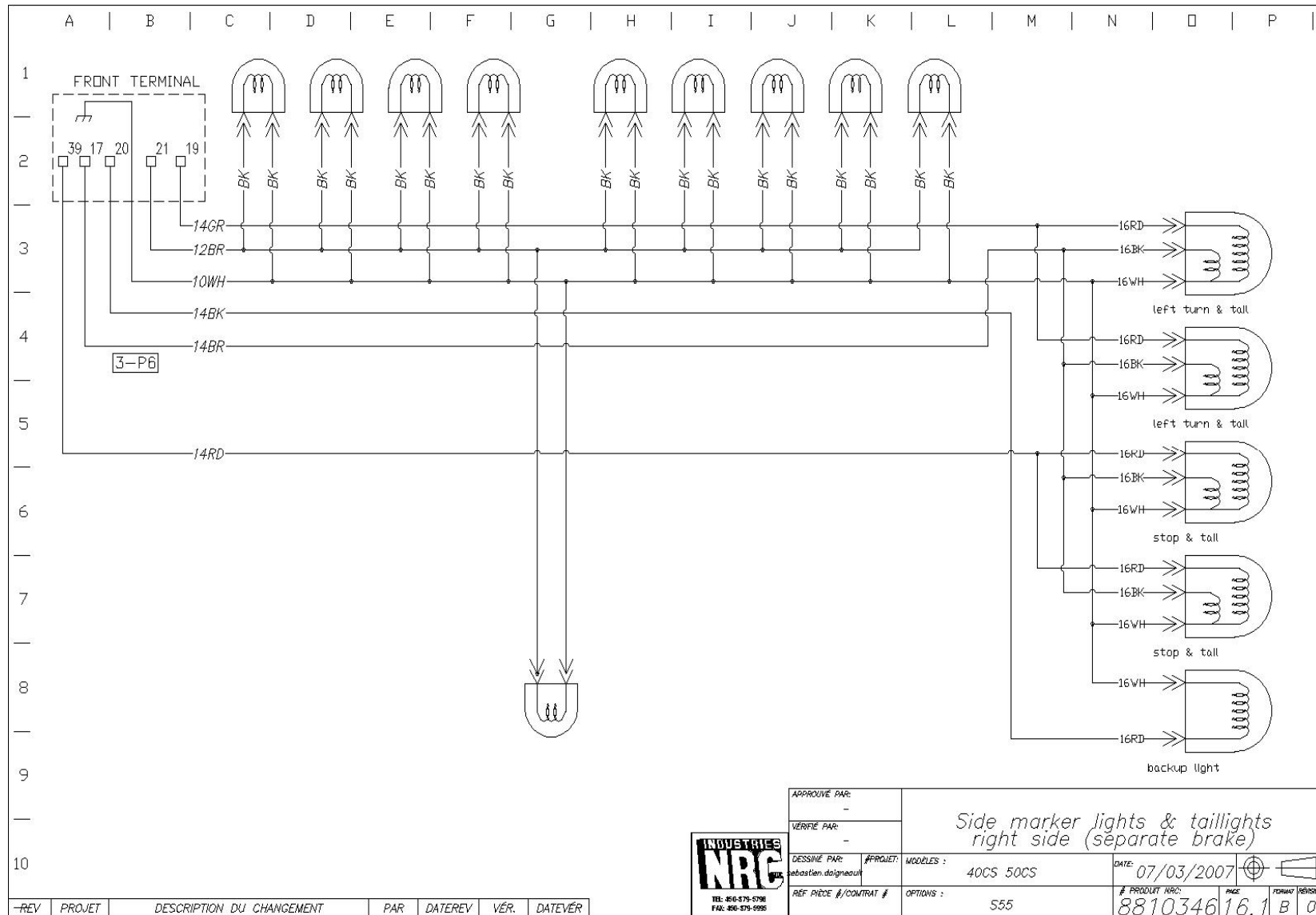
2.1.1.22. Emergency stop



2.1.1.23. Side marker lights and taillights left (24 Volts)



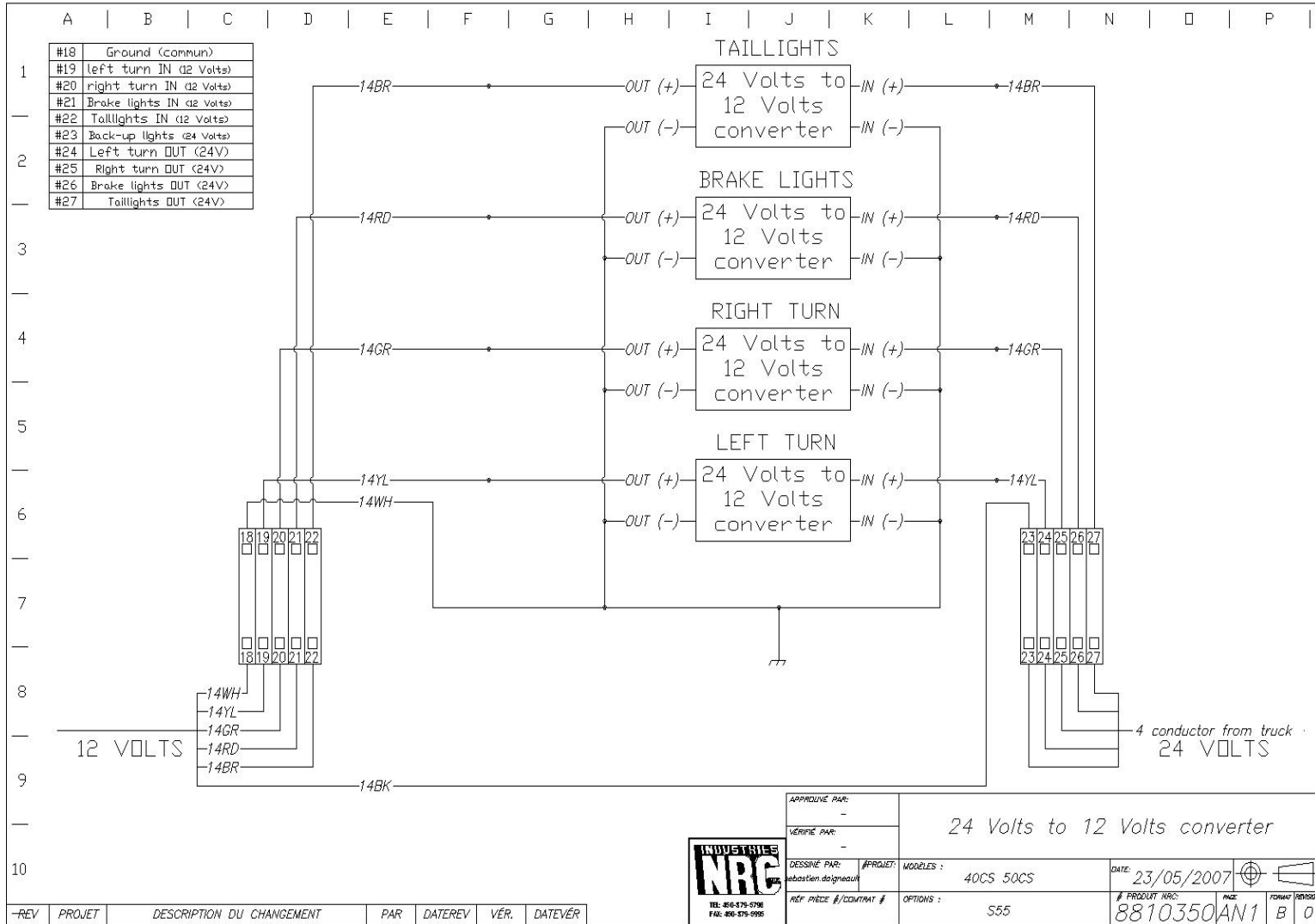
2.1.1.24. Side marker lights and taillights right (24 Volts)



