

E-Flo[®] DCi Motor

3A8815C

EN

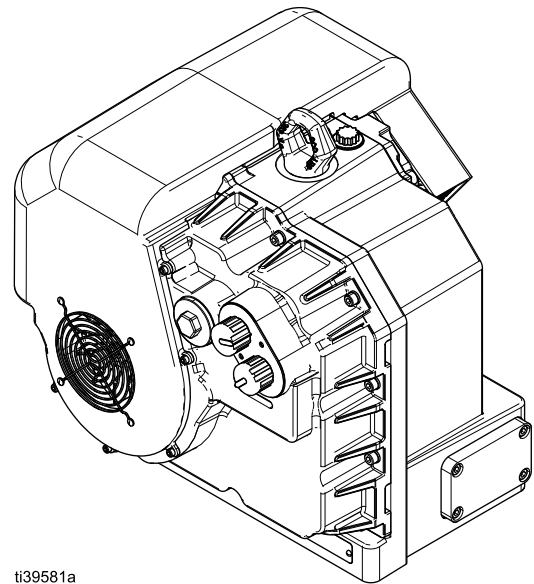
Electric drive for Graco paint circulation and supply pumps. For professional use only.

See page 4 for model information.



Important Safety Instructions

Read all warnings and instructions in this manual and in any related manuals before using the equipment. Be familiar with the proper control and usage of the equipment. Save all instructions.



ti39581a

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Related Manuals

Manual	Description	Referenced Equipment
3A8352	E-Flo DCi Motor Installation - Operation	E-Flo DCi Motor
3A7828	E-Flo DCi Sealed 4-Ball Pumps Instructions	4-Ball Pumps
311619	Pump Mounting Kits Instructions	Wall and Stand Mounting Kit
3A8471	DCi Link Communication Module	Communication Module
3A7826	E-Flo DCi 2-Ball pump	2-Ball pumps

Models

The E-Flo DCi Motors are exclusively compatible with select models of Pump Lowerers. All compatible Pump Lowerers are defined in the DCi Pump System manuals listed in **Related Manuals**, page 2. There are no other Pump Lowerers that are compatible with E-Flo DCi.

Model	Series	Description	kVA
YM1132	A	3 HP (2.24 kW) Basic	3.4
YM1131	A	3 HP (2.24 kW) Advanced	3.4
YM1152	A	5 HP (3.73 kW) Basic	5.7
YM1151	A	5 HP Advanced	5.7
YM1134	A	3 HP (2.24 kW) Basic Asian Country Approvals	3.4



YM1133	A	3 HP Advanced Asian Country Approvals	3.4
YM1154	A	5 HP (3.73 kW) Basic Asian Country Approvals	5.7
YM1153	A	5 HP Advanced Asian Country Approvals	5.7

‡ Motor approvals are listed in the E-Flo Dci motor manual. See **Related Manuals**, page 2.





Warnings


The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.










DANGER

 	<p>SEVERE ELECTRIC SHOCK HAZARD</p> <p>This equipment is powered by more than 240V. Contact with this voltage will cause death or serious injury.</p> <ul style="list-style-type: none"> Turn off and disconnect all incoming power at the main switch before disconnecting any cables and before servicing equipment. This equipment must be grounded. Connect only to a grounded power source. All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.
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WARNING

   	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> Use equipment only in well-ventilated area. Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking). Ground all equipment in the work area. See Grounding instructions. Keep work area free of debris, including solvent, rags, and gasoline. Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. Use only grounded hoses. Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive. Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. Keep a working fire extinguisher in the work area
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	<p>SPECIAL CONDITIONS FOR SAFE USE</p> <p>All flameproof joints are critical to the integrity of the motor. Do not repair flame proof joints. Replace all damaged parts with genuine Graco parts with no substitutions. The following conditions relate to safe installation and/or use of the equipment.</p> <ul style="list-style-type: none"> The equipment must use M8x1.25 steel alloy class 12.9 screws with a tolerance fit of 6g/6H. Flameproof joints shall not be repaired.
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 <h1 style="margin: 0;">WARNING</h1>	
	<p>BURN HAZARD</p> <p>Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:</p> <ul style="list-style-type: none"> Do not touch hot fluid or equipment.
 	<p>MOVING PARTS HAZARD</p> <p>Moving parts can pinch, cut, or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> Keep clear of moving parts. Do not operate equipment with protective guards or covers removed. Equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure in your pump manual and disconnect all power sources.
    	<p>SKIN INJECTION HAZARD</p> <p>High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> Engage trigger lock when not dispensing. Do not point dispensing device at anyone or at any part of the body. Do not put your hand over the fluid outlet. Do not stop or deflect leaks with your hand, body, glove, or rag. Follow the Pressure Relief Procedure in your pump manual when you stop dispensing and before cleaning, checking, or servicing equipment. Tighten all fluid connections before operating the equipment. Check hoses and couplings daily. Replace worn or damaged parts immediately.



WARNING



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Specifications** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Specifications** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure.
- Turn off all equipment and follow the **Pressure Relief Procedure** in your pump manual when equipment is not in use. Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.



TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.



PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Component Identification

Knobs

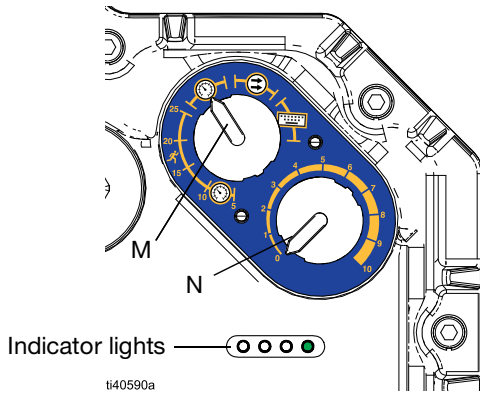


FIG. 1 Motor Components

M	Mode Knob	Selects operating mode
N	Setpoint Knob	Customizes the mode settings

Indicator Lights

Red	Error	Blinking red light indicates an error
Blue	PLC	Indicates PLC connectivity
Green	Power	Indicates the power is on

Maintenance

Change the Oil

Change the oil after a break-in period of 200,000–300,000 cycles. After the break-in period, change the oil once a year.

NOTE: Use Graco Kit No. 20A933, or Mobil SHC634. Use of alternate oils may cause damage and void warranty.

Drain the Oil

1. Place a minimum 2 quart (1.9 liter) container under the oil drain plug.
2. Remove the oil drain plug.
3. Allow all oil to drain from the motor.

4. Reinstall the oil drain plug. Torque to 15–20 ft-lb (20–27 N•m).
5. **Add Oil**, page 7.

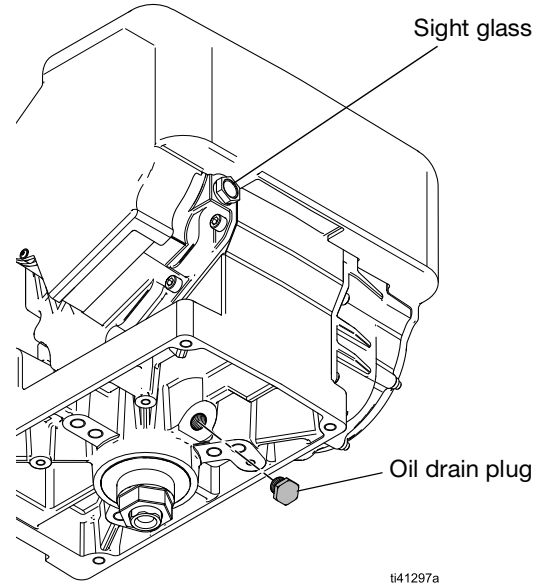


FIG. 2 Oil drain plug

Add Oil

1. Open the fill cap (FC).
2. Add silicone-free synthetic gear oil (Graco Kit No. 20A933).
3. Check the oil level in the sight glass, see FIG. 2, and fill until the oil level is near the halfway point of the sight glass.

NOTE: The oil capacity is approximately 2.0 quarts (1.9 liters). Do not overfill.

4. Reinstall the fill cap (FC) and hand tighten.

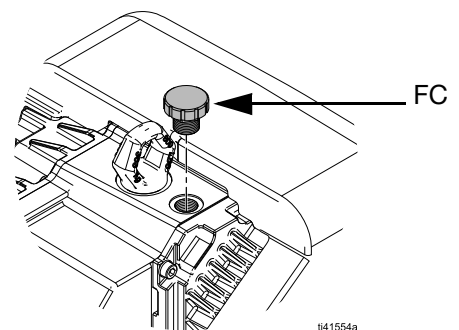


FIG. 3: Fill cap

Repair

Prepare Equipment for Service

<p>Models in Explosive Atmospheres or Hazardous (Classified) Locations: To avoid injury from fire and explosion, move the equipment to a non-explosive or non-hazardous location before performing any electrical service or repair to the equipment.</p>				

Prepare for Repair

<p>Capacitors will retain a charge for a brief period after power is removed from the motor. To avoid electric shock, turn off the equipment power and shut off the power at the main circuit breaker before repairing. Wait for indicator lights to turn off.</p>				

1. Remove power from the motor and wait for all of the indicator lights to turn off. See **Indicator Lights**, page 7.
2. Follow the appropriate lock-out/tag-out procedures.
3. Follow the **Pressure Relief Procedure**.
4. Decouple the pump lower from the motor. Refer to manuals 3A7828, E-Flo DCi Sealed 4-Ball pumps or 3A7826, E-Flo DCi Sealed 2-Ball pumps for instructions.
5. If you are replacing the oil, gears, or output shaft, see the **Change the Oil** procedure on page 7.

Pressure Relief Procedure

Follow the Pressure Relief Procedure whenever you see this symbol.

<p>This equipment stays pressurized until pressure is relieved. To help prevent serious injury from splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying, and before cleaning, checking, or servicing the equipment.</p>				

1. Pull and turn the setpoint knob (N) to 0.
2. Ensure that the electrical disconnect is shut off and locked out.
3. Relieve all fluid pressure as explained in the E-Flo DCi pump manual.

Shutdown

<p>The equipment connected to the motor stays pressurized until the pressure is manually relieved. Pressurized fluid can cause serious injury such as skin injection, splashing fluid, and moving parts. Follow the Pressure Relief Procedure in your pump manual when you shutdown the motor.</p>				

Pressure Mode, Pressure Mode with Integrated Runaway Protection Mode, and Flow Mode

1. Pull and turn the setpoint knob (N) to 0.
2. Shut-off and lock out the electrical disconnect.
3. Follow the Pressure Relief Procedure in your pump manual.

Remote Mode

1. Shutdown the motor on the PLC.
2. Shut-off and lock out the electrical disconnect.
3. Follow the Pressure Relief Procedure in your pump manual.

