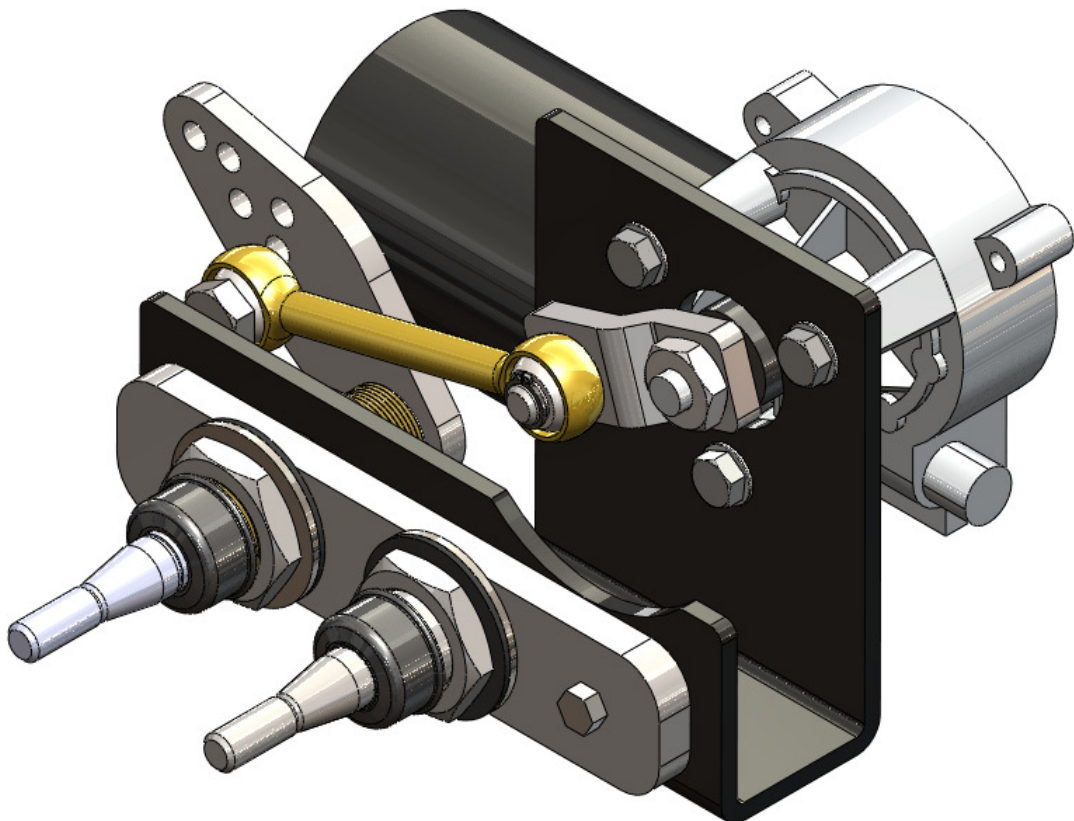




B. HEPWORTH
AND COMPANY LIMITED

*...performance wiper
systems...*

INSTALLATION AND MAINTENANCE
INSTRUCTIONS FOR S61213X UNITS
30NM DROP-IN REPLACEMENT



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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 the 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.

Where internal fixing screws and/or nuts are factory set and paint marked, leave untouched unless required to be changed or paint mark is damaged.

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

Wiper Motor Assembly

The entire wiper motor/mounting bracket/linkage is mounted internally. The electric wiper motor forms the central part of the windshield wiper system. The wiper motor is mounted on a fabricated steel bracket which is polyester powder coated to prevent corrosion. The motor is connected electrically by means of a multi-pin connector.

The drive crank is secured to the wiper motor shaft and connected through a double bearing or a tie-bar/bearing assembly, to the main spindle lever assembly. These components transfer the motor shaft rotation to the wiper arm assembly.

The drive mechanism 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.

A single main spindle only is used on pendulum units. This passes through the bulkhead, connecting the drive mechanism to the wiper arm. This is manufactured from stainless steel, to prevent corrosion.

An idler spindle is used on pantograph units. This is mounted on an external plate, connecting directly to the wiper arm. The spindle is manufactured from stainless steel, to prevent corrosion.

Wiper Arm Assembly

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

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 spindles with a series of nuts and washers.

NOTE

In some applications the arm may have a forward and/or sideways crank to aid wiping.

Wiper Blade

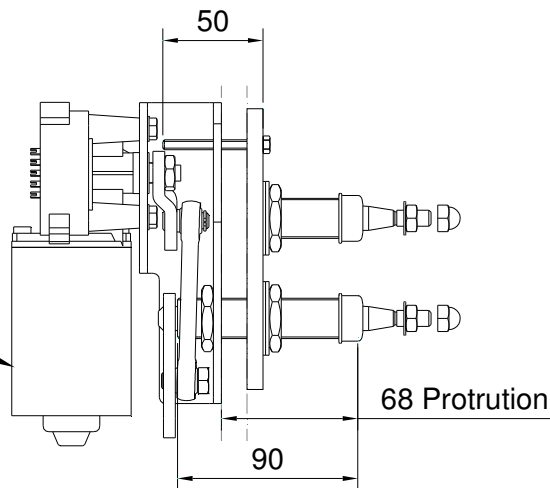
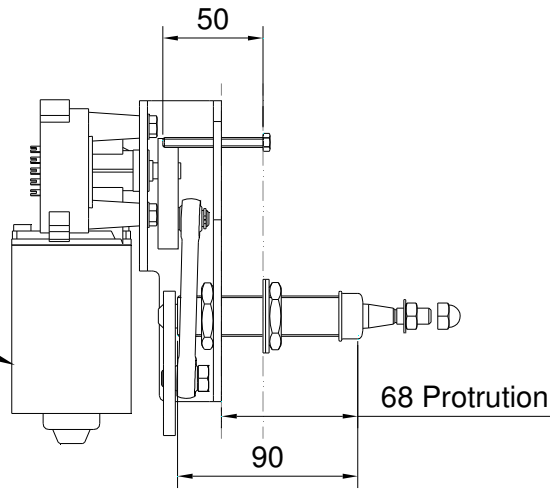
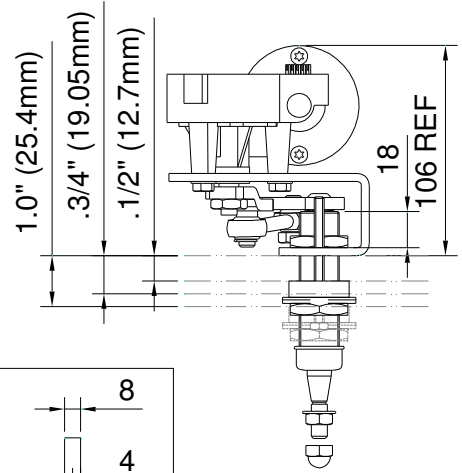
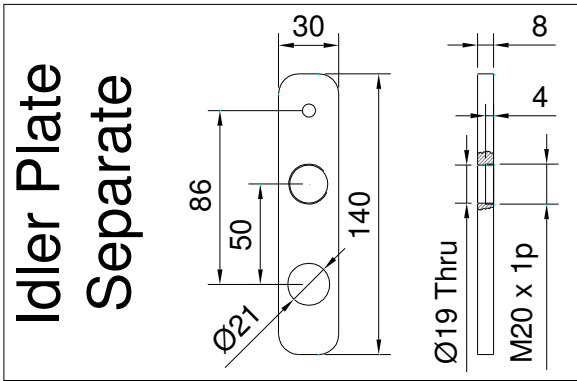
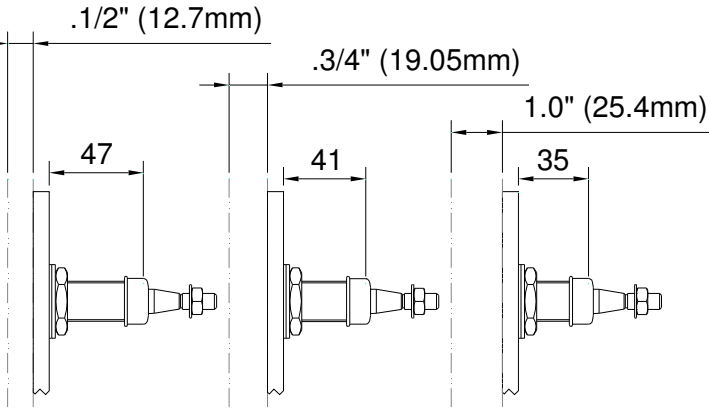
The blade is secured to the arm assembly using the blade clip arrangement on the arm with a blade retaining screw and nylock nut.

WIPER UNIT - S612132 - 24V & S612133 - 12V

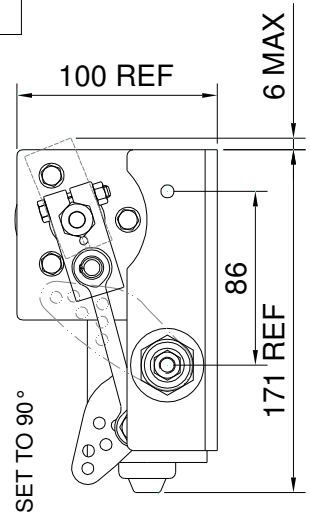
S612133
30Nm 12v Motor
Splined Drive

S612132
30Nm 24v Motor
Coned Drive

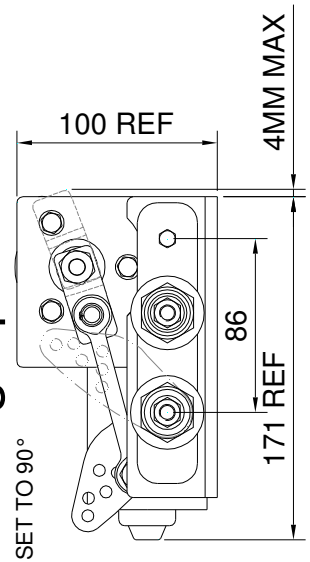
Idle Liner Protrusion
by Bulkhead Thickness



Pendulum Unit



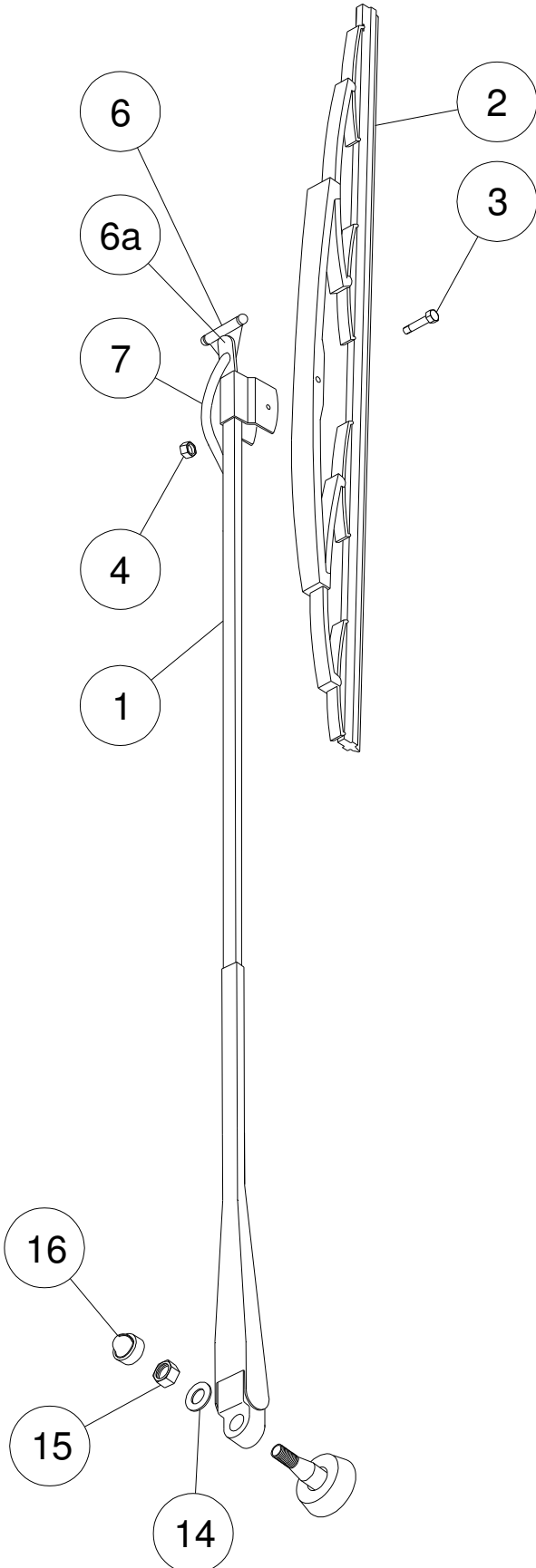
Pantograph Unit



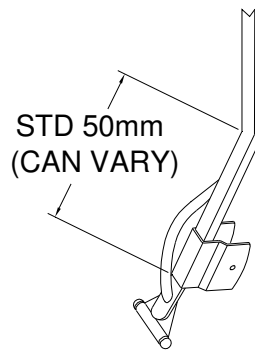
PENDULUM ARM - F63 STYLE

(Channel Section) - 14mm Blade Clip

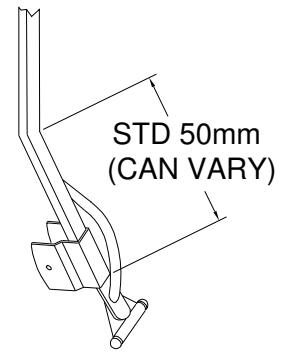
Part No. = Arm Type Arm Length Suffix TJ (if required)
 F63 12 or F63 12 TJ (Lengths 12" - 24" available)



