

Masterflex® B/T® pump 07585-30

OPERATING MANUAL:

B/T® RAPID-LOAD DIRECT DRIVE PERISTALTIC PUMP AND DRIVES

Model Numbers

07585-30

07585-35

07585-50

07585-55



Cole-Parmer Instrument Co.

1-800-MASTERFLEX (627-8373) (U.S. and Canada only)
11 (847) 549-7600 (Outside U.S.) • (847) 549-7600 (Local) • www.masterflex.com



**Barnant
Company**

Barnant Company

1-800-637-3739 (U.S. and Canada only)
11 (847) 381-7050 (Outside U.S.) • (847) 381-7050 (Local) • www.barnant.com



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SAFETY PRECAUTIONS

CAUTION: *This product is intended for use with a motor that has a maximum speed of 1725 rpm. Do not use a motor with a higher speed capacity.*



DANGER: *High voltages exist and are accessible in the Modular Drive. Use extreme caution when servicing internal components.*



WARNINGS: *Tubing breakage may result in fluid being sprayed from pump. Use appropriate measures to protect operator and equipment.*



To reduce risk of injury, power must be removed from pump before removing or installing tubing. Fingers or loose clothing could get caught in drive mechanism. Do not operate this pump without plastic protective cover assembly properly installed. Rotating parts can cause serious injury.

To reduce risk of injury, do not pump materials hotter than 150 degrees Fahrenheit, (65.5°C).

WARNING: *Risk of electric shock—this pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.*



WARNING: *Electrical connections and grounding (earthing) must conform to local wiring codes.*



WARNING: PRODUCT USE LIMITATION

This product is not designed for, nor intended for use in, patient-connected applications, including, but not limited to, medical and dental use, and, accordingly, has not been submitted for FDA approval. If drive is used in a manner not specified in this manual the protection provided by the equipment may be impaired.

INTRODUCTION

This manual provides information for installing, operating and servicing the following models of Masterflex® B/T® RAPID-LOAD® Direct-Drive Variable-Occlusion Peristaltic Pumps and Drives.

MODEL	TYPE
07585-30	Pump with variable speed washdown motor and NEMA 4 controller, 115V AC system.
07585-35	Pump with variable speed washdown motor and NEMA 4 controller, 230V AC system.
07585-50	Pump with 5:1 gear head to accommodate NEMA Type 56C frame motors (no motor, no controller).
07585-55	Pump with 5:1 gear head to accommodate an IEC-72, Frame number 71, flange number F130, foot mounted, 0.37 kW motor (71-14F130) (no motor, no controller).

The unique design of these peristaltic pumps provides a greatly simplified means for rapid loading and changing of tubing. In addition, the following features are incorporated:

- Pumps up to 12 GPM.
- Uses continuous tubing to ensure a sanitary and non-contaminating -system.
- Fluid contacts only the tubing.
- Handles wide range of viscosities.
- Several different size tubing and formulations can be used.
- 5:1 gear head eliminates need for belt and pulley.
- Washdown motor and NEMA 4 controller provided on some models.

APPLICATION DATA

The gentle peristaltic action of these pumps is ideal for pumping highly viscous and shear-sensitive liquids. These pumps are also ideally suited for use where sterile conditions and purity are required. Toxic and hazardous fluids can be pumped with the proper selection of Masterflex® B/T® tubing since the fluid contacts only the tubing and not the pump.

WARNING: *Tubing breakage may result in fluid being sprayed from pump. Use appropriate measures to protect operator and equipment.*



GENERAL DESCRIPTION

The RAPID-LOAD® B/T® peristaltic pump (see Figure 1) is mounted on a base and attached to a NEMA 56C frame motor or IEC-72 71-14F130 frame motor (with foot mountings) through a 5:1 gear head and adapter. Depending on the model, the motor is either supplied or customer furnished and is attached to the adapter by four bolts and to the base by an additional four bolts. The controller is mounted on a bracket above the gear head. The bracket and controller can be removed and hung by two bolts at a location up to 10 ft. away. The controller incorporates a REV-OFF-FWD switch and a speed control.