Replace Oil

1. Prepare for Repair, page 8.
2. Drain the Oil, page 7.
3. Add Oil, page 7.

Replace the Felt Wiper Kit 2004266

1. Prepare for Repair, page 8.
2. Cycle the rack assembly (19) until the shaft is in the uppermost position.

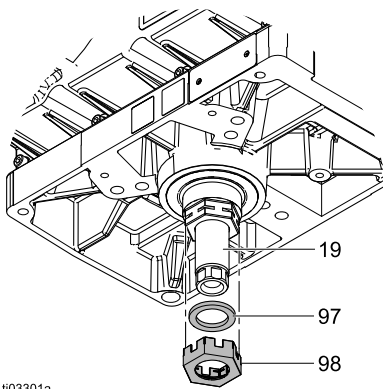


FIG. 4

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3. Snap off the wiper cap (98) from the bottom of the rack assembly (19).
4. Replace the felt wiper seal (97) and the wiper cap (98).
5. Reattach the wiper cap to the bottom of the rack assembly (19) and snap into place on the housing.

Replace the Rack

1. Prepare for Repair, page 8.
2. Drain the Oil, page 7.

Prepare to Remove the Rack

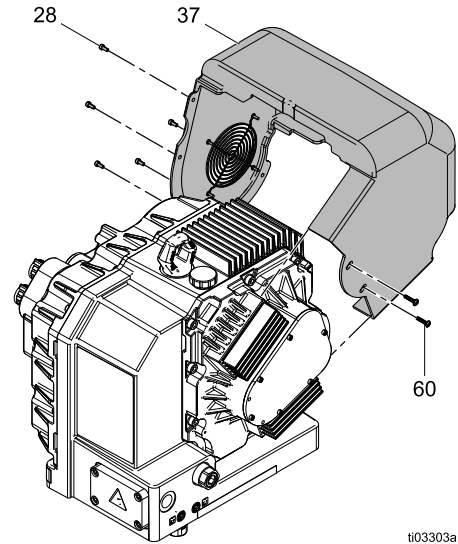


FIG. 5

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1. Loosen and remove screws (28 and 60) on each side of the shroud (37), and remove the cover from the motor.
2. Place a small container beneath the lower edge of the bearing adjuster cover (74).

NOTE: The container will catch any residual oil that will leak out as the bearing adjuster cover (74) is removed.

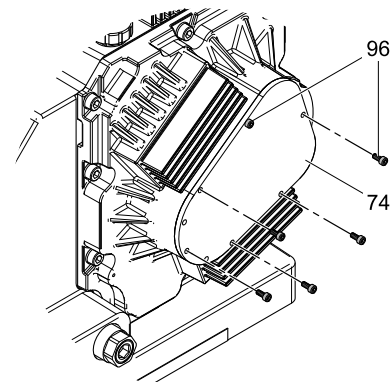


FIG. 6

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3. Loosen and remove five screws (96), leaving the uppermost screw in place.

- Loosen the remaining upper screw (96), but leave it attached.

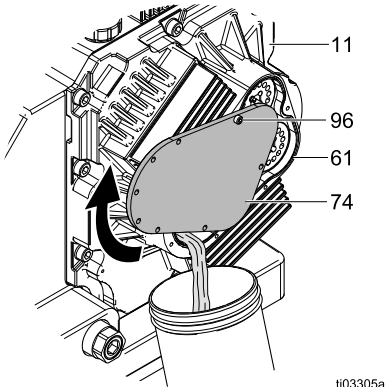


FIG. 7

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- Twist and pull the cover (74) away from the motor frame to break the seal and allow residual oil to pour into the container from step 2.
- After oil has stopped draining, remove the final screw (96) and the cover (74).

Remove the Rack Assembly

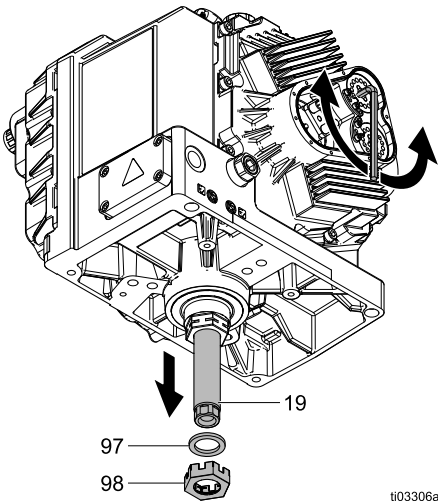


FIG. 8

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- Spin the pinion to drive down the rack.
- Place a bucket beneath the rack assembly (19).

- Remove felt wiper, see step 3 of **Replace the Felt Wiper Kit 2004266**, page 9.

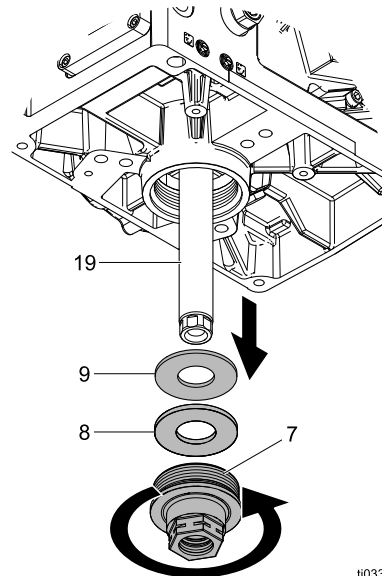


FIG. 9

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- Use a large wrench to loosen, but not remove, the shaft bearing assembly (7).
- While firmly holding the shaft (19), remove the shaft bearing assembly (7).