RIGHT HAND
 CRANK 10°- 25°



LEFT HAND
 CRANK 10°- 25°



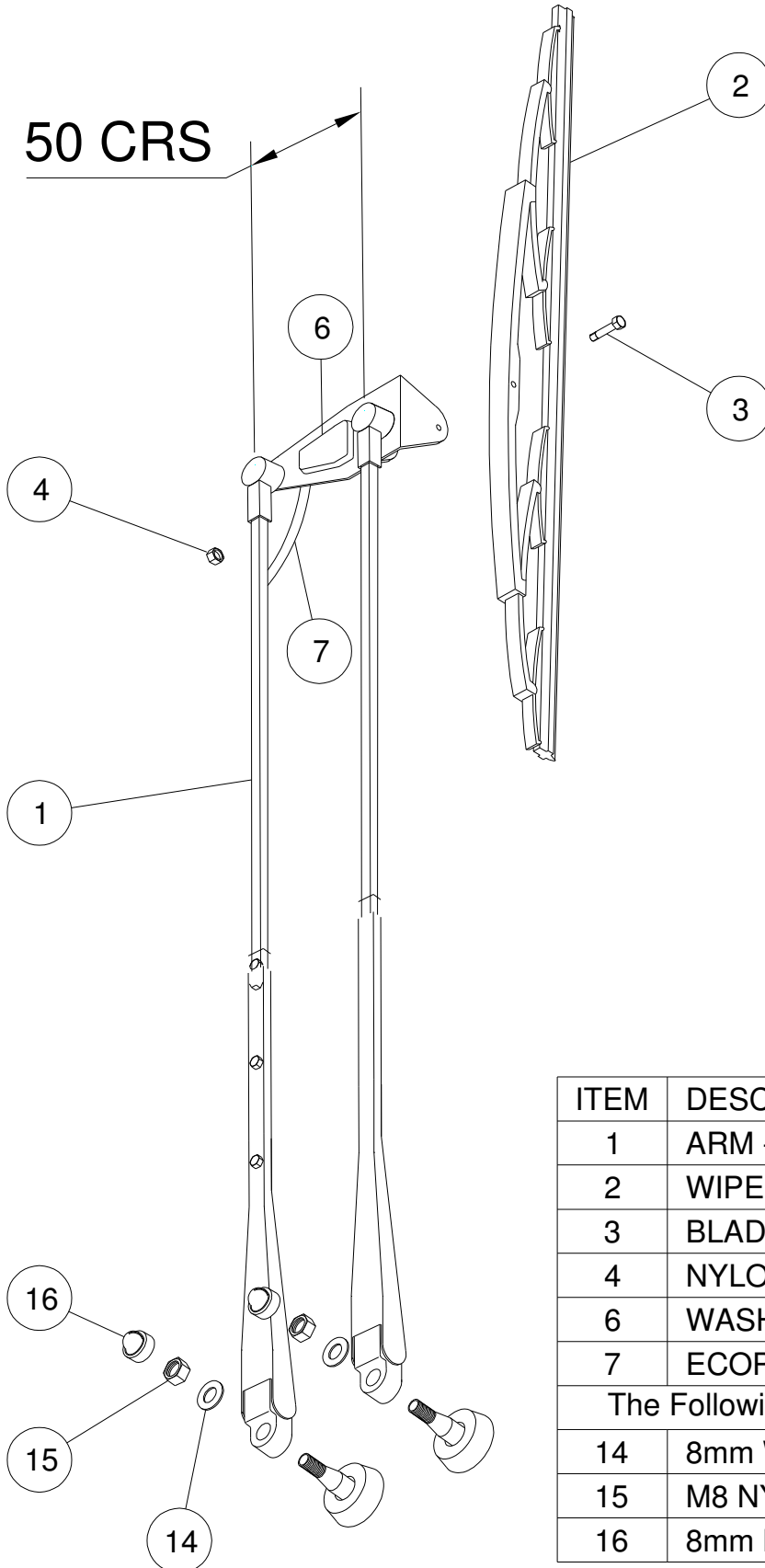
ARM DETAILS	
TYPE	ANGLE
F63	STRAIGHT
F64	10° RH CRK
F65	20° LH CRK
F66	15° LH CRK
F67	10° LH CRK
F68	20° RH CRK
F69	15° RH CRK
F70	25° RH CRK
F71	25° LH CRK

ITEM	DESCRIPTION	QTY
1	ARM - CHANNEL SECTION	1
2	WIPER BLADE	1
3	BLADE RETAINING SCREW	1
4	NYLOCK NUT	1
6	WASH JET ASSY	1
6a	WASH JET BRACKET	1
7	ECOPRENE WASH TUBE	Mtrs
The Following Items are on the Linkage		
14	8mm WASHER - FLAT	2
15	M8 NYLOCK NUT	2
16	8mm NUT CAP	2

PANTOGRAPH ARM - P613 STYLE

(Channel Section) - 1 Piece T Piece - 14mm Blade Clip

Part No. = Arm Type Arm Length Suffix TJ (if required)
P613 12 or P613 12 TJ (Lengths 12" - 24" available)

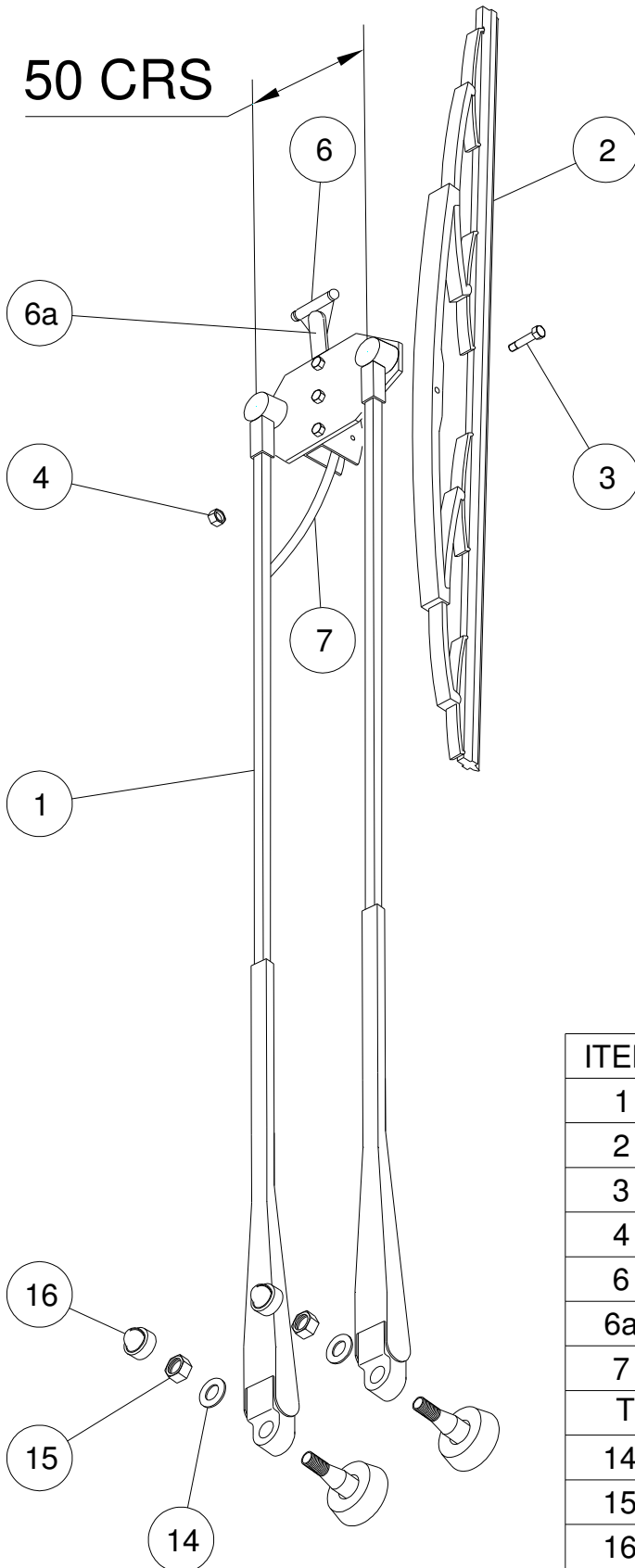


ITEM	DESCRIPTION	QTY
1	ARM - CHANNEL SECTION	1
2	WIPER BLADE	1
3	BLADE RETAINING SCREW	1
4	NYLOCK NUT	1
6	WASH JET ASSY	1
7	ECOPRENE WASH TUBE	Mtrs
The Following Items are on the Linkage		
14	8mm WASHER - FLAT	2
15	M8 NYLOCK NUT	2
16	8mm NUT CAP	2

PANTOGRAPH ARM - P614 STYLE

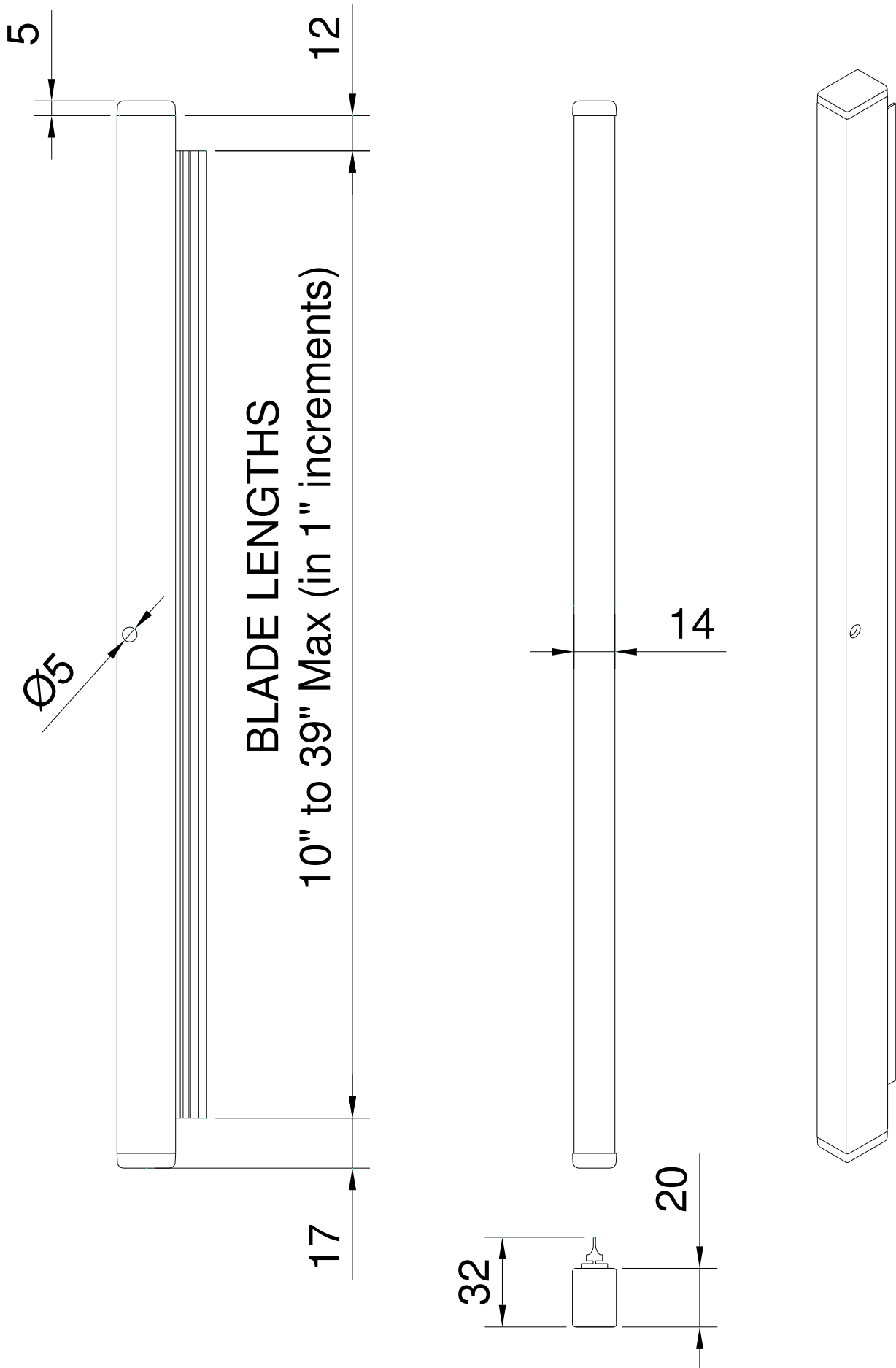
(Channel Section) - Swivel Plate - 14mm Blade Clip

Part No. = Arm Type Arm Length Suffix TJ (if required)
 P614 12 or P614 12 TJ (Lengths 12" - 24" available)