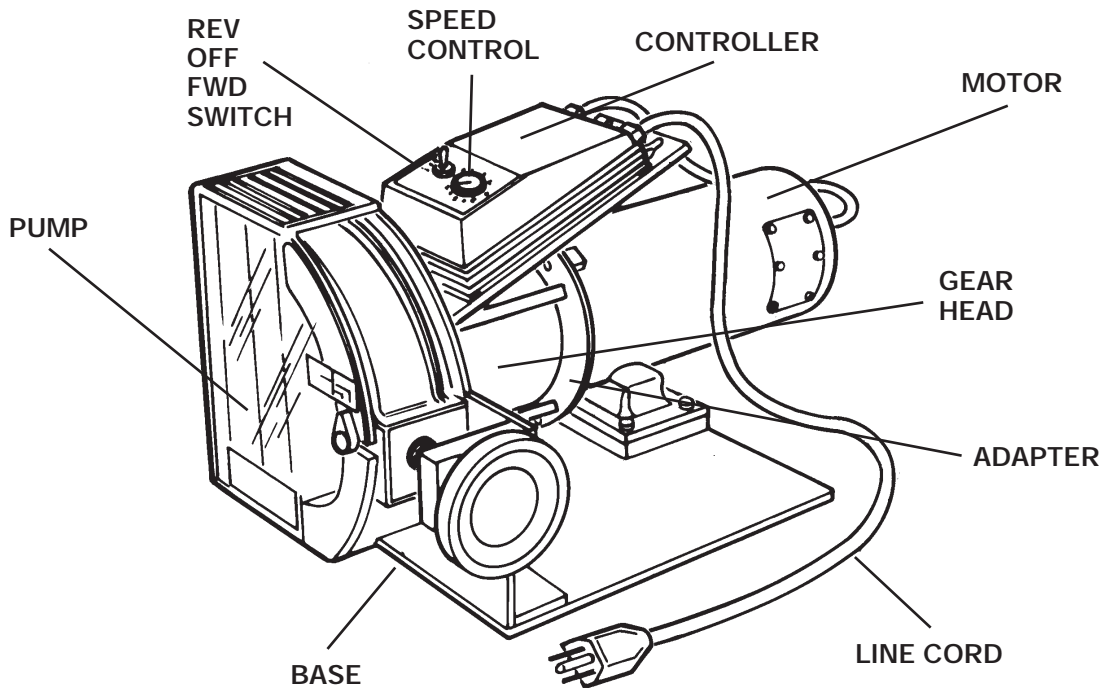


Figure 1. TYPICAL RAPID-LOAD PUMP AND DRIVE

Due to its unique design, several different Masterflex® B/T® tubing sizes can be accommodated by this RAPID-LOAD® peristaltic pump. The adjusting knob (see Figure 2) allows the user to load tubing quickly and consistently and is used to set the nominal occlusion (amount of squeeze on the tubing) for each size tubing. The indicator pointer can be aligned with index marks for the different tube sizes, thus simplifying the setting of nominal occlusion. Occlusion is adjusted by turning the occlusion ring adjusting knob clockwise to increase occlusion or counterclockwise to decrease occlusion until the desired performance is obtained. When maximum flow is not required, reduction in the occlusion can greatly increase tubing life. Increased occlusion provides improved vacuum and pressure performance.

The maximum recommended rotor speed is 350 rpm. A tachometer access port is provided to allow monitoring of pump rotation speed. The pump rotor can turn either clockwise or counterclockwise. When turning clockwise (FWD) the top connection is for suction and the bottom connection is for discharge. The 350 rpm speed is obtained from the standard 1725 rpm fractional horsepower motor through the 5:1 gear reduction. Faster speeds will increase flow, but will also considerably shorten average tubing life. (We cannot be responsible for pump performance when operated at speeds higher than 350 rpm.)

If the pump is to be operated with back-pressure on the discharge line greater than 5 PSIG, hose clamps or screw-type band clamps are recommended on the tubing connections on the discharge side of the pump. Silicone or C-FLEX® tubing, because of their highly elastic natures, can expand very quickly if back-pressure is present and could create leakage at the fittings if not securely retained. It is this same elastic nature, however, that makes them such excellent materials for this peristaltic type pump. Norprene® tubing yields longer life, especially under pressure. Do not attempt to use other materials in lieu of these, as pump performance could be severely compromised with possible damage to the pump. Refer to Table 1 for tubing recommendations.

