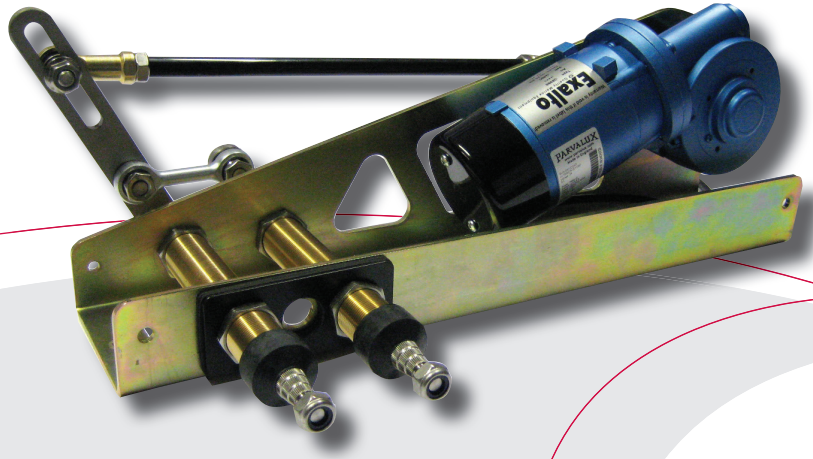
Exalto

Parts • **Wipers** • Bearings • Propulsion

User manual for
Exalto windshield wiper
Type 280 BS 24 Volt



Cat. no. 2178.30 (24 Volt)

version 6 - 2013

Safety

Although Exalto windshield wipers are easy to install, a fair amount of technical knowledge (mechanical and electrical) is required of the technician. Consult the manual or your vendor in case of doubt on installation or functioning.

Safety symbols

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

Dangers

The installation and use of Exalto wipers doesn't inflict any personal dangers or damage, provided that installation is done according to the requirements.

- 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 isolate the electrical circuit when performing maintenance. Prevent the installation from being started (accidentally) by others.

Safety provisions

Safety provisions protect the user against contact with moving, electrical or hot parts. Some of them must be provided by the installer. There are several safety provisions:

- ! Cover or panel (compelled): covers moving parts and electrical connections. The installer MUST provide a selfmade 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) in the main cable.

Safety requirements

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

- Read the entire manual before installation.
- Keep your working environment as well as the wiper parts clean.
- Check to be sure no parts are missing or damaged.
- Use only well maintained 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.

Use of the manual

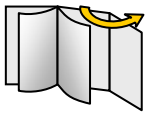
Read the entire manual before installation. In this manual you can find the following expressions and symbols:

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

Attention!
Alerts you to possible problems and safety warnings.

Careful!
Warns if the product can be damaged when working carelessly.

Warning!
You can hurt yourself or damage the product severly.



At back of manual
Look at the back of the manual for a drawing.

Contents

1 Introduction 4
1.1 Introduction 4
1.2 Environmental factors 4
1.3 Modified use and guarantee 4

2 Technical 5
2.1 General 5
2.2 Electrical data 24 Volt 5
2.3 Mechanical data 5

3 Installation 6
3.1 Preparation 6
3.2 Installation of mechanical parts 6
3.3 Electrical install 8
3.4 Final installation 8

4 Operation and use 10
4.1 Preparation for first use 10
4.2 Use 10

5 Maintenance 11
5.1 General maintenance 11
5.2 Servicing 11
5.3 Changing the wipe arc and park position 11
5.4 Rough determination of wipe arc and wiper blade 12
5.5 Disassembly and assembly 13

6 Troubleshooting 14

7 Declaration of conformity 15

8 Parts list 16

9 Drawings and schemes 17
9.1 Assembly overview 17
9.2 Internal wiring diagram 18

1 Introduction

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

1.1 Introduction

The Exalto windshield 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 housing of the self-lubricating bearings is made of bronze. All arms and blades have a black, weather-resistant coating, to prevent reflection.

Wiper type 280 BS is designed to be mounted in the bulkhead. The wiper arc is steplessly adjustable from 40° to 90°. By standard the 280 BS can be supplied for a bulkhead thickness of 25 mm. The pantograph arms are adjustable in length, to set the wipe area accurately. The motor of the 280 BS has IER (Insulated Earth Return).

1.2 Environmental factors

In the wiper, materials are used that are harmful for the environment (e.g. copper). At disposal of the wiper, parts can be re-used or recycled well. No harmful materials can get off when using or disassembling the wiper.

1.3 Modified use and guarantee conditions

All modifications or defects in the product are subject to the Orgalime General Conditions of Sale. Contact your vendor if you want to use Exalto wipers for a non-maritime environment or for another application, or in case of any doubt.