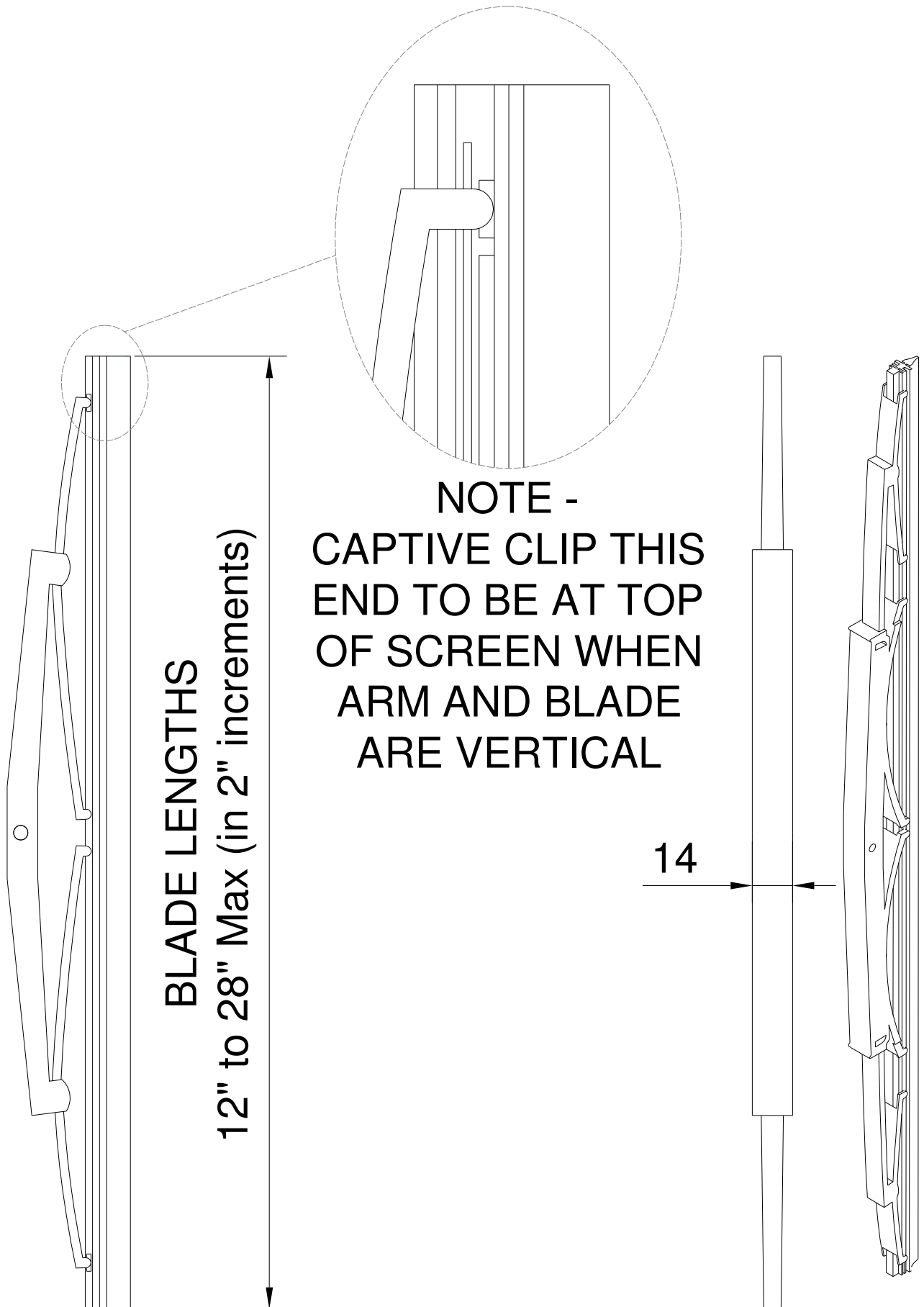


ITEM	DESCRIPTION	QTY
1	ARM - CHANNEL SECTION	1
2	WIPER BLADE	1
3	BLADE RETAINING SCREW	1
4	NYLOCK NUT	1
6	WASH JET ASSY	1
6a	WASH JET BRACKET	1
7	ECOPRENE WASH TUBE	Mtrs
The Following Items are on the Linkage		
14	8mm WASHER - FLAT	2
15	M8 NYLOCK NUT	2
16	8mm NUT CAP	2

RIGID (FLAT) WIPER BLADES- 14MM SADDLE



ARTICULATED WIPER BLADES - 14MM SADDLE



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.

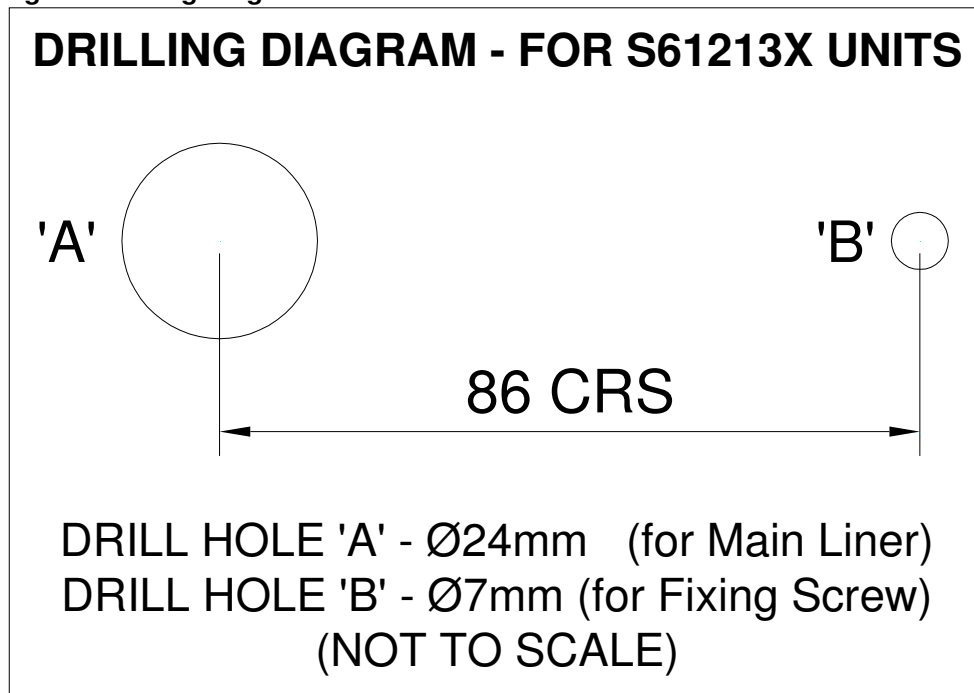


WARNING:

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

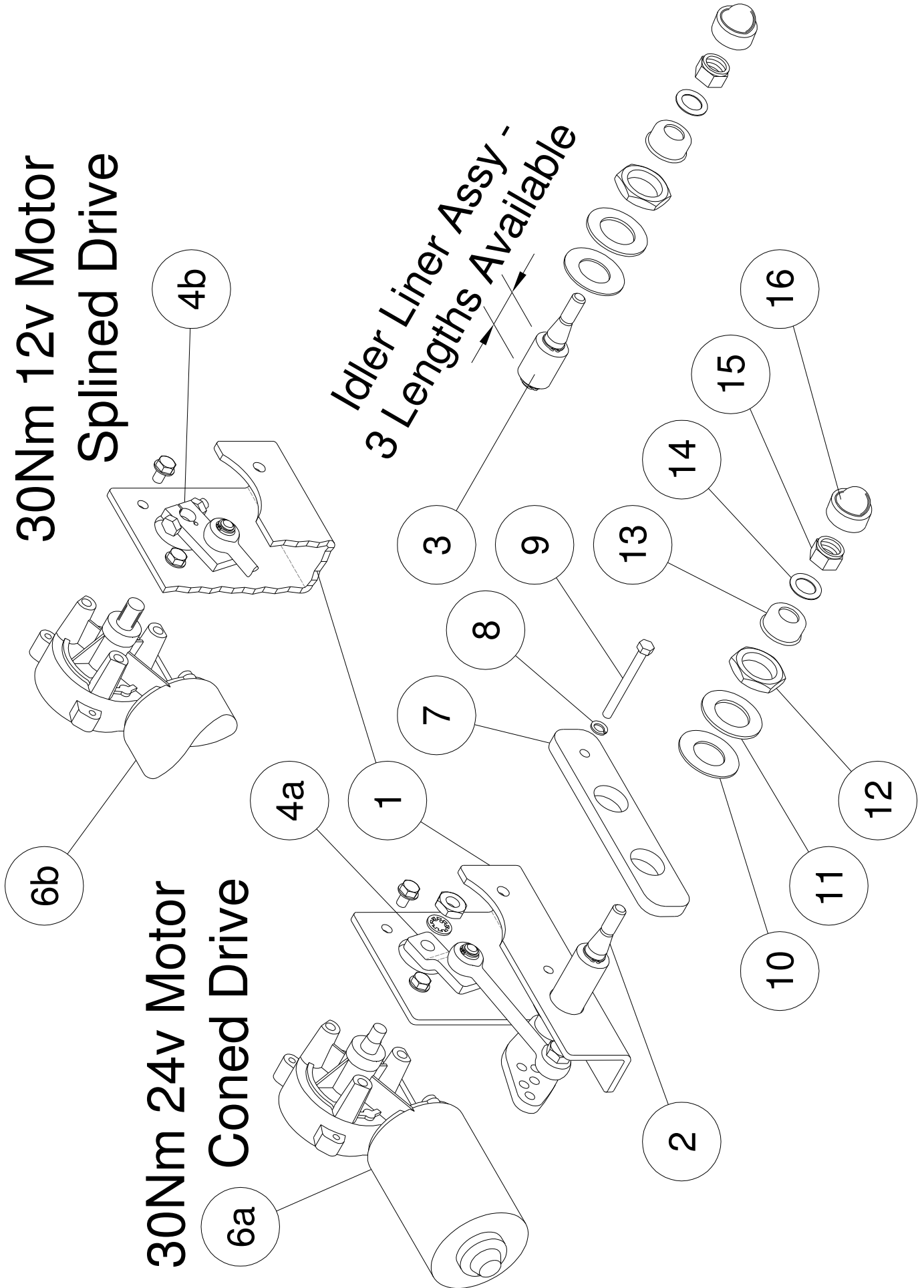
DRILLING DIAGRAM

Figure - Drilling Diagram



EXPLODED DIAGRAM

Figure - Exploded Diagram



FITTING THE WIPER UNIT

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.

Ref Figure - Drilling Diagram

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

Ref Figure -Exploded Diagram

1. Remove and retain from main spindle one weather cap (16), one M8 nut (15), and one washer - flat (14),

NOTE

Weather cap(s) (16), M8 nut(s) (15), and washer(s) - flat (14), are replaced when fitting the wiper arm

2. Remove and retain from main liner assy (2), one weather cap (13), one M20 nut (12), one washer - flat (11), and one washer - neoprene (10)
3. Remove and retain one M5 x 50 hex head screw (9), and one washer - flat (8), and external idler mounting plate (7)

NOTE

The Motor Unit is MOUNTED from INSIDE the Bulkhead.

4. Slide liner assy through predrilled mounting hole.
5. **Externally** - ENSURE a proprietary sealant (**Not supplied**) is used around all points of entry through bulkhead.

On Pantograph units only –

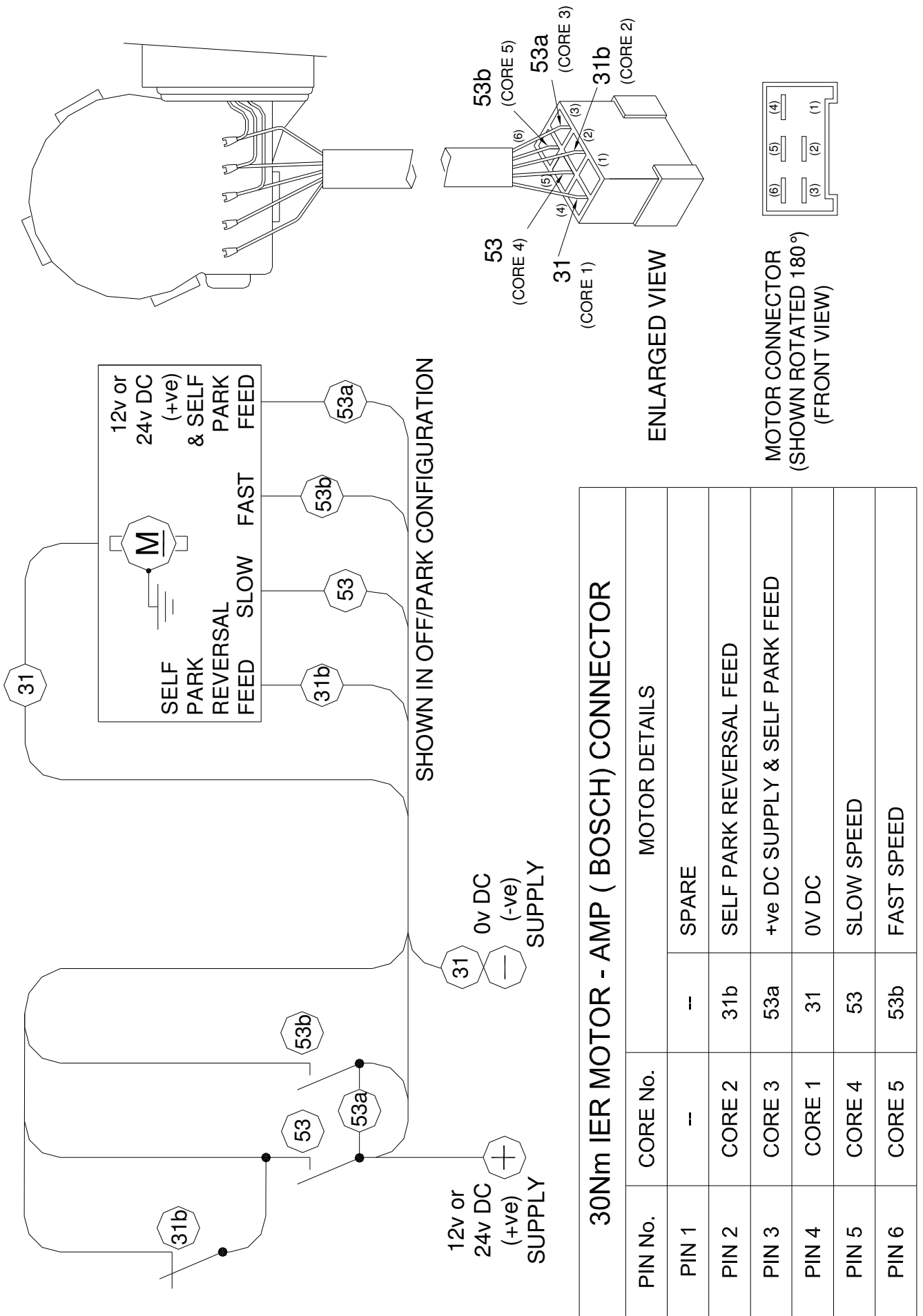
6. Remove and retain from idler spindle one weather cap (16), one M8 nut (15), and one washer - flat (14)
7. Screw idler liner assy (3), into external idler mounting plate (7)
8. **Fit following items** - external idler mounting plate (7), (**complete with idler liner assy (3) if pantograph**) and one washer - flat (8), and one M5 x 50 hex head screw (9)
Torque M5 = 6Nm (on Idler Plate Fixing - Screw)