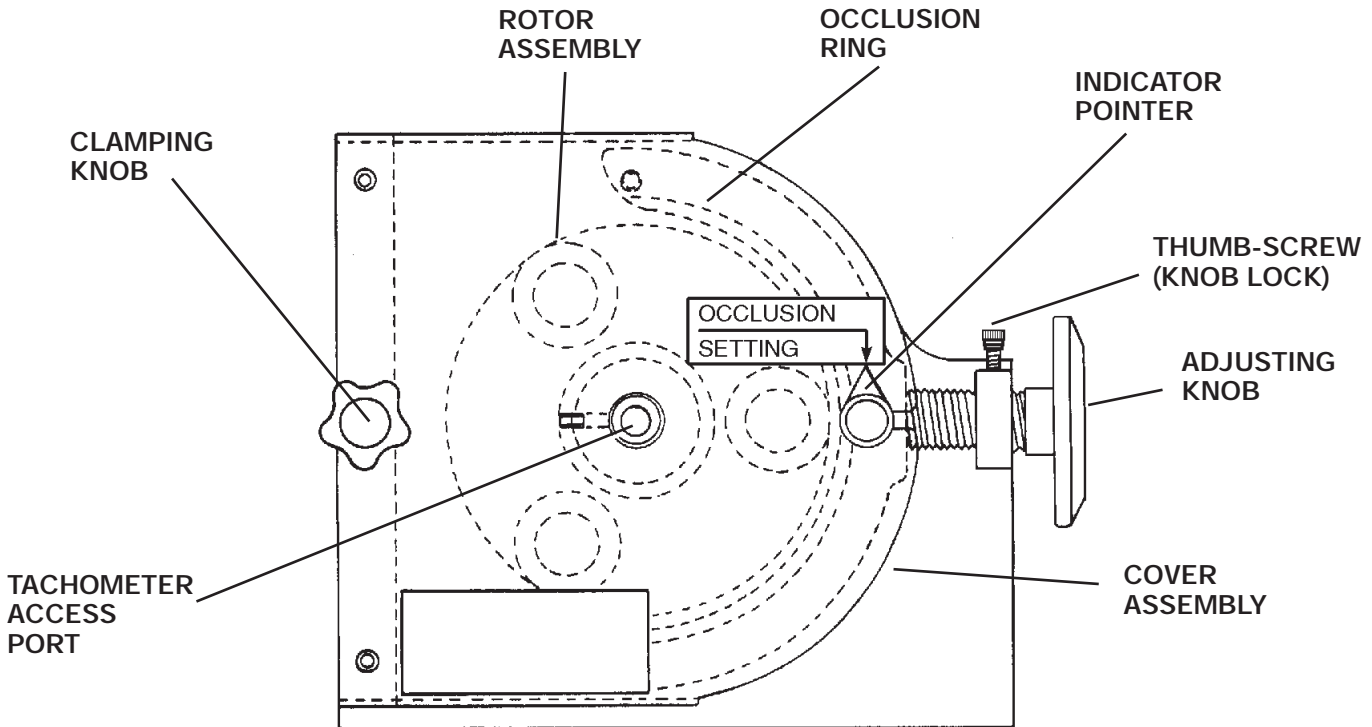


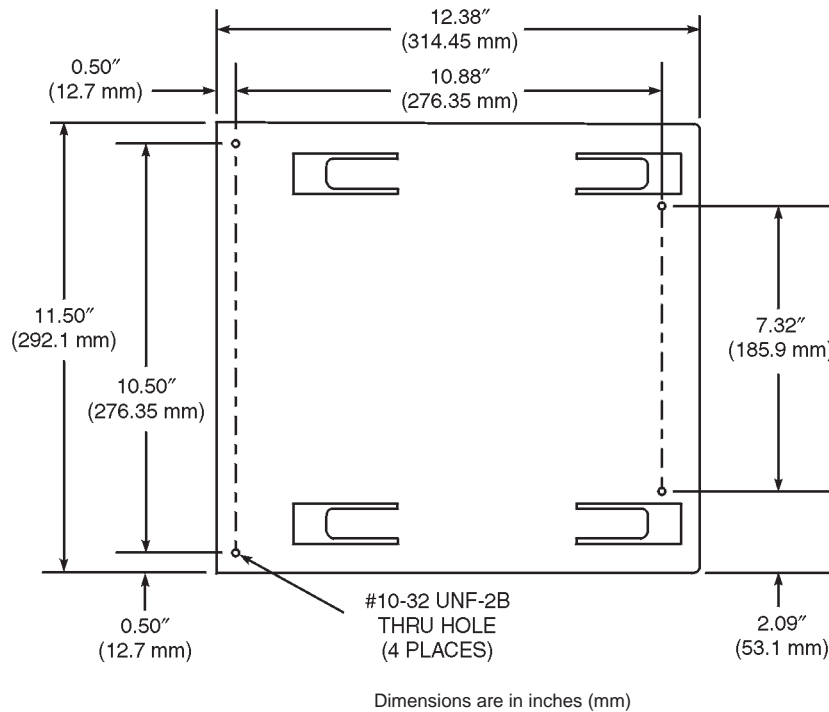
Figure 2. RAPID-LOAD PUMP ASSEMBLY

INSTALLATION AND SETUP

These units should be placed on a flat surface such as a floor, bench or table and should be near an electrical power source. Be sure to check data plate for proper voltage rating(s). See Appendix for Model 07585-50 and Model 07585-55 motor mounting instructions.

Note: For those models with a controller, the controller and bracket can be removed and located up to 10 feet away. Secure the bracket using two bolts inserted through the keyhole slots.

Pump Mounting Dimensions



MODEL NOS. 7585-30, -35, -50, -55

TUBING TYPES

Use only Masterflex® B/T® precision tubing with Masterflex® pumps to ensure optimum performance. Use of other tubing may void applicable warranties.

Note: Use Masterflex® B/T® tubing. These pumps are designed to use B/T® tubing sizes 86, 88, 90 and 92 only. The tubing sizes refer to the last two digits of the Masterflex® B/T® tubing model number.

The following chart provides information for the various sizes of tubing.

