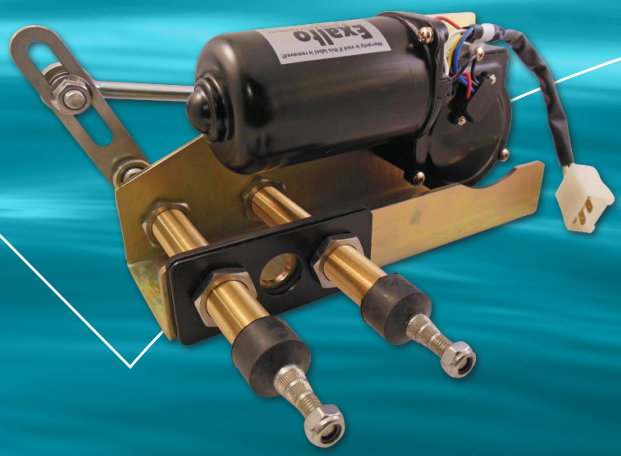
Exalto
WIPER TECHNOLOGIES

WIPER SYSTEMS

Exalto windscreen wiper type 255BS

ITEM NO. 211255.35/211255.65 (12V) - 212455.35/212455.65 (24V)



CLEARLY THE BEST

Dear Customer,

Thank you for buying our products.
Exalto wiper systems are designed and manufactured to the highest standards for marine applications. We guarantee you a clear view for many years.

Complete range of products
We offer a wide range of wiper systems for all types of vessels, both leisure and commercial. For the leisure market we cover all windows with our LD and MD wipers. For commercial use we have our HD wipers to offer perfect wiping of large window sizes. We also can provide linked or straight line systems. Please see the below table as an overview.

After sales support
We have an excellent after sales support. Our wiper specialists can provide a comprehensive advice to ensure the system works accurately and to your wishes. Should problems occur with the product, it is always our main priority to solve it quickly and accurately, with the help of your local dealer close by you.

Exalto window wiper systems

						
Window height	**Up to 1100 mm**		**Up to 1600 mm**		**Between 1100-2500 mm**	
Nm range	15	23-35	40		55	85-120
Motor series	215	223 232	240		255	285 2120
Arms series	LD (LD)	MD1 (PU)	MD2 (PF)		HD1 (P10)	HD2 (P12)

Use of the manual

Read the entire manual before installation. In this manual you can find the following expressions and symbols:

Hint!
Gives you advice on how to perform a task more easily.

Attention!
Alerts you to possible problems and safety warnings.

Safety

Exalto windscreen wipers are easy to install, yet a fair amount of technical knowledge (mechanical and electrical) is required of the installer. Please consult the manual or contact your vendor in case of doubt during installation or operation.

Main Precaution

Disconnect all the electric connections of the wiper before making any change to the wiper system.

Safety symbols
An exclamation mark in front of the text warns you, that injury or damage can occur if a procedure is badly performed.

Dangers
The installation and use of Exalto wipers will not inflict any personal dangers or damage, provided that installation is done according to the procedures specified in the manual.

- Never remove covers or other safety provisions, unless maintenance is being performed and all safety requirements are obeyed.
- The installer must provide all necessary covers.
- Always disconnect the electrical power when performing maintenance.

Prevent the installation from being started (accidentally) by others.

Safety provisions

The safety provisions will protect the user against contact with moving, electrical or hot parts. Some of these have to be provided by the installer. There are several safety provisions:

- Cover or panel (obligatory): covers moving parts and electrical connections. The installer MUST provide a self-made cover or place the wiper behind a panel.
- Make sure the wiper has enough ventilation when placing it behind a panel or cover.
- Place a fuse (see specifications) sized to protect the motor.

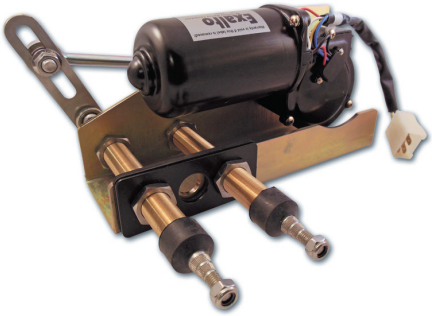
Safety requirements

Before the Exalto wiper is installed, we strongly recommend the following:

- Read the entire manual before installation.
- Make sure your working environment as well as the wiper parts are clean.
- Check to be sure no parts are missing or damaged.
- Use only high quality tools and have them within reach when installing.
- Handle the parts with care.
- Never install or maintain the wiper with the electrical voltage applied, unless this is specifically mentioned in the manual.
- Clear your tools after installation.

1. Introduction

With this user manual we want to guide you in the installation and use of the Exalto windscreen wiper. Please follow all instructions and install all safety provisions.



1.1 Introduction

Exalto windscreen wipers are especially designed to keep working even with the most extreme weather conditions at sea. All external parts are made of corrosion resistant materials. The spindle housings with the self-lubricating bearings are made of naval brass. The wiper is designed to be mounted through the bulkhead above or below the window. The wipe arc is stepless adjustable from 40° to 90°. By standard the model can be supplied for a bulkhead thickness of 35 mm and 65 mm. The matching Exalto HD1 (P10) pantograph arms have adjustable arms between 750 and 1000 mm in length. The motor has insulated earth return.

1.2 Environmental factors

Some materials used in the construction of the wiper motor maybe harmful to the environment (e.g. copper). These parts of the wiper may be re-used or recycled.
No harmful substances are released when using or disassembling the wiper.

