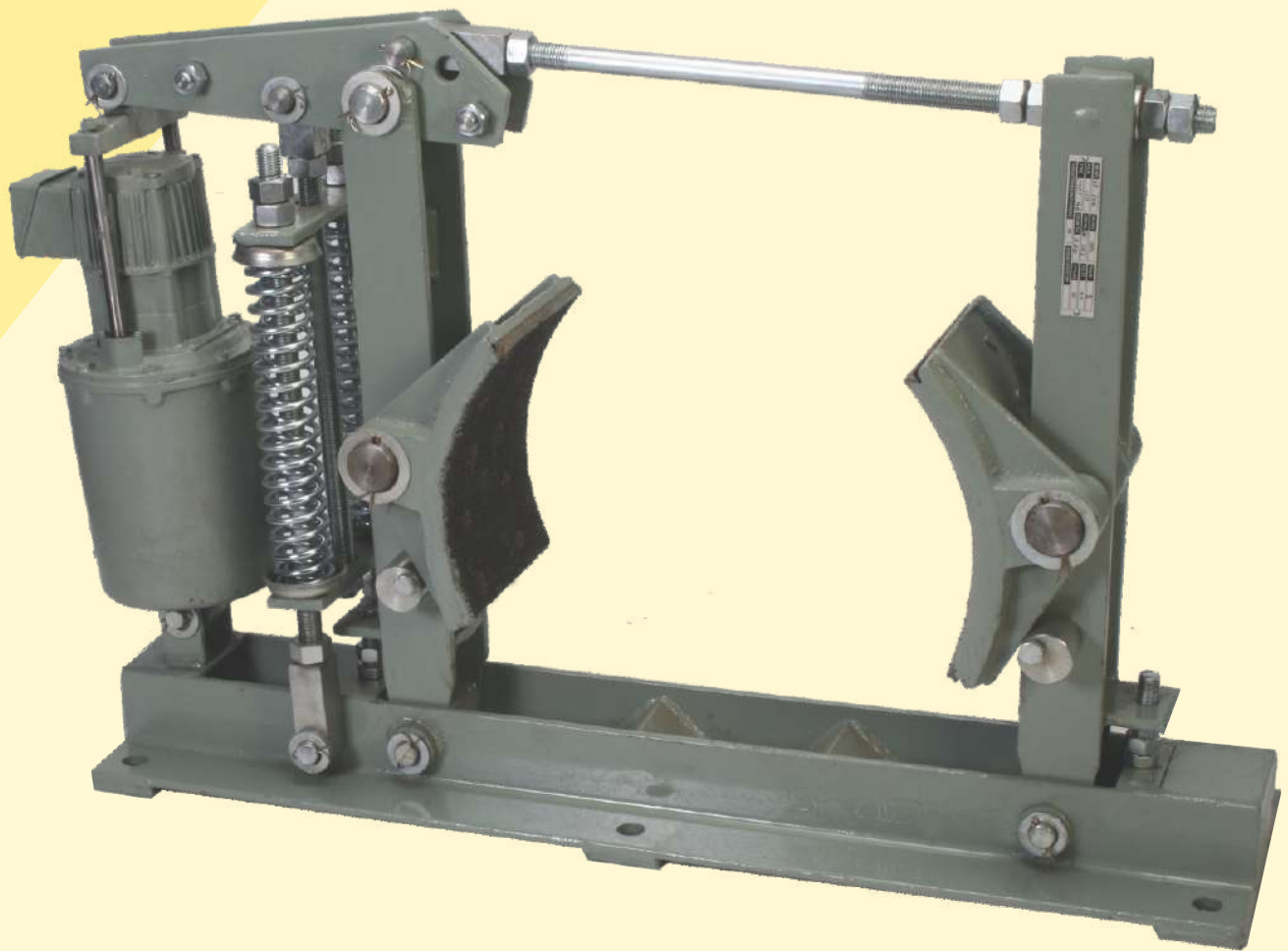


MILL DUTY THRUSTER BRAKES



ELECTRO HYDRAULIC
Thruster ST 515/520



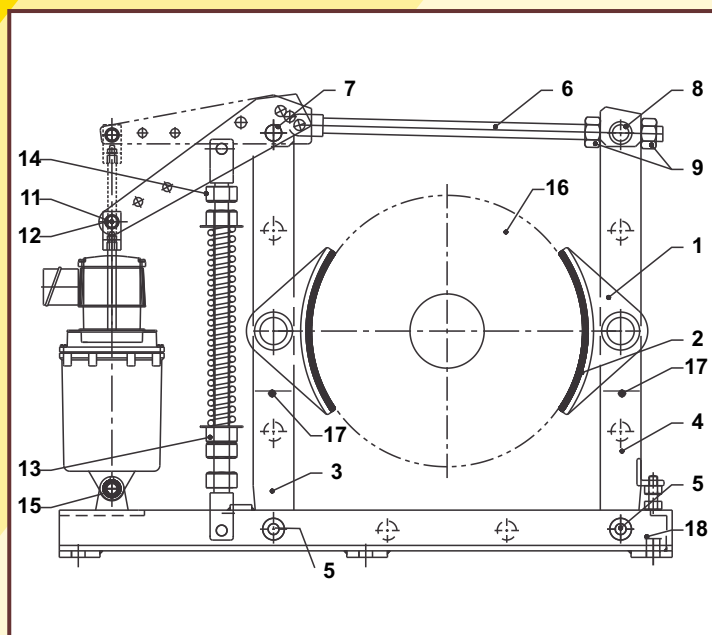
ELECTRO HYDRAULIC
Thruster ST 535

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CRANE CONTROL GEAR V2



INTRODUCTION

Thruster brake is a device to retard the speed of moving machinery and to stop it accurately to the desired position. The braking force is applied to the brake shoes by a pre-stressed compression spring. The shoe press on the rotating brake drum retarding its speed and finally stopping it. Other release device like pneumatics /hydraulic cylinder or manual release arrangements can be offered on request.

CONSTRUCTION AND OPERATION

A thruster shoe brake has a pair of shoes **1** which are lined up with friction pads **2** the shoes are hinged on main arm **3** and side arm **4** of the brake, each of them have hinge pin **5** fitted in the base. Both arms are connected to each other on top by a tie rod **6**. A hinge **7** in the main arm and the swivel block **8** lock nut **9** in the side arm, and the other end is fixed on top clevis **11** of the thruster by a hinge pin **12**. A brake spring **13**, is fixed on the main arm and is pre - loaded by a locknut **14** on the lever. The pre-tension in this spring decides the braking torque. The thruster is fitted on the base by a hinge pin. When the thruster is not energized, the brake shoes are pressed on the brake drum **16** fitted on the drive motor shaft and is braked under the effect of braking force provided by spring. In such condition, the brake is applied, and the drum cannot rotate. When the thruster motor is energized, the lifting force provided by thruster lifts up the crank lever causing the arms and the shoe to move away and the brake is released. The spring is compressed and braking energy is stored for the next cycle.

INSTALLING BRAKE IN POSITION

To insert the brake in position, the brake shoes are to be taken apart to clear the drum diameter. To do this, slacken the spring settling nut **14** and the tie-rod nut **9** in the side arm and pull it slightly. This increase the distance between the brake shoes. Insert the brake on the foundation bolts. Adjust shoes by setting screws **17** and position them on brake drum. Re-tighten the setting bolt **9** and the tie-rod nut. Tighten the foundation bolt **18**.

INSTALLING THRUSTER ON BRAKE

The thruster tank is to be filled with sufficient quantity of oil as mentioned in the Thruster dimension Table. To mount the thruster on the brake, remove one side splits pins on the thruster hinge pins **15** in the base frame of brake and lever **12**. Remove both pins and re-insert them after positioning the thruster on the pin holes in the base and the lever of the base. Replace both split pins. Check that the thruster movement is unobstructed when the crane lever is pulled manually and the thrust rod of the thruster is free to move. Open the terminal box cover of the thruster and connect power supply cables to the three terminals on the terminal plate inside the terminal box. Terminate the earthing lead on the earth terminal plate inside the terminal provided on the thruster or brake. Replace the terminal box cover on the terminal box. The thruster is ready for operation.