On All units –

9. Fit onto main liner assy (2), one washer - neoprene (9), one washer - flat (11), one M20 nuts (12)
Torque M20 = 25Nm (on Liner Nut– Metal Structure)
10. Fit onto main liner assy (2), one M20 weather cap (13), ensuring that it sits tightly around spindle shaft.
11. **Internally** - Wire motor to vessels electrics via switch/controller (**May or may not be supplied**)
In accordance with Installation Instructions - Electrical Connections and/or Switch Connections
12. Fit wiper arm assy and wiper blade
In accordance with Installation Instructions - Fitting the Wiper Arm Assy

ELECTRICAL CONNECTIONS

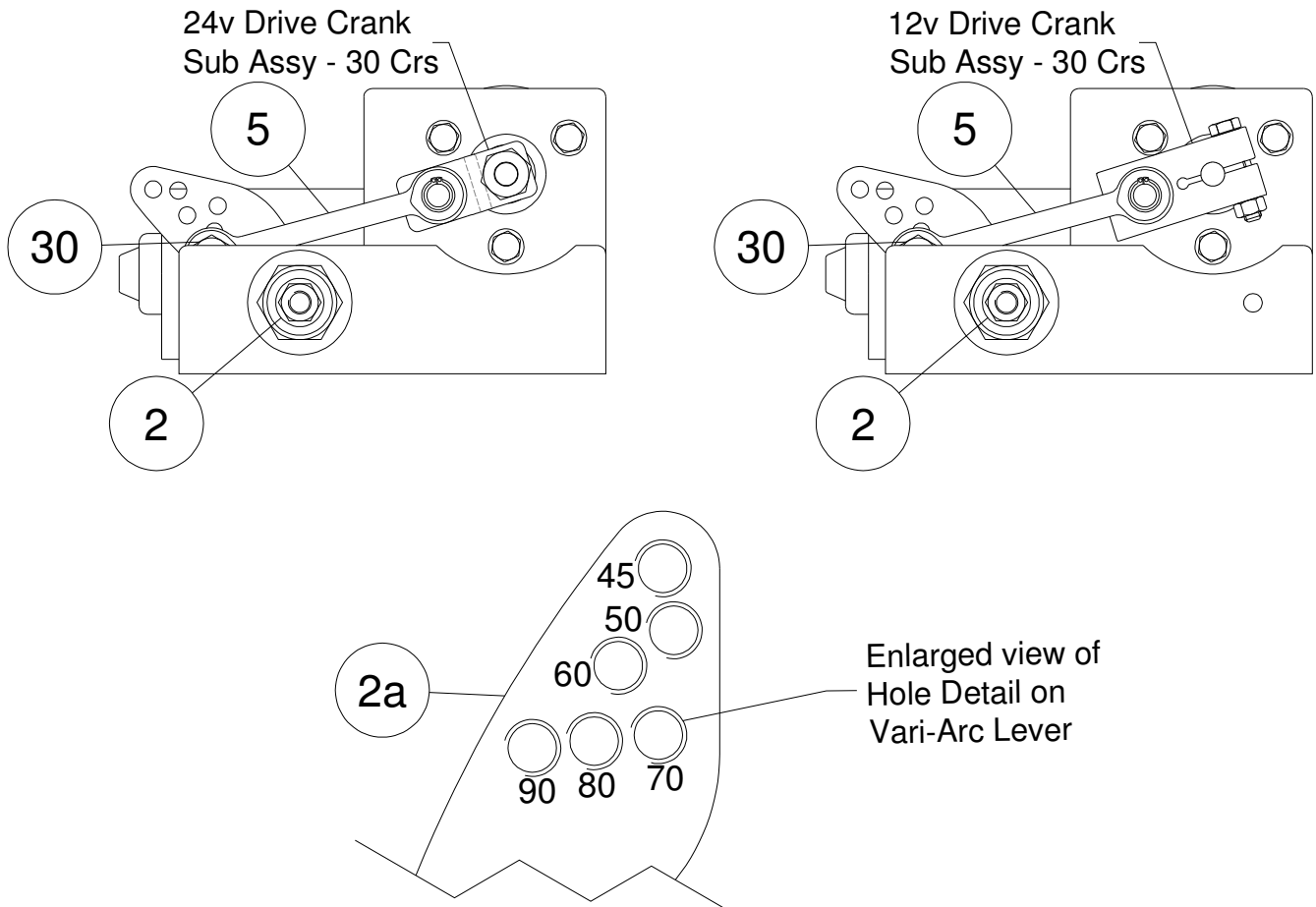
Figure - Electrical Connections



30m IER MOTOR - AMP (BOSCH) CONNECTOR					
PIN No.		CORE No.			
PIN 1		--	--	SPARE	
PIN 2		CORE 2	31b	SELF PARK REVERSAL FEED	
PIN 3		CORE 3	53a	+ve DC SUPPLY & SELF PARK FEED	
PIN 4		CORE 1	31	0V DC	
PIN 5		CORE 4	53	SLOW SPEED	
PIN 6		CORE 5	53b	FAST SPEED	

ARC ADJUSTMENT

Figure - Arc Adjustment



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.

Ref Figure - Arc Adjustment

1. Undo M8 securing bolt (30), on vari arc lever (2a)

NOTE

Each hole position has respective angle marked against it.

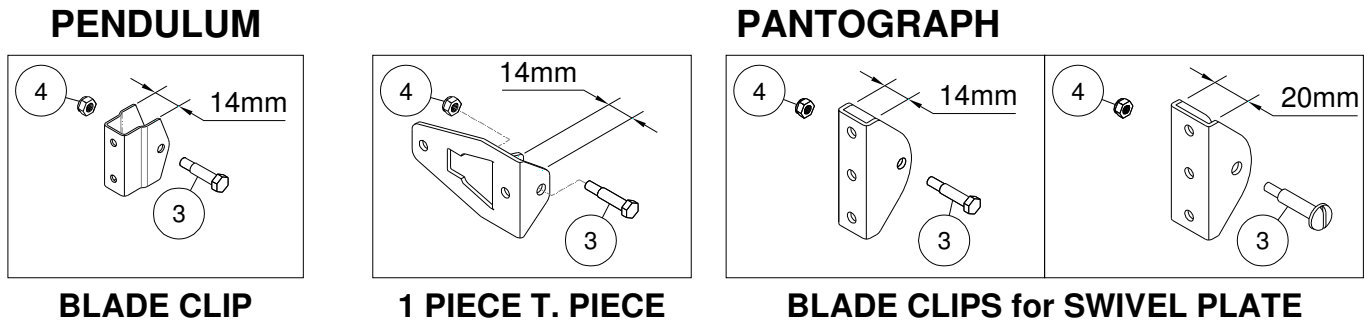
2. Reposition double ended bearing (5), and M8 securing bolt (30), into threaded hole centre required.
3. Tighten M8 securing bolt (30), on vari arc lever (2a) when desired arc is reached.
Torque M8 = 20Nm (on Vari-Arc Lever)

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 the Maintenance Table and the Troubleshooting Table – Continued

Figure - Blade Clip Fixings



Ref Figure - Blade Clip Fixings

1. Remove and retain 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
TOP OF SCREEN

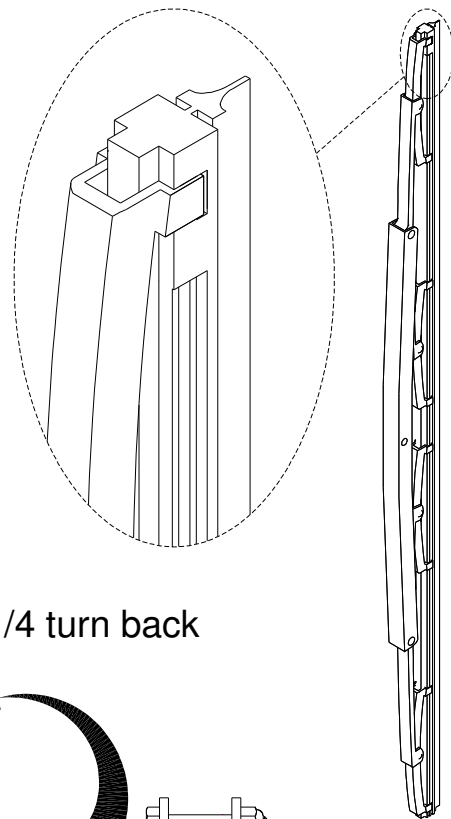
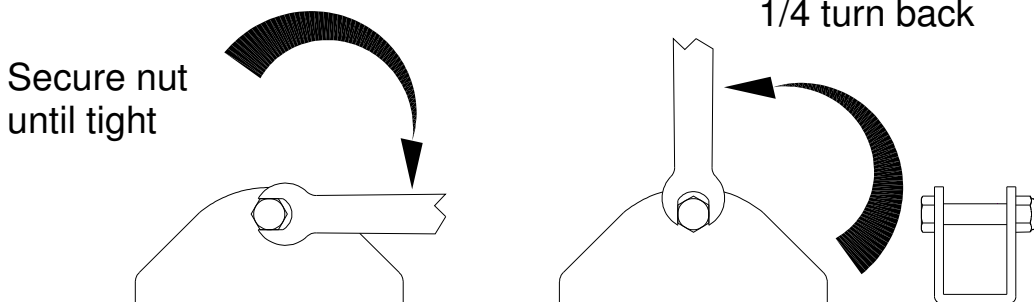


Figure - Nut Tightening



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)

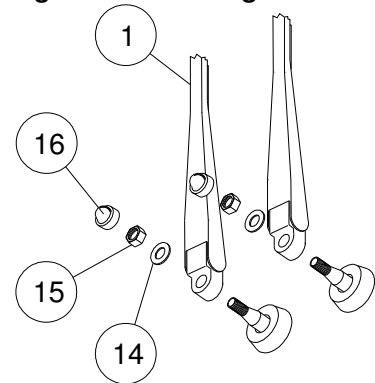
Following applies to all styles of arm

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. 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

4. Fit one 8mm flat washer (14) on to spindle next to arm head, then one M8 nylock nut (15), on to each spindle.
5. Only tighten nut sufficiently to allow arm and blade to travel across glass when motor is run to see if positioning is correct.
6. 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.

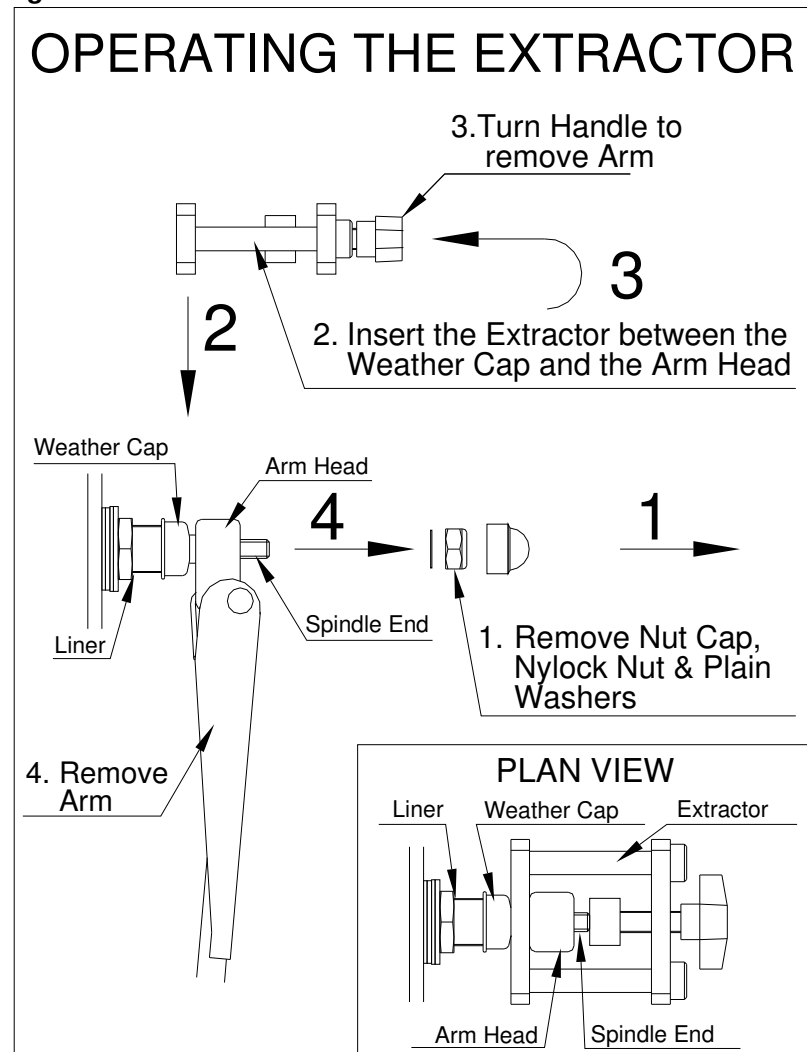
Figure - Arm Fittings



Ref Figure - Arm Extractor

7. 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
8. When correctly aligned, tighten M8 spindle nuts
Torque M8 = 20Nm (on Spindle Nut)
9. Fit weather caps supplied with linkage (16)
10. Carefully push black wash hose attached to wiper arm onto bulkhead connector
(May not be supplied)