1.3 Modified use and warranty conditions

All modifications or defects in the product are subject to the Orgalime General Conditions of Sale. Please contact your vendor in case of any questions or if you want to use Exalto wipers in a non-maritime environment or other applications.

2. Technical data

2.1 General

· Product	**Exalto windscreen wiper**
· Type	**255BS (Bulkhead fitting, stepless adjustable)**
· Catalogue numbers	**211255.35, 211255.65 (12 Volt)**
	212455.35, 212455.65 (24 Volt)

2.2 Electrical data 12 Volt

· Torque (max.)	**55 Nm**
· Voltage	**12 Volt**
· Current	**7 A**
· Power consumption (max.)	**85 W**
· Number of revolutions	**Low speed 38 rpm, high speed 60 rpm**
· Recommended cable	**5 wires, 1½ mm² (16 g) or 2½ mm² (14 g) up to 10 m long**
· Recommended fuse	**8 A slow blow**
· Grounding	**Insulated earth return**

Electrical data 24 Volt

· Torque (max.)	**55 Nm**
· Voltage	**24 Volt**
· Current	**4 A**
· Power consumption (max.)	**96 W**
· Number of revolutions	**Low speed 38 rpm, high speed 60 rpm**
· Recommended cable	**5 wires, 1½ mm² (16 g) or 2½ mm² (14 g) up to 10 m long**
· Recommended fuse	**6 A slow blow**
· Grounding	**Insulated earth return**

2.3 Mechanical data

· Dimensions	**L x w x h = 250 x 127 x 126 mm**
· Shaft diameters	**Drive shaft Ø 20/support shaft Ø 20 mm at 50 mm ctrs**
· Mounting	**Through bulkhead or glass (35 mm and 65 mm)**
· Bearing	**Bronze housing, self-lubricating**
· Wiper arms	**Model HD1 (P10) up to 1000 mm**
· Wiper blades	**Up to 1200 mm**
· Wipe arc	**Slotted lever 40°-90°, stepless adjustable**
· Weight	**Approx. 4,80 kg**

3. Installation

Before starting the installation read the chapter on safety. Check before installation that all parts are present and undamaged. In case of errors, contact your vendor.

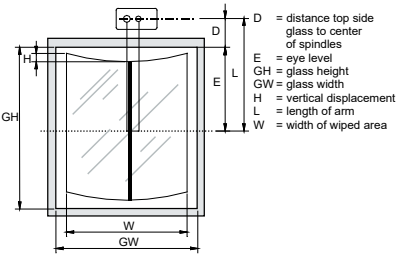
3.1 Preparation

The complete wiper, with packaging, can be handled and transported by hand. Leave the wiper in the packing, until you are ready to install it; this will reduce the risk of damage and loss of parts. Make sure all parts, tools and other means are ready.

3.2 Installation of mechanical parts

1. The wipe arc of your wiper is not pre-set unless specified in the order and manufacturing process. Please follow steps described in paragraphs 5.3 and 5.4 to set the wiping arc prior to installation.
2. Rough determination of wiping arc and wiper blade. With this method the wiping arc and the wiper blade length can roughly be determined. Please contact your vendor to calculate your configuration more accurately.
   - Determine length of pantograph arm (L):

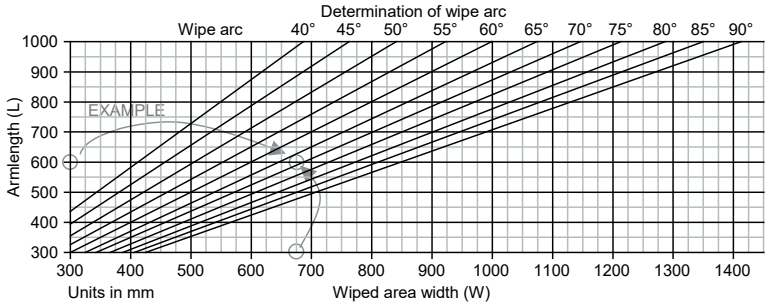
     L = E + D



- Get the maximum wiped area width (W):

  W = ±0.9 * GW

- Find the intersection of L en W in the diagram below;



- The wipe arc-line closest to the intersection, shows the wipe arc;
- Find in the table below the vertical displacement of the blade (H);

Determining the vertical displacement of the wiper blade

Armlength (L)		300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Wipe arc	40°	19	21	25	26	30	34	37	40	43	45	48	51	54	57	60
	45°	23	27	30	35	38	42	46	50	53	57	61	65	68	72	76
	50°	26	33	36	43	47	52	56	61	66	70	75	80	84	89	94
	55°	34	40	45	51	57	62	66	74	79	85	90	96	102	107	113
	60°	40	47	54	60	67	74	80	87	94	100	107	114	121	127	134
	65°	47	55	63	71	79	86	94	102	110	117	125	133	141	149	157
	70°	55	63	73	81	90	100	109	118	127	136	145	154	163	172	181
	75°	62	73	83	93	104	114	124	135	145	155	165	176	186	196	207
	80°	70	82	94	105	117	129	140	152	164	175	187	199	211	222	234
	85°	79	92	105	119	132	145	158	171	184	197	210	223	236	250	263
	90°	86	103	117	132	146	161	176	190	205	220	234	249	264	278	293

