



**B. HEPWORTH**  
AND COMPANY LIMITED

***...performance wiper  
systems...***

INSTALLATION AND MAINTENANCE

INSTRUCTIONS FOR THE

**110NM SINGLE STATION**

**WINDSCREEN WIPER SYSTEM**

2-4 MERSE ROAD, NORTH MOONS MOAT, REDDITCH,  
WORCESTERSHIRE, B98 9HL ENGLAND

TEL: +44(0)1527 61243 OR 67701

FAX: +44(0)1527 66836

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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 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 ROD LINKAGE 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 0 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.

## Introduction

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

## Vari-Arc Lever Settings

### **IMPORTANT**

**Vari-arc levers which have been factory set will be torqued and paint marked. Do not adjust. Unpainted lever nuts must be torque tightened M8 = 20Nm, prior to the unit being fitted.**

# CHAPTER 1

## Functional and Equipment Description of System

### *Wiper Motor Assembly*

The wiper motor and bracket is shown in Figures 1 & 2. The electric wiper motor forms the central part of the windshield wiper system. The motor is mounted on a fabricated mild steel bracket which is polyester powder coated to prevent corrosion. The motor is connected electrically by means of a multi-pin connector. Ref Figure 8

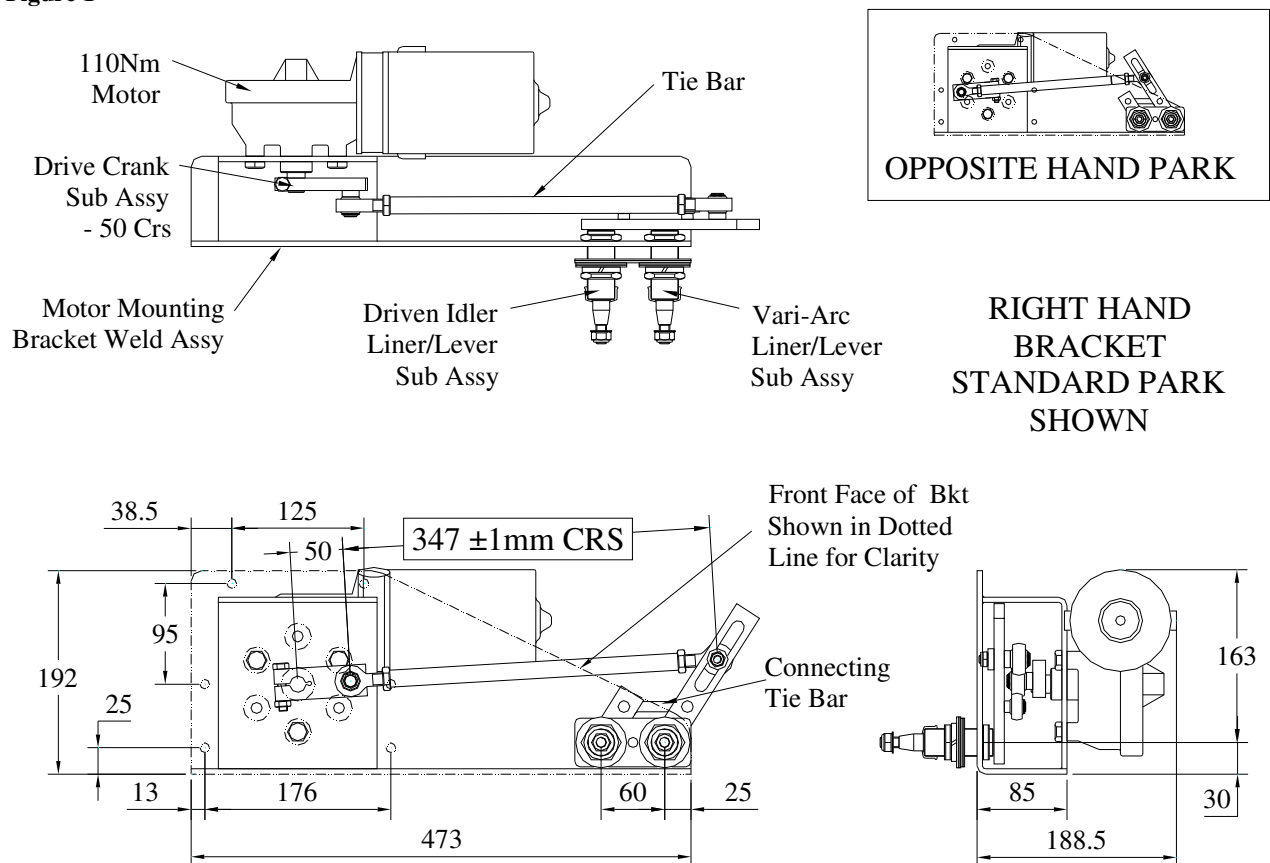
The drive lever is secured to the wiper motor shaft and connected through a tie bar, to the spindle lever assembly. These components transfer the motor shaft rotation to the wiper arm assemblies.

The drive mechanism provided transfers the rotary output from the motor; to a reciprocating motion of the spindles, this mechanism is zinc plated and is sized to give the correct angle of arc for the windscreen wiper arm being driven.

The Spindles that drive the wiper arms pass through the bulkhead, connecting the drive mechanism to the wiper arm; these are manufactured from stainless steel, to prevent corrosion. The spindles are driven from the main drive crank by connecting tie bars which distributes the load evenly between the shafts of the wiper arm thus reduces the load on the individual interfaces between the wiper arm and the spindles.

