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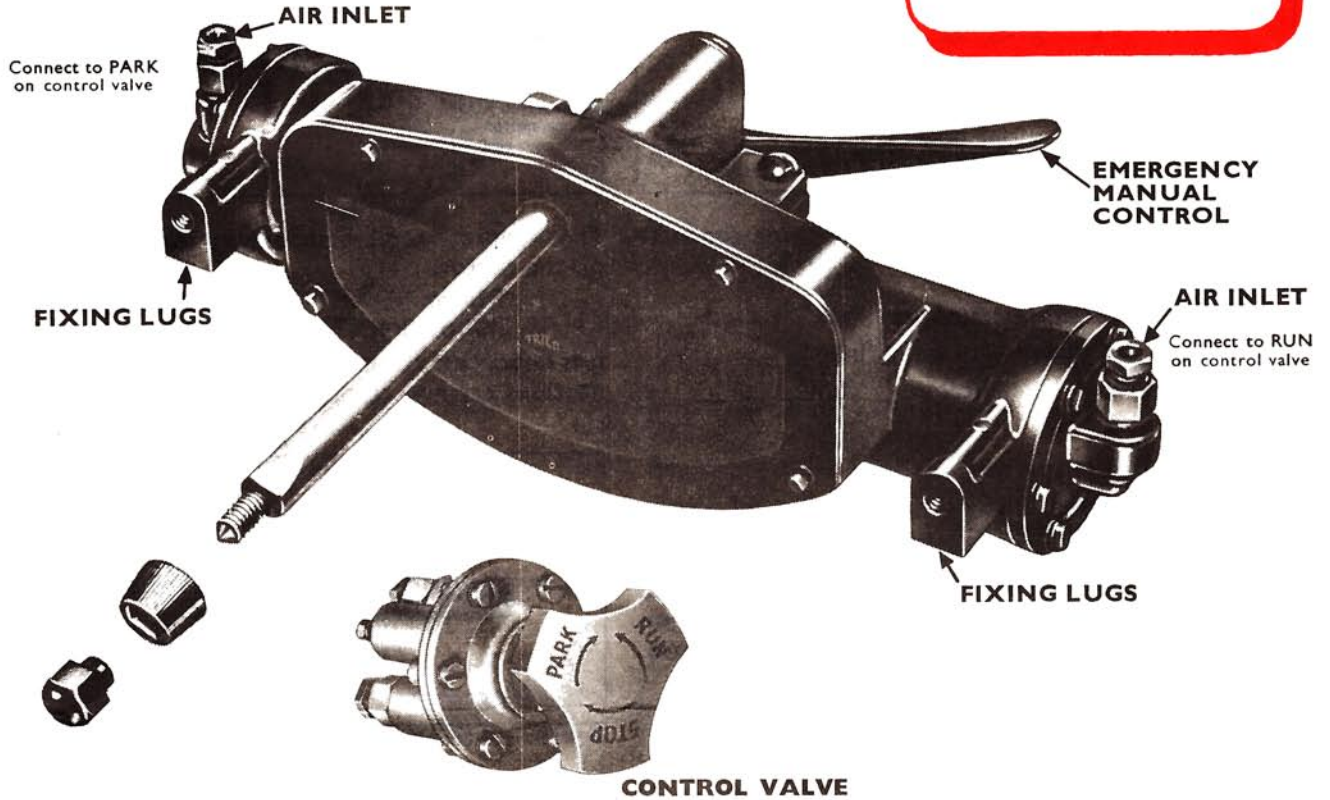
FITTING INSTRUCTIONS

