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# Installation & Operation Manual

## Type C Straight Line Wiper

### With

## Series 2000 Control Unit

### Issue 16

**WARNING:** A suitably qualified person should perform all installation and maintenance. All electrical wiring should be carried out in accordance with relevant regulations. Ensure all products are correctly earthed and all connections are made in accordance with the wiring diagram. Non-compliance may result in damage, malfunction or personal injury. Before commencing any installation or maintenance work, ensure that the electrical supply is disconnected.

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# **GENERAL INFORMATION AND SAFETY SUMMARY**

As we will have no influence on the installation of complete windscreen wiper systems if installation is to be carried out by the customer, we are unable to accept liability for installation errors.

If you require any additional information or any special problems arise which the installation/maintenance instructions do not treat in sufficient detail please contact Customer Service at B. Hepworth and Co Ltd directly.

## **Safety Precautions**

### **CAUTION! BEWARE OF INJURY!**

**BEFORE WORKING ON THE WIPER SYSTEM, OBSERVE THE FOLLOWING REMARKS WITHOUT FAIL!**

Most wiper motors have a park setting, which permits them to default to the parked position if connected to the vehicle electrical system, even when the wiper is switched off. FOR THIS REASON, AT THIS POINT IN TIME, NEITHER MAY THE WIPER ARM BE MOUNTED, NOR MAY ANY PERSON HAVE HANDS, FINGERS, ETC ANYWHERE NEAR THE WIPER SYSTEM. Even small wiper motors can neither be braked nor stopped by hand.

**NEVER REACH INTO THE AREA OF THE DRIVE BELT WHEN THE SYSTEM IS RUNNING!**

When putting into service (i.e. when connecting the wiper motor to the vehicle electrical system, even if the wiper switch is in the off position), never leave any loose items such as screwdrivers in the area of the wiper system, as flying objects could lead to injury.

Please ensure the equipment is handled with care. Do not drop or bang the equipment down on a hard surface taking extra care around the area where the motor shaft is situated. Do not hammer the motor shaft when installing the equipment, as this will cause the motor gear plate to deform causing premature failure of the unit.

Wipers should be wrapped in protective material after installation to protect them from damage. Type of material depends on work done in the vicinity, for instance, if welding or grinding work needs to be done near the wipers then a fire resistant blanket should be used. If no welding or grinding work is required near the wipers then bubble is sufficient.

## **Introduction**

The Windscreen Wiper system utilised is detailed on the following pages. The primary components that form the Windscreen Wiper System are the wiper case assembly, the wiper arm assemblies and the wiper blades.

# TYPE C WIPER DESCRIPTION AND SPECIFICATION

The 'Type C' is a Heavy Duty Straight Line Wiper with an electric motor mounted internally. The wiper can be mounted either above or below the window.

All electric motors incorporate a worm reduction gearbox. Windings are to Class F insulation.

The DC motor option is suitable for single speed operation. Complies with the EMC Directive according to the following: EN 60945:2002

The AC 1-phase motor option is single speed operation. Complies with the EMC Directive according to the following: EN 60945:2002

The standard AC 3-phase motor option is for either 1 or 2 speed operation. Complies with the EMC Directive according to the following: EN 60945:2002

The variable frequency AC 3-phase motor option is for 3 speed operation and must be used with the 8000 Series Controller. Complies with the EMC Directive according to the following: EN 60945:2002

## *Motor Specifications*

Motor	Type	Nominal Voltage	Full load current at 50/60 Hz	Fusing Value 50/60 Hz	Speed	Compass Safe Distance	Protection Rating
PM3M	Permanent Magnet	24V DC	4.5 A	6.0 A	1.4 m/s	2.4 m	IP54
PM3M (L)	Permanent Magnet	24V DC	4.5 A	6.0 A	0.7 m/s	2.4 m	IP54
PARV65	1 Phase Induction	115 V	2.3/2.6 A	2.5/3.15 A	1.4 m/s	0.5 m	IP20
PARV65L	1 Phase Induction	115 V	1.5/1.6 A	2.5/3.15 A	0.7 m/s	0.5 m	IP20
PARV64-T	1 Phase Induction	230 V	1.2/1.6 A	2.5/3.15 A	1.4 m/s	0.5 m	IP20
PARV64L	1 Phase Induction	230 V	0.75/0.95 A	1.0/1.6 A	0.7 m/s	0.5 m	IP20
PARV61	3 Phase Induction	115V AC	1.3/1.1 A	2.0/1.6 A	0.7/1.4 m/s	0.5 m	IP20
PARV62D+	3 Phase Induction	220V AC	0.6/0.6 A	1.0/1.0 A	0.7/1.4 m/s	0.5 m	IP20
PARV81	3 Phase Induction	115V AC	1.5 A	8000 Controller	0.7/1.1/1.4	0.5 m	IP20
PARV82	3 Phase Induction	220V AC	1.1 A	8000 Controller	0.7/1.1/1.4	0.5 m	IP20

For protection it is recommended that the wiper system have fuses fitted. The fuses will not blow in normal conditions, however if the wiper is jammed, then the fuses are designed to blow before the motor is damaged. Each wiper requires its own fuse. Fuse values shown above.

Compass safe distances, BSH (Germany) certified, have the values shown above. The distance quoted is the maximum figure for '*Magnet-Regelkompass*'.

Drive shaft lengths are optional. These are available in standard and gas tight versions. The standard length is 84 mm. Other lengths available are 35mm, 140mm, 200mm and 220mm. The Certificate of Conformity will advise which option has been fitted.

## *Spray nozzles & water connections*

A fresh water supply can be plumbed directly to the wiper into a 6mm overall diameter compression fitting. On stroke lengths below 1015mm, 1 nozzle is fitted, above 1015mm, 2 nozzles are fitted at ¼ stroke + 137mm from either end. The installer needs to provide pressurised water supply and the interconnecting plumbing. When the wash option is installed, the maximum pressure for the system is 8 bar or 118 PSI and the minimum pressure for adequate spray reach is 1 bar or 15 PSI. Example flow rates for a single spray jet are shown below.

### *Water System Pressure And Flow Rates*

Pressure		Flow rate	
Bar	Psi	Litres/min	Gallons/min
1.0	15	0.95	0.20
1.5	22	1.20	0.25
2.0	29	1.40	0.30
3.0	44	1.75	0.40

## *De-icing Heaters*

Optional de-icing heaters may be fitted inside the wiper case to ensure effective operation in cold conditions. Standard cable length is 2M. Optional lengths are 5M, 10M, 15M and 20M. Power consumption is according to the wiper stroke length, shown below.

### *Heater Power Ratings – Single Wipers*

STROKE (mm)	STROKE (inch)	HEATER SIZE	WATTS (24VDC)	STROKE (mm)	STROKE (inch)	HEATER SIZE	WATTS (24VDC)
305 up to 430	12 up to 17	1	97	1500 up to 1800	59 up to 71	8	390 (186)
457 up to 735	18 up to 29	2	135	1930 up to 2100	76 up to 83	10	485 (150)
760 up to 1095	30 up to 42	4	211	2260	89	12	574 (123)
1118 up to 1450	43 up to 57	6	301 (238)				

Quoted Power is for nominal 115 or 230 Volts (bracketed values are for 24 Volts). For stroke lengths up to 1065 mm, power ratings are the same for all voltages.

### *Heater Power Ratings – Twin Wipers*

OVERALL STROKE (mm)	STROKE (inch)	HEATER SIZE	WATTS (24VDC)	OVERALL STROKE (mm)	STROKE (inch)	HEATER SIZE	WATTS (24VDC)
585 up to 685	2 x 12 – 2 x 15	2	135	1855 up to 2165	2 x 37 – 2 x 43	10	485 (150)
735 up to 1042	2 x 16 – 2 x 21	4	211	2210 up to 2565	2 x 44 – 2 x 51	12	574 (123)
1091 up to 1445	2 x 22 – 2 x 29	6	301 (238)	2645 and above	2x 53 – 2 x 89	14	663 (106)
1495 up to 1805	2 x 30 – 2 x 36	8	390 (186)				

Quoted Power is for nominal 115 or 230 Volts (bracketed values are for 24 Volts). For stroke lengths up to 1041 mm, power ratings are the same for all voltages.

# TYPE C WIPER INSTALLATION

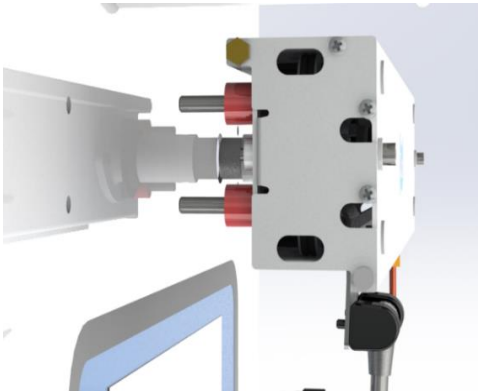


**CAUTION:** Ensure that the correct wiper, blade and arms are selected for each window.

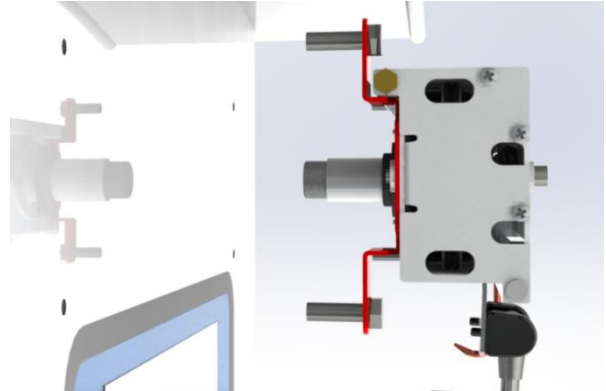
**CAUTION:** Before drilling, ensure that there are no obstructions / hazards at the chosen mounting position. The main frame should be mounted on a flat surface that will not bend or twist the casing, as this will prevent correct operation of the wiper.

**CAUTION:** Where more than one wiper unit is to be mounted close together, allow a distance of 70mm minimum between the wiper units.

## *Stud or Bracket Mounting*



**Stud Mounting**



**Bracket Mounting**

1. Locate the self-adhesive template in the correct mounting position on the outside of bulkhead (stud mounting only).

**NOTE:** For motors mounted at the opposite end, the template should be inverted.

2. Drill the wiper 2 off fixing holes (11 mm diameter) and the drive shaft housing hole (57mm diameter).
3. Detach the front cover from main unit. Hold the back casing in the required position and mark-out the remaining fixing holes, or calculate their position from the drawing i.e. stroke length plus 266 mm.
4. Drill the remaining wiper fixing & cable holes for the heater and park sensor, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.
5. Fit the wiper case into position and secure with M10 bolts. Ensure that the bolts are sealed where they pass through the bulkhead.
6. Push the drive shaft seals into place. It is advisable to use a suitable sealant to prevent water ingress.
7. Using the supplied M6 x 10mm screws, secure the wiper arm to the carriage plate.

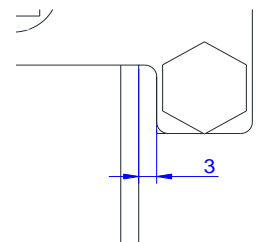


**CAUTION:** Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.

8. Bolt the front cover to the back case using the 2 off M8 bolts fitted.



**CAUTION:** Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper cover.

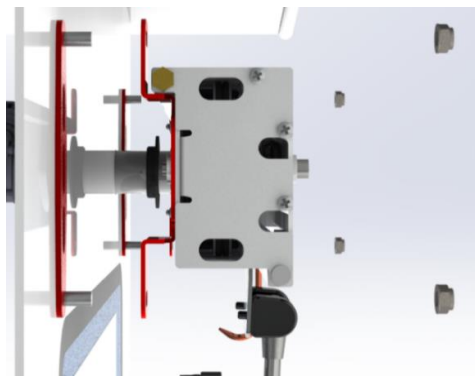


9. If necessary, slacken the screws on the wiper blade attachment clip, move the blade up or down for optimum position and then retighten screws.
10. Move the wiper arm/blade assembly over its full stroke and check that there is no restriction to movement (the motor will offer some resistance, but should not jam the wiper). Investigate and rectify any restrictions. If necessary adjust the wiper blade up or down on the arm to avoid the window frame.
11. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front cover to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.

**NOTE:** If a heater is fitted pass the heater cable through the bulkhead, leaving a loop as required, and seal.

12. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.
13. Fit the motor to the drive shaft.

### *Universal Carrier & Bracket Mounting*



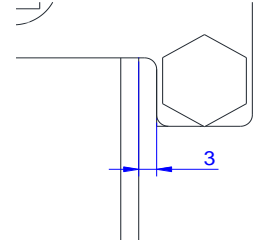
#### **Universal Bracket Mounting**

1. Carefully mark the position of the drive shaft housing hole and 2 (3 for longer wipers) universal carrier plates.
2. Drill the drive shaft housing hole (57mm diameter).
3. Prepare the bulkhead and universal carrier plates carefully and weld the 2 (or 3 for longer wipers) universal mounting brackets into position. Treat bare metal to prevent corrosion.
4. Drill the remaining wiper fixing & cable holes for the heater and park sensor, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.
5. Fit the wiper case into position on the Universal Carrier studs and secure with supplied M10 spring washers, M10 flat washers and M10 nuts.
6. Push the drive shaft seals into place. It is advisable to use a suitable sealant to prevent water ingress.
7. Using the supplied M6 x 10mm screws, secure the wiper arm to the carriage plate.





**CAUTION:** Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.



8. Bolt the front cover to the back case using the 2 off M8 bolts fitted.



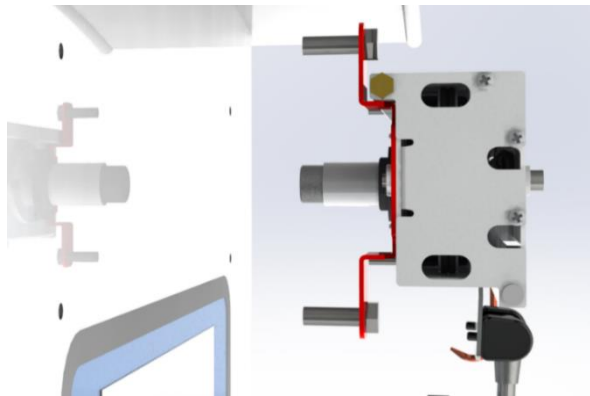
**CAUTION:** Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper cover.

9. If necessary, slacken the screws on the wiper blade attachment clip, move the blade up or down for optimum position and then retighten screws.
10. Move the wiper arm/blade assembly over its full stroke and check that there is no restriction to movement (the motor will offer some resistance, but should not jam the wiper). Investigate and rectify any restrictions. If necessary adjust the wiper blade up or down on the arm to avoid the window frame.
11. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front assembly to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.

**NOTE:** If a heater is fitted pass the heater cable through the bulkhead, leaving a loop as required, and seal.

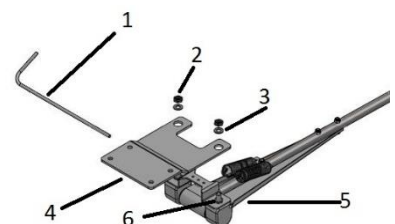
12. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.
13. Fit the motor to the drive shaft.

### *Bracket Mounting – Quick Release Arms*



#### **Bracket Mounting**

1. Mark out and drill the 4 (6 for longer wiper units) off fixing holes (11 mm diameter) and the drive shaft housing hole (57mm diameter).
2. Mark out and drill the cable holes for the heater and park sensor, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.
3. The wiper unit should be supplied with the arm mounting plate (4) already fitted. If it is not fitted, remove 2 x ¼ UNF Thin Nuts (2) and 2 x M6 washers (3) from the pivot block threads and remove the wiper arm sub assembly (5) from the arm mounting plate (4). Fit the arm mounting plate (4) to the wiper unit before installing the wiper unit using the supplied M6 x 10mm screws.



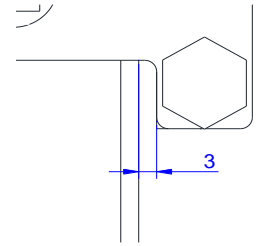


**CAUTION:** Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.

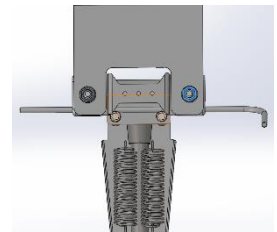
4. Fit the wiper blade to the wiper arm sub assembly (5), ensuring that the captive end of the wiper blade is at the top.
5. Bolt the front cover to the back case using the 2 off M8 bolts fitted.



**CAUTION:** Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper cover.



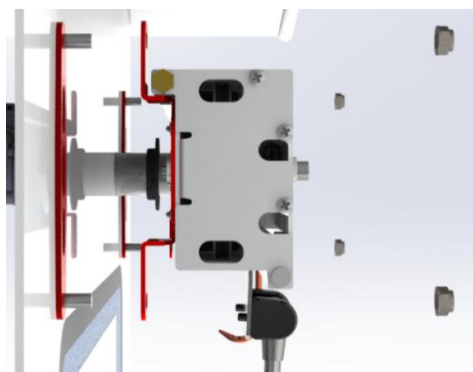
6. Fit the wiper case into position and secure with M10 bolts. Ensure that the bolts are sealed where they pass through the bulkhead.
7. Push the drive shaft seals into place. It is advisable to use a suitable sealant to prevent water ingress.
8. Fit the wiper arm sub assembly (5) to the arm mounting plate (4) ensuring that the wiper arm sub assembly pivot block nuts (6) sit inside the holes in the arm mounting plate (4). Refit the 2 x M6 washers (3) and 2 x ¼ UNF Thin Nuts (2) to the pivot block threads and tighten.
9. Gently lift the wiper arm away from the window and remove the spring retaining pin (1). Keep safe for future use.
10. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front cover to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.



**NOTE:** If a heater is fitted pass the heater cable through the bulkhead, leaving a loop as required, and seal.

11. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.
12. Fit the motor to the drive shaft.

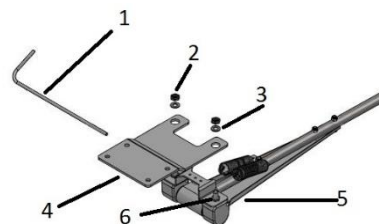
### *Universal Carrier & Bracket Mounting – Quick Release Arms*



#### **Universal Bracket Mounting**

1. Carefully mark the position of the drive shaft housing hole and 2 (3 for longer wipers) universal carrier plates.
2. Drill the drive shaft housing hole (57mm diameter).

3. Prepare the bulkhead and universal carrier plates carefully and weld the 2 (or 3 for longer wipers) universal mounting brackets into position. Treat bare metal to prevent corrosion.
4. Mark out and drill the cable holes for the for the heater and park sensor, ensuring that all holes are circular and carefully de-burred. Treat bare metal to prevent corrosion.
5. The wiper unit should be supplied with the arm mounting plate (4) already fitted. If it is not fitted, remove 2 x ¼ UNF Thin Nuts (2) and 2 x M6 washers (3) from the pivot block threads and remove the wiper arm sub assembly (5) from the arm mounting plate (4). Fit the arm mounting plate (4) to the wiper unit before installing the wiper unit using the supplied M6 x 10mm screws.

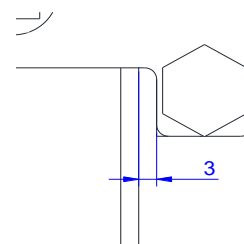


**CAUTION:** Ensure the correct length screws are used, as supplied. Longer screws will cause the carriage assembly to jam.

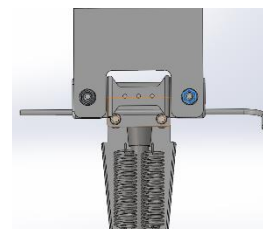
6. Fit the wiper blade to the wiper arm sub assembly (5), ensuring that the captive end of the wiper blade is at the top.
7. Bolt the front cover to the back case using the 2 off M8 bolts fitted.



**CAUTION:** Do not overtighten the cover bolts. There should be 3mm clearance between arm mounting plate and inside of wiper cover.