NOTE: Residual oil will leak out of the shaft bearing assembly (7) while it is being removed.

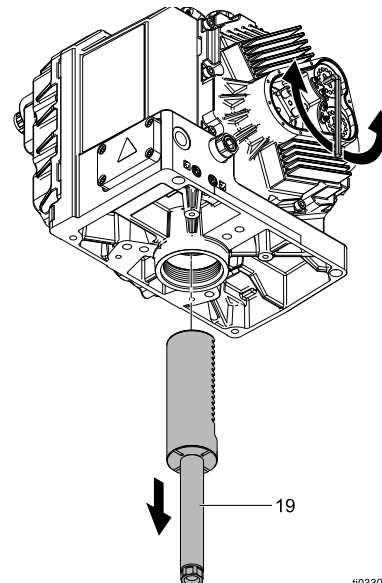


FIG. 10

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- Manually rotate the pinion in (11) while the rack assembly (19) is lowered out of the motor frame.

Reinstall Rack Assembly

1. Insert new rack assembly into motor frame with the gear teeth facing away from the electrical panel.
2. Spin the pinion back while holding rack to pull the rack back up approximately halfway, roughly eight rotations of the pinion.
3. Install the shaft bearing assembly (7) with a sharp push to get a seal on the rack assembly.
4. Use large wrench to tighten the shaft bearing assembly (7) to the motor frame. Torque to 70-80 ft-lbs.
5. Install felt wiper seal and cap. See steps 4-5 of **Replace the Felt Wiper Kit 2004266**, page 9.
6. Reinstall bearing adjuster gasket (61).
7. Reinstall the bearing adjuster cover (74), and torque six screws (96) to 54-58 in-lbs.
8. **Add Oil**, page 7.
9. Install shroud (37) over motor.
10. Apply medium strength thread locker to screws (18 and 60).
11. Install screws (18 and 60) on each side of the shroud (37), and torque screws to 8-9 in-lbs.

Replace the Gear

Remove the Gear Train

1. **Prepare for Repair**, page 8.
2. **Drain the Oil**, page 7.
3. **Remove the Rack Assembly**, page 10.

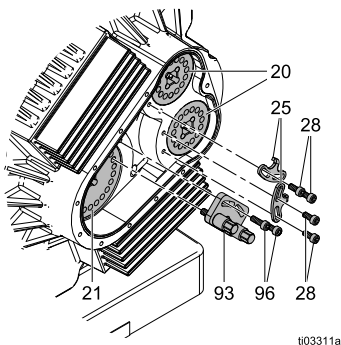


FIG. 11

4. Remove all three bearing adjuster locks (25, 93).
5. Loosen all three bearing adjusters (20, 21), approximately 360°.
6. Remove the set screw (17) and loosen the motor pinion bolt (16) approximately 360°. Do not remove the motor pinion bolt (16) from the motor pinion (18). To prevent the motor from spinning, use an additional wrench to hold the first stage gear (5). **Note:** A second person holding this stage can be beneficial.

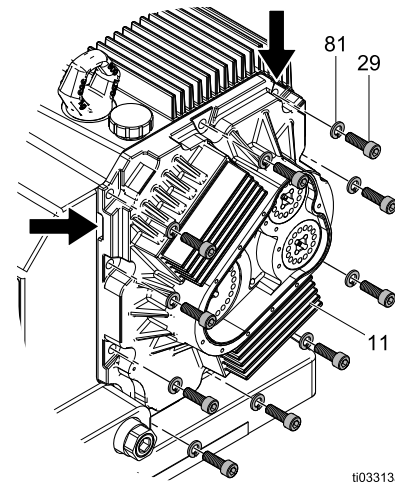


FIG. 12

7. Remove the ten bolts (29) from the gear cover (11).
8. Loosen gear cover (11).

NOTE: It may be necessary pry the cover loose from the motor frame using the two existing notches in the gear cover.

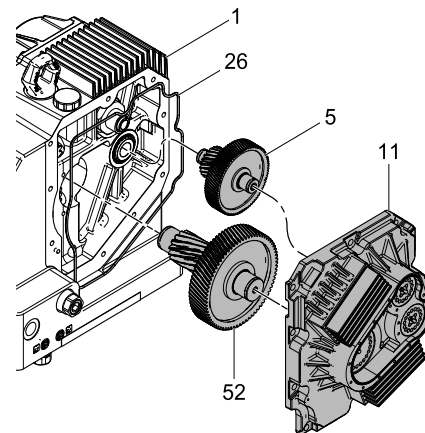


FIG. 13

9. Remove gear cover, being careful to not drop existing gears held in place by the cover.
10. Ensure that the Stage 1 (5) and 2 (52) gears are removed from motor frame.

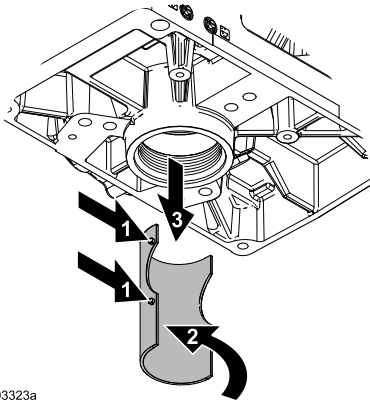


FIG. 14

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11. Press the tabs on the rack bearing (2) to release the rack bearing, and rotate to remove through the bottom of the motor frame.

