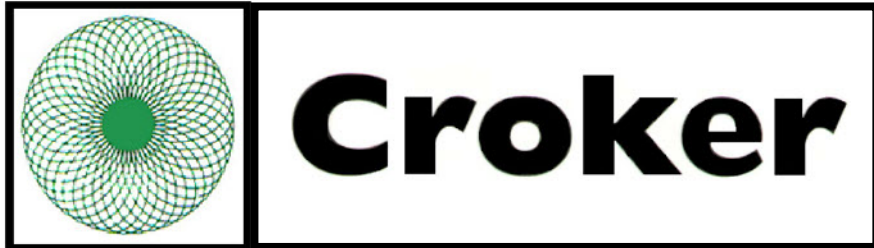


WINGET



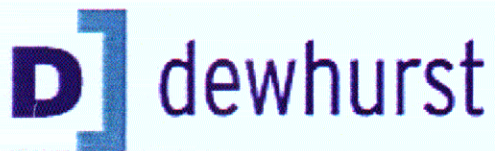
Please note: Dewhurst Electromagnetic Brake Parts are no longer available. Winget Limited are unable to supply parts for any Dewhurst Brake. This manual appears on our Web Site to assist users of older Winget/Croker Equipment fitted with Dewhurst Brakes to carry out service related tasks.

DEWHURST ELECTROMAGNET BRAKE TYPES DC & DNC INSTALLATION & SET UP INSTRUCTIONS

We are unable to assist users of other manufacturers equipment fitted with these Brakes

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Installation and setting
instructions

ELECTROMAGNETIC BRAKES

Types DC and DNC
Type N (Single Phase)
Type T (Three Phase)

Publication Number: II010/1091

Important

These instructions must remain with the product to ensure correct installation. If extra copies are required please contact Dewhurst plc and quote publication number and issue

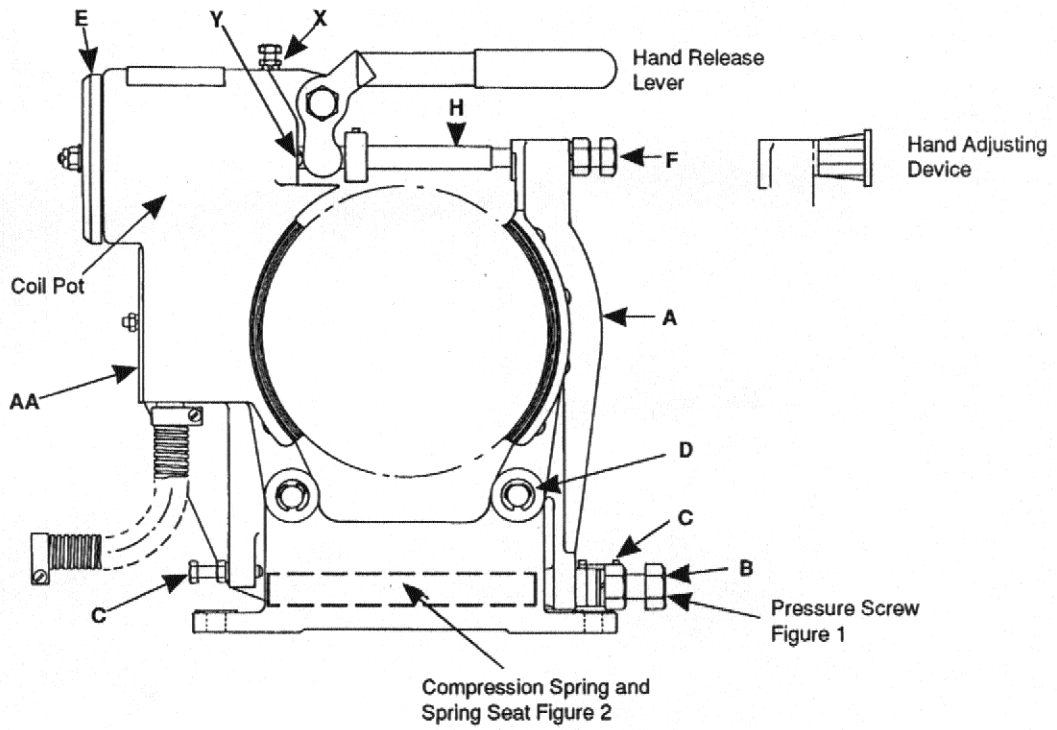
If you have any problems or questions, please contact our technical support desk direct on **+44 (0)20 8607 7322/7383** during office hours.