Table 1. Tubing Data

Characteristic	Tubing Size			
	B/T® 86	B/T® 88	B/T® 90	B/T® 92
Inside Dia. in (mm)	0.37 (9.5)	0.5 (12.7)	0.75 (19.0)	1 (25.4)
Outside Dia. in (mm)	0.87 (22.2)	0.87 (22.2)	1.25 (31.8)	1.37 (35)
Hose barb size in (mm)	3/8 (9.5)	1/2 (12.7)	3/4 (19.0)	1 (25.4)
Flow Range (with 12–350 rpm drive)	0.3–7.5 liter/min (0.07–2 GPM)	0.5–15 liter/min (0.15–4.0 GPM)	1–30 liter/min (0.3–8 GPM)	1.5–45 liter/min (0.4–12 GPM)
Nominal Flow Per Revolution	21 mL	42 mL	84 mL	126 mL
Maximum Vacuum	26 in Hg	26 in Hg	26 in Hg	26 in Hg
Maximum; Outlet Pressure	20 psig (1.4 bar)	20 psig (1.4 bar)	20 psig (1.4 bar)	20 psig (1.4 bar)
Flow ranges are approximate—calculated under the following conditions: 0 psi at inlet, 0.5 psig at outlet and water circulant at 22°C (72°F).				

REPLACING THE PUMP TUBING

WARNING: *To reduce risk of injury, power must be removed from pump before removing or installing tubing. Fingers or loose clothing could get caught in drive mechanism. Do not operate this pump without plastic protective cover assembly properly installed. Rotating parts can cause serious injury.*



1. Cut off power to the pump by disconnecting line cord. Do not assume that turning off the switch at the motor (or controller) is "safe enough."
2. Rotate thumb-screw (knob lock) counterclockwise to release adjusting knob.
3. Retract occlusion ring by turning the adjusting knob counterclockwise.
4. Turn the clamping knob, Figure 2, counterclockwise and remove the protective cover assembly.
5. Remove the old tube from the rotor assembly.
6. If the new tube must be cut from a length of approved replacement tubing, minimum 2 feet will be required for a new tube.
7. Wrap the tube around the rotor assembly and position in the proper ports for the tube size being used (see Figure 3). Outer ports are for B/T® 90 and B/T® 92 tubing. Inner ports are for B/T® 86 and B/T® 88 tubing.
8. Position protective cover assembly on the pump and pull tubing taut, but do not stretch tubing.
9. Tighten the clamping knob.

WARNING: *Do not operate this pump without the plastic protective cover assembly is properly installed. Rotating parts can cause serious injury.*

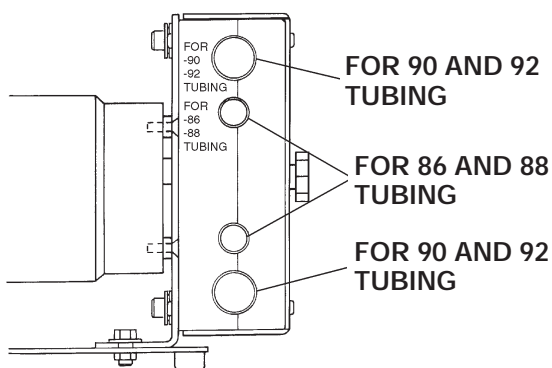


Figure 3. TUBING PORTS

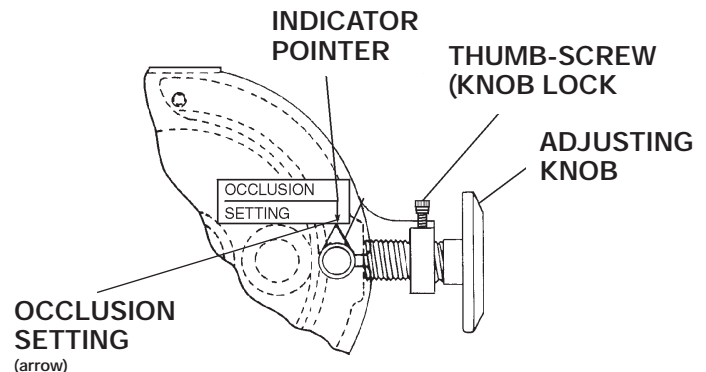


Figure 4. OCCLUSION SETTING

10. Restore power to the pump.
11. Turn the motor on and turn the adjusting knob clockwise until the indicator pointer aligns with the OCCLUSION SETTING arrow (see Figure 4).
12. Rotate thumb-screw (knob lock) clockwise to lock and hold adjusting knob in place. Finger-tighten only.