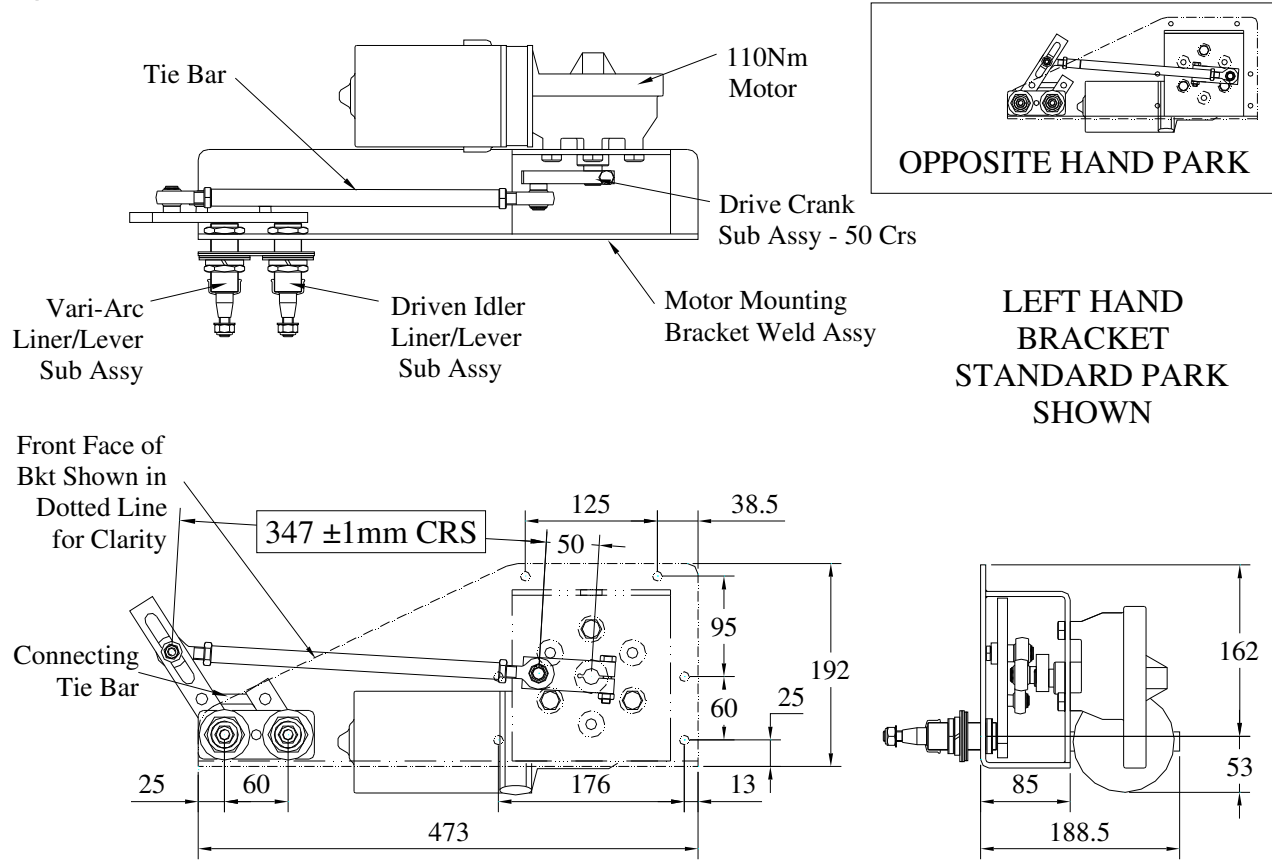
### *Wiper Motor Assembly – RH BRACKET*

Figure 1



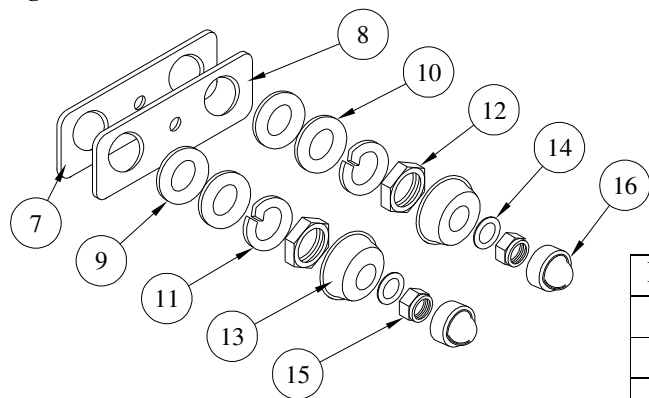
## Wiper Motor Assembly – LH BRACKET

**Figure 2**



## External Fixings for Liner/Spindle Assemblies

**Figure 3**



ITEM	DESCRIPTION	QTY
7	Idler Plate - Gasket	2
8	Idler Plate	1
9	26mm Washer - Neoprene	2
10	26mm Washer – Flat	2
11	26mm Washer – Single Coil	2
12	M26 Hex. Nut	2
13	26mm Weather Cap	2
14	10mm Washer - Flat	2
15	M10 Nylock Nut	2
16	10mm Nut Weather Cap	2

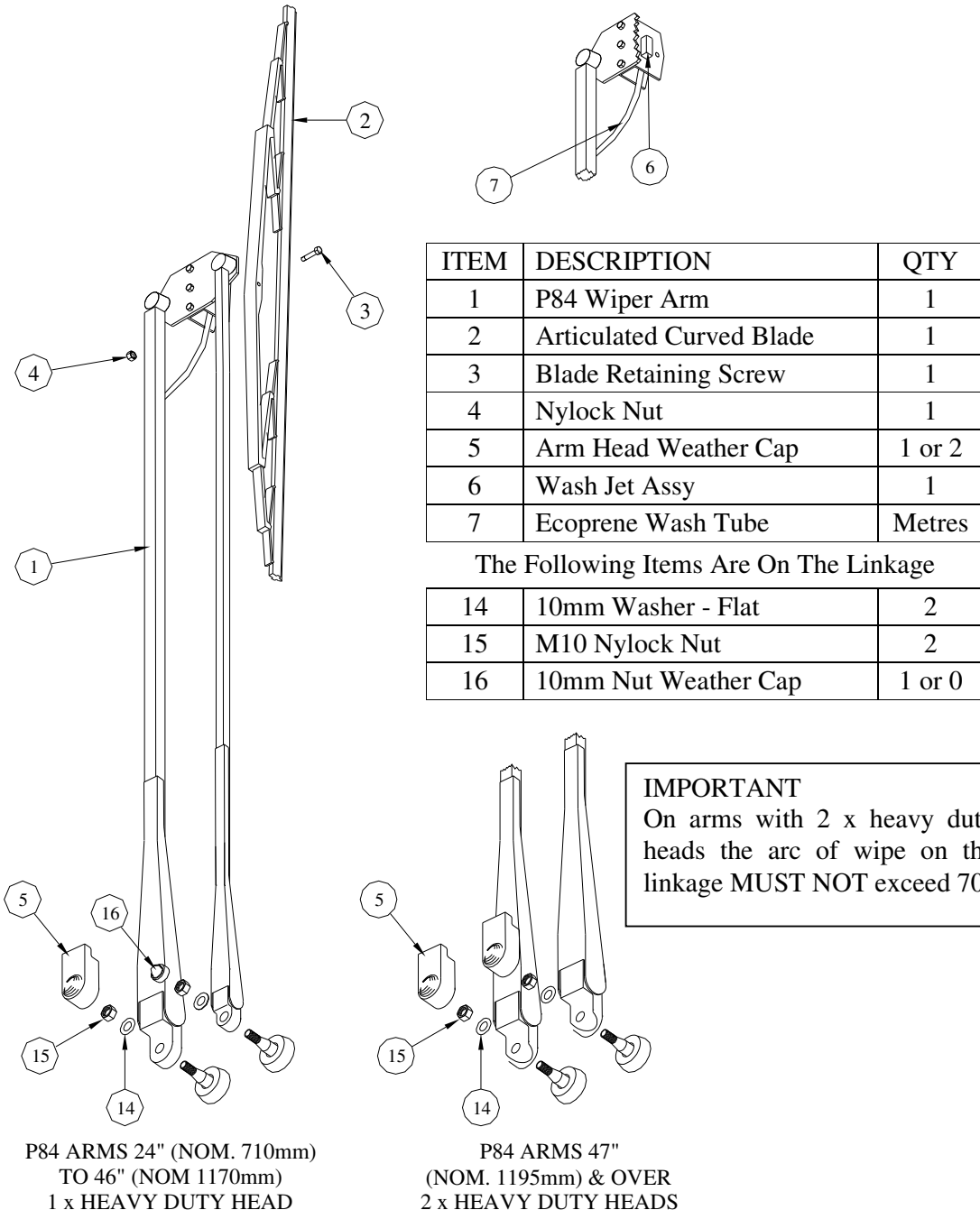
## Wiper Arm Assembly – P84

The wiper arm is manufactured from stainless steel and is polyester powder coated to prevent corrosion and to be of good appearance.

The wiper arm is shown in Figure 4. One wiper arm assembly is used on each unit. The wiper arm assembly mounts directly onto the spindles protruding through the bulkhead. The wiper arm is secured to the spindle via a series of nuts and washers.

The blade is secured to the arm assembly using the blade clip arrangement on the arm and blade bolt.

