

GENERAL CONSTRUCTION

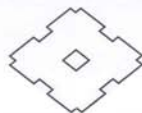


Fig. B-1 Single Reduction (Horizontal Foot Mount)

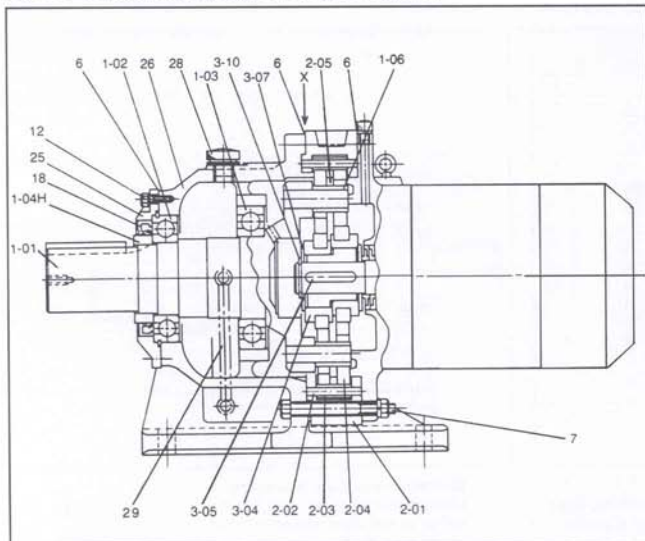
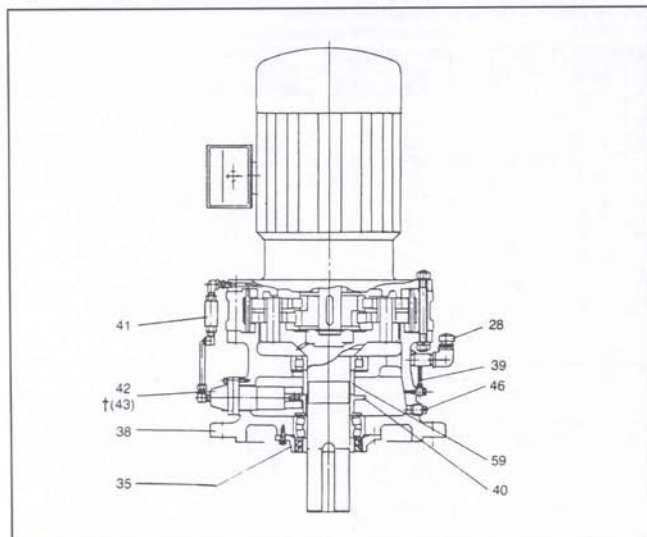


Fig. B-2 Single Reduction (Vertical Base Mount)



Note: For details of oil seals, bearings or gaskets, refer to pages B-10 and B-11.
 †Refer to Table B-13 on Pg. B-9 for units that require a positive displacement pump.

Table B-1 Main Parts

Part No.	Part Name
1-01	Slow Speed Shaft w/pins
1-02	Bearing A
1-03	Bearing B
1-04H	Oil Seal Collar—Horizontal
1-06	Slow Speed Shaft Rollers
2-01	Ring Gear Housing
2-02	Ring Gear Pins
2-03	Ring Gear Rollers
2-04	Cyclo Disc
2-05	Spacer Ring
3-04	Eccentric Bearing Assembly
3-05	Eccentric Key
**3-06	Balance Weight
3-07	Spacer
3-10	Retaining Ring
‡5-01	Intermediate Shaft w/Pins
‡5-02	Bearing F
‡5-03	Bearing G
‡5-04	Eccentric Bearing Assembly
6	Gasket Set
7	Casing Nuts & Bolts
12	Bolts For SS Oil Seal Housing
‡15	Grease Nipple
18	Slow Speed Output Oil Seal
25	Horizontal Oil Seal Housing
26	Horizontal Case
28	Oil Fill Plug
29	Oil Gauge—Horizontal Unit
35	Vertical Oil Seal Housing
38	Vertical Case (Integral V Type)
39	Oil Gauge—Vertical Unit
40	Cam
41	Piping Set & Oil Signal
42	Plunger Pump
†43	Positive Displacement Pump
46	Drain Plug
‡55	Intermediate Cover
‡57	Eye Bolt
*59	Spacer

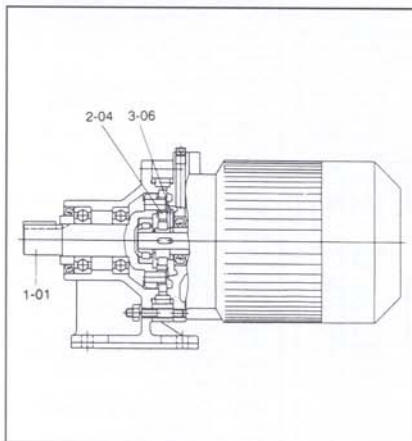
* Pt. No. 59 — frame sizes 6205-6275 only.