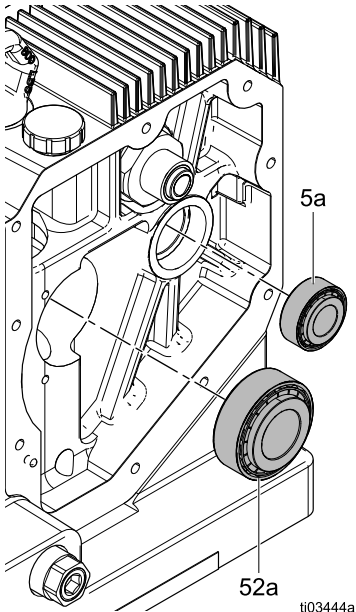


FIG. 15

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12. Pull the two bearing races from the motor frame.

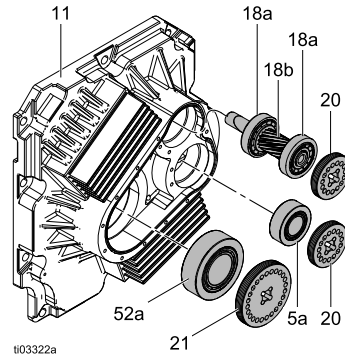


FIG. 16

ti03322a

13. Remove the bearing adjusters (20 and 21), pinion, and four bearing races from the gearbox cover (11).

NOTE: The bearing races for the pinion and the Stage 1 gear are the same diameter, but different thicknesses. This difference is important to note when reassembling.

Gear Reassembly

Install the Motor Pinion

1. Apply motor oil (55) to the bearing races and gears of the motor pinion (18a & 18b)
2. Install the bottom bearing race (18a), then motor pinion (18b) and top bearing race (18a) into the gear cover (11) pocket.
3. Install the bearing adjuster (20) into the motor pinion pocket of the gear cover (11) until finger tight.

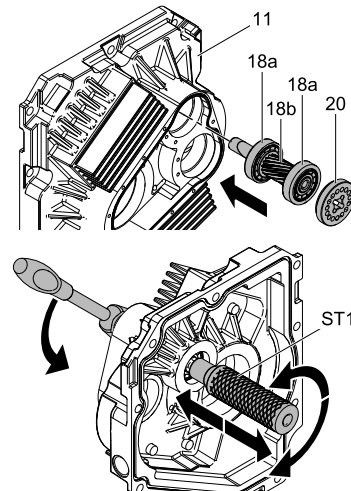


FIG. 17

- Spin the motor pinion (18a) back and forth, then in and out using the tool (ST1) provided in the rebuild kit while torquing the bearing adjuster (20) to 6 in-lbs multiple times until the bearing adjuster does not turn anymore.

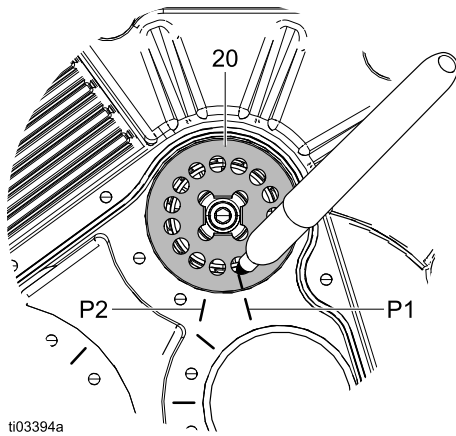


FIG. 18

- The tick mark most counter clockwise on the gear cover (11) is the home mark (P1), and the tick mark most clockwise is the end location (P2). Mark the start location by extending the home line onto the bearing adjuster.
- Rotate the bearing adjuster (20) until it reaches the end position (P2).

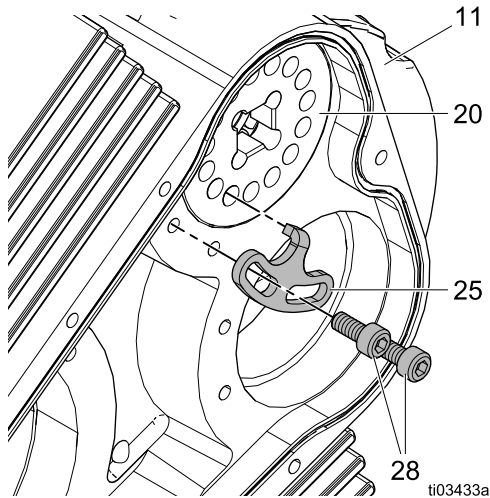


FIG. 19

- Install the bearing adjuster lock (25) and screws (28). Torque screws to 54/58 in-lbs (6.1/6.6 Nm).

Install Stage 1 and Stage 2 Gears

- Apply motor oil (55) to the bearing races and gears (5, 52) of the first and second stage.
- Install the rack bearing (2) into the center housing (1) until it clicks in place.

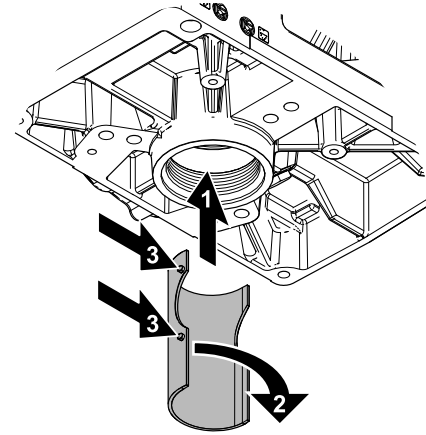


FIG. 20

- Install the bearing adjusters (20, 21) into their respective pockets of the gear cover (11).