**Figure 4**



# CHAPTER 2

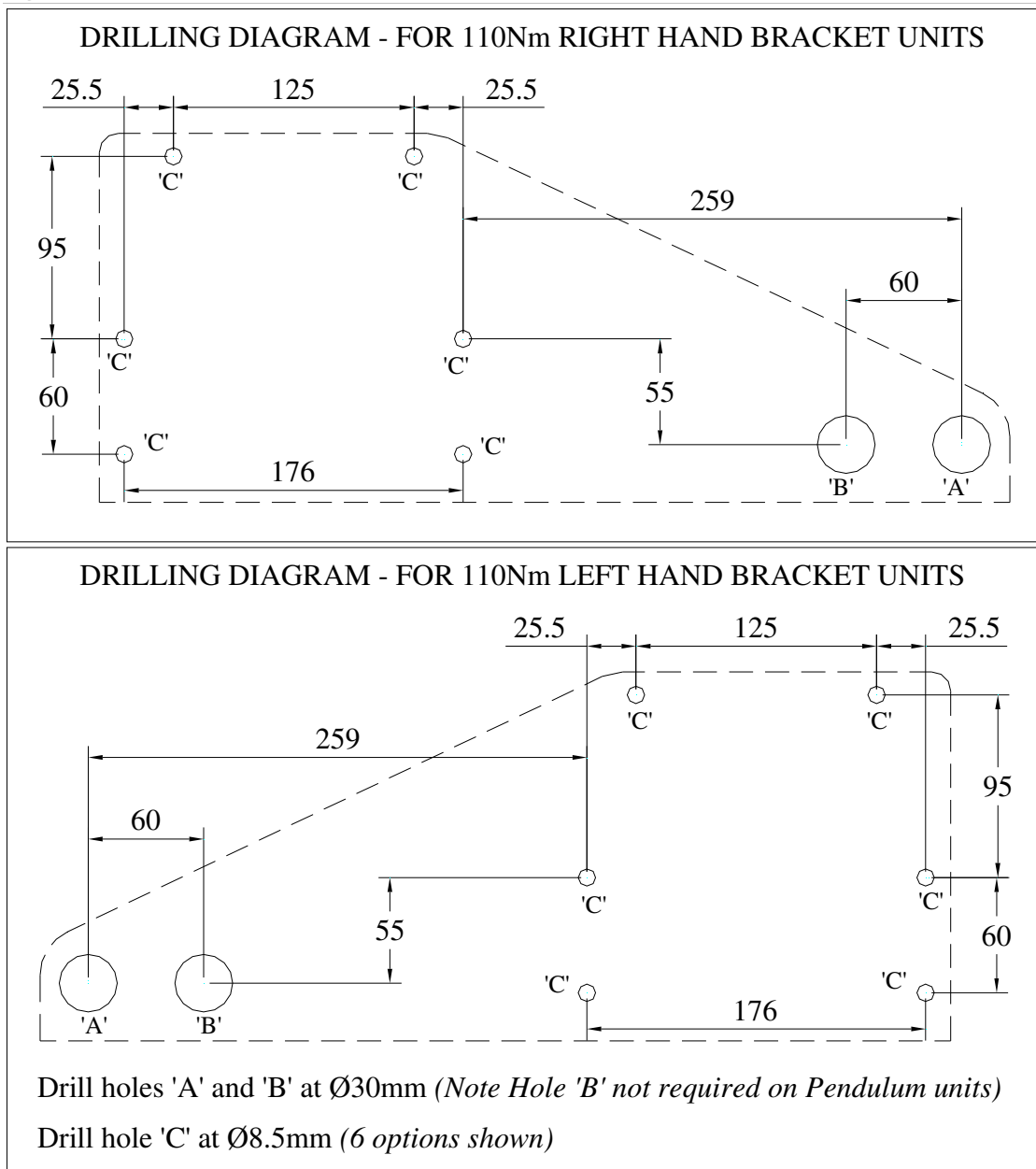
## Installation Instructions

These instructions are meant as a guide. If you experience any difficulty in the fitting of these units, please do not hesitate to contact us for advice.

### Drilling Diagram

NOTE - Drilling diagram is NOT to size and is for reference only

Figure 5



## Fitting the Wiper Motor Assembly

When the spindle positions have been drilled in the bulkhead, the following procedures apply.

**Reference Figures 1, 2 & 3, Pages 4 & 5**

- Remove 10mm weather Caps (16). M10 nuts (15), washers - flat (14), 26mm weather caps (13). M26 nuts (12), 26mm washers - single coil (11), 26mm washers - flat (10), 26mm neoprene washers (9), idler plate (8) and finally idler plate gasket (7).  
**Keep safe as will be required on assembly.**

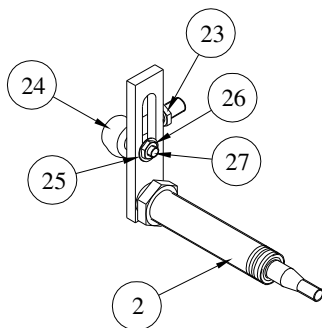
### NOTE

**The Motor Unit is MOUNTED from INSIDE the Bulkhead.**

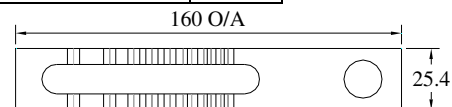
- Slide liners through holes in bulkhead, align mounting bracket (1), with predrilled mounting holes and fix in place. (**Fixing bolts not supplied**).
- Externally** - ENSURE a proprietary sealant (**Not supplied**) is used around all points of entry through bulkhead.
- Fit following items** - one idler gasket (7), one idler plate (8), - **over both liners, next to bulkhead. Then on each Liner** - washer - neoprene (9), washer - flat (10), washer - single coil (11), M26 nylock nut (12)  
**(Torque Tighten ref Table 1, Page 13)**
- Fit 26mm weather caps (13).

## Vari Arc Units - Arc adjustment

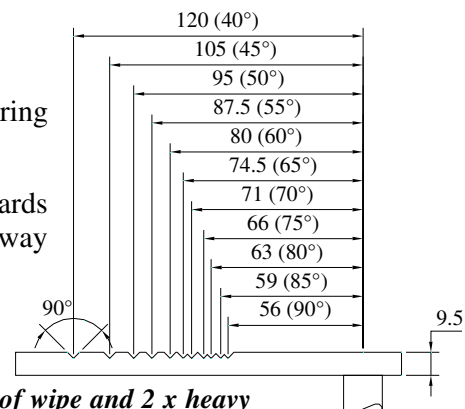
Figure 6



ITEM	DESCRIPTION	QTY
2	Liner V.Arc Lever Sub Assy	1
23	12mm Right Hand Bearing Nut	1
24	12mm Right Hand Bearing	1
25	8mm Washer – Flat	1
26	M8 Securing Nylock Nut	1
27	V.Arc Bearing Pivot Pin	1



- Run motor to insure it is parked correctly; then disconnect all Electrical Power.
- Slacken bearing nuts both ends of tie-bar and securing nylock nut (26) on vari-arc lever.
- Slide bearing/tie-bar assy pivot pin (27) towards liner/spindle assy to INCREASE arc to 90° max or away from liner/spindle assy to DECREASE arc to 40° min.
- Ensure you note markings on lever when correct arc is reached.



**Important: Pantograph Systems must not exceed 90° arc of wipe and 2 x heavy duty heads must not exceed 70°**



5. Adjust arc until blade parks approximately 75mm from edge of screen when screen is dry. Test on a wet screen to prove clearance is acceptable.
6. Tighten bearing nuts both ends of tie-bar and securing nylock nut (26) on Vari-arc lever. **(Torque Tighten ref Table 1, Page 13).**

**IMPORTANT: Ensure BEARING CENTRES are as stated on drawings (Figures 1 & 2)**

### *Electrical Connections*

The 110Nm marine motor is 24v DC, two speed, self-parking and insulated earth return as standard.. The motor should be connected through a two speed self-park multi speed control switch, a toggle switch or a rotary switch *(not supplied – Can be ordered separately).*

***For Ships Supply's of nominal 110/120v AC 1 Phase – one of the following will be required***

PSU/115/24/6	POWER SUPPLY UNIT-115v 24v 6.amp	will power 1 Motor Unit
PSU/115/24/12	POWER SUPPLY UNIT-115v 24v 12.amp	will power 2 Motor Units

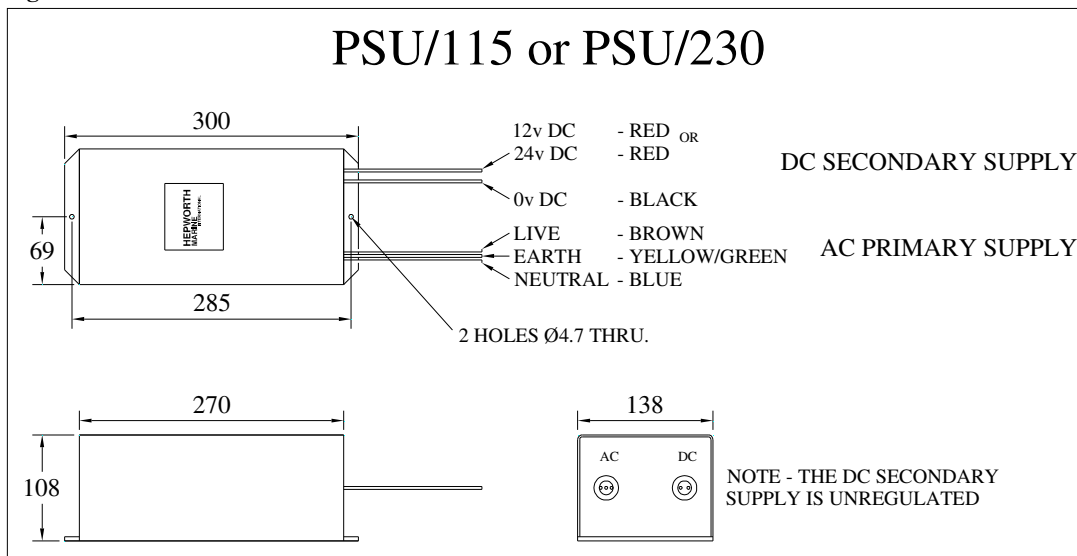
***For Ships Supply's of nominal 220/240v AC 1 Phase – one of the following will be required***

PSU/230/24/6	POWER SUPPLY UNIT-230v 24v 6.amp	will power 1 Motor Unit
PSU/230/24/12	POWER SUPPLY UNIT-230v 24v 12.amp	will power 2 Motor Units