** See Fig. B-3, Page B-4.

‡ See Fig. B-4, Page B-4.

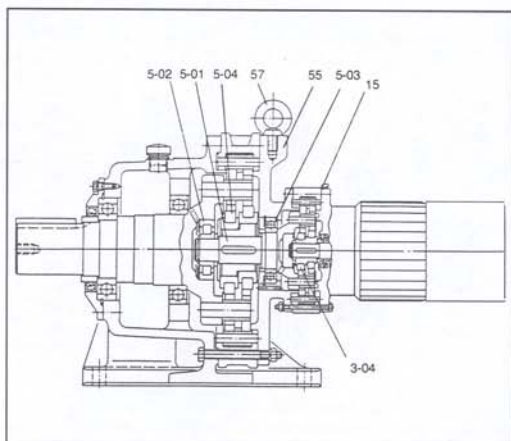
GENERAL CONSTRUCTION

Fig. B-3 Gearmotor/Single Disc Type (Frame Size 6060-6095)



Speed Reducer — Single Disc
SM-CYCLO single reduction, Models No. 6060-6095 employ the use of a single planetary gear (Cycloid Disc) and a balance weight.

Fig. B-4 Gearmotor/Double Reduction



Multiple Reduction Reducers
Multiple reduction SM-CYCLO Reducers are a combination of standard reduction mechanism assemblies connected using an intermediate shaft (Part No. 5-01) and intermediate cover (Part No. 55) between them.

Table B-2. Frame Sizes and Ratio Combination of Double Reduction Models

Frame Size Combination

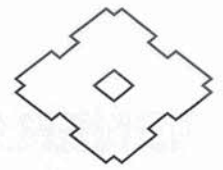
Frame Size	Second Stage	First Stage
6060DA	6060	6060
6065DA	6065	6065
6070DA	6070	6065
6075DA	6075	6065
6090DA	6090	6075
6095DA	6095	6075
6100DA	6100	6075
6105DA	6105	6075
6120DA	6120	6075
6120DB	6120	6095
6125DA	6125	6075
6125DB	6125	6095
6130DA	6130	6075
6130DB	6130	6095
6130DC	6130	6105
6135DA	6135	6075
6135DB	6135	6095
6135DC	6135	6105
6140DA	6140	6075
6140DB	6140	6095
6140DC	6140	6105
6145DA	6145	6075
6145DB	6145	6095
6145DC	6145	6105
6160DA	6160	6095
6160DB	6160	6105
6160DC	6160	6125
6165DA	6165	6095
6165DB	6165	6105

Frame Size	Second Stage	First Stage
6165DC	6165	6125
6170DA	6170	6095
6170DB	6170	6105
6170DC	6170	6125
6175DA	6175	6095
6175DB	6175	6105
6175DC	6175	6125
6180DA	6180	6105
6180DB	6180	6135
6185DA	6185	6105
6185DB	6185	6135
6190DA	6190	6125
6190DB	6190	6135
6195DA	6195	6125
6195DB	6195	6135
6205DA	6205	6125
6205DB	6205	6135
6215DA	6215	6135
6215DB	6215	6165
6225DA	6225	6135
6225DB	6225	6175
6235DA	6235	6165
6235DB	6235	6185
6245DA	6245	6165
6245DB	6245	6185
6255DA	6255	6175
6255DB	6255	6195
6265DA	6265	6195
6275DA	6275	6195

Reduction Ratio Combination

Total Ratio	Second Stage Ratio	First Stage Ratio
104	13	8
121	11	11
143	13	11
165	15	11
195	15	13
231	21	11
273	21	13
319	29	11
377	29	13
473	43	11
559	43	13
649	59	11
731	43	17
841	29	29
1003	59	17
1247	43	29
1479	87	17
1849	43	43
2065	59	35
2537	59	43
3045	87	35
3481	59	59
4437	87	51
5133 ^[1]	87	59
6177	87	71
7569	87	87

Note: [1] For frame sizes 6205DA, DB or DC - 6265DA, DB or DC, second stage ratio is 59 and first stage ratio is 87.