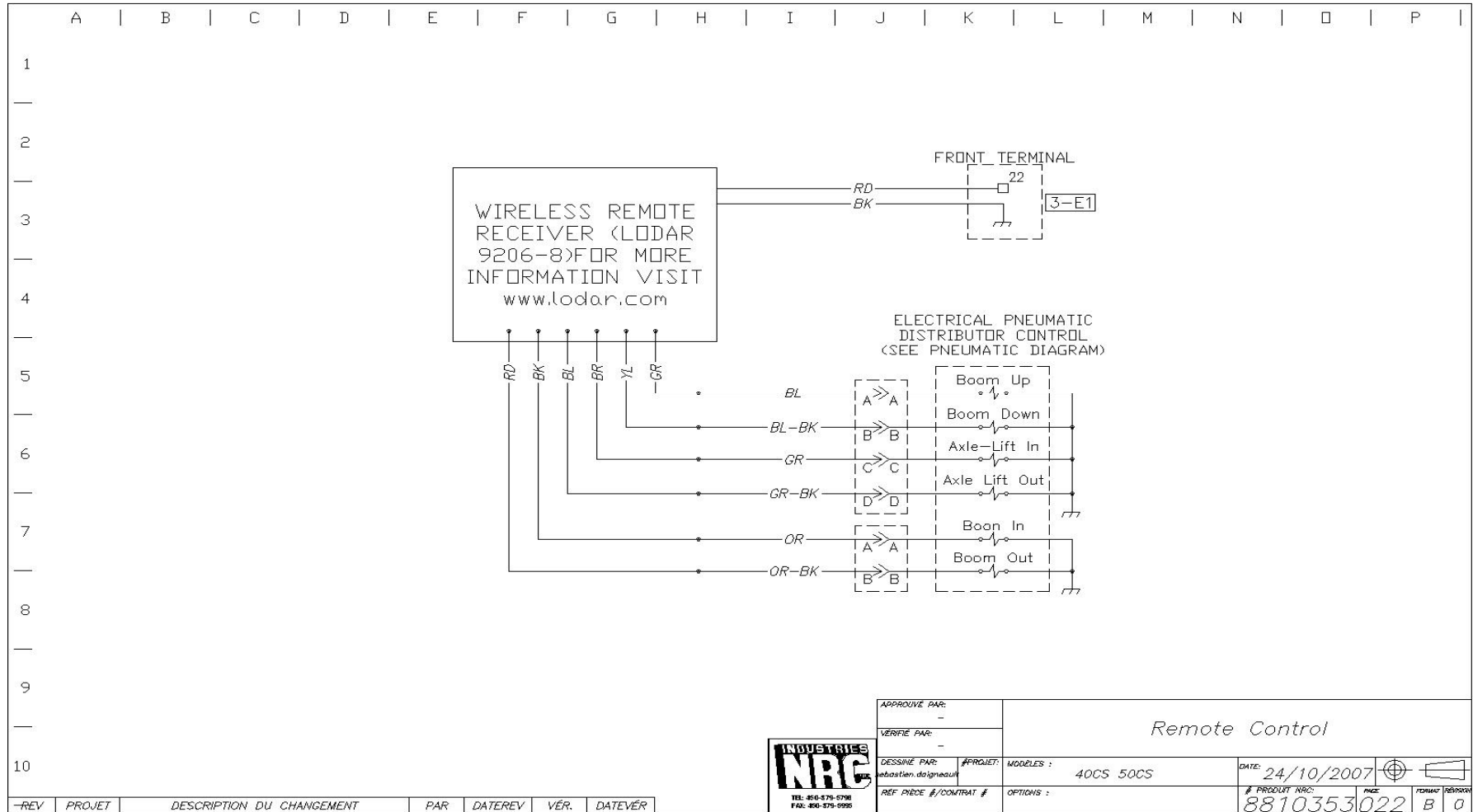
APPROUVÉ PAR: -		Side marker lights & taillights right side (separate brake)		DATE: 07/03/2007			
VÉRIFIÉ PAR: -				MOUDLES : 40CS 50CS			
DRESSINE PAR: sebastien.daigneul		#PROJET: -		# PRODUIT 1400:		PAGE:	
REF. PIÈCE #/CONTRAT #		OPTIONS : 555		8810346		16.1	