Note if more than 2 motors required – information of part number and supply details will be given on request

### *Wiring the Power Supply Unit (PSU)*

**Figure 7**



#### *AC Primary Side*

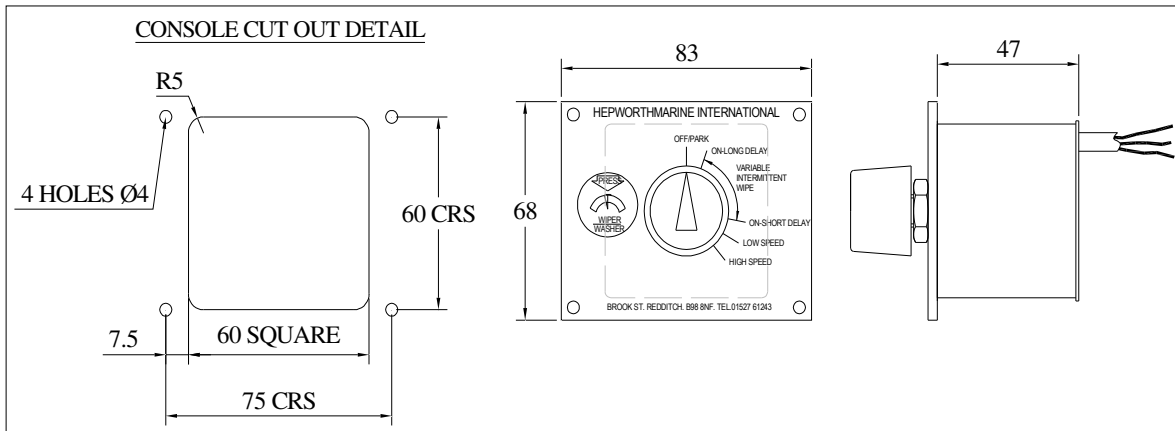
Connect live, earth and neutral wires on AC primary side of power supply unit to ships supply - **110/120v AC 1 Phase** to a PSU/115 Unit, or **220/240v AC 1 Phase** to a PSU/230 Unit

#### *DC Secondary Side*

Connect **24v DC (+ ve)** to toggle, rotary or multi speed control switch as positive ship's supply

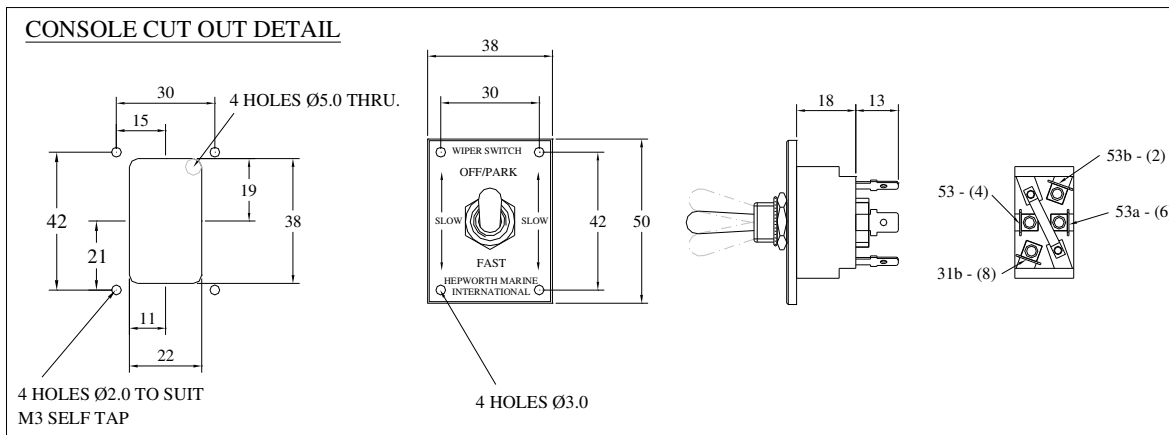
Connect **0v DC (- ve)** to toggle, rotary or multi speed control switch as negative ship's supply

## Wiring to a Multi Speed Control Switch



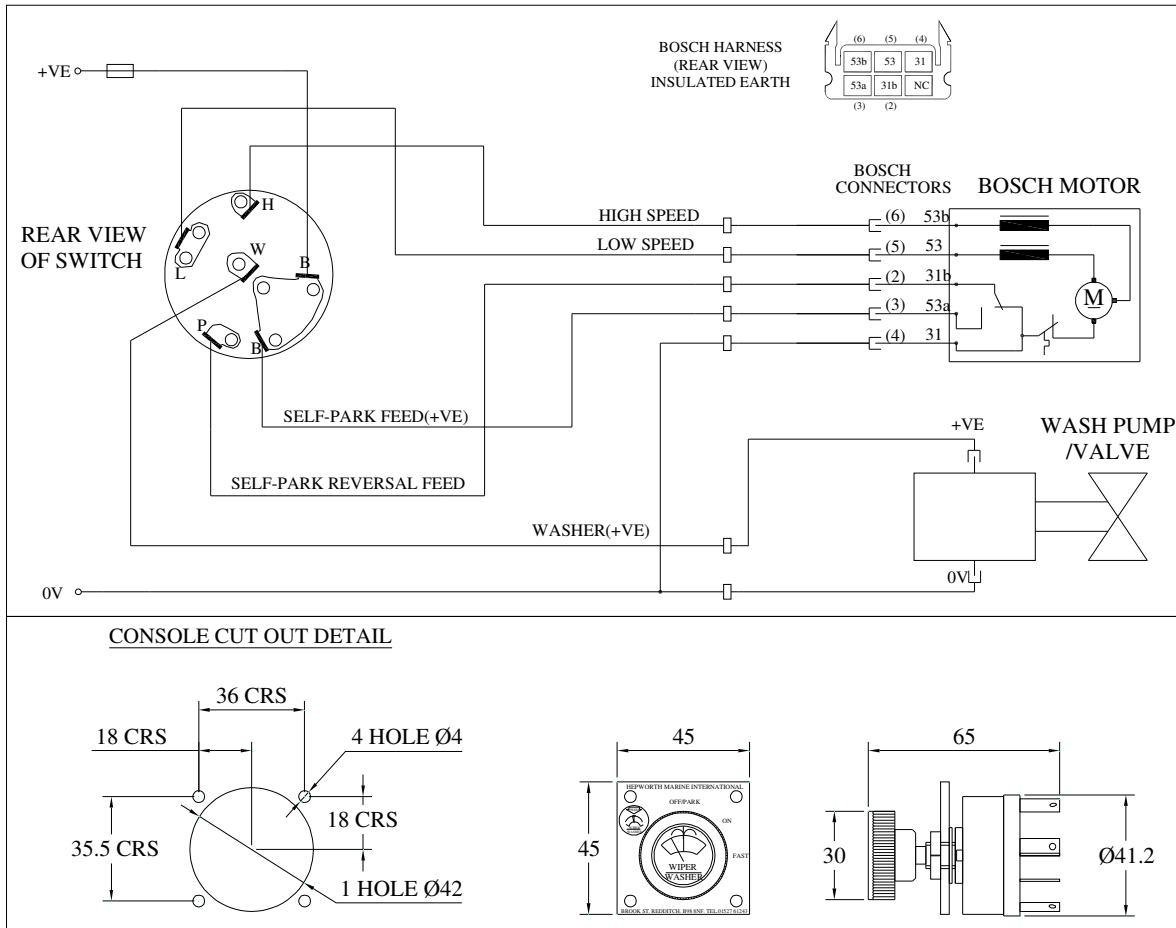
The RED wire on the switch	To terminal <b>53a</b> on the motor - ( <b>SELF PARK FEED</b> ) and the positive ship's supply – <b>24v DC (+ ve)</b>
The WHITE wire on the switch	To terminal <b>53b</b> on the motor - ( <b>HIGH SPEED</b> )
The YELLOW wire on the switch	To terminal <b>53</b> on the motor - ( <b>LOW SPEED</b> )
The BLUE wire on the switch	To terminal <b>31b</b> on the motor - ( <b>SELF PARK REVERSAL FEED</b> )
The BLACK wire on the switch	To terminal <b>31</b> on the motor and the negative ship's supply – <b>0v DC (- ve)</b>
The BROWN wire on the switch	To the Washer Pump (+ ve)

