



B. HEPWORTH
AND COMPANY LIMITED

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

INSTALLATION AND MAINTENANCE
INSTRUCTIONS FOR THE
1850 EXTERNAL SERIES
SINGLE STATION
WINDSCREEN WIPER SYSTEM
WITH WIRING FOR
CONTROL SWITCHES
AND/OR PSU

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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 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.

Abbreviations and Definitions

<i>Abbreviation</i>	<i>Definition</i>
Assy	Assembly
Brk	Bracket
D. Crk	Drive Crank

<i>Abbreviation</i>	<i>Definition</i>
LH	Left Hand
RH	Right Hand
S.A.	Sub Assembly

DESCRIPTION OF WIPER SYSTEM

The wiper motor/bracket unit fitted inside the sealed external mounting box. 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.

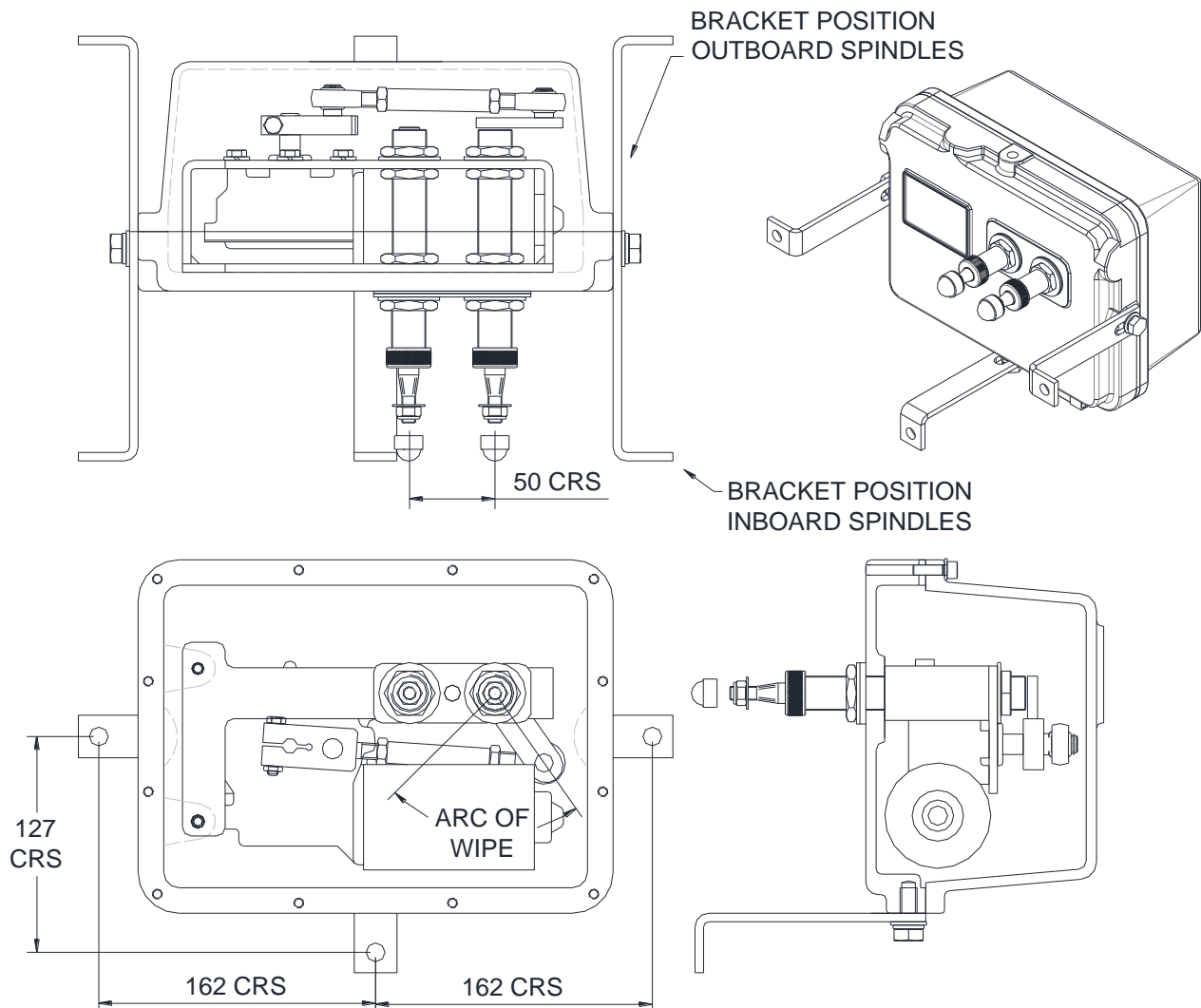
The drive lever is secured to the wiper motor shaft and connected through a tie bar, to the spindle lever assembly. The drive mechanism provided transfers the rotary output from the motor; to a reciprocating motion of the spindles, this mechanism is zinc plated and is sized to give the correct angle of arc for the windscreen wiper arm being driven.

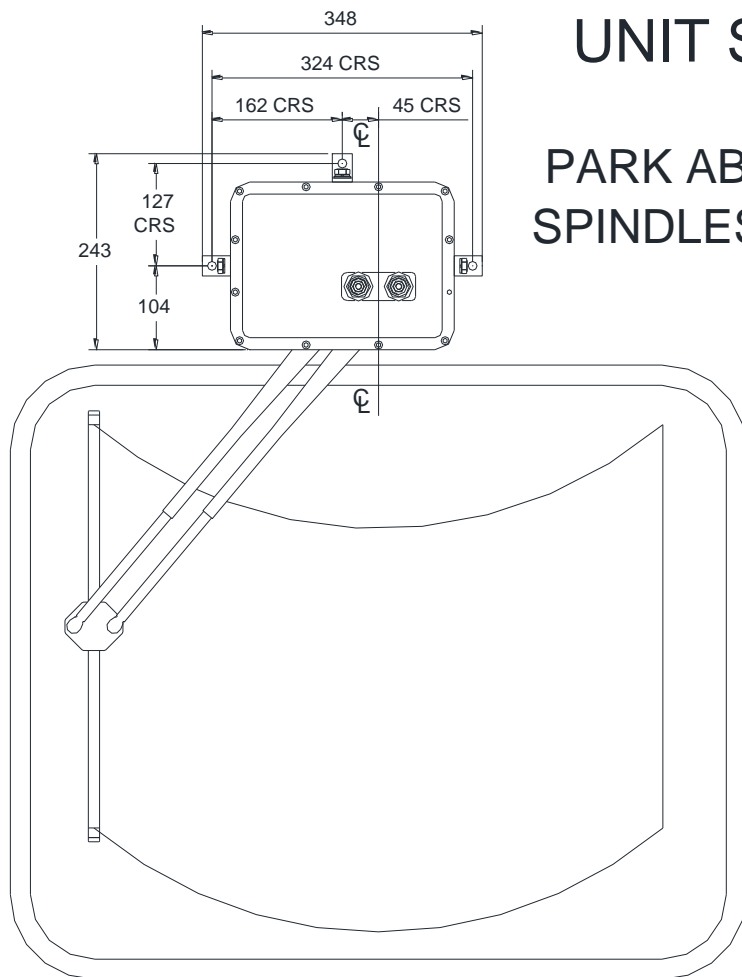
The Spindles that drive the wiper arms pass through the external mounting box, connecting the drive mechanism to the wiper arm; these are manufactured from stainless steel, to prevent corrosion.

Motor Specifications

Motor Voltage	Wipe speed (Cycles per Minute)	Start Current (Amps)	Normal Run Current (Amps)	Fuse Value (Amps)	Starting Torque (Nm)	Drive Unit Rating
24 DC	28 and 43	5	3	6.3 T	50	IP68
12 DC	33 and 50	5	3	6.3 T	50	IP68

Wiper Motor Assembly

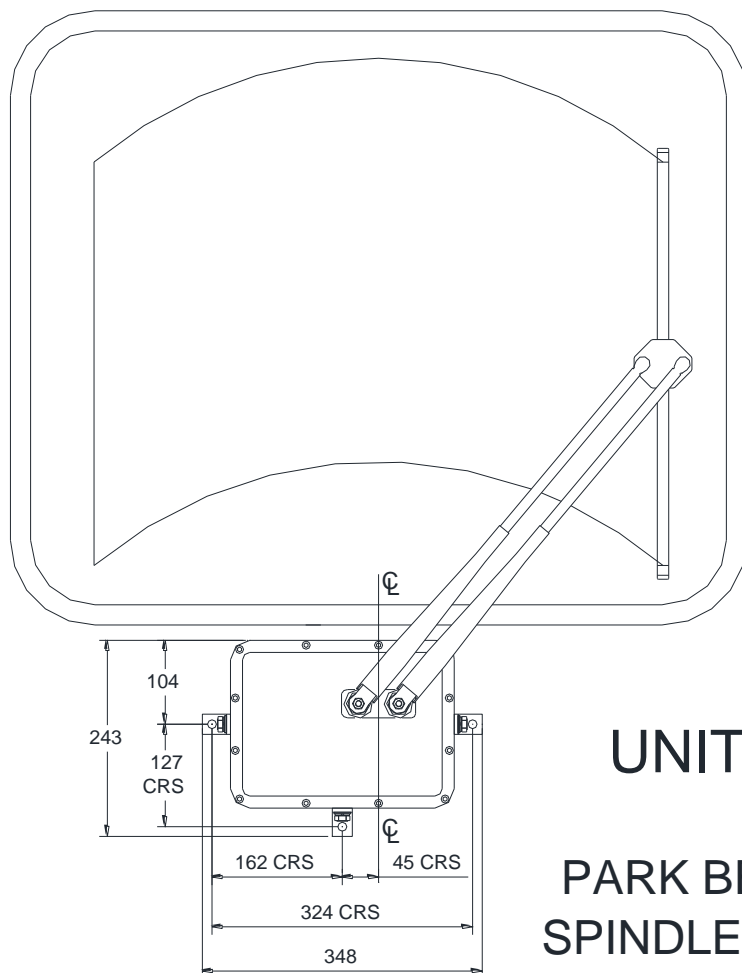




UNIT SHOWN
PARK ABOVE LEFT
SPINDLES INBOARD



VIEW ON
OUTSIDE
LOOKING IN



UNIT SHOWN
PARK BELOW RIGHT
SPINDLES OUTBOARD

WIPER ARM ASSEMBLY

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 available in two versions for inboard and outboard mounted wiper units. The wiper arms are shown in 1850 1 – range arms and 1850 0 – range arms drawings.

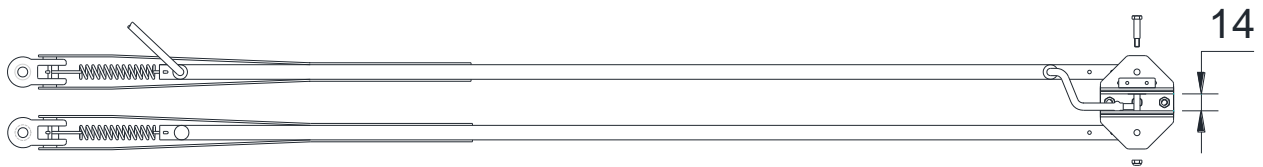
One wiper arm assembly is used on each unit. The wiper arm assembly mounts directly onto the spindles. The wiper arm is secured to the spindles via a series of nuts and washers.

Note: In some cases the Arm may have a forward crank to aid wiping.

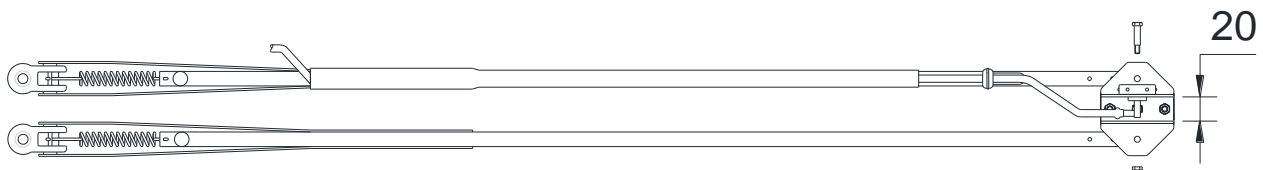
The blade is secured to the arm assembly using the blade clip arrangement on the arm and blade bolt.