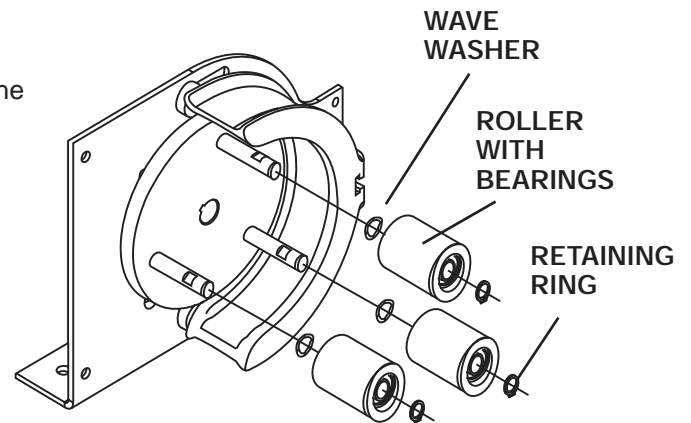
Note: Under some circumstances, tubing may creep into pump. If this problem occurs it can be remedied by installing a hose clamp or fitting immediately upstream of and very close to the inlet port.

INTERCHANGING ROLLERS

For tubing sizes B/T® 86 and B/T® 90, use the smaller rollers with -86 -90 etched into the end faces. For tubing sizes B/T® 88 and B/T® 92, use the larger rollers with -88 -92 etched into the end faces.

To replace rollers:

1. Using a retaining ring tool, part no. 07585-06, remove the retaining rings from the ends of the roller axles and slide the rollers off. Take care to avoid opening the retaining rings too wide.
2. Check to be sure that the wave washers are installed on the axles against the rotor plate.
3. Slide the new rollers onto the axles, placing the ends with the flush bearing surface inward toward the rotor plate against the wave washers, and the etched ends with the recessed bearing surface outward toward the free ends of the roller axles.
4. Replace the retaining rings. You may have to push the rollers in to compress the wave washers to allow the retaining rings to engage the grooves in the axles.



EXPLODED ROLLER SUB-ASSEMBLY

OPERATION

Controller:

Models 7585-30 (115V model) and 7585-35 (230 V model) are supplied with an electronic controller (see Figure 5) for controlling pump speed.

1. Place FWD-OFF-REV switch in the desired position, clockwise (FWD) or counterclockwise (REV) direction.
2. Adjust SPEED control for the desired pump speed. Note that a tachometer can be connected to the pump shaft tachometer access port (see Figure 2) to measure pump speed.

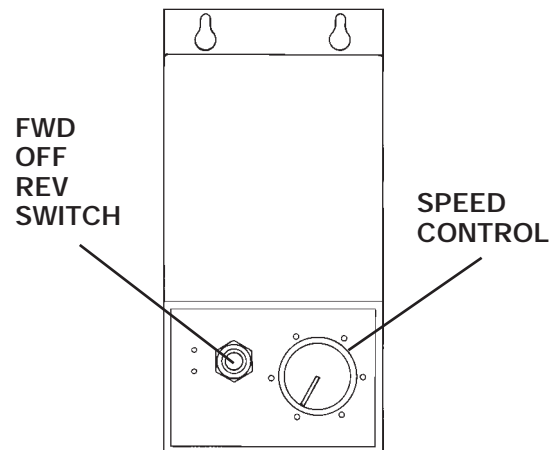


Figure 5. CONTROLLER

Pump Head:

The only operating control on the pump head is the occlusion adjusting knob (see Figure 4).

1. Rotate thumb-screw (knob lock) counterclockwise to release adjusting knob.
2. Rotate adjusting knob to align the indicator pointer with the OCCLUSION SETTING arrow for a nominal occlusion setting.
3. For higher pressure and vacuum, turn the adjusting knob further clockwise.
4. For longer tube life, turn the adjusting knob counterclockwise to reduce occlusion.
5. For an indirect estimate of flow rate, a tachometer access port (see Figure 2) has been provided. Use a tachometer to measure rotor speed in rpm and multiply this times the nominal flow per revolution estimate in Table 1 to obtain a value of flow rate in mL/min.

(Note: 3785 mL=1 U.S. liquid gallon.)

MAINTENANCE

Tools Required: Phillips screwdriver

Motor Brush Replacement Models 7585-30 and 7585-35

WARNING: *Power must be removed from motor before performing this procedure.*



1. Cut off power to the motor by disconnecting line cord. Do not assume that turning off the switch at the motor (or controller) is "safe enough."
2. To access the motor brushes, remove six screws securing the access plate and remove plate (see Figure 6).
3. Loosen screw terminal at top of brush housing and disconnect brush wire.
4. Press down on brush retainer to disengage tabs then rotate brush retainer slightly toward front of motor and remove brush retainer.
5. Slide brush assembly out of housing.
6. Install new brush assembly with brush wire toward rear of motor and spring assembly on top.
7. Insert brush retainer against brush springs and push down, then rotate retainer slightly toward rear of motor to engage tabs of retainer under rear edge of brush housing.
8. Attach brush wire to screw terminal at top of brush housing. Be sure wire is clear of access opening.