## Wiring to a Toggle Switch



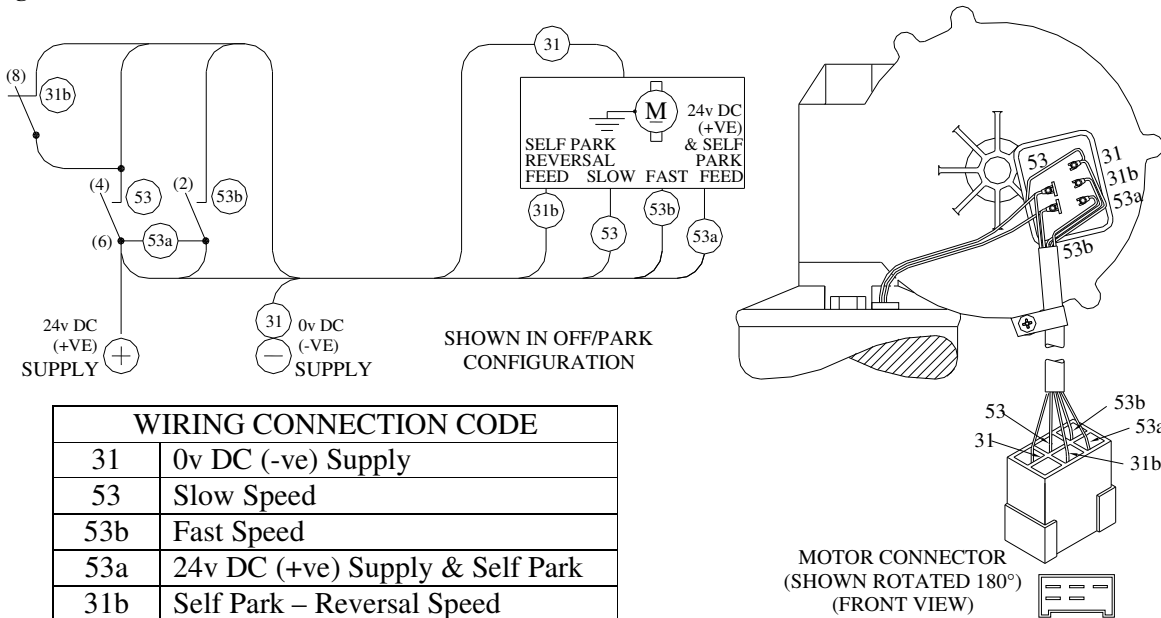
Position 8 on the switch	To terminal <b>31b</b> on the motor ( <b>SELF PARK REVERSAL FEED</b> )
Position 4 on the switch	To terminal <b>53</b> on the motor ( <b>LOW SPEED</b> )
Position 6 on the switch	To terminal <b>53a</b> on the motor ( <b>SELF PARK FEED</b> ) and the positive ship's supply – <b>24v DC (+ ve)</b>
Position 2 on the switch	To terminal <b>53b</b> on the motor ( <b>HIGH SPEED</b> )
The negative ship's supply – <b>0v DC (- ve)</b>	To terminal <b>31</b> on the motor

## Wiring to a Rotary Switch



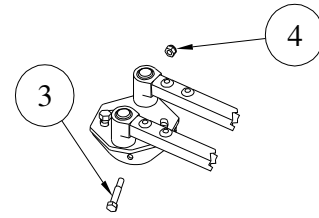
## Electrical Connections

**Figure 8**



## Fitting the Wiper Blade

The wiper blades should be changed every 6 months but this is dependent on use and operating conditions  
(With reference to Chapter 3, Table 1 & Chapter 5, Table 2 – continued, Wiper Blades)

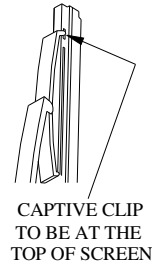


1. Remove blade retaining screw (3) and nut (4) from blade clip on arm.
1. Place wiper blade into blade clip on arm.

### NOTE

**Captive end on blade rubber to be at top of screen**

2. Ensure that all fixing holes align. Secure in place with blade retaining screw (3), and nut (4).



### IMPORTANT

**Do not over tighten blade screw and nut, as blade is required to pivot on glass.**

## Fitting the Wiper Arm Assembly

### IMPORTANT

**The Blade must be fitted to the arm prior to the arm being fitted. (This is to prevent the blade clip damaging the screen,)**

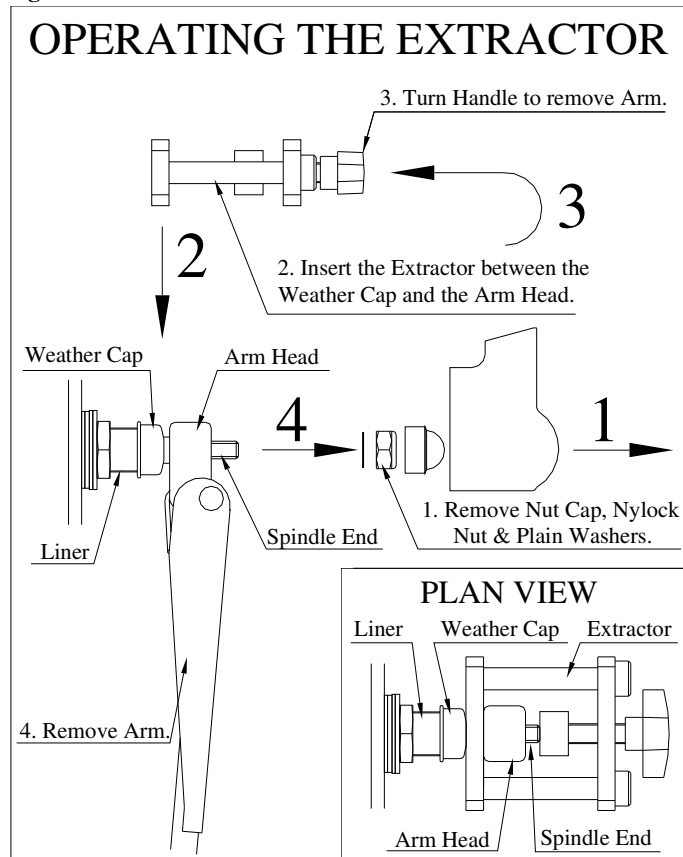
1. *Internally* - Run motor to insure it is parked correctly. Disconnect all electrical power.

### IMPORTANT

**Externally - While linkage is being run, observe direction drive spindle rotates in, immediately before it stops. This direction will give PARK POSITION.**

2. Fit arm (1), onto spindle allowing blade to lie approx 75-100mm from edge of glass in PARKED POSITION.
3. Fit one M10 flat washer (14) on to spindle next to arm head, then a M10 nylock nut (15).
4. Tighten spindle nut sufficiently to allow wiper arm and blade to travel across glass when motor is run.
5. De-isolate electrical supply to motors. Spray water on screen and briefly run wipers, checking area covered.

Figure 9

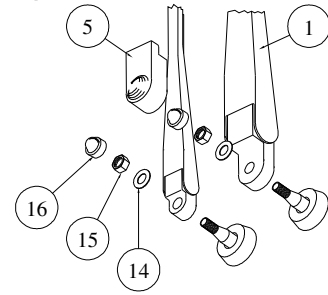


## CAUTION

Do not attempt to rotate or twist the wiper arm on the spindle it will cause damage to the spline on the spindle, resulting in the wiper arm and blade slipping in operation.

6. If blades position needs adjusting, isolate electrical supply to motors.
7. Loosen one M10 spindle nut (15). Carefully pull arm (1), up spindle (2), and realign.  
*Use arm extractor tool to help pull wiper arm up spindle, if required.*
8. When correctly aligned, isolate electrical supply to motors. Tighten one M10 nylock nut (15).  
*Tighten Torque in accordance with torque table.*
9. Fit two M10 arm weather head caps (5).

Figure 10



## IMPORTANT

On first fitting, check spring pressure on blade in parked position, it must NOT exceed recommended pressure. If this happens contact B. Hepworth. For details see Chapter 4, Table 2 – Continued.

# CHAPTER 3

## Maintenance

### *Introduction*

This chapter contains all preventative maintenance and removal and replacement procedures for the windscreen wiper components. Preventative maintenance procedures include the information required to replace the wiper blades.

### *Safety Precautions*

Always disconnect the power when servicing the windscreen wiper system, or on any ancillary components. Serious damage to the equipment and/or personal injury may occur if the power is not disconnected.

### *Scheduled Maintenance Action Check*

Table 1 is a scheduled maintenance action index. The index provides a list of all performance tests if applicable and preventative maintenance procedures. The table has three columns: periodicity, equipment and task

The periodicity column indicates the intervals between the maintenance tests and preventative maintenance procedures.