Dewhurst plc

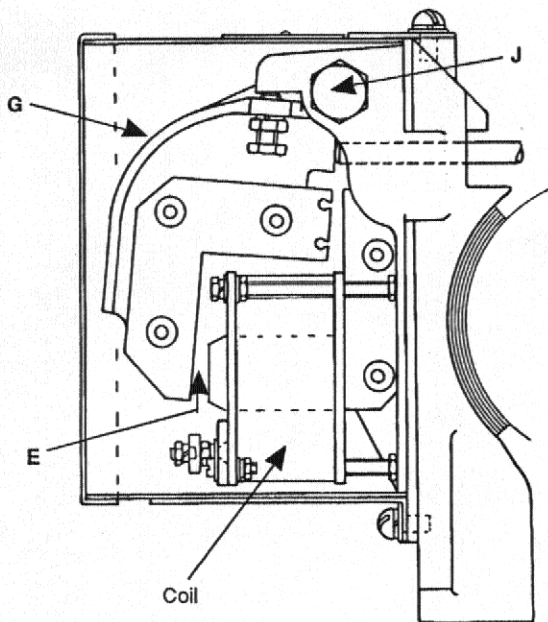
Inverness Road Hounslow TW3 3LT United Kingdom
tel +44 (0)20 8607 7300 fax +44 (0)20 8572 5986
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1. GENERAL

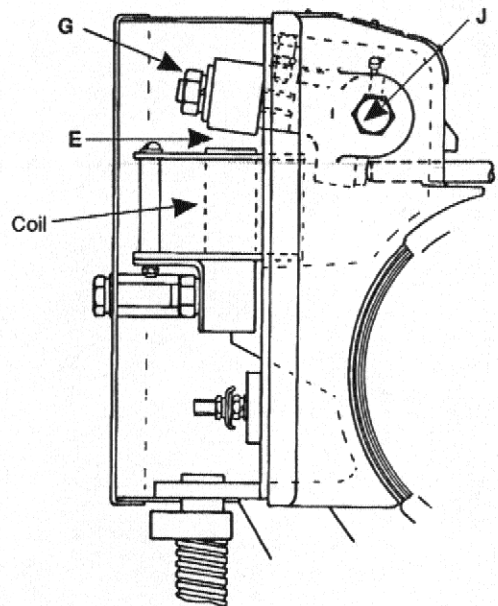
Mounting and adjustment instructions are similar for all three types of brake illustrated below.



Types DC and DNC



Type N



Type T

1.1 Health and Safety Precautions

Before carrying out any work, engineers must determine the means of:

- 1.1.1 isolating the electricity supplies controlling the machine drive and brake coil.
- 1.1.2 removing the load torque from the brake drum to prevent unexpected rotation.
- 1.1.3 protection against dust and dirt, particularly during maintenance work. Brake linings on old brakes may contain asbestos based materials. Between 1987 and 1989 non-toxic linings were introduced and are now supplied for all applications.
- 1.1.4 cleaning or replacing linings on a brake having old type asbestos based linings. Health and Safety precautions must be observed.
- 1.1.5 working safely to prevent damage to themselves, the equipment or to others in the vicinity. We suggest that small incremental adjustments followed by proving tests should minimise any risks involved.

2. DISMANTLING BRAKE FOR INSTALLATION

- 2.1 If it is not practicable to slip the complete brake assembly directly over the brake drum it is necessary to remove brake arm(s) A and/or AA as follows:
 - 2.1.1 For guidance during reassembly check and note amount of free adjustment present at pressure screw gap B, Figure 1. Release spring pressure by unscrewing pressure screw B.
 - 2.1.2 Release set screw(s) C at heel of brake arms.
 - 2.1.3 Remove pivot pin(s) D and lift brake arm(s) A and/or AA clear of brake base.

3. ASSEMBLING BRAKE ONTO BRAKE DRUM

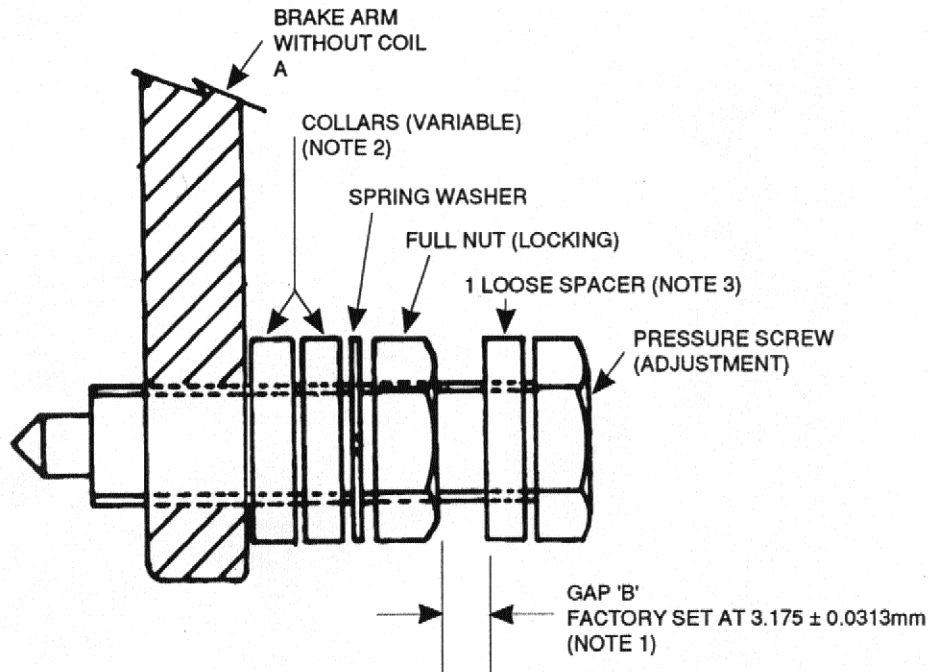
- 3.1 Set the brake base in position on the machine bedplate. Partially screw in the fixings to maintain the base in its correct location during the assembly procedure.
- 3.2 Clean and lubricate pivot pin D. Replace brake arm, with coil, AA. Refit pivot pin D and its retaining device.
- 3.3 Clean and lubricate the compression spring. Lay the spring in the centre of the curved base channel. Locate the end of the spring over the cast spigot on brake arm AA as shown in Figure 2.
- 3.4 Clean and lubricate the spring seat and locate it on the free end of the compression spring as shown in Figure 2. Check the spring is central in base channel.
- 3.5 Set the conical tip of pressure screw B flush with the internal face of brake arm A. Clean and lubricate pivot pin D. Replace brake arm A. Refit pivot pin D and its retaining device.
- 3.6 Locate the free end of pressure rod H into the top of brake arm A whilst screwing in pressure screw B until it just touches the spring seat.
 - 3.6.1 The location of the spring can be checked by inserting the hand into the space between the compression spring and brake drum and feeling for movement of spring and spring seat.
 - 3.6.2 **Continue to tighten pressure screw B whilst simultaneously rotating the compression spring by hand to ensure that it is correctly engaged around the cast spigot on brake arm AA and the spring seat over the conical tip of the pressure screw B.**