Figure - Arm Extractor

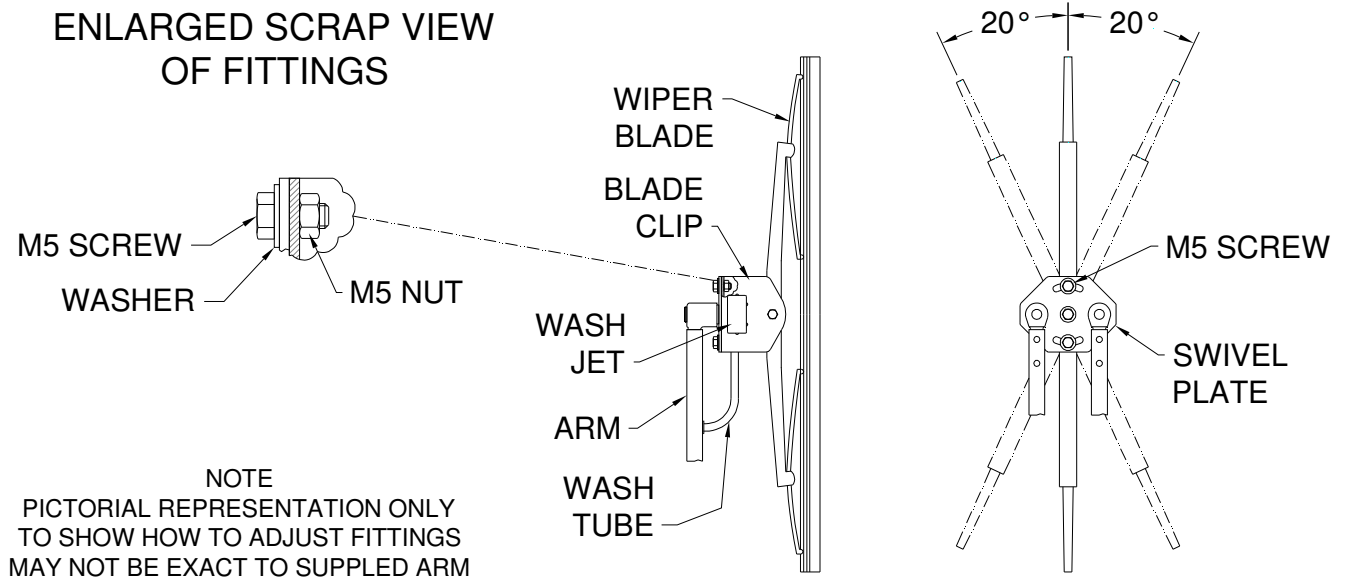


IMPORTANT

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

ADJUSTING THE WIPER BLADE ANGLE

Figure - Adjusting the Wiper Blade Angle



IMPORTANT

Adjusting the wiper blade angle only applies to pantograph arms with a swivel plate - P614

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 20° 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

<i>SYMPTOM</i>	<i>PROBABLE CAUSE</i>	<i>TESTS AND CHECKS</i>	<i>CORRECTIVE ACTION</i>
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. <i>Reference torque settings table</i>
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. <i>Reference torque settings table</i>
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 Replace wiper arm after cleaning spindle spline with wire brush. Reference torque settings table 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 (see Note) Replace tank (see Note) Replace pump if faulty (see Note)

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

INSPECTION / MAINTENANCE - TABLES

Introduction

This chapter contains daily inspection and all preventative maintenance details for the windscreen wiper components. Preventative maintenance procedures include the information required for when to replace the wiper blades.

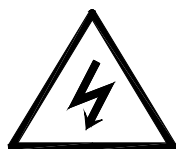
IMPORTANT

Refer to Maintenance Instructions 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 Inspection and Maintenance Tables are a Scheduled Maintenance Action Index. The index provides a list of all performance tests if applicable and preventative maintenance procedures. The tables have 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.

Inspection Table

IMPORTANT

Where internal fixing screws and/or nuts are factory set and paint marked, leave untouched unless required to be changed or paint mark is damaged.

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

***Tank may not be supplied by Hepworth's, but we recommend checking, as lack of washer fluid on screen may lead to damage or premature failure of Windscreen Wiper equipment.**

Maintenance Table

IMPORTANT

Where internal fixing screws and/or nuts are factory set and paint marked, leave untouched unless required to be changed or paint mark is damaged.

<i>PERIODICITY</i>	<i>EQUIPMENT</i>	<i>TASK</i>
Once after 3 Months or As required	Fixings of wiper arm to wiper spindle	Check torque settings (Set torque wrench to correct setting. Fit on nut, turn, if correct, wrench should click.) Reference torque setting table
6 Monthly or as required	Wiper blades	Non serviceable item Replace wiper blades
Once after 6 Months. Then visually check Annually	Complete System	Check for wear, Replace/overhaul parts if necessary Check all torque settings for complete wiper system. Reference torque setting table Carry out a visual check for wear in rod end. Reference Figure - Rod End Bearing

TORQUE SETTINGS

NOTE

If required - Set torque wrench to correct setting, fit on nut, turn, if correct, wrench should click.

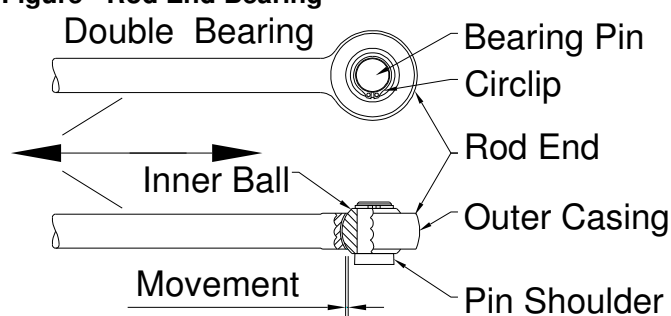
<i>WHERE USED</i>	<i>DESCRIPTION</i>	<i>SIZE</i>	<i>TORQUE</i>
Arm -Swivel Plate/Blade Clip (<i>P614 Only</i>)	Nut & Bolt	M5	4.5Nm
Idler Plate Fixing	Bolt	M5 x 40	6Nm
Wiper Motor (<i>Swageform Screw</i>)	Bolt	M6 x 16	12Nm
Splined Drive Crank (<i>12v Motor</i>)	Nut & Bolt	M6 x 35	18Nm
Coned Drive Crank (<i>24v Motor</i>)	Nut	M8	16Nm
Vari-Arc Lever	Bolt	M8 x 20	20Nm
Ø12 Spindle	Nut	M8	20Nm
Brass Liner	Nut	M20	25Nm

HOW TO CHECK FOR WEAR ON THE ROD END

Ref Figure - Rod End Bearing

1. Pull on tie-bar to see if any movement in rod end bearing at inner ball on outer casing.
2. If excessive movement - replace

Figure - Rod End Bearing



MAINTENANCE INSTRUCTIONS

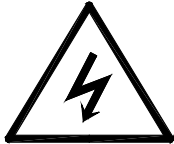
NOTE

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 manufacturer 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

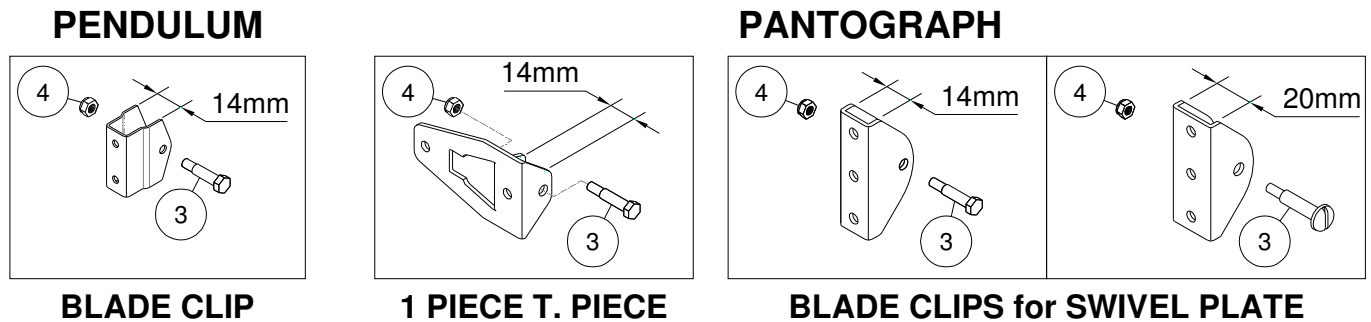
The wiper blades should be changed every 6 months but this is dependent on use and operating conditions

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 Clip 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.

Figure - Blade Captive End TOP OF SCREEN

Reassembly

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)

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

Ref Figure - Blade Captive End

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

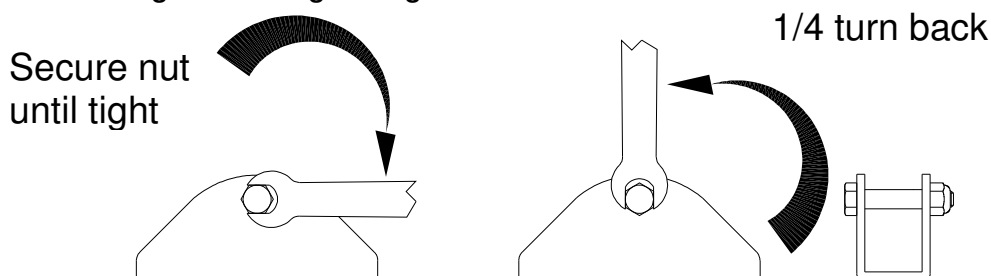
IMPORTANT

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

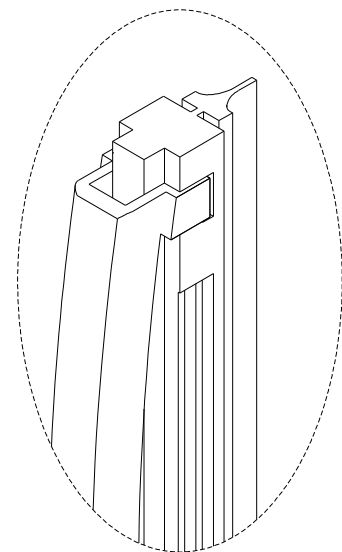
Ref Figure - Nut Tightening

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

Figure - Nut Tightening



4. Lower wiper blade carefully back onto windscreen.



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

TO REPLACE THE WIPER ARM ASSY

Removal

IMPORTANT

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

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

NOTE.

The wash hose may leak washer fluid on removal from the bulkhead connector. Keep washer fluid away from any electrical and/or mechanical part that could be affected by it.

2. Remove wash tube from external end of bulkhead connector.

Ref Figure - Spindle/Arm Fittings

3. Remove one weather cap (5) from each arm head.
4. Remove from each spindle one 8mm nut cap (16), one M8 nylock nut (15), one washer - flat (14)

Ref Figure - Arm Extractor Tool

5. Using arm extraction tool carefully remove wiper arm.

Figure - Arm Fittings

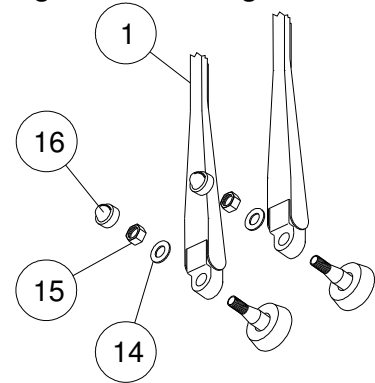
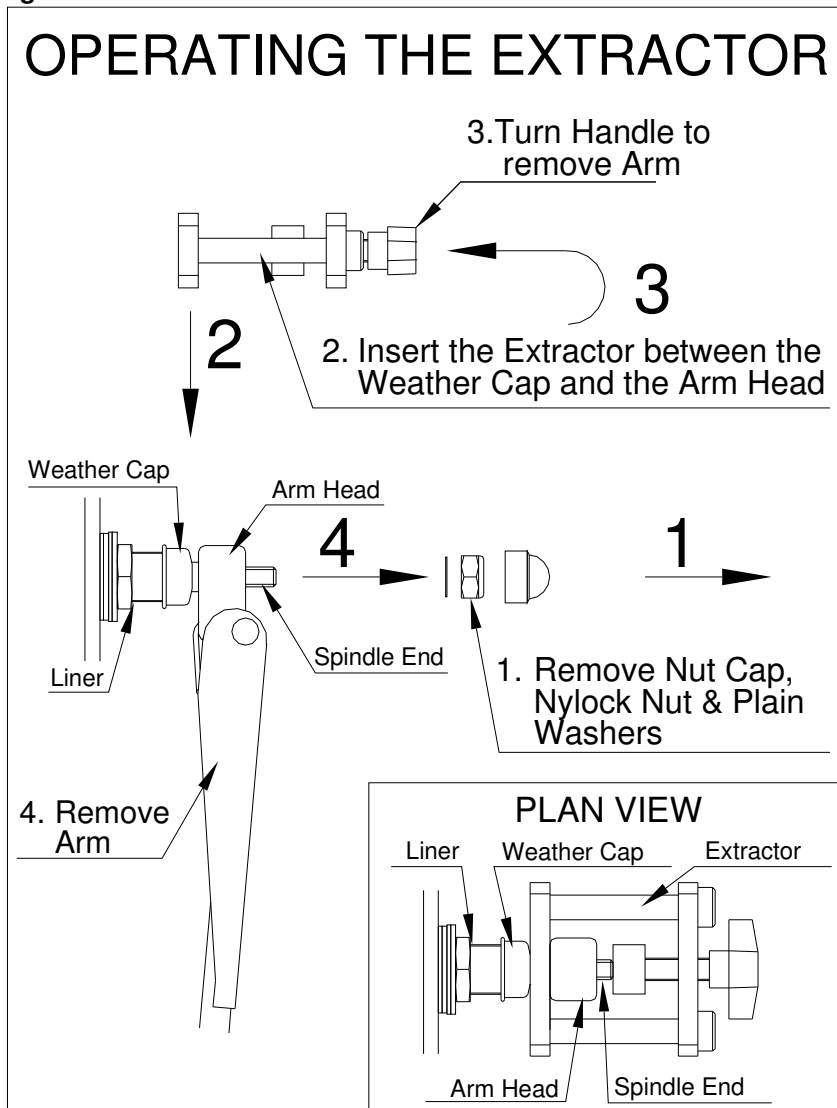