-REV	PROJET	DESCRIPTION DU CHANGEMENT	PAR	DATEREV	VÉR.	DATEVÉR

2.1.1.25. 24 Volts to 12 Volts converter



2.1.1.26. Remote control



2.1.2. Hydraulic diagram

2.1.2.1. Valve description

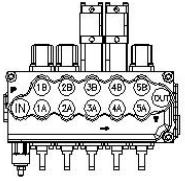
REVISION : SÉRIE (SÉRIAL)

Item	Qté	Code	Nom	Description

NOTES :

LEFT VALVE

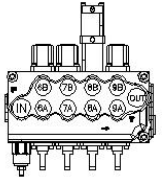
A	B	Hydraulic Function
1	o.- \	SLID
2	o.- \	LEFT REAR JACK LEG
3	\ o.-	AXLE LIFT EXTENSION
4	\ o.-	BOOM ELEVATION
5	\ o.-	LEFT WINCH



STANDARD

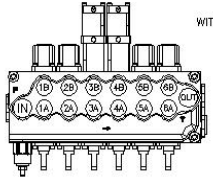
RIGHT VALVE

A	B	Hydraulic Function
6	o.- \	RIGHT REAR JACK LEG
7	\ o.-	AXLE LIFT FOLD
8	\ o.-	BOOM EXTENSION
9	\ o.-	RIGHT WINCH



LEFT VALVE

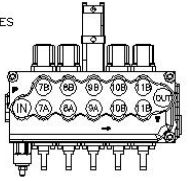
A	B	Hydraulic Function
1	o.- \	SLID
2	o.- \	LEFT REAR JACK LEG
3	\ o.-	AXLE LIFT EXTENSION
4	\ o.-	BOOM ELEVATION
5	\ o.-	LEFT WINCH
6	\ o.-	AUXILIARY LEFT WINCH



WITH OPTIONNAL AUXILIARY WINCHES

RIGHT VALVE

A	B	Hydraulic Function
7	o.- \	RIGHT REAR JACK LEG
8	\ o.-	AXLE LIFT FOLD
9	\ o.-	BOOM EXTENSION
10	\ o.-	RIGHT WINCH
11	\ o.-	AUXILIARY RIGHT WINCH



DESIGNER PAR: **sebastien.daigneault**

MODELES: **4DCS, 50CS**


DATE: **27/09/2007**

#PROJET: NOM: -

OPTIONS:

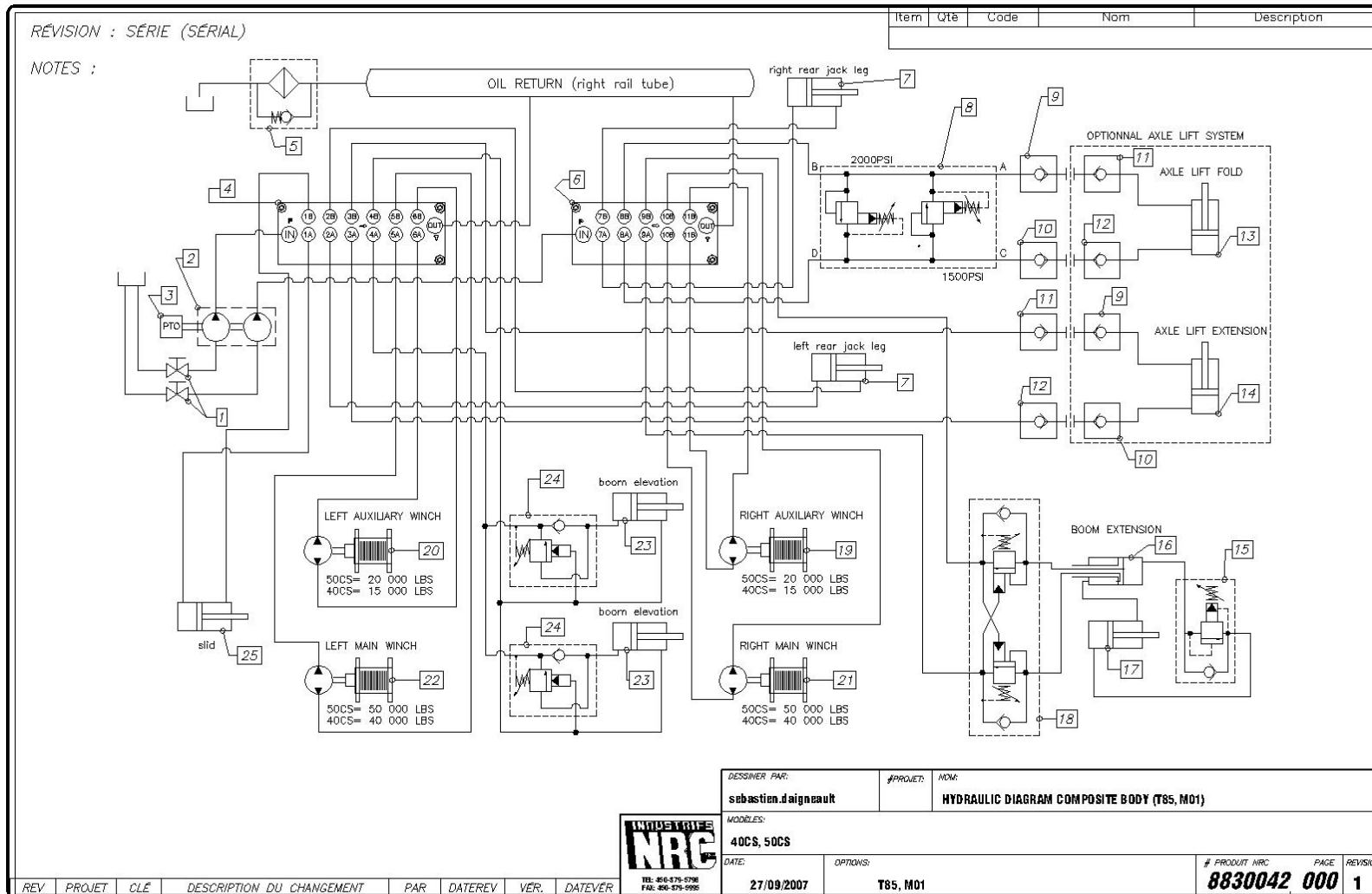
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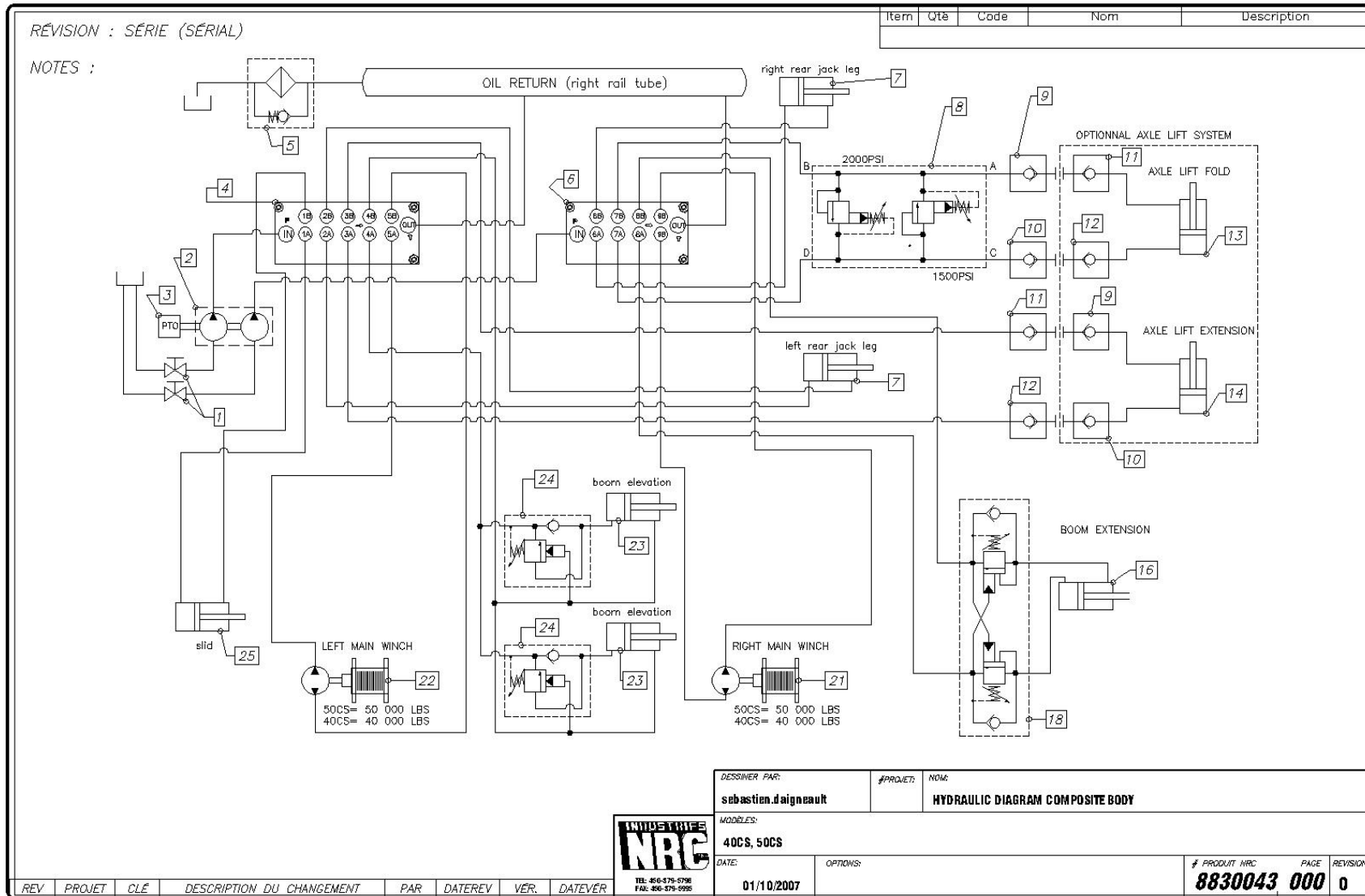