AIR PRESSURE WIPER MOTORS

FPK.312

FPK.375

Sheet One



INSTRUCTIONS FOR CONNECTING FPK MOTORS WITH F1430-1 CONTROL VALVE AND ASSEMBLY OF WIPER ARMS AND BLADES TO SHAFTS

1. END CAPS



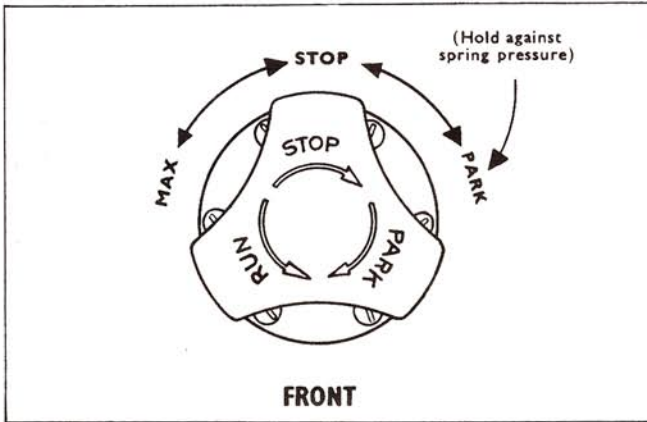
The FPK Motor is marked on each end cap of the cylinder with the words 'Run' or 'Park', the 'Park' end also having the letters 'LH' or 'RH' stamped thereon; the 'Run' end is also marked with the degrees of the

arc of wipe. 'LH' represents left hand parking and 'RH' right hand parking. The position of parking is always determined with the motor mounted at the top of the screen and when viewed from inside the vehicle.

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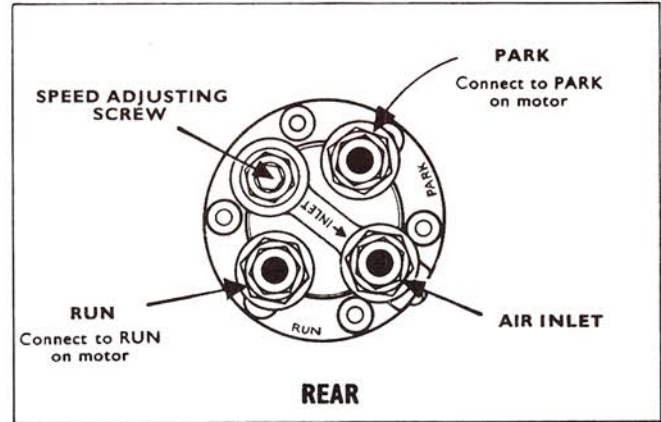
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2. CONTROL VALVE



The F1430-1 control valve is fitted with three connections each marked as follows:—

- 'PK' abbreviation for 'Park'.
- 'IN' abbreviation for 'Inlet'.
- 'RUN' indicates 'Run'



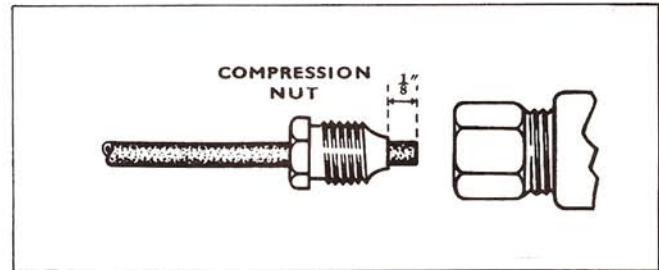
The 'Run' connection should be connected to 'RUN' on the motor.

- 'PK' or 'PARK' to 'Park' on motor.
- 'IN' or 'INLET' to the main air supply

It is important to ensure that the 'Run' and 'Park' connections are not reversed when installing.

3 AIR CONNECTIONS

Ensure that approximately $\frac{1}{8}$ " (4 mm) of tubing extends beyond the end of the compression nut (see dia.) before inserting and tightening the nut into the compression bodies used on both end caps and control valve above.



4 CONTROL OF SPEED

Diametrically opposite the 'IN' connection on the F1430-1 control valve will be found a small hexagon head screw which is locked in position by means of a nut. This adjusting screw is adjusted at the Works to provide an average wiping speed of 120 single strokes per minute, but it will be necessary to adjust this screw upon installation to provide the desired speed when the screen is wet. The nut should first be loosened before

attempting to adjust the screw and when a satisfactory maximum speed has been obtained the lock nut should be tightened, taking care not to disturb the position of the screw. During the setting of this restrictor screw the control knob should be maintained in the maximum speed position, i.e. fully counter-clockwise. The turning of this knob to the right should gradually reduce the speed until the wiper motor becomes stationary.