1850 1 – range arms

Straight Arms – Inboard Facing Spindles



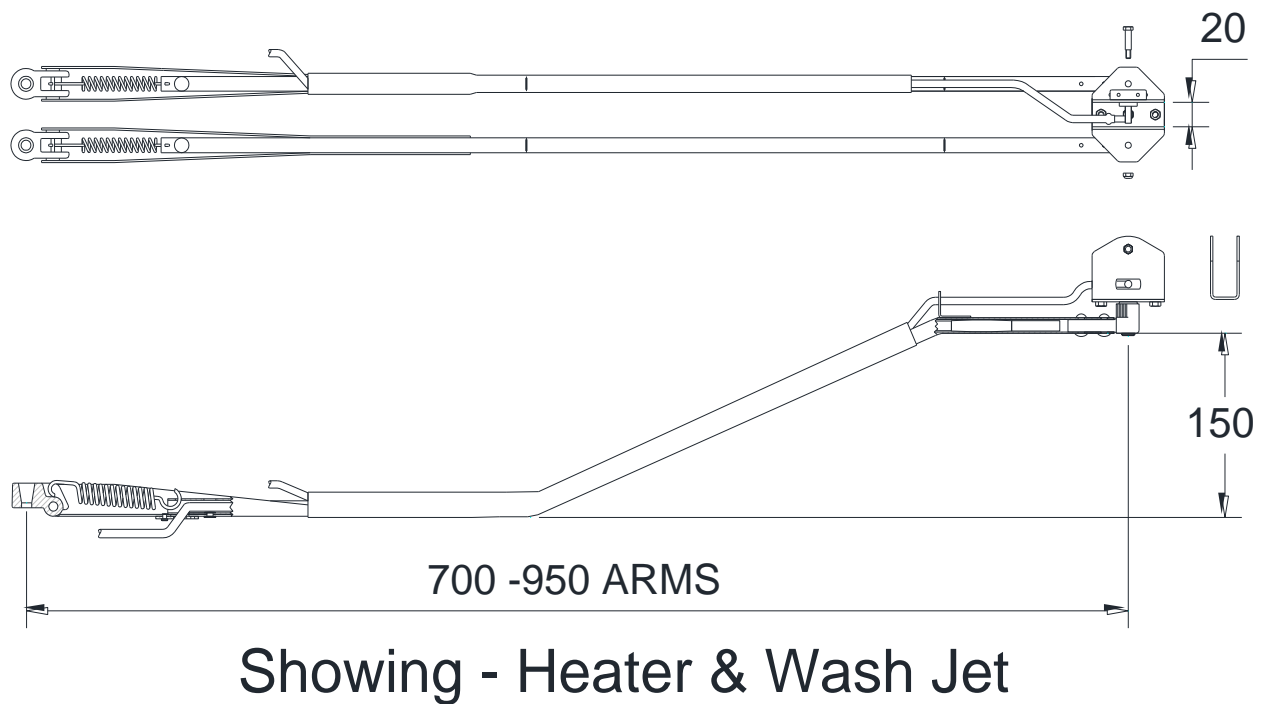
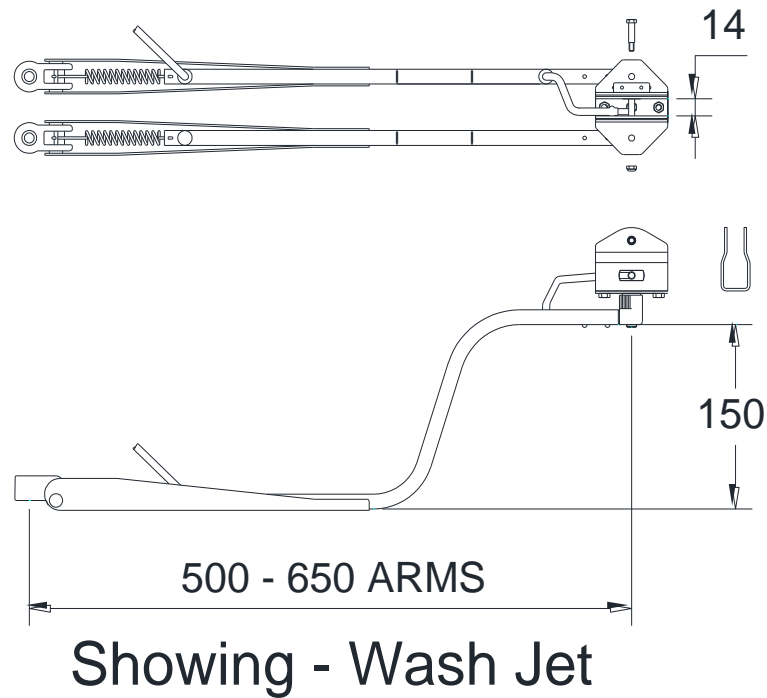
Showing - Wash Jet



Showing - Heater & Wash Jet

1850 0 – range arms

Cranked Arms – Outboard Facing Spindles



INSTALLATION INSTRUCTIONS

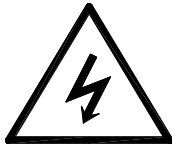
NOTE

Retain all items removed in a safe place, as they will be required on reassembly.

Any item to be discarded must be done in accordance to vessels manufacturer described task guidelines

If you experience any difficulty in the fitting of any of the units/components, please do not hesitate to contact Customer Service at B. Hepworth & Co. for advice.

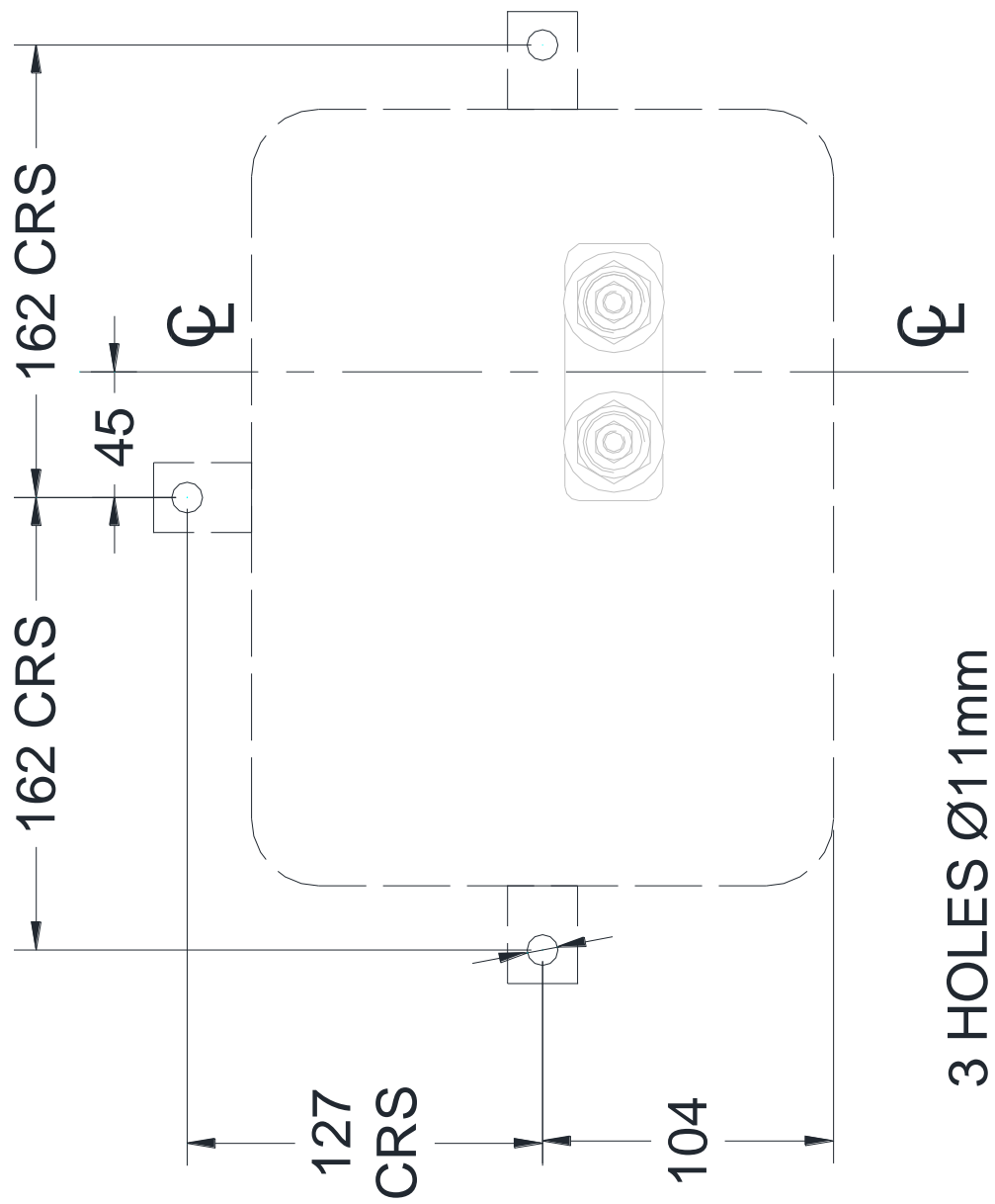
Use the drawings for reference.



WARNING:

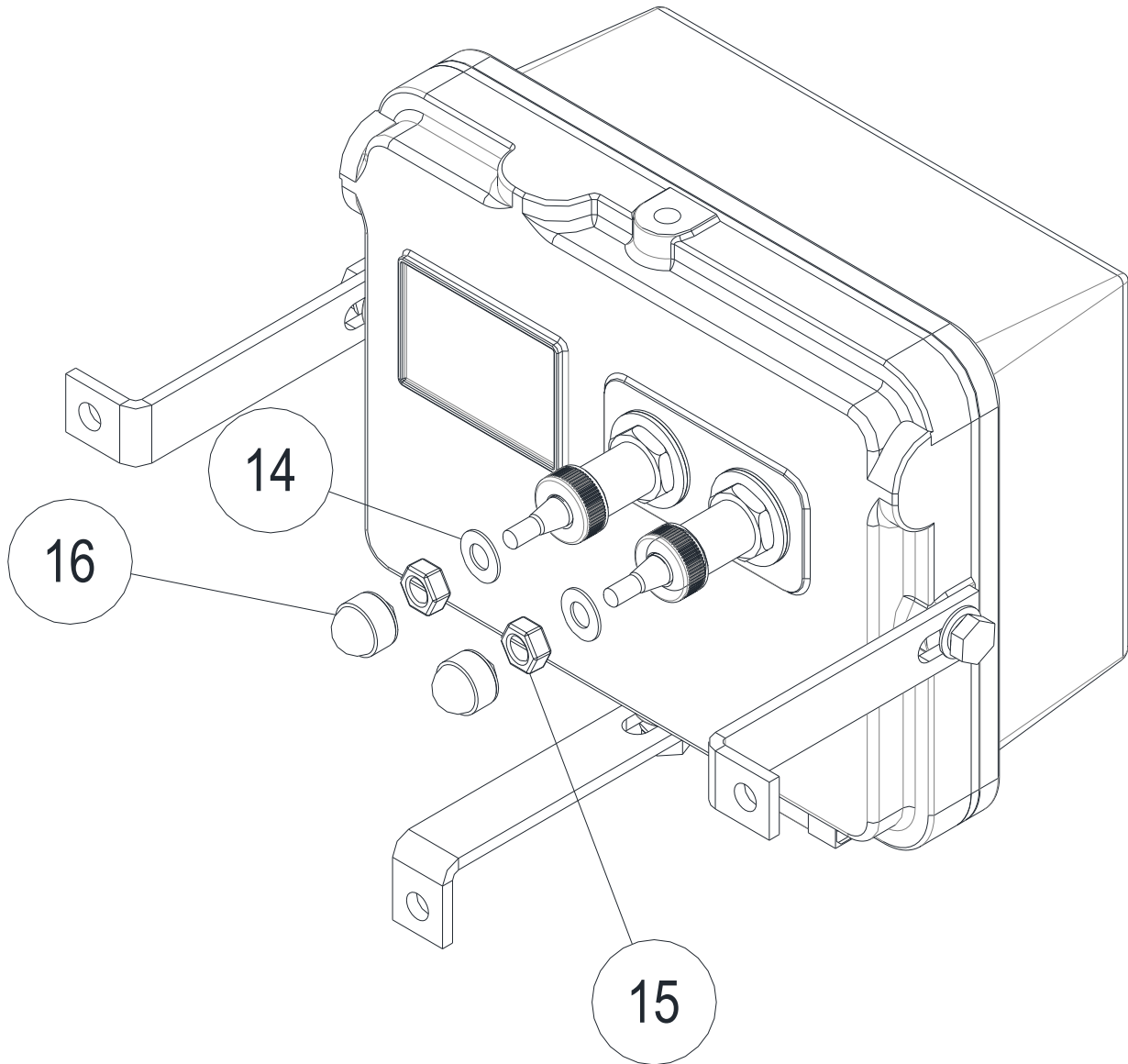
Isolate the electrical supply before commencing any fitting work on any part of the wiper system.