On some breaks, already assembled onto a brake drum, access limitations may necessitate temporary removal of the brake base fixing screws to enable the complete brake assembly to be moved sideways, in order to carry out the inspection procedure. If the brake is dismantled in this way, the reassembly and adjustment procedures must be fully implemented before the brake is put into service.
 - 3.6.3 Rotate the compression spring freely on its end pivots just before spring pressure is applied. Figure 2 illustrates correct and incorrect assemblies.
 - 3.6.4 When the assembly is correct, continue tightening pressure screw B until the brake drum is gripped tightly by both brake arms.
- 3.7 Before proceeding check that the brake base is laying flat on the machine bed plate, the brake linings are fully in contact with the brake drum and the base fixings can be freely rotated. Use the hand release device to move the brake if necessary.
 - 3.7.1 To compensate for difference in centre height between the brake and brake drum a set of four steel shims are provided. Fit shims as necessary and tighten brake base fixings.
 - 3.7.2 Insert a feeler gauge between the brake drum and brake linings around their entire periphery. Ensure that gaps are small and evenly spread to minimise excessive localised wear whilst bedding down.
 - 3.7.3 Repeat the procedures detailed in clause 3.7 until a satisfactory fit is achieved.
 - 3.7.4 Check that brake base fixings are tight and pressure rod H is free to rotate.

4. ELECTRICAL CONNECTIONS

- 4.1 Connect the flexible conduit to the brake coil housing.
- 4.2 Check the power supply characteristics of the brake coil from the brake data plate.
- 4.3 Wire and connect an appropriately rated, switched and overcurrent protected electricity supply to the brake coil.
- 4.4 Wire and connect an appropriately rated earth continuity conductor between the brake earth terminal and control system earth terminal so as to bridge the flexible conduit.
- 4.5 Carry out appropriate electrical test procedures which should include earth loop impedance and insulation resistance measurements.

FIGURE 1 - PRESSURE SCREW ASSEMBLY



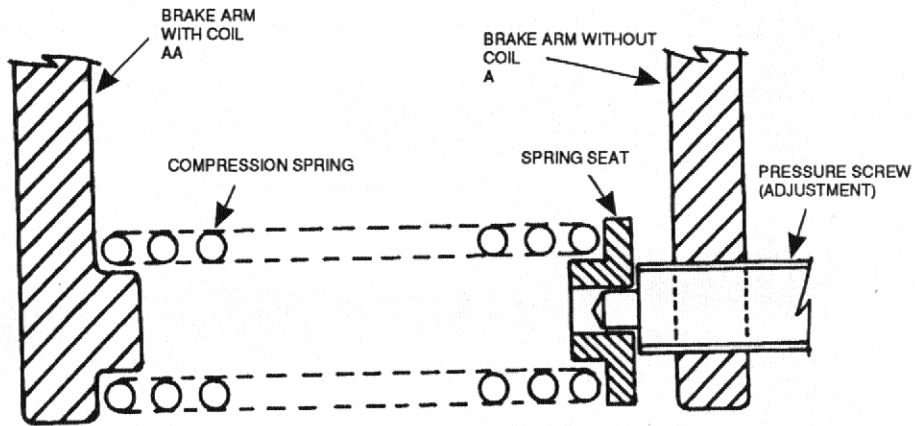
TYPICAL PRESSURE SCREW ASSEMBLY (ILLUSTRATION)

- NOTE 1** Gap 'B' is provided to compensate for wear of the friction surfaces. It is always factory set within the dimensions and tolerances detailed above.
- NOTE 2** The quantity and depth of collars fitted on each individual brake will vary. The collars are selected during the factory test to compensate for manufacturing tolerances. When Gap 'B' is set correctly the brake will produce its full rated torque providing the new linings are fully bedded onto the brake drum.
- NOTE 3** The loose spacer is provided to cover any uncut thread on the pressure screw which would otherwise prevent the pressure screw from being fully tightened.
- NOTE 4** The pressure screw should not be completely removed from the brake arm casting, in order to eliminate the possibility of misplacing collars and spacer etc.