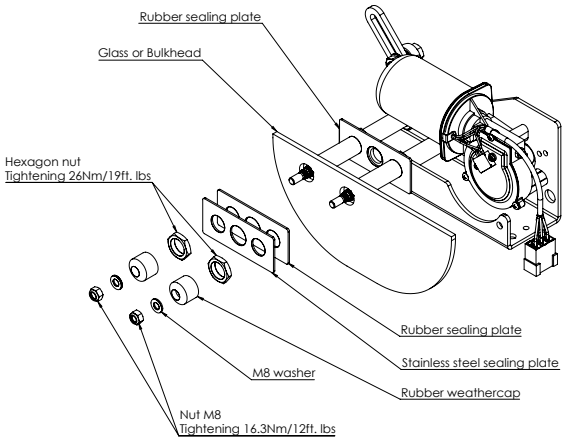
Units in mm — Vertical displacement of the blade (H)

Now the wiper blade length can be calculated: **Length of wiper blade = 0.9 * 2 * (E-H).**

3. Determine the place where the wiper is to be installed. The dimensions are shown below. The wiper can be installed in any position above or below the window.

Attention!
When installing the wiper, reserve space for a housing or cover.

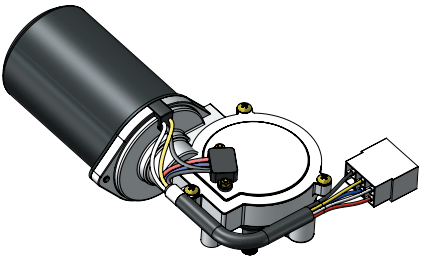
4. Place the windscreen wiper in the pre-drilled holes of the bulkhead (see figure). A rubber sealing gasket must be placed at both sides of the bulkhead. Hole sizes are 2x clearance on M20 at 60 mm centers.



Attention!
Do not fit the wiper arm before finishing the electrical connections.

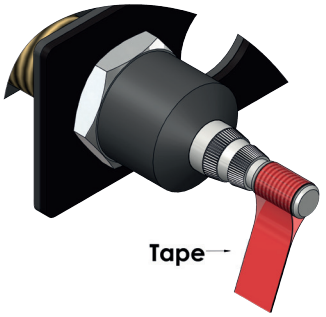
3.3 Electrical installation

1. Install the wiper switch in the dashboard.
2. Connect the wiper to the ship's electrical system. Use a cable with 5 wires with a diameter of at least 1½ mm² (16 g) up to a maximum length of 10 m. Use larger diameters when using longer cable lengths.
3. Fit a slow blow fuse of 8 A (12 Volt) or 6 A (24 Volt) in the main cable (positive).
4. Connect the switch to the wiper (refer to the switch manual for installation).



3.4 Final installation

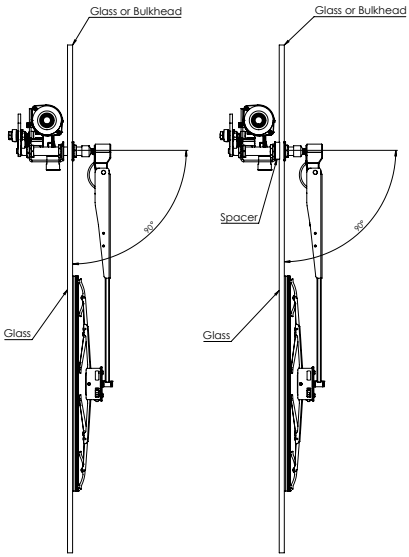
1. Switch on the power and test the motor briefly. Wait until the motor stops after turning off the switch. The motor will be in park position. The standard park position is shown in the figure under point 5.3.2.



Hint!
If you have doubts regarding the park position, make a vane with tape to simulate the position of the arms.

Attention!
This wiper model 255 is suitable for wiper arms model HD1 (P10) up to 1000 mm and wiper blades up to 1200 mm.

2. Place the wiper arm and blade assembly on the shafts. Fasten the nuts loosely onto the shafts.



Attention!
To ensure the arm has the right spring pressure, install the wiper arm in such a way that the shaft makes a 90° angle with the window (figure left) and that the shaft makes a 90° angle with the wiper arm (figure right). If this is not the case, please install spacer(s) to make the 90° angles.

3. Switch on the power and test the motor briefly again to check the wiped area.
4. When the wipe arc is correct, adjust the position and the length of the arm if necessary. Tighten the nuts to the correct torque (33Nm/25ft.lbs).

4. Operation & Use

4.1 Preparation for first use

When the wiper has been installed and adjusted, the system can be prepared for first use. We recommend a thorough inspection of the system to ensure proper operation.

Check:

- there are no leaks where the shafts go through the bulkhead;
- the wiping arc cleans the entire window;
- the park position is correct.

If the wiping arc or the park position is wrong, adjust them again. Follow the procedure in paragraph 5.3.

4.2 Normal operation

All Exalto windscreen wipers are provided with the following functions:

- low speed;
- high speed;
- self parking.

Do not use the wiper on a dry window; excessive wear of the blades and the motor will occur in this case. Because of the wide variety of wiper switches, refer to the user manual for the installed switch to learn about the functions of that specific switch. In the back of this manual you will find some general controls and its wiring instructions.

5. Maintenance

5.1 General maintenance

To keep the Exalto wiper in good condition, you are advised to:

- clean wiper arms and blades with fresh water after every journey in salt water (to prevent salt from clogging moving parts);
- never use the wiper on a dry window.

