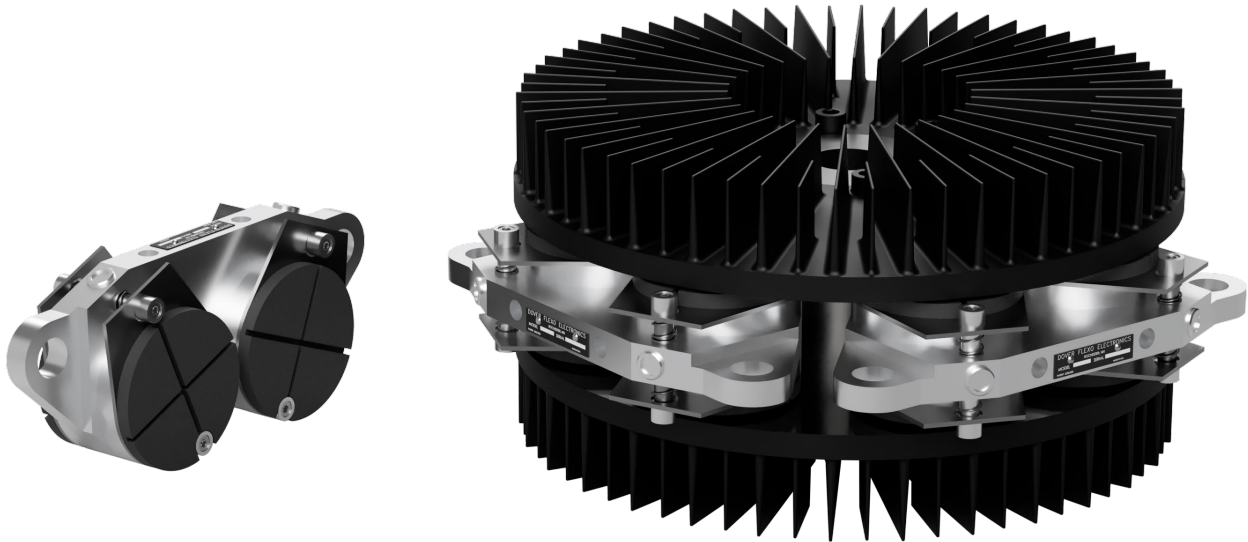




THE TENSION CONTROL SPECIALISTS

INSTRUCTION MANUAL



**Pneumatic Dual Disc Brakes
60, 90, 110, 130 and 1800 Series**

Dover Flexo Electronics
307 Pickering Road
Rochester, NH 03867- 4630
U.S.A.

FOR ASSISTANCE:

TECHNICAL SERVICE - Installations, Start-Up, Troubleshooting, Repairs, Field Service or Returns. **Call (603) 332-6150 and ask for Technical Support or email us at: techsupport@dfc.com**

CUSTOMER SERVICE - Replacement Parts, Individual Products, Questions about Orders, Manuals. **Call (603) 332-6150 and ask for Customer Service or email us at: customerservice@dfc.com**

SALES - Product Information, System Application Questions or Placing Orders, **Please e-mail us at: sales@dfc.com or call (603) 332-6150 and ask for Sales.**

Telephone: (603) 332-6150 Fax: (603) 332-3758

E-mail: info@dfc.com Internet: www.dfc.com

SAFETY



This label indicates: “Read The Manual”

Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your Pneumatic Dual Disc Brake. If you have any questions concerning the operation of your device or the information in this manual, please contact us.

Email: techsupport@dfc.com
Telephone: (603) 332-6150

- **Observe all warning labels.**
- **Never remove warning labels.**



WARNING: If this equipment is not connected or operated in the manner specified, the operating safety of this unit or of connected equipment cannot be guaranteed.

Table of Contents

1	OVERVIEW / DESCRIPTION	5
1.1	GENERAL DESCRIPTION.....	5
1.2	SPECIFICATIONS.....	5
1.3	FEATURES.....	7
1.4	ADDITIONAL DOCUMENTATION	7
2	INSTALLATION.....	7
2.1	INSTALLATION REQUIREMENTS.....	7
2.2	INSTALLATION STEPS.....	8
2.3	60 SERIES BRAKE ASSEMBLY	9
2.4	90 SERIES BRAKE ASSEMBLY	10
3	CARE AND MAINTENANCE.....	11
3.1	GENERAL CARE	11
3.2	BRAKE PAD REPLACEMENT	11
4	REPLACEMENT PARTS & ACCESSORIES	12
4.1	REPLACEMENT PARTS.....	12
4.2	ACCESSORIES.....	13
	TERMS AND CONDITIONS OF SALE AND SHIPMENT.....	15

1 OVERVIEW / DESCRIPTION

1.1 GENERAL DESCRIPTION

Dover Flexo's Pneumatic Dual Disc Brakes are available in sizes ranging from 3 lb-inches up to 17,990 lb-inches of braking torque. Designed for industrial unwind applications, all brake models include anti-squeal technology by way of our patented Silencer™ friction pads.