The equipment column lists the equipment, assembly or subassembly that corresponds to the maintenance action.

The task column lists the maintenance task to be performed.

*Table 1*

PERIODICITY	EQUIPMENT	TASK
Daily	Wiper Blades	Inspect wiper blades for damage, torn or missing rubber blades. Replace wiper blades as required.
Daily	Windscreen Wiper System	Perform function test of wiper washer system. Do not carry out function test on a dry screen.
Daily	Washer Tubing and Spray Nozzle	Inspect tubing for damage or loose connection on nozzle. Check operation of spray nozzle on windscreen
Daily	Wash Tank	Ensure wash tank is filled with washer fluid to prevent wipers being used on a dry screen
Six Monthly or As required	Wiper Blades	Replace wiper blades
Six Monthly	Complete System	<p>Check all torque settings for complete wiper system. (Set torque wrench to correct setting. Fit on nut, turn, if correct, wrench should click.)</p> <p>M8 = 18-20Nm (<i>Motor Bolts, Drive Crank, Fixing Nuts/Bolts &amp; V.Arc Lever</i>)</p> <p>M10 = 36-38Nm (<i>Spindle Nut</i>)</p> <p>M12 = 28-30Nm (<i>Tie-bar</i>)</p> <p>M26 = 78-82Nm (<i>Liner - Steel Structure / Bulkhead</i>)</p> <p>M26 = 50-52Nm (<i>Liner - G.R.P.</i>)</p> <p>Carry out a visual check for wear in rod end. (Pull on tie-bar to see if any movement in rod ends bearings at inner ball on outer casing.)</p>

## CHAPTER 4

### Troubleshooting

#### *Introduction*

This chapter provides all the instructions and information necessary to locate problems and conduct tests on the windscreen wiper system components. The trouble-shooting chart is provided for logical isolation of faults.

#### *Safety Precautions*

Always disconnect the power when servicing the windscreen wiper system, or on any ancillary components. Serious damage to the equipment and/or personal injury may occur if the power is not disconnected.

## *Troubleshooting Procedures*

Typical windshield wiper system troubleshooting procedures are contained in Table 2. These troubleshooting and repair procedures should be followed when encountering operational problems with the windshield wiper system

*Table 2*

SYMPTOM	PROBABLE CAUSE	TESTS AND CHECKS	CORRECTIVE ACTION
Wiper motor fails to start	On/off switch Voltage level System jammed Defective wiper motor	Check position of switch Check supply voltage to switch. Check wiring and switch connections Check wiper linkage	Turn switch to on position Replace switch. Correct loose wiring connections. Replace broken wires Release linkage. Release wiper arm Replace motor
Motor shaft turns but linkage & arm remain static	Defective or loose drive crank	Check linkage for a loose drive crank	Secure (Torque 18-20Nm) or replace drive crank. Clean motor output shaft with wire brush before replacing
System operates but wiper arm remains static	Wiper arm	Check for loose wiper arm connection onto drive spindle	Secure or replace wiper arm after cleaning spindle spline with wire brush. Torque to M10 = 36-38Nm
Slow Motor Operation	Voltage level Switch Motor bracket Linkage Defective wiper motor	Check for <b>24v DC</b> supply to wiper system Check for broken bracket Check to see if linkage is free moving	Correct voltage supply problem Replace faulty switch Replace defective bracket Free linkage replace worn or damaged components Replace wiper motor
Erratic Motor	Voltage level Switch Wiring	Check for <b>24v DC</b> supply to wiper system Check for loose or broken wires	Correct voltage supply problem Replace faulty switch Repair or replace wiring up to motor. Replace motor if this wiring is damaged
Excessive wear on blade.	Spring pressure.	Use spring balance on centre of blade clip till blade begins to lift off glass. 1 – 1.1/2 kg	Replace spring/arm.

*Table 2 - continued*

SYMPTOM	PROBABLE CAUSE	TESTS AND CHECKS	CORRECTIVE ACTION
Arm and Blade not operating correctly or over sweep operation	Voltage level	Check for <b>24v DC</b> supply to wiper system	Correct voltage supply problem
	Linkage	Check for worn or broken linkage	Replace linkage
	Spindle	Check for excessive wear in spindle	Replace spindle
	Arm	Check that arm is not loose on spindle	Re-tighten spindle
		Check for excessive wear on arm	Clean spline on spindles with wire brush. Replace arm
	Blade	Check fixing for wear	Replace blade
Check blade for wear		Replace blade	
Check for excessive smearing on screen		Replace blade	
Washer system not working correctly	No water from jets	Check water level in tank	Fill tank ( <i>see note</i> )
		Check for damage to tank	Replace tank ( <i>see note</i> )
		Check Pump is operational	Replace pump if faulty ( <i>see note</i> )

**NOTE**

**Tank and Pump are not supplied by Hepworth's but we recommend checking of these items as lack of water on screen may lead to damage or premature failure of Windscreen Wiper equipment**

## CHAPTER 5

### Maintenance Instructions

**IMPORTANT NOTE:**

**Before replacing the drive crank, motor, tie-bar or liner/lever sub assemblies, it is necessary to remove the entire wiper motor unit from the bulkhead. First remove the arms and blades**

**Retain all items removed in a safe place, as they will be required on reassembly. If you experience any difficulty in fitting these units, please do not hesitate to contact us for advice. Use the drawings for reference.**



## To Replace the Wiper Blade

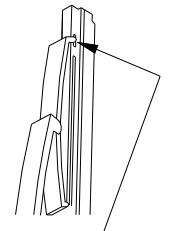
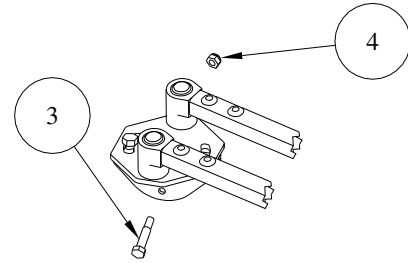
### NOTE

The wiper blades should be changed every 6 months but this is dependent on use and operating conditions.

(With reference to Chapter 3, Table 1 & Chapter 4, Table 2 – continued - Wiper Blade)

### Removal

1. **Internally** - Run motor to insure it is parked correctly. Then disconnect all electrical power.
2. **Externally** - Carefully pull wiper arm assembly away from windscreen to enable access to wiper blade.
3. Remove blade retaining screw (3) and nut (4) from blade clip on arm.
4. Remove blade from blade clip on arm.



CAPTIVE CLIP  
TO BE AT THE  
TOP OF SCREEN

### Replacement

1. Place wiper blade into blade clip on arm.

### NOTE

**Captive end on blade rubber to be at top of screen**

2. Ensure that all fixing holes align. Secure in place with blade retaining screw (3), and nut (4).

### IMPORTANT

**Do not over tighten blade screw and nut, as blade is required to pivot on glass.**

3. Lower blade carefully back onto windscreen.

## To Replace the Wiper Arm

### Removal

1. **Internally** - Run motor to ensure it is parked correctly. Disconnect all electrical power.
2. **Externally** - While unit is being run it is IMPORTANT to observe direction drive spindle rotates in, immediately before it stops. This direction will give PARK POSITION.
3. Remove arm weather cap (5 & 16), M10 nylock nut (15) and 10mm washer - flat (14). Then using Arm Extraction Tool carefully remove Arm  
(Arm Extractor Tool is available see Figure 8, Page 16 for instructions)

### Replacement

### IMPORTANT

**The blade must be fitted to the arm prior to the arm being fitted. (This is to prevent the blade clip damaging the screen,)**

1. Replace arm and blade  
With reference to Chapter 2, Fitting the Wiper Arm and Blade

## *To Remove the Entire Wiper Motor Unit Assembly*

### *Removal*

1. *Internally* - Run motor to ensure it is parked correctly. Disconnect all electrical power.

### **IMPORTANT**

**Please make a note of PARKED position of ARMS and BLADES, before removal**

2. *Externally* - Remove arm and blade.  
*With reference to Chapter 5, To Replace the Wiper Arm - Removal*
3. From main liner/lever sub assembly (2), and driven idler liner/lever sub assembly (3), remove one M26 weather cap (13), one M26 nut (12), one washer - single coil (11), one washer - flat (10), and one washer - neoprene (9), idler plate (8) and finally idler plate gasket (7).