5 AUTOMATIC PARKING

First turn the control knob to the clockwise position. Further pressure applied will be found to operate against a fairly strong spring. The knob should be held in this position until the arm and blade travel once or twice across the screen when it should park the blade and arm automatically to one side; the knob can then be released. In this position the arm and blade are held mechanically

in the parked position and it will be found impossible to move the blade and arm from outside the screen. The emergency manual control will, however, operate the blade and arm from inside the vehicle as all air will be disconnected from the motor. Turning the knob to a fully counter-clockwise position will automatically release the parking mechanism and start the motor.

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6 SHAFT ALIGNMENT

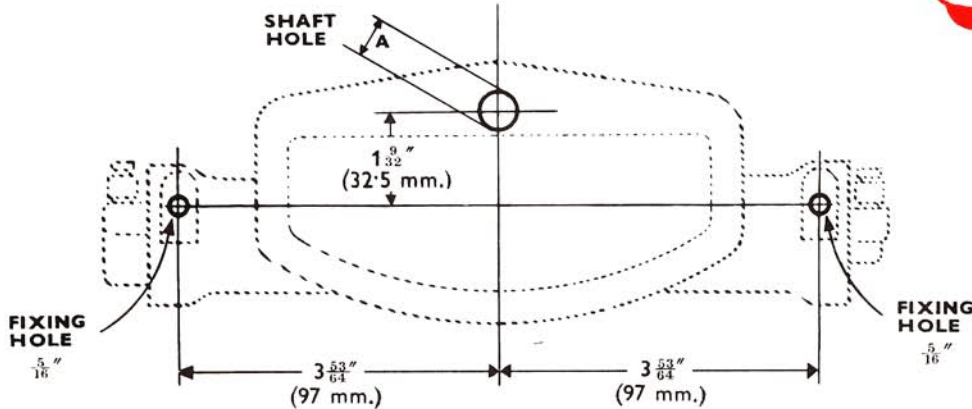


CHART OF SHAFT HOLES

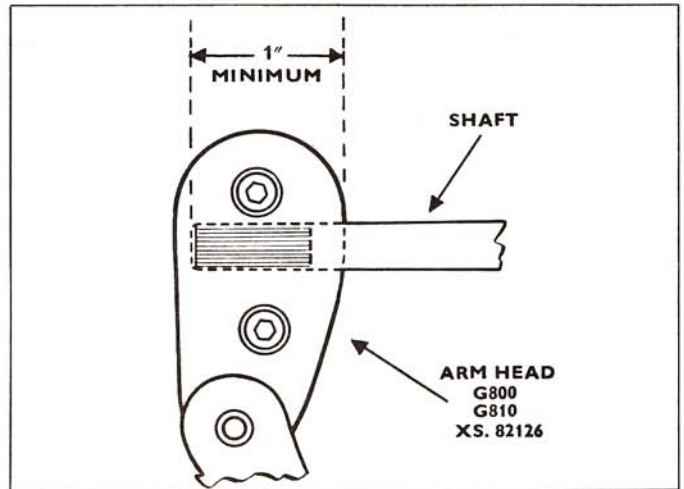
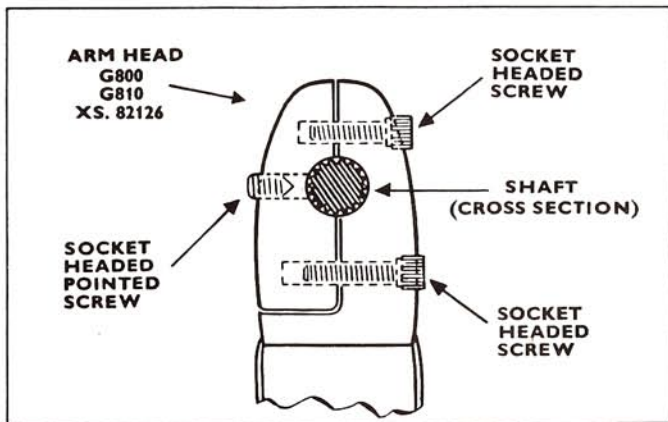
A	$\frac{7}{16}$ " dia. for $\frac{5}{16}$ " dia. Shaft. without waterproof gland.
	$\frac{1}{2}$ " dia. for $\frac{5}{16}$ " dia. Shaft. with waterproof gland.
	$\frac{1}{2}$ " dia. for $\frac{3}{8}$ " dia. Shaft. without waterproof gland.
	$\frac{9}{16}$ " dia. for $\frac{3}{8}$ " dia. Shaft. with waterproof gland.