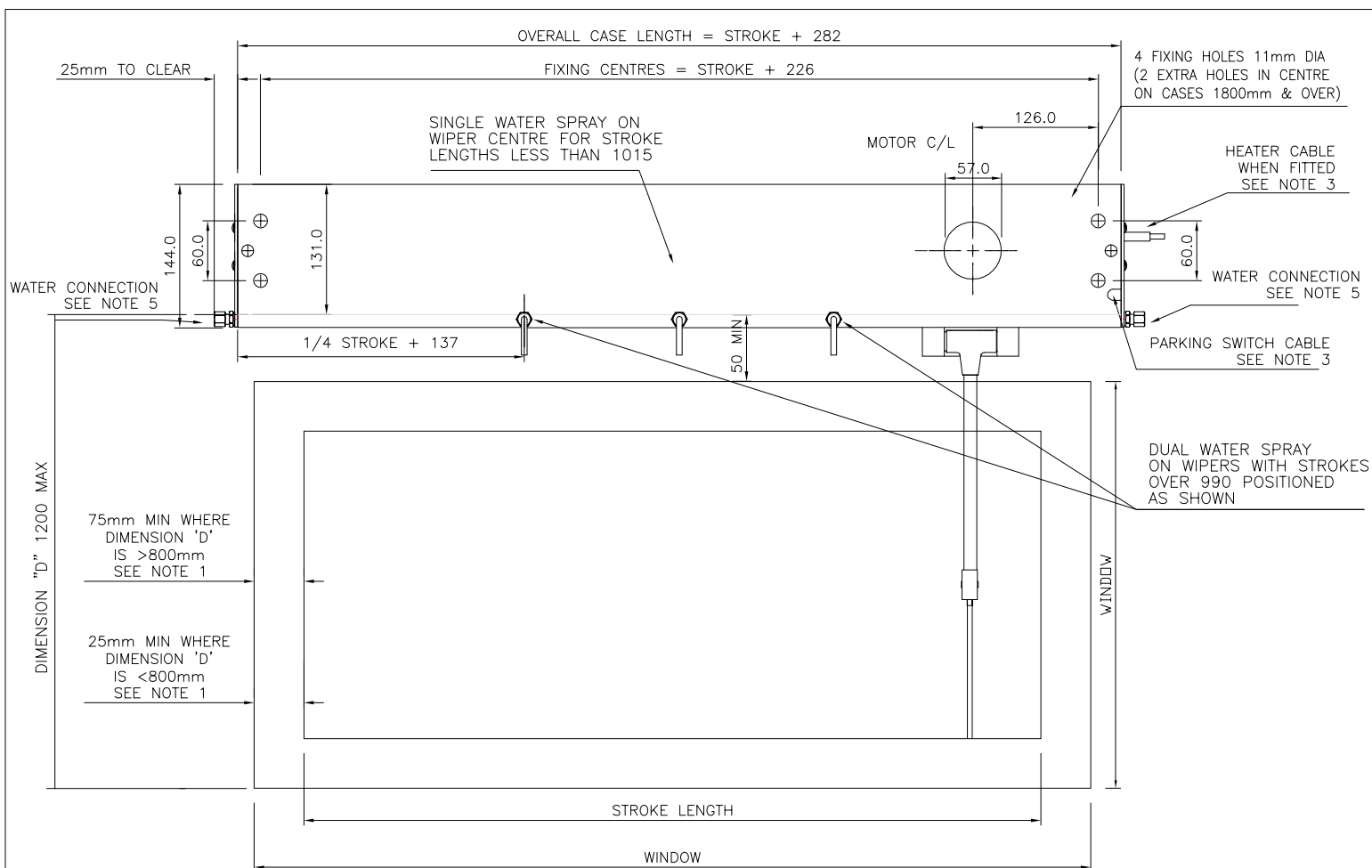


8. Fit the wiper case into position on the Universal Carrier studs and secure with supplied M10 spring washers, M10 flat washers and M10 nuts.
9. Push the drive shaft seals into place. It is advisable to use a suitable sealant to prevent water ingress.
10. Fit the wiper arm sub assembly (5) to the arm mounting plate (4) ensuring that the wiper arm sub assembly pivot block nuts (6) sit inside the holes in the arm mounting plate (4). Refit the 2 x M6 washers (3) and 2 x ¼ UNF Thin Nuts (2) to the pivot block threads and tighten.
11. Gently lift the wiper arm away from the window and remove the spring retaining pin (1). Keep safe for future use.
12. Pass the cables through the bulkhead, leaving sufficient spare cable to allow the front cover to be lifted away from the rear case during the maintenance period. Ensure the wiper is correctly earthed.



**NOTE:** If a heater is fitted pass the heater cable through the bulkhead, leaving a loop as required, and seal.

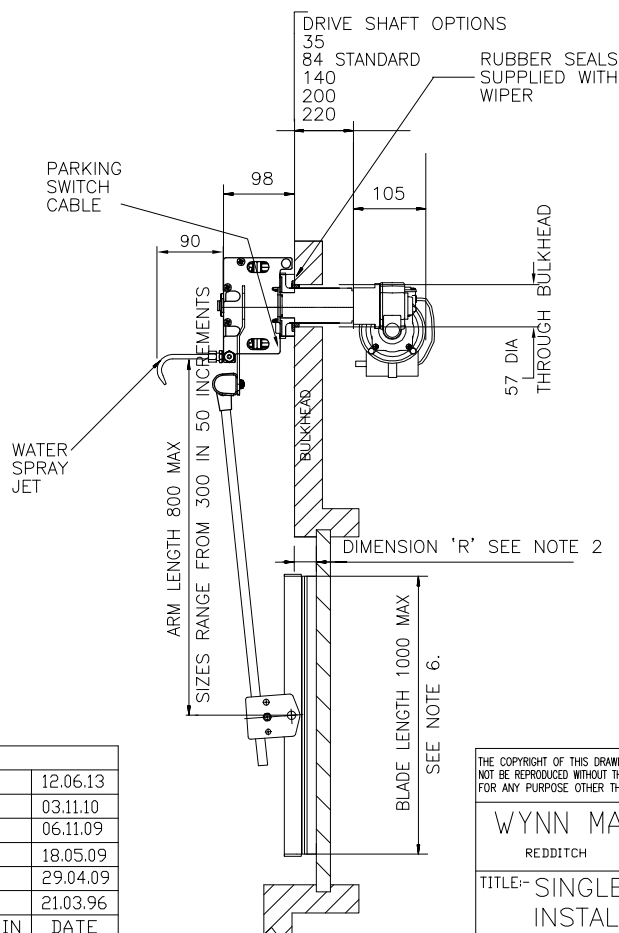
13. Ensure that wherever the cable passes through the bulkhead a suitable cable gland or seal is used to prevent water ingress and cable chaffing.
14. Fit the motor to the drive shaft.



## NOTES

1. THESE MINIMUM DIMENSIONS ARE LIMITED BY THE SIZE OF THE CORNER RADII ON THE WINDOW.
2. THE BLADE ARM MAY BE CRANKED WHERE DIMENSION "R" IS GREATER THAN 75.
3. OPTIONAL HEATER AND PARKING SWITCH STANDARD CABLE LENGTH 2 METRES. PARKING SWITCH POSITIONED AT MOTOR END WHEN FITTED.
4. THE HEATER AND PARK SWITCH CABLING TO RUN THROUGH THE BULKHEAD.
5. THE WATER CONNECTION BLANKING PLUG CAN BE FITTED AT EITHER END.
6. RIGID WIPER BLADE LENGTHS RANGE FROM 300 TO 800 AND ARTICULATED WIPER BLADE LENGTHS RANGE FROM 500 TO 1000 BOTH IN 50 INCREMENTS.
7. SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.
8. THE MOTOR CAN BE POSITIONED RADIALLY THROUGH 360 DEGREES AROUND THE DRIVE SHAFT CENTRE-LINE TO SUIT THE INSTALLATION. ENSURE THAT THE ACCESS SPACE AROUND THE MOTOR SHOWN ON THE DRAWING IS MAINTAINED.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY



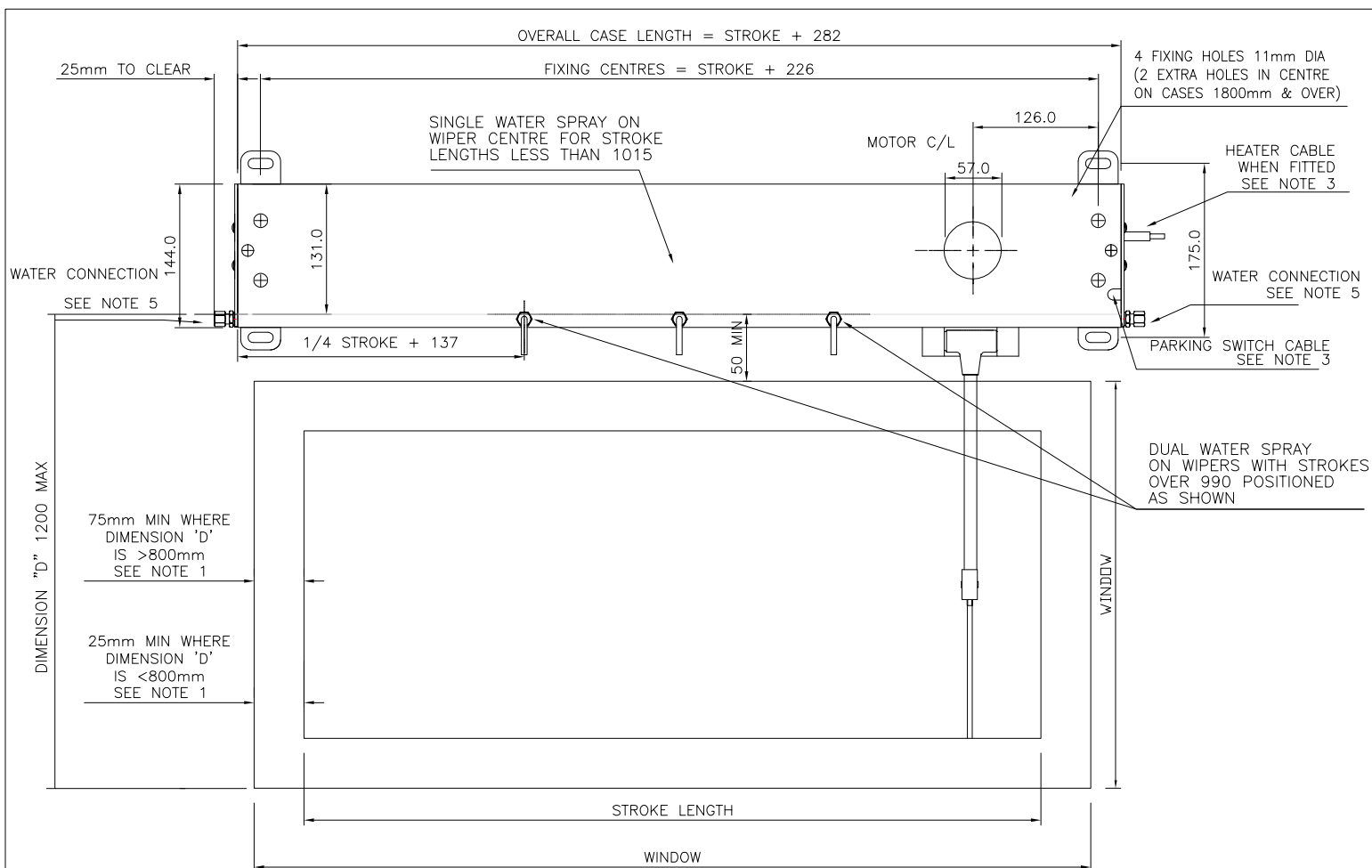
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WYNN MARINE LIMITED  
REDDITCH ENGLAND

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INSTALLATION DRG.

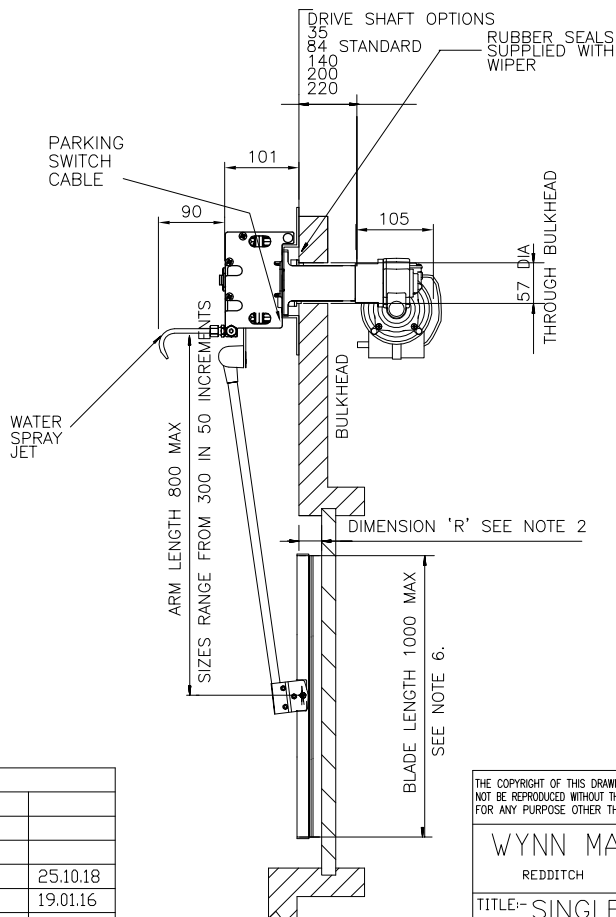
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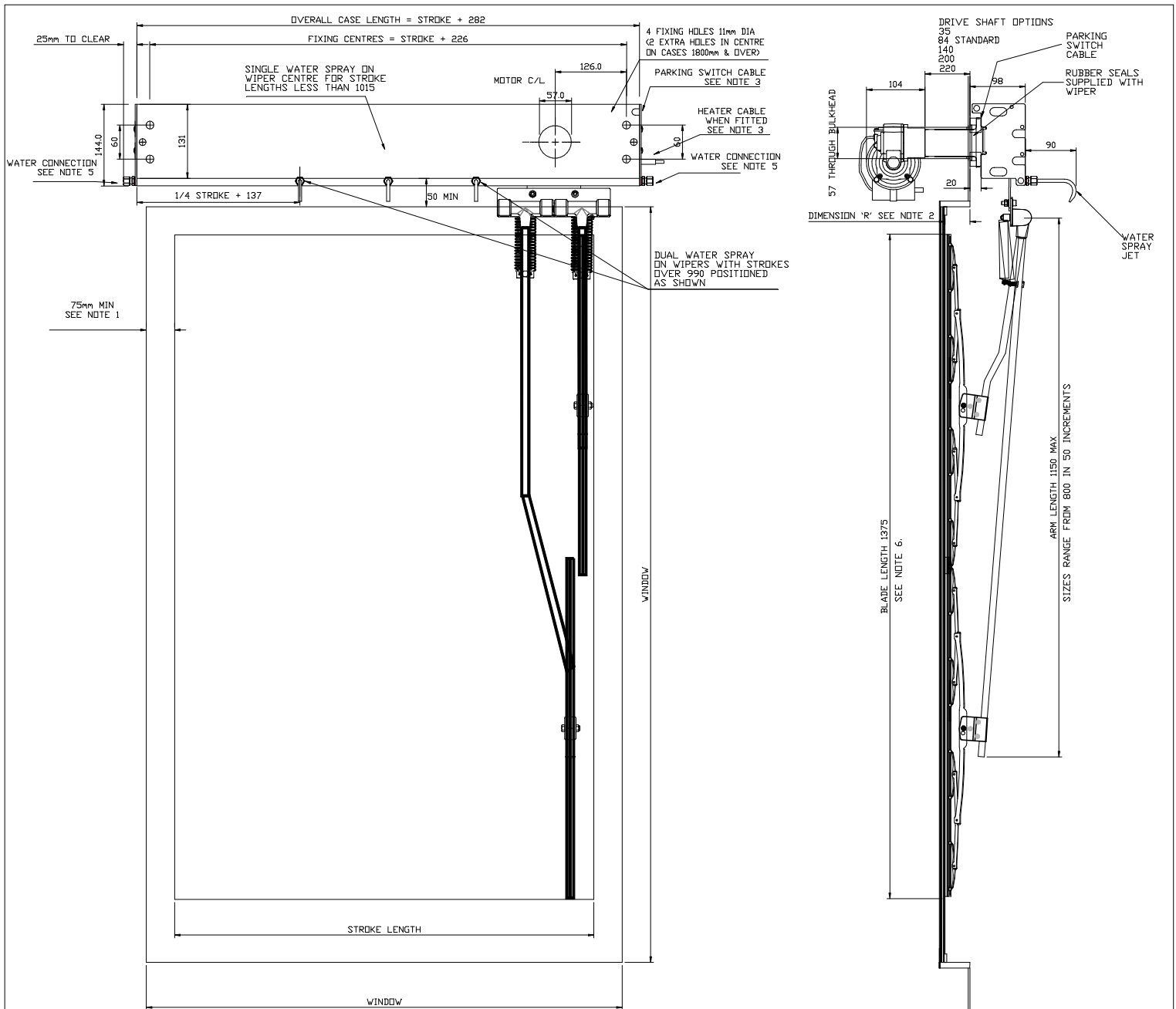
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TOLERANCES UNLESS OTHERWISE STATED DECIMAL DIMS. TO 2 PLACES ± 0.1mm. DECIMAL DIMS. TO 1 PLACE ± 0.25mm NO DECIMAL PLACES ± 0.5mm ANGLES ± 1°										
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TITLE:- SINGLE TYPE C  
INSTALLATION DRG.

DRAWING No. 1588-01-BKT



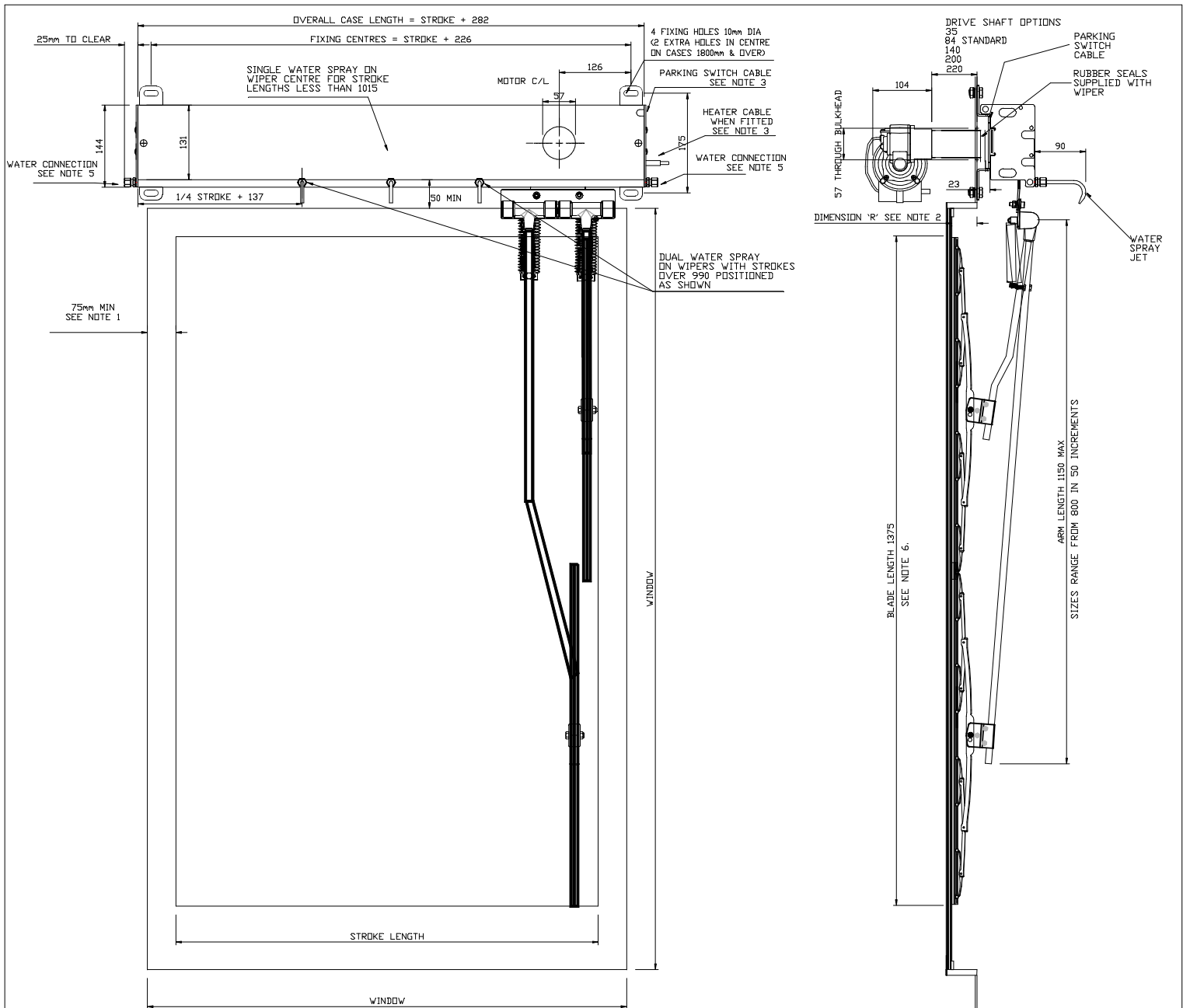
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5. THE WATER CONNECTION BLANKING PLUG CAN BE FITTED AT EITHER END.
6. WIPER BLADE LENGTH 700 EACH, OVERALL 1375.
7. SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.
8. THE MOTOR CAN BE POSITIONED RADially THROUGH 360 DEGREES AROUND THE DRIVE SHAFT CENTRE-LINE TO SUIT THE INSTALLATION. ENSURE THAT THE ACCESS SPACE AROUND THE MOTOR SHOWN ON THE DRAWING IS MAINTAINED.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY

CAD FILENAME+DIRECTORY		M:\DRAW\1588\1588-01-CCOVER Dbl Arm					
3rd ANGLE PRO.							
TOLERANCES UNLESS OTHERWISE STATED							
DECIMAL SIZES TO 2 PLACES ± 0.1mm							
DECIMAL SIZES TO 1 PLACE ± 0.25mm							
NO DECIMAL PLACES ± 0.5mm							
ANGLES ± 1°							
MATERIAL:-		ISS. DIN	DATE	ISS. DIN	DATE	1	06.11.18
FINISH:-		SCALE:- NTS	DRAWN:- DD	CHKD:-	CHANGED:-		

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WYNN MARINE LIMITED	
REDDITCH	ENGLAND
TITLE-SINGLE TYPE C	
INSTALLATION DRG.	
DRAWING No. 1588-01-CCOVER Dbl Arm	



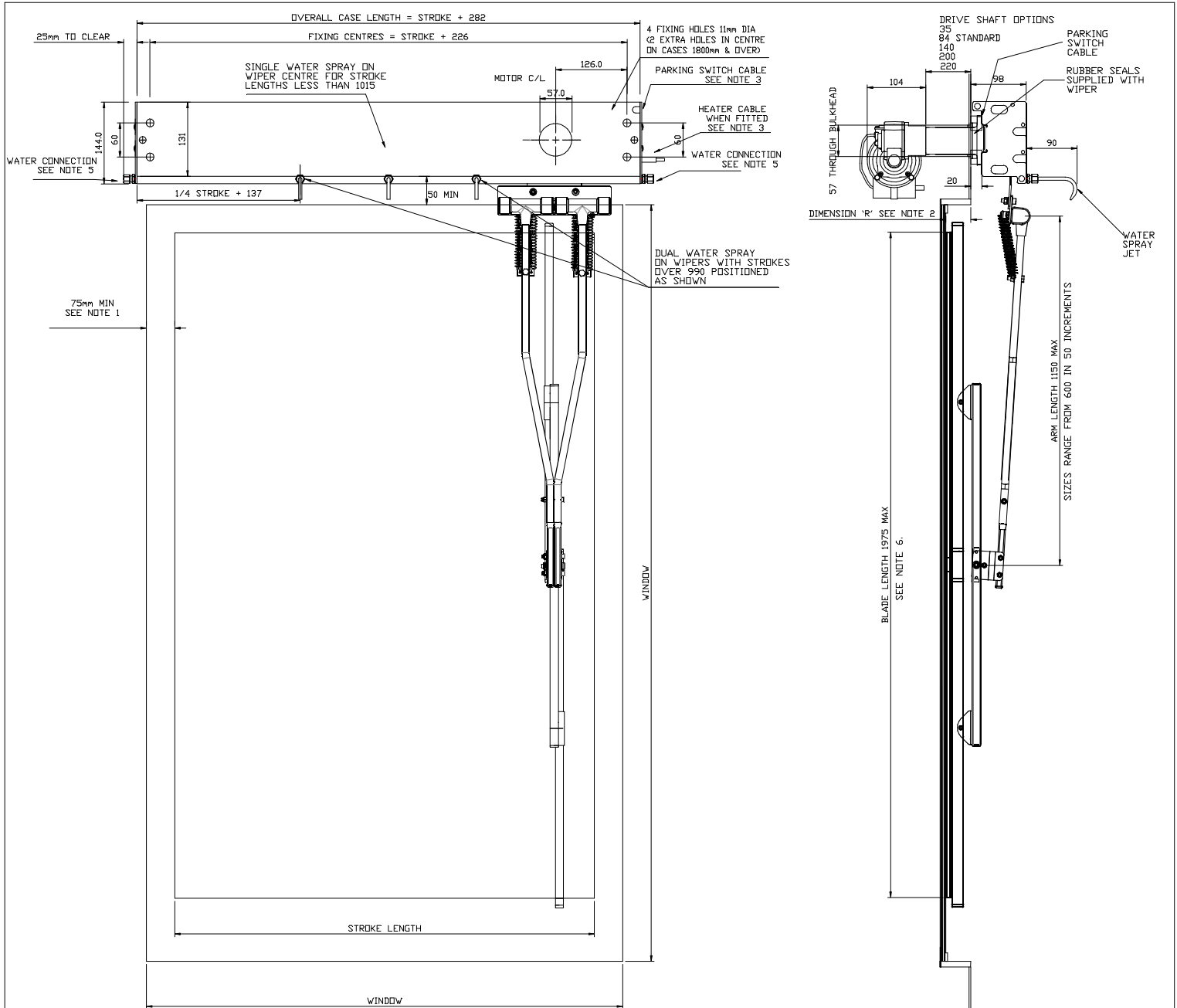
# NOTES

- THESE MINIMUM DIMENSIONS ARE LIMITED BY THE SIZE OF THE CORNER RADII ON THE WINDOW.
- THE BLADE ARM MAY BE CRANKED WHERE DIMENSION 'R' IS GREATER THAN 75mm.
- OPTIONAL HEATER AND PARKING SWITCH 'STANDARD CABLE LENGTH 2 METRES. PARKING SWITCH POSITIONED AT MOTOR END WHEN FITTED.
- THE HEATER AND PARK SWITCH CABLING TO RUN THROUGH THE BULKHEAD.
- THE WATER CONNECTION BLANKING PLUG CAN BE FITTED AT EITHER END.
- WIPER BLADE LENGTH 700 EACH, OVERALL 1375.
- SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.
- THE MOTOR CAN BE POSITIONED RADially THROUGH 360 DEGREES AROUND THE DRIVE SHAFT CENTRE-LINE TO SUIT THE INSTALLATION. ENSURE THAT THE ACCESS SPACE AROUND THE MOTOR SHOWN ON THE DRAWING IS MAINTAINED.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY

CAD FILENAME+DIRECTORY		M:\DRAW\1588\1588-01-BKT Dol Arm			
3rd ANGLE PRO.					
TOLERANCES UNLESS OTHERWISE STATED					
DECIMAL SIZES TO 2 PLACES ± 0.1mm					
BOTH SIZES TO 1 PLACE ± 0.25mm					
NO DECIMAL PLACES ± 0.5mm					
ANGLES ± 1°					
MATERIAL:-		ISS. DIN	DATE	ISS. DIN	DATE
FINISH:-		SCALE:- NTS	DRAWN:- DD	CHKD:-	CHANGED:-


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WYNN MARINE LIMITED	
REDDITCH	ENGLAND
TITLE-SINGLE TYPE C	
INSTALLATION DRG.	
DRAWING No. 1588-01-BKT Dol Arm	



#### NOTES

1. THESE MINIMUM DIMENSIONS ARE LIMITED BY THE SIZE OF THE CORNER RADII ON THE WINDOW.
2. THE BLADE ARM MAY BE CRANKED WHERE DIMENSION 'R' IS GREATER THAN 75.
3. OPTIONAL HEATER AND PARKING SWITCH 'STANDARD CABLE LENGTH 2 METRES. PARKING SWITCH POSITIONED AT MOTOR END WHEN FITTED.
4. THE HEATER AND PARK SWITCH CABLING TO RUN THROUGH THE BULKHEAD.
5. THE WATER CONNECTION BLANKING PLUG CAN BE FITTED AT EITHER END.
6. DUAL WIPER BLADE LENGTHS RANGE FROM 1175 TO 1975 IN 100 INCREMENTS.
7. SEE MANUAL HEATER POWER RATINGS TABLE FOR STROKE OPTIONS AND HEATER DETAILS.
8. THE MOTOR CAN BE POSITIONED RADIALLY THROUGH 360 DEGREES AROUND THE DRIVE SHAFT CENTRE-LINE TO SUIT THE INSTALLATION. ENSURE THAT THE ACCESS SPACE AROUND THE MOTOR SHOWN ON THE DRAWING IS MAINTAINED.

ALL DIMENSIONS IN MM FOR REFERENCE ONLY

CAD FILENAME+DIRECTORY		M:\DRAW\1588\1588-01-CCOVER HD Arm									
3rd ANGLE PRO.											
TOLERANCES UNLESS OTHERWISE STATED											
DECIMAL SIZES TO 2 PLACES ± 0.1mm											
FRACTIONAL SIZES TO 1 PLACE ± 0.25mm											
NO DECIMAL PLACES ± 0.5mm											
ANGLES ± 1°											
MAT'L:-		ISS. DIN	DATE	ISS. DIN	DATE	1	06.11.18				
FINISH:-		SCALE:- NTS	DRAWN:- DD	CHKD:-	CHANGED:-						

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WYNN MARINE LIMITED	
REDDITCH	ENGLAND
TITLE-SINGLE TYPE C	
INSTALLATION DRG.	
DRAWING No. 1588-01-CCOVER HD Arm	

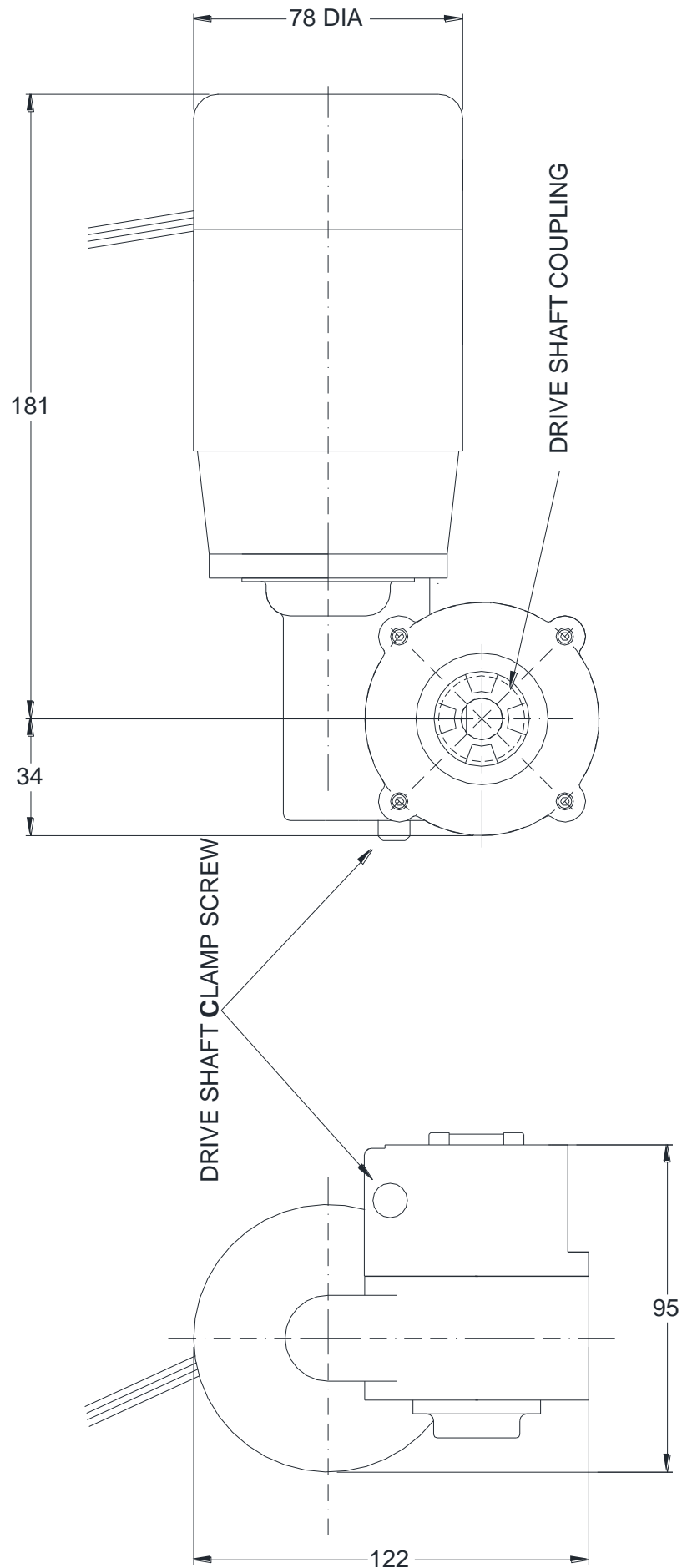


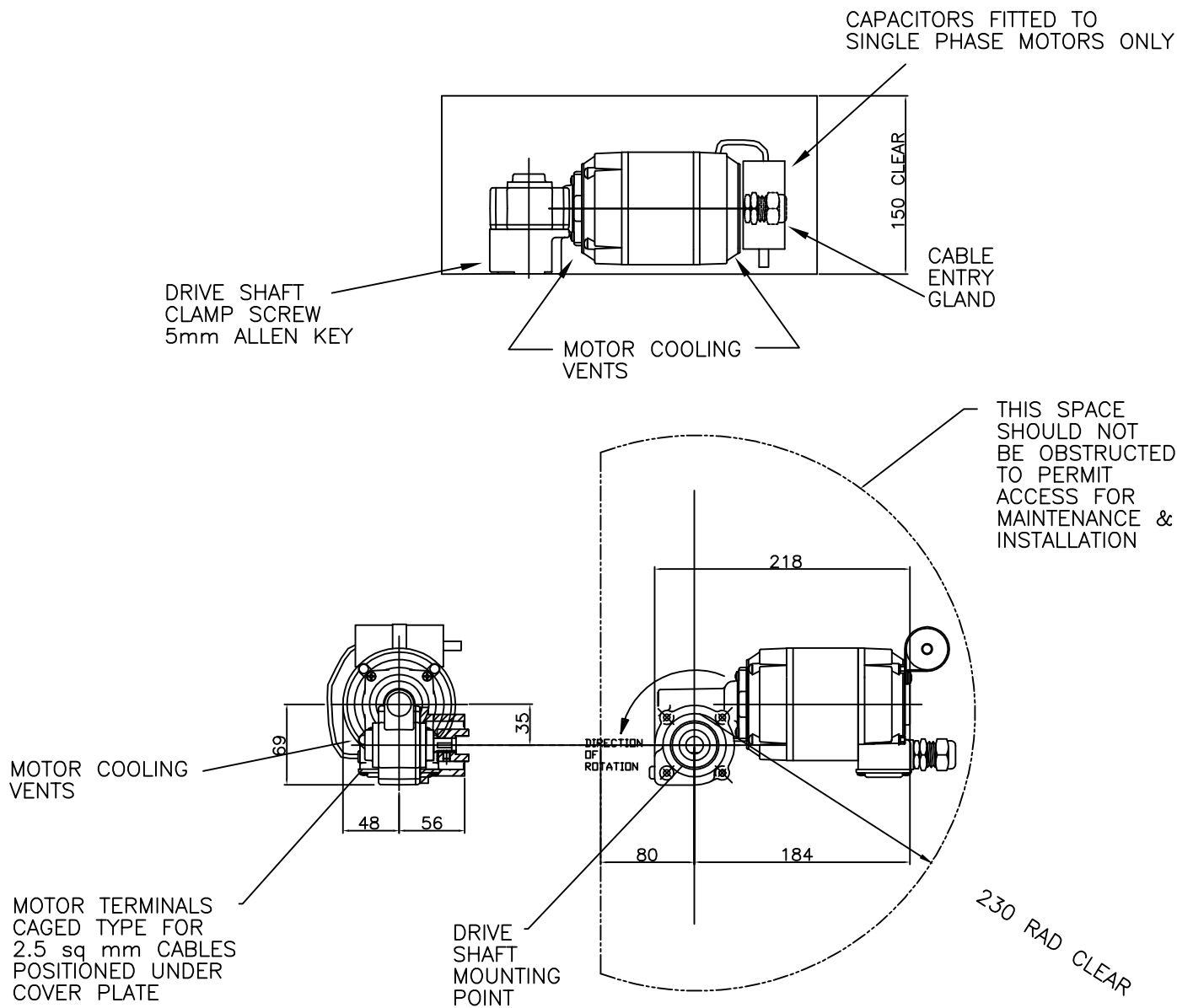






# DC MOTOR DIMENSIONS





## NOTES

1. USE T RATED FUSES.
2. EARTH BONDING TO CONFORM TO APPROPRIATE NATIONAL CODES AND STANDARDS.
3. CUSTOMER TO WIRE FROM MOTOR CABLES OR TERMINATIONS TO TERMINALS ON THE CONTROLLER WHEN SUPPLIED.
4. ALL MOTORS CAN BE ROTATED THROUGH 360 DEGREES AROUND THE DRIVE SHAFT CENTRE-LINE. NOTE THE ACCESS SPACE WILL ROTATE WITH THE MOTOR.

PARVALUX MOTORS WEIGHT 4.5Kg

## MOTOR OPTIONS

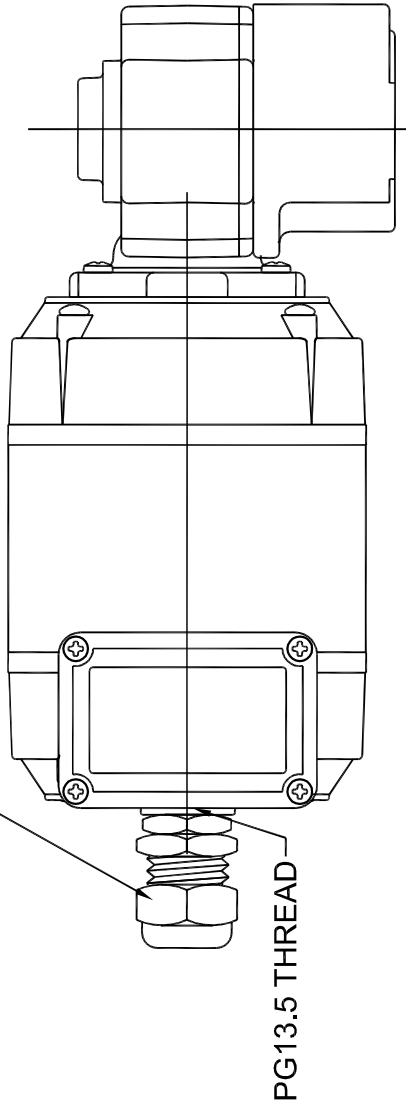
MOTOR TYPE	VOLTAGE	Hz	PHASE	SPEED	SAFE COMPASS DISTANCE MIN	RUN CURRENT 50Hz	RUN CURRENT 60Hz	FUSE RATING 50Hz	FUSE RATING 60Hz	CAPACITOR
PARV61	115AC	50/60	3	2	0.5M	1.3A	1.1A	2.0A	1.6A	—
PARV62D	230AC	50/60	3	2	0.5M	0.6A	0.6A	1.0A	1.0A	—
PARV64	230AC	50/60	1	1	0.5M	1.2A	1.6A	1.6A	2.0A	8.4uF M-MISC-098PARV
PARV64L	230AC	50/60	1	1	0.5M	0.75A	0.95A	1.0A	1.6A	5uF M-MISC-095PARV
PARV65	115AC	50/60	1	1	0.5M	2.3A	2.6A	2.5A	3.15A	28uF M-MISC-099PARV
PARV65L	115AC	50/60	1	1	0.5M	1.5A	1.6A	2.0A	3.15A	28uF M-MISC-099PARV
PARV81	115AC	50	3	V	0.5M	1.5A		CONTROLLER		—
PARV82	220AC	50	3	V	0.5M	1.1A		CONTROLLER		—