DRILLING DIAGRAM



FITTING THE WIPER UNIT

Exploded View of Linkage



Ref Figure – Drilling Diagram

When the mounting holes have been drilled in the bulkhead, the following procedures apply.

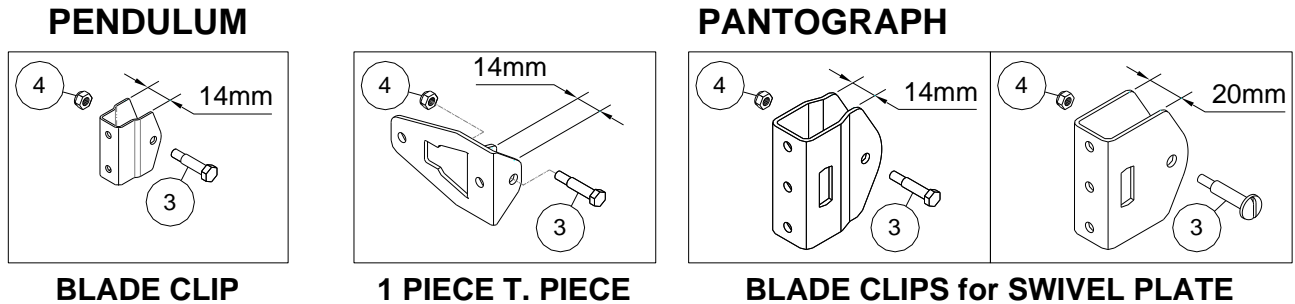
1. Fit the Motor Unit and fix in place through the predrilled mounting holes (Fixing bolts not supplied)
2. ***Externally*** – ENSURE a proprietary sealant (***Not supplied***) is used around all points of entry through bulkhead.
3. ***Internally*** – Wire motor to vessels electrics via switch/controller (***May or may not be supplied***)
With Reference to Fitting Instructions – Electrical Connections

FITTING THE WIPER BLADE

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

With reference to the Maintenance Table and the Troubleshooting Table – Continued

Figure – Blade Clip Fixings



Ref Figure – Blade Clip Fixings

1. Remove blade retaining screw (1), and M4 Nylock nut (2), from blade clip on arm.

NOTE

No plastic spacers required – if supplied with blade

If only one end of the wiper blade rubber is captive, it must be fitted so it will be at the top of the screen when the arm is in the vertical position.

(Articulated blades only)

Ref Figure – Blade Captive End

2. Place wiper blade directly into arm blade clip.
3. Ensure that all fixing holes align, on wiper blade and arm blade clip.

Ref Figure – Blade Clip Fixings

4. Secure in place with blade retaining screw (1), and M4 Nylock nut (2).

IMPORTANT

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

Ref Figure – Nut Tightening

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

Figure – Blade Captive End

Must be at top

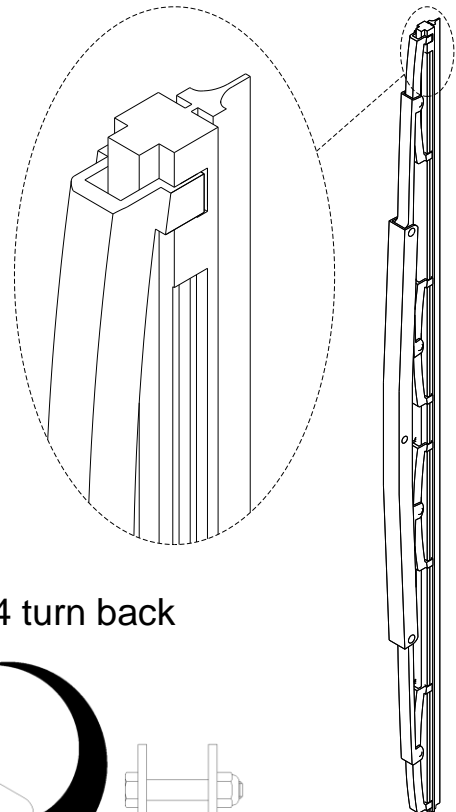
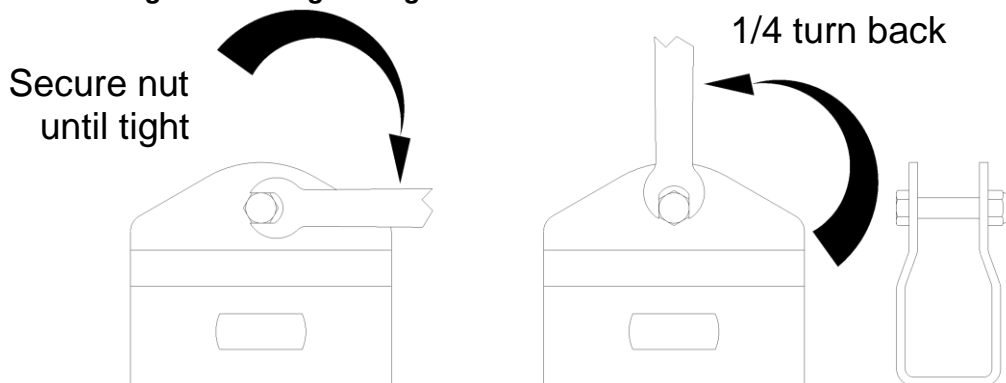


Figure – Nut Tightening



NOTE

Pictorial representation only, May not be exact to supplied arm

FITTING THE WIPER ARM ASSEMBLY

IMPORTANT:

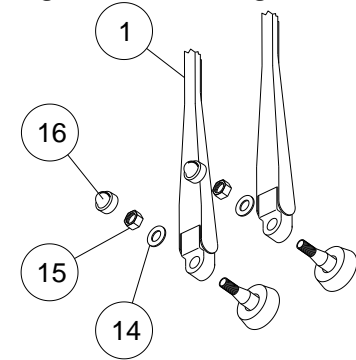
The blade must be fitted to arm prior to arm being fitted. (This is to prevent blade clip damaging screen)

1. **Internally** – Run motor to insure 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 from each spindle one weather cap (16), one M8 nut (15), one washer – flat (14).
4. Fit arm onto spindle allowing blade to lie approx 50-75mm from edge of glass in PARKED POSITION. Test on a wet screen to prove clearance is acceptable.

Ref Figure – Arm Fittings

5. Fit one 8mm flat washer (14) on to spindle next to arm head, then one M8 Nylock nut (15), on to each spindle.
6. Only tighten nut sufficiently to allow arm and blade to travel across glass when motor is run to see if positioning is correct.
7. If incorrectly positioned – DO NOT ATTEMPT TO ROTATE OR TWIST ARM ON SPINDLE this will damage splined end of drive spindle, resulting in arm and blade slipping in operation.

Figure – Arm Fittings



Ref Figure – Arm Extractor

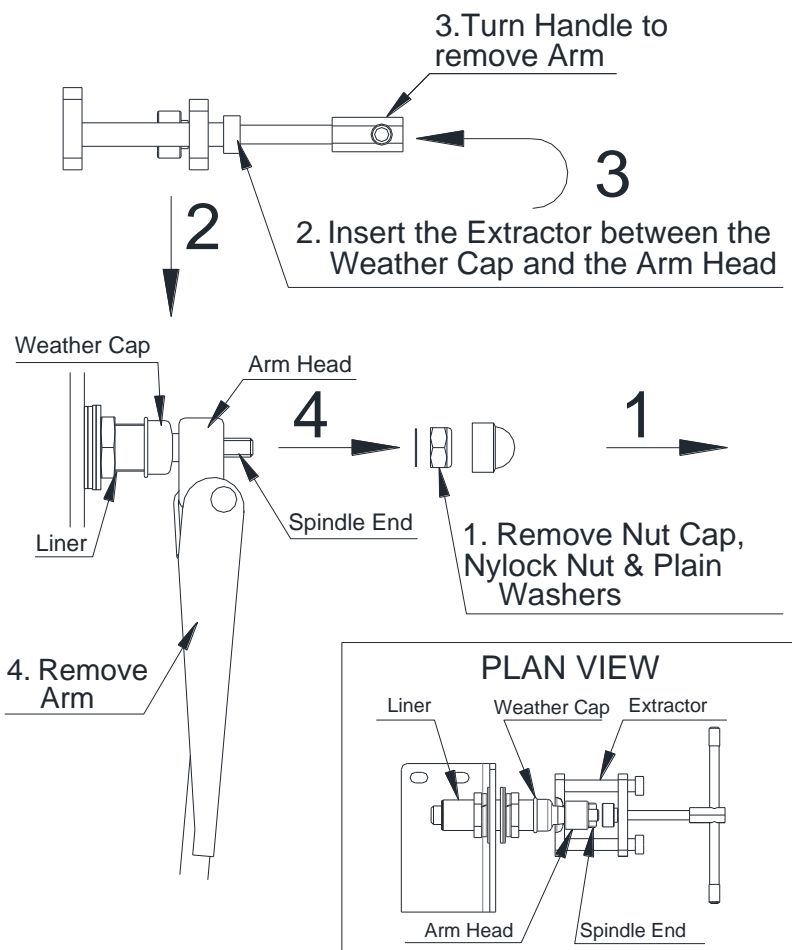
8. To correct alignment errors, – loosen nut and gently pull arm up spindle, realign and repeat stages above.

Use arm extractor tool to help pull wiper arm up spindle, if required

9. When correctly aligned, tighten M8 spindle nuts
Torque M8 = 20Nm (on Spindle Nut)
10. Fit weather caps supplied with linkage (16)
11. Carefully push black wash hose attached to wiper arm onto bulkhead connector (**Not Supplied**)

Figure – Arm Extractor

OPERATING THE EXTRACTOR

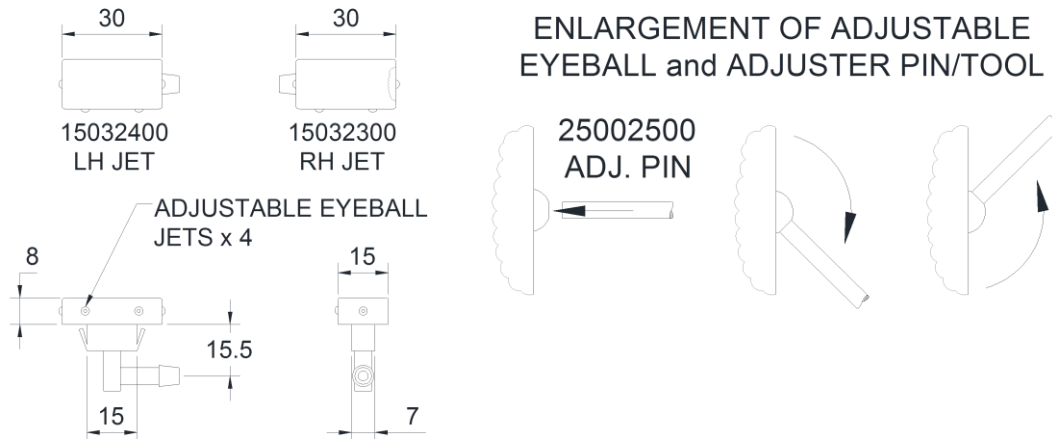


IMPORTANT

On first fitting check spring pressure on blade in parked position it must NOT exceed recommended pressure 1-1.5kg