Braking force is applied between the two discs on opposing sides of the brake utilizing precision CNC machined actuators. Each actuator is comprised of twin brake cylinders which can be activated independently. 90 Series and larger brakes use Dover's unique Universal Actuator™. The actuator is called universal because of its simple interchangeability between dual disc brakes of different sizes. It is also interchangeable with the pneumatic cylinder assemblies on some of the standard dual disc brakes of other manufacturers.

Some advantages of DFE's actuator designs include: Hassle-free friction pad removal and installation — no tools are required to change brake pads, and limited travel actuator piston that prevents disc scoring and a return spring that cannot puncture the actuator diaphragm.

1.2 SPECIFICATIONS

GENERAL SPECIFICATIONS	BRAKE SERIES				
	60	90	110	130	1800
Min. Torque - lb-in (N-M)	3 (0.3)	14 (1.5)	19 (2)	23 (2.6)	33 (4)
Max. Torque - lb-in (N-M)	1,010	3,000	6,210	9,840	17,990
Disc/Hub Inertia - Slug-in ²	2.54	7.9	22.2	56.9	178.9
Max # of Cylinders	6	4	6	8	10
Min. Shaft Length – in.	4.6	7.1	7.3	7.3	9.2
Min. Bore Size (mm)	0.625 (13)	0.750 (19)	1.250 (32)	1.375 (35)	2.00 (50)
Max. Bore Size (mm)	1.375 (35)	1.375 (35)	2.438 (62)	2.750 (70)	4.500 (115)
Max. RPM	6400	4500	3600	3100	3900
Disc/Hub Weight - lb	9.1	28.4	54.9	94.6	172.8
Max. Shipping Weight - lb	22.5	45	80	130	236

TORQUE CAPACITY, LB-IN (N-M)

Torque Capacity at 75psi (5.17 bar)

BRAKE SIZE		PAD COEFFICIENT OF FRICTION	
SERIES	# OF Cylinders	0.10 (#1) LB-IN (N-M)	0.45 (#4) LB-IN (N-M)
60	1	40 (5)	170 (19)
	2	80 (9)	340 (38)
	3	110 (12)	500 (56)
	4	150 (17)	670 (76)
	5	190 (21)	840 (95)
	6	230 (19)	1010 (114)
90	1	170 (19)	750 (85)
	2	330 (37)	1500 (169)
	3	500 (56)	2250 (254)
	4	660 (74)	3000 (339)
110	1	230 (26)	1040 (117)
	2	460 (52)	2070 (234)
	3	690 (78)	3110 (351)
	4	920 (104)	4140 (468)
	5	1150 (130)	5180 (585)
	6	1380 (156)	6210 (702)
130	1	270 (30)	1230 (139)
	2	550 (62)	2460 (278)
	3	820 (93)	3690 (416)
	4	1090 (123)	4920 (555)
	5	1370 (155)	6150 (694)
	6	1640 (185)	7380 (833)
	7	1910 (216)	8610 (972)
	8	2190 (247)	9840 (1111)
1800	1	400 (45)	1800 (203)
	2	800 (90)	3600 (407)
	3	1200 (136)	5400 (610)
	4	1600 (181)	7200 (813)
	5	2000 (226)	9000 (1017)
	6	2400 (271)	10800 (1220)
	7	2800 (316)	12590 (1422)
	8	3200 (361)	14390 (1626)
	9	3600 (407)	16190 (1829)
	10	3990 (451)	17990 (2033)

1.3 FEATURES

- Heavy duty for unwind applications
- Wide torque range
- Large heat dissipation capacity
- Cylinders can be actuated individually
- Replace worn brake pads in seconds, without tools
- Unique actuator design prevents disc scoring and blown diaphragms
- Each brake ships with a pair of Silencer™ Pads for squeal-free performance

1.4 ADDITIONAL DOCUMENTATION

Please see our website for additional documentation such as datasheets and dxf drawings.

<https://dfe.com/products/pneumatic-disc-brakes/>

2 INSTALLATION

2.1 INSTALLATION REQUIREMENTS

In order to obtain best performance and ensure trouble-free operation, the installation environment and related machinery must comply with the following conditions. Compliance with these requirements is necessary to validate the 5 Year Warranty and No-Squeal Warranty.