ALL UNSPECIFIED UNITS OF LENGTH IN mm's

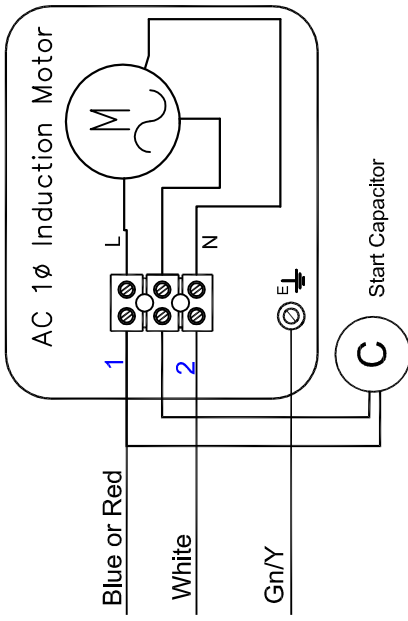
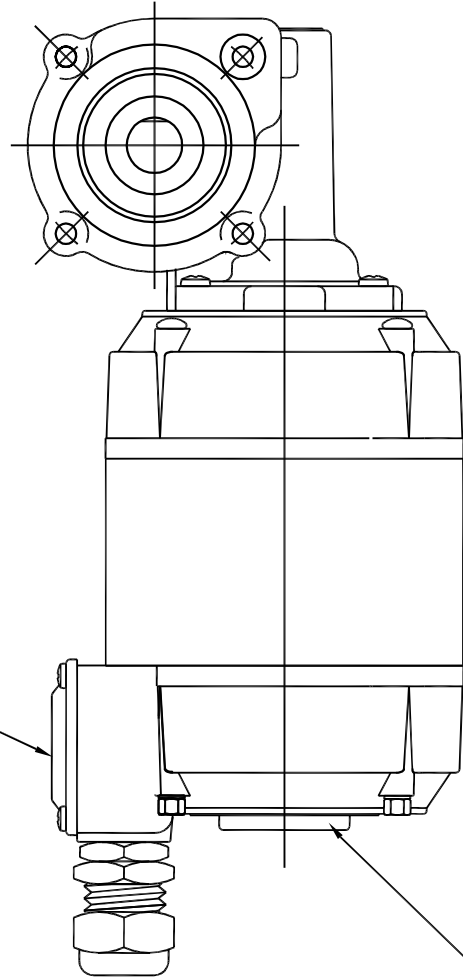
			WYNN MARINE LTD REDDITCH ENGLAND	THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.
5		12.05.11		
4		03.11.10		TITLE:— TYPE C WIPER STANDARD PARVALUX MOTOR OPTIONS CHART
ISSUE	DIN	DATE		DRAWING NUMBER:— INST—1588—06

# CUSTOMER WIRING

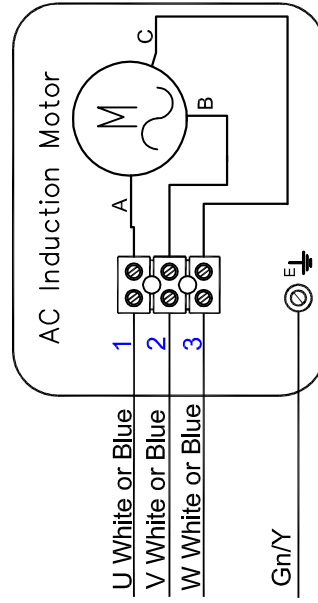
CABLE GLAND



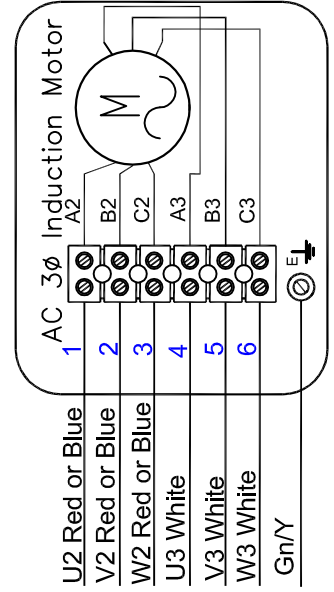
TERMINAL BLOCK  
UNDER COVER



MOTOR TERMINAL BLOCK WIRING DIAGRAM  
FOR A PARVALUX 1 PHASE MOTOR  
FIT CAPACITORS AS SUPPLIED



MOTOR TERMINAL BLOCK WIRING DIAGRAM  
FOR A PARVALUX GA81/GA82 MOTOR



MOTOR TERMINAL BLOCK WIRING DIAGRAM  
FOR A PARVALUX 3 PHASE 2SP MOTOR

## WIRING DIAGRAM FOR PARVALUX TYPE AC MOTORS FOR WYNN TYPE C STRAIGHT LINE WIPER

# GENERAL FAULT FINDING GUIDE

**NOTE:** This fault finding guide assumes a reasonable level of technical ability and should be carried out by a suitably qualified person.

*Problems: Control panel does not operate wiper.*

Possible Cause	Solution
No Power.	Check power supply is on and working.
Power not reaching motor	Check ship's incoming supply fuses or circuit breakers. Check for wiring fault, broken wire or loose terminal. If possible confirm (with voltmeter) power is present at motor input and output terminals of control module.
Connections to motor incorrect.	Check wiring according to the appropriate electrical installation drawing.
Ship's voltage too low.	Check voltage as close to the motor as possible, with motor running. See relevant tables for acceptable values.
Motor Thermal Cut Out tripped. Single Phase AC motors only.	The 1 Ø AC motors have a thermal cut out embedded into the stator winding. If the motor gets too hot the thermal cut out disconnects the supply to the motor. Switch off and allow the motor to cool down. About 20 minutes later the cut out will reset allowing normal operation.
Motor brushes or commutator worn (DC motor only)	Check motor commutator and brushes
Motor burned out.	This should not be possible - could happen by incorrect voltage of motor, or a motor fault. The motor needs a reasonable amount of free space to provide sufficient cooling airflow – check. The motor should be protected by fuses, check type and rating.
Wiper motor not fully engaged on coupling.	Slacken pinch bolt, move motor and/or wiper arm to align coupling and push motor into engagement with coupling. Retighten pinch bolt. Make sure that the rubber coupling is fitted
Carriage motion jammed.	It should be possible by pushing the blade arm to move the mechanism over the stroke length. Remove cover and check for obstructions. Check the Blade Arm Screws.
Drive pulley turning but belt slipping.	Excessive friction - Check carriage rollers and motor drive coupling. Replace as required. Idle pulley springs broken or missing. Replace.
Drive belt broken or damaged.	Inspect belt for slip or burn damage. Belt at end of life. Replace.
Idle pulley jammed.	Damaged by impact, or bearing system failed. Replace assembly.
Corrosion.	If corroded, check for water ingress through seals and tightness of connections, Replace wiper unit if necessary

*Problem: Wiper runs but at wrong speed*

**Possible Cause**

**Solution**

Ship's voltage incorrect.	Check voltage as near as possible to the motor, with motor running.
Motor brushes worn (DC Only)	Inspect brushes and replace as necessary.
High / Low speed wiring incorrect (3 Phase 2 Speed models only)	Check wiring complies with appropriate drawing.
One phase missing (3 Phase 2 Speed models only)	Check controller. Check ships fuses.

*Problem: Wiper runs but is noisy*

**Possible Cause**

**Solution**

Wiper arm is obstructed by: - Window frame, spray jets, etc.	If necessary gently bend arms or spray jets out of path of wiper arm.
Incorrect arm attachment screws.	These must not be longer than the 10mm screws provided by Wynn
Vibration of wiper unit	Check the front cover fixing screws are secure.
Arm attachment plate fouling on wiper case	Attachment screws not fully tightened - check. Blade arm or bracket bent out of place - check.

*Problem: Wiper does not clean the screen properly.*

**Possible Cause**

**Solutions**

Blade not in contact with screen.	Blade or arm bent - inspect and replace. Arm pivots seized due to corrosion - replace. Heaters ineffective allowing ice build up.
Weak springs on blade arm.	Stronger springs may be required. Contact Agent/Distributor
Broken springs on blade arm.	Investigate reason of failure and replace. Springs are good down to -40°C.
Blade rubber missing or damaged.	Maintenance item. Replace as required.

*Problem: Wiper does not park correctly*

**Possible Cause**

**Solution**

Park Sensor failed.	Check reed sensor action, will need tester (meter).
Park Sensor Actuator missing.	Check magnet/spacer arrangement on carriage.



*Problem: If fitted, heater does not become warm when switched on*

<b>Possible Cause</b>	<b>Solutions</b>
Fuse blown or circuit breaker tripped (if fitted).	Check for short-circuited heater, will need tester (meter). Check for wiring damage or loose wires. Check connections are good.
Heater failed.	Check for continuity, will need tester (meter).
Earth leakage circuit breaker trips.	It is common for earth leakage to rise if a heater has not been used for a while - if possible allow heater the warm up so to dry out. The heater's water seal or cable may be damaged allowing ingress of water - check and replace.
No power.	Check Controller.

*Problem: If fitted, little or no washer water comes out when button pressed.*

<b>Possible Cause</b>	<b>Solution</b>
Pump or supply pressure too low.	Check Ship's water supply, or pump for output pressure.
On reservoir systems, empty.	Check - refill.
Water control valve faulty or not operating.	Check solenoid valve continuity. Replace if open circuit.
Supply lines or jets blocked.	Try air purge, if available. Dismantle and flush pipes.
Water frozen.	Switch on heaters.

# TYPE C WIPER MAINTENANCE

Wynn products have been proven over many years to perform well under the harshest condition of use. To maintain their performance the following schedule is recommended:

## TOOLS REQUIRED:

- |       |                             |
|-------|-----------------------------|
| I.    | 4MM ALLEN KEY               |
| II.   | 5MM ALLEN KEY               |
| III.  | 6MM ALLEN KEY               |
| IV.   | 6MM SOCKET                  |
| V.    | 8MM SPANNER                 |
| VI.   | 10MM SPANNER                |
| VII.  | 10MM SOCKET                 |
| VIII. | 11MM SPANNER                |
| IX.   | 3MM FLAT BLADE SCREWDRIVER  |
| X.    | NO2 CROSS POINT SCREWDRIVER |

### *Every 6 Months*

#### *DC motors only*

1. Inspect the motor brushes. Remove motor end cover. Prevent brushes from running down to less than 6mm height in service. Brushes can be lifted out of their holder after lifting off the springs. Replace brushes back into same holder and in the same orientation. Ensure that the brush 'pig tails' is free and that the springs are correctly replaced.
2. When replacing brushes, carefully clear out any residual carbon dust from the motor.



**WARNING:** DO NOT INHALE THE CARBON DUST.

3. Inspect the motor commutator – it should still be bright. If it is blackened the motor should be replaced or serviced. This can be done with light cleaning with 'flour' paper, but not 'emery' paper.

### *Every 12 Months*

1. Check condition of the Articulated/Rigid Wiper Blade. Replace if necessary.
2. Check Heaters if fitted. If these have not been used for some time, then leave them on for approximately 2 hours.

**NOTE:** If not used for long periods, some mineral insulated heaters will take up moisture and begin to show current leakage to ground. By running them for the stated time this process can be reversed and the insulation returned to near infinity values. When dry, insulation resistance is > 100 M ohm at 500V.

3. Check the drive belt for deterioration. Replace if necessary.
4. Check carriage is smooth and all guide rollers are free to rotate. Inspect 'tyres' on the guide rollers for splitting / perishing. Replace complete roller if necessary.



**Caution:** Guide rollers have an integral dry bearing and MUST NOT be oil or grease lubricated.

5. Check for free movement of idler pulleys in response to belt tension. Lubricate as necessary with water resistant grease.

6. Ensure free movement of drive pulley. Replace if damaged or when showing signs of excessive wear.

**NOTE:** The drive pulley is jig assembled and should not be dismantled.

7. Check for free blade arm spring movement. Dismantle, re-grease or replace if necessary.

# TYPE C WIPER INSPECTION / RENEWAL OF PARTS



**WARNING:** To ensure health & safety, remove power from the control unit, before working on any parts of the wiper either inside or outside.

## TOOLS REQUIRED:

- I. 4MM ALLEN KEY
- II. 5MM ALLEN KEY
- III. 6MM ALLEN KEY
- IV. 6MM SOCKET
- V. 8MM SPANNER
- VI. 10MM SPANNER
- VII. 10MM SOCKET
- VIII. 11MM SPANNER
- IX. 3MM FLAT BLADE SCREWDRIVER
- X. NO2 CROSS POINT SCREWDRIVER

### *Blade Replacement*

1. Loosen the 2 x 8mm nuts on the blade attachment clip.
2. Slide the blade attachment clip and blade assembly off the wiper arm.
3. Re-assembly is reversal of above instructions.

### *Arm Replacement*

1. If Heaters are fitted disconnect from terminals to allow the cover to be removed from the wiper.

#### OUTSIDE

2. Remove any pipework fittings / blanking plugs from both ends of the wiper.
3. Slacken cable glands and withdraw heater cable from bulkhead.
4. Remove the 2 x M8 Cap head bolts at each end of the cover and set aside.
5. Carefully remove the cover and set aside.
6. Remove the 4 x M6x10mm screws securing the arm to the carriage plate. The arm and blade assembly is now free from the wiper, set both assembly and fasteners aside.
7. Slacken the blade clip bolts and remove blade. Set aside for reuse.
8. Re-assembly is reversal of above instructions.

### *Drive Belt*

1. If Heaters are fitted disconnect from terminals to allow the cover to be removed from the wiper.

#### OUTSIDE

2. Remove any pipework fittings from both ends of the wiper.
3. Slacken cable glands and withdraw heater cable from bulkhead.
4. Remove the 2 x M8 Cap head bolts at each end of the cover and set aside.

5. Carefully remove the cover and set aside.
6. Remove the 4 x M6x10mm screws securing the arm to the carriage plate. The arm and blade assembly is now free from the wiper, set both assembly and fasteners aside.
7. Slip the belt off the spring-loaded pulleys then slide the carriage/belt assembly out of the end of the case at the idler pulley end. Note: The assembly can be removed from the drive pulley end, but the park sensor will then need to be detached first (where fitted).
8. In multi wiper installations, if there is insufficient space between adjacent wipers to remove the carriage, then it will be necessary to draw the carriage / belt assembly through adjacent wiper cases, detaching park sensors where necessary.
9. Inspect the drive belt and replace if damaged or worn. To detach the drive belt, note how the parts are assembled, then undo the 2 small nuts securing the belt to the clip.
10. Fit a new belt. Spare belts are supplied with nuts and clip plate. Refit and tighten nuts to the same height as the original and secure with Loctite thread lock (or similar).
11. Fit the carriage & belt assembly back into the casing and slip the belt onto the drive & idler pulleys.
12. Move the carriage by hand and ensure that it travels the full stroke length freely and without any obstruction. (Motion will feel restricted because the motor is being rotated if in doubt discount the motor). Refit the blade assembly with special screws removed.
13. Refit the front cover and secure with the 2 off M8 cover bolts. Reconnect any pipework fittings removed in para 2, and heater cable if removed at para 1.

### *Guide Rollers*

1. Follow the Drive Belt renewal instructions 1 to 7 above.
2. Remove the M5 Nylock nut & flat washer securing the guide roller and remove the guide roller. M5 Nylock nuts & flat washers supplied with set of 8 guide rollers.
3. Fit the new guide roller and secure with the M5 Nylock nut & flat washer. Ensure that M5 Nylock nut is tightened firmly.
4. Re-assembly is reversal of above instructions.



**Caution:** Guide rollers have an integral dry bearing and **MUST NOT** be oil or grease lubricated.

### *Drive Shaft and Pulley Assembly*

1. Slacken the clamping bolt securing the motor to the drive shaft assembly, withdraw the motor from the shaft and set aside ensuring the black coupling is kept with the motor.
2. Follow the Drive Belt renewal instructions 1 to 6 above.
3. Remove the 2 screws securing the park switch to the wiper case, withdrawing the cable through the slot in the case. Keep screws and fittings safe.
4. Dismount wiper from bulkhead and set aside fixings.

5. Unbolt drive shaft and pulley assembly from the main body of the wiper and set the fixings aside.
6. Withdraw the assembly from the wiper body and discard.
7. Insert the new assembly onto the body. Re-assembly is reversal of the above instructions and in accordance with the standard wiper installation instructions elsewhere in the manual.

### *Wiper Motor Replacement*

1. Disconnect motor wiring and make a note of the connections.
2. Loosen motor pinch bolt and remove motor.
3. Ensure new motor has a rubber coupling fitted to the dog gear. Line up motor dog gear with drive shaft dog gear and slide motor into position. Tighten pinch bolt.
4. Wire to motor terminal connections.

### Type C Common Cover Wiper Spares List

Ident	Description	Quantity	Part Number
1a	Flat Blade Assembly	1	FB WSL ***
1b	Articulated Blade Assembly	1	SP1279-553-***
1c	Heavy Duty Dual Blade Assembly	1	805201-***
2	Blade Attachment Clip (14mm Articulated Blade & FB)	1	SP1279-493
	Blade Attachment Clip (20mm Articulated Blade)	1	SP1279-532
3	Blade Arm Assembly	1	CC**#R
4	Blade Arm Torsion Spring	1	SP1292-221
4a	Arm Spring(s) - where fitted at top of arm ‡	A/R	1279-157
5	Blade Arm Pivot Blocks	1 Kit/arm	SP1279-486-#.#
6	Arm Attachment Screws	Set of 4	SP1588-488
7	Carriage Plate Assembly – Single Blade	1	SP1588-005-M
	Carriage Plate Assembly – Twin Blade	1	SP1588-312-***
8	8 Guide Rollers C/W Nuts	Set of 8	SP1588-117
	Guide Roller Assy	1	SP1588-006
10	Connecting Rod Assembly – Single	1	SP1588-474
	Connecting Rod Assembly – Twin Blade	1	SP1588-474T
11	Vee-Belt	1	SP1279-106-###
12	Idler Pulley Assembly c/w Springs (Single Blade)	1	SP1588-452
	Idler Pulley Assembly c/w Spring (Twin Blade)	1	SP1588-452T
13	Idler Pulley Tension Spring (Single Blade)	Set of 2	SP1279-157
	Idler Pulley Tension Spring (Twin Blade)	Set of 2	SP1279-496
14	Idler Pulley Guide Assembly	1	SP1588-490
15	Drive Shaft and Pulley Assembly - 84mm Std	1	SP1588-009-117
	Drive Shaft and Pulley Assembly - 140mm	1	SP1588-009-173
	Drive Shaft and Pulley Assembly - 200mm	1	SP1588-009-233
	Drive Shaft and Pulley Assembly - 220mm	1	SP1588-009-253

Ident	Description	Quantity	Part Number
	Drive Shaft and Pulley Assembly - 240mm	1	SP1588-009-273
	Drive Shaft and Pulley Assembly - 310mm	1	SP1588-009-310A
	Drive Shaft and Pulley Assembly - 35mm	1	SP1642-003
	Gas Tight Drive Shaft and Pulley Assembly Std	1	SP1588-030-117
	Gas Tight Drive Shaft and Pulley Assembly 140mm	1	SP1588-030-173
	Gas Tight Drive Shaft and Pulley Assembly 200mm	1	SP1588-030-233
17a	Parvalux 61, 115V AC, 50/60Hz, 3-Ph, 2 Speed	1	SP1490-000GA61
	Parvalux 62D+, 230V AC, 50/60Hz, 3-Ph, 2 Speed	1	SP1490-000GA62D
	Parvalux 64-T, 230V AC, 50/60Hz, 1-Ph, 1 Speed	1	SP1490-000GA64
	Parvalux 64L, 230V AC, 50/60Hz, 1-Ph, Low Speed	1	SP1490-000GA64L
	Parvalux 65, 115V AC, 50/60Hz, 1-Ph, 1 Speed	1	SP1490-000GA65
	Parvalux 65L, 115V AC, 50/60Hz, 1-Ph, Low Speed	1	SP1490-000GA65L
	Parvalux 81, 115V AC, 3 Speed	1	SP1490-000GA81
	Parvalux 82, 220V AC, 3 Speed	1	SP1490-000GA82
17c	PM3M 24Vdc Motor	1	SP1279-558-24
	PM3M 24Vdc Motor Slow Speed	1	SP1279-558L-24
18	Front Cover - Less Heater	1	See calculator 1681-161
19	Heater - Single Wiper	1	SP1588010\$\$\$^
19a	Heater Clip	A/R	SP1588-056
20	Spray Tube Assembly	1	SP1588-418
21	Cover Bolts	each	zA0008-090S
22	End Cover Left Hand	each	SP1588-058L*
	End Cover Right Hand	each	SP1588-058R*
23a	Fixing Screw	6	zP00012S-1.0S
23b	Blanking Plug	2	1588-062
23c	Metric Pipe Fitting	1	1588-038
23d	Tubing Plug	1	1588-037



Ident	Description	Quantity	Part Number
24	Self-Parking Assembly (Reed sw and magnet) 2m	1	SP1588-012-1
	Self-Parking Assembly (Reed sw only) 2m	1	SP1587-034-1
25	Main Frame	1	See calculator 1681-161
26	Motor Housing Nut	each	10015100
27	Motor Housing Washer	each	10025306B
28	Motor Housing Bolt	each	zA0006-020S
29	Pivot Block Securing Nut	2	zNL0.25F-S
not shown	Wash Fittings SLW Single	1	SP1588-672
not shown	Wash Fittings SLW Twin	1	SP1588-673
not shown	Wash Fittings SLW Single Long	1	SP1588-674
not shown	Drive Coupling – fitted inside Drive Shaft	1	SP1279-250
not shown	L050 Rubber Spider – fitted to Drive Coupling	1	SP1279-252
not shown	Sealing Grommet – fitted around Drive Shaft	1	SP1279-137
not shown	Sealing Grommet Spacer– fitted around Drive Shaft	1	SP1588-745

\*\*\* In the Part Number means length in mm.