ADJUSTING THE WASH JET SPRAY AREA

Figure – Adjusting the Wash Jet



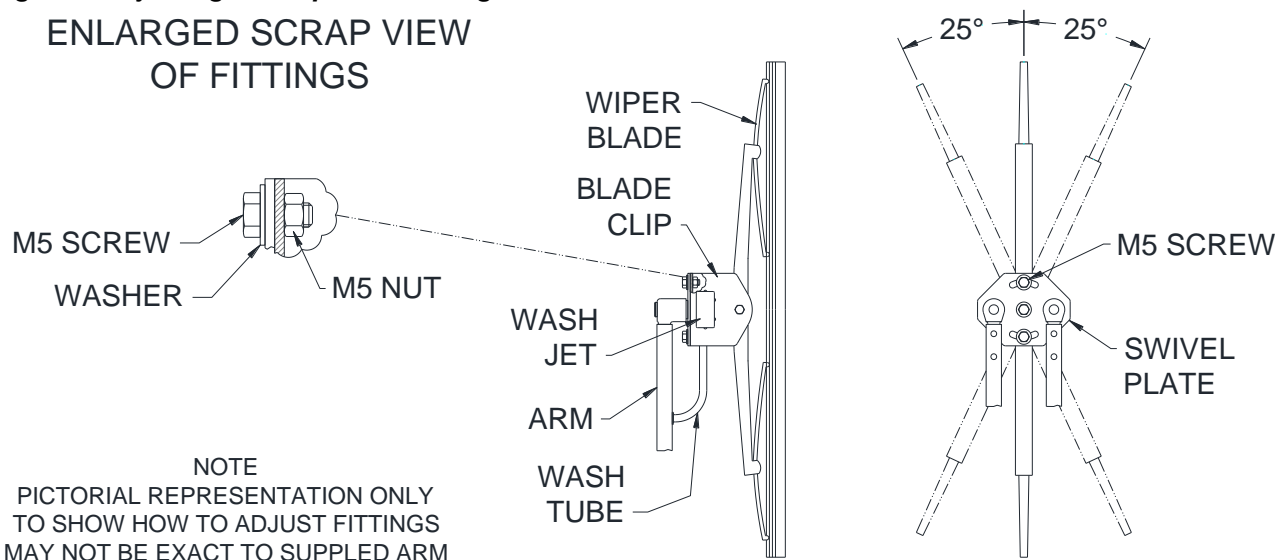
Ref Figure – Adjusting the Wash Jet

1. There are four adjustable eyeball jets on each jet body. Jet bodies are handed to suit leading edge of blade.
2. Ensure the windscreen is wet before operating wipers. Make sure flow of washer fluid from jet nozzle, on wiper arm is directed onto windscreen within sweep of wiper.
3. Using adjuster pin/tool provided, adjust eyeball jets, so that the spray pattern on screen is within sweep of wiper.

ADJUSTING THE WIPER BLADE ANGLE

Figure – Adjusting the Wiper Blade Angle

ENLARGED SCRAP VIEW
OF FITTINGS



IMPORTANT

Adjusting the Wiper Blade Angle only applies to Pantograph Arms with a Swivel Plate

Ref Figure – Adjusting the Wiper Blade Angle

1. On back of adjustable swivel plate, slacken all M5 screw and nut assemblies to allow movement of blade clip on plate.
2. Rotate blade clip and blade to correct angle. Max 25° about centre.
3. Re-tighten all M5 screw and nut assemblies
Torque M5 = 4.5Nm (on Arm – Swivel Plate/Blade Clip)

TROUBLESHOOTING

Introduction

The following provides all the instructions and information necessary to locate problems and conduct tests on the windscreen wiper system components. The trouble-shooting tables provide 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 the Tables. These troubleshooting and repair procedures should be followed when encountering operational problems with the windshield wiper system

Troubleshooting Table

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 or replace drive crank. Clean motor output shaft with wire brush before replacing. With Ref to Maintenance Table – continued for Torque settings.
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 M8 = 20Nm
Erratic Motor	Voltage level Switch Wiring	Check supply voltage 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

Troubleshooting Table – Continued

SYMPTOM	PROBABLE CAUSE	TESTS AND CHECKS	CORRECTIVE ACTION
Slow Motor Operation	Voltage Level Switch Motor Bracket Linkage Defective Wiper Motor	Check supply voltage 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
Arm and blade not operating correctly or over sweep operation	Voltage level Linkage Spindle Arm Blade	Check supply voltage to wiper system. Check for worn or broken linkage Check for excessive wear in spindle Check that arm is not loose on spindle Check for excessive wear on arm Check fixing for wear Check blade for wear Check for excessive smearing on screen	Correct voltage supply problem Replace linkage Replace spindle Re-tighten spindle Clean spline on spindles with wire brush. replace arm Replace blade Replace blade Replace blade
Excessive wear on blade.	Spring pressure.	Use spring balance on centre of blade clip till blade begins to lift off glass. 1.0 – 1.1/2 kg Must not exceed 2.0 kg	Replace spring/arm.
Washer system not working correctly	No washer fluid from jets	Check washer fluid level in tank Check for damage to tank Check Pump is operational	Fill tank (<i>see Note</i>) Replace tank (<i>see Note</i>) Replace pump if faulty (<i>see Note</i>)

NOTE

Tank and / or Pump may not be supplied by Hepworth's, but we recommend checking of these items in any case as lack of washer fluid on screen may lead to damage or premature failure of Windscreen Wiper equipment

MAINTENANCE – TABLE

Introduction

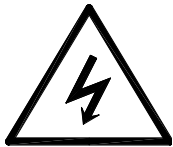
The following contains all preventative maintenance details for the windscreen wiper components. Preventative maintenance procedures include the information required for when to replace the wiper blades.

Refer to the Maintenance Instructions Section for removal and replacement for procedures.

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



WARNING:

Isolate the electrical supply before commencing any fitting work on any part of the wiper system.

The Maintenance Table 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.

Maintenance Table

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	Wash Tank	Ensure wash tank is filled with washer fluid to prevent wipers being used on a dry screen
Yearly or as required	Wiper blades	Non serviceable item. Replace at overhaul period or as required.

MAINTENANCE INSTRUCTIONS

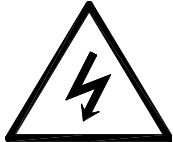
NOTE

Retain all items removed in a safe place, as they will be required on reassembly.

Any item to be discarded must be done in accordance to vessels described task guidelines

If you experience any difficulty in the removal/replacement of any of the units/components, please do not hesitate to contact Customer Service at B. Hepworth & Co. for advice.

Use the drawings for reference.



WARNING:

Isolate the electrical supply before commencing any fitting work on any part of the wiper system.

TO REPLACE THE WIPER BLADE

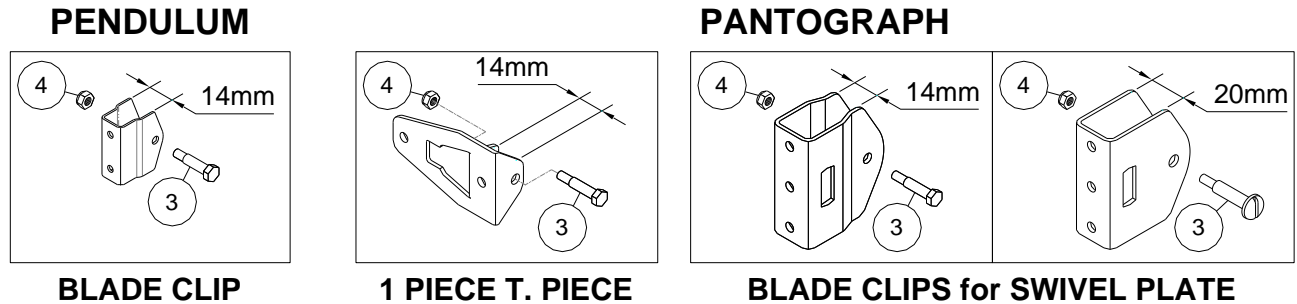
The wiper blades should be changed every 12 months but this is dependent on use and operating conditions

With reference to the Maintenance Table and the Troubleshooting Table – Continued

Removal

1. **Internally** – Run motor to ensure it is parked correctly. Disconnect all electrical power.
2. **Externally** – Carefully pull wiper arm assembly away from windscreen to enable access to wiper blade.

Figure – Blade Clip Fixings



Ref Figure – Blade Fittings

3. Remove one blade retaining screw (3), and one M4 Nylock nut (4), from blade clip on arm.
4. Remove wiper blade from blade clip on wiper arm.

Reassembly

NOTE

Note if only one end of blade rubber captive, it must be at top of screen

1. Place wiper blade into blade clip on wiper arm.

Ref Figure – Blade Captive End

2. Ensure that all fixing holes align.

3. Secure in place with blade retaining screw (3), and nut (4).

IMPORTANT

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

Ref Figure – Nut Tightening

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

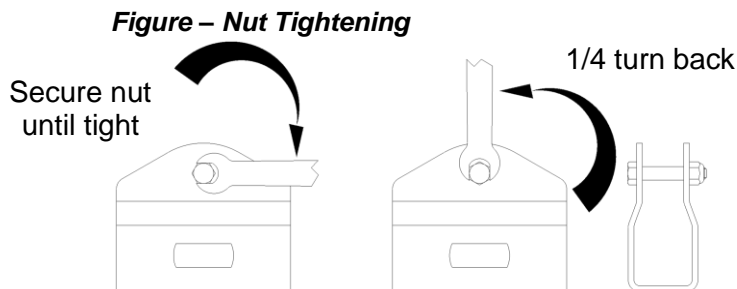
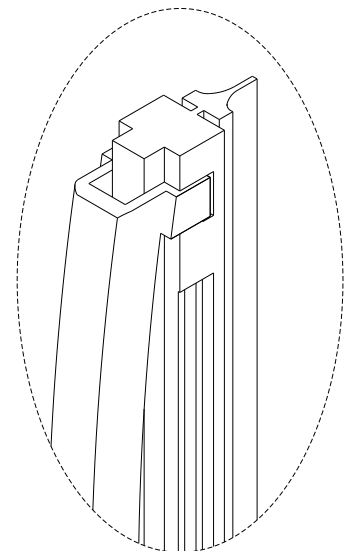


Figure – Blade Captive End



5. Lower wiper blade carefully back onto windscreen.

TO REPLACE THE WIPER ARM

Removal

With Reference to Wiper Arm Assembly – Pantograph or Pendulum

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 8mm Nut Cap(s) – (16), M8 Nylock Nut(s) – (15) and 8mm Flat Washer(s) – (14). Then using Arm Extraction Tool carefully remove Arm
(Arm Extractor Tool is available see Fitting the Wiper Arm Assembly 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. Fit wiper arm
In accordance with Fitting the Wiper Arm Assembly

CONTROLLER INSTALLATION INSTRUCTIONS

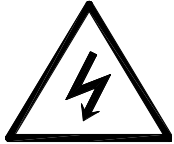
NOTE

Retain all items removed in a safe place, as they will be required on reassembly.

Any item to be discarded must be done in accordance to vessels manufacturer described task guidelines

If you experience any difficulty in the fitting of any of the controller /switches, please do not hesitate to contact Customer Service at B. Hepworth & Co. for advice.