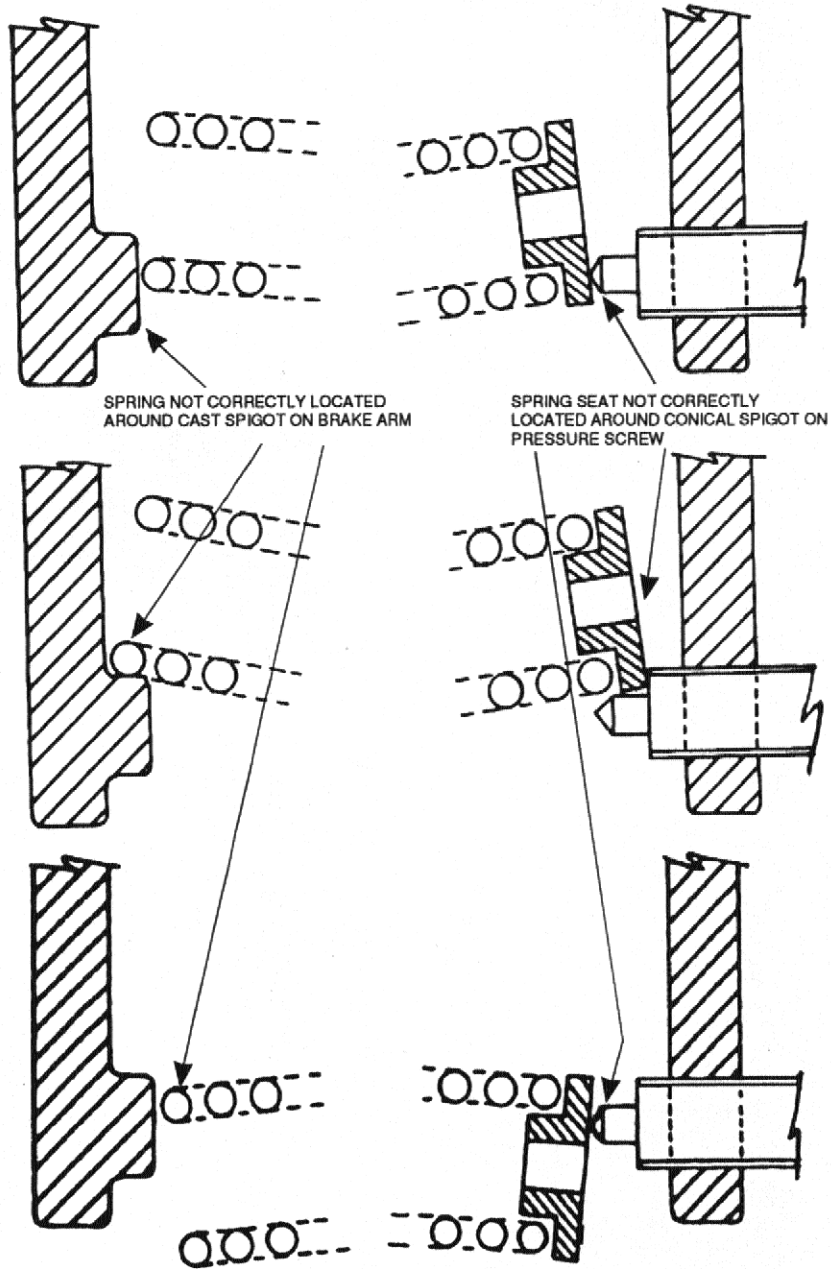
SAFETY

Gap 'B' is sensitive to change. It may be reduced to zero as the brake linings wear but should not be increased beyond the permitted maximum tolerance as the available torque then quickly reduces until the brake becomes ineffective.

FIGURE 2 - COMPRESSION SPRING ASSEMBLY



DETAILS OF CORRECT METHOD OF COMPRESSION SPRING ASSEMBLY



EXAMPLES OF POTENTIALLY HAZARDOUS ASSEMBLIES OF COMPRESSION SPRING

TABLE 1 - DIMENSIONAL DATA

Brake Size	GAP E MAXIMUM			M Spanner Size Types N & T only	Recommended clearance in front of brake for withdrawal of pivot pins
	Type N	Type T	Type DC		
2" (51mm)	2.4mm	-	1.27mm	-	51mm
3" (76mm)	4.8mm	-	1.27mm	-	51mm
4" (102mm)	6.4mm	-	1.27mm	3/8"W	51mm
5" (127mm)	6.4mm	-	-	3/8"W	51mm
6" (152mm)	7.9mm	6.4mm	1.52mm	7/16"W	89mm
8" (204mm)	7.9mm	6.4mm	1.78mm	1/2"W	102mm
9" (229mm)	9.5mm	7.9mm	1.78mm	9/16"W	127mm
10" (254mm)	9.5mm	7.9mm	1.78mm	9/16"W	127mm
12" (305mm)	9.5mm	7.9mm	2.03mm	13/16"W	152mm
15" (381mm)	11.1mm	9.5mm	2.03mm	1"W	178mm
18" (457mm)	-	-	2.54mm	-	204mm
20" (508mm)	-	11.1mm	3.18mm	-	280mm
25" (635mm)	-	12.7mm	3.96mm	-	343mm
30" (762mm)	-	15.9mm	4.75mm	-	381mm

NOTE: Operating gap E should always be set to the figure given on the brake label. Dependant on the duty classification it may differ from the figure listed above.