TEL: 456-575-5736
FAX: 456-575-9995

2.1.2.2. Hydraulic diagram composite body (With winches under the boom)



2.1.2.3. Hydraulic diagram composite body

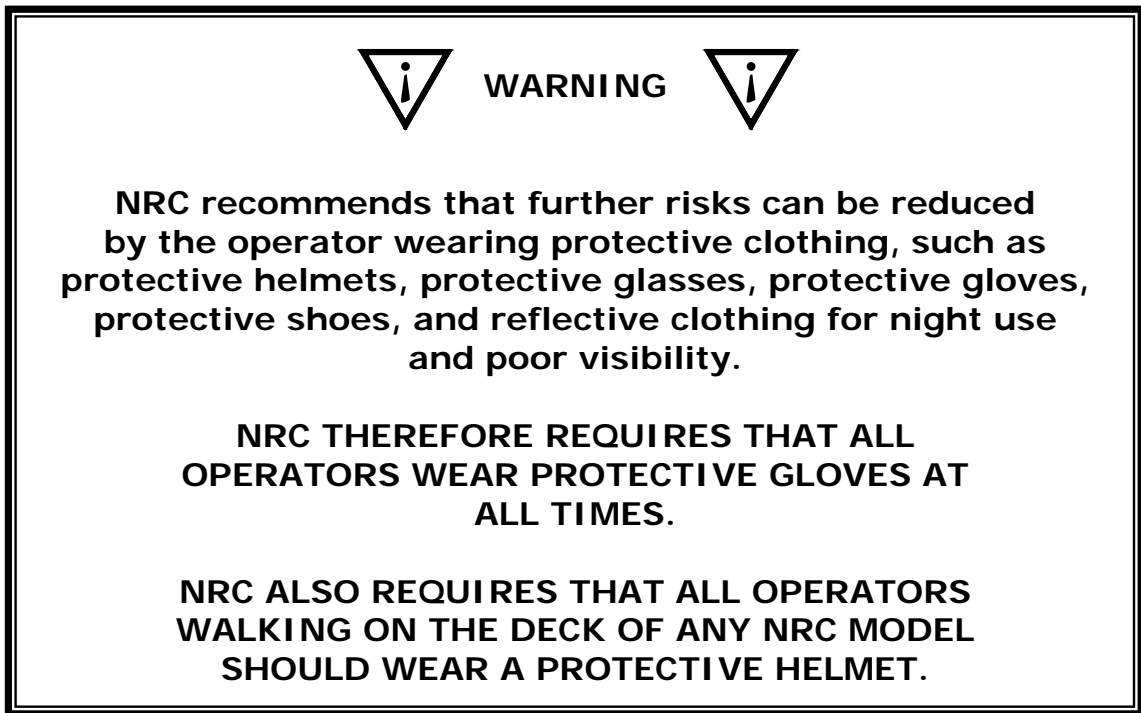


3. Operation

3.1. Lifting precautions

Before using the equipment, open the control panel on the side of the vehicle and 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.



Only trained operators wearing safety footwear should attempt to walk on the deck of a NRC vehicle.

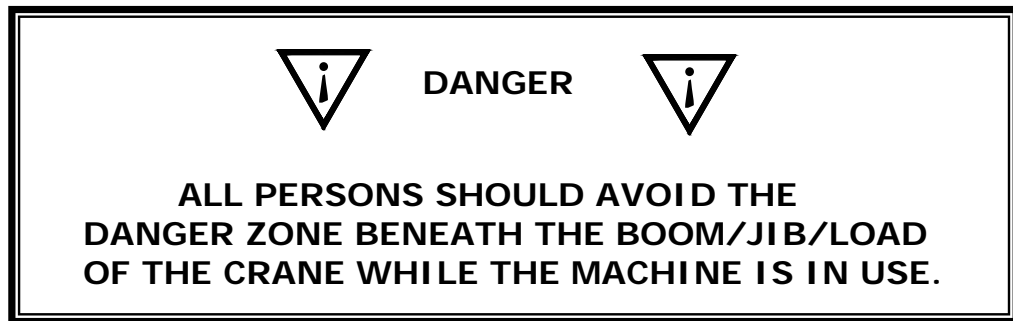
All lever controls are non-functional when the Power Take Off is not engaged, a warning light in the cab warns the driver/operator not to drive the vehicle with the Power Take Off engaged. All operators are advised to check that the P.T.O. is disengaged both visually and manually before driving the vehicle.

NRC recommends that when the vehicles are operated by the roadside or in any danger zone, the operator should select the controls situated

away from the danger zone or 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 mounting plates for all models 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 ONLY by a NRC distributor at least once a year.

3.2. Procedures for operating the boom

Note: Always make sure to engage the P.T.O. properly when using the equipment. If a strange noise is heard, stop the engine immediately. If the truck is equipped with a P.T.O. air shifter, wait until the pressure is at 90 P.S.I. before using it.

To become familiarised with the equipment, we suggest to let the engine run at low speed. Read the information carefully before using the lever controls. Usually, it is recommended to adjust the throttle between 600 and 800 R.P.M. for a big engine (more than 270 hp), and between 600 and 1000 R.P.M. for a small engine (less than 270 hp). Higher R.P.M. can damage the pump.

1. Start the engine of the truck, making sure that the P.T.O. is disengaged. Depress the clutch, engage the P.T.O. and release the clutch to start the hydraulic system that operates the boom and axle-lift.
2. Position the control panel switch located on the dash to **ON**.
3. Disengage the winches using the switches situated near the control levers. The levers may have to be pushed up and down to allow the dog clutches to disengage correctly.

4. In order to use the boom without the axle-lift, a decision must be made whether to keep the axle-lift in place or take it off. There are two options:

OPTION 1: Keeping the Axle-Lift in place

WARNING: This mode of operation for the crane, i.e. with the axle-lift attached while the crane is in use, does limit the field of operation of the crane as the hydraulic lifting cylinders for **the boom will come into contact with the top of the axle-lift arm when the boom is lowered with the crane "slid" right to the back of the chassis.** Care should be taken when using the crane in this position as damage can be caused by contact at this point.

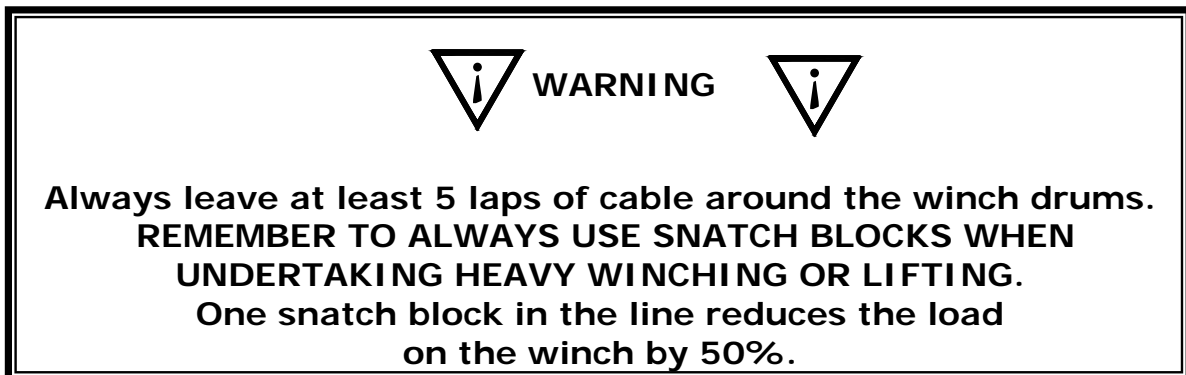
- a) Once the winches are disengaged, lift the axle-lift arm with the crane, just enough to allow the safety pin (normally stowed in the front locker) to be slid into place through the axle-lift arm in the hole provided.
- b) Lower the arm with the pin inserted, down onto the top of the rails on the backplate of the vehicle, so that the weight of the axle-lift is supported by the pin. **WARNING: Do not put any pressure or downward force on this pin with the boom.**
- c) Remove the two safety clips situated at the top of the axle-lift arm to allow the removal of the boom head. Put them somewhere safe.
- d) Lower the boom just enough to allow the hooks on the boom head to pass under the pin in the top of the axle-lift arm.
- e) Extend the boom so that the axle-lift is completely detached and the crane is now ready for use.