5.2 Servicing

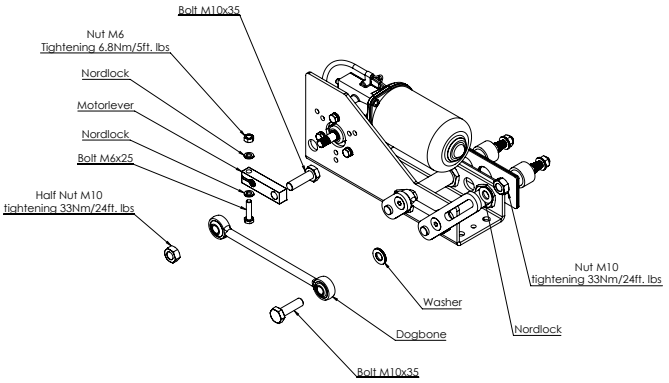
As long as the wiper system functions normally and is kept in good shape (see paragraph 5.1), servicing the motor is not necessary. Check yearly (monthly when used intensively) if the wiper blades are worn. Replace blades when worn or when the blades leave many stripes across the glass. In case of failure or adjustments, have servicing done solely by qualified mechanics. In chapter 6, Troubleshooting, a list is given of possible problems and their solutions.

5.3 Changing the wiping arc and park position

If the wiped area is not optimal, the wipe arc and park position can be changed. Always disconnect the electric before opening the housing.

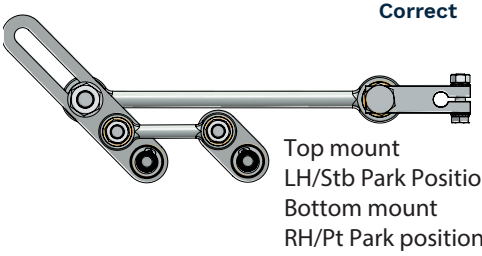
5.3.1 Adjusting the wipe arc

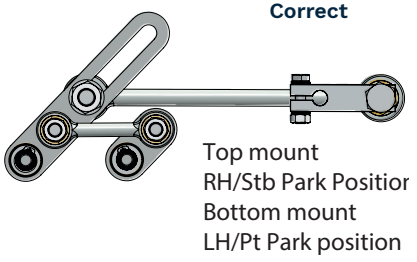
1. Remove the wiper arms from the shafts;
2. Move the screw in the slot from the shaft lever away from the shaft for a smaller and towards the shaft for a larger wipe arc;
3. Fasten the nut again (33Nm/25 ft.lbs);
4. Place the motor lever in the desired park position (see paragraph 5.3.2).

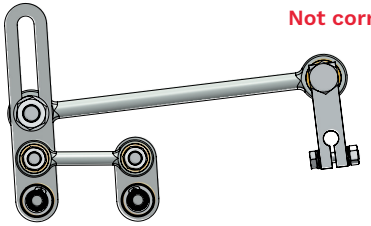


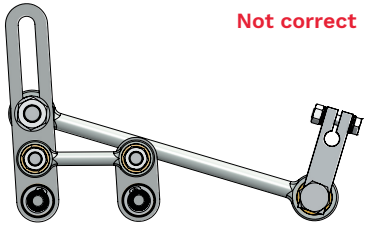
5.3.2 Adjusting the park position

1. Place the motor lever loose on the shaft, parking right or left (see drawing in paragraph 3.4 and below for reference);
2. Place the motor lever in such a way that it forms an almost straight line with the connection lever (see drawing);
3. Tighten the motor lever well and place the wiper in the bulkhead;
4. Run the motor briefly to check performance;
5. Install the wiper arm in correct parking position.



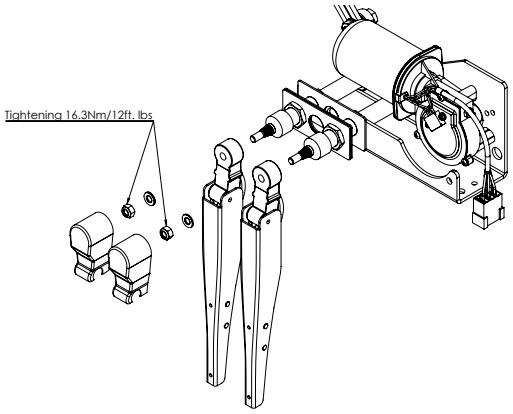






5.4 Disassembly and assembly

Prevent injuries when disassembling by disconnecting the wiper from the power supply. Keep all necessary tools within reach and remember the chapter on safety. Provide protective packaging, if you're going to store or transport the wiper assembly.



5.4.1 Removing the wiper assembly from the bulkhead

1. Disconnect all the electric connections to the wiper;
2. Remove the wiper arms;
3. Remove the nuts (see 7.1,) and plates on the outside;
4. Remove the wiper from the holes in the bulkhead or glass;
5. If you want to replace the wiper, follow chapter 3.

5.4.2 Disassembling the drive crank lever

1. Disconnect all the electric connections to the wiper;
2. Remove the wiper from the bulkhead (see 5.4.1);
3. Unscrew the nut (see 7.1) and bolt on the shaft and remove the lever;
4. For adjusting the wipe arc, follow section 5.3.

5.4.3 Removing the motor from the wiper assembly

1. Disconnect all the electric connections to the wiper;
2. Remove the wiper arm (see 5.4.1);
3. Disassemble the drive crank lever from the motor;
4. Unscrew the three bolts of the motor (see 7.1) and remove the motor;
5. When replacing, bolt the motor on the housing and follow section 5.3 to install the drive crank lever and set to the correct park position.