GENERAL CONSTRUCTION OF MOTOR

Fig. B-12 Motor construction

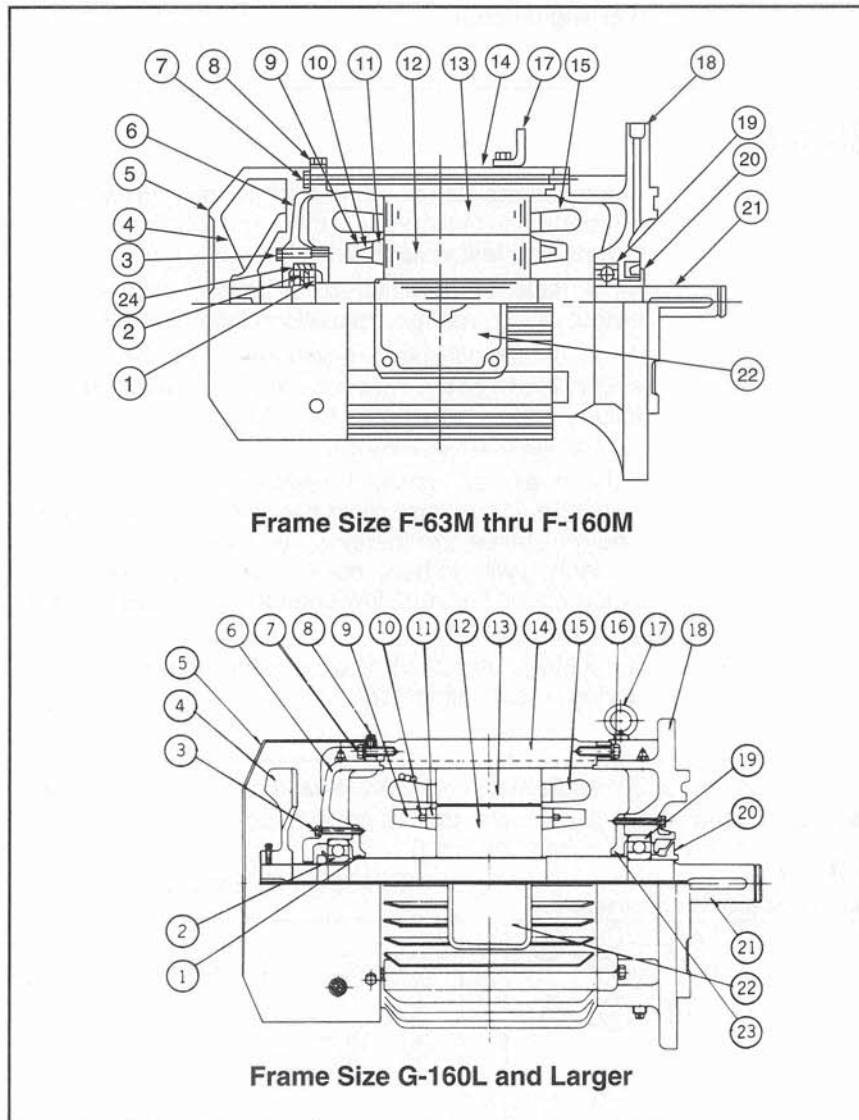


Table B-25. Main Parts
Part No. Part Name

1	Bearing Cover**
2	Bearing
3	Bolt**
4	Fan*
5	Fan Cover
6	End Bracket
7	Bolt
8	Bolt
9	Internal Fan
10	Hub
11	Short Circuit Ring
12	Rotor Core
13	Stationary Core
14	Stator Frame
15	Stator Winding
16	Bolt
17	Eye Bolt
18	Cyclo Flange Bracket
19	Bearing
20	Slinger/Oil Seal
21	Motor Shaft
22	Conduit Box
23	Bearing Cover
24	Bearing Sleeve

*No Fan 1/8 H.P., F-63S frame.