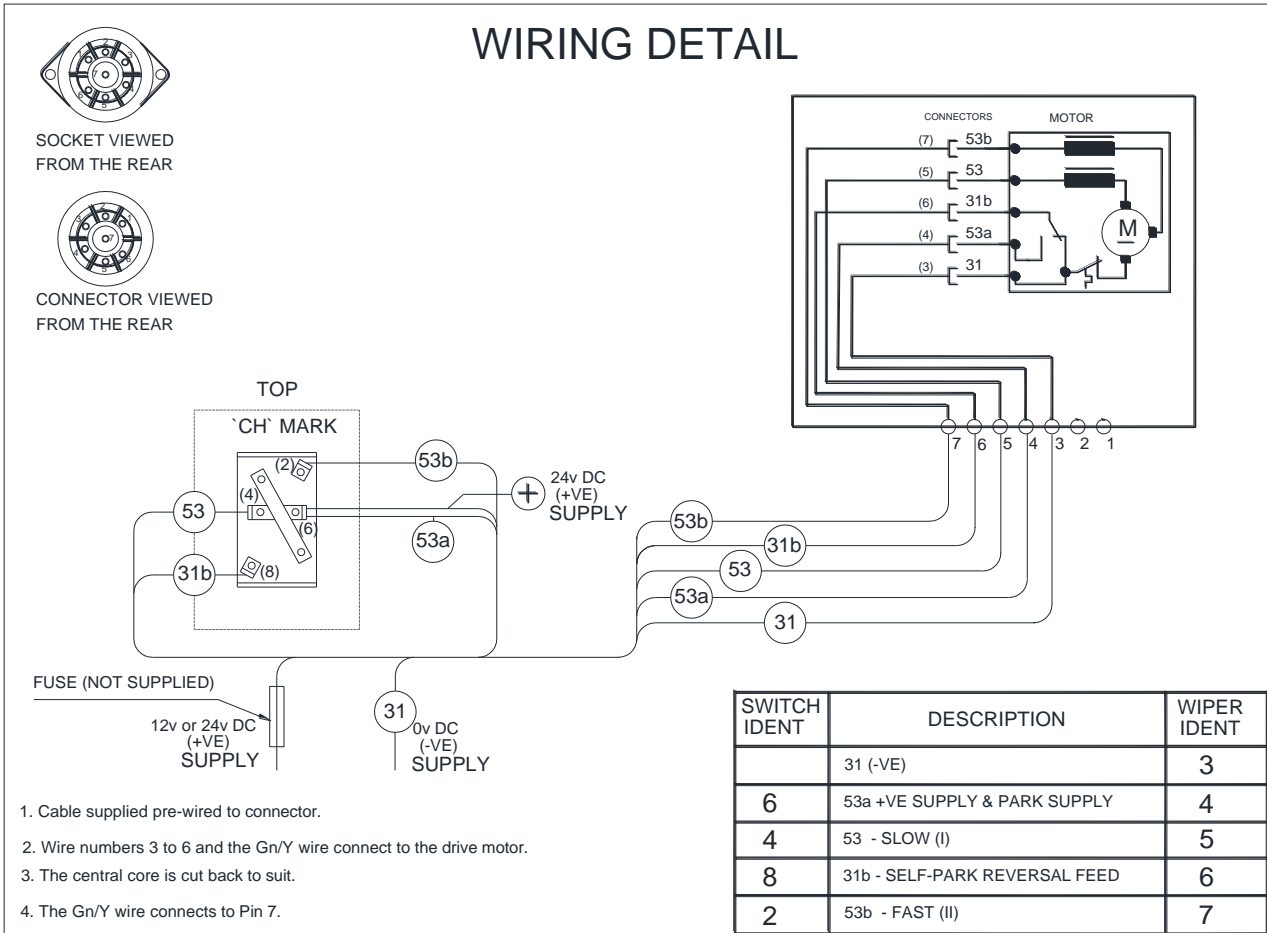
Use the drawings for reference.



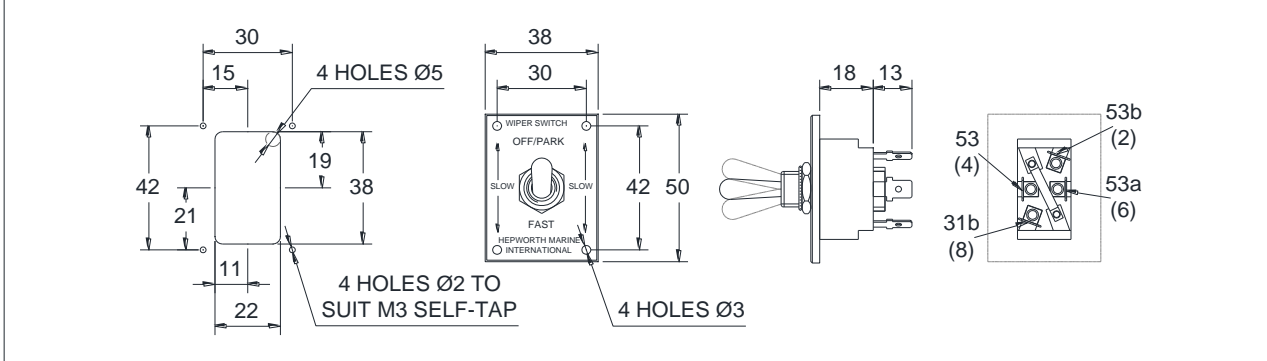
WARNING:

Isolate the electrical supply before commencing any fitting work on any part of the wiper system.

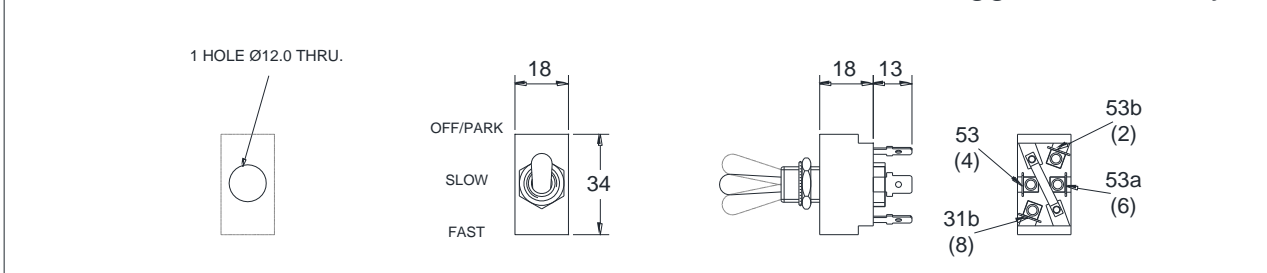
12V/24V TOGGLE SWITCH – WIRING & SIZES



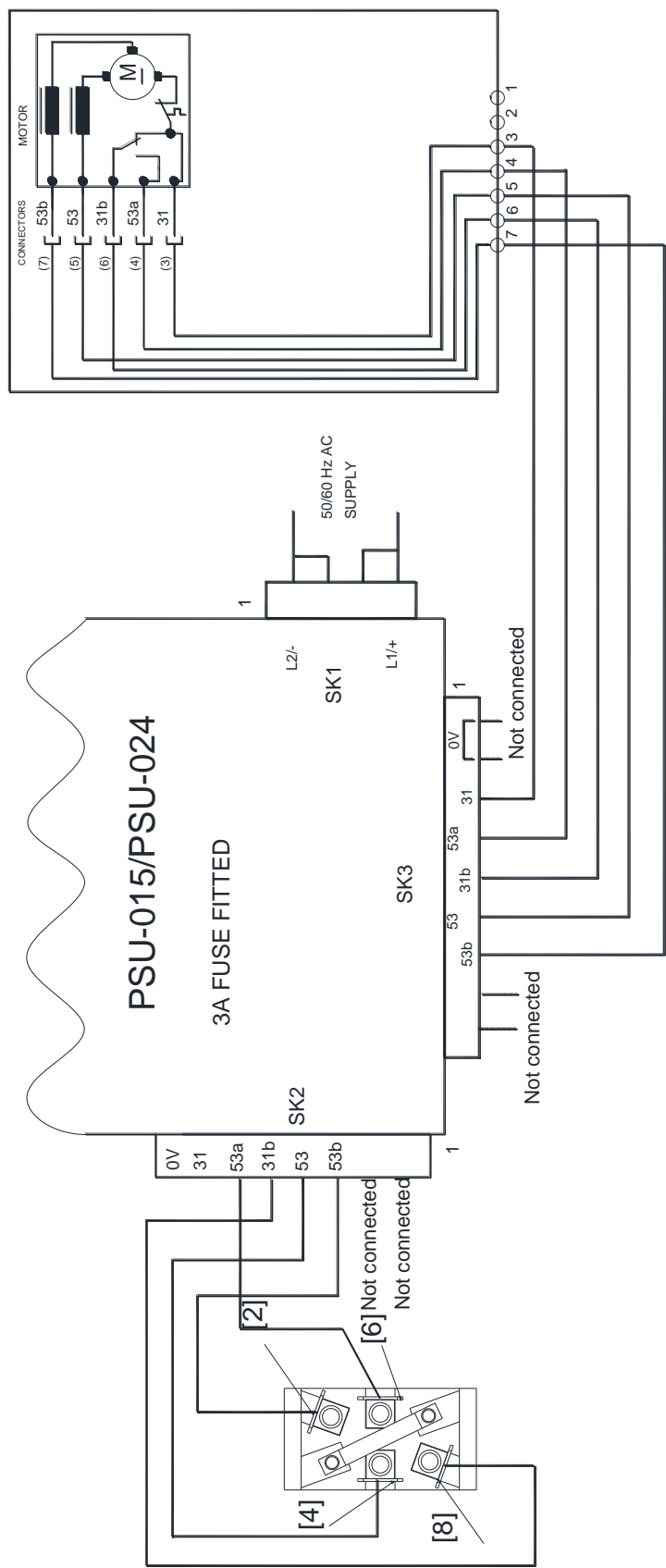
CONSOLE CUT OUT DETAIL - 90041400 - 1 x 12/24v Toggle Switch & Plate



CONSOLE CUT OUT DETAIL - 10079200 - 1 x 12/24v Toggle Switch only



24V TOGGLE SWITCH – PSU WIRING



1. Cable supplied pre-wired to connector.
2. Wire numbers 3 to 6 and the Gn/Y wire connect to the drive motor.
3. The central core is cut back to suit.
4. The Gn/Y wire connects to Pin 7.

12V/24V TOGGLE SWITCH – OPERATION

NOTE

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

Ref Figure – Toggle Switch

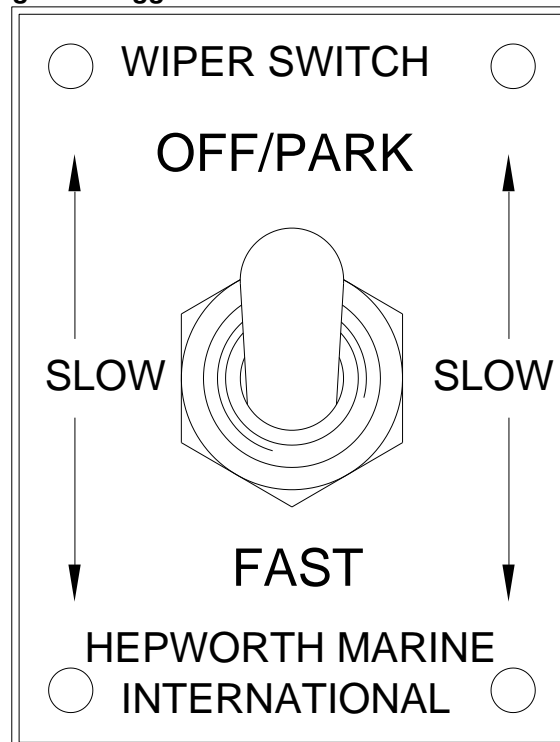
1. Check switch is in off position before starting. *(OFF/PARK)*