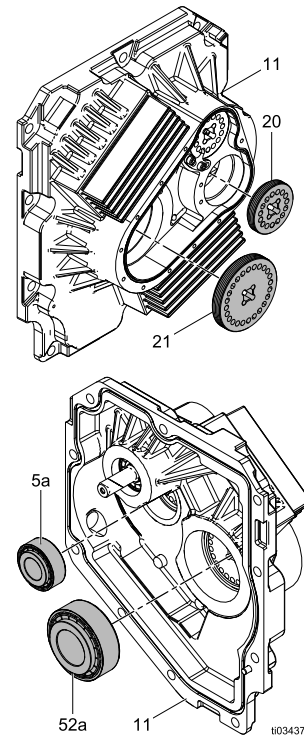


FIG. 21

4. Insert bearing races (5a, 52a) for stage 1 and stage 2 gears into the gear cover (11) bearing journals.
5. Insert bearing races (5a, 52a) for stage 1 and stage 2 gears into the center housing (1) bearing journals.

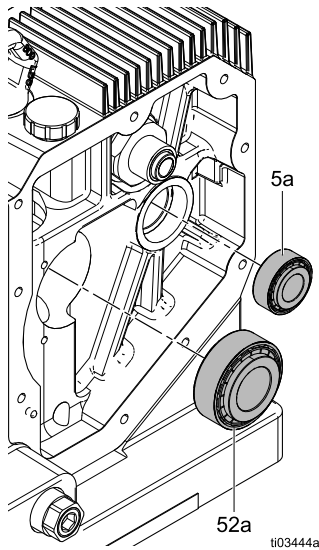


FIG. 22

6. Install stage 1 gear (5) into the gear cover (11).
7. Install stage 2 gear (52) into the center housing (1).
8. Lubricate and install gear cover o-ring (26) into the gear cover (11)

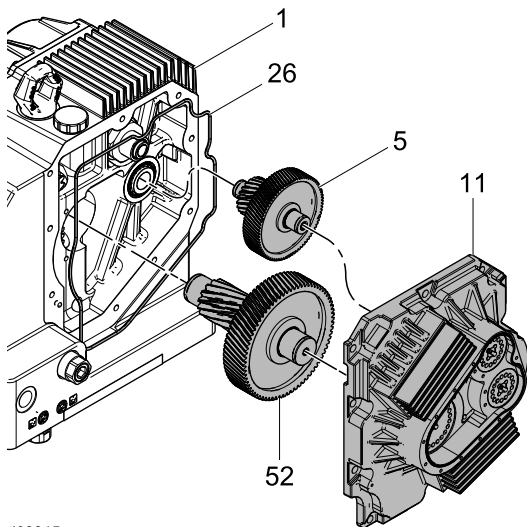


FIG. 23

9. Install the assembled gear cover (11) to the center housing (1). Rotate motor pinion (18) in gear cover to mesh with the motor coupler.

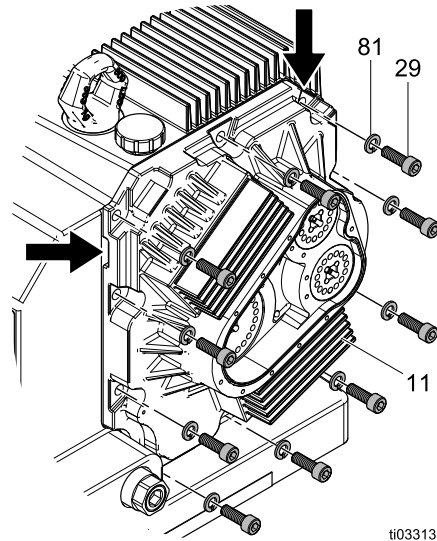


FIG. 24

10. Install the 10x gear cover washers (81) and bolts (29). Torque bolts to 52/62 ft-lbs (70/84 Nm). Torque the bolts in star pattern beginning with the bolt closest to the locating pin.

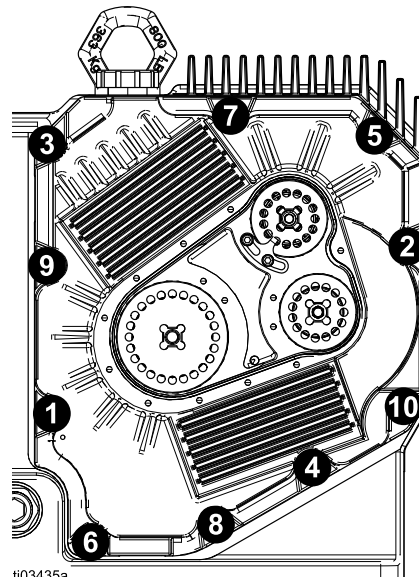


FIG. 25

Lock the Motor Coupler

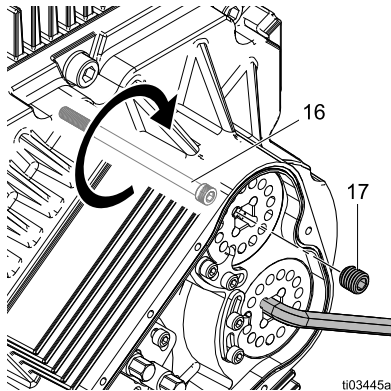


FIG. 26

1. Once the gear cover bolts are all installed, torque the bolt (16) that goes through the motor pinion (18) to 18/22 ft-lbs (24/30 Nm). To prevent the motor from spinning, use an additional wrench to hold the first stage gear (5). Note: A second person holding this stage can be beneficial.
2. Apply blue (removable) threadlocker to the set screw (17), then assemble the set screw into the motor pinion (18) and torque to 28/32 ft-lbs (38/43 Nm). Again, hold the first stage gear while doing this.