5. STATIC ADJUSTMENTS

- 5.1 These procedures must be implemented before any load is applied.
- 5.2 Tighten up pressure screw B until gap B is within the tolerances defined in Figure 1.
- 5.3 Set gap E in accordance with Table 1 by means of adjusting screw F, or hand adjusting device where fitted. It is important that armature G is held against pressure rod H whilst the gap is being checked.
- 5.4 Set screws C are provided at the bottom of both brake arms on the larger brakes but only on brake arm AA on the smaller sizes. These screws are intended to serve as backstops to permit adjustment to equalise shoe clearance i.e. lift of each brake arm.
 - 5.4.1 It is important that only one of the screws should be set, the other should be discarded.

Under no circumstances should any attempt be made to adjust both screws C as this could result in maloperation of the brake and possible fracture of the screw lugs.
 - 5.4.2 The screw fitted to the brake arm with coil AA is usually retained since the additional weight of the magnet coil assembly tends to increase the clearance between the brake shoe lining and brake drum on that side.
 - 5.4.3 Adjust screw C hand tight then unscrew about half turn to obtain minimum clearance between the brake lining and brake drum. Secure screw C locknut.

6. FINAL DYNAMIC ADJUSTMENTS

- 6.1 These procedures must be implemented before any load is applied.
- 6.2 Disconnect the electrical power supply from the machine drive to prevent rotation of the brake drum.
- 6.3 Connect a voltmeter across the brake terminals. Switch on the electrical power supply to the coil only. Check that the measured voltage matches the specified voltage marked on the data plate within a 6% tolerance.
 - 6.3.1 Switch the power off. Check that the magnet releases completely and the brake shoes are fully contacting the brake drum.
 - 6.3.2 Switch the power on. Check that the brake magnet fully seals without undue effort. If practicable, move the brake drum to prove the shoes have lifted clear of the brake drum. Switch the brake off.
 - 6.3.3 If the brake does not perform smartly i.e. within one second, repeat static adjustments until a satisfactory result is achieved.
- 6.4 Reconnect the electrical power supplies to the machine drive. Apply the minimum practicable load torque to the drive system. Arrange for an assistant to control movement and power supplies to prevent a safety incident. See also recommendations in clause 1.1.

- 6.4.1 Adjust screw F one flat at a time until the brake arms can be held so that neither shoe touches the brake drum whilst it is revolving. Check gap E is not excessive and the magnet operates easily. Secure screw F locknut.
- 6.4.2 Adjust screw C one flat at a time until the magnet coil arm AA only just clears the brake drum. Secure screw C locknut.
- 6.4.3 Readjust screw F one flat at a time until the brake arm A only just clears the brake drum. Secure screw F locknut.
- 6.4.4 Check that gap E on the magnet is set within the maximum permitted dimension. Check the brake still operates easily and the brake shoes clear the brake drum on each operation. Repeat procedure 6.4 onwards until a satisfactory result is obtained.
- 6.4.5 If it is not practicable to maintain gap E within the specified dimension whilst simultaneously keeping the brake shoes clear of the brake drum, then the brake drum must itself be checked for faults e.g. eccentricity, surface finish, worn bearings or vibration. These must be resolved before proceeding.
- 6.5 Check that pressure screw B is set within the tolerance defined in Figure 1. Correct as necessary. Increase the drive load torque in practical increments. Observe that on each step the brake is capable of preventing movement of the static load and can decelerate the moving load in an acceptable distance. Continue these tests up to full rated load and when appropriate overload conditions.
 - 6.5.1 Increase braking torque by turning pressure screw B clockwise a flat at a time up to its fully clockwise position. **Collars and spacers must not be removed to obtain further torque capability.**
 - 6.5.2 If braking torque is too fierce at full rated load then pressure screw B may be carefully turned anticlockwise a flat at a time to increase gap B. **The brake shoes must be fully bedded in before this adjustment can be considered as only very limited adjustment is available before the torque reduces to zero.**
 - 6.5.3 Check that the brake still operates easily and the brake shoes clear the brake drum on each operation.
- 6.6 **Until new linings are bedded down it may be necessary to temporarily increase torque by reducing gap B. It will also be necessary to check gap E frequently and readjust as necessary during this period.**

7. **MANUAL BRAKE RELEASE**

7.1 **A.C. Brakes**

When necessary a.c. brakes can be released manually, using a spanner size indicated in Table 1, applied to release device J.

7.2 **D.C. Brakes**

When necessary d.c. brakes can be released manually by applying upward movement to the hand release lever.

8. **BRAKE MAINTENANCE**

These procedures concern the long term use of the brake including replacement of shoe linings and coils.

8.1 **Inspection**

- 8.1.1 Check the condition of the brake at frequent intervals. This interval is dependent upon the operating frequency particularly as the friction surfaces bed down.
- 8.1.2 Check security of all fixings, locking devices etc.
- 8.1.3 Check gap E. Set to the minimum practicable gap less than or equal to the dimension defined on the brake label or Table 1. This dimension is dependent on the duty classification, where they differ the dimensions on the label shall prevail.