When fitting the motor it is important to ensure that fixing holes are correctly positioned so that sufficient clearance is allowed for the different wiper shafts (see chart). The above diagram gives particulars of the

two fixing holes and the wiper shaft hole, all of which should be very carefully drilled to ensure that when the motor is fitted, the shaft is aligned at right angles (90°) to the face of the glass.

7(A) FIXING ARMS TO WIPER SHAFT

FPK-312- $\frac{5}{16}$ " (8 mm.) Diameter Knurled Shaft



The three types of arms for use with the FPK-312 motors are as follows:—

- G800 Single Motion Arm.
- G810 Single Motion Arm with rotating blade clip to permit the blade to be fixed at an angle to the arm.
- XS82126 Pantograph Motion Arm with slave arm at $1\frac{1}{4}$ " (31.7mm) centres.

These three arms have similar heads consisting of two halves which are clamped together with two socket head screws. There is a third screw in the centre which is pointed and hardened and it is of the utmost importance that the point of this screw does not protrude on to the shaft when first assembling the arm to the wiper motor. For preference it should be completely removed. 1" (26mm) of shaft (see diagram) must be fully inserted

CAUTION

IN THE CASE OF FITTING PANTOGRAPH ARMS AND NORMAL ARMS AND BLADES OVER 20" IN LENGTH ON MAXIMUM ARC, WE DO NOT NORMALLY RECOMMEND BOTTOM MOUNTING EXCEPT AT OUR ENGINEER'S RECOMMENDATIONS AFTER REVIEWING THE DETAILS OF THE INSTALLATIONS.

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7(A) FIXING ARMS TO WIPER SHAFT Continued

into the arm head before tightening the two outer screws equally after having first determined the best position for the arm. Should it be necessary to change the position of the arm when installing, these two screws should be loosened and the arm removed before replacing in the correct position. The two screws should finally be tightened using as much pressure as possible with the correct socket head key. The wiper motor should then be operated to confirm that the arm is in the correct position and the motor operates satisfactorily.

Only then should the pointed screw be inserted and tightened to form a deep dimple in the shaft. The purpose of the two clamp screws is to form an internal knurl by compression of the two halves of the wiper head on the knurl of the steel wiper shaft and maximum pressure is necessary to achieve this operation. Under no circumstances should any attempt be made to move the arm on the shaft once the hardened screw is fully tightened, as a new shaft is then necessary if it is required to change the position of the arm.

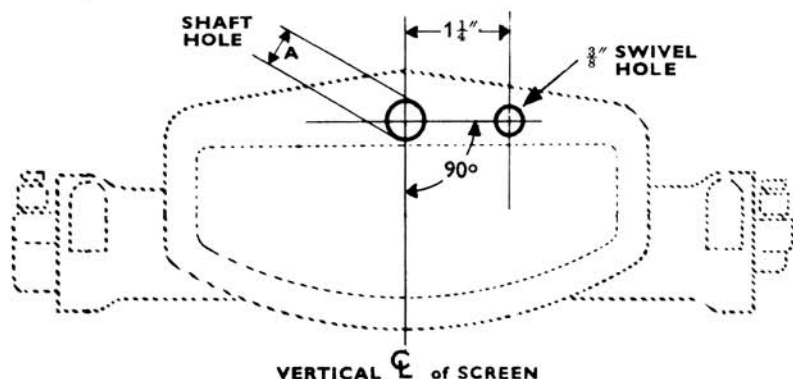


CHART OF SHAFT HOLES

A	$\frac{7}{16}$ " dia. for $\frac{5}{16}$ " dia. Shaft. without waterproof gland.
	$\frac{1}{2}$ " dia. for $\frac{5}{16}$ " dia. Shaft. with waterproof gland.