Stage 1 Load Bearings

1. Using a 6mm hex wrench, spin the motor pinion (18) clockwise while torquing the first stage bearing adjuster (20) to 6 in-lbs until the bearing adjuster does not move.
2. Insert the screw provided in the rebuild kit into the first stage gear (5) and push/pull the gear in and out.

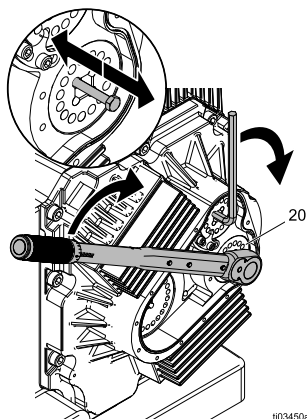


FIG. 27

3. Repeat steps 1 and 2 until there is no noticeable movement of the gear and the bearing adjuster (20) does not rotate anymore after torquing.
4. The tick mark most counter clockwise on the gear cover (11) is the home mark (P1), and the tick mark most clockwise is the end location (P2). Mark the start location by extending the home line onto the bearing adjuster.

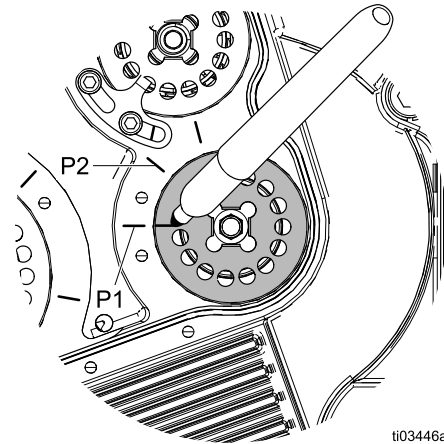


FIG. 28

5. Rotate the bearing adjuster (20) until it reaches the end position (P2).
6. Install the bearing adjuster lock (25) and screws (28). Torque screws to 54/58 in-lbs (6.1/6.6 Nm).

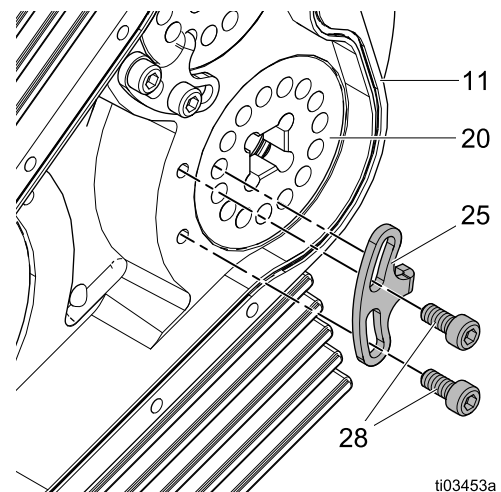


FIG. 29

Stage 2 Load Bearings

1. Using a 6mm hex wrench, spin the motor pinion (18) counter clockwise while torquing the second stage bearing adjuster (21) to 6 in-lbs until the bearing adjuster does not move.

2. Insert the screw provided in the rebuild kit into the second stage gear (52) and push/pull the gear in and out.

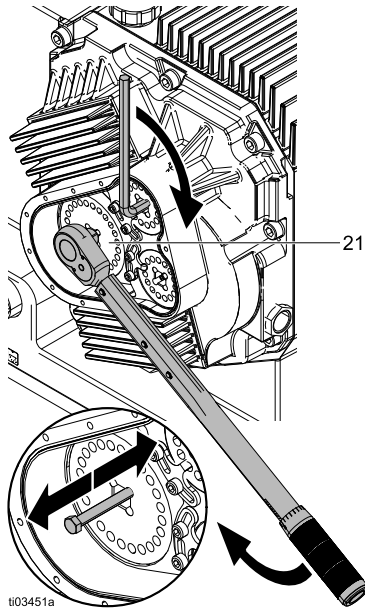


FIG. 30

3. Repeat steps 1 and 2 until there is no noticeable movement of the gear and the bearing adjuster (21) does not rotate anymore after torquing.
4. The tick mark most counter clockwise on the gear cover (11) is the home mark, and the tick mark most clockwise is the end location. Mark the start location by extending the home line onto the bearing adjuster.