IMPORTANT

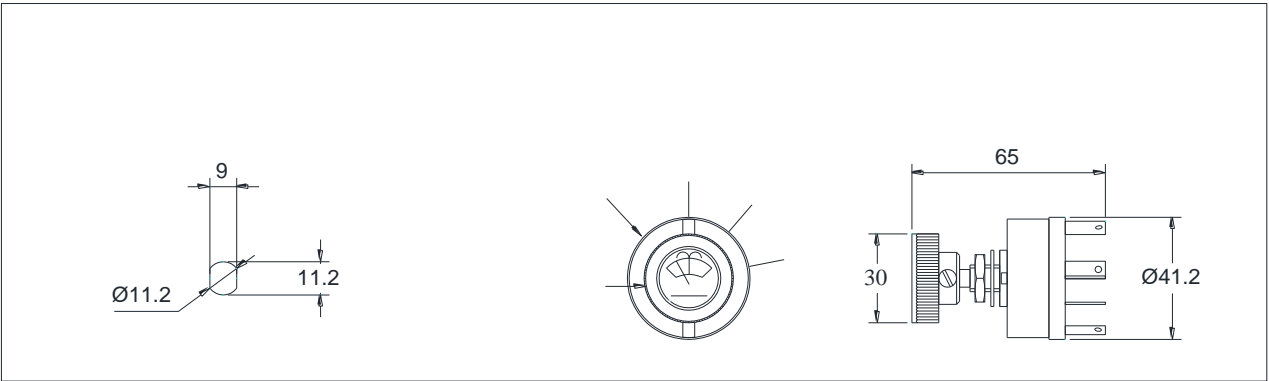
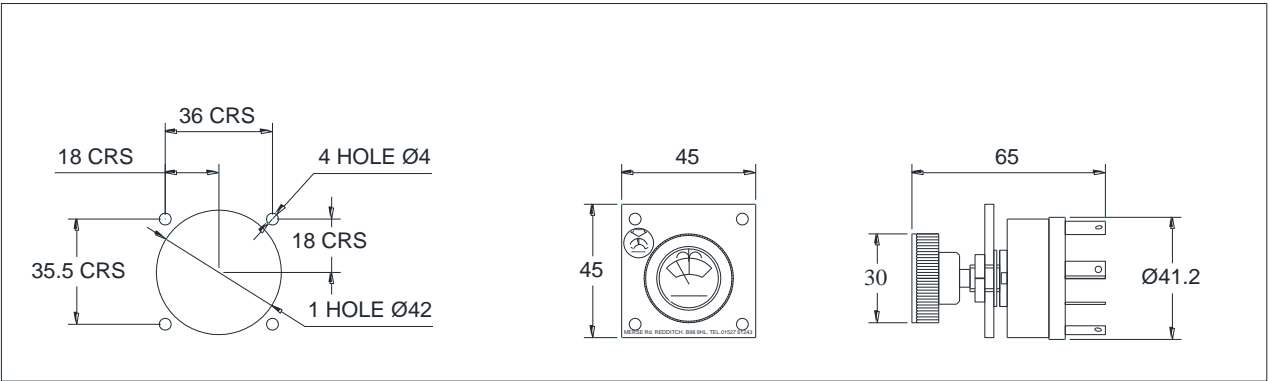
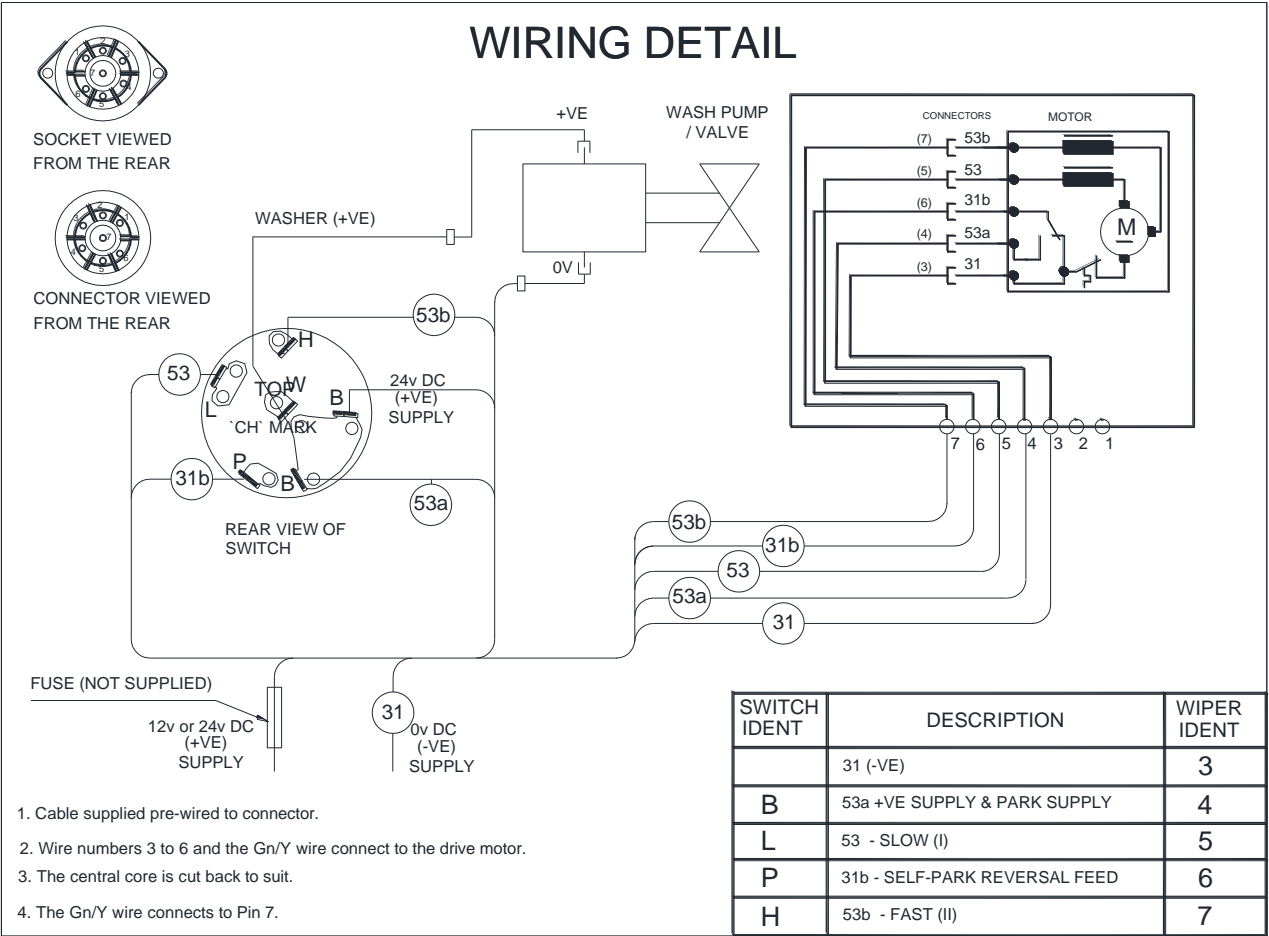
Do not run wipers on a dry screen.

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

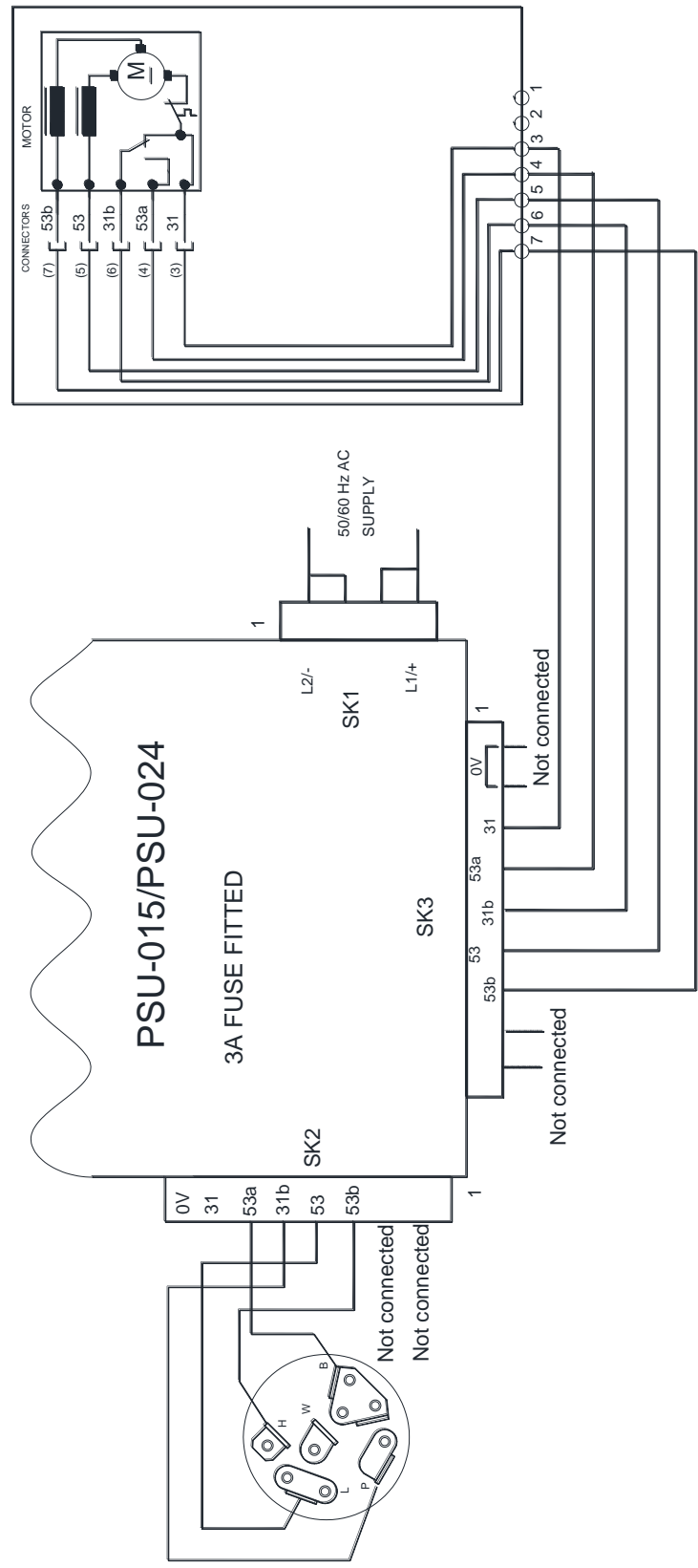
Figure – Toggle Switch



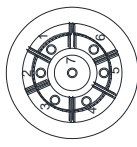
12V/24V ROTARY SWITCH – WIRING & SIZES



24V ROTARY SWITCH – PSU WIRING



SWITCH IDENT	DESCRIPTION	WIPER IDENT
	31 (-VE)	3
B	53a +VE SUPPLY & PARK SUPPLY	4
L	53 - SLOW (I)	5
P	31b - SELF-PARK REVERSAL FEED	6
H	53b - FAST (II)	7



CONNECTOR VIEWED FROM THE REAR



SOCKET VIEWED FROM THE REAR

- 1. Cable supplied pre-wired to connector.
- 2. Wire numbers 3 to 6 and the Gn/Y wire connect to the drive motor.
- 3. The central core is cut back to suit.
- 4. The Gn/Y wire connects to Pin 7.

12V/24V ROTARY SWITCH – OPERATION

NOTE

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

Ref Figure – Rotary Switch

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

IMPORTANT

Do not run wipers on a dry screen.

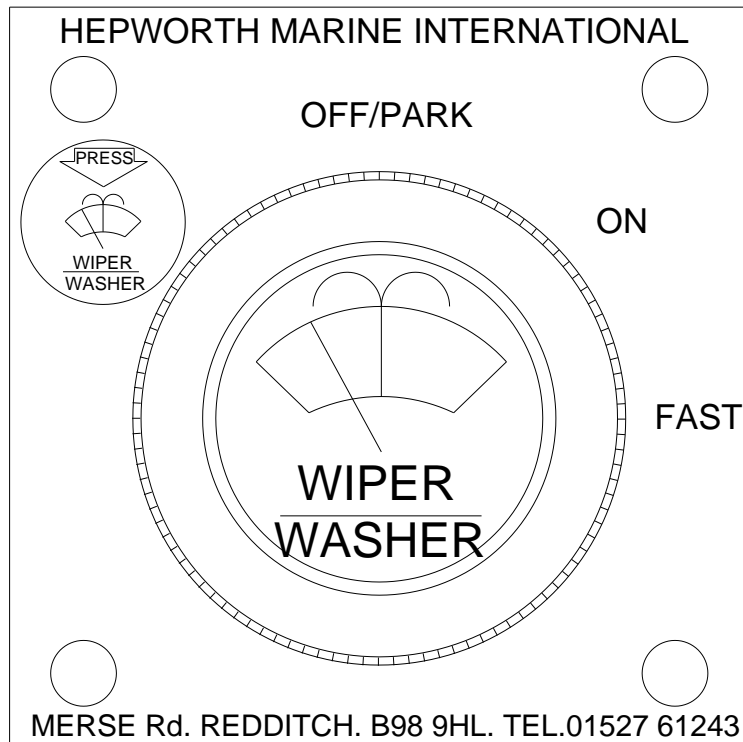
2. To apply washer fluid to screen, press knob. **(WIPER WASHER)** This will apply washer fluid for period of time button is pressed.