OPTION 2: Completely removing the Axle-Lift Arm

- a) Follow all the steps in OPTION 1, then turn off either the engine of the truck or disengage the P.T.O. so that the hydraulic pump is not operating.
- b) Move the operating levers for the axle-lift up and down to remove any pressure that there may be in the lines.

- c) Disconnect the four hydraulic lines that connect the axle-lift to the body and put the protective covers over the exposed ends.
 - d) Restart the engine or engage the P.T.O.
 - e) Lift the boom so that there is space between it and the top of the axle-lift.
 - f) Gently unwind the cables (under power) of each winch and attach the hooks to the eyes situated near the top of the axle-lift arm.
 - g) Raise the boom, which in turn will start to lift up the entire axle-lift. The center of gravity of the axle-lift can be found by extending the boom until no more pressure is being exerted on the two guide wheels in the rails on the back of the vehicle. **You need to find the center of gravity for the axle-lift to avoid having the unit swinging in one direction or another when it is lifted out of the rails. Too much swinging could mean the unit hitting either the back of the body or some other part of the vehicle.**
 - h) Once the axle-lift is lifted clear of the rails, the two bearing wheels must be taken off of the bottom of the axle-lift. These bearing wheels are held in place by the rails and will fall off if not removed and kept in a safe place. **Note:** The bearing wheels must be reinstalled before putting the axle-lift back in the rails.
 - i) The axle-lift can now be put it down on a firm surface.
 - j) Disconnect the two winch cables and the crane is now ready for use.
5. To use the "slider" effect of the crane, first open the two doors situated on the floor of the truck body that covers the two slide rails. Make sure that the two rails are well lubricated (Teflon grease is recommended for this).
6. It is suggested that the crane be slid backwards and forwards a few times in order to spread out the grease evenly.
7. Hydraulic legs and sand anchors: When winching loads at a distance with the two winch cables, it is often necessary to install the two sand anchors onto the bottom of the two hydraulic legs. To do this, slide one of the pins on the sand anchor out far enough to be able to install the anchor on the foot of the hydraulic leg and put the pin back into place to secure the anchor.

8. Always make sure that the ground on which the work is being done is solid enough to support the weight of the wrecker **plus** the weight of the load being lifted.
9. To lift very heavy loads it is recommended to slide the crane as far back along the chassis (towards the rear of the vehicle) as possible and elevate the boom to the maximum elevation possible. This way the radius between the back of the truck and the load being lifted can be kept to a minimum, therefore maximising the crane's lifting capability. Basically, the load should be as close as possible to the truck.
10. When using the winches to their maximum capability, it is recommended that the crane be slid to the front of the chassis (behind the cab of the truck) with the safety doors over the slide rails closed. The safety devices connected to these doors will prevent the crane from sliding backwards and protect the hydraulic cylinder inside from overloading.



11. After the job is finished, park the boom back in place behind the cab.
12. Switch **OFF** the pilot pressure switch.
13. Reattach the axle-lift to the boom by reversing the procedures in step 13 above making sure to put the safety locks/clips back in place, lift the axle-lift and remove the safety pin. Store the safety pin back in the locker.
14. Disengage the P.T.O.
15. Switch **OFF** the control panel switch.

3.3. 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 engine of the truck with the P.T.O. disengaged. Depress clutch and engage the P.T.O. to give hydraulic power to the crane.
2. Freespool the two winches by operating the two switches 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 it's retaining clamp. Lower the arm completely.
4. Lower and extend the boom of the crane to put 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 back of the tow truck, through the two guides on either side of 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. Lower the axle-lift arm to the position desired 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 two winches (by reversing procedure 2 above) and tighten the cables after attaching the hooks to a suitable point. Never tighten the cables to their maximum capacity as this could cause damage to the winches, the cables or parts of the boom and axle-lift.
14. Disengage the P.T.O. and drive away carefully.

3.4. Procedures for operating winches

3.4.1. Winches for Model 9735S

DP 30BCX4L2F and 30BCX4R2F 30,000 lbs. winches are installed on Model 9735S.

Operating Procedures for Shifting Gears

The following steps are necessary for proper gear shifting operation

Single Speed Gearbox*:

Gear Disengagement:

1. Winch must be "at rest" and have **NO LOAD** on cable.
2. Shift winch to out of gear "free spool" mode.

Gear Engagement:

1. Winch must be "at rest" and have **NO LOAD** on cable.
2. Shift winch to in-gear mode and **slowly** rotate drum 90° in pay out direction, and then **stop** rotation.

Next, **slowly** rotate drum in pay in direction to insure gears are fully engaged and begin paying of load.

Two Speed Gearbox*:


Low Gear to High Gear:

1. Winch must be "at rest" and have **NO LOAD** on cable.
2. Shift winch from low gear to high gear and **slowly** rotate drum 90° in pay out direction, and then **stop** rotation. Next, **slowly** rotate drum in pay in direction to insure gears are fully engaged and begin paying in of load.


High Gear to Low Gear:

1. Winch must be "at rest" and have **NO LOAD** on cable.
2. Shift winch from high gear to low gear and **slowly** rotate drum 90° in pay out direction, and then **stop** rotation. Next, **slowly** rotate drum in pay in direction to insure gears are fully engaged and begin paying in of load.