Figure - Arm Extractor Tool

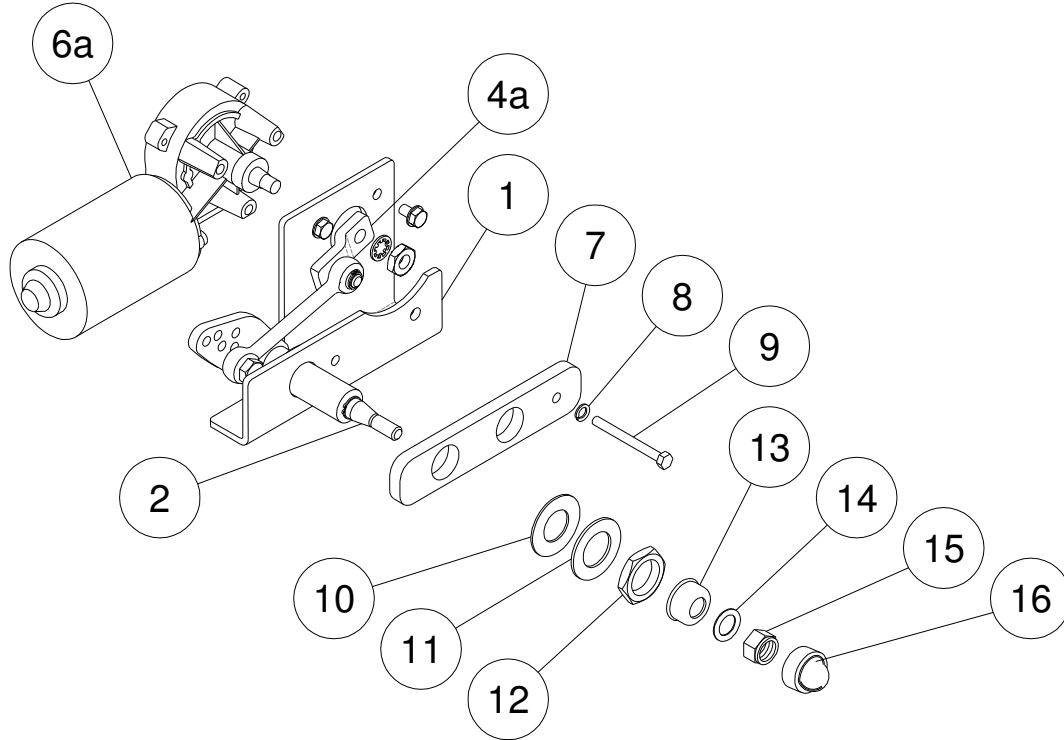


Replacement

1. Replace wiper arm and blade assy.
In accordance with Installation Instructions - Fitting the Wiper Arm Assy

TO REPLACE THE ENTIRE WIPER UNIT

Figure- Entire Wiper Unit



NOTE

The isometric / exploded view above is based on the 24v unit S612132, as both units although different motors / drive cranks they have the same fitting principles.

Removal

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

IMPORTANT

Externally - Please make a note of PARKED position of ARMS and BLADES.

3. Remove wiper arm and blade
In accordance with Maintenance Instructions, To Replace the Wiper Arm - Removal.

Ref Figure - Entire Wiper Unit

4. Remove from main liner (2), one weather cap (13), one M20 nuts (12), one washer - flat (11), and one washer - neoprene (10)
5. Remove and retain one M5 x 50 hex head screw (9), and one washer - flat (8)

On Pantograph Units Only –

6. Remove external idler mounting plate (7), (complete with idler liner assy (3))

On All Units –

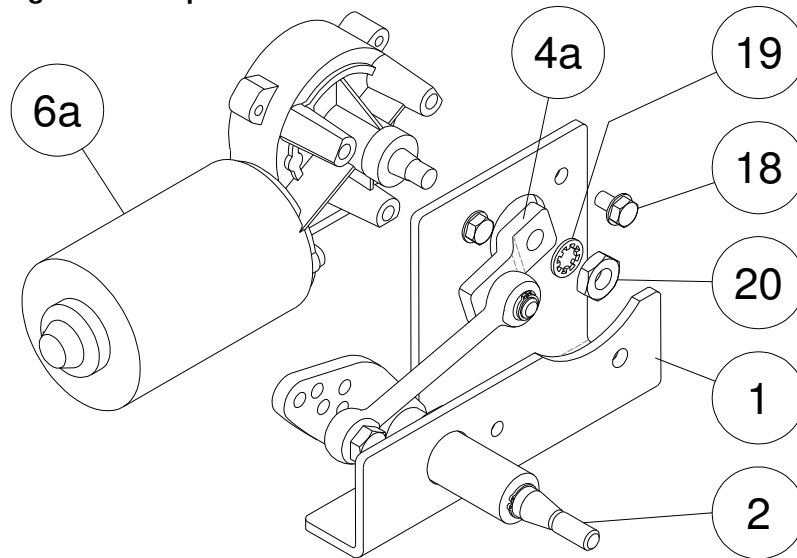
7. **Internally** -Carefully remove entire wiper motor unit from bulkhead.

Replacement

1. Replace entire wiper motor unit assembly.
In accordance with Installation Instructions, Fitting the Wiper Motor Unit Assy

TO REPLACE THE 24V WIPER MOTOR ASSY

Figure- 24v Wiper Motor



Removal

NOTE

If the motor is damaged it may not be able to park, but the following procedures still apply

1. **Internally** - Run motor to ensure it is parked correctly. Disconnect all electrical power.
2. **Externally** - Remove wiper arm and blade assy.
In accordance with Maintenance Instructions, To Replace the Wiper Arm – Removal
3. Carefully remove entire wiper linkage assy from cab structure.
In accordance with Maintenance Instructions, To Remove the Entire Wiper Motor Unit Assembly

IMPORTANT

If able to park - Please make a note of drive crank position relative to spindle lever, as this will affect park position for wiper arm and blade, i.e. spindle lever facing towards or away from motor

Ref Figure - 24v Wiper Motor

4. Unscrew and remove drive crank nut (20), and washer - Internal lock (19). Carefully remove drive crank assy (4), (complete with double bearing (5)), from motor drive shaft
5. Unscrew three swaged fixing bolts (18) and remove wiper motor (6), from bracket (1).

Replacement

IMPORTANT

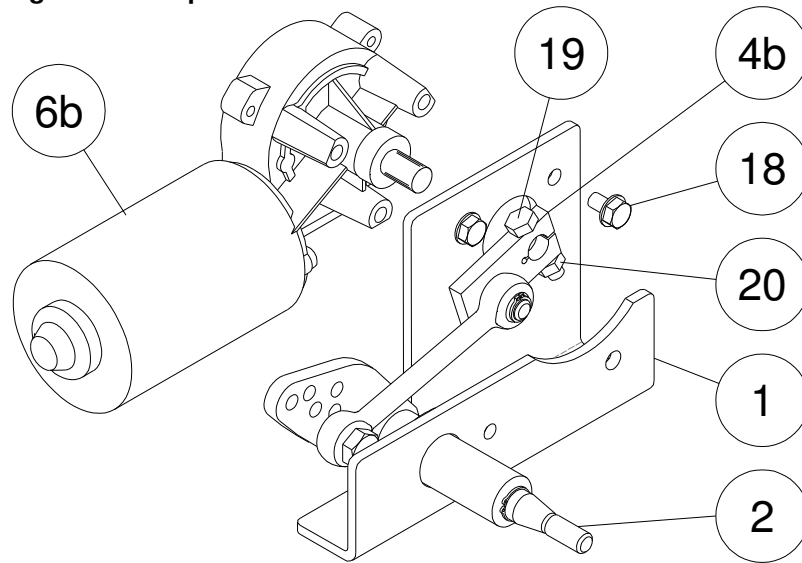
Prior to fitting - Park the new motor and if required clean the drive shaft, with a wire brush

Ref Figure - Wiper Motor

1. Replace wiper motor (6) into bracket (1), and fit three swaged fixing bolts (18)
Torque M8 = 15Nm (on Motor - Bolts)
2. Carefully fit drive crank assy (4), over motor drive shaft, (*Referring to note after operation 2*) on 'removal' for position.
3. Tighten drive crank nut (20)
Torque M8 = 16Nm (on Coned Drive Crank - Nut)

TO REPLACE THE 12V WIPER MOTOR ASSY

Figure- 12v Wiper Motor



Removal

NOTE

If the motor is damaged it may not be able to park, but the following procedures still apply

1. **Internally** - Run motor to ensure it is parked correctly. Disconnect all electrical power.
2. **Externally** - Remove wiper arm and blade assy.
In accordance with Maintenance Instructions, To Replace the Wiper Arm – Removal
3. Carefully remove entire wiper linkage assy from cab structure.
In accordance with Maintenance Instructions, To Remove the Entire Wiper Motor Unit Assembly

IMPORTANT

If able to park - Please make a note of drive crank position relative to spindle lever, as this will affect park position for wiper arm and blade, i.e. spindle lever facing towards or away from motor

Ref Figure - 12v Wiper Motor

4. Slacken drive crank nut (20), and bolt (19), carefully remove drive crank assy (4), (**complete with double bearing (5)**), from motor drive shaft
5. Unscrew three fixing bolts (18) and remove with three washers – single coil (17), and three washers - flat (25). Remove wiper motor (6), from bracket (1).

Replacement

IMPORTANT

Prior to fitting - Park the new motor and if required clean the drive shaft, with a wire brush

Ref Figure - Wiper Motor

1. Replace wiper motor (6) into bracket (1), and fit three swaged fixing bolts (18)
Torque M8 = 15Nm (on Motor - Bolts)
2. Carefully fit drive crank assy (4), over motor drive shaft, (**Referring to note after operation 2**) on 'removal' for position.
3. Tighten drive crank nut (20), and bolt (19)
Torque M8 = 25Nm (on Splined Drive Crank - Nut & Bolt)

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.

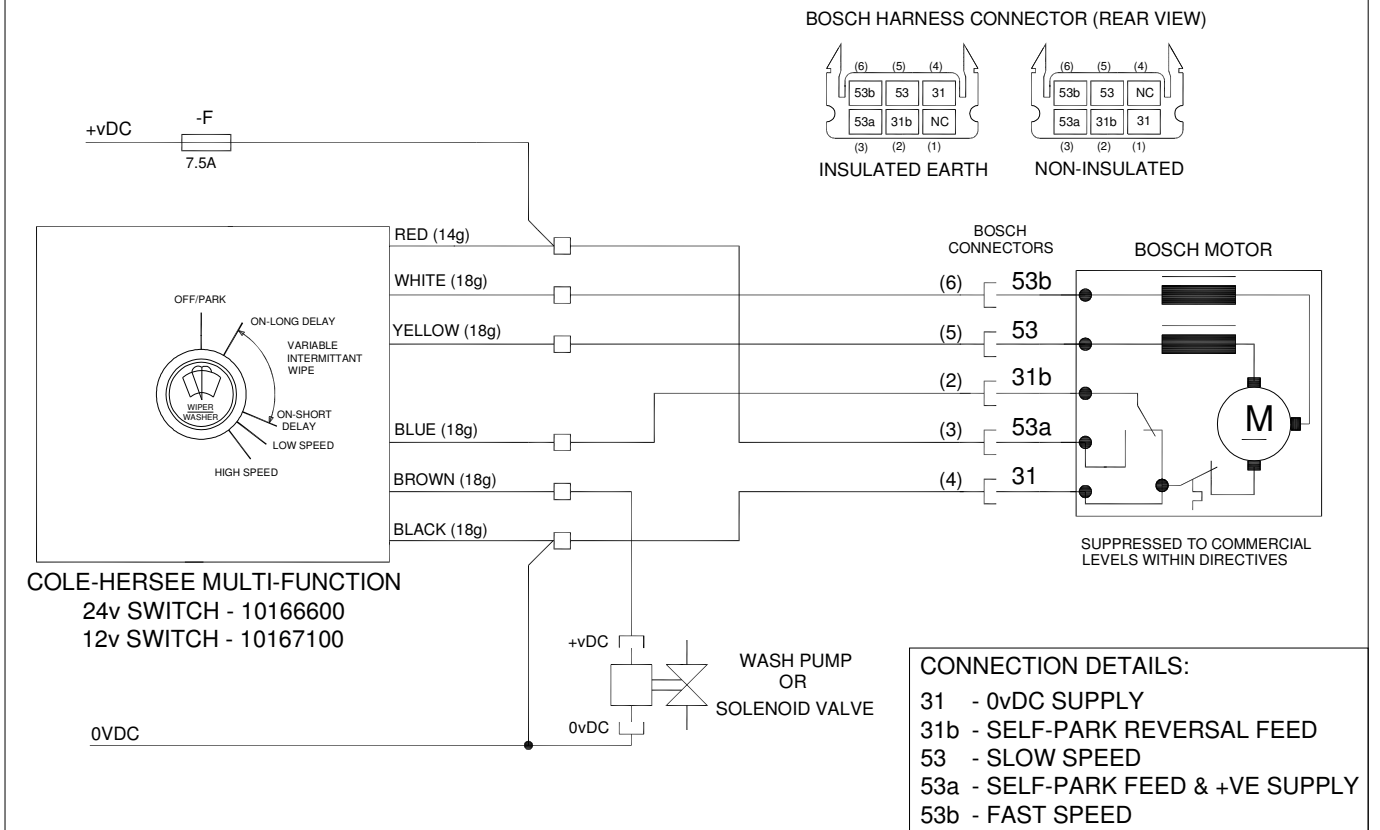


WARNING:

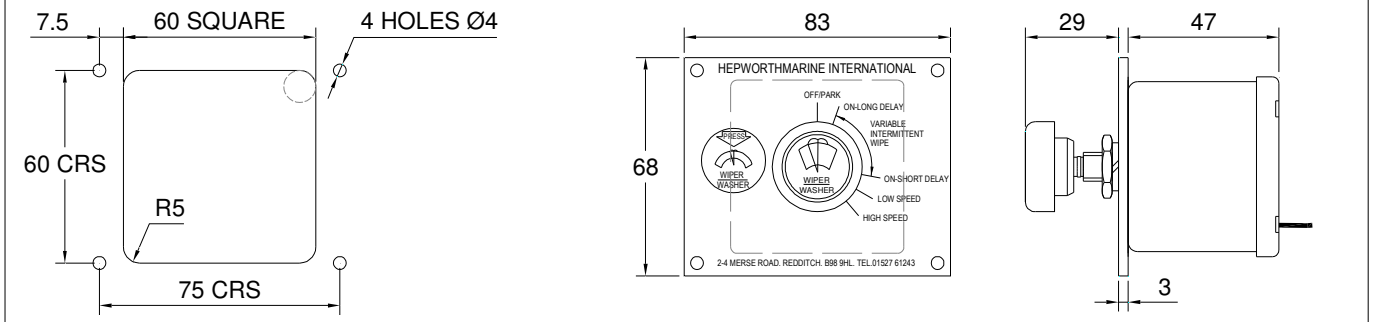
Isolate the electrical supply before commencing any fitting work on any part of the wiper system.