8.2 **Adjustments**

- 8.2.1 When adjustments are necessary to maintain brake performance then work in accordance with the procedures described in clauses 5 and 6 in the order defined.

8.3 **Lubrication**

- 8.3.1 A.C. Brakes only. Periodically apply a trace of machine oil to the armature spindle bearings. Oil holes are provided.
- 8.3.2 Whenever a brake is dismantled it is necessary to relubricate the pivot pins D, compression spring and spring seat with a graphite based grease. On a.c.brakes the armature spindle should be lightly lubricated with machine oil.

8.4 Cleaning

- 8.4.1** During use or when replacing brake linings dust particles are abraded from the linings. Avoid creating dust clouds. Use a vacuum cleaner or damp cloth. Do not use a brush or air blower. Note comments in clause 1 regarding personal protection.
- 8.4.2** Clean frequently to minimise build up of dirt and dust. Dispose of contaminated materials in a safe manner taking into account the safety of others who may come into contact with containers etc.

9. REPLACEMENT OF BRAKE LININGS

- 9.1** Disconnect wiring from coil and earth terminal together with associated flexible conduit. Carefully pull it free from brake arm.
- 9.2** Dismantle both brake arms in accordance with clause 2.
- 9.3** Remove the compression spring and spring seat and place them aside.
- 9.4** Check that the replacement brake linings are the correct size and fit correctly. All rivets and fixing screws, provided with the linings are of sufficient quantity and are undamaged.
- 9.5** The smaller brake linings are predrilled. However, the large diameter brakes have to be carefully drilled using the existing parts as templates.
- 9.6** Countersink the inner face of the lining sufficiently to bury the rivet and screw heads approximately 50% of the lining thickness to allow for wear of the lining surface.
 - 9.6.1** Take care whilst drilling to prevent damage during drill breakthrough.
 - 9.6.2** Clean all burrs from the linings and clean the faces of the brake arms. Secure the brake linings to the brake arms using rivets or screws where appropriate commencing at the centre of the linings and working towards each extremity in turn.
- 9.7** Reassemble the brake arms etc. and reconnect the flexible conduit etc. in accordance with clauses 3 and 4 respectively.
- 9.8** Carry out static and final dynamic adjustments etc. in accordance with clauses 5 and 6 respectively.
- 9.9** On completion of the work clean the area and dispose of contaminated materials in accordance with clause 8.4.

10. REPLACEMENT OF BRAKE COIL - A.C. BRAKE TYPES N & T

- 10.1** Isolate the electricity supply to the drive machine and brake.
- 10.2** Remove the cover from the magnet/coil assembly.
 - 10.2.1** If the brake is already installed and pressure screw B adjusted to hold static torque, then it is not necessary to disturb this setting.
Turn adjusting screw F until the push rod H is free and the magnet armature has relaxed.
 - 10.2.2** If the brake assembly has not been installed around the brake drum then relax the magnet armature by releasing pressure screw B.
- 10.3** Remove the Allen screw from the top of the magnet armature.
- 10.4** Remove hinge pin J, note position of all spacing shims and pull magnet armature free.
- 10.5** Disconnect wiring from the coil terminals. Remove all coil retaining nuts and washers noting their location. Withdraw coil from armature pole piece.
- 10.6** Install new coil, replace nuts and washers in their correct positions. Take care not to overstress the coil bobbin when securing. Reconnect wiring to coil terminals.
- 10.7** Lightly lubricate Hinge Pin J and refit whilst replacing spacer shims in their correct locations.
- 10.8** Rotate hinge Pin J until the dimple on the hinge pin aligns with the Allen screw hole. Refit the Allen screw, check it locates in the dimple and secure.
- 10.9** Install and adjust the brake as described in these instructions and information on cover mounted data plate. Refit cover and secure.

11. REPLACEMENT OF BRAKE COIL - D.C. BRAKE TYPES DC AND DNC

- 11.1** Isolate the electricity supply to the drive machine and brake.
- 11.2** Remove armature disk G by unscrewing its nyloc nut.
 - 11.2.1** If the brake is already installed and pressure screw B adjusted to hold static torque, then it is not necessary to disturb this setting.
Turn adjusting screw F until the push rod H is free and the magnet armature has relaxed.
 - 11.2.2** If the brake assembly has not been installed around the brake drum then relax the magnet armature by releasing pressure screw B.
- 11.3** Completely remove core locking screw X. Take care not to mislay the locking washer and nut.
- 11.4** Remove coil terminal cover plate and disconnect the site wiring only from the terminals.
- 11.5** Loosen the two coil holding screws Y but do not remove them completely.
- 11.6** Insert two stiff metal pins in the coil core and plate holes and remove the core by unscrewing in an anti-clockwise direction.
- 11.7** Remove the screw protecting copper pellet at the base of screw X. This may fall through into the pot housing as the coil and core are removed, but if not, it is easily pushed through with a small screwdriver etc.
- 11.8** Unscrew the pillars retaining the coil terminal board, remove the terminal board and coil bobbin.
- 11.9** Disconnect the original coil terminals from the terminal board and connect the new coil leads in the same orientation.
- 11.10** Replace the terminal board and coil, check that coil and leads are not trapped in the pot housing, secure the fixing pillars. Reconnect the site wiring and replace the terminal cover and secure.
- 11.11** Adjust the coil core until the end plate is approximately 0.05mm below the edges of the pot housing when measured with the help of a straight-edge.
- 11.12** Replace the copper pellet and core locking screw X and secure.
- 11.13** Carefully and evenly tighten coil holding screw Y until the coil bobbin is secure. Do not overtighten, hand tight is sufficient to prevent damage and coil movement in use. Secure the lock nuts.
- 11.14** Replace armature disk G and secure with its nyloc nut.
- 11.15** Install and adjust the brake as described in these instructions and information on cover mounted data plate.