*Also applies for two speed gearbox with neutral position.



WARNING



IF YOUR WINCH HAS EVER BEEN "SHIFTED UNDER LOAD" OR HAS EVER ENCOUNTERED "ROTATIONAL FACE CONTACT OF NON-ENGAGED GEAR COMPONENTS", THE GEAR TEETH COULD BE DAMAGED. DAMAGED GEAR TEETH CAN PREVENT YOUR WINCH FROM FULLY ENGAGING INTO GEAR AND COULD ALLOW IT TO JUMP OUT OF GEAR. IF THIS HAS HAPPENED TO YOUR WINCH, THIS PROCEDURE MAY *NOT* INSURE THAT IT IS FULLY ENGAGED AND IT MAY NEED TO BE INSPECTED FOR POSSIBLE GEAR DAMAGE.

Source: DP Winch Parts and Operators Manual

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 steel plate on the boom's slides, the axle-lift and the outriggers by applying 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. Lubricate the boom slide tube by applying Teflon grease all around the tubing.
7. For the bolts securing the steel plate to the chassis we recommend to inspect it the first month and then once every three (3) months.
8. 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

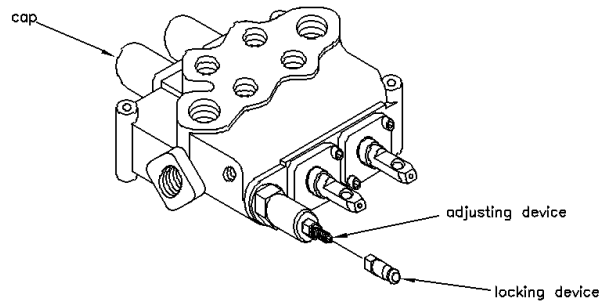
PARTS	TYPE OF LUBRICANT	INTERVAL
cables	cable lubricant	4 to 6 months
winches	oil SAE 90EP	check twice a year
oil tank	AW-22	the level should be 3” from the top of the tank
boom plates & the outriggers	waterproof grease	once every 3 months
axle-lift plates	waterproof grease	monthly
lubricators (zert)	waterproof grease	monthly
axle-lift (zert)	waterproof grease	every week
valves	antifreeze white grease	once a year
slider tube	Teflon grease	every week

4.3. Hydraulic pressure adjustment

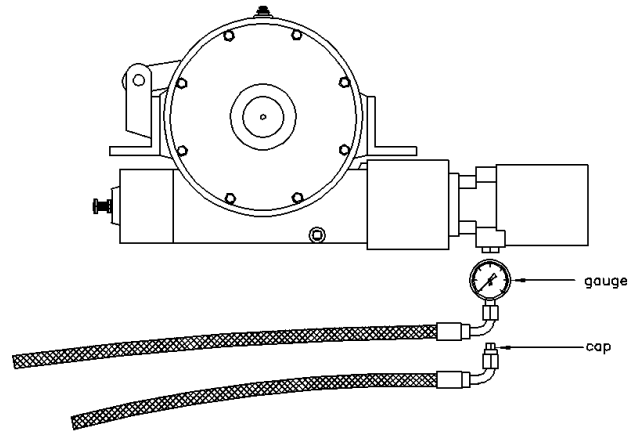
NRC Slider Models have a dual hydraulic system. The pressure has to be adjusted on each hydraulic valve bank.

1. Use a pressure gauge calibrated from 0 to 5000 P.S.I. For hydraulic bank valve #2 use one of the ½" hydraulic exits (in & out of axle-lift) on the rear bumper.
2. For the hydraulic bank valve #1 it is suggested to use the right winch, but all the others functions on bank valve #1 could be used.
3. For an exact reading, fix the throttle between 600 and 800 R.P.M. for a big engine (more than 270 hp) and between 600 and 1000 R.P.M. for a small engine (less than 270 hp).
4. Release the P.T.O.
5. Push and pull the lever control on the extension of the axle-lift as well as the lever control of the right winch to release the pressure in the hoses.
6. Disconnect the hoses on the right winch, put a cap on one end, engage the P.T.O. and with the gauge take the pressure on the other end. The pressure has to be at 2800 P.S.I. for all models except the 9260SS which should read 3000 P.S.I. If not, follow steps 7 to 9.
7. Unscrew the locking device on the corresponding valve, pull or push the lever control, and turn the adjusting device until the pressure reaches the required P.S.I. and then lock the locking device.
8. Release the pressure in the hydraulic line by pushing and pulling the lever control and re-attach the hoses as they were before.
9. Do the same thing for the other valve bank with the ½" hydraulic exit on the rear bumper.

HYDRAULIC VALVE



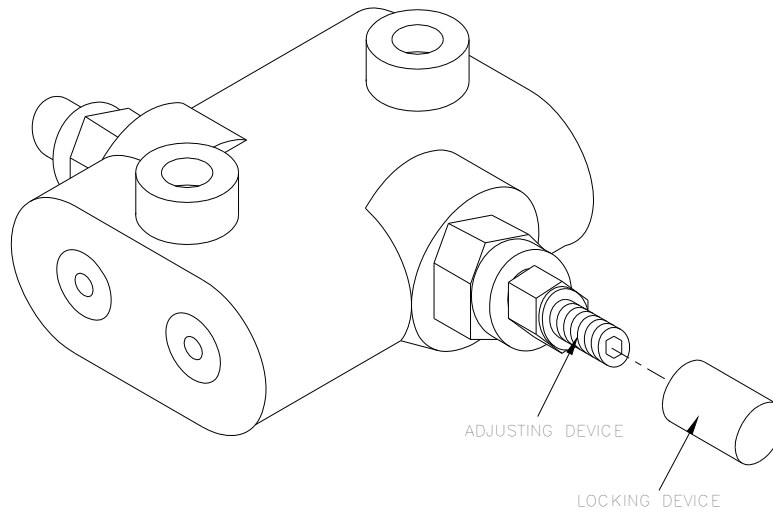
PRESSURE MEASUREMENT ON THE WINCH



4.4. Cushioning valve adjustment

1. Make sure that the axle-lift is completely retracted before adjusting the cushioning valve. If the axle-lift can be folded up when it is retracted it means that the cushioning valve is correctly adjusted.
2. Unscrew the locking device. Make sure to choose the appropriate cushioning valve.
3. Turn the adjusting device on the cushioning 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.