2 Technical data

2.1 General

- Product ..... Exalto windshield wiper
- Types ..... 280 BS – 24 Volt
- Catalogue numbers 24V 2178.30

2.2 Electrical data 24 Volt

- Torque (max.) ..... 80 Nm
- Voltage ..... 24 Volt
- Current ..... 3,2 A
- Power consumption (max.) ..... 77 W
- Number of revolutions ..... Low 30 rpm, high 45 rpm
- Recommended cable ..... 5 wires, 1½ (16 g) or 2½ mm^2 (14 g) ..... up to 10 m long
- Recommended fuse ..... 10 A slow blow
- Grounding ..... Insulated earth return

2.3 Mechanical data

- Dimensions ..... l x w x h = 547 x 160 x 180 mm
- Bearing diameters ..... Drive shaft Ø27 /support shaft Ø27 mm
- Mounting ..... In bulkhead (25 mm)
- Bearing ..... Bronze housing, self-lubricating
- Wiperarms ..... Model P12 up to 1500 mm
- Wiperblades ..... Up to 1200 mm
- Wipe arc ..... Slotted lever 40°-90° steplessly ..... adjustable
- Weight ..... approx. 9,7 kg

3 Installation

Read the chapter on safety. Check before installation if the parts are all present and undamaged. In case of errors, contact your vendor.