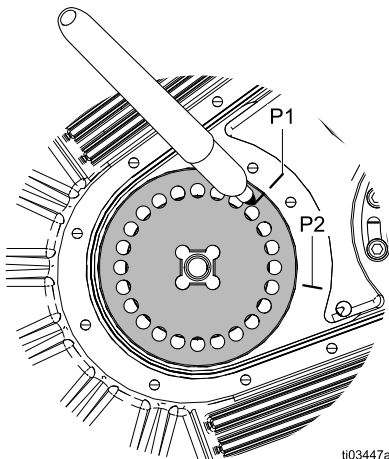


FIG. 31

5. Rotate the bearing adjuster (21) until it reaches the end position (EP).

6. Install the bearing adjuster lock (93) and screws (96). Torque screws to 54/58 in-lbs (6.1/6.6 Nm).

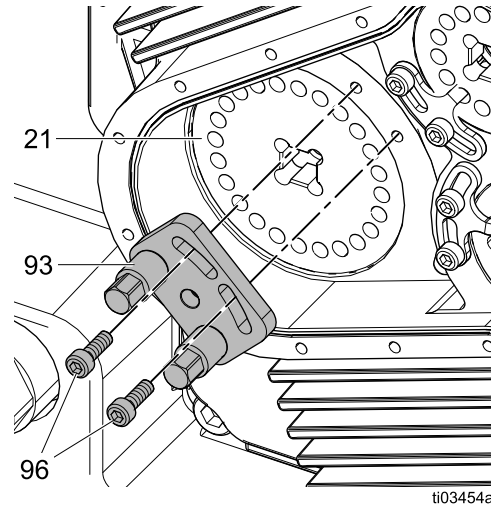


FIG. 32

7. Reinstall Rack Assembly, page 11

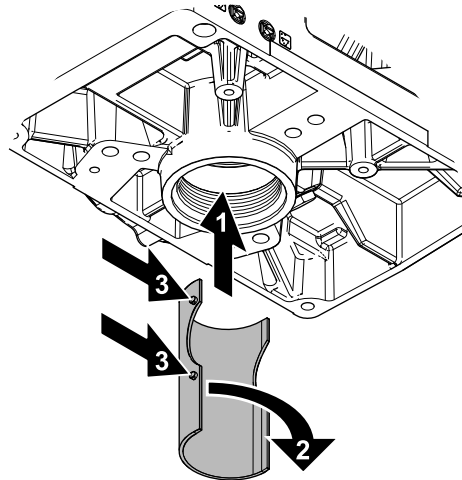


FIG. 33

Electronic Cover Replacement Kits 2004323, 2004279, 2012534, and 2012535



Overview

The main control board assembly manages the operation of the E-Flo DC. It is permanently attached to the electronics cover.

Tools Required

- 6 mm hex wrench
- Phillips screwdriver (#1)
- Torque wrench 20–25 ft-lb (27–34 N•m)

Disconnect Power



Capacitors will retain a charge for a brief period after power is removed from the motor. To avoid electric shock, turn off the equipment power and shut off the power at the main circuit breaker before repairing. Wait for indicator lights to turn off.

1. Remove power from the motor and wait for all of the indicator lights to turn off. See **Indicator Lights**, page 7.

Disconnect Pump Lower

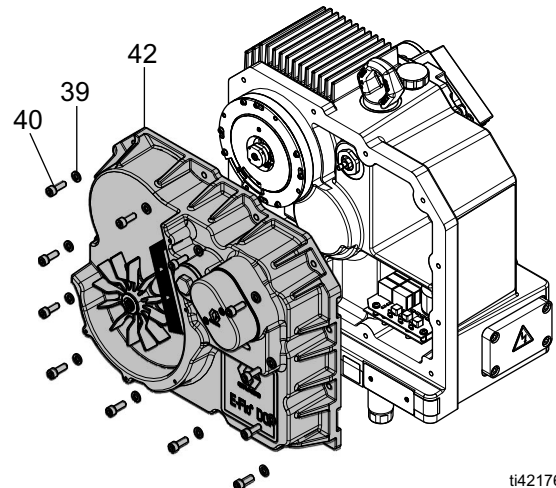
1. Disconnect the lower from the motor. Use a repair manual that corresponds with your pump model. Identify pump models in **Models**, page 3.
2. Loosen the coupling nut that connects the pump lower to the output shaft.
3. Unscrew the nuts and separate the lower.

Remove the Electronics Cover

NOTICE

To avoid equipment damage, carefully support the cover when removing the last bolt. Hold the cover horizontally and take care that the wires are not pulled tight.

1. Using a 6 mm hex wrench, remove the 12 bolts that hold the electronics cover.
2. Support the cover after the bolts are removed to prevent excess strain on the wires inside the E-Flo DCi.



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FIG. 34: Electronics Cover

Disconnect the Control Board

NOTE: The control board is inside the electronics cover. To replace the control board, you must replace the entire electronics cover.

1. Unplug the position sensor (J5), encoder (J3), motor temperature sensor (J23), Ethernet (107),

motor wires (J10, J11, J12), AC input wires (J8, J9, J10), and DC Link inductor*(J15).

NOTE: When removing motor wires make sure to document proper location. If motor wires are installed wrong the motor will not function properly.

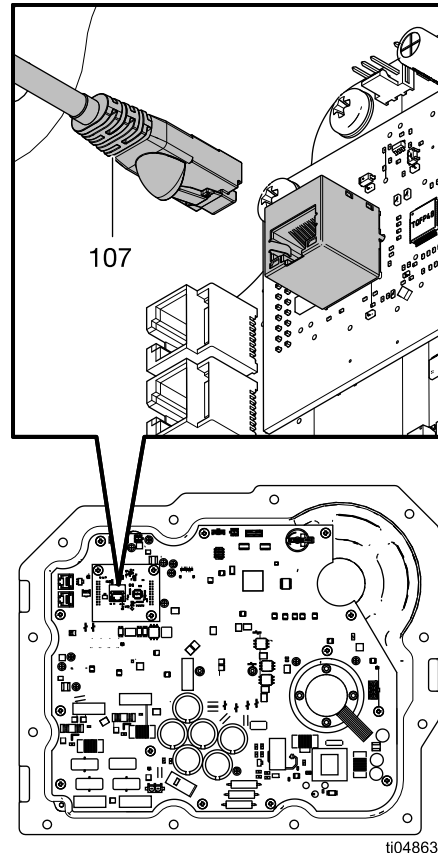