Cushioning Valve



4.5. Component disassembly

4.5.1. Boom Disassembly

4.5.1.1. Two Stage Boom Disassembly

1. Extend the boom about 3 feet.
2. Remove the spacer bolts and the nylon slide pad.
3. Raise the boom by it's end and remove the nylon slide pad under the boom.
4. Extend the boom completely, the spacers should go free at the same time, if not, pull them out.
5. Release the P.T.O. and release the pressure in the hydraulic line by pulling and pushing the control lever that extends the boom.
6. Disconnect the hoses from the cylinder and remove the pin that fixes the cylinder to the main section of the boom.
7. Pull out the inner section.
8. Reverse these procedures to reassemble.

4.5.1.2. Three Stage Boom Disassembly

1. Extend the boom about 3 feet.
2. Remove the spacer bolts and the nylon slide pad.
3. Raise the boom by it's end and remove the nylon slide pad under the boom.

4. Extend the boom completely, the spacers should go free at the same time, if not, pull them out.
5. Repeat these steps for the other section of the boom.
6. Raise the boom with the elevation cylinder until the pin of the cylinder lines up with the hole in the mast.
7. Release the P.T.O. and release the pressure in the hydraulic line by pulling and pushing the control lever that extends the boom.
8. Disconnect the hoses from the hydraulic cylinder, remove the pin, then pull out the sections.
9. If the boom is being dismantled for a cylinder problem, the two smallest sections of the boom do not have to be separated. Therefore, the spacers and the nylon slide pads between the two sections do not have to be removed.
10. Before removing the tube from the two smallest sections of the main section, make sure to have extended the smallest section in an appropriate way so that the pin can be removed from the cylinder.
11. Reverse these procedures to reassemble.

4.5.2. Axle-Lift Disassembly

1. Unfold the axle-lift and remove the adapter receiver.
2. Raise the axle-lift from the tracks, lay it on the ground as close as possible to the rear bumper so that the hydraulic hoses will not need to be disconnected.
3. Remove the spacer bolts and the nylon slide pad from the big section.

4. Extend the cylinder, and remove the nylon slide pad and the spacers.
5. Release the P.T.O., release the pressure in the hydraulic line by pulling and pushing the control levers that unfold the cylinder and extend and retract the axle-lift.
6. Disconnect the hydraulic hoses.
7. Remove the pin from the big section.
8. Remove the two smallest sections from the main section.
9. To remove the smallest section, remove the two stoppers and pull back the smallest section.
10. 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.**
11. Reverse these procedures to reassemble. **Do not forget to weld the stoppers back on.**
12. If the axle-lift was disassembled for cylinder problems, remove both pins (from the biggest section and smallest section).

4.5.3. Jack Leg Disassembly

1. Raise the rear of the vehicle.
2. Remove the bolts that lock the pin into the bushing (#1 from Jack Leg Parts List).
3. Fill the zert on the pin (#3 from Jack Leg Parts List).
4. Remove the door and fill the zert in the bushing of the cylinder.

5. The next step is important. Fill the internal zert located on the cap welded to the external leg tube (#4 from Jack Leg Parts List). Fill it up until the grease comes out of the bushing. If no grease comes out of the bushing, continue to fill with grease until it gets too difficult to keep filling. At this point the pressure of the grease may push the pin out.
6. Remove the hoses.
7. If the pin didn't come out, try to pull the pin. If the pin turns, it should come out easily.
8. If the pin still won't come out, heat the bushing and pull on the pin.
9. The last solution is to fire cut the pin on each side of the bushing of the cylinder.
10. Remove the internal section with the cylinder.

5. Troubleshooting guide

5.1. Boom

<i>Boom Troubleshooting</i>	
<i>Condition</i>	<i>Possible Causes; Solutions</i>
Boom Lowers on its own	<ol style="list-style-type: none"> 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 by-pass in boom elevation 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, using the winch cables, 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 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	<ol style="list-style-type: none"> 1. Check all hydraulic lines for oil leaks 2. Check all hydraulic connections for oil leaks due to possible over-tightening.
Boom extend with a load on axle-lift or retract by itself with a load on the winch cables	<ol style="list-style-type: none"> 1. Check for any external oil leak, if not, go to step 2. 2. Loosen the nut that locks the set screw on the cartridge. Turn the set screw counter clockwise until it stops. Place the Allen key on an easy position to count how many turns you will set the screw. Turn the set screw clockwise 1 and $\frac{3}{4}$ of a turn and maintain the screw at this position while you tighten the locking nut on the set screw. If the problem is still there, go to step 3. 3. Retract the boom completely and maintain it retracted by using a winch cable hooked to the D-Ring on the wrecker body. Disconnect the hose from the lock valve that comes from the bottom of the cylinder and not from the pipe along the cylinder in the case of a two-stage boom or if it is a three-stage boom, disconnect the hose that comes from the bottom of the big square bushing at the end of the rod of the boom cylinder. Let the end of the hose open and put it in a pail or any container to receive oil that could come from the cylinder. Plug the port on the aluminium block where the hose was connected. Start the hydraulic system, pull and maintain the boom in & out lever like if you wanted to retract it again and with the help of someone else, watch if oil comes from the hose continuously. If oil comes, push the lever back to neutral position and check if oil stops to leak and pull the lever again to see if oil starts again to leak and if it is the case, one cylinder has to be rebuilt or replaced. If not, disconnect the other hose from the aluminium block and plug every open oil port. Release the winch cable and try to lift a heavy load with the axle lift. If the boom stays retracted by itself, your cylinders are OK. You could try a brand new cartridge.