\*\*# In the Part Number means length in cm and arm spring pressure code.

## In the Part Number means spring pressure in lb/ft. This is determined by Wynn according to arm and blade dimensions, together with any window rake angle from the vertical. This value can also be obtained from the original order documentation. See Wynn Agent for more details.

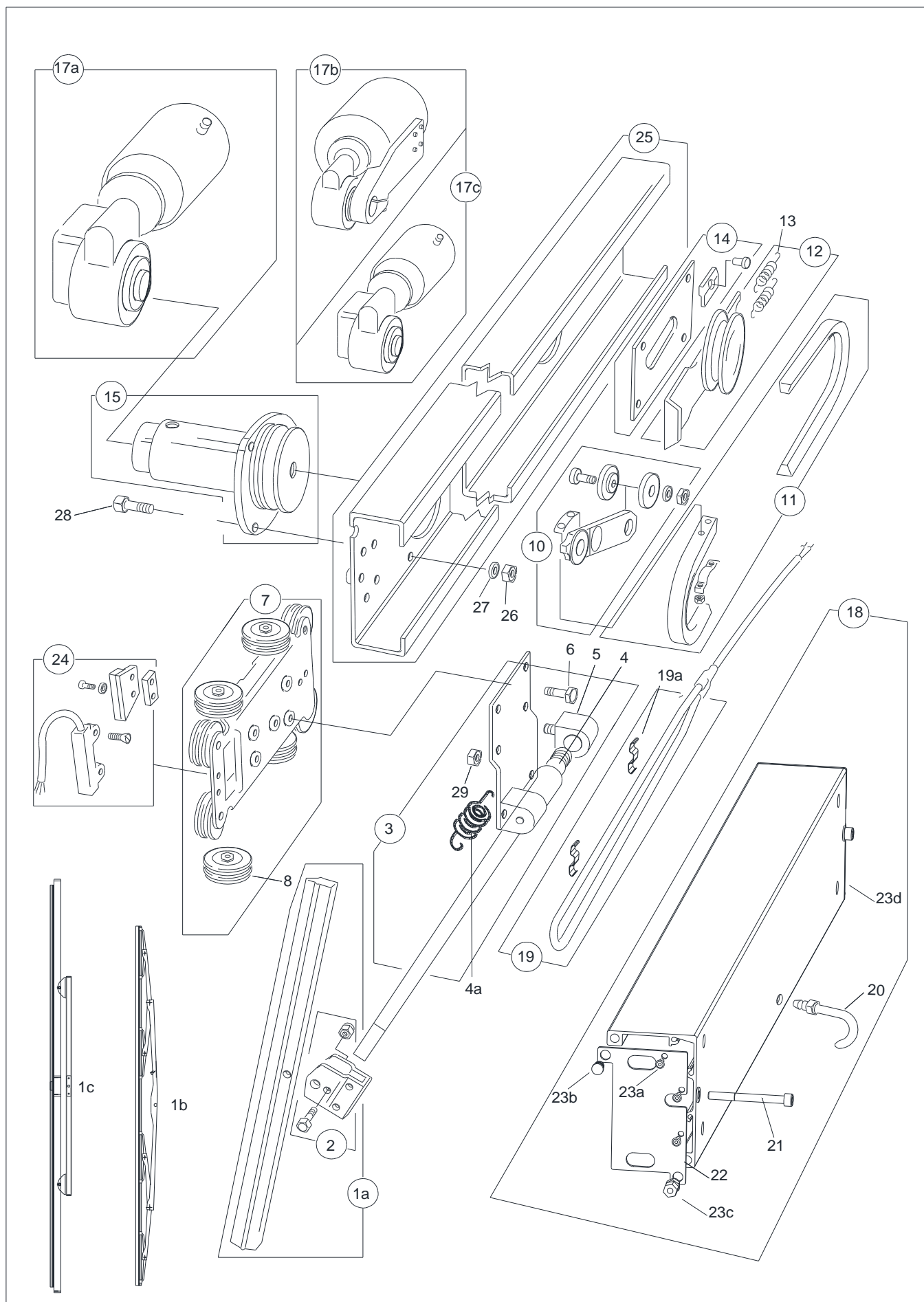
### Belt length (written on belt as A####) in Inches.

‡ Where required, extra spring pressure is obtained by the addition of 1 or 2 springs to the wiper arm. Where fitted, order 1 or 2 as required. Contact Wynn Agent for more details.

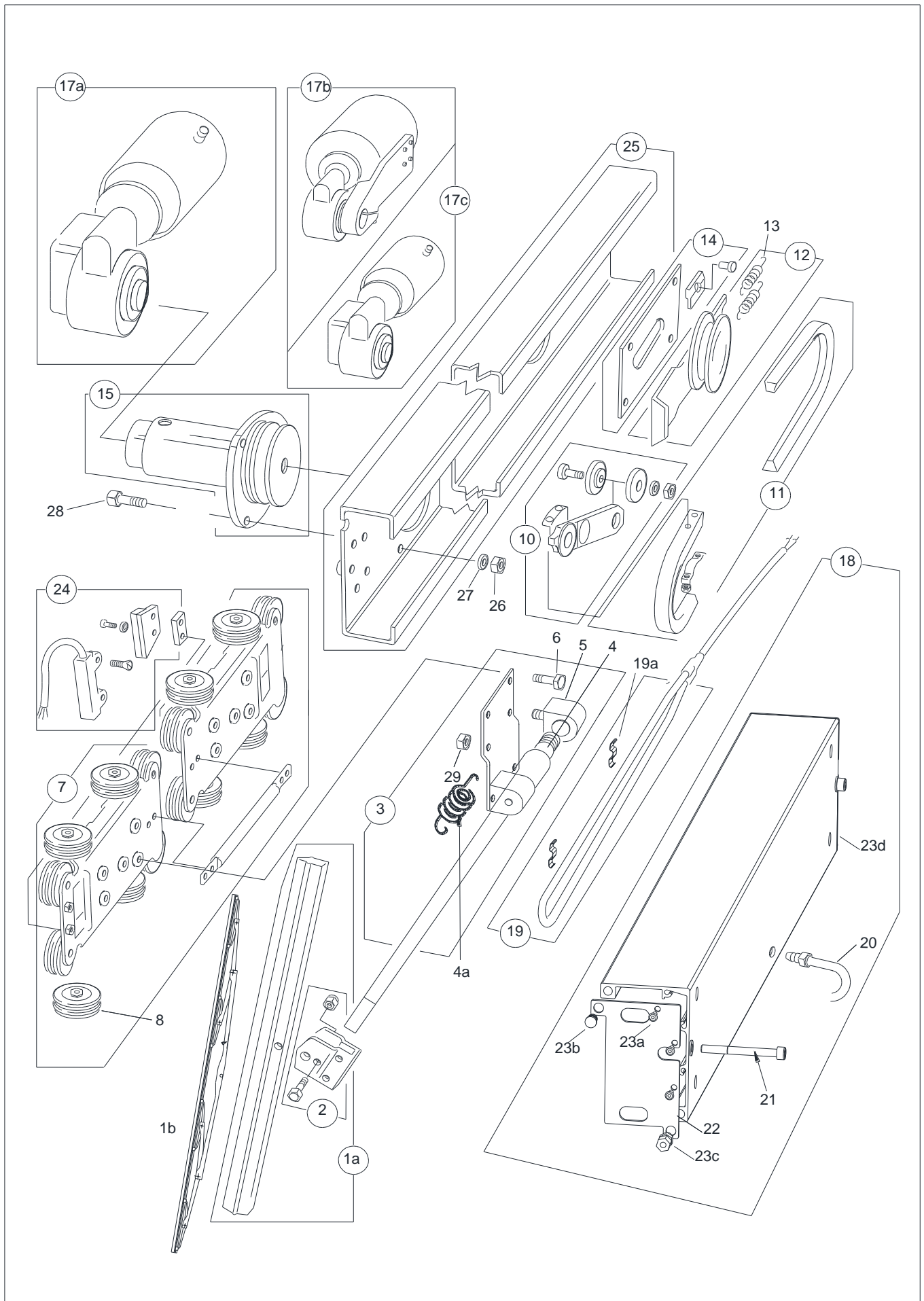
\$\$\$ Where \$\$\$ is voltage (220,115 or 024)

^^ Where ^ is heater length code.

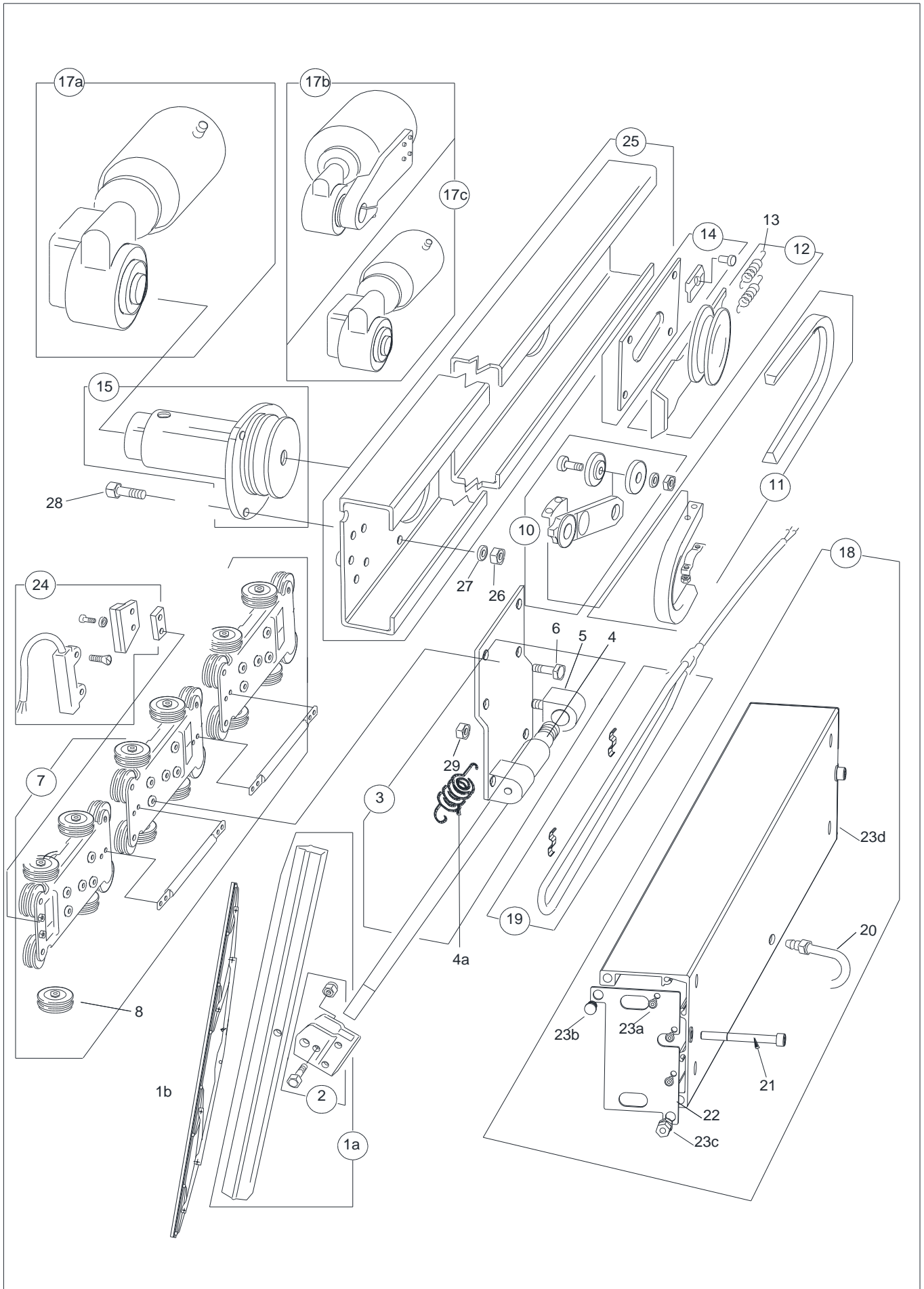
## Type C Common Cover Single Spare Parts Drawing



# *Type C Common Cover Twin Spare Parts Drawing (Short)*



## Type C Common Cover Twin Spare Parts Drawing (Long)



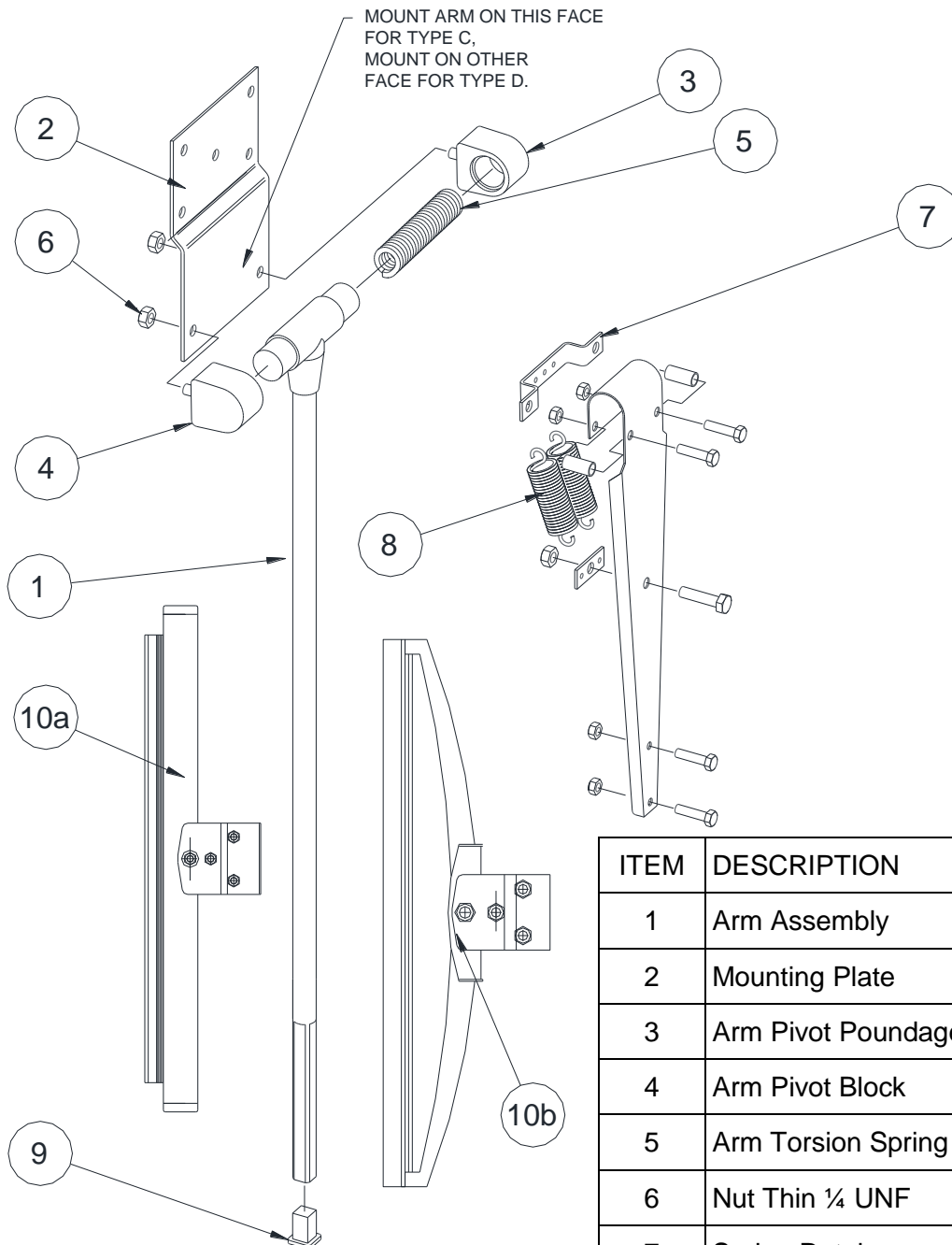
## SLW Wiper Arm

The wiper arm is manufactured from stainless steel.

The wiper arm is shown below. One wiper arm assembly is used on a single bladed wiper, two wiper arm assemblies on a twin bladed wiper and three wiper arm assemblies on a triple bladed wiper unit.

The wiper arm assembly mounts on to the wiper assembly carriage plate. The wiper arm is secured to the carriage plate via four 10mm long mounting bolts.

The blade is secured to the arm assembly using the blade clip arrangement fitted to the wiper blade.



ITEM	DESCRIPTION	QTY
1	Arm Assembly	1
2	Mounting Plate	1
3	Arm Pivot Poundage Block	1
4	Arm Pivot Block	1
5	Arm Torsion Spring	1
6	Nut Thin ¼ UNF	2
7	Spring Retainer	1 (A/R)
8	Additional Spring	(0, 1, 2)
9	Sealing Plug	1
10a	Flat Blade	1
10b	Articulated Blade	

# QUICK FIT SLW WIPER ARM INSTALLATION

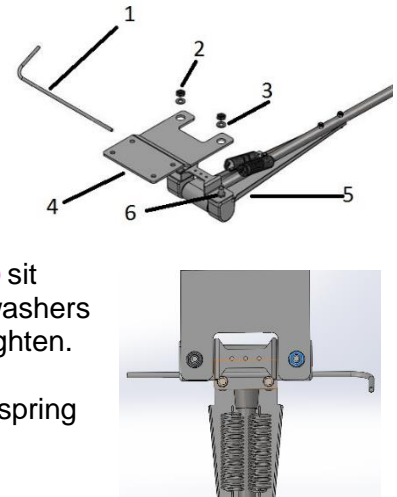


**CAUTION:** Ensure that the correct wiper, blade and arms are selected for each window. The wiper arm should not be installed/removed without the spring retaining pin fitted.

## *Installation*

**NOTE:** The wiper unit should be supplied with the arm mounting plate (4) already fitted. If it is not fitted, remove 2 x ¼ UNF Thin Nuts (2) and 2 x M6 washers (3) from the pivot block threads and remove the wiper arm sub assembly (5) from the arm mounting plate (4). Fit the arm mounting plate (4) to the wiper unit before installing the wiper unit.

1. Remove 2 x ¼ UNF Thin Nuts (2) and 2 x M6 washers (3) from the pivot block threads.
2. Fit the wiper blade to the wiper arm sub assembly (5), ensuring that the captive end of the wiper is at the top.
3. Fit the wiper arm sub assembly (5) to the arm mounting plate (4) ensuring that the wiper arm sub assembly pivot block nuts (6) sit inside the holes in the arm mounting plate (4). Refit the 2 x M6 washers (3) and 2 x ¼ UNF Thin Nuts (2) to the pivot block threads and tighten.
4. Gently lift the wiper arm away from the window and remove the spring retaining pin (1). Keep safe for future use.



## *Arm Removal/Replacement*

### *Removal*

1. Gently lift the wiper arm away from the window and insert the spring retaining pin (1).
2. Remove 2 x ¼ UNF Thin Nuts (2) and 2 x M6 washers (3) from the pivot block threads. Keep safe for future use.
3. Remove the wiper arm sub assembly (5) from the arm mounting plate (4).

### *Replacement*

1. Fit the wiper arm sub assembly (5) to the arm mounting plate (4) ensuring that the wiper arm sub assembly pivot block nuts (6) sit inside the holes in the arm mounting plate (4). Refit the 2 x M6 washers (3) and 2 x ¼ UNF Thin Nuts (2) to the pivot block threads and tighten.
2. Gently lift the wiper arm away from the window and remove the spring retaining pin (1). Keep safe for future use.