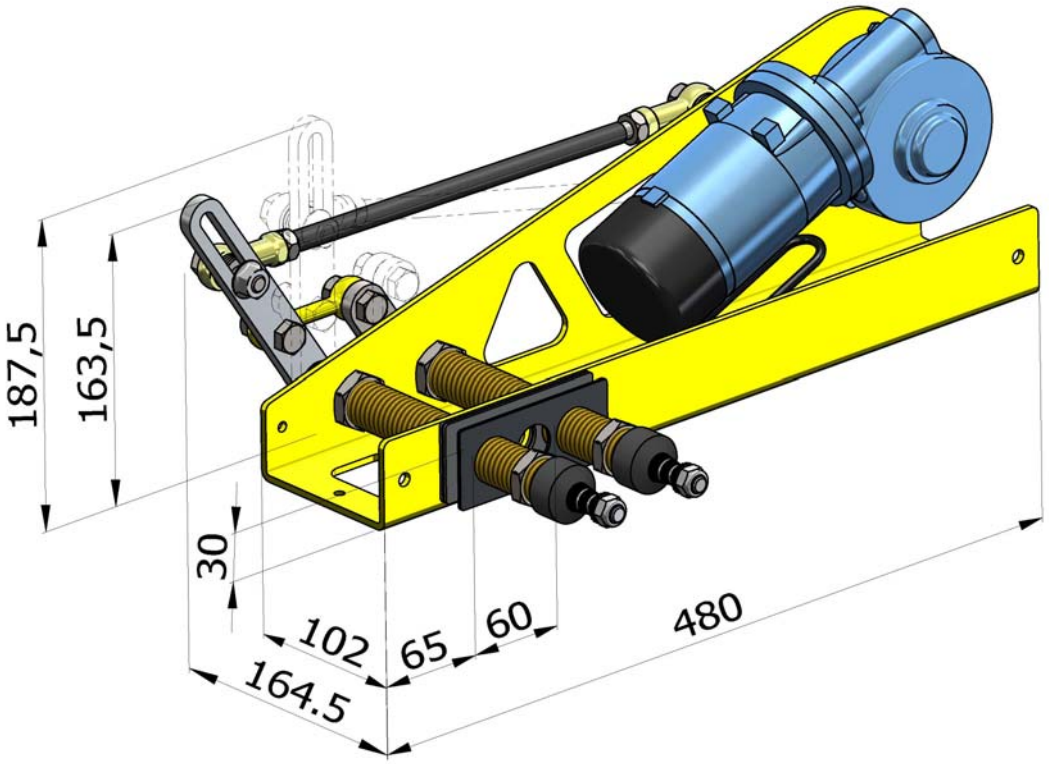
3.1 Preparation

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

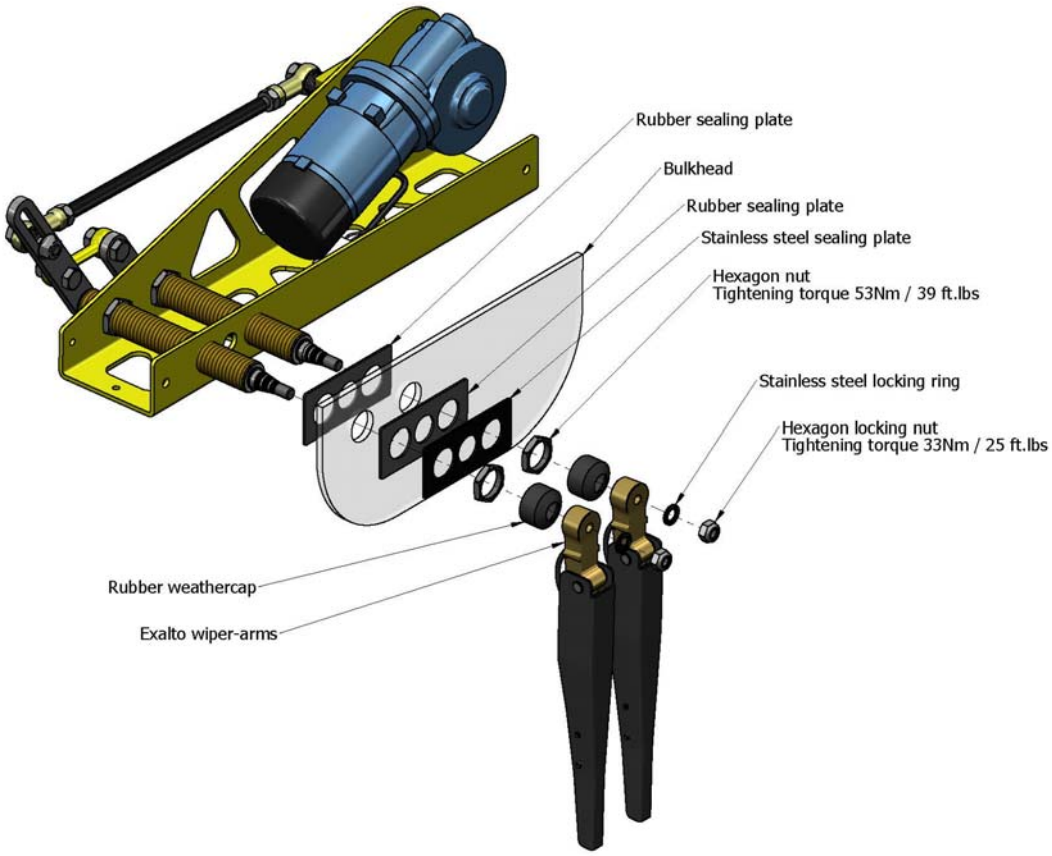
3.2 Installation of mechanical parts

1. If your wiper is supplied with the wipe arc lever and motor lever uninstalled, please follow steps 5.3 and 5.4 to set the wiping arc prior to installation.

   Determine the position where the wiper is to be installed. The dimensions are shown below. The wiper can be installed in any position.



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

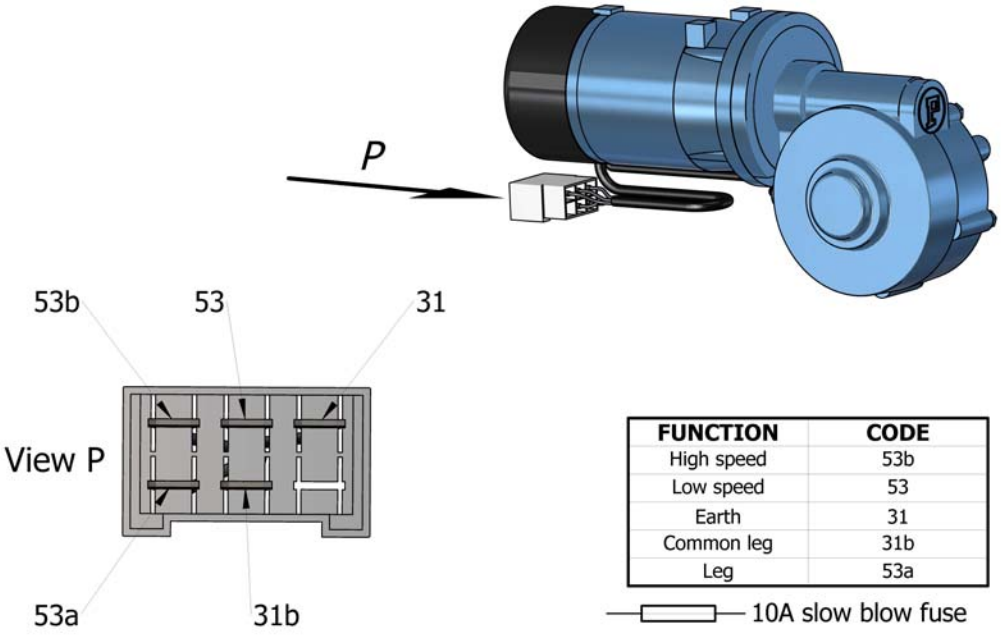


2. Place the windshield wiper in the pre-drilled holes of the bulkhead (see figure). A nitrile plate must be placed at both sides of the bulkhead.