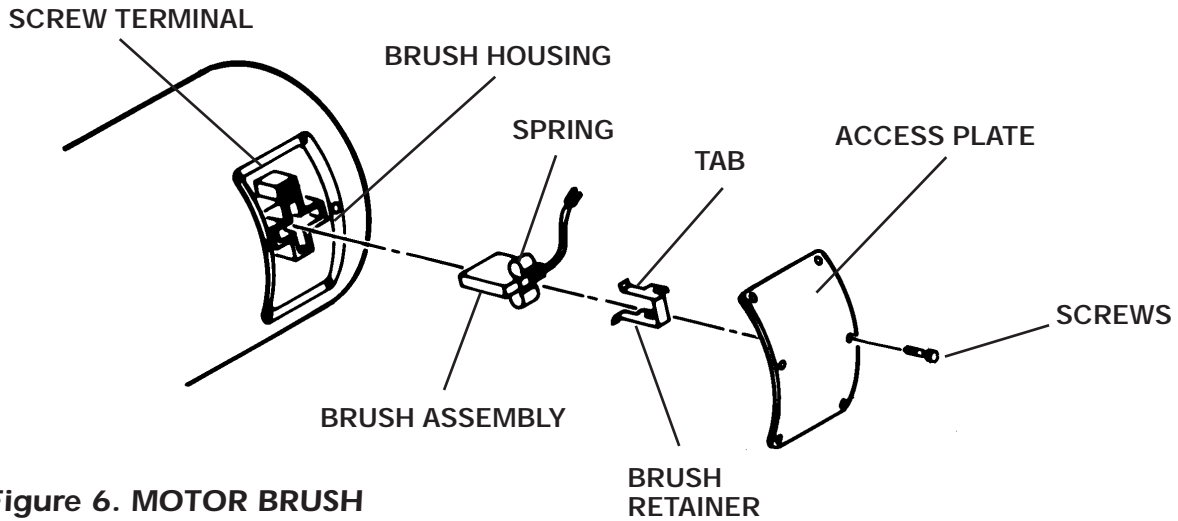


Figure 6. MOTOR BRUSH

9. Attach cover plate with six screws.

Note: Always replace both brushes at the same time.

Replacement Parts

The following list identifies the replaceable parts and includes the part numbers.

Description	Part Number	Qty per Unit
Motor Brush Set (only applicable to Model 7585-30)	A-4156-CR	1
Motor Brush Set (only applicable to Model 7585-35)	A-4158-CR	1
Knob (occlusion adj.)	A-4215-CR	1
Knob (tubing retainer)	B-3077	1
Pointer	B-3386	1
Protective Cover Assembly	5469-CR	1
Rubber Feet (w/screws)	A-4216-CR	4
Thumb-screw (knob lock)	B-4036	1
Masterflex® B/T® Roller Kit, size 86/90	07584-01	1
Masterflex® B/T® Roller Kit, size 88/92	07584-02	1
Masterflex® B/T® Rotor Assembly, size 86/90	07584-03	1
Masterflex® B/T® Rotor Assembly, size 88/92	07584-04	1

Cleaning

Keep the drive enclosure clean with mild detergents. Never immerse nor use excessive fluid.

ACCESSORIES

All Masterflex® tubing in sizes B/T® 86, B/T® 88, B/T® 90 and B/T® 92 can be used with this pump. Be sure tubing material matches application.

Description	Part Number
Retaining Ring Tool	07585-06

SPECIFICATIONS

Output:

Pump Speed: 12 to 350 rpm

Torque output, maximum: 1440 oz-in (104 kg-cm)

Tubing compatibility: Sizes 86, 88, 90 or 92

Flow Range: Up to 12 GPM

Input:

Supply voltage limits:

Model 7585-30 90 to 130 Vrms @ 50/60 Hz

Model 7585-35 200 to 260 Vrms @ 50 Hz

Current, max:

Model 7585-30 6.5A

Model 7585-35 3.3A

Installation Category:

Installation Category II per IEC 664 (Local level—appliances, portable equipment, etc.)

Motor Drive:

Requirement (motor not supplied):

Model 7585-50 NEMA Type 56C; 1800 rpm and

0.5 Hp max.

Model 7585-55 IEC-72 71-14F130; 1800 rpm and

0.5 Hp max.

SPECIFICATIONS (cont.)