LIFT TECHNICAL BULLETIN L.130

ELECTROMAGNETIC BRAKES

ELECTROMAGNETIC BRAKE TYPES DC, DNC, N AND T

Warning of Potential Safety Hazard

When brakes have been dismantled for new installation or maintenance purposes, it has been discovered that it is possible to reassemble the compression spring and spring seat incorrectly as illustrated in Figure 1.

If this occurs and the compression spring or spring seat should then slip in service, even into their correct locations, it is possible that the brake may not then exert sufficient force to hold its static load or decelerate a moving load.

Action Required

When reassembling a brake, take the following precautions:

1. Inspect the pressure screws, compression spring and spring seat to ensure that they have been correctly assembled as illustrated in Figures 1 and 2.

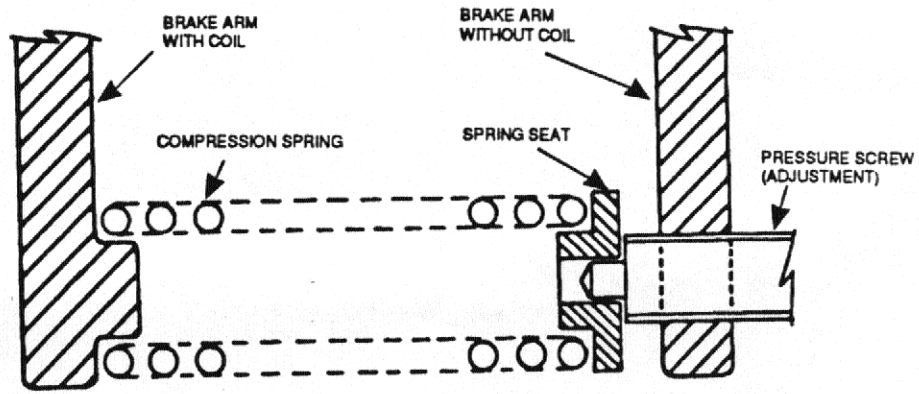
Location of the compression spring on the cast spigot of the brake arm and the spring seat on the conical spigot of the pressure screw can be readily checked by temporarily releasing spring pressure, releasing the pressure screw and rotating the spring and spring seat on their pivot points.

On some brakes, already assembled onto the brake drum, access limitations may necessitate temporary removal of the brake base fixing screws to enable the complete brake assembly to be moved sideways, in order to carry out the inspection procedure. If the brake is dismantled in this way, the reassembly and adjustment procedures must be fully implemented before the brake is put into service.

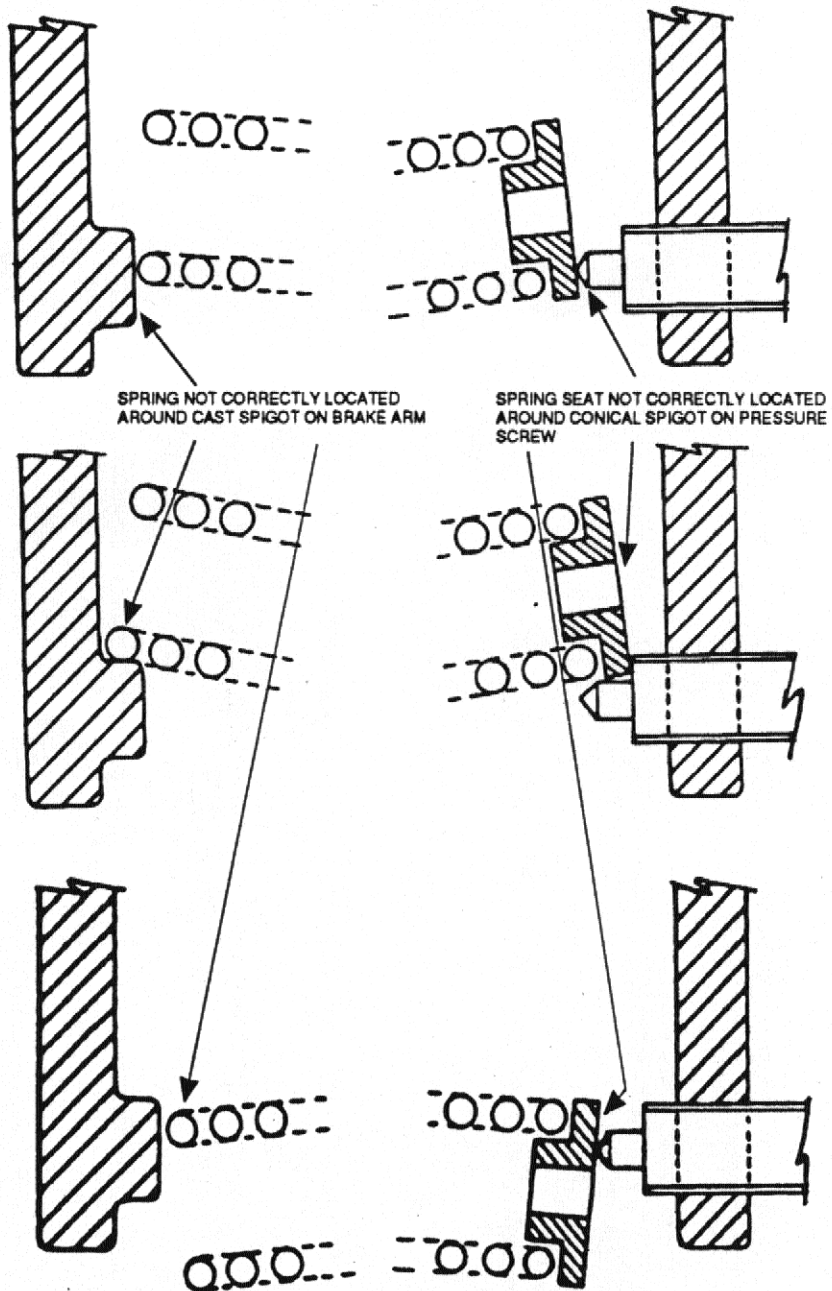
2. If the technique of correct assembly is *not* clear, you are recommended to read the step by step details in the Installation and Maintenance Instructions.