XS82126 Pantograph Arm—Fixing Holes.

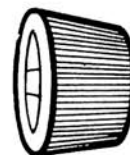
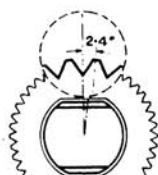
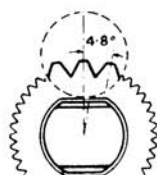
The method of fixing the driving arm to the wiper shaft is similar to that given above, but great care must be exercised in drilling the $\frac{3}{8}$ " (9.5 mm.) diameter hole for the swivel assembly. The swivel assembly should be positioned at exactly $1\frac{1}{4}$ " (31.7 mm.) centres from the centre of the wiper shaft. A horizontal centre line

passing between these holes should be exactly 90° with the vertical centre line of the screen. This will ensure that the blade remains truly vertical in all positions of the wiping arc. Any inaccuracy of hole positioning will result in greatly exaggerated misalignment of the wiper blade.

7 (B) FPK-375— $\frac{3}{8}$ " (9.5 mm.) Diameter Shaft.

This type of motor is fitted with a separate 75 pitch knurled driver, which is located on two parallel flat faces on the wiper shaft. A 75 pitch knurl normally gives individual arm locations of 4.8° , but having an uneven

number of knurls, it is possible to discriminate the position to 2.4° by removing the driver from the shaft and replacing on the two "flats" after first rotating the driver through 180° . The illustration below makes this clear.



75 TEETH EQUALLY SPACED

The three types of arms for use with the knurled driver on the FPK-375 motor are as follows:—

- G37500 Single Motion Arm.
- G37510 Single Motion Arm with rotating blade clip to permit the blade to be fixed at an angle to the arm.
- GS37526 Pantograph Motion Arm with slave arm at $1\frac{3}{4}$ " (44.5 mm.) centres.

CAUTION

IN THE CASE OF FITTING PANTOGRAPH ARMS AND NORMAL ARMS AND BLADES OVER 20" IN LENGTH ON MAXIMUM ARC, WE DO NOT NORMALLY RECOMMEND BOTTOM MOUNTING EXCEPT AT OUR ENGINEER'S RECOMMENDATIONS AFTER REVIEWING THE DETAILS OF THE INSTALLATIONS.

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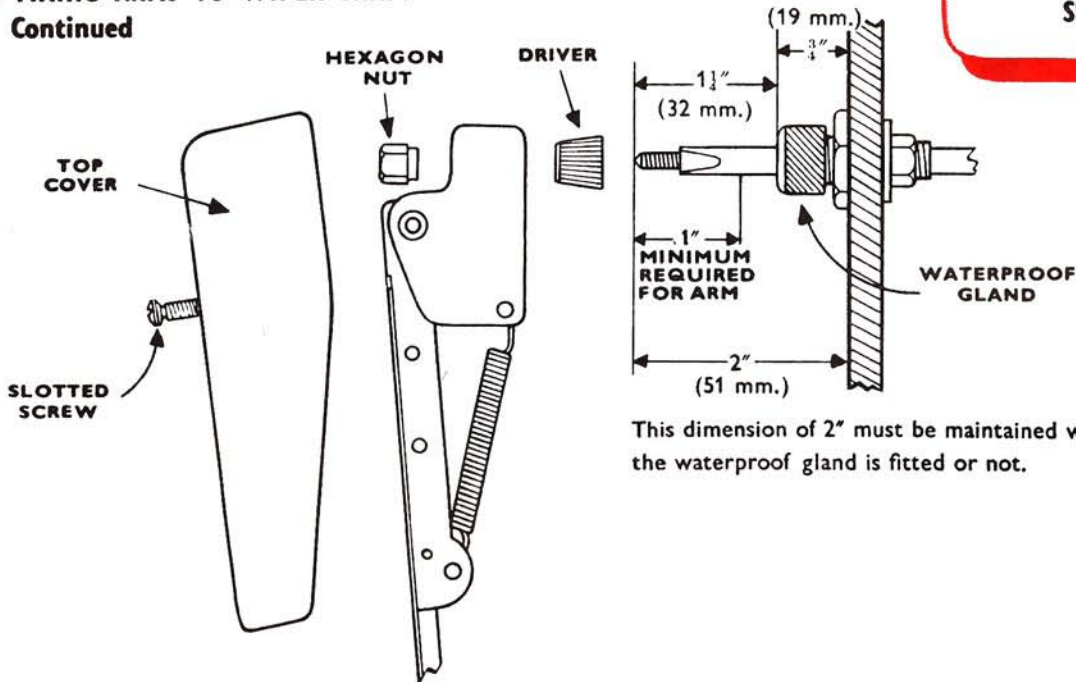
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7 (B) FIXING ARMS TO WIPER SHAFT Continued