Construction:

Dimensions:

Model 7585-30 16.5 in W x 14 in H x 22 in D
(41.9 cm W x 35.6 cm H x 55.9 cm D)

Model 7585-35 16.5 in W x 14 in H x 22 in D
(41.9 cm W x 35.6 cm H x 55.9 cm D)

Model 7585-50 16.5 in W x 14 in H x 9 in D
(41.9 cm W x 35.6 cm H x 22.9 cm D)

Model 7585-55 16.5 in W x 14 in H x 9 in D
(41.9 cm W x 35.6 cm H x 22.9 cm D)

Weight:

Model 7585-30 89 lbs (40.4 kg)

Model 7585-35 89 lbs (40.4 kg)

Model 7585-50 30 lbs (13.6 kg)

Model 7585-55 30 lbs (13.6 kg)

Enclosure Rating:

Model 7585-30 IP56 (NEMA 4) per IEC 529

Model 7585-35 IP56 (NEMA 4) per IEC 529

Environment:

Temperature, Operating: 0°C to 40°C (32°F to 104°F)

Storage Temperature: -20°C to 60°C (-4°F to 140°F)

Humidity
(non-condensing): 10% to 90%

Altitude: Less than 2000 m

Pollution Degree: Pollution Degree 3 per IEC 664
(Sheltered locations)

Chemical Resistance: Exposed material is painted aluminum,
plastic and vinyl

Compliance: Units are designed to meet UL 778

WARRANTY

Use only Masterflex® B/T® precision tubing with Masterflex® pumps to ensure optimum performance. Use of other tubing may void applicable warranties.

The Manufacturer warrants this product to be free from significant deviations from published specifications. If repair or adjustment is necessary within the warranty period, the problem will be corrected at no charge if it is not due to misuse or abuse on your part, as determined by the Manufacturer. Repair costs outside the warranty period, or those resulting from product misuse or abuse, may be invoiced to you.

The warranty period for this product is noted on the Warranty Card.

PRODUCT RETURN

To limit charges and delays, contact the seller or Manufacturer for authorization and shipping instructions before returning the product, either within or outside of the warranty period. When returning the product, please state the reason for the return. For your protection, pack the product carefully and insure it against possible damage or loss. Any damages resulting from improper packaging are your responsibility.

TECHNICAL ASSISTANCE

If you have any questions about the use of this product, contact the Manufacturer or authorized seller.

We reserve the right to make improvements in design, construction and appearance of our products without notice.

<p>Cole-Parmer Instrument Co. 625 East Bunker Court Vernon Hills, Illinois U.S.A. 60061-1844 1-800-MASTERFLEX (627-8373) (U.S. and Canada only) 11 (847) 549-7600 (outside U.S.) (847) 549-7600 (Local) FAX (847) 247-2929 (U.S. and Canada only) 11 (847) 549-1700 (Fax outside U.S.) www.masterflex.com e-mail: techinfo@coleparmer.com</p> <p>ISO9001 SUPPLIER CERTIFIED</p> <hr/> <p>Barnant Company 28W092 Commercial Ave. Barrington, Illinois U.S.A. 60010-2392 1-800-637-3739 (U.S. and Canada only) 11 (847) 381-7050 (outside U.S.) (847) 381-7050 (Local) 11 (847) 381-7053 (Fax outside U.S.) (847) 381-7053 (Local Fax) www.barnant.com e-mail: barnant@barnant.com</p> <p>ISO9001 REGISTERED SUPPLIER</p>

APPENDIX A

MOTOR MOUNTING

Install customer-supplied motors in accordance with the following procedure.

CAUTION: *This product is intended for use with a motor that has a maximum speed of 1725 rpm. Do not use a motor with a higher speed capacity.*



WARNING: *Electrical connections and grounding (earthing) must conform to local wiring codes.*



Model 7585-50

Tools required: 1/8 in Hex Key, 5/16 in Hex Key, 9/16 in Wrench

Model 7585-50 is designed to be installed to a customer-supplied NEMA Type 56C frame motor with foot mountings. To install the unit, refer to Figure A1 and follow these steps:

1. Place coupling on motor shaft and ensure that it is fully engaged, then secure with setscrew using the 1/8 inch hex key. Torque from 79 to 91 inch-pounds.
2. Place motor on mounting feet.

Note: The pump rotor may need to be rotated for alignment in the next step.

3. Slide motor forward to engage the male motor coupling with the female gear head coupling. Rotate pump rotor if necessary to align the couplings.
4. Using the 5/16 inch hex key, bolt the motor to the gear head adapter by inserting the four bolts through the gear head adapter into the motor. Torque bolts from 17 to 19 foot-pounds.
5. Using the 9/16 inch wrench, secure the motor mounting feet to the base using the four bolts. Torque bolts from 9 to 11 foot-pounds.