3. Make the electrical connection before fitting the wiper arm.

3.3 Electrical installation

4. Install a wiper switch in the dashboard.



FUNCTION	CODE
High speed	53b
Low speed	53
Earth	31
Common leg	31b
Leg	53a

10A slow blow fuse

Wiring diagram 280 BS 24 Volt

5. Connect the wiper to the ship's electrical installation; see the schemes above. Use a cable consisting of 5 wires with cross-sections of at least 1½ mm^2 (16 g) up to a maximum of 10 m. Use larger cross-sections when using longer cables.

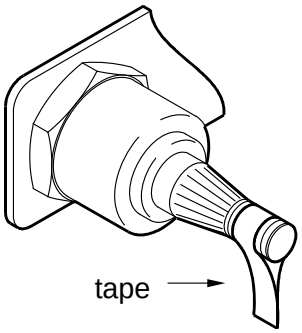
6. Place a slow blow fuse of 10 A (24 Volt) in the main cable.

7. Connect the switch to the wiper (refer to that specific manual for installation).

3.4 Final installation

8. Testrun the motor briefly. Wait until the motor stops after turning the switch off. If the wiper is well installed, the motor will be in park position. The standard park position is shown in the figure on page 12.

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



Attention!
The 280 BS is suitable for wiper arms model P12 up to 1500 mm and matching blades up to 1200 mm.

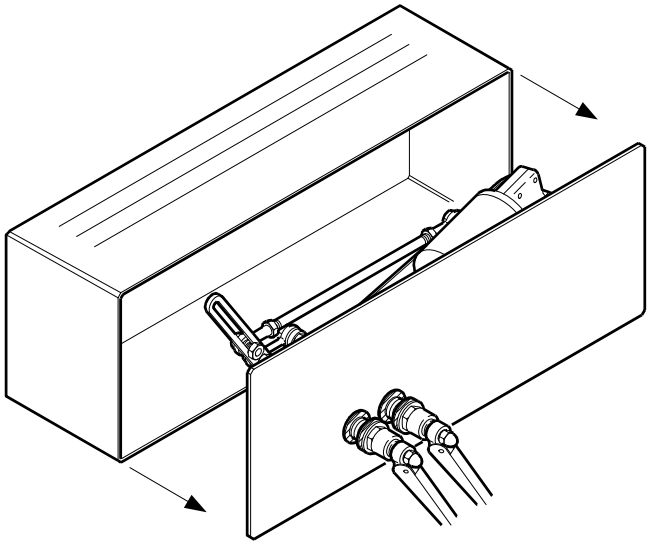
9. Place the wiper arms with the blade on the shafts. Fasten the nuts onto the shafts, but not too tight yet.

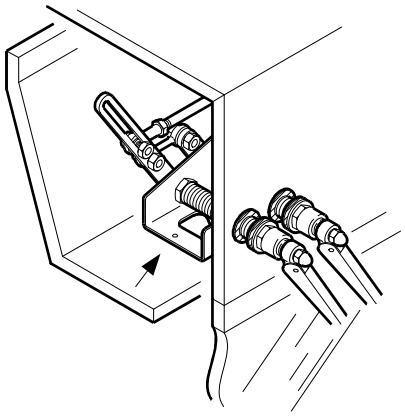
10. Testrun the motor again to check the wiped area.

11. If the wipe arc is correct, adjust the position and the length of the arm if necessary. Tighten the nuts properly now.

! 12. To complete the installation, the wiper must be enclosed by means of a panel or cover. Provide the wiper with sufficient ventilation.

Place a protection cover or panel.
Provide sufficient ventilation.





4 Operation and use

4.1 Preparation for first use

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

Check:
… if there are no leaks where the bearings go through the window;
… if the set wipe arc cleans the entire window;
… if the park position is correct.

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

4.2 Use

All Exalto windshield wipers are provided with the following functions:

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

Don't run the wiper on a dry window; excessive wear of the blades and the motor can occur. Clean the wiper frequently (see also paragraph 5.1).

Because of the big variety of wiper switches, refer to the user manual of the chosen switch to learn about the functions of that specific switch.

5 Maintenance

5.1 General maintenance

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

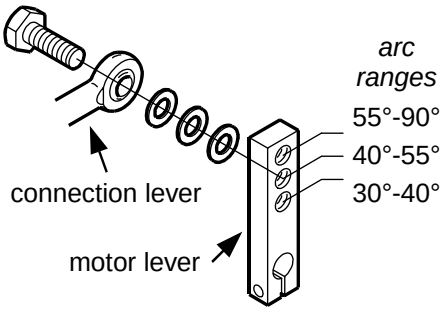
- clean wiper, arms and blades with fresh water after every journey in salt water (to prevent salt from clogging moving parts);
- prevent running the wiper on a dry window.

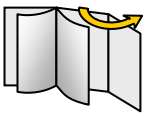
5.2 Servicing

As long as the wiper system functions normally and is kept in good shape (see section 5.1), servicing the drive 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 listing is given of possible troubles.