ALIGNING AND SETTING OF BRAKE

Next, align the brake shoes with the diameter and the surface of the brake drum and adjust the lock nuts **9** on the tie-rod such that shoes grip the brake drum equally. Energize the power cables, this will cause the thrust rod of the thruster to move up and the shoes release the brake drum. Adjust the gap between the drum and shoes to 0.3 to 0.5mm (with feeler gauge) equally by adjusting the setting bolts **17** on both arms. For equal and uniform liner wear it is necessary that the shoes and the arms move equally. Ensure the brake drum is free to rotate when the brake is released.

ADJUSTING BRAKING TORQUE

To adjust the braking torque to the desired value, the pre-loading of the compression spring **13** is to be done by top nuts **14** on the spring tie rod. To increase torque, turn nut clockwise. For most applications, braking torque of about 150 to 250% of rated torque of the drive motor is sufficient.

TECHNICAL DATA

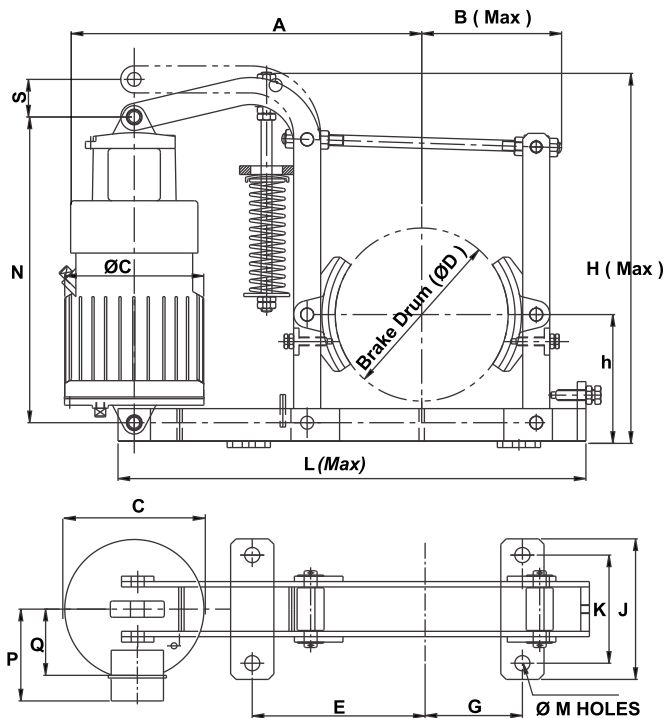
| | |
|-----------------------|---------------------------------|
| POWDER COATING | Colour RAL 7021 |
| OPTIONAL | |
| LAF | Asbestos Free Liner |
| LWI | Lining Wear Indicator |
| OL | Open Brake Limit Switch |
| MS | Manual Opening & Locking System |