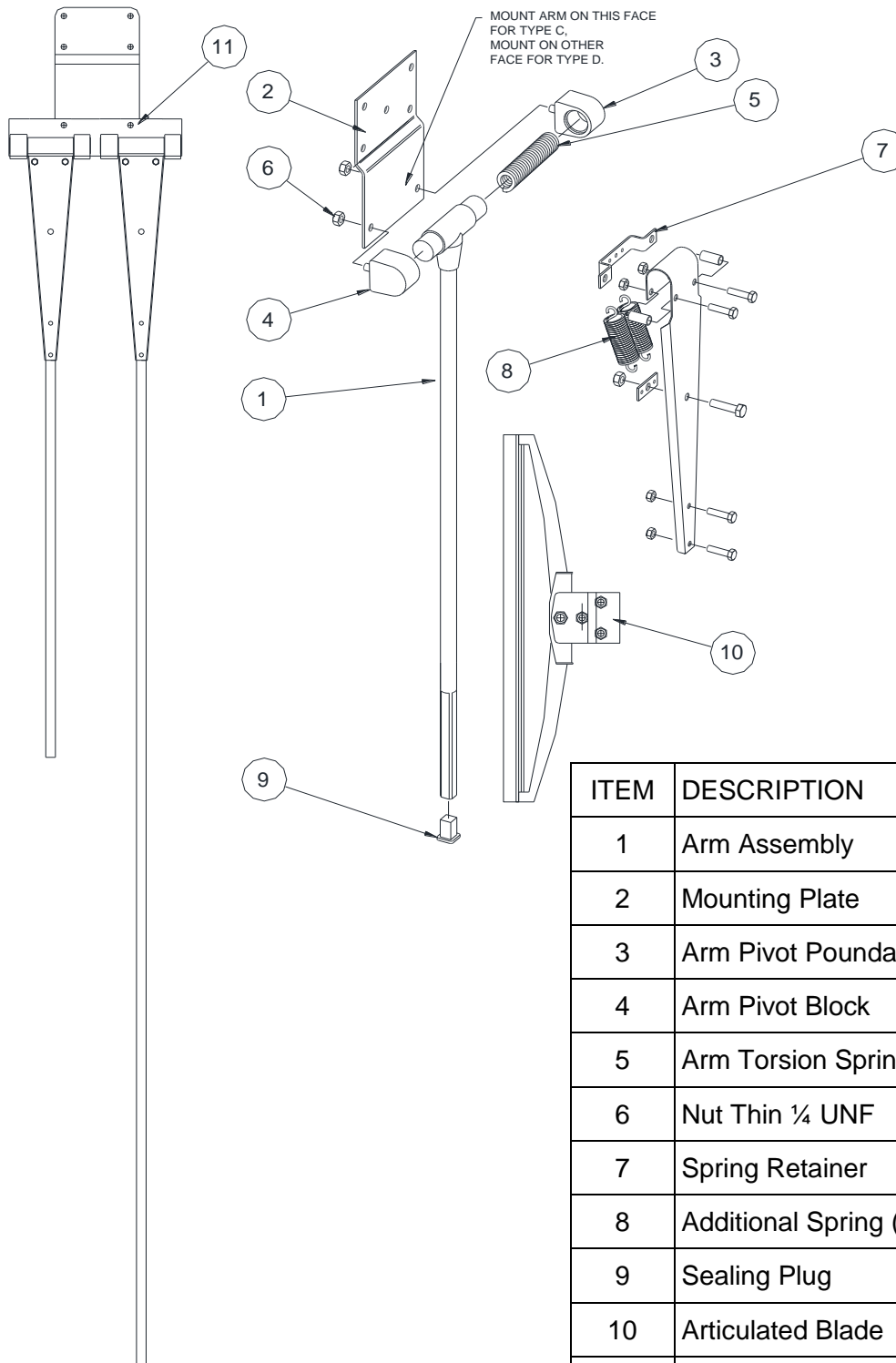
## SLW Double Wiper Arm Assembly

The wiper arm is manufactured from stainless steel.

The wiper arm is shown below. One wiper arm assembly is used on a single bladed wiper, two wiper arm assemblies on a twin bladed wiper.

The double wiper arm mounting plate is secured to the wiper arm mounting plate with two bolts, washers and nuts. The complete wiper arm assembly mounts on to the wiper assembly carriage plate. The wiper arm is secured to the carriage plate via four 10mm long mounting bolts.

The blade is secured to the arm assembly using the blade clip arrangement fitted to the wiper blade.



ITEM	DESCRIPTION	QTY
1	Arm Assembly	2
2	Mounting Plate	1
3	Arm Pivot Poundage Block	2
4	Arm Pivot Block	2
5	Arm Torsion Spring	2
6	Nut Thin ¼ UNF	4
7	Spring Retainer	2(A/R)
8	Additional Spring (per arm)	(0, 1, 2)
9	Sealing Plug	2
10	Articulated Blade	2
11	Double Arm Mtg Plate	2

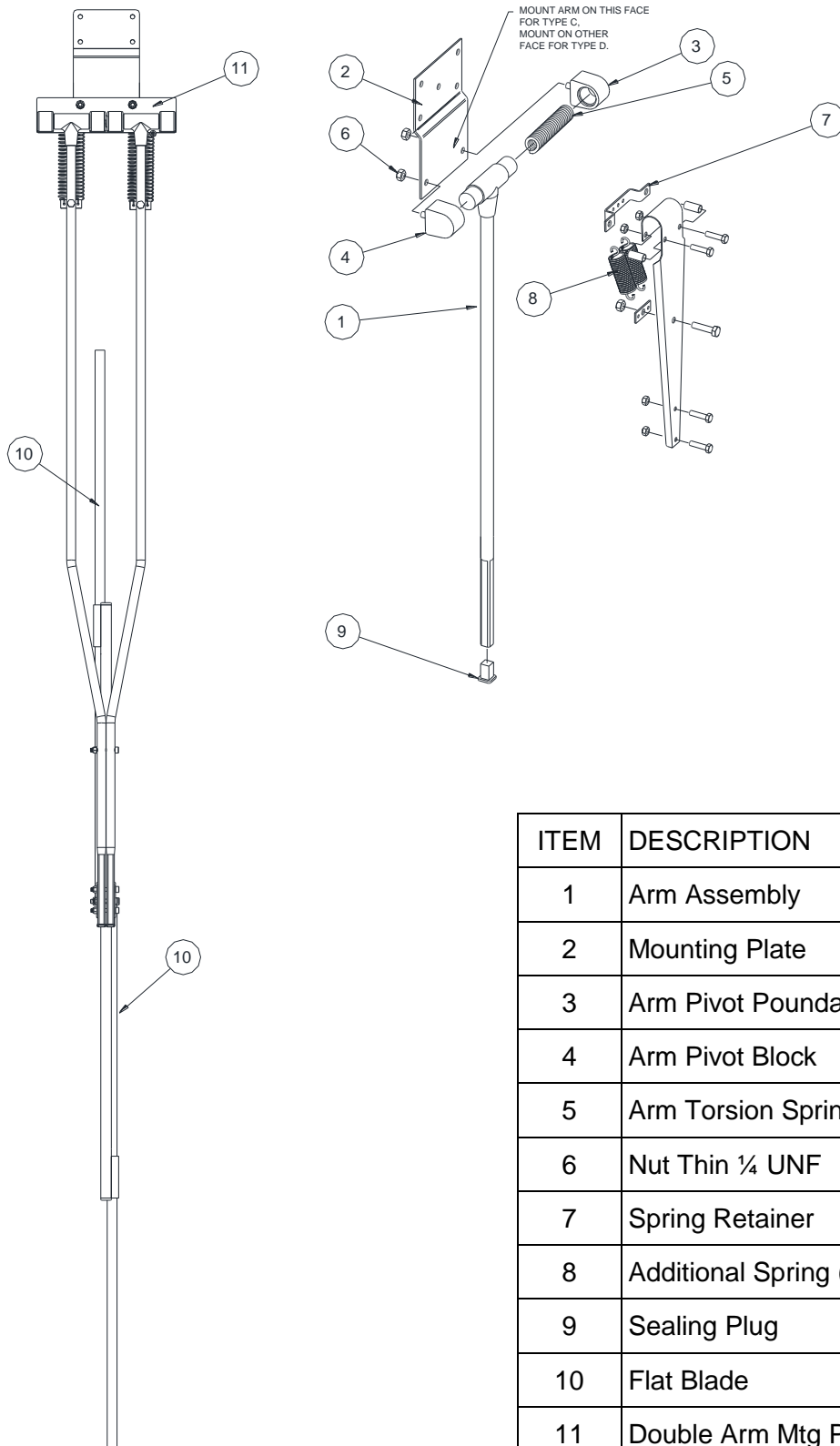
## SLW Heavy Duty Wiper Arm Assembly

The wiper arm is manufactured from stainless steel.

The wiper arm is shown below. One wiper arm assembly is used on a single bladed wiper.

The heavy duty wiper arm mounting plate is secured to the wiper arm mounting plate with two bolts, washers and nuts. The complete wiper arm assembly mounts on to the wiper assembly carriage plate. The wiper arm is secured to the carriage plate via four 10mm long mounting bolts.

The blade is secured to the arm assembly using the blade clip arrangement fitted to the wiper blade.



ITEM	DESCRIPTION	QTY
1	Arm Assembly	2
2	Mounting Plate	1
3	Arm Pivot Poundage Block	2
4	Arm Pivot Block	2
5	Arm Torsion Spring	2
6	Nut Thin ¼ UNF	4
7	Spring Retainer	2(A/R)
8	Additional Spring (per arm)	(0, 1, 2)
9	Sealing Plug	2
10	Flat Blade	2
11	Double Arm Mtg Plate	2



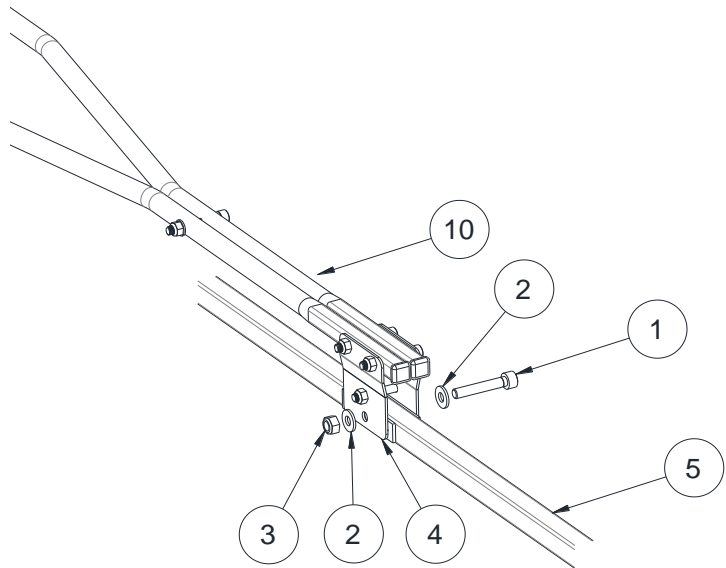
# FITTING THE WIPER BLADE CARRIER

The wiper blades should be changed every 12 months but this is dependent on use and operating conditions

## Ref Figure – Dual Blade Clip

1. Remove one M6 blade retaining bolt (1), two M6 flat washers (2), and M6 Nylock nut (3), from blade clip on double wiper arm assy (10).
2. Place dual blade carrier assy (5), into blade clip on Arm (10).
3. Ensure that all fixing holes align.
4. Secure in place with one M6 blade retaining bolt (1), two M6 flat washers (2), and M6 Nylock nut (3).

Figure – Dual Blade Clip



## IMPORTANT

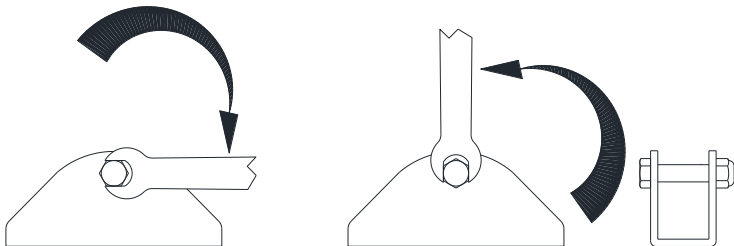
**DO NOT** over tighten blade carrier retaining bolt and nut, as blade carrier is required to pivot on glass.

## Ref Figure – Nut Tightening

5. Secure nut until tight – then 1/4 turn back

Figure – Nut Tightening

Secure nut  
until tight      1/4 turn back



## NOTE

*Pictorial representation only, May not be exact to supplied arm*

EXAMPLE  
NUMBER

D 5 1 1 1 1 A 1 C E B A 1 A - -

WIPER TYPE	CODE
D1	D1
D2	D2
D3	D3
D4	D4
D5	D5
C1	C1
C2	C2
C3	C3
C4	C4
C5	C5
C6	C6
C7	C7
C8	C8
C9	C9

STROKE TYPE	CODE
Single	1
Twin	2
Special Twin Case (Non-std crs)	Q
Special Single (See Instructions)	S
Special Twin (See Instructions)	T
Type C Single Old Style Cse/Cvr	3
Type C Single Old Style Cse/Cvr	4
Type C Twin Old Style Cse/Cvr	5
Type D Twin Old Style Cse/Cvr	6
Type 76 Converted to Type D	7

TWIN STROKE LENGTH STANDARD			
1 INCH (25MM) STROKE OVERLAP			
INCHES	MILLIMETRES	CODE	
2 X 13	2 X 330	13	
2 X 14	2 X 356	14	
2 X 15	2 X 380	15	
2 X 16	2 X 407	16	
2 X 17	2 X 430	17	
2 X 18	2 X 457	18	
2 X 19	2 X 480	19	
2 X 20	2 X 510	20	
2 X 21	2 X 533	21	
2 X 22	2 X 558	22	
2 X 23	2 X 583	23	
2 X 24	2 X 610	24	
2 X 25	2 X 635	25	
2 X 26	2 X 660	26	
2 X 27	2 X 685	27	
2 X 28	2 X 710	28	
2 X 29	2 X 735	29	
2 X 30	2 X 760	30	
2 X 31	2 X 787	31	
2 X 32	2 X 810	32	
2 X 33	2 X 835	33	
2 X 34	2 X 865	34	
2 X 35	2 X 890	35	
2 X 36	2 X 915	36	
2 X 37	2 X 940	37	
2 X 38	2 X 965	38	
2 X 39	2 X 990	39	
2 X 40	2 X 1015	40	
2 X 41	2 X 1040	41	
2 X 42	2 X 1065	42	
2 X 43	2 X 1095	43	
2 X 44	2 X 1145	44	
2 X 45	2 X 1195	45	
2 X 46	2 X 1245	46	
2 X 47	2 X 1295	47	
2 X 48	2 X 1345	48	
2 X 49	2 X 1395	49	
2 X 50	2 X 1445	50	
2 X 51	2 X 1495	51	
2 X 52	2 X 1545	52	
2 X 53	2 X 1595	53	
2 X 54	2 X 1645	54	
2 X 55	2 X 1695	55	
2 X 56	2 X 1745	56	
2 X 57	2 X 1795	57	
2 X 58	2 X 1845	58	
2 X 59	2 X 1895	59	
2 X 60	2 X 1945	60	
2 X 61	2 X 1995	61	
2 X 62	2 X 2045	62	
2 X 63	2 X 2095	63	
2 X 64	2 X 2145	64	
2 X 65	2 X 2195	65	
2 X 66	2 X 2245	66	
2 X 67	2 X 2295	67	
2 X 68	2 X 2345	68	
2 X 69	2 X 2395	69	
2 X 70	2 X 2445	70	
2 X 71	2 X 2495	71	
2 X 72	2 X 2545	72	
2 X 73	2 X 2595	73	
2 X 74	2 X 2645	74	
2 X 75	2 X 2695	75	
2 X 76	2 X 2745	76	
2 X 77	2 X 2795	77	
2 X 78	2 X 2845	78	
2 X 79	2 X 2895	79	
2 X 80	2 X 2945	80	
2 X 81	2 X 2995	81	
2 X 82	2 X 3045	82	
2 X 83	2 X 3095	83	
2 X 84	2 X 3145	84	
2 X 85	2 X 3195	85	
2 X 86	2 X 3245	86	
2 X 87	2 X 3295	87	
2 X 88	2 X 3345	88	
2 X 89	2 X 3395	89	
2 X 90	2 X 3445	90	
2 X 91	2 X 3495	91	
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2 X 93	2 X 3595	93	
2 X 94	2 X 3645	94	
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2 X 174	2 X 7645	174	
2 X 175	2 X 7695	175	
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2 X 185	2 X 8195	185	
2 X 186	2 X 8245	186	
2 X 187	2 X 8295	187	
2 X 188	2 X 8345	188	
2 X 189	2 X 8395	189	
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2 X 212	2 X 9545	212	
2 X 213	2 X 9595	213	
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2 X 215	2 X 9695	215	
2 X 216	2 X 9745	216	
2 X 217	2 X 9795	217	
2 X 218	2 X 9845	218	
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2 X 322	2 X 15045	322	
2 X 323	2 X 15095	323	
2 X 324	2 X 15145	324	
2 X 325	2 X 15195	325	
2 X 326	2 X 15245	326	
2 X 327	2 X 15295	327	
2 X 328	2 X 15345	328	
2 X 329	2 X 15395	329	
2 X 330	2 X 15445	330	

EXAMPLE  
NUMBER

5

1	1	*
---	---	---

*	9	B	*
---	---	---	---

1	A	*	*
---	---	---	---

1	1	*
---	---	---

A	1	*
---	---	---

$\square \cdot *$

COVER/ CASE	CODE
COVER	-1
CASE	-2
COVER	-3
old style C	
COVER	4
old style D	

TWIN STROKE		LENGTH	STANDARD
1 INCH (25mm)		STROKE OVERLAP	
INCHES	MILLIMETRES	CODE	
2 X 13	2 X 330	13	
2 X 14	2 X 356	14	
2 X 15	2 X 380	15	
2 X 16	2 X 407	16	
2 X 17	2 X 430	17	
2 X 18	2 X 457	18	
2 X 19	2 X 480	19	
2 X 20	2 X 510	20	
2 X 21	2 X 533	21	
2 X 22	2 X 558	22	
2 X 23	2 X 585	23	
2 X 24	2 X 610	24	
2 X 25	2 X 635	25	
2 X 26	2 X 660	26	
2 X 27	2 X 685	27	
2 X 28	2 X 710	28	
2 X 29	2 X 735	29	
2 X 30	2 X 760	30	
2 X 31	2 X 787	31	
2 X 32	2 X 810	32	
2 X 34	2 X 865	34	
2 X 36	2 X 915	36	
2 X 40	2 X 1015	40	
2 X 41	2 X 1040	41	
2 X 43	2 X 1095	43	
2 X 45	2 X 1145	45	
2 X 47	2 X 1195	47	
2 X 49	2 X 1245	49	
2 X 52	2 X 1335	52	
2 X 57	2 X 1450	57	
2 X 61	2 X 1560	61	
2 X 67	2 X 1700	67	
2 X 71	2 X 1800	71	
2 X 76	2 X 1930	76	
2 X 79	2 X 2005	79	
SPECIAL TWIN		ST	
(for twins, eg: 2x24" is shown as 24 with the 2 being stated at the previous part number digit)			

12	305
15	350
17	430
19	480
21	533
23	585
25	635
27	685
29	735
31	787
33	840
35	890

HEATER CABLE LENGTH CODE	Not Supplied -0
	<b>2 Metres -1</b>
	3 Metres -7
	5 Metres -2
	6 Metres -8
	8 Metres -9
	10 Metres -3
	15 Metres -A
	20 Metres -4
	25 Metres -5
	Terminated
	In Enclosure -6

PARKING	CODE
Parking Not Filled	0
<b><u>Standard Drive End Parking</u></b>	
Normally open	) - A
Reed Switch (TYPE D)	
Normally open	) - B
Reed Switch (TYPE C)	
Proximity Switch (TYPE D)	- J
<b><u>Non-Standard Drive End Parking</u></b>	
Proximity Switch (TYPE D)	- G
Reed Switch Change over (Special Type C)	- C
<b><u>Standard Idler End Parking</u></b>	
Normally open	) - D
Reed Switch (TYPE D)	
Normally Open	) - E
Reed Switch (Type C)	)
<b><u>Non-Standard Idler End Parking</u></b>	
Proximity Switch (Type D)	- H
Reed Switch c/over (Special Type C)	- F

SPRAY	CODE
No Spray	-0
<u>Std Spray Fitted</u>	<u>-1</u>
Spray Std + Banjo	-2
Spray Jet S/Steel	-3
150mm Spray Jet	-4
SEE INST	-S

NOTE:  
 SPRAY FITTED TO COVERS  
 ONLY  
 NO SPRAY ON 80, B OR 48

WINDOW  
HANDING

Not Supplied -0

LEFT	-1
------	----

RIGHT      -2

(above window)

MOUNTING	CODE
Std Boss - 24 O/A (1586-057)	A
Boss - 26 O/A (1586-820)	B
Bracket (1586-870 - Type C) (1642-870 - Type D)	C
<del>Universal Carrier (1586-874 - Type C) (1642-874 - Type D)</del>	D (DO NOT USE)
Boss - 64 O/A (1586-057-460)	E
Quick Release - No Plug (1642-468)	F
Quick Release and CVN Plug (1642-468) + (A-ELEC-701)	G
QUICK RELEASE ONLY (1586-647)	H
C-SHAPED BRACKET (1586-874 - Type C) (1642-874 - Type D)	J

WIPER SPARE  
CASE/COVER  
PART NUMBERS

CAD FILENAME + DIRECTORY M:\DRAW\1681\1681-161.DWG										USED ON:		
										MOD STATUS		
30	S1702	17.10.11	40	S21993	15.12.16	35	S7760	21.08.13				
29	S618	10.05.11	39	S21025	14.12.16	34	S6646	18.04.13				
28	S448	19.04.11	38	S21726	24.11.16	33	S6249	07.03.13				
27	11-134	08.03.11	37	S15178	30.07.2015	32	S2930	16.03.12				
41	S23510	03.05.17	36	S11968	16.10.2014	31	S2641	15.02.12				
MAT'L:-		ISS.	DIN	DATE	ISS.	DIN	DATE					
FINISH:-		SCALE:-	DRAWN:-	DD	CHKD:-							

3rd ANGLE PRO.