5.3 Changing the wipe arc and park position

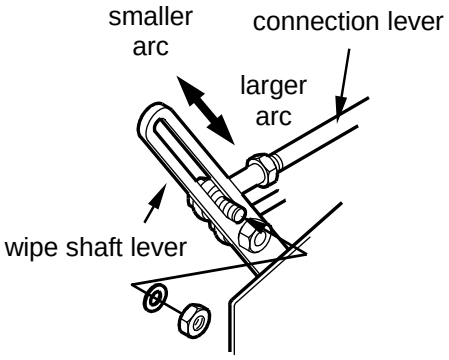
If the wiped area is not optimal, the wipe arc and park position can be changed. Always isolate the electrical circuit before opening the housing.





Adjusting the wipe arc

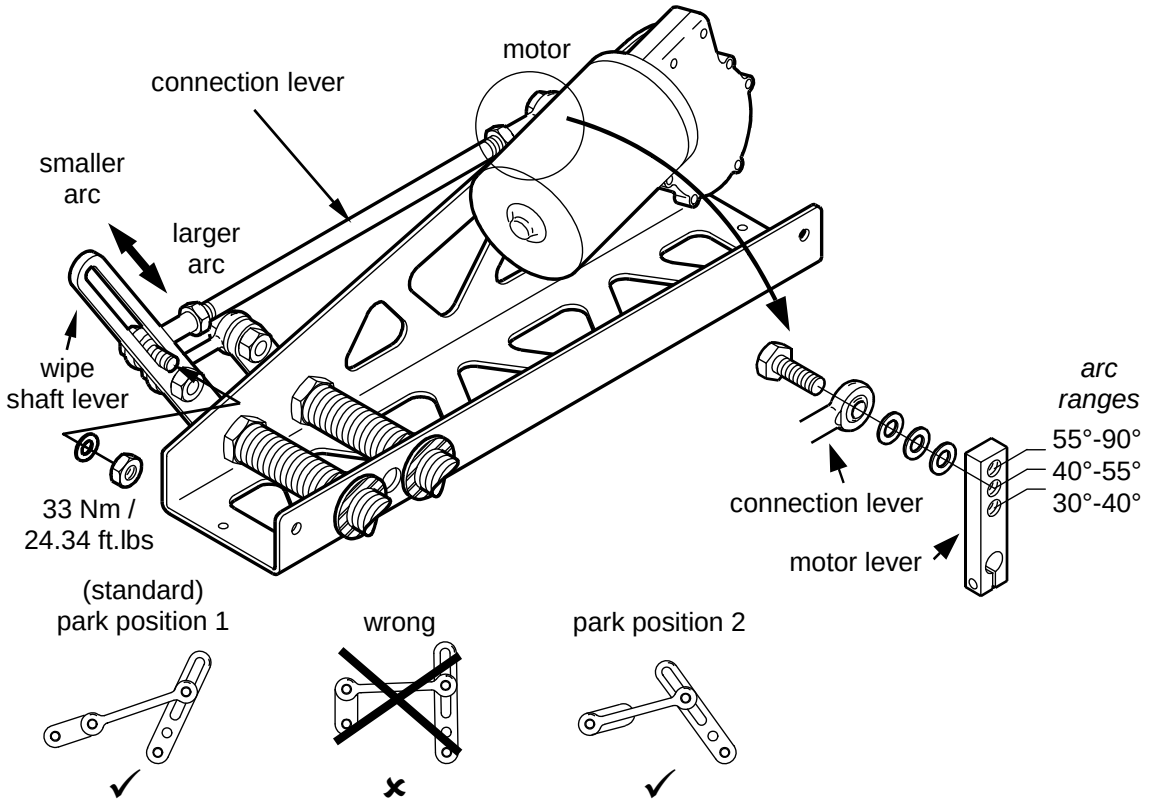
- Isolate the electrical circuit;
- move the screw of the *motor lever* to the correct wipe arc range (see the upper figure);
- move the screw in the slot from the *wipe shaft lever* away from the shaft for a smaller and towards the shaft for a larger wipe arc;
- fasten the nut again (max. 33 Nm / 24.34 ft.lbs);
- run the motor briefly to park it;
- place the motor lever in the desired park position (see the text below).