MILL DUTY THRUSTER BRAKES



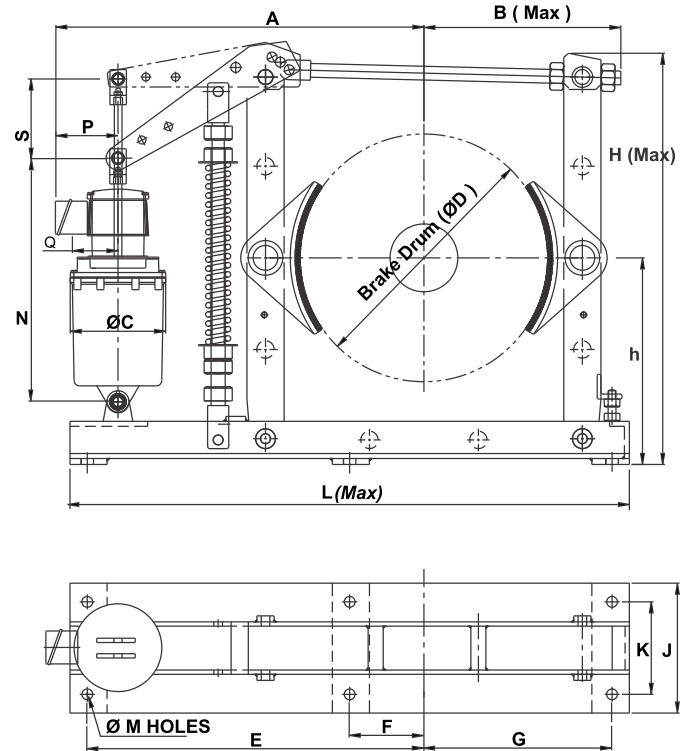
Thruster Brake MDT

(Drum Diameter 100 to 250 mm.)



Thruster Brake MDT

(Drum Diameter 300 to 600 mm.)



TECHNICAL DATA :

| Brake Model | Brake Drum Dia. mm | Brake Torque | | Thruster Details | | | | C | N | P | Q | Mass kg. | | | | | | | | |
|----------------|-----------------------|--------------|-----|------------------|--------------|--------------|---------------|-----|-----|-----|----|----------|----|----|--|--|--|--|--|----|
| | | kg-m | N-m | Model | Force kg. | Force (N) | Stroke (s) | | | | | | | | | | | | | |
| MDT - 100 - 15 | 100 | 5 | 50 | ST 515 | 15 | 150 | 51 | 135 | 280 | 105 | 85 | 14 | | | | | | | | |
| MDT - 150 - 15 | 150 | 7.5 | 75 | | | | | | | | | 17 | | | | | | | | |
| MDT - 160 - 15 | 160 | | | | | | | | | | | | | | | | | | | |
| MDT - 100 - 18 | 100 | 6 | 60 | | | | | | | | | | | | | | | | | |
| MDT - 150 - 18 | 150 | 9 | 90 | ST 520 | 18 | 180 | 51 | 160 | 349 | 110 | 85 | 11 | | | | | | | | |
| MDT - 160 - 18 | 160 | | | | | | | | | | | | | 12 | | | | | | |
| MDT - 200 - 18 | 200 | 20 | 200 | | | | | | | | | | | | | | | | | 18 |
| MDT - 250 - 18 | 250 | 35 | 350 | | | | | | | | | | | | | | | | | 22 |
| MDT - 300 - 18 | 300 | 42 | 420 | | | | | | | | | | 30 | | | | | | | |

DIMENSIONS :

| Break Model | A | B | E | G | h | H | J | K | L | M | SHOE WIDTH |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|------------|
| MDT - 100 - 15 | 235 | 110 | 160 | 100 | 125 | 350 | 130 | 100 | 385 | 13 | 70 |
| MDT - 150 - 15 | 265 | 145 | | | | | | | 445 | | |
| MDT - 160 - 15 | | | | | | | | | 433 | | |
| MDT - 100 - 18 | 350 | 146 | 160 | 100 | 125 | 406 | 130 | 100 | 385 | 13 | 70 |
| MDT - 150 - 18 | 360 | 148 | | | | | | | 435 | | |
| MDT - 160 - 18 | | | | | | | | | | | |
| MDT - 200 - 18 | 450 | 215 | 360 | 170 | 200 | 508 | 160 | 125 | 580 | 14 | 88 |
| MDT - 250 - 18 | 480 | 240 | 320 | 170 | 225 | 563 | 160 | 120 | 635 | 18 | 108 |
| MDT - 300 - 18 | 525 | 270 | 480 | 250 | 275 | 548 | 205 | 145 | 780 | 20 | 140 |