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

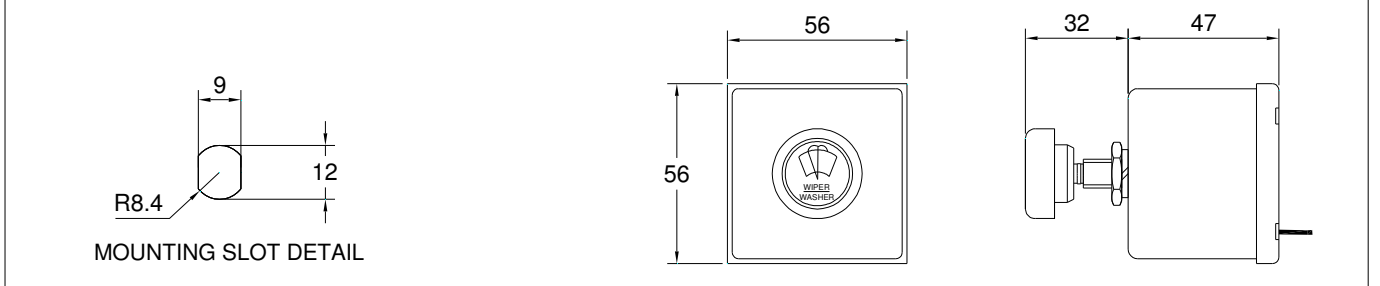
WIRING DETAIL



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



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

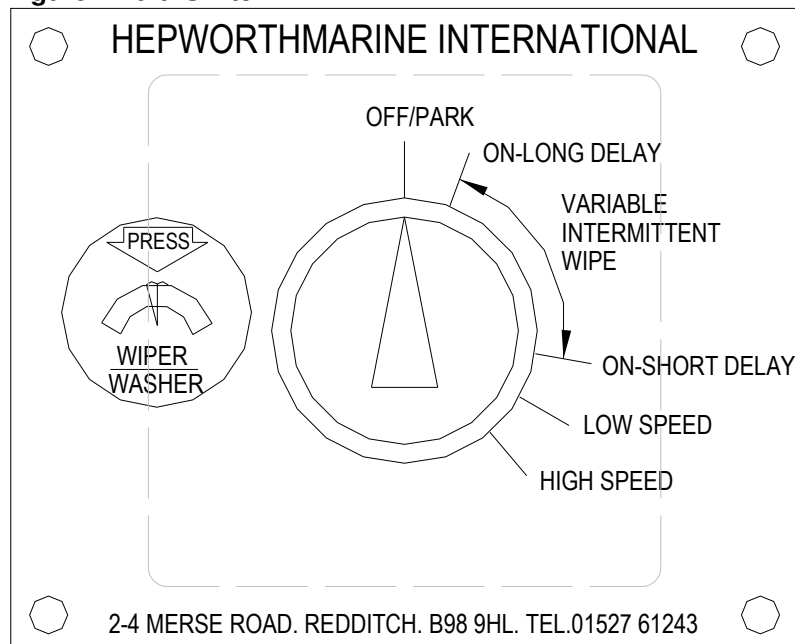
The wiper will also operate for 3-4 wipes at normal speed after the washer fluid stops.

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**)

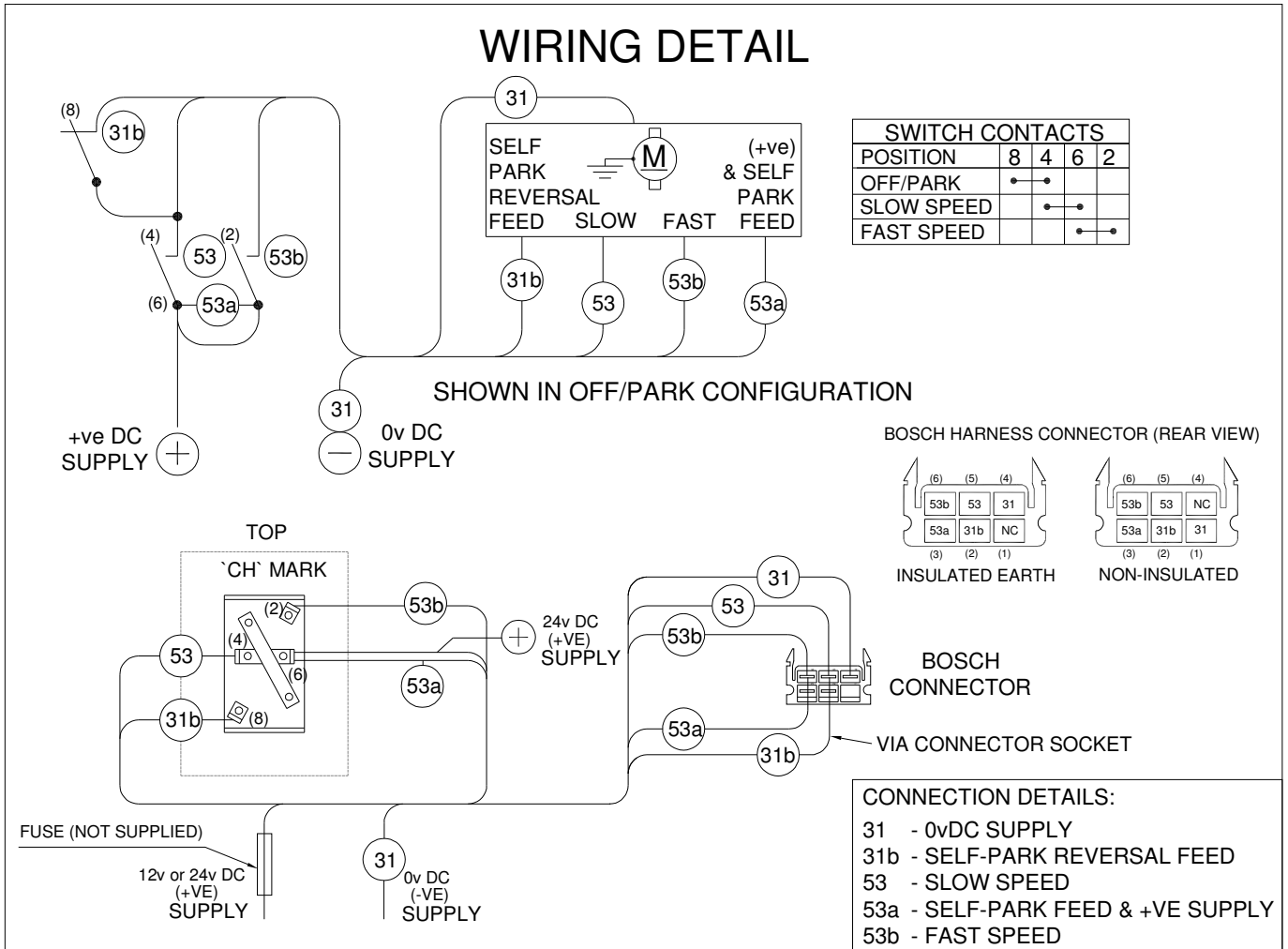
IMPORTANT

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

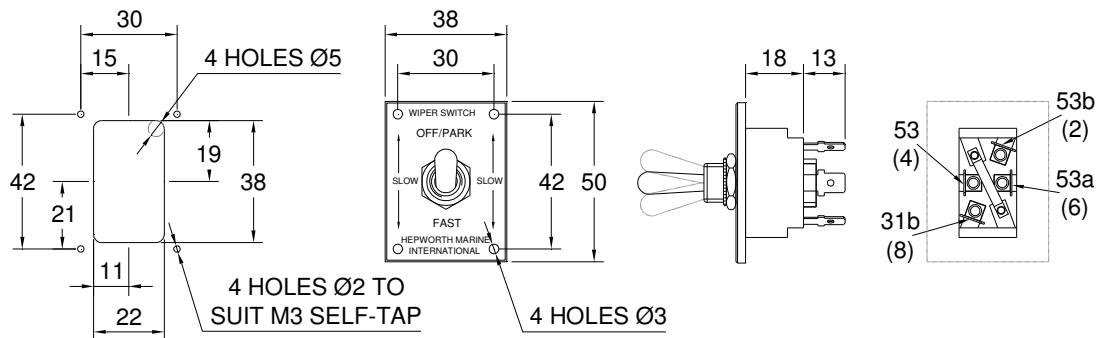
Figure - Multi-Switch



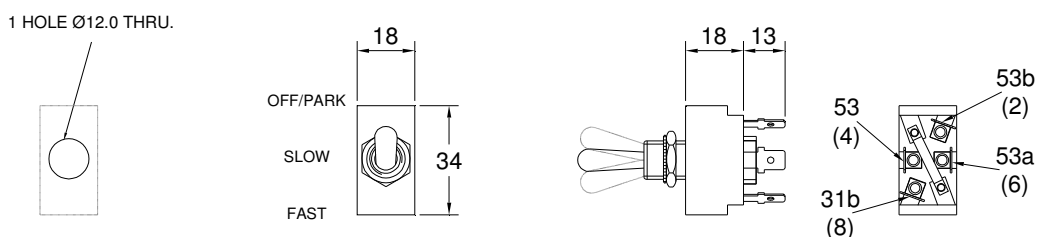
12V/24V TOGGLE SWITCH – WIRING & SIZES



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



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



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

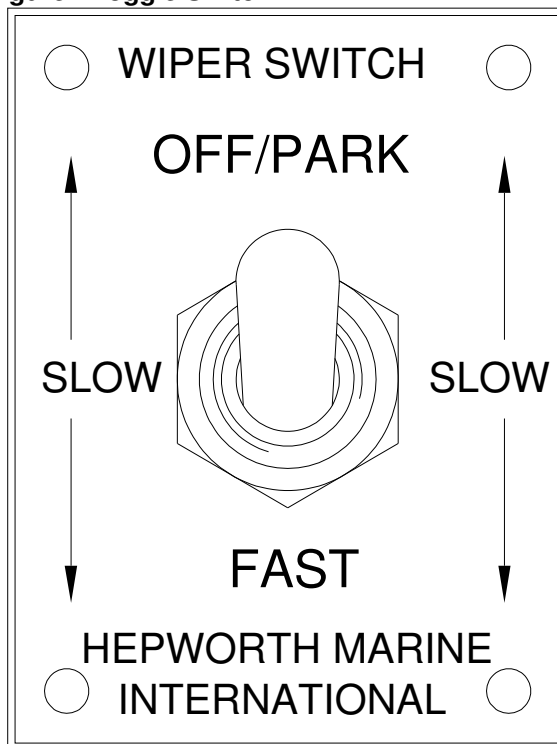
1. Check switch is in off position. (**OFF/PARK**)

IMPORTANT

Do not run wipers on a dry screen.

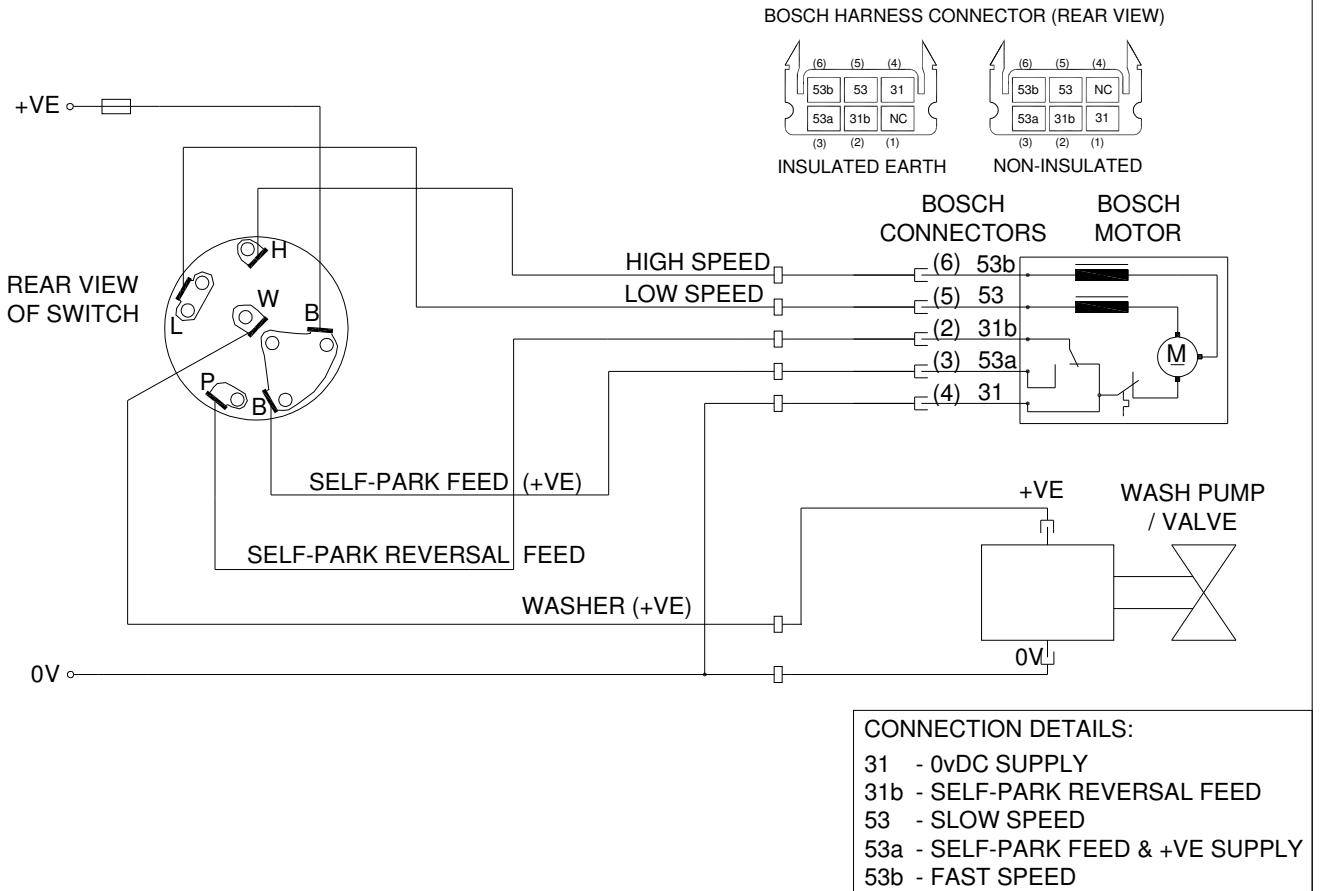
2. This switch does not control application of washer fluid.
3. Pushing toggle to centre position (**SLOW**) gives a continuous wipe across screen at a standard speed, with no delay between wipes.
4. Pushing toggle to bottom position (**FAST**) gives a continuous wipe across screen at a faster speed,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