Adjusting the park position

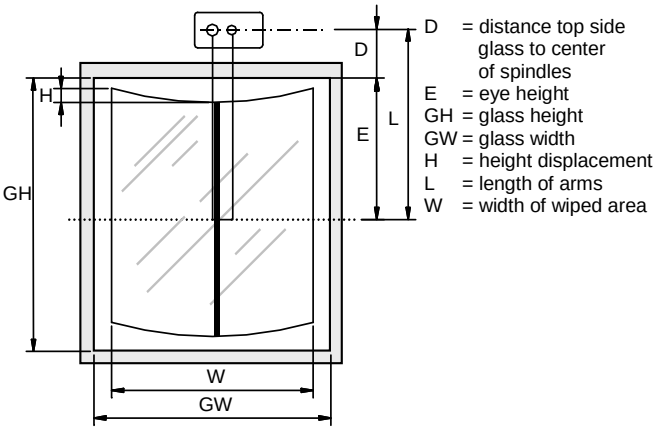
- Place the motor lever loose on the shaft, parking right or left (see the drawing in paragraph 3.4 and the picture on page 12 for reference);
- place the motor lever in such a way that it forms an almost straight line with the connection lever (see the drawing on page 12);
- tighten the motor lever well now;

- place the wiper in the bulkhead;
- adjust the wiper arm to the correct length, if necessary.

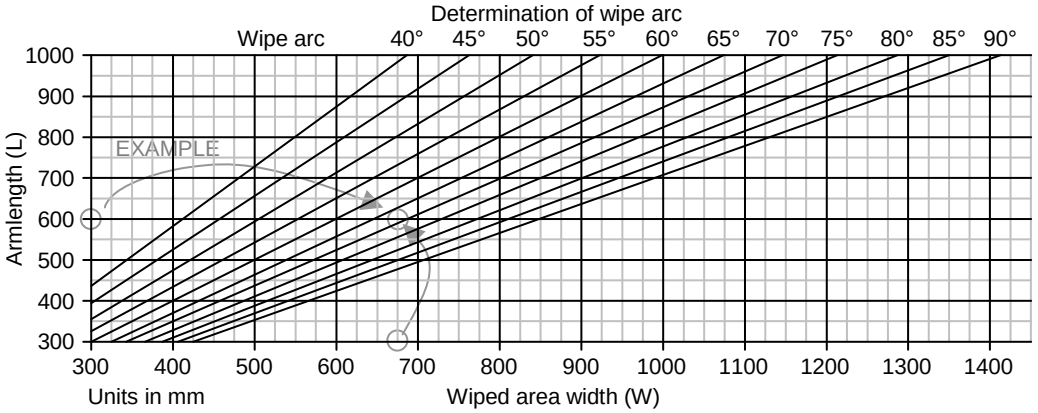


5.4 Rough determination of wipe arc and wiper blade

With this method the wipe arc and the wiper blade can be determined roughly. Contact your vendor to determine your configuration more accurately.



- Determine length of panto-graph 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

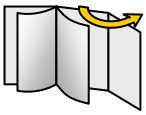
Armlength (L)		300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Wipe arc	40°	19	21	25	26	30	34	37	40	43	45	48	51	54	57	60
	45°	23	27	30	35	38	42	46	50	53	57	61	65	68	72	76
	50°	26	33	36	43	47	52	56	61	66	70	75	80	84	89	94
	55°	34	40	45	51	57	62	66	74	79	85	90	96	102	107	113
	60°	40	47	54	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 can be calculated:
  Length of wiper blade = 0.9 * 2 * (E - H)

5.5 Disassembly and assembly

Prevent injuries when disassembling: isolate the wiper from the electrical installation. Keep all necessary tools within reach and remember the chapter on safety. Provide a protecting packaging, if you're going to stock or transport the wiper.



5.5.1 Removing the wiper assembly from the bulkhead

1. Isolate the electric circuit and disconnect the wires.
2. Remove the wiper arms.
3. Remove the nuts and rings on the outside.
4. Remove the wiper out of the holes in the bulkhead.
5. For replacing the wiper, follow chapter 3.

5.5.2 Removing the motor from the wiper assembly

1. Isolate the electrical circuit, disconnect the wires and remove the wiper.
2. Disassemble the motor lever (see 5.5.2).
3. Unscrew the motor and remove it.
4. When replacing, screw the motor on the housing. Follow section 5.3 to install the motor lever in the right park position.

6 Troubleshooting

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

6.1 Wiper doesn't run after switching on

- Possible causes:
  1. Wiper switch has failed.
  2. Burned or incorrectly sized fuse.
  3. Electrical connections are miswired or damaged.
  4. Motor failed.
- Solutions:
  1. Test and replace it. Check if the current is (and keeps being) too high.
  2. (See solution 1).
  3. Test for a charge on the motor and check all connections.
  4. Replace the motor and check for drag or a current that is too high.

6.2 Wiped area or park park position wrong

- Possible causes:
  1. The wiper arms were placed without parking the motor first.
  2. The wipe arc is set wrong or changed due to high loads (e.g. spring tension arms to high, drag).
  3. The wires are connected wrong.
- Solutions:
  1. Remove the wiper arms. Run the motor shortly to park it and re-install the arms according to chapter 3.
  2. Determine the wipe arc if needed (see section 5.4) and set the wipe arc again (see chapter 5.3).
  3. Check and reconnect the wiring (see the scheme in section 3.3).