NOTE

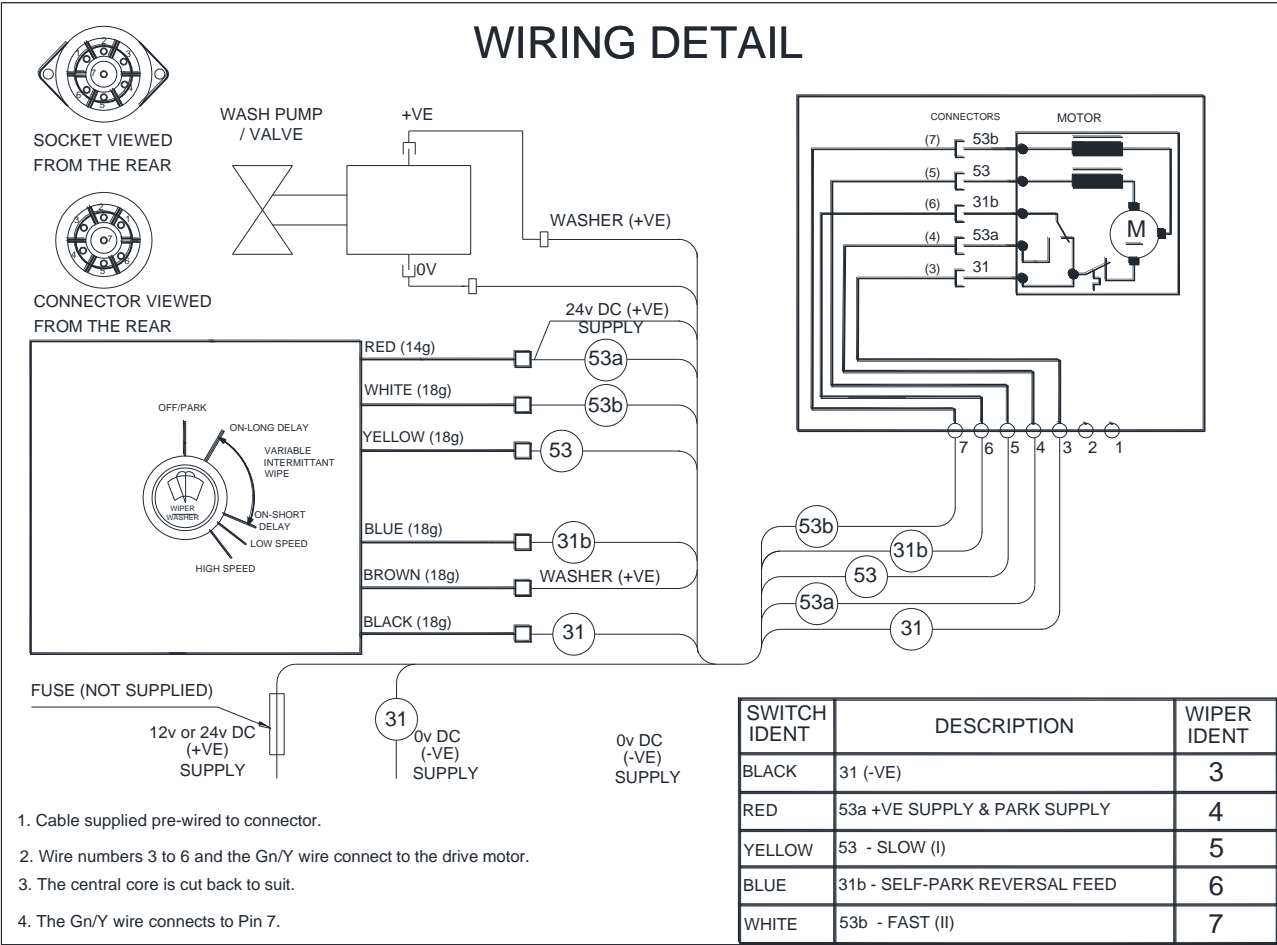
It does not activate the wiper

3. Turn knob CLOCKWISE it will (CLICK) which turns wipers on, **(ON)**. This setting gives a continuous wipe across screen at a standard speed, with no delay between wipes.
4. Turn knob CLOCKWISE to last (CLICK) **(FAST)**. This setting gives a continuous wipe across screen at a faster speed, with no delay between wipes.
5. Turn knob ANTI-CLOCKWISE to off position when finished. **(OFF/PARK)**

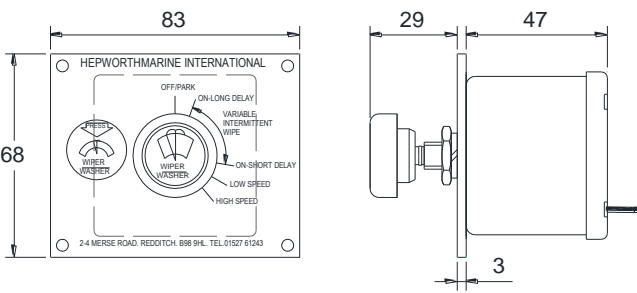
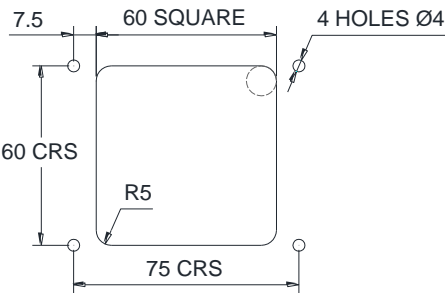
Figure – Rotary Switch



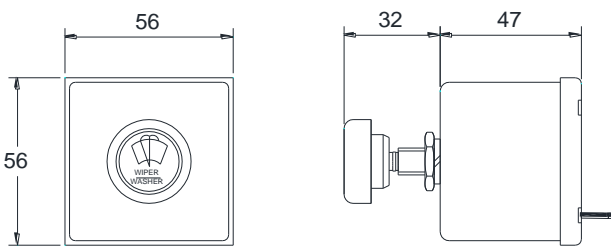
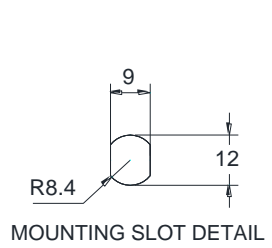
12V OR 24V MULTI-SWITCH – WIRING & SIZES



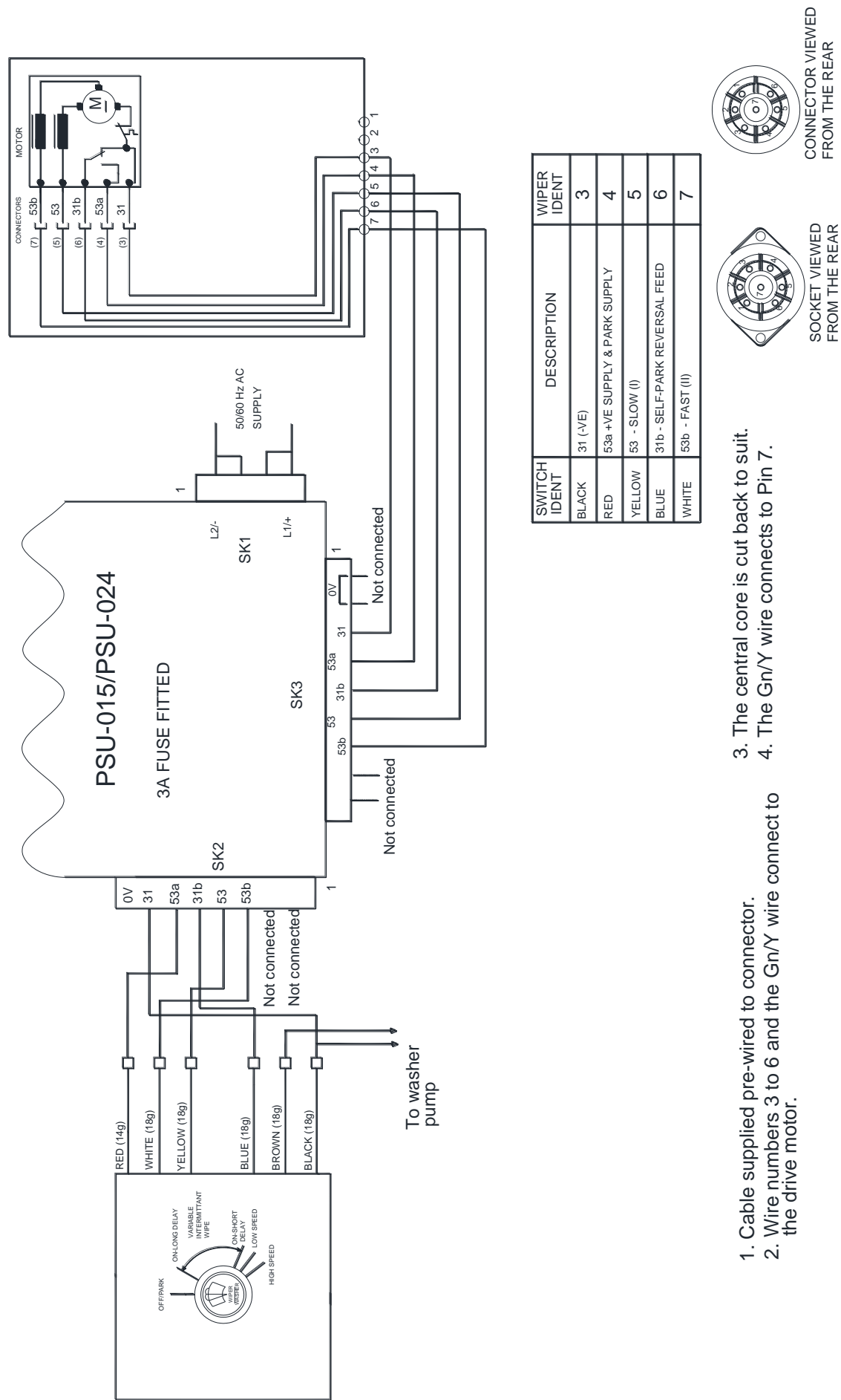
CONSOLE CUT OUT DETAIL - 90087010 - 1 x 24v Multi-Switch & Plate - 90087200 - 1 x 12v Multi-Switch & Plate



CONSOLE CUT OUT DETAIL - 10166600 - 1 x 24v Multi-Switch only - 10167100 - 1 x 12v Multi-Switch only



24V MULTI-SWITCH – PSU WIRING



- 1. Cable supplied pre-wired to connector.
- 2. Wire numbers 3 to 6 and the Gn/Y wire connect to the drive motor.
- 3. The central core is cut back to suit.
- 4. The Gn/Y wire connects to Pin 7.

12V OR 24V MULTI-SWITCH – OPERATION

NOTE

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

Ref Figure – Multi-Switch

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

IMPORTANT

Do not run wipers on a dry screen.

2. To apply washer fluid to screen, press knob. **(WIPER WASHER)** This will apply washer fluid for period of time button is pressed.

NOTE

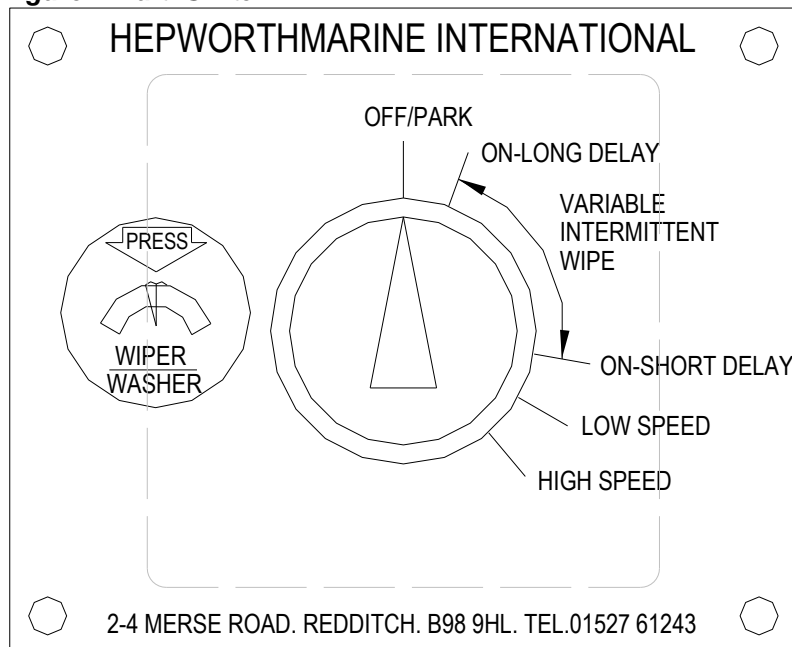
The wiper will also operate for 3-4 wipes at normal speed after the washer fluid stops.