6. Troubleshooting

In this chapter, several malfunctions are mentioned combined with possible causes and solutions. Please leave servicing to qualified mechanics.

6.1 Wiper does not work after switching on

• Possible causes:

1. Wiper switch is not working properly.
   Solution: *Test and replace it. Check if the current is (and keeps being) too high.*
2. Burned or incorrectly sized fuse.
   Solution: *Test and replace it. Check if the current is (and keeps being) too high.*
3. Electrical connections are wired incorrectly or might be damaged.

Solution: *Measure the voltage across the motor and check all connections are correct.*

4. The wiper motor has failed.
   Solution: *Replace the motor and check for excessive drag or high current.*

6.2 Wiped area or park position is not correct

• Possible causes:

1. The wiper arm was placed without parking the motor first.
   Solution: *Remove the wiper arm. Run the motor to the park position and re-install the arm.*
2. The wipe arc is set wrong or has changed due to high loads (e.g. spring pressure of arms too high, excessive drag).
   Solution: *Determine the wiping arc if needed (see paragraph 5.4) and set the wiping arc again (see paragraph 5.3).*
3. The wires are connected incorrectly.
   Solution: *Check and reconnect the wiring (see the scheme in paragraph 3.3).*

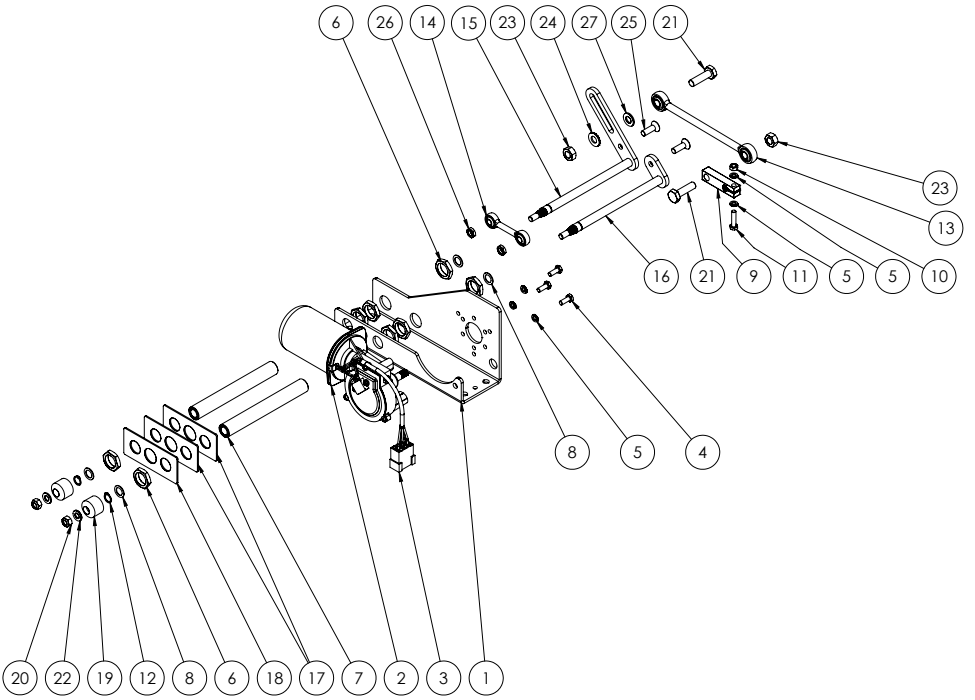
6.3 Motor runs, but the wiper arm does not move

• Possible causes:

1. Mechanical joints are loose.
   Solution: *Replace worn parts or tighten as required.*
2. Parts are broken.
   Solution: *Replace broken parts, re-adjust as required.*
3. Splines of shafts are worn
   Solution: *Replace all loose, broken or worn parts and adjust as required.*