TOLERANCES UNLESS OTHERWISE STATED  
 DECIMAL DIMS. TO 2 PLACES ± 0.1mm.  
 DECIMAL DIMS. TO 1 PLACE ± 0.25mm  
 NO DECIMAL PLACES ± 0.5mm  
 ANGLES ± 1°

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**VYNN**

**MARINE LIMITED**

CHEL TENHAM ENGLAND

TITLE:-

STRAIGHT LINE WIPER COVER/CASE  
SPARES PART NUMBER OPTIONS

DRAWING No. 1681-161

SHEET 2 OF 2

# SERIES 2000 CONTROL UNIT

Series 2000 controllers are available in units from 1 – 6 ways. They allow direct connection of the wiper motor without the need for intermediate power supplies. Wipers can be individually controlled or Group controlled by the Master Control Switch. Wipers are synchronised when in intermittent mode.

AC supply voltages at the controller input with wiper running should be within +/- 10%. The DC supply for electronic components is either generated by an internal 24V power supply or from an external source (model dependent).

The system complies with all relevant safety and EMC regulations.

For 24VDC controllers (2-6 way) external contactors **MUST** be fitted between the controller and wiper case heaters.

## *Installation of Controller*



Installation of the control unit and wiper must be done by a competent electrician.

1. Cut out and de-burr a hole in the console, relevant to the sizes shown in the table below.

Controller Type	Panel cut out (mm)	Overall size (mm)	Fixing Holes Location (mm)
1-way	86 x 107	95 x 135	81 x 121
2-way	167 x 107	175 x 135	161 x 121
3-way	167 x 107	175 x 135	161 x 121
4-way	167 x 222	175 x 270	159 x 254
5-way	167 x 222	175 x 270	159 x 254
6-way	167 x 222	175 x 270	159 x 254

2. Remove the connector(s) from the rear of the unit.
3. Fit the unit into the mounting hole and secure with 4 off M4 screws or similar.
4. Fit the DIN rail mounting wiper case heater contactors in a suitable location close to the control unit. (24VDC unit only, if supplied)
5. Connect wiring to the removed connectors according to the appropriate wiring diagram.
6. Connect wiring between wiper heater contactors, control unit and wiper unit.
7. Reconnect the connectors to the rear of the controller, taking care to fit into the correct channel.

## *Operating Instructions*

To operate the wiper, turn the wiper operation switch clockwise one position to select Intermittent wipe, turn a further position for low speed or fully clockwise for high speed operation if it is a 3 phase 2 speed version.

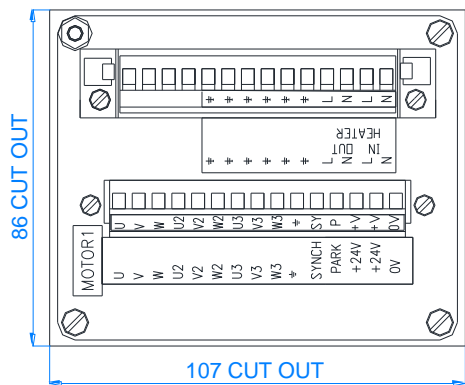
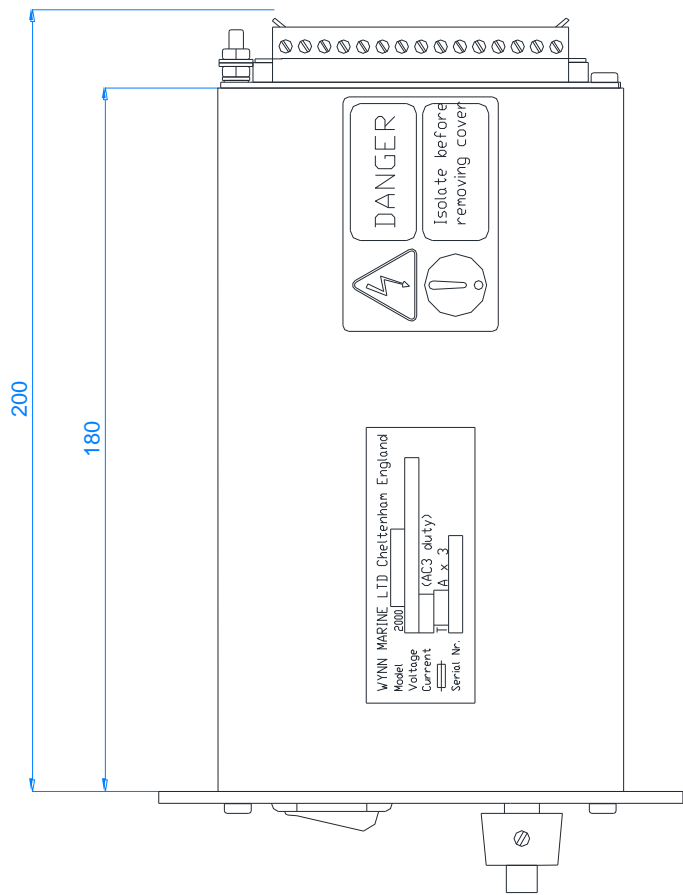
To park the wipers, turn the switch fully anticlockwise. The wipers will complete their current wipe and then park.

The intermittent switch has 15 positions; each turn clockwise decreases the delay between wipes, from 32 seconds down to 4 seconds.

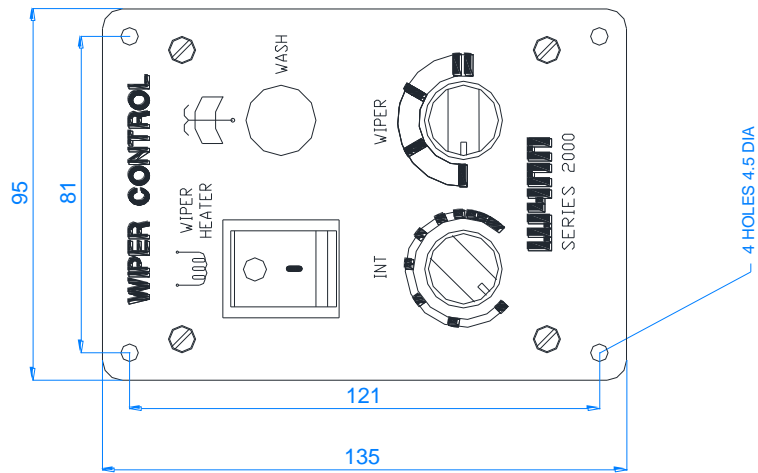
## *Functional Test*

1. Set the wiper switch to the off position (fully anti-clockwise). Set the Intermittent switch to the shortest time increment (fully clockwise). Apply power to the system. Check each wiper switch in turn as follows:
2. Switch to Intermittent mode, the first clockwise position. The wiper will immediately make one wipe returning to the park position. After 4 seconds the wiper will make one wipe and park.
3. Switch control to continuous speed (second clockwise position). The wiper will operate continuously. Slow speed in 3-phase application. Fast speed in 1-phase applications.
4. Switch into fully clockwise position. Fast speed in 3-phase 2 speed AC systems only.
5. Heaters. Switch on and ensure that the wipers begin to heat up.
6. Wash / Wipe. Switch on and hold down and ensure water is sprayed through the system.

# SERIES 2000 CONTROLLER ONE WAY DIMENSIONS



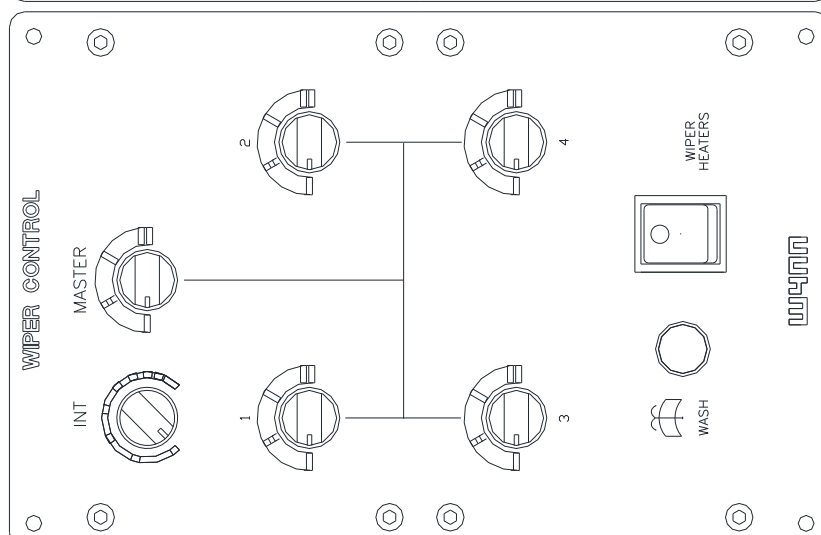
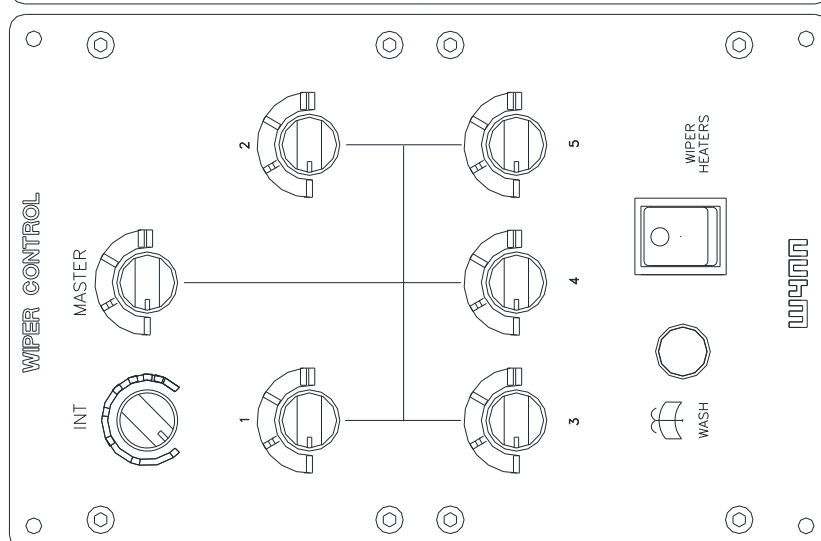
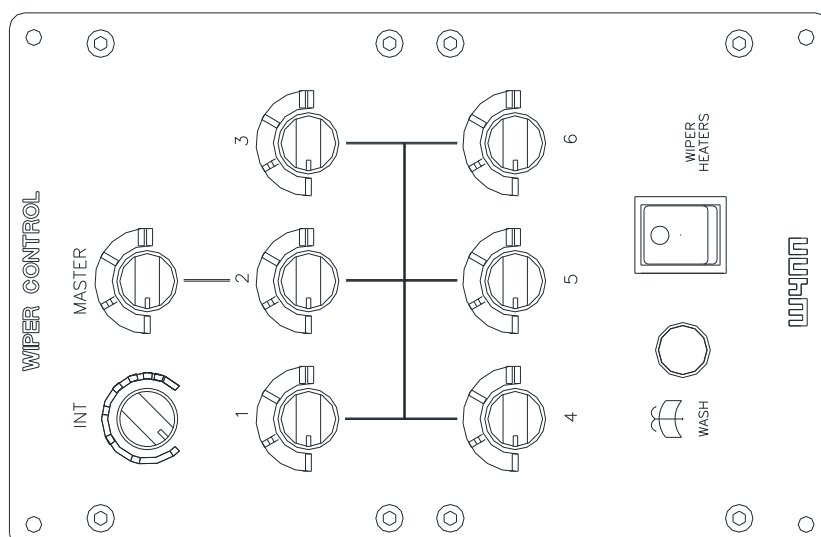
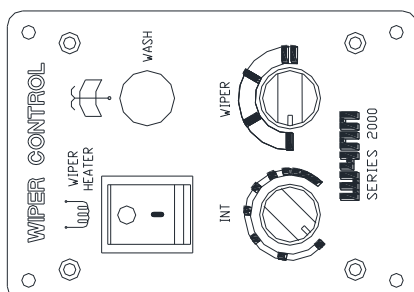
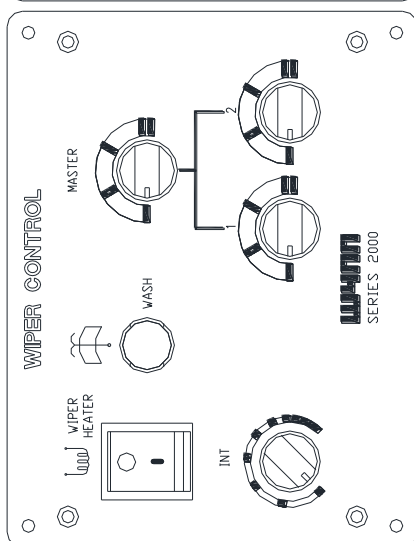
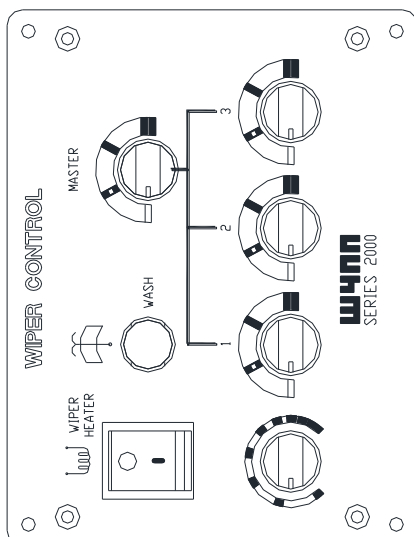
VIEW ON REAR OF UNIT

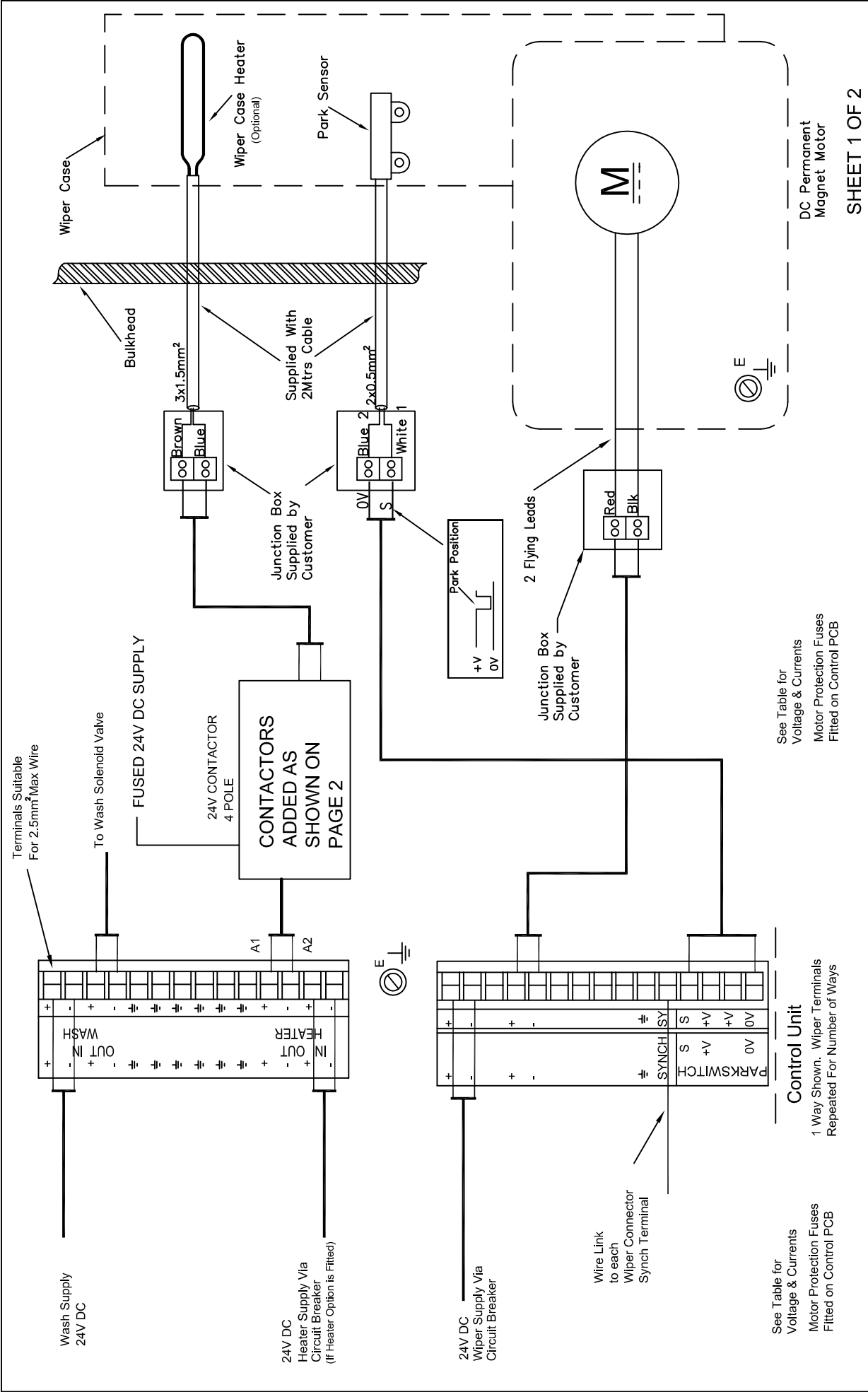


CONTROLLER NOT FITTED WITH INTERNAL POWER SUPPLY UNIT	CONTROLLER OPTION	SWITCH FITTED AS DRAWN	BLANKING PLUG FITTED	PARKSWITCH
CONTROLLER NOT FITTED WITH 24V DC INTERNAL POWER SUPPLY UNIT	2000-3X0-100	✓	✓	0V
	2000-3X0-101	✓	✓	4V
	2000-3X1-101	✓	✓	S
	2000-3X1-102	✓	✓	ADDITIONAL LABEL USED WHEN PSU FITTED
CONTROLLER NOT FITTED WITH 24V DC INTERNAL POWER SUPPLY UNIT	2000-3X0-103	✓	✓	ADDITIONAL LABEL USED WHEN PSU FITTED
	2000-3X1-103	✓	✓	ADDITIONAL LABEL USED WHEN PSU FITTED
	2000-3X1-104	✓	✓	ADDITIONAL LABEL USED WHEN PSU FITTED
	2000-3X1-105	✓	✓	ADDITIONAL LABEL USED WHEN PSU FITTED

WEIGHT OF UNIT 2.0KG

## SERIES 2000 CONTROL PANEL VARIANTS





SHEET 1 OF 2



3rd ANGLE PRO.