3. Turn knob CLOCKWISE it will (CLICK) which turns wipers on. Switch is now in area of variable intermittent wipe cycle time. Which is between **(ON-LONG DELAY 15 seconds)** and **(ON-SHORT DELAY 2 seconds)** positions.
4. As knob is turned further clockwise between two positions it shortens delay period between wipes.
5. Turn knob CLOCKWISE to next (CLICK) **(LOW SPEED)**. This gives a continuous wipe across screen at a standard speed, with no delay between wipes.
6. Turn knob CLOCKWISE to last (CLICK) **(HIGH SPEED)**. This gives a continuous wipe across screen at a faster speed, with no delay between wipes.
7. Turn knob ANTI-CLOCKWISE to off position when finished. **(OFF/PARK)**

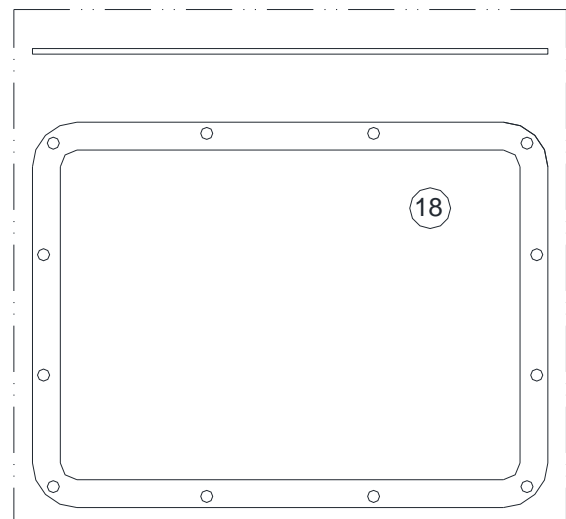
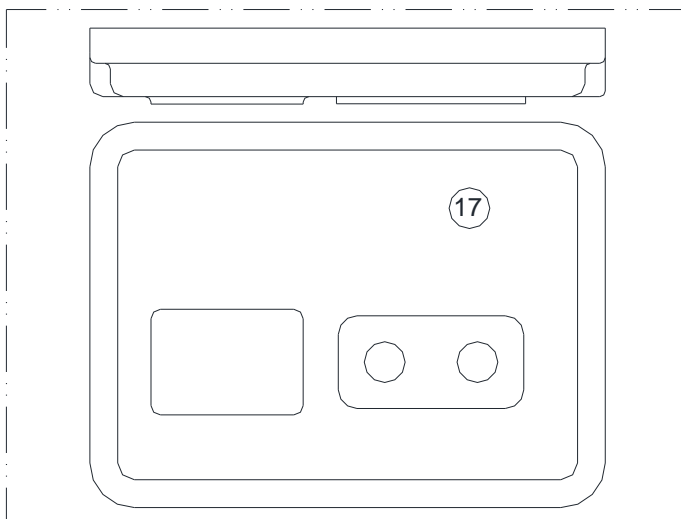
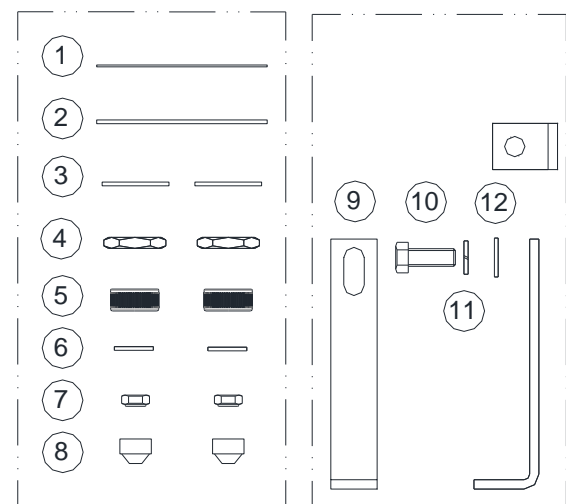
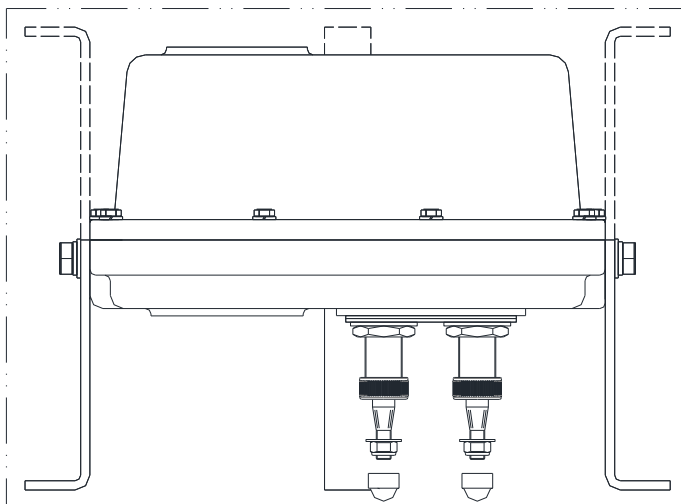
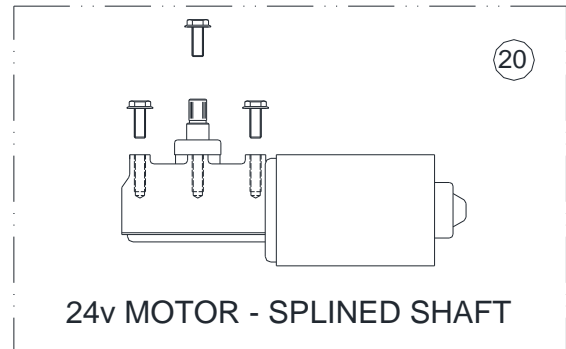
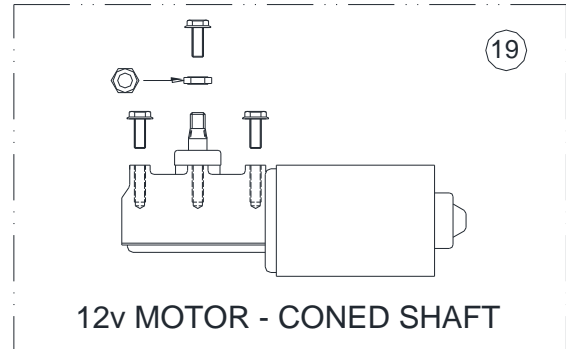
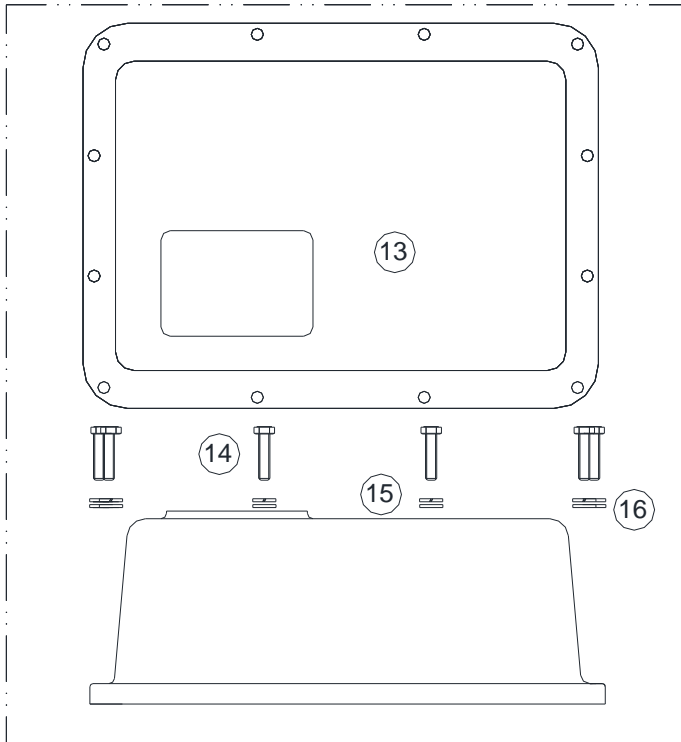
IMPORTANT

When turning to the off position ensure that it CLICKS to confirm fully off

Figure – Multi-Switch



1850L LINKAGE SPARES

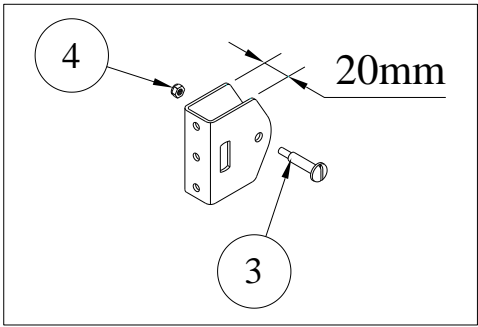
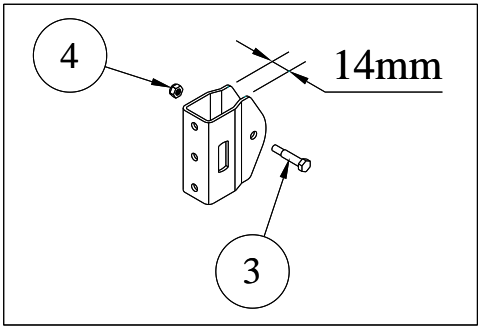


1850L – SPARES LIST

Ident	Description	Quantity	Part Number
1	Idler Gasket	1	60267900
2	Idler Plate	1	60119600
3	20mm Washer – Plain	2	10024300
4	M20 Hex Nut	2	10011900
5	20mm Brass Weather Cap (Chromed)	2	10067320
6	M8 Washer – Plain	2	10022500B
7	M8 Nylock Nut	2	10013900B
8	8mm Nut Cap	2	10060300
9	Mounting Bracket – White	3	1800-066P
10	M10 x 20 Set Screw	3	zH0010-020S
11	M10 Washer – Single Coil	3	10024400
12	M10 Washer – Plain	3	10027801
13	Unit Cover	1	1800-055
14	M6 x 25 Set Screw Hex Hd	12	zA0006-025S
15	M6 Washer – Plain	12	10025306B
16	M6 Washer – Single Coil	12	10230900
17	Unit Base	1	65305300
18	Unit Gasket/Seal	1	1800-059
19	12v Motor – Coned Drive Shaft with Fittings	1	100860/3
20	24v Motor – Splined Drive Shaft with Fittings	1	100865/2

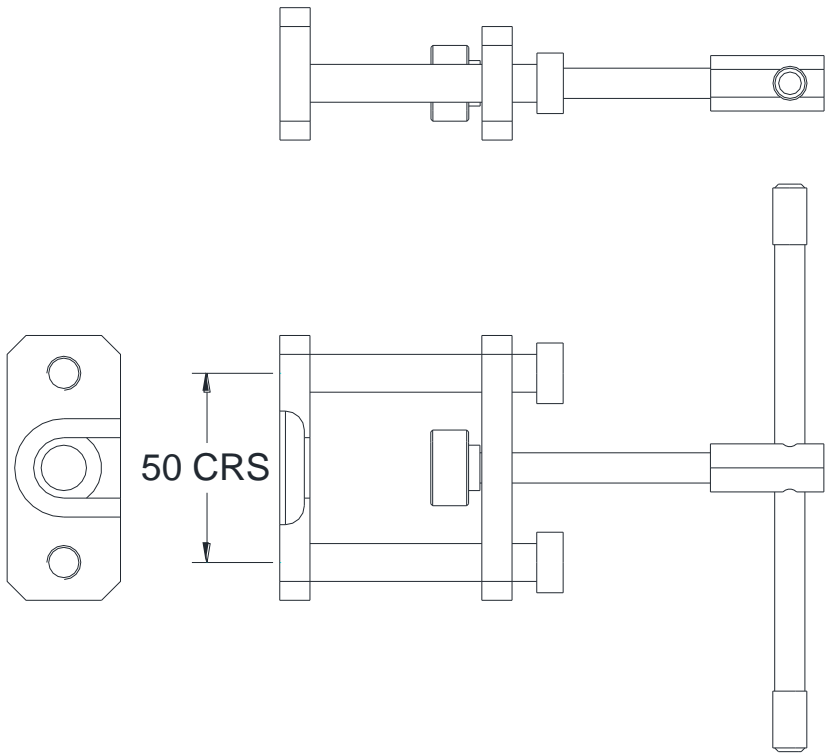
ARMS SPARES LIST

Fittings for Arm and Blade



Part No.	Description	Qty
80010700	Blade Retaining Screw (20mm Blade Clip) (3)	1 per Arm
80205600	Blade Retaining Screw (14mm Blade Clip) (3)	1 per Arm
10011400	M4 Nylock Nut (4)	1 per Arm

Part No.	Description	Qty
60680600	Arm Extractor Tool – All Head Types	As Required



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