6.3 Motor runs, but arms don't move

- Possible causes:
  1. Mechanical joints are loose.
  2. Parts are broken.
  3. Grooves of shafts are worn.
- Solutions:
  1. Check if the arms are well fastened. If not, open the housing (follow chapter 5) and check all joints and parts to see if they are loose, broken or worn.

7 Declaration of conformity

MANUFACTURER'S DECLARATION
according to Appendix II sub B of Directive 89/392/EEG (Machines)

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The Netherlands
☎ +31 (0)184-61.58.00
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hereby declares that

Exalto windshield wiper type 280 BS

… is intended to be built into another machine or as a component, or is to be integrated with other machines to a machine where Directive 89/392/EEG applies to;

… **does not** fully comply to the requirements of mentioned Directive;

… complies to the following harmonised standards:

Pleasure yachts

- NEN-EN-ISO 10133 Extra-low voltage D.C. installations (1997) (regarding color codes)

…and declares that the sub-assembly in question shall not be set into operation until the complete machine, into which the sub-assembly is fitted, shall be complete and conforms to all aspects of Directive 89/392/EEG.

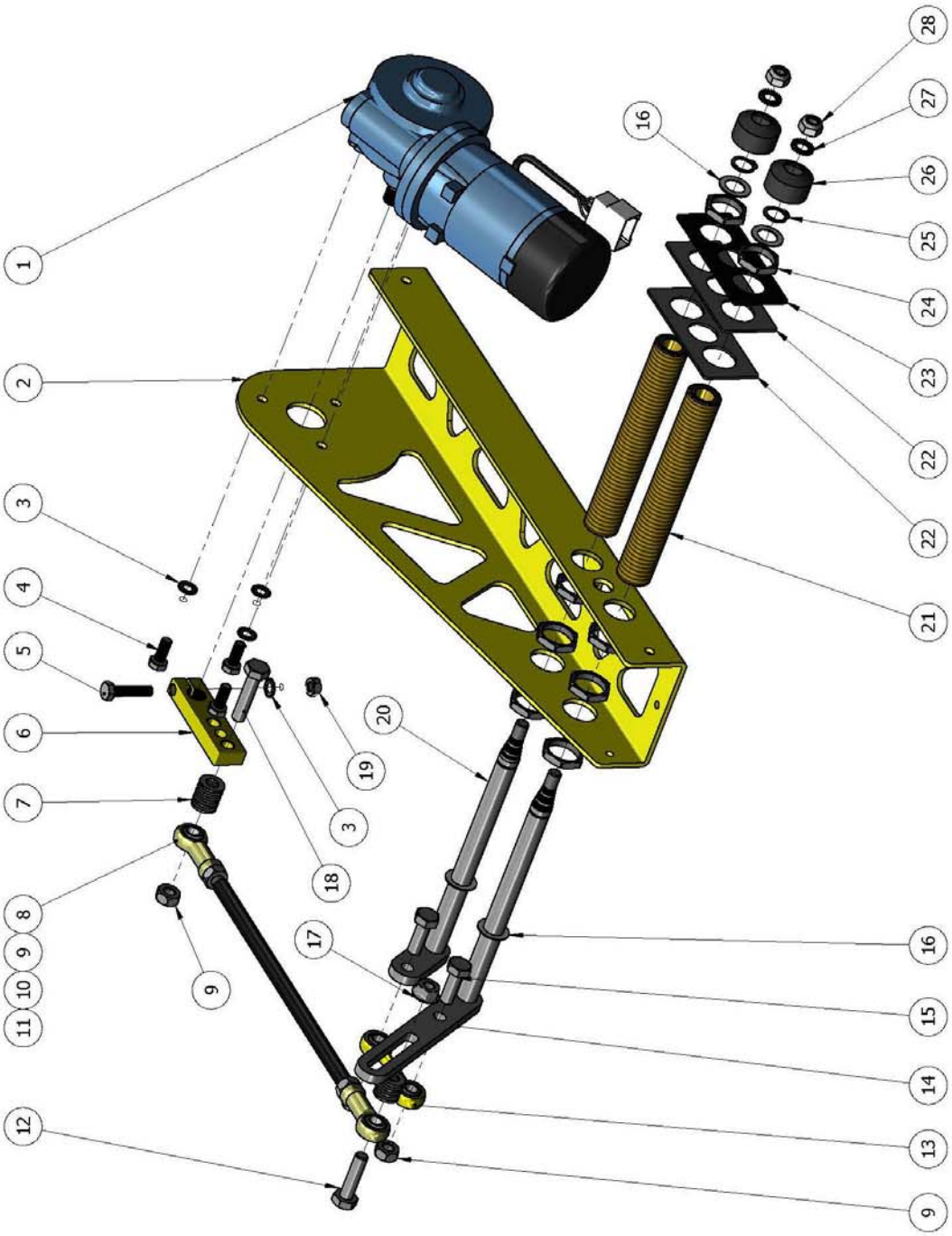
Hardinxveld-Giessendam
04-15-2013 (m-d-y)