TECHNICAL DATA :

| Brake Model | Brake Drum Dia. mm | Brake Torque | | Thruster Details | | | | C | N | P | Q | Mass kg. |
|---------------------|--------------------|--------------|------|------------------|-----------|-----------|------------|-----|-----|-----|-----|----------|
| | | kg-m | N-m | Model | Force kg. | Force (N) | Stroke (s) | | | | | |
| MDT - 200 - 34 - 46 | 200 | 32 | 320 | ST 535 | 34 | 340 | 51 | 174 | 444 | 112 | 110 | 27 |
| MDT - 250 - 34 - 46 | 250 | 42 | 420 | | | | | | | | | 30 |
| MDT - 300 - 34 - 46 | 300 | 62 | 620 | | | | | | | | | 70 |
| MDT - 400 - 34 | 400 | 90 | 900 | | | | | | | | | 85 |
| MDT - 400 - 46 | 400 | 110 | 1100 | ST 545 | 46 | 460 | 76 | 215 | 508 | 180 | 124 | 95 |
| MDT - 400 - 68 | 400 | 170 | 1700 | ST 870 | 68 | 680 | | | | | | 132 |
| MDT - 500 - 46 | 500 | 190 | 1900 | ST 545 | 46 | 460 | | | | | | 190 |
| MDT - 500 - 68 | 500 | 290 | 2900 | ST 870 | 68 | 680 | | | | | | |
| MDT - 500 - 114 | 500 | 485 | 4850 | ST 8110 | 114 | 1140 | 76 | 215 | 508 | 180 | 124 | |
| MDT - 600 - 68 | 600 | 350 | 3500 | ST 870 | 68 | 680 | | | | | | |
| MDT - 600 - 114 | 600 | 580 | 5800 | ST 8110 | 114 | 1140 | | | | | | |

DIMENSIONS :

| Brake Model | A | B | E | F | G | h | H | J | K | L | M | SHOE WIDTH |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|----|------------|
| MDT - 200 - 34 - 46 | 463 | 215 | 350 | - | 180 | 200 | 540 | 160 | 125 | 600 | 18 | 88 |
| MDT - 250 - 34 - 46 | 523 | 250 | 320 | - | 170 | 225 | 563 | 160 | 120 | 640 | | 108 |
| MDT - 300 - 34 - 46 | 542 | 285 | 480 | 100 | 250 | 275 | 600 | 205 | 145 | 780 | | 140 |
| MDT - 400 - 34 | 641 | 350 | 508 | 65 | 377 | 310 | 650 | 236 | 180 | 955 | 20 | 180 |
| MDT - 400 - 46 | | | | | | | | | | | | |
| MDT - 400 - 68 | | | | | | | | | | | | |
| MDT - 500 - 46 | 800 | 410 | 680 | 150 | 380 | 417 | 857 | 302 | 215 | 1130 | 25 | 200 |
| MDT - 500 - 68 | | | | | | | | | | | | |
| MDT - 500 - 114 | | | | | | | | | | | | |
| MDT - 600 - 68 | 688 | 215 | 765 | 150 | 485 | 475 | 970 | 322 | 235 | 1300 | | 240 |
| MDT - 600 - 114 | | | | | | | | | | | | |

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MILL DUTY THRUSTER BRAKES



SELECTION OF BRAKE SIZE

Electo-hydraulic thruster is a device which develops linear thrust (or force) required to operate the required mechanism. The input to the device is three phase supply.

The brake torque must be \Rightarrow than motor full load as referred with drum. Formula as below:

$$T = \text{Torque in Kgm} = \frac{716 \times \text{Hp}}{\text{rpm}}$$

$$T = \text{Torque in Nm} = \frac{9552 \times \text{Kw}}{\text{rpm}}$$

Where Hp/Kw = motor output & rpm = Rev/minute

ELECTRO HYDRAULIC THRUSTER - (ST)

Electro-hydraulic thruster is a device which develops linear thrust (or force) required to operate the required mechanism. The input to the device is three phase supply. The thrusters are widely used to actuate Thruster Shoe Brakes, commonly used in material handling machines. Thrusters in various models develop 15 kg to 295 kg. In stroke lengths of 51, 76 and 127 mm.