### **NOTE**

**Keep safe as will be required on assembly.**

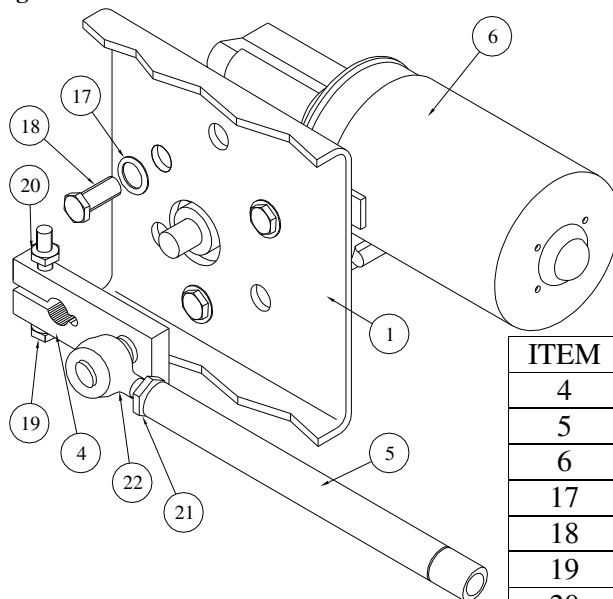
4. *Internally* - Remove fixings from mounting bracket (1), position to bulkhead.
5. Disconnect wiring from Motor.
6. Carefully remove entire wiper linkage assy from bulkhead.

### *Replacement*

1. Replace entire wiper linkage assy  
*With reference to Chapter 2, Fitting the Wiper Linkage Assy*
2. Replace wiper arm and blade  
*With reference to Chapter 2, Fitting the Wiper Arm and Blade*

## *To Replace the Drive Crank Assembly*

**Figure 11**



ITEM	DESCRIPTION	QTY
4	Drive Crank Sub Assy 50 Crs	1
5	Tie-bar – 270mm Overall	1
6	110Nm 24v (IER) Motor	1
17	10mm Washer – Single Coil	3
18	M10 Fixing Bolts	3
19	M8 Securing Bolt	1
20	M8 Securing Nylock Nut	1
21	M12 Left Hand Bearing Nut	1
22	M12 Left Hand Bearing	1

## Removal

### Reference figure 11

1. **Internally** - Run motor to ensure it is parked correctly. Disconnect all electrical power.
2. **Externally** - Remove arm and blade.  
*With reference to Chapter 5, To Replace the Wiper Arm - Removal*
3. Carefully remove entire wiper linkage assy from bulkhead  
*With reference to Chapter 5, To Replace the Entire Wiper Linkage - Removal*

### IMPORTANT

**Please make a note of drive crank position relative to spindle lever, as this will affect park position for arms and blades, i.e. spindle lever facing towards motor or away from motor**

4. Slacken both bearing nuts at either end of tie-bar.
5. Slacken drive crank nut (20), and bolt (19), carefully remove drive crank/bearing assy (4), from motor drive shaft.
6. Unscrew tie-bar (5) from drive crank bearing (LH thread) (22).

## Replacement

1. Screw tie-bar onto bearing (LH thread) (22), of NEW drive crank/bearing Assy (4).

### NOTE

**Clean the motor output shaft with a wire brush before replacing the drive crank.**

2. Carefully fit drive crank/bearing assy (4), over motor drive shaft, (referring to NOTE after operation 2 on 'Removal' for position). Tighten drive crank nut (20), and Bolt (19).  
**(Torque tighten ref Table 1, Page 13).**

**IMPORTANT: Ensure BEARING CENTRES are as stated on drawings (Figures 1 & 2)**

3. Tighten both bearing nuts at either end of tie-bar.  
*Tighten Torque in accordance with torque table.*
4. Replace entire wiper linkage assy  
*With reference to Chapter 2, fitting the Wiper Linkage Assy*
5. Replace wiper arm and blade  
*With reference to Chapter 2, Fitting the Wiper Arm and Blade*

## To Replace the Wiper Motor

## Removal

### Reference figure 11

1. **Internally** - Run motor to ensure it is parked correctly. Disconnect all electrical power.
2. **Externally** - Remove arm and blade.  
*With reference to Chapter 5, To Replace the Wiper Arm - Removal*

- Carefully remove entire wiper linkage assy from bulkhead  
*With reference to Chapter 5, To Replace the Entire Wiper Linkage - Removal*

**NOTE**

**Check and note position of drive crank before removal, i.e. away from spindles, as this will affect the park position on reassembly.**

- Slacken both bearing nuts at either end of tie-bar.
- Slacken drive crank nut (20), and bolt (19), carefully remove drive crank/bearing assy (4), from motor drive shaft.
- Unscrew three fixing bolts (18) and remove with washers (17) remove wiper motor (6)

*Replacement*

- Replace wiper motor (6) replace and tighten three fixing bolts (18) and washers (17) (Torque ).

**NOTE**

**Clean the motor output shaft with a wire brush before replacing the drive crank.**

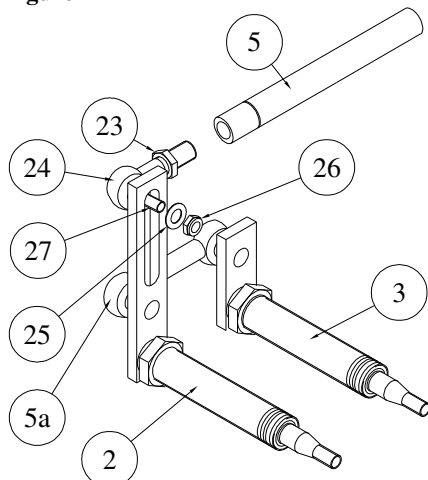
- Carefully fit drive crank/bearing assy (4), over motor drive shaft, (referring to NOTE after operation 2 on 'Removal' for position). Tighten drive crank nut (20), and Bolt (19). (Torque tighten ref Table 1, Page 13).

**IMPORTANT: Ensure BEARING CENTRES are as stated on drawings (Figures 1 & 2)**

- Tighten both bearing nuts at either end of tie-bar.  
*Tighten Torque in accordance with torque table.*
- Replace entire wiper linkage assy  
*With reference to Chapter 2, fitting the Wiper Linkage Assy*
- Replace wiper arm and blade  
*With reference to Chapter 2, Fitting the Wiper Arm and Blade*

*To Replace the Lever/Liner/Spindle Sub Assembly*

Figure 12



ITEM	DESCRIPTION	QTY
2	Liner V.Arc Lever Sub Assy	1
3	Driven Idler Liner/Lever Sub Assy	1
5	Tie-bar – 270mm Overall	1
5a	Connecting Tie-bar – 60mm Crs	1
23	12mm Right Hand Bearing Nut	1
24	12mm Right Hand Bearing	1
25	8mm Washer – Flat	1
26	M8 Securing Nylock Nut	1
27	V.Arc Bearing Pivot Pin	1

## Removal

### Reference figure 12

1. **Internally** - Run motor to ensure it is parked correctly. Disconnect all electrical power.
2. **Externally** - Remove arm and blade.  
*With reference to Chapter 5, To Replace the Wiper Arm - Removal*
3. Carefully remove entire wiper linkage assy from bulkhead  
*With reference to Chapter 5, To Replace the Entire Wiper Linkage - Removal*

### NOTE

**Check and note position of drive crank before removal, i.e. away from spindles, as this will affect the park position on reassembly.**

4. Slacken both bearing nuts at either end of tie-bar.

### IMPORTANT

**Make a note of the protrusion length of the liner and/or spindle from the front of the bracket.**

5. Unscrew tie-bar (5) from main liner/lever/bearing assy (RH Thread) (2).
6. Unscrew remove main liner/lever/bearing assy (2), complete with driven idler (3) and connecting tie-bar (5a), from bracket.

## Replacement

1. Screw main liner/lever/bearing assy (2) complete with driven idler (3) and connecting tie-bar (5a), into bracket. (*Referring to NOTE after operation 3 on 'Removal' for position*).
2. Screw tie-bar onto bearing (RH thread) (24) at main liner/lever/bearing assy (2). (*Referring to NOTE after operation 2 on 'Removal' for position*).

**IMPORTANT: Ensure BEARING CENTRES are as stated on drawings (Figures 1 & 2)**

3. Tighten both bearing nuts at either end of tie-bar.  
*Tighten Torque in accordance with torque table.*
4. Replace entire wiper linkage assy  
*With reference to Chapter 2, fitting the Wiper Linkage Assy*
5. Replace wiper arm and blade  
*With reference to Chapter 2, Fitting the Wiper Arm and Blade*
6. Tighten both bearing nuts at either end of tie-bar

## Vari Arc Units - Arc adjustment

1. Adjust Vari-arc lever settings.  
**In accordance with removal instructions, Page 8**

# CHAPTER 6

## NOTE

For other all other switch or control instructions refer to the ship's fitters/suppliers manual.