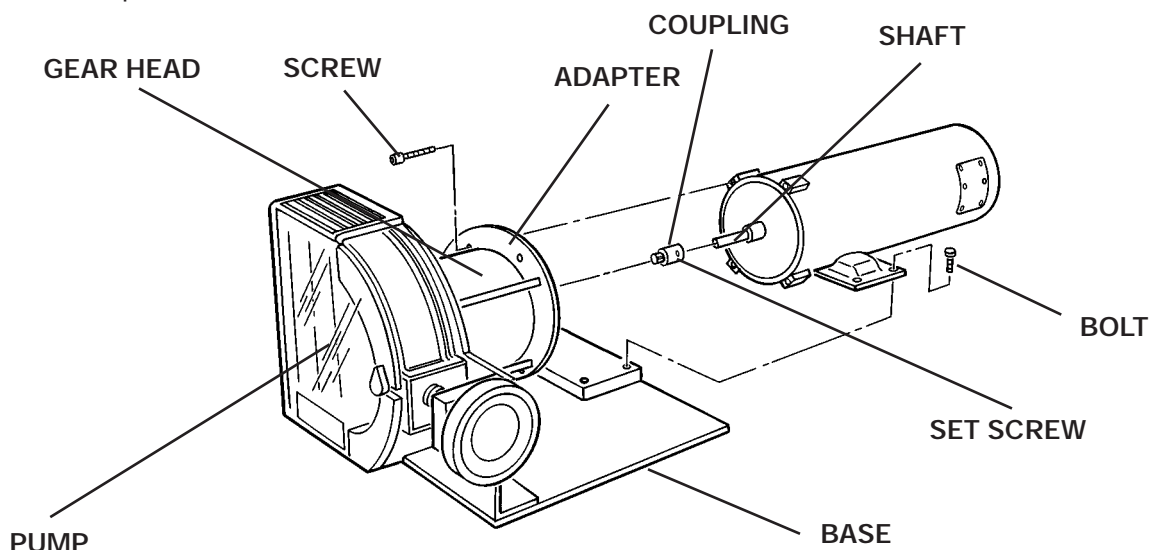


Figure A1. MOTOR MOUNTING NEMA TYPE 56C MOTOR FRAME

Model 7585-55

Tools required: 2.5 mm Hex Key, 13 mm Wrench, 10 mm Wrench

Model 7585-55 is designed to be installed to a customer-supplied IEC-72 71-14F130 motor with foot mountings. To install the unit, refer to Figure A2 and follow these steps:

1. Place coupling on motor shaft and insure that it is fully engaged, then secure with setscrew using the 2.5 mm hex key. Torque from 2.9 to 3.3 Nm.
2. Place motor on mounting feet.

Note: The pump rotor may need to be rotated for alignment in the next step.

3. Slide motor forward to engage the male motor coupling with the female gear head coupling. Rotate pump rotor if necessary to align the couplings.
4. Using the 13 mm wrench, bolt the motor to the gear head adapter by inserting the four bolts through the motor and into the gear head adapter. Torque from 12.5 to 14.5 Nm.
5. Using the 10 mm wrench, secure the motor mounting feet to the base with the four bolts. Torque from 6.7 to 7.5 Nm.

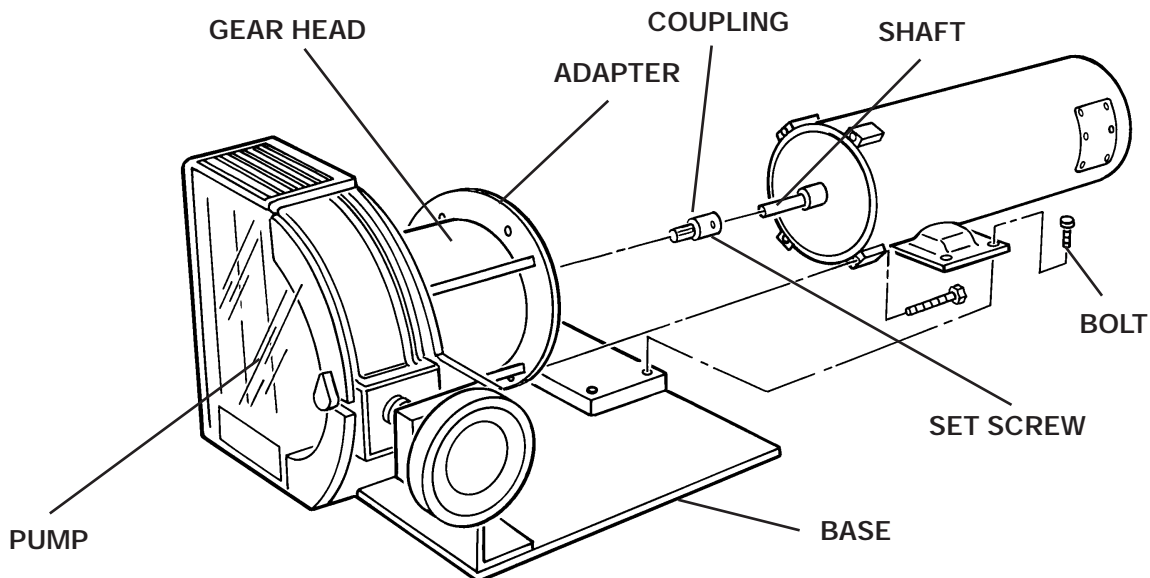


Figure A2. MOTOR MOUNTING IEC-72 71-14F130 MOTOR FRAME

Notes . . .