**No bearing cover and bolt for frame sizes F-63S ~ F-132S.

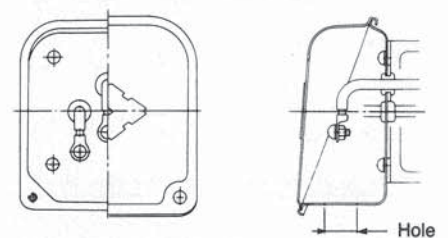


Fig. B-13 Conduit Box-Standard Type

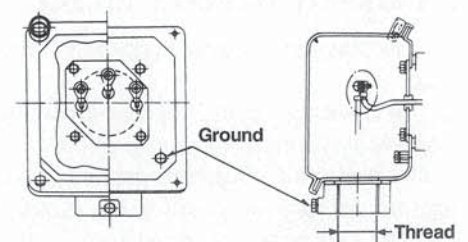


Fig. B-14 Weather-Proof Type

FB MODELS – CONSTRUCTION, OPERATION & MAINTENANCE

Models FB-1B, -2B, -3B

Construction

Fig. C-4 illustrates the construction of the brake. The restraining bolt (7) fastens the brake shoe (15), gap adjusting sleeves (5) and spacer (4) onto the stationary core (1). The armature plate (16) is kept from rotation by the restraining bolt (7), but moves axially by electromagnetic attraction and the tension of the pressure spring (17). The brake lining (8) is fitted to the hub (10), which is secured to the motor shaft with a key. The solenoid coil (18) is energized via a rectifier provided within the terminal box.

Table C-5. FB-1B, -2B, -3B Parts

No.	Part Name	No.	Part Name
1	Stationary Core*	11	Retaining Ring
2	Brake Release Support	12	Fan Cover
3	Shifting Pin	13	Fan Set Pin
4	Spacer*	14	Fan
5	GAP Adjusting Sleeve*	15	Brake Shoe*
6	Brake Release Lever	16	Armature*
7	Restraining Bolt*	17	Pressure Spring*
8	Brake Lining*	18	Solenoid Coil*
9	Leaf Spring*	19	Fan Side Bearing
10	Hub*	20	Motor Shaft

*These parts are included in a complete brake kit.

Operating Principles

The brake is a (fail safe type) spring actuated type brake that will release the brake mechanism when the solenoid coil is energized and engage when the coil is de-energized.

When power is applied to the unit, the solenoid coil and the electric motor will energize, and the energized coil attracts the armature plate (16) against the tension of the pressure spring (17). As a result, the brake lining (8) will disengage and the motor begins to run.

When the power is disconnected, the solenoid coil and the electric motor is de-energized. This causes the pressure spring (17) to actuate the armature plate (16), which in turn presses the brake lining (8) against the brake shoe (15) and brings the motor to a quick stop.

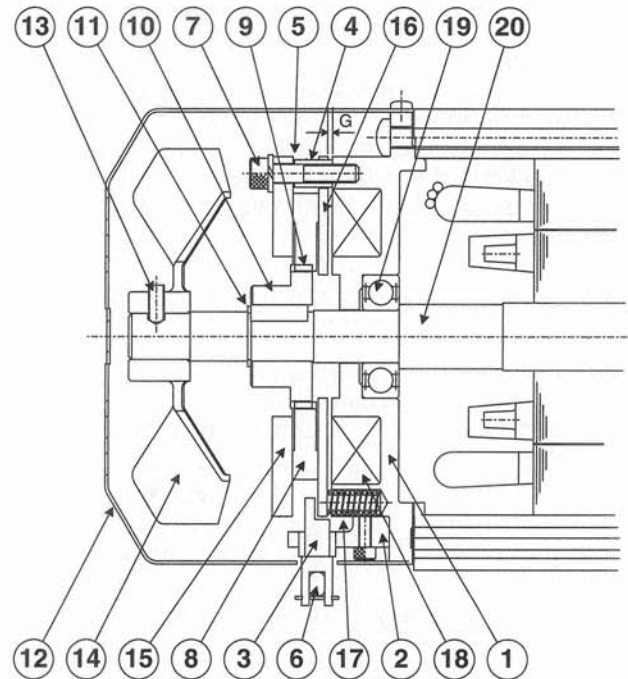


Fig. C-4 FB-1B, -2B, -3B Models

Inspection, Adjustment and Maintenance

Inspection

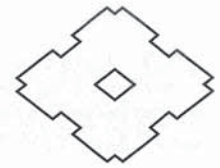
Check the following points at regular intervals:

- The unit is operating normally.
- The brake lining is not worn excessively (or gap G is normal).
- No screws in the unit are loose.