1. The brake mounting surface must be rigid and strong enough so it does not deflect when loaded by brake torque.
2. The shaft must be straight. (Bent shafts cause disk run-out, resulting in vibration and noise)
3. The shaft must not have noticeable end play.
4. The shaft bearing must be in good condition, with no noticeable free-play or noise.
5. The shaft diameter must be properly matched to the brake bore. (A loose fit can cause balance problems and disc run-out)
6. The shaft must be perpendicular to the brake mounting surface to within 0.040" (1mm), measured at the end of the shaft.
7. The set screws must be tight so the disc assembly does not move on the shaft.
8. The actuator plates must be centered between the discs and be parallel to the brake mounting surface.
9. All mounting bolts must be tight.
10. The friction surfaces of the discs and friction pads must be clean and free of oil or any other lubricant or substance.
11. The friction pads must be installed with the friction surface against the disc and the steel back plate against the air cylinder.
12. Actuator plates must be parallel to the discs (misaligned actuators cause uneven wear and noise).

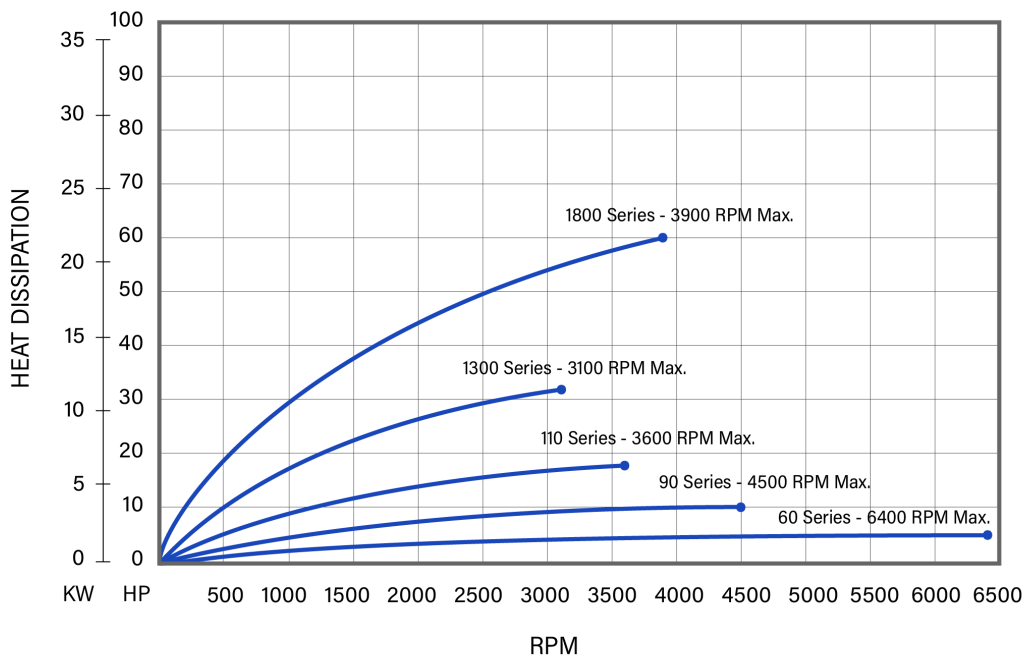
2.2 INSTALLATION STEPS

1. Drill machine frame for the mounting bolts or mounting plate according to the Application Data sheet for the brake size being installed.
2. If a mounting plate is used, install the plate to the machine frame and/or safety chuck. Tighten the bolts firmly.
3. Slide the disk hub assembly onto the shaft. Align the keyways in the hub and shaft. and insert the key. Do not tighten the set screw in the disk hub assembly at this time.
4. Insert the actuator assembly between the discs. Insert the spacers, bolts and lock washers securing the actuator assembly. Tighten actuator mounting bolts to appropriate specs, see chart.