7. Drawings & Schematics

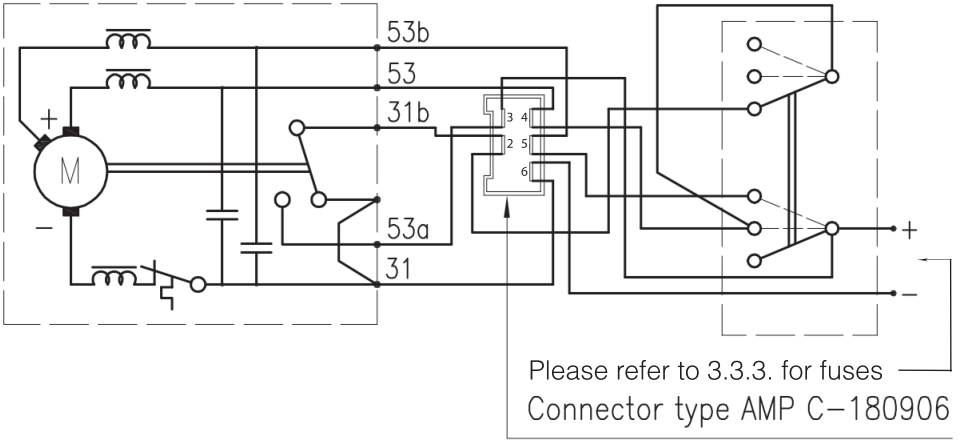
7.1 Assembly overview



7.2 Parts list

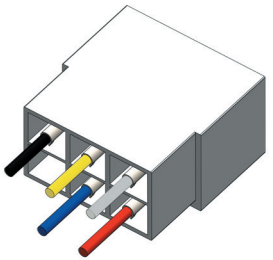
Pos	QTY.	Description EN	Part nr/Note
1	1	Wiper housing for 255BS	2197.035
2	1	Exalto Motor 12V 55Nm RHD	2100.1255RHD-A
	1	Exalto Motor 24V 55Nm RHD	2100.2455RHD_A
3	1	Plug for 223BD/223BS	2178.003 - C180906
4	3	Hexagon head bolt s.s. M6x16 (A4)	0933A406016
5	5	Lock washer M6	2100.413
6	8	Nut M20x1	2100.350
7	2	Bearing house 255BS bh = 35mm	2197.157
	1	Bearing house 255BS bh = 65mm	2197.187
8	4	Plain washer s.s. M12x1,0	2100.400
9	1	Drive crank L=36,3mm for 255BS	2197.081_B
10	1	Nut s.s. M6 A4 din934	0934A406
11	1	Hexagon bolt, Din933-A4-M6x25	0933A406025
12	2	circlip 12mm	0471A2012
13	1	Connecting rod Ø10 L=175	2100.939
14	1	Connecting rod Ø8 L=60mm	2100.940
15	1	Spindle with lever and pin bh = 35mm	2197.103_A
	1	Spindle with lever and pin bh = 65mm	2197.104_A
16	1	Support shaft with leven and pin bh = 65mm	2197.106_A
	1	Support shaft with leven and pin bh = 65mm	2197.107_A
17	2	Rubber sealing plate	2100.492
18	1	SS sealing plate	2100.482
19	2	Weathercap M20	2100.361
20	2	Self-locking nut M8	0985A408
21	2	Hexagon bolt, Din933-A4-M10x35	0933A410035
22	2	Ring-DIN125A-A4-M8	0125A408
23	2	Nut s.s. M10 A4 din934	0934A410
24	1	Lock ring M10x21mm	2100.412L
25	2	Countersunk screw DIN799-A4-M8x25	7991A408025
26	2	Nut M8 flat	0439A408
27	1	Ring-DIN125A-A4-M10	0125A410

7.3 Motor Wiring Schematic - Connection data



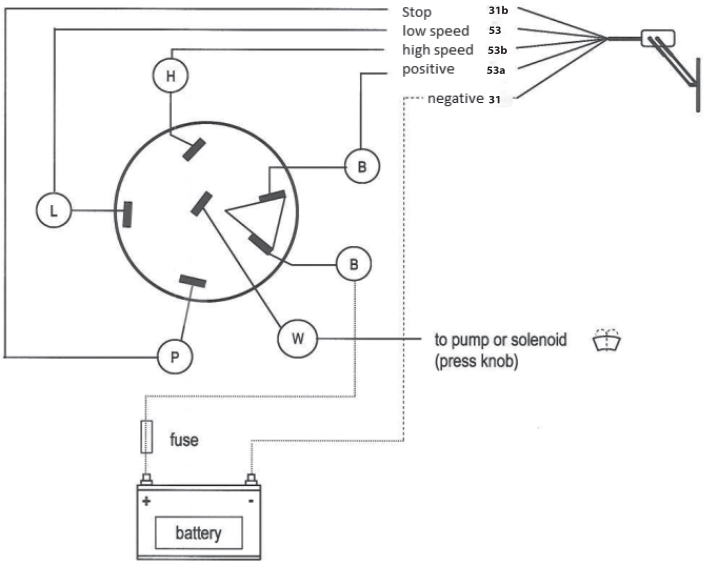
7.4 Wiring diagrams for switches and control systems

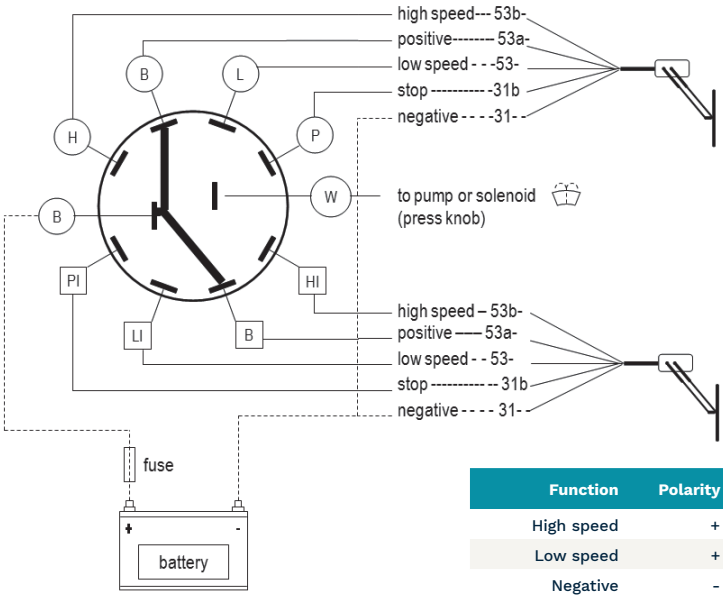
Exalto wiper motors can be connected through a wide variety of simple switches to complex controllers. Below you will find some connection wiring diagram examples of Exalto switches and controllers. Please refer for detailed instructions to the specific switch or controller manual.