TOLERANCES UNLESS OTHERWISE STATED  
DECIMAL DIMS. TO 2 PLACES ± 0.1mm.  
DECIMAL DIMS. TO 1 PLACE ± 0.25mm  
NO DECIMAL PLACES ± 0.5mm  
ANGLES ± 1°

MAT'L:-

2000\EL\DC-C-3

ISS. DIN

SCALE:-NTS

DATE

DRAWN:- DCT

ISS. DIN

CHKD:-

MOD STATUS

6	07.6.19
5	02.03.09
4	30.06.08
3	14.4.99
2	30.11.98
1	27.4.98

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**WYNN MARINE LIMITED**  
CHELTENHAM ENGLAND

TITLE:- Connection Diagram for 2000 Series Controller to C Type Wiper with a DC Motor

DRAWING No. 2000-EL-DC-C

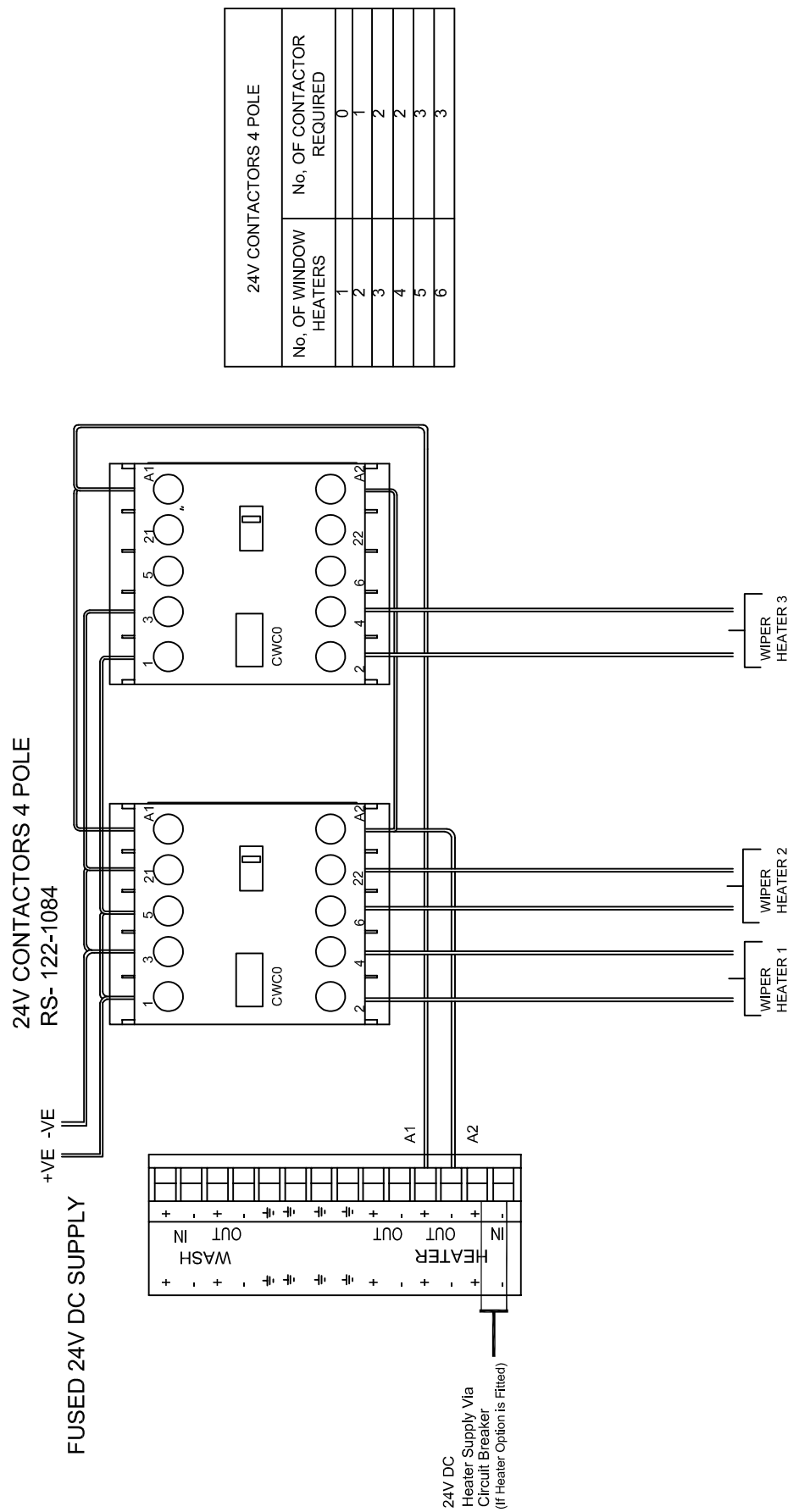
See Table for Voltage & Currents  
Motor Protection Fuses Fitted on Control PCB

See Table for Voltage & Currents  
Motor Protection Fuses Fitted on Control PCB

See Table for Voltage & Currents  
Motor Protection Fuses Fitted on Control PCB



**NOTE: THE 24V CONTACTOR 4 POLE NEEDS TO BE WIRED BY CUSTOMER  
CONTACTOR NOT REQUIRED FOR SINGLE WINDOW HEATER**



24V CONTACTORS 4 POLE	
No. OF WINDOW HEATERS	No. OF CONTACTOR REQUIRED
1	0
2	1
3	2
4	2
5	3
6	3

SHEET 2 OF 2

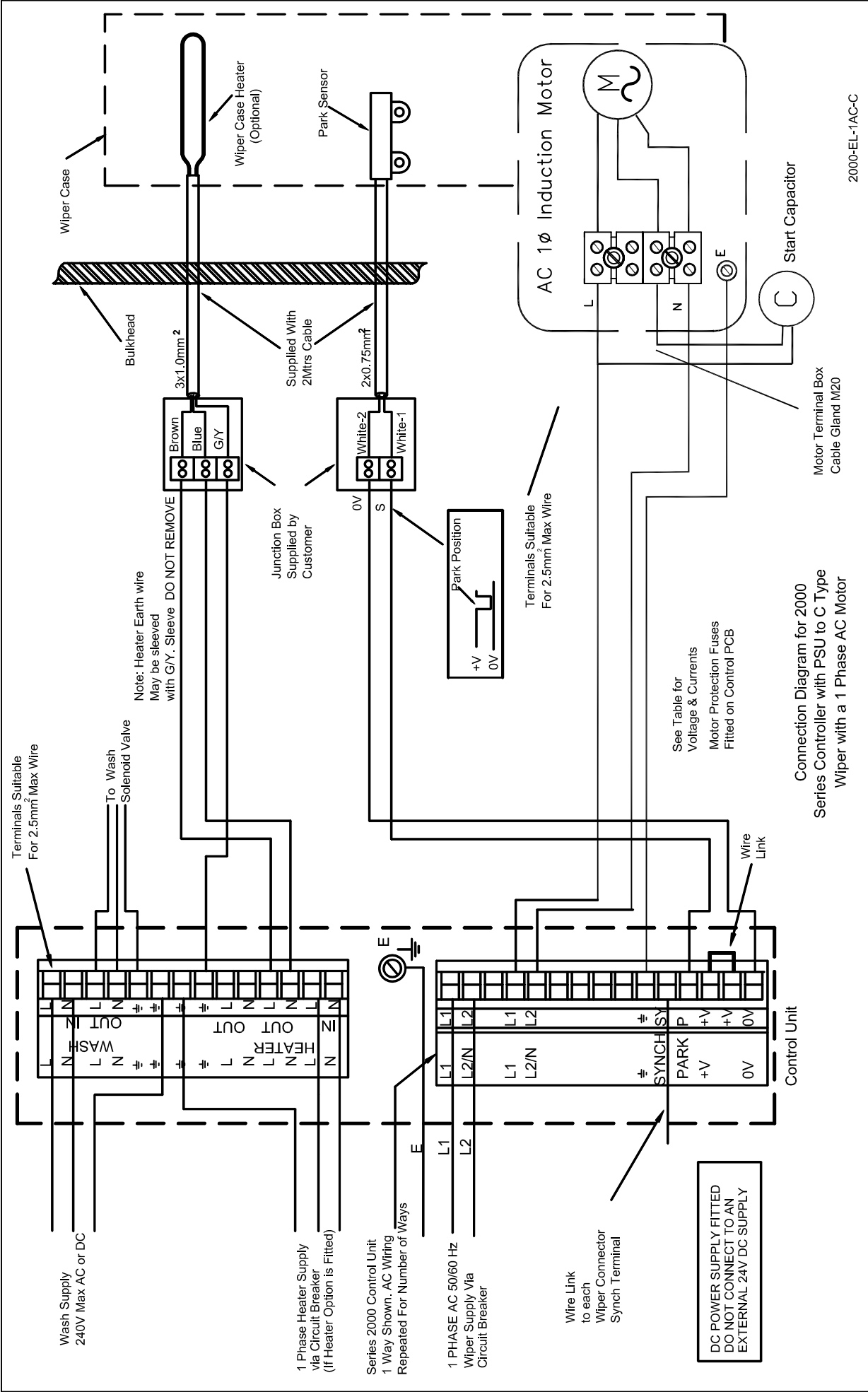
3rd ANGLE PRO.



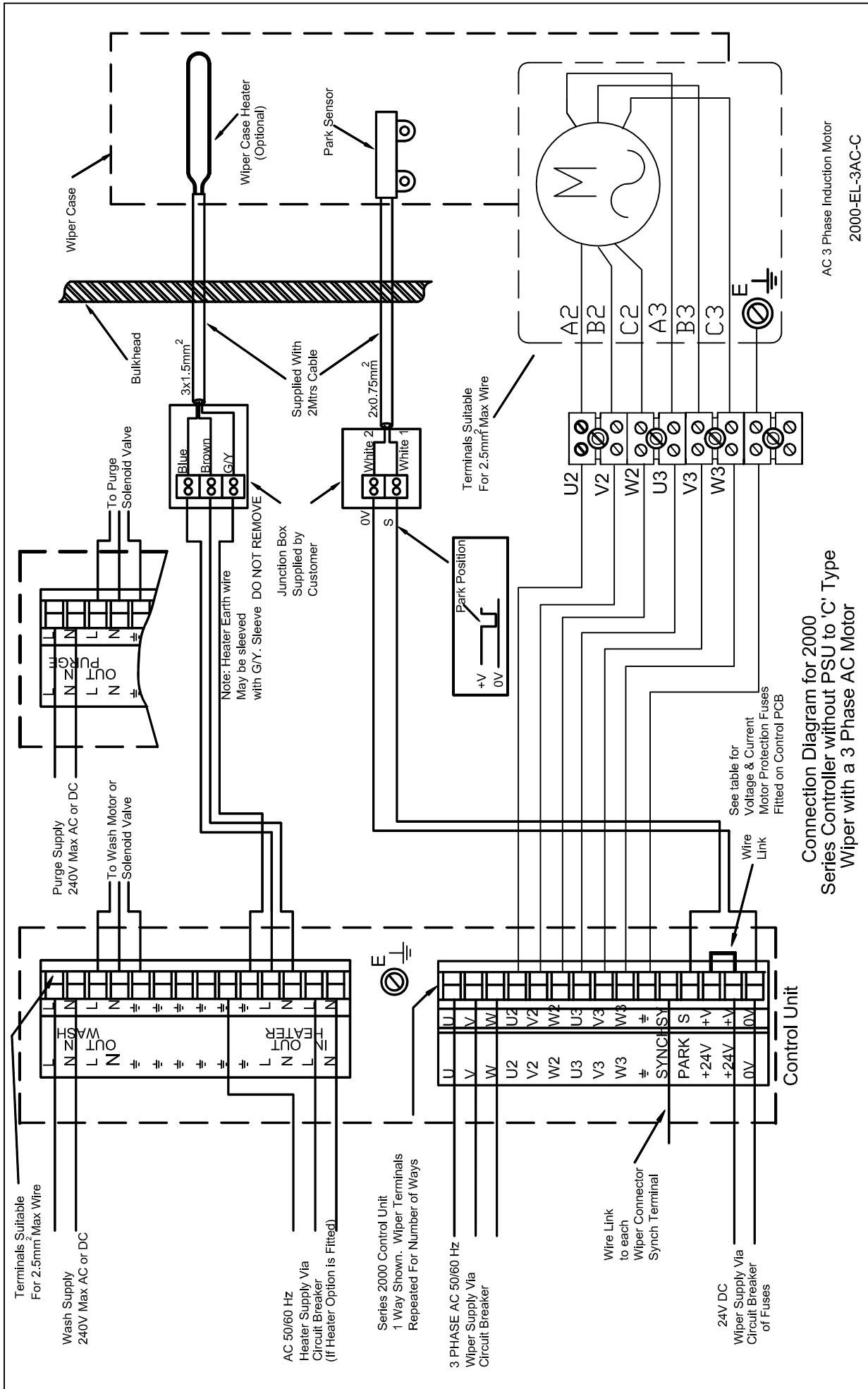
TOLERANCES UNLESS OTHERWISE STATED  
DECIMAL DIMS. TO 2 PLACES  $\pm 0.1\text{mm}$ .  
DECIMAL DIMS. TO 1 PLACE  $\pm 0.25\text{mm}$   
NO DECIMAL PLACES  $\pm 0.5\text{mm}$   
ANGLES  $\pm 1^\circ$

MAT'L:-	ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN	DATE
2000\EL\DC-C-3	SCALE:-	NTS	DRAWN:-	DCT	CHKD:-		CHANGED:-		
									Wiper with a DC Motor
									DRAWING No. 2000-EL-DC-C






3rd ANGLE PRO.	TOLERANCES UNLESS OTHERWISE STATED DECIMAL DIMS. TO 2 PLACES ± 0.1mm, DECIMAL DIMS. TO 1 PLACE ± 0.25mm NO DECIMAL PLACES ± 0.5mm ANGLES ± 1°		ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN	DATE	MOD STATUS	THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.	
	MAT'L:-		7						1	1293	27.4.98	30.03.09	WYNN MARINE LIMITED CHELTENHAM ENGLAND	
	2000\EL\1AC\1AC-C-13								2	1451	9.4.99	30.06.08	TITLE:- Connection Diagram for 2000 Series Controller with PSU to C Type Wiper with a 1 Phase AC Motor	
	SCALE:- NTS								4	2286	21.10.02	30.03.09	DRAWING No. 2000-EL-1ACP-C	
	DRAWN:- DCT								5			30.06.08		



AC 3 Phase Induction Motor  
2000-EL-3AC-C

3rd ANGLE PRO. 											MOD STATUS	THE COPYRIGHT OF THIS DRAWING IS VESTED IN WYNN MARINE LTD. AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION OF THE COMPANY OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN SUPPLIED.	
TOLERANCES UNLESS OTHERWISE STATED DECIMAL DIMS. TO 2 PLACES ± 0.1mm, DECIMAL DIMS. TO 1 PLACE ± 0.25mm NO DECIMAL PLACES ± 0.5mm ANGLES ± 1°												WYNN MARINE LIMITED CHELTENHAM ENGLAND	
MAT'L:-	ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN	DATE	ISS.	DIN	DATE	TITLE:- Connection Diagram for 2000 Series Controller without PSU to 'C' Type Wiper with a 3 Phase AC Motor
	SCALE-N/TS		DRAWN:- DCT		CHKD:-		CHANGED:-					DRAWING No. 2000-EL-3AC-C	



# SERIES 2000 CONTROLLER FAULT FINDING



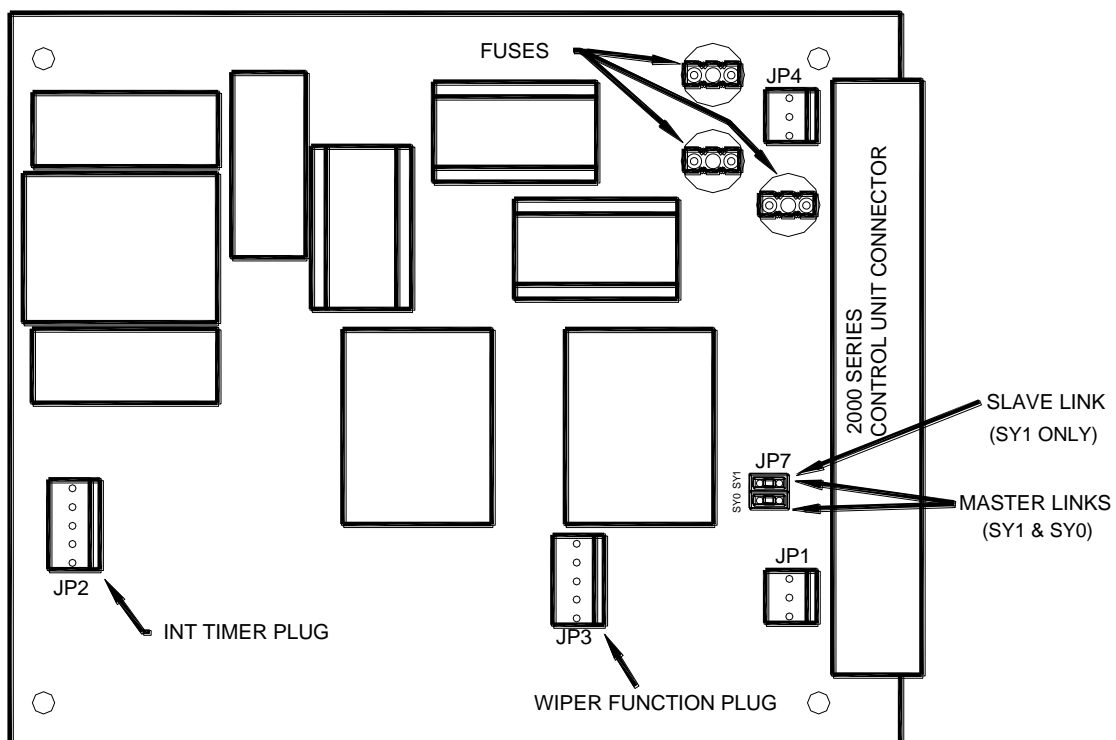
**WARNING:** Ensure that all power is disconnected whilst working on the controller.

The controller contains few user serviceable items. The only items that may need to be accessed in the event of a fault are as follows:

1. Remove the 4 off screws from front panel. Carefully pull out the controller front panel as far as it will go (50 to 75 mm).
2. The wash and heat switches are now accessible. The wiper control switches are not serviceable. Refer to Wynn.
3. To replace heater switch, disconnect wires from rear of switch, depress the 2 lugs whilst pulling through from front.
4. To replace wash wipe switch, release main switch body from rear of switch. Unscrew retaining ring before withdrawing switch from front.
5. To replace a PCB board, firstly note all connections (see drawing below), then remove 5 way header plugs and switch connections. Remove rear panel (4 off screws). Unscrew PCB boards from back panel and replace with new board. Refitting is reversal of removal.
6. Fuses are situated next to the rear connector strip on the PCB. Replace with sub miniature type PCB mounting Anti-surge TR5 250V series Wickmann fuse of the same value.

**NOTE:** The correct fuse value is dependent on motor type and supply frequency and can be found in earlier in this manual.

## *Fuse and Header Plug Locations*



# DOCUMENTATION

Whilst every effort is made to provide accurate information in good faith, no responsibility can be accepted by Wynn for inaccuracies and Wynn reserves the right to alter and amend specifications and designs without prior notice in line with our policy of continued improvement.

## *Spares Parts*

To enable technical troubleshooting and ordering of spare parts, this manual should be kept in a safe place on board. It is also advisable to keep one set of spare parts on board for emergency use. Please contact Wynn directly or your local distributor / service centre for all order requirements.

## *Maintenance Schedules*

Plan your maintenance work according to the schedule in this manual.

## *Our Commitment*

We are committed to a 10 year product support programme. This ensures that any spare part will be available for any wiper at least 10 years after its purchase. It is strongly recommended that only genuine replacement parts manufactured by WYNN be used. This will guarantee that only suitable materials have been used and will ensure interchangeability of parts.

## *Quality and Testing*

We are committed to the principles of Total Quality Management, ISO 9000. We manufacture our range of marine products to the highest standard and quality. We therefore maintain an ongoing schedule of product improvement and testing. To help us sustain such standards we maintain a salt-water test rig on which our products are taken, at random from the production line, and subjected to 3,000 hour continuous testing. We are sure you will receive many years trouble-free service from your Wynn product and hope you find this information pack comprehensive.

## *Guarantee*

All Wynn equipment is tested before despatch from our works. The Windscreen Wiper System supplied has a 1 year warranty period provided the installation of the system and the subsequent maintenance is in accordance with the installation/maintenance instructions.

We cannot accept any responsibility for the installation of equipment, or damage to the equipment during installation, or normal wear and tear. The guarantee is negated if the equipment is not installed strictly observing the instructions set out in this manual, or not maintained as specified.

The Wiper System is very reliable but to ensure its continued smooth running we recommend that the following guidelines are adhered to:-

### *Monthly*

- Check for wear on all parts subject to friction
- Visual inspection should be made of the blades to ensure that they are still in good condition and replace as soon as there are signs of wear or damage

### *Annually*

- It is recommended that the blades are changed every 12 months

After the Wiper System has been operating in severe weather conditions it is advisable to thoroughly check the unit for signs of wear or damage.

This warranty excludes the wiper blades which are a consumable item and any replacements that are detailed in the manual as part of any regular maintenance requirement.

This guarantee is expressly in lieu of all other guarantees expressed or implied and of all other obligations of liabilities on our part, and we neither assume nor authorise any other person to assume for us any other liability in connection with the sale of our equipment. Faulty equipment must be returned, carriage paid, to our works for examination. Any legal action must be settled in the English courts under English law.



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