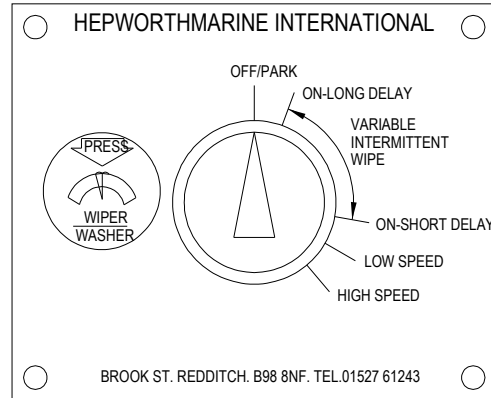
### Switch Operation – Multi-Switch

1. Check switch is in the off position before starting. (**OFF/PARK**)

#### IMPORTANT

**Do not run on a dry screen.**

2. To apply water to the screen, press the knob. (**WIPER WASHER**) This will apply water for the duration of pressing the button. The wiper will also operate for 3-4 wipes at normal speed after the water stops.
3. Turn the knob **CLOCKWISE** it will (**CLICK**) which turns the wipers on. The switch is now in the area of variable intermittent wipe cycle time. Which is between the (**ON-LONG DELAY**) and (**ON-SHORT DELAY**) positions.
4. The further clockwise the knob is turned between the two positions shorter the delay between the wipes.
5. Turn the knob **CLOCKWISE** to the next (**CLICK**) (**LOW SPEED**) gives a continuous wipe across the screen at a standard speed, with no delay between the wipes.
6. Turn the knob **CLOCKWISE** to the last (**CLICK**) (**HIGH SPEED**) gives a continuous wipe across the screen at a faster speed, with no delay between the wipes.
7. Turn the knob **ANTI-CLOCKWISE** to the off position when finished. (**OFF/PARK**)



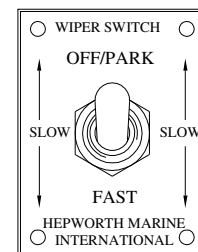
### Switch Operation – Toggle Switch

1. Check switch is in the off position before starting. (**OFF/PARK**)

#### IMPORTANT

**Do not run on a dry screen.**

2. This Switch does not control water.
3. Pushing the Toggle to the centre position (**SLOW**) gives a continuous wipe across the screen at a standard speed, with no delay between the wipes.
4. Pushing the Toggle to the bottom position (**FAST**) gives a continuous wipe across the screen at a faster speed, with no delay between the wipes.
5. Push the Toggle to the top position when finished. (**OFF/PARK**)



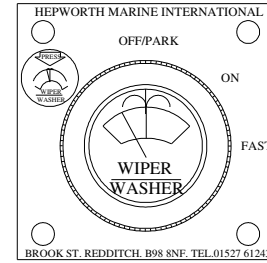
## Switch Operation – Rotary Switch

1. Check switch is in the off position before starting. (**OFF/PARK**)

### IMPORTANT

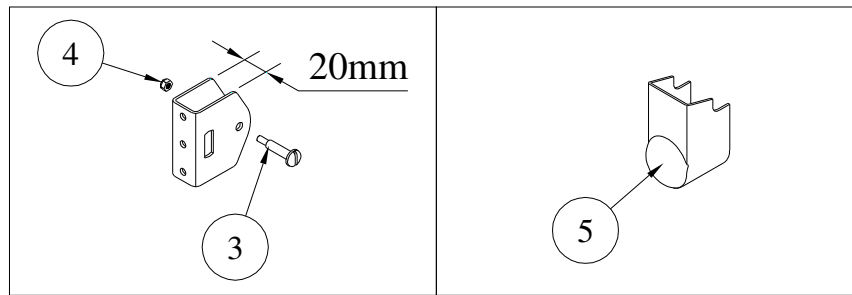
**Do not run on a dry screen.**

2. To apply water to the screen, press the knob. (**WIPER WASHER**)  
This will apply water for the duration of pressing the button. (Note – it does not activate the wiper)
3. Turn the knob **CLOCKWISE** it will (**CLICK**) which turns the wipers on, (**ON**). This setting gives a continuous wipe across the screen at a standard speed, with no delay between the wipes.
4. Turn the knob **CLOCKWISE** to the last (**CLICK**) (**FAST**). This setting gives a continuous wipe across the screen at a faster speed, with no delay between the wipes.
5. Turn the knob **ANTI-CLOCKWISE** to the off position when finished. (**OFF/PARK**)



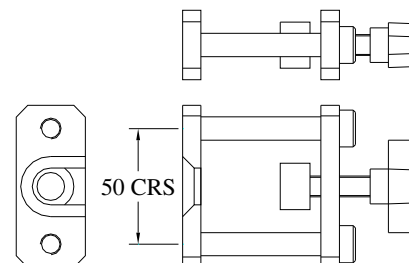
## SPARES LIST

### *Fittings for Arm and Blade*



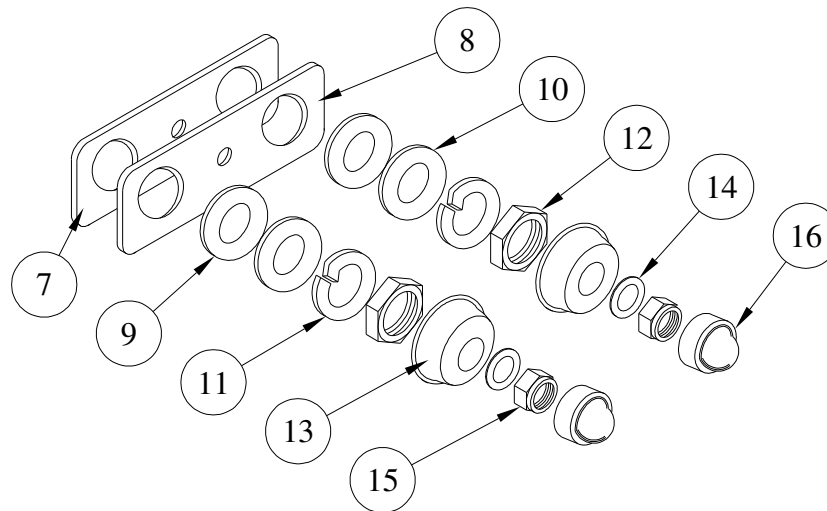
<i>Part No.</i>	<i>Description</i>	<i>Qty</i>
80010700	Blade Retaining Screw (20mm Blade Clip) (3)	1 per Arm
10011400	M4 Nylock Nut (4)	1 per Arm
80005100	Heavy Duty Head – Weather Cap (5)	1 per Arm

<i>Part No.</i>	<i>Description</i>
60680600	Arm Extractor Tool - All Head Types As Required



# EXTERNAL FITTINGS - 80Nm

*Fittings for M26 Liners and 16mm Spindles protruding outside the Bulkhead*



<i>Part No.</i>	<i>Description</i>	<i>Qty</i>
60250300	Idler Gasket (7) ( <i>Pantograph Units Only</i> )	1 per Unit
60250200	Idler Plate (8) ( <i>Pantograph Units Only</i> )	1 per Unit
10029100	26mm Washer - Neoprene (9)	1 per Liner
10026100	26mm Washer - Flat (10)	1 per Liner
10026600	26mm Washer – Single Coil (11)	1 per Liner
10015300	M26 Hex Nut (12)	1 per Liner
60054600	26mm Weather Cap (13)	1 per Liner
10027800	10mm Washer - Flat (14)	1 per Liner
10018000	M10 Hex. Nut (15)	1 per Liner
10063500	10mm Nut Cap (16)	1 per Liner

## **Documentation**

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

## **Spare Part**

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 Hepworth and Wynn directly or your local distributor / service centre for all order requirements.

## **Maintenance Schedule**

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 HEPWORTH AND 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 Hepworth and Wynn product and hope you find this information pack comprehensive

## **Guarantee**

All Hepworth and Wynn equipment is tested before despatch from our works. Should any product or part prove defective in material or workmanship within one year of entering service, or two years of leaving the factory, whichever is the shortest, it will be repaired or replaced free of charge. No further claim can be considered.

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.

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.