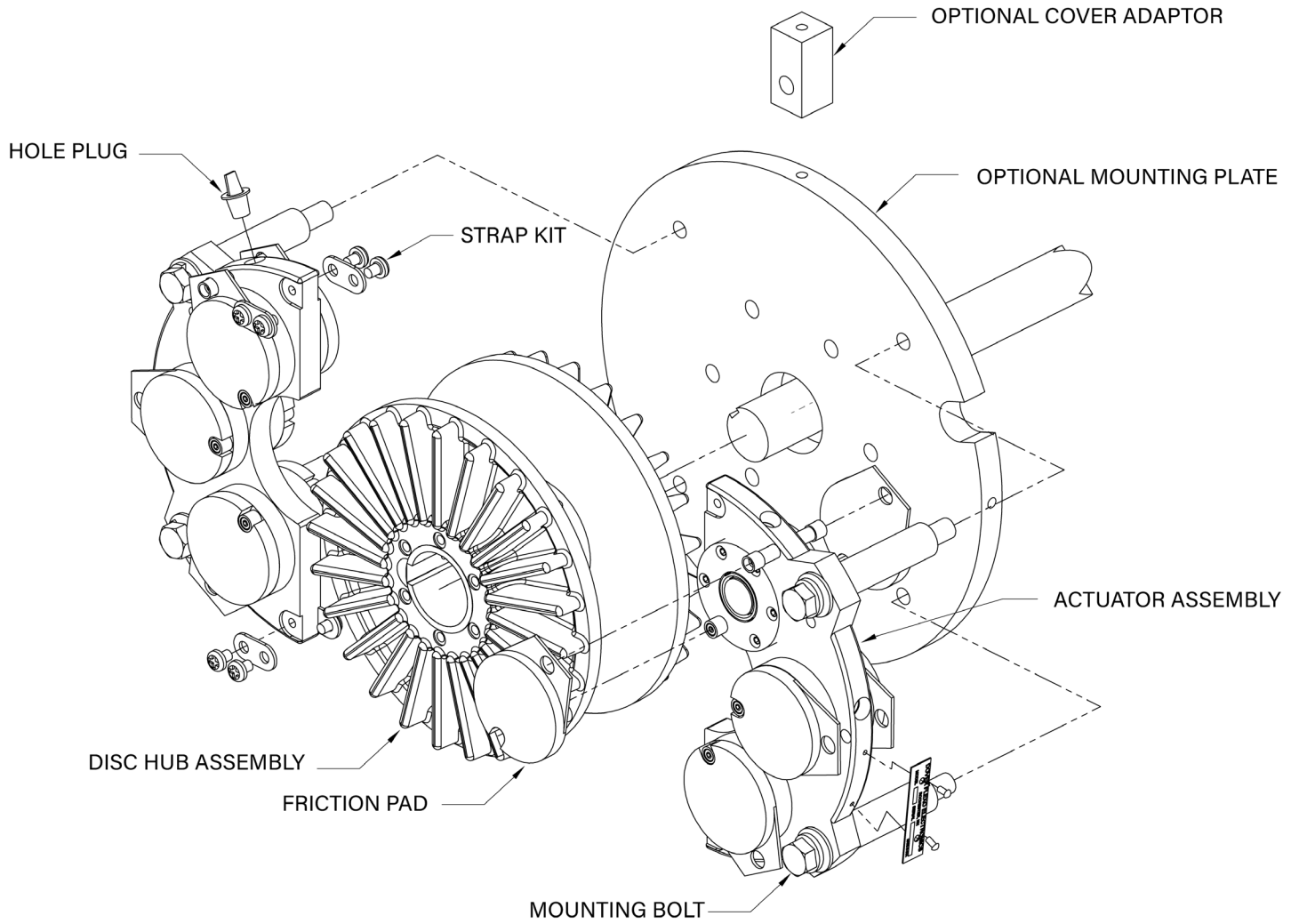
BOLT TYPE	60 SERIES	90 – 1800 SERIES
Inch	23 lb-ft	200 lb-ft
Metric	30 Nm	480 Nm

5. Position the disc hub assembly on the shaft so that the friction pads on the actuator assembly are centered between the 2 discs. The disc hub assembly should not touch the friction pads. Tighten the set screws in the disc hub assembly firmly. Ensure that the friction pads are installed properly with the friction material facing the disc and the metal backing plate toward the piston.
6. Connect the air supply to the actuator plate(s). Install the brake guard/cover and tighten the lock screws firmly. Note: Brake guard/cover mounting adapters may be needed when a DFE mounting plate is not used.
7. Once the brake has entered service take care to follow cooling speed recommendations. If RPMs are insufficient to dissipate HP, add a fan to the brake to increase airflow.