8 Parts list

Pos.	Qua	Description	Dimensions	Cat. no.
1	1	Motor 80Nm		2100.PM3-0004
2	1	Wiper bracket	480×103×160	2197.027
3	4	Locking washer Ø8mm	M8	2100.091
4	3	Hexagon bolt ISO 4017 M8 x 20-S-A4	M8×20	933140080020
5	1	Hexagon Bolt ISO 4017 M8 x 35-S-A4	M8×35	933140080035
6	1	Motor crank 280BS		2197.077
7	9	Washer 10mm din125	M10	2197.092
8	2	Rod end M10		2197.070
9	5	Hexagon nut M10 din934	M01	2197.090
10	1	Threaded end	M10	0975140101000
11	1	Nylon tubing Ø10		211210
12	1	SS Hexagon bolt M10 ISO4017	M10	093388010040
13	1	Dogbone 60mm		2100.938
14	1	Driven spindle 25mm		2197.082
15	2	SS Hexagon bolt M10 ISO4017	M10×30	093388010030
16	4	Washer Ø25×16×1mm SS		2100.353
17	1	Flanged nut M10	M10	2100.069
18	1	SS Hexagon bolt M10 ISO4017	M10×45	093388010045
19	1	Nut M8	M8	2100.460
20	1	Support spindle WD25		2197.083
21	2	Liner M27×1.5mm	M27×1,5mm	2100.344
22	2	Rubber Sealing plate		2100.511
23	1	Stainless steel sealing plate		2100.521
24	8	Nut M27×1,5mm SS	M27×1,5mm	2100.352
25	2	Circlip for shafts Ø16 din471		2100.411
26	2	Wheatercap Ø34mm		2100.359
27	2	Locking washer 10mm	M10	2100.092
28	2	Nyloc nut M10 SS	M10	2100.074

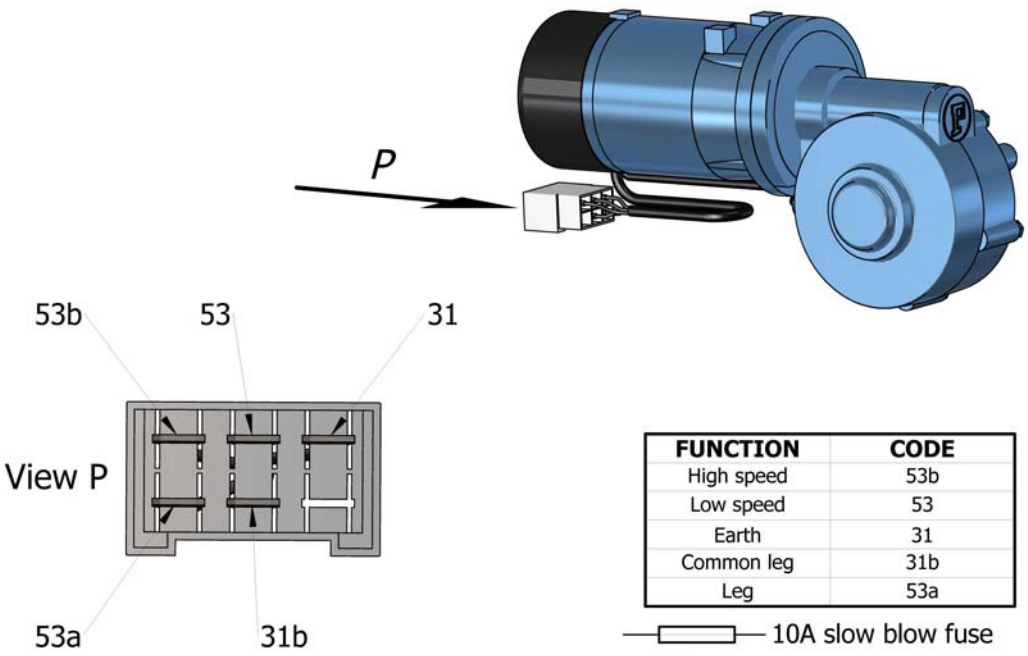
9 Drawings and schemes

9.1 Assembly overview



9.2 Internal wiring diagram

The following diagram is to help understand the principle of the wiper motor.



Function	Polarity	Motor code	Switch code	Cable (since 6-1999)
high speed	+	53b	H	white
low speed	+	53	L	yellow
earth	-	31b		black
common leg		53e	P	blue
self parking	+	53a	B	red

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