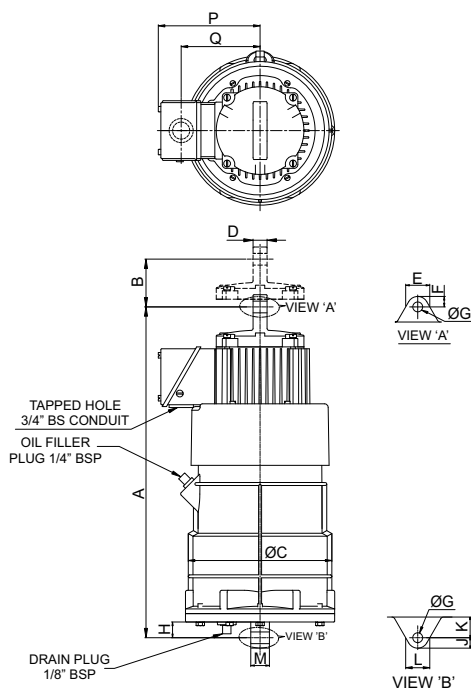
Rated supply : 400/440 V / 50 Hz / 3 - Phase.

(Thrusters or other voltages (up to 600 V) on request.)

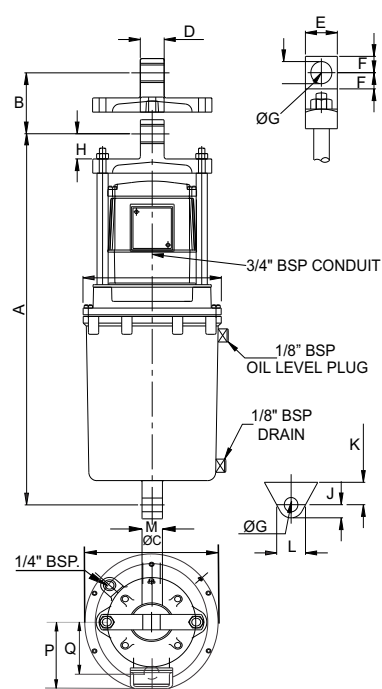
Thrusters should be mounted with in $\pm 10^\circ$ from vertical.

Working fluid - Transformer oil to BS 148.

THRUSTER ST-515 / ST 518 / ST 520



THRUSTER ST-535 ... ST-13300



| TYPE | THRUST kgs.(N) | STROKE MM. | WATTS | A | B | C | D | E | F | G | H | J | K | L | M | P | Q | Wt. (Kg.) | * OIL CAPACITY LITRES | | |
|----------|-------------------|---------------|-------|-----|-----|-----|----|----|----|------|----|------|----|----|----|-----|-----|--------------|-----------------------------|----|---|
| ST 515 | 15 (150) | 51 | 90 | 280 | 51 | 130 | 19 | 25 | 13 | 12.7 | 19 | 16 | 19 | 30 | 19 | 105 | 85 | 6 | 2 | | |
| ST 520 | 18 (180) | | | 349 | | 160 | | | | | | | | 32 | | 110 | 85 | 6 | 2 | | |
| ST 535 | 34 (340) | | 150 | 444 | | 174 | | 22 | 30 | 15 | | 19.7 | | 21 | 27 | 41 | 25 | 110 | 95 | 12 | 3 |
| ST 545 | 45 (450) | | 180 | | | | | | | | | | | | | | | | | | |
| ST 870 | 68 (680) | 76 | 200 | 508 | 76 | 215 | 25 | 32 | 16 | 22.2 | 40 | 24 | 29 | 48 | 32 | 110 | 85 | 34 | 5 | | |
| ST 8110 | 114 (1140) | | 250 | | | | | | | | | | | | | | | | | | |
| ST 13200 | 225 (2250) | 127 | 420 | 660 | 127 | 254 | 32 | 38 | 19 | 25.4 | 30 | 27 | 45 | 54 | 38 | 152 | 132 | 55 | 9.0 | | |
| ST 13300 | 295 (2950) | | 580 | | | | | | | | | | | | | | | | | | |

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