HEAT DISSIPATION vs. RPM

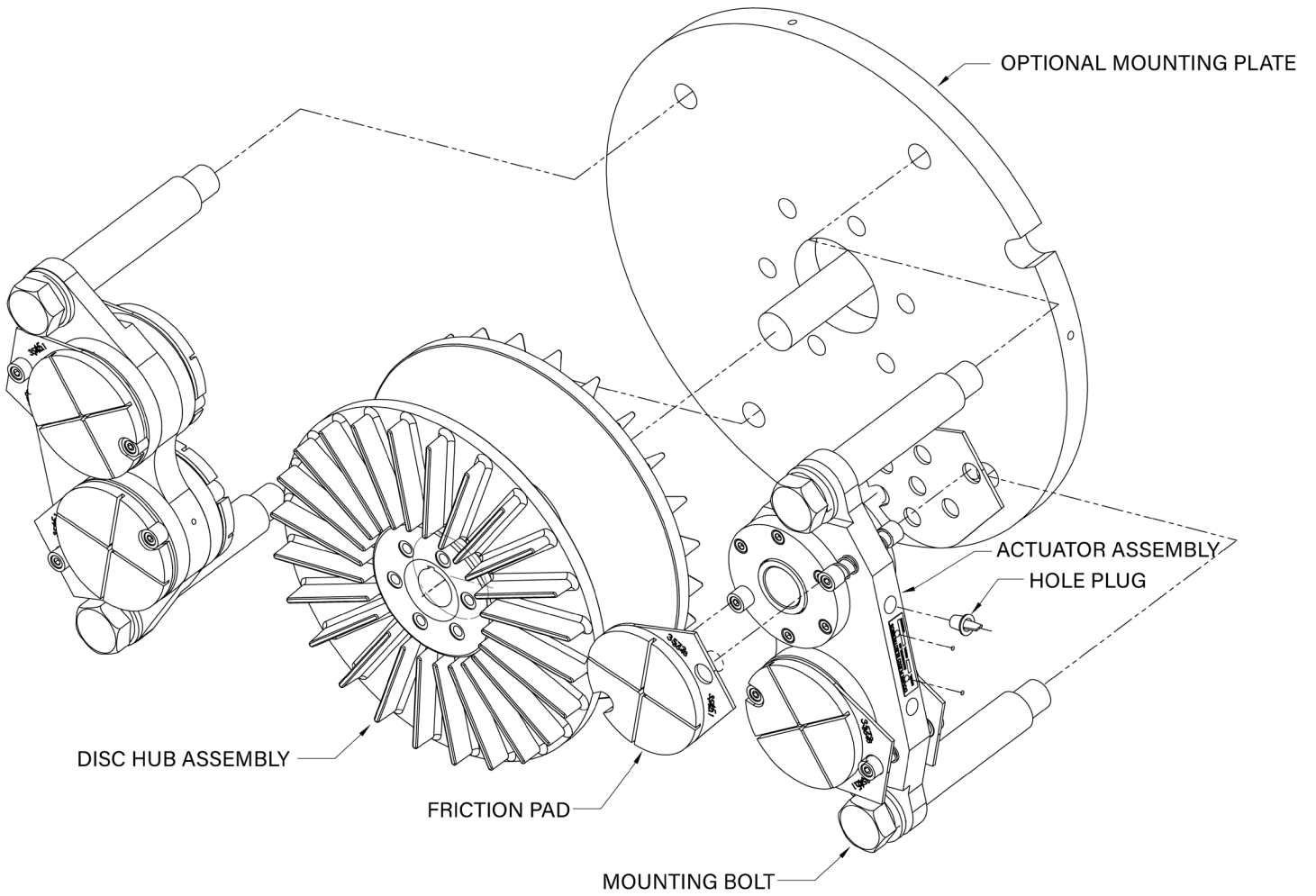


2.3 60 SERIES BRAKE ASSEMBLY



2.4 90 SERIES BRAKE ASSEMBLY

(110 thru 1800 series similar)



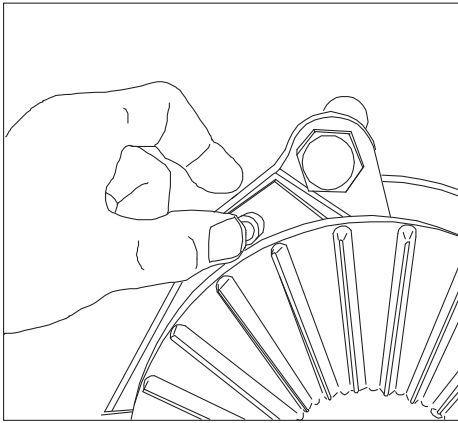
3 CARE AND MAINTENANCE

Dover Flexo Pneumatic Dual Disc Brakes are manufactured with quality materials. With proper application and installation your brake will require little maintenance beyond replacement of worn brake pads. Piston diaphragms are the second most common replacement part. The replacement intervals for piston diaphragms are difficult to predict because operating temperatures and air pressures are different for each application. To maximize the service life of piston diaphragms, use an air regulator to limit max air pressure sent to the brake to 75 psi and make sure that the brake does not operate beyond max HP specifications or below recommended cooling speeds.