Figure - Toggle Switch

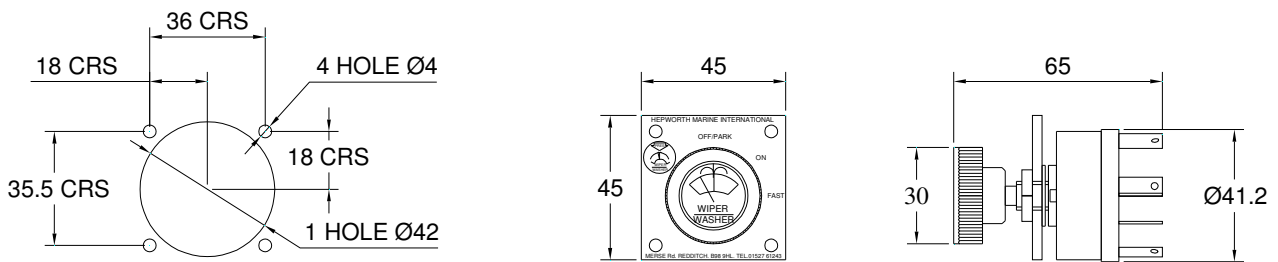


12V/24V ROTARY SWITCH - WIRING & SIZES

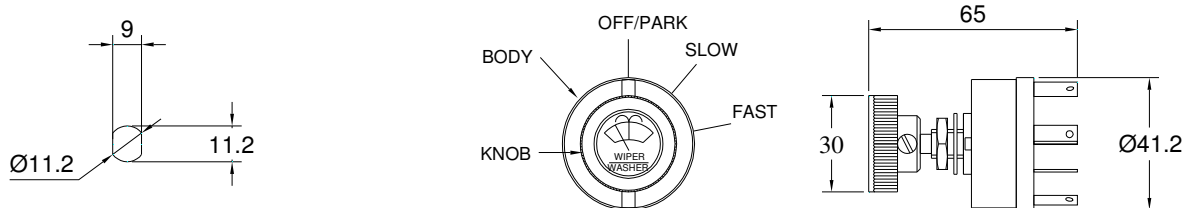
WIRING DETAIL



CONSOLE CUT OUT DETAIL - 90043000 - 1 x 12/24v Rotary Switch & Plate



CONSOLE CUT OUT DETAIL - 10094800 - 1 x 12/24v Rotary Switch only



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.

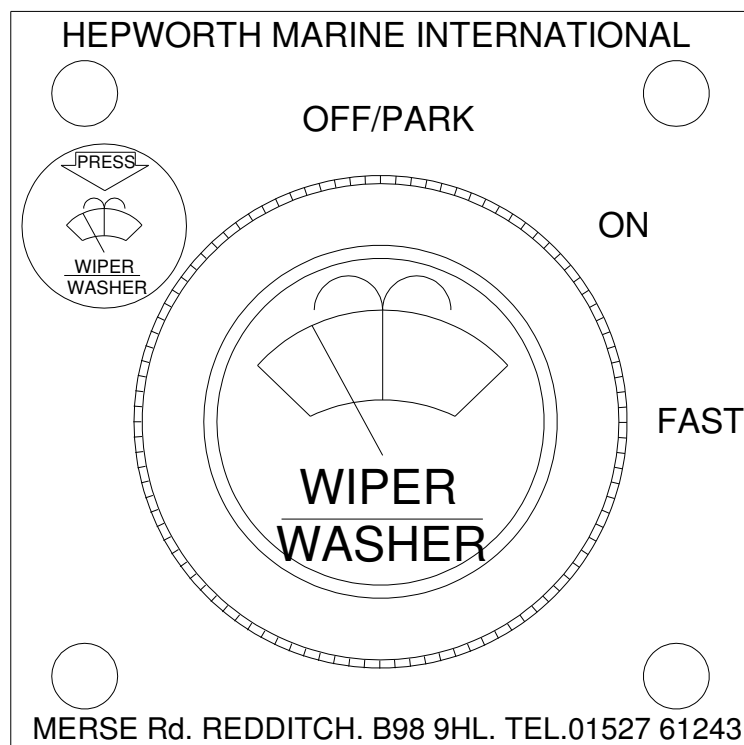
2. To apply washer fluid to screen, press knob. (**WIPER WASHER**) This will apply washer fluid for period of time button is pressed.

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**)

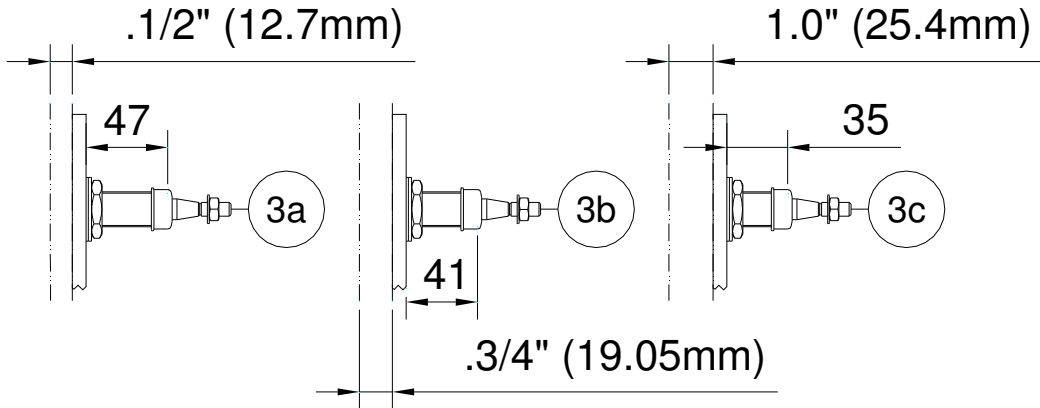
Figure – Rotary Switch



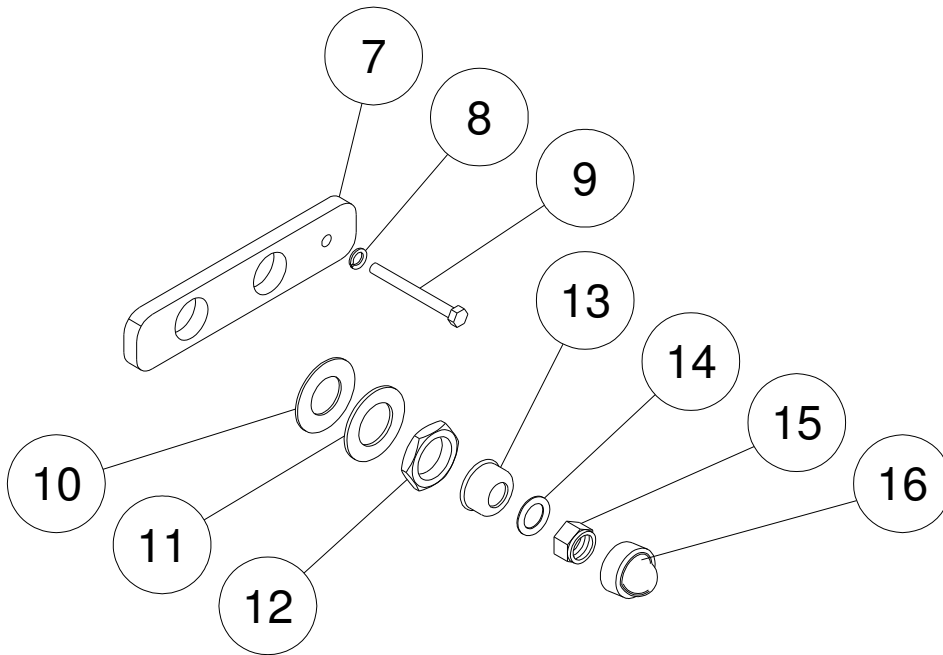
EXTERNAL FITTINGS - LINKAGE

Idler Fittings for M20 Liners

Idler Liner Assy (Includes Fittings) (Protrusion by Bulkhead Thickness)



Fittings for M20 Liners and 12mm Spindles protruding outside the Bulkhead

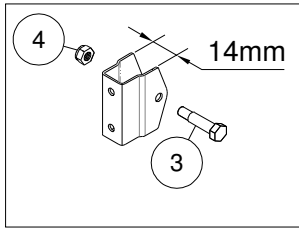


Part No.	Description	Qty
	(7)	1 per unit
	(8)	1 per unit
	(9)	1 per unit
10020600	20mm Washer - Neoprene (10)	1 per liner
10024300	20mm Washer - Plain (11)	1 per liner
10011900	M20 Hex Nut (12)	1 per liner
60034600	20mm Weather Cap (13)	1 per liner
10022500B	M8 Plain Washer (14)	1 per liner
10013900B	M8 Nylock Nut (15)	1 per liner
10060300	8mm Nut Cap (16)	1 per liner

EXTERNAL FITTINGS - ARMS - CHANNEL SECTION

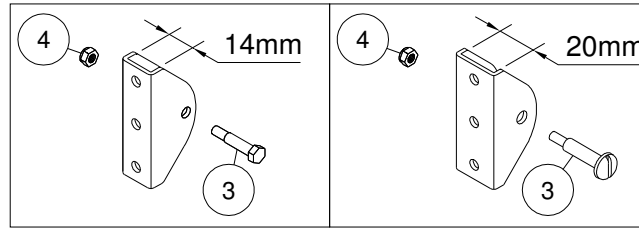
Fittings for Arm and Blade - Pendulum & Swivel Plate Pantograph F63 and P614 Styles

PENDULUM



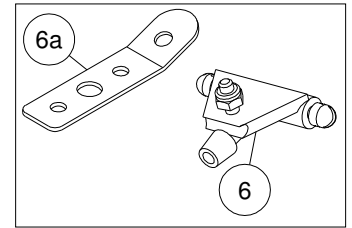
BLADE CLIP

PANTOGRAPH



BLADE CLIPS for SWIVEL PLATE

TJ ARMS

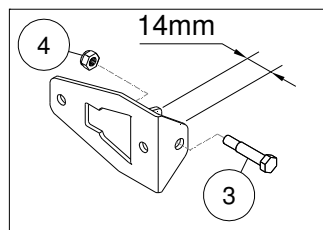


WASH JET & BRK

Part No.	Description	Qty
80204600	Blade Retaining Screw (14mm B. Clip) (3) (<i>Pendulum</i>)	1 per arm
80205600	Blade Retaining Screw (14mm B. Clip) (3) (<i>Pantograph</i>)	1 per arm
80010700	Blade Retaining Screw (20mm B. Clip) (3) (<i>Pantograph</i>)	1 per arm
10011400	M4 Nylock Nut (4) (All Arm Blade Retaining Screws)	1 per arm
80200100	Wash Jet Assy (6)	1 per arm
80201700	Wash Jet Bracket (6a)	1 per arm
80200400	Wash Hose - 4mm I/D x 6Mmm O/D (7) (<i>Not shown</i>)	Metres

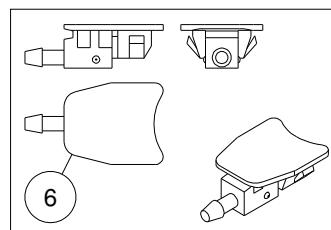
Fittings for Arm and Blade - 1 Piece T. Piece Pantograph - P613 Style

PANTOGRAPH



1 PIECE T. PIECE

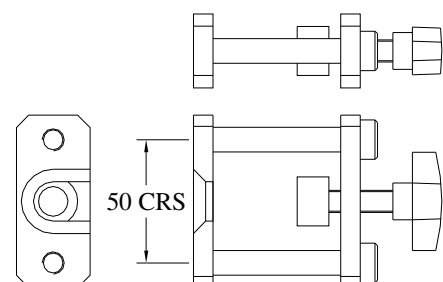
TJ ARMS



WASH JET

Part No.	Description	Qty
80205600	Blade Retaining Screw (14mm B. Clip) (3) (<i>Pantograph</i>)	1 per arm
80010700	Blade Retaining Screw (20mm B. Clip) (3) (<i>Pantograph</i>)	1 per arm
10011400	M4 Nylock Nut (4) (All Arm Blade Retaining Screws)	1 per arm
15031100	Wash Jet Assy (6)	1 per arm
80200400	Wash Hose - 4mm I/D x 6Mmm O/D (7) (<i>Not shown</i>)	Metres

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



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