Function	Polarity	Switch code	Cable
High speed	+	H	White
Low speed	+	L	Yellow
Negative	-		Black
Stop - self park		P	Blue
Positive	+	B	Red

Switch 2134 & 2135:

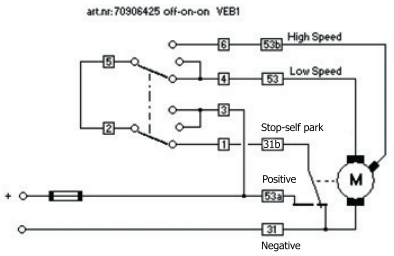


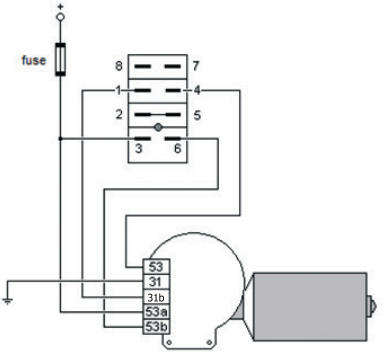


Function	Polarity	Switch code	Cable
High speed	+	H	White
Low speed	+	L	Yellow
Negative	-		Black
Stop - self park		P	Blue
Positive	+	B	Red

Carling switching VEB1:

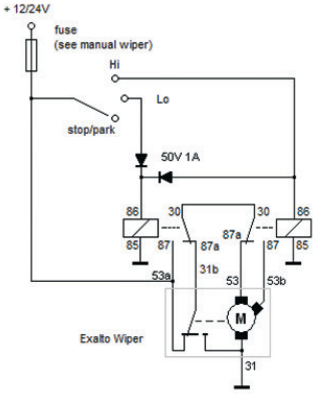
(Exalto number 70906425.SET) as per following details which is wiper switch specific.

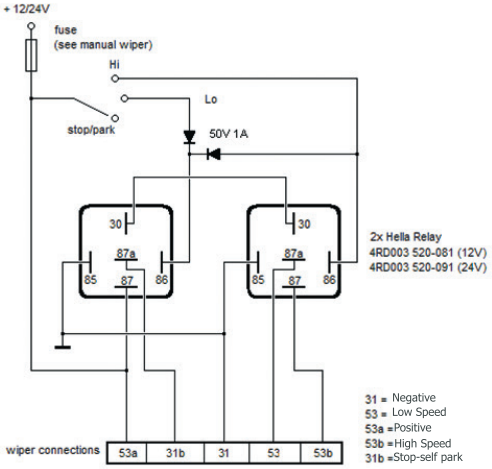




Function	Polarity	Switch code	Cable
High speed	+	H	White
Low speed	+	L	Yellow
Negative	-		Black
Stop - self park		P	Blue
Positive	+	B	Red

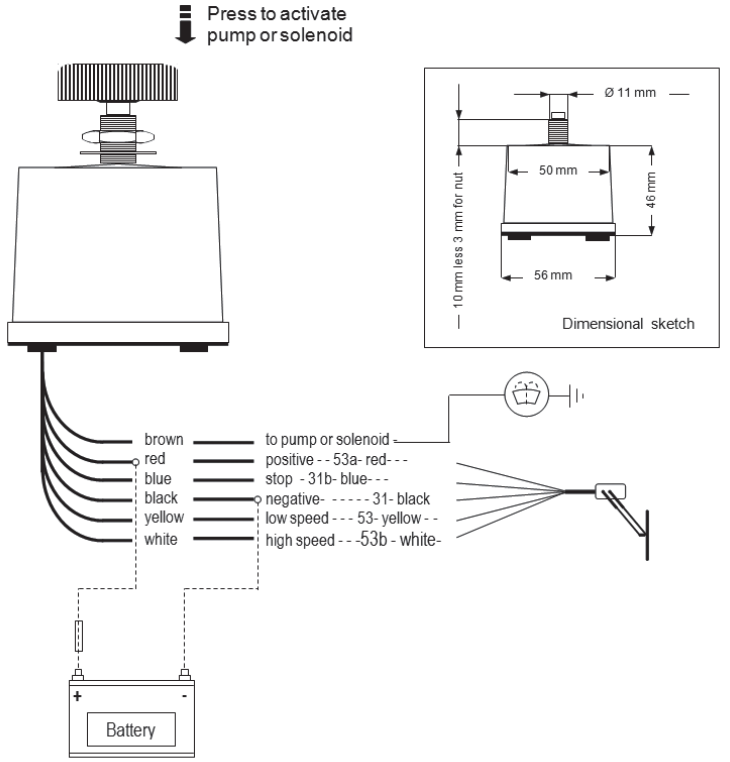
For a standard 3 stage switch of Carling or alternative this scheme below has to be used. This scheme can also be used for the case of digital switching modules with only simple output channels.