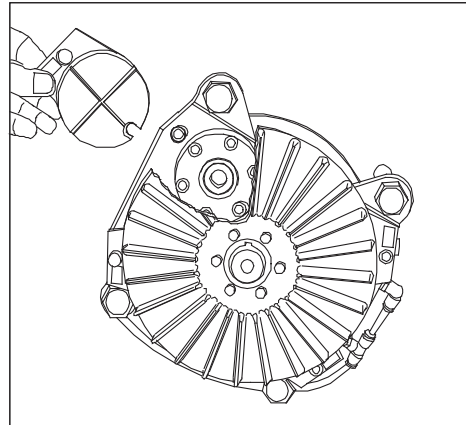
3.1 GENERAL CARE

1. Keep brake disc and friction pad surfaces clean and contaminant free from liquids, solids or powders.
2. Ensure that mounting bolts and other fasteners do not become loose over time.

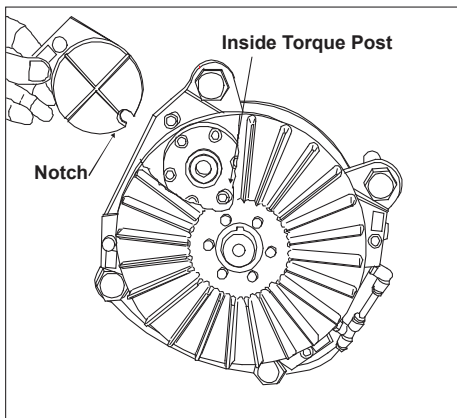
3.2 BRAKE PAD REPLACEMENT



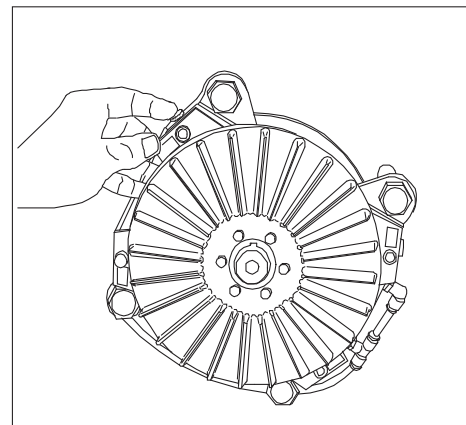
1. Slide the torque post within the friction pad you want to change.



2. Pull the friction pad out.



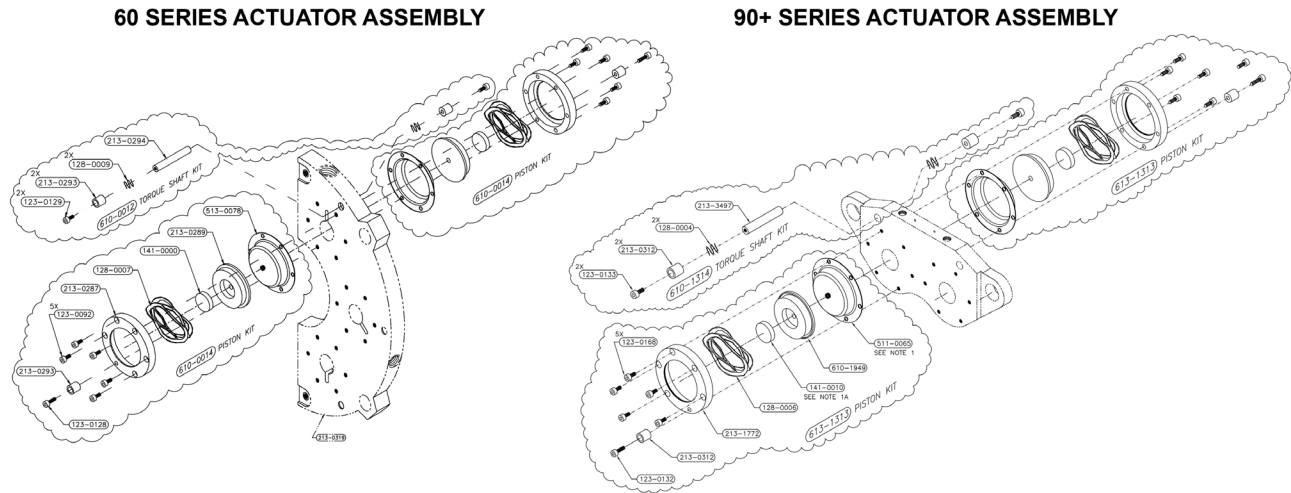
3. Insert the new friction pad into place.



4. Older brakes may have buttons to depress to slide and hold the torque shafts, allowing removal and replacement of pads as shown above. After inserting the pad you will need to press the release button to make the torque post snap back through the pad's backing hole.

4 REPLACEMENT PARTS & ACCESSORIES

4.1 REPLACEMENT PARTS



Actuator Assemblies

May be used as replacement parts or to increase torque as add-ons, space provided. Specify friction pads and mounting bolt kits separately. Note: Addition of a second actuator to a 60 Series brake requires Strap Kit 610-0018.

	60 SERIES	90 – 1800 SERIES
1 Cylinder	613-0188	613-0007
2 Cylinders	613-0190	613-0005
3 Cylinders	613-0192	N/A

Cylinder Kits

A Cylinder kit includes (2) Piston kits and (1) Torque Shaft kit. Friction pads and mounting bolts are not included.

60 SERIES	90 – 1800 SERIES
613-1305	613-1317

Torque Shaft Kit

Included with each Cylinder kit but can also be purchased separately as needed.

60 SERIES	90 – 1800 SERIES
610-0012	610-1314

Piston Diaphragms

1 required per piston / 2 required per cylinder assembly.

60 SERIES	90 – 1800 SERIES
513-0078	511-0065

Mounting Kits

Used to mount brakes to a mounting plate or machine surface. Kits contain bolts, washers and spacers.

	60 SERIES	90 – 130 SERIES	1800 SERIES
Inch	610-3610	610-3612	610-3625
Metric	610-3632	610-3630	610-3645

Standard Friction Pads

Available in two coefficients. #4 (0.45) is standard on DFE brakes.

COEFFICIENT	60 SERIES	90 – 1800 SERIES
#1 (0.10)	613-3544	613-3543
#4 (0.45)	613-3574	613-3573

Silencer™ Friction Pads

Successful at eliminating brake squeal. Available in two coefficients. #4 (0.45) is standard on DFE brakes.

COEFFICIENT	60 SERIES	90 – 1800 SERIES
#1 (0.10)	610-3741	610-3250
#4 (0.45)	610-3009	610-3433

4.2 ACCESSORIES

External Shut-off Valve Assemblies

Controls the air supply for actuators.

NUMBER of VALVES	PART NUMBER
One - Valve Assembly	613-0238
Two - Valve Assembly	613-0240
Three - Valve Assembly	613-0242
Four - Valve Assembly	613-0244
Replacement Slider Valve	119-0007

Guard Assemblies

Safety device to prevent people or objects from touching brake when in use.

SERIES	MODELS	PART NUMBER
60	ALL	613-1311
90	ALL	613-1346
110	No Adapters	613-1316
	with Adapters	613-1347
130	No Adapters	613-1347
	With Adapters	613-1349
1800	ALL	613-1349

Guard Mounting Blocks

Right angle block with 0.344 inch through hole to machine frame. Allows installation of the guard if a mounting plate is not used. All brake series require 4 per unit.

ALL SERIES	213-0310
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Mounting Adapter Assemblies

A plate with short bolts that connect adjacent actuator assemblies. Reduces the quantity of mounting bolts needed and provides an optional mounting bolt pattern. Mounting bolts not included.

MODEL	PART NUMBER
110 Series - 115 & 116 only	613-1318
130 Series - 135 & 138 only	613-1191
1800 Series - Standard	613-1193

Mounting Plates

Flat plate for mounting the brake and guard if used.

SERIES	MODELS	PART NUMBER
60	ALL	213-0305
90	ALL	213-1364
110	No Adapters	213-1365
	with Adapters	213-1366
130	No Adapters	213-1366
	With Adapters	213-1367
1800	ALL	213-1367

TERMS AND CONDITIONS OF SALE AND SHIPMENT

1. THE COMPANY

Dover Flexo Electronics, Inc. is hereinafter referred to as the Company.

2. CONFLICTING OR MODIFYING TERMS

No modification of, additions to or conflicting provisions to these terms and conditions of sale and shipment, whether oral or written, incorporated into Buyer's order or other communications are binding upon the Company unless specifically agreed to by the Company in writing and signed by an officer of the Company. Failure of the Company to object to such additions, conflicts or modifications shall not be construed as a waiver of these terms and conditions nor an acceptance of any such provisions.

3. GOVERNING LAW

This contract shall be governed by and construed according to the laws of the state of New Hampshire, U.S.A. The parties agree that any and all legal proceedings pursuant to this contract shall take place under the jurisdiction of the courts of the State of New Hampshire in the judicial district of Strafford County.

4. PENALTY CLAUSES

Penalty clauses of any kind contained in orders, agreements or any other type of communication are not binding on the Company unless agreed to by an officer of the Company in writing.