The above instructions are available from our Market Services Department at Hounslow by quoting Publication Number II010.

FIGURE 1 - COMPRESSION SPRING ASSEMBLY

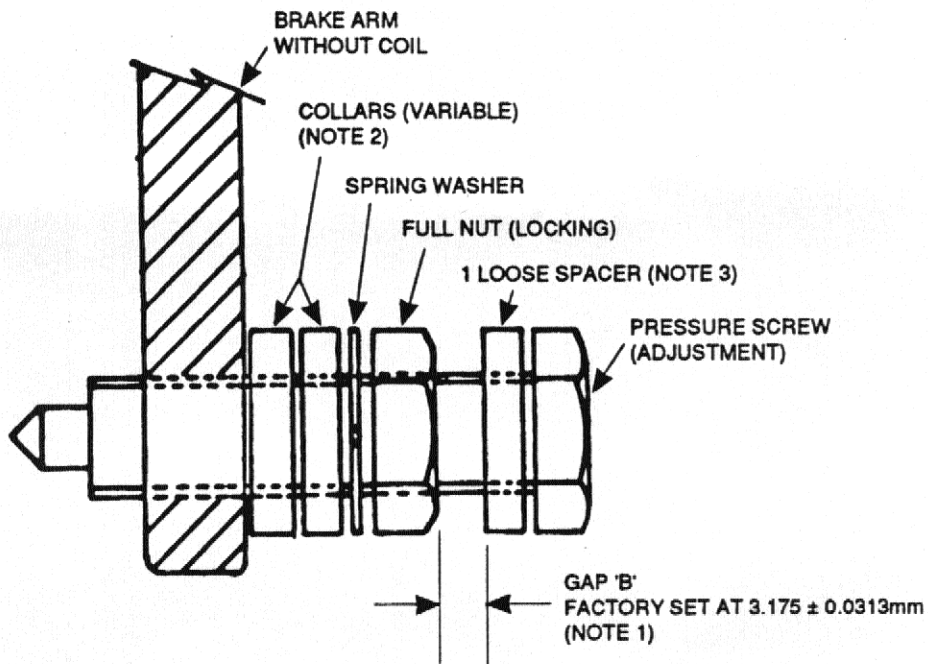


DETAILS OF CORRECT METHOD OF COMPRESSION SPRING ASSEMBLY



EXAMPLES OF POTENTIALLY HAZARDOUS ASSEMBLIES OF COMPRESSION SPRING

FIGURE 2 - PRESSURE SCREW ASSEMBLY



TYPICAL PRESSURE SCREW ASSEMBLY (ILLUSTRATION)

- NOTE 1** Gap 'B' is provided to compensate for wear of the friction surfaces. It is always factory set within the dimensions and tolerances detailed above.
- NOTE 2** The quantity and depth of collars fitted on each individual brake will vary. The collars are selected during the factory test to compensate for manufacturing tolerances. When Gap 'B' is set correctly the brake will produce its full rated torque providing the new linings are fully bedded onto the brake drum.
- NOTE 3** The loose spacer is provided to cover any uncut thread on the pressure screw which would otherwise prevent the pressure screw from being fully tightened.
- NOTE 4** The pressure screw should not be completely removed from the brake arm casting, in order to eliminate the possibility of misplacing collars and spacer etc.

SAFETY

Gap 'B' is sensitive to change. It may be reduced to zero as the brake linings wear but should not be increased beyond the permitted maximum tolerance as the available torque then quickly reduces until the brake becomes ineffective.

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