Function	Polarity	Switch code	Cable
High speed	+	H	White
Low speed	+	L	Yellow
Negative	-		Black
Stop - self park		P	Blue
Positive	+	B	Red

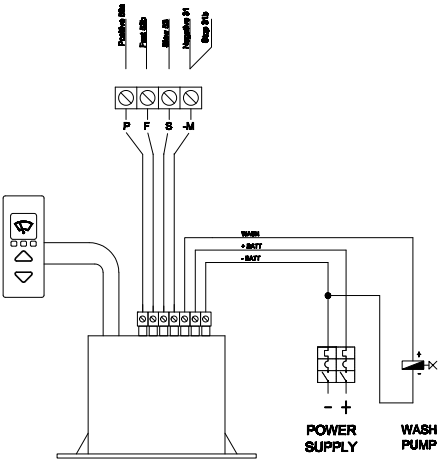
Switch 2158 & 2159:



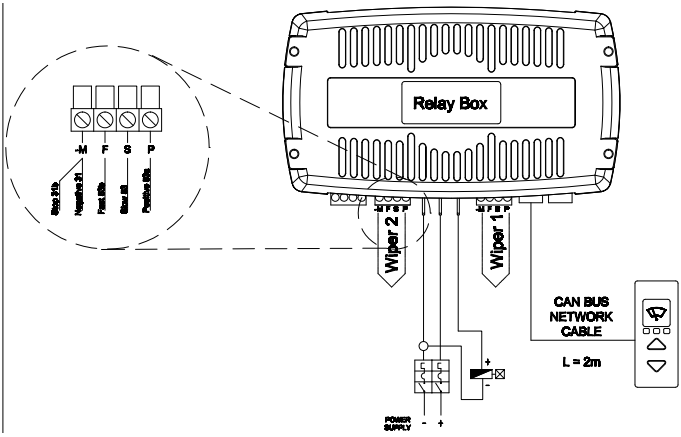
Please refer to the instruction manuals as supplied with the units for motor wiring.

Function	Polarity	Switch code	Cable
High speed	+	H	White
Low speed	+	L	Yellow
Negative	-		Black
Stop - self park		P	Blue
Positive	+	B	Red

Switch 210341-P:

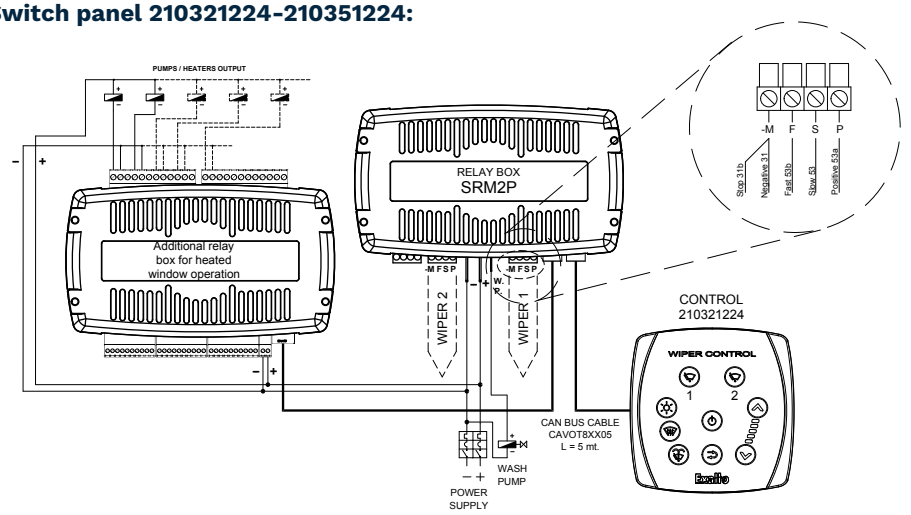


Switch 210342-P:



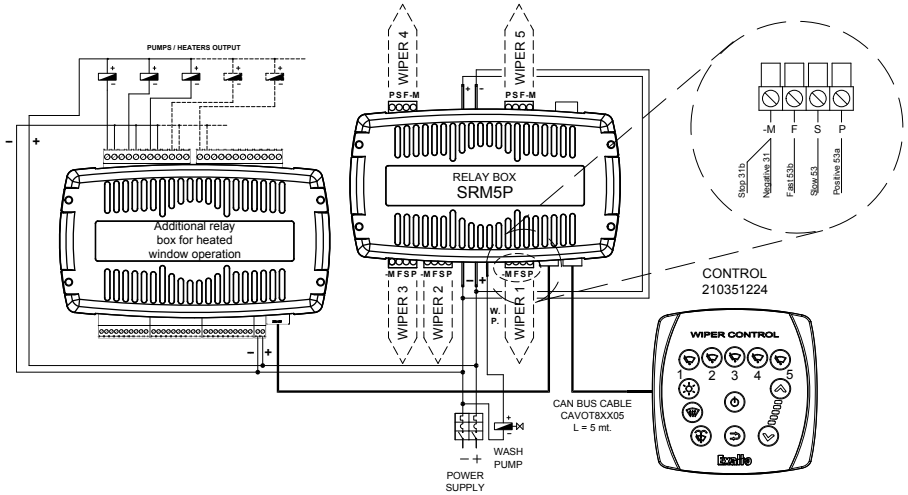
Function	Polarity	Switch code	Cable
High speed	+	H	White
Low speed	+	L	Yellow
Negative	-		Black
Stop - self park		P	Blue
Positive	+	B	Red

Switch panel 210321224-210351224:



Additional relay box for pumps/heaters is not supplied in standard equipment.

Function	Polarity	Switch code	Cable
High speed	+	H	White
Low speed	+	L	Yellow
Negative	-		Black
Stop - self park		P	Blue
Positive	+	B	Red



Function	Polarity	Switch code	Cable
High speed	+	H	White
Low speed	+	L	Yellow
Negative	-		Black
Stop - self park		P	Blue
Positive	+	B	Red

CLEARLY THE BEST

Hereby declares that Exalto windscreen wiper type 255BS complies to the following harmonised standards:

Pleasure yachts electric systems
- NEN-EN-ISO 10133:2017 Extra-low voltage D.C. installations (regarding color codes)

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