This dimension of 2" must be maintained whether the waterproof gland is fitted or not.

First remove the top cover of the arm by unscrewing the coin slot screw. After determining the correct position of the arm, the hexagon nut should be tightened as much as possible, but care should be exercised when fitting the arm to the driver to ensure that the knurls are in precise engagement. It is generally advis-

able to operate the wiper motor manually before fully tightening the nut, as some difficulty will be experienced in removing the arm or the driver once the nut is fully tightened. Before replacing the cover, it is a good plan to pack the moving parts of the arm and the spring with grease which will preserve the mechanism.

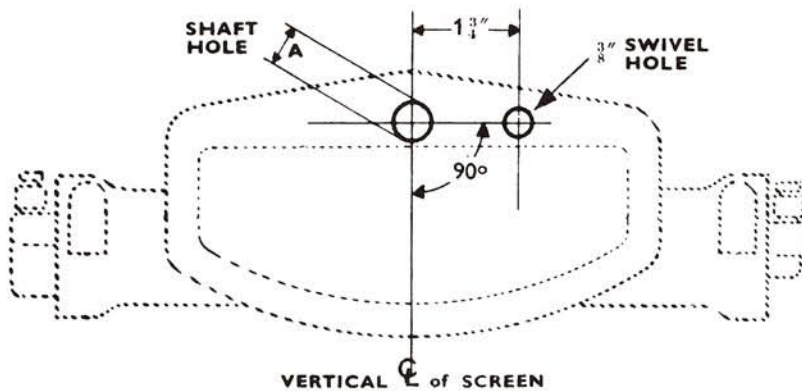


CHART OF SHAFT HOLES

A	1/2" dia. for 3/8" dia. Shaft. without waterproof gland.
	9/16" dia. for 3/8" dia. Shaft. with waterproof gland.

GS37526 Pantograph Arms.

The same care should be exercised in drilling the holes for the GS37526 Pantograph Arm as for the XS82126, but in this case the holes should be drilled at 1 3/4" (44.5 mm.) centres, and the centre line passing through these holes should form an exact right angle (90°) with the vertical centre line of the glass screen. Great care

should be exercised in determining the best position of the knurled driver, as usually with pantograph motion the arm setting is extremely critical, and full advantage should be taken of the alternative position of the driver as previously described, which can give a discrimination of 2.4°

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8 PARKING ANGLE.

All FPK motors have automatic parking on left or right hand as specified. With one exception (90°) parking requires an additional movement of the wiper arm and

allowance should be made for this when fitting the arm to the wiper shaft.

Parking angles are as follows :—

<i>Arc of Wipe</i>	<i>Park</i>	<i>Arc of Wipe</i>	<i>Park</i>
33°	+ 3°	70°	+ 4°
40°	+ NIL	80°	+ 5 $\frac{3}{4}$ °
50°	+ 3°	90°	+ NIL
55°	+ 3°	90°/1	- 2°
60°	+ 3°	100°	+ 4°
65°	+ 3°	110°	+ 4°

Made under one or more of the following Patents: British Patents 594627, 664575. American Patents 2209921, 2572727. Also various Foreign Patents. Further Patents pending.