Manual brake release procedure

To manually release the brake with power to the unit off, use the brake release mechanism as follows:

FB-1B, -2B, and -3B brakemotors are equipped with a one-touch release mechanism. To disengage brake, pull out the brake release lever from its holder and push it forward toward the reducer. Releasing the lever will re-engage the brake.



Models FB-1B, -2B, -3B (cont.)

Gap inspection and adjustment

The brake lining will wear after the unit has been used for a long period of time. It is necessary to check the brake for gap G from time to time (Fig. C-4). Should gap G become too large, the solenoid coil may fail to pull in the armature plate and hence cannot release the brake, resulting in the unit remaining in a continuously braked condition.

Gap Inspection Procedure

1. Remove fan cover (12).
2. Insert a gap gage into the gap between stationary core (1) and armature plate (16), and measure the size of the gap. Adjustment is needed if the measured value is close to the allowable limit shown in Table C-6. Gap measurement should be made at three appropriate circumferential points.

Table C-6. Brake Gap Size

Brake Type	Gap value G (in)	
	Spec. value	Allowable limit
FB-1B	0.008 ~ 0.012	0.020
FB-2B	0.008 ~ 0.012	0.020
FB-3B	0.008 ~ 0.012	0.028

Gap Adjustment Procedure

If the brake lining is so heavily worn that gap adjustment is necessary, proceed as follows:

1. Remove fan cover (12). Measure the gap size to confirm the deviation from the specified value. The minimum adjustable setting is no less than the thickness of the GAP adjusting sleeve, 0.008 in.
2. Loosen set pin (13) and remove fan (14).
3. Slightly loosen restraining bolt (7), remove parts (4), (5), (7), and (15) as a set. Be careful not to remove only bolt (7) and loose sleeves (5).
4. The thickness of one gap adjusting sleeve (5) is 0.008 in. Decrease the number of the sleeves in use according to the degree of the wear. Reassemble parts (4), (5), (7), and (15) as a set.
5. After reassembly, check gap G. If the gap size is still too large, adjust the number of the sleeves again.
6. After completion of gap adjustment, check for brake performance by turning system power on and off a few times.
7. Replace fan (14), set pin (13) and cover (12).

Brake lining replacement

When the brake lining has been worn to such a degree that its thickness has reached the allowable limit shown in Table C-7, or when sleeve adjustment is no longer an effective means of gap adjustment, replace the brake lining with a new one as follows:

1. Remove fan cover (12), measure gap G. Remove set pin (13) and fan (14).
2. Slightly loosen restraining bolt (7), then remove parts (4), (5), (7), and (15) as a set.
3. Take out brake lining (8) and measure its thickness. During removal of the lining, take care to prevent leaf spring (9) from coming off.
4. Install the new brake lining. Then, check to ensure that the lining moves along the hub (10) smoothly. Take care to ensure that the leaf spring (9) is not damaged or removed during the installation of the lining.
5. Replace the gap adjusting sleeves removed during gap adjustment. Then, reinstall parts (4), (5), (7), (15) as a set.
6. Measure gap G. Readjust if gap is out of the specification value.
7. Check for brake performance by turning system power on and off a few times. If no abnormalities are detected, replace fan (14), set pin (13) and cover (12).

Table C-7. Brake Lining Size

Brake Type	Brake lining dimension	Initial thickness t_0 (in)	Allowable thickness limit t_0 (in)
FB-1B		0.276	0.236
FB-2B		0.322	0.283
FB-3B		0.354	0.315

FB MODELS – CONSTRUCTION, OPERATION & MAINTENANCE

Models FB-5B, -8B, -10B, -15B

Construction

Fig. C-5 and Fig. C-6 illustrate the construction of the brake. Among the brake parts, stationary core (1), solenoid coil (18), and stud bolt (3) constitute an integral sub-assembly unit. The armature plate (16) is kept from rotating by the stud bolt (3), but moves axially by electromagnetic attraction and the tension of the pressure spring (17). The adjusting washer (4) and spring washer (7) hold the brake shoe (15) against the nut (8) at all times. The brake lining (9) is fit to the hub (10), which is secured to the motor shaft with a key. The solenoid coil is energized via a rectifier provided within the terminal box.