5. WARRANTY

Dover Flexo Electronics, Inc. warrants, to the original Buyer, its' products to be free of defects in material and workmanship for five years from date of original shipment. Repairs on products are warranted for 90 days from date of shipment. During the warranty period the Company will repair or replace defective products free of charge if such products are returned with all shipping charges prepaid and if, upon examination, the product is shown to be defective. This warranty shall not apply to products damaged by abuse, neglect, accident, modification, alteration or mis-use. Normal wear is not warrantied. All repairs and replacements under the provisions of this warranty shall be made at Dover Flexo Electronics or at an authorized repair facility. The Company shall not be liable for expenses incurred to repair or replace defective products at any other location or by unauthorized persons or agents. This warranty contains all of the obligations and warranties of the Company. There are no other warranties, either expressed or implied. No warranty is given regarding merchantability or suitability for any particular purpose. The Company shall not be liable in either equity or law for consequential damages, losses or expenses incurred by use of or inability to use its' products or for claims arising from same. No warranty is given for products of other manufacturers even though the Company may provide these products with its' own or by themselves. The provisions of this warranty cannot be changed in any way by any agent or employee of the Company. Notice of defects must be received within the warranty period or the warranty is void. The warranty is void if the serial number tag is missing or not readable.

6. PAYMENTS

Standard terms of credit are net 30 days from date of shipment, providing satisfactory credit is established with the Company. Amounts past due are subject to a service charge of 1.5% per month or portion thereof or 18% per annum. The Company reserves the right to submit any unpaid late invoices to a third party for collection and Buyer shall pay all reasonable costs of such collection in addition to the invoice amount. All quoted prices and payments shall be in U.S. Dollars. If the Company judges that the financial condition or payment practices of the Buyer does not justify shipment under the standard terms or the terms originally specified, the Company may require full or partial payment in advance or upon delivery. The Company reserves the right to make collection on any terms approved in writing by the Company's Finance Department. Each shipment shall be considered a separate and independent transaction and payment therefore shall be made accordingly. If the work covered by the purchase order is delayed by the Buyer, upon demand by Company payments shall be made on the purchase price based upon percentage of completion.

7. TAXES

Any tax, duty, custom, fee or any other charge of any nature whatsoever imposed by any governmental authority on or measured by any transaction between the Company and the Buyer shall be paid by the Buyer in addition to the prices quoted or invoiced.

8. RETURNS

Written authorization (MRA) must be obtained from the Company's factory before returning any material for which the original Buyer expects credit, exchange, or repairs. Material returned for credit must be unused, received back within 30 days of original ship date and shall be subject to a re-stocking charge of 15%. Special Product Requests (SPRs), product manufactured specially to customer specifications, and non-DFE product purchased on customer behalf shall not be returnable for any reason. All material returned, for whatever reason, shall be sent with all freight charges prepaid by the Buyer.

9. SHIPPING METHOD AND CHARGES

All prices quoted are EXW the Company's factory. The Company shall select the freight carrier, method and routing. Shipping charges are prepaid and added to the invoice of Buyers with approved credit, however the Company reserves the right to ship freight-collect if it prefers. Shipping charges will include a charge for packaging. Company will pay standard ground freight charges for items being returned to Buyer which are repaired or replaced under the Warranty. Claims of items missing from a shipment must be received, in writing, within 30 days of original shipment.

10. CANCELLATION, CHANGES, RESCHEDULING

Special Product Requests (SPRs), product manufactured specially to customer specifications, and non-DFE product purchased on customer behalf shall not be returnable for any reason. Buyer will be subject to a 15% fee for any standard item on order with the Company which is cancelled by the Buyer. A one-time hold on any item ordered from the Company shall be allowed for a maximum of 30 days. After 30 days, or upon notice of a second hold, Company shall have the right to cancel the order and issue the appropriate cancellation charges which shall be paid by Buyer. Items held for the Buyer shall be at the risk and expense of the Buyer unless otherwise agreed upon in writing. Company reserves the right to dispose of cancelled material as it sees fit without any obligation to Buyer. If Buyer makes, or causes to make, any change to an order the Company reserves the right to change the price accordingly.

11. PRICES

Prices published in price lists, catalogs or elsewhere are subject to change without notice and without obligation. Written quoted prices are valid for thirty days only.

12. EXPORT SHIPMENTS

Payment for shipments to countries other than the U.S.A. and Canada or to authorized distributors shall be secured by cash in advance or an irrevocable credit instrument approved by an officer of the Company. An additional charge will apply to any letter of credit. There will also be an extra charge for packaging and documentation.

13. CONDITION OF EQUIPMENT

Buyer shall keep products in good repair and shall be responsible for same until the full purchase price has been paid.

14. OWNERSHIP

Products sold are to remain the property of the Company until full payment of the purchase price is made.

Rev.10 10/15/19



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