Table C-8. FB-5B, -8B, -10B, -15B Parts

No.	Part Name	No.	Part Name
1	Stationary Core*	12	Fan Cover
2	Brake Release Support	13	Fan Set Screw or Pin
3	Stud Bolt*	14	Fan
4	GAP Adjusting Washer*	15	Brake Shoe*
5	Shifting Pin	16	Armature Plate*
6	Brake Release Lever	17	Pressure Spring*
7	Spring Washer*	18	Solenoid Coil*
8	Nut*	19	Fan Side Bearing
9	Brake Lining*	20	Motor Shaft
10	Hub*	21	Bearing Cover
11	Retaining Ring	22	Leaf Spring*

*These parts are included in a complete brake kit.

Operating Principles

The brake is a (fail safe type) spring actuated type brake that will release the brake mechanism when the solenoid coil is energized and engage when the coil is de-energized.

When power is applied to the unit, the solenoid coil and the electric motor will energize, and the energized coil attracts the armature plate (16) against the tension of the pressure spring (17). As a result, the brake lining (9) will disengage and the motor begins to run.

When the power is disconnected, the solenoid coil and the electric motor is de-energized. This causes the pressure spring (17) to actuate the armature plate (16), which in turn presses the brake lining (9) against the brake shoe (15) and brings the motor to a quick stop.

Inspection, Adjustment and Maintenance

Inspection

Check the following points at regular intervals:

1. The unit is operating normally.
2. The brake lining is not worn excessively (or gap G is normal).
3. All the mounting screws are securely tightened.

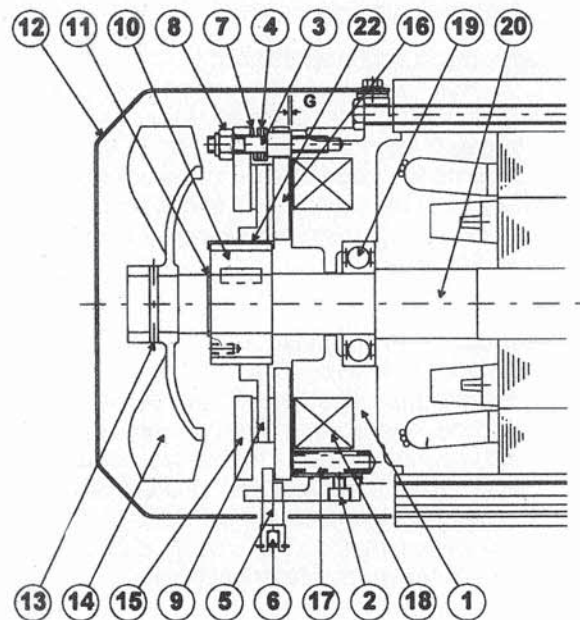


Fig. C-5 FB-5B, FB-8B Models

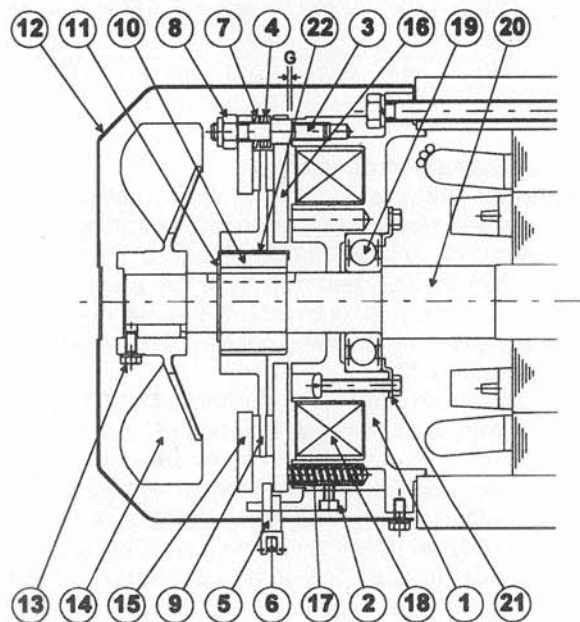


Fig. C-6 FB-10B, FB-15B Models

Manual brake release procedure

To manually release the brake with power to the unit off, use the brake release mechanism as follows:

FB-5B, -8B, -10B, and -15B brakemotors are equipped with a one-touch release mechanism. To disengage brake, pull out the brake release lever from its holder and push it forward toward the reducer. Releasing the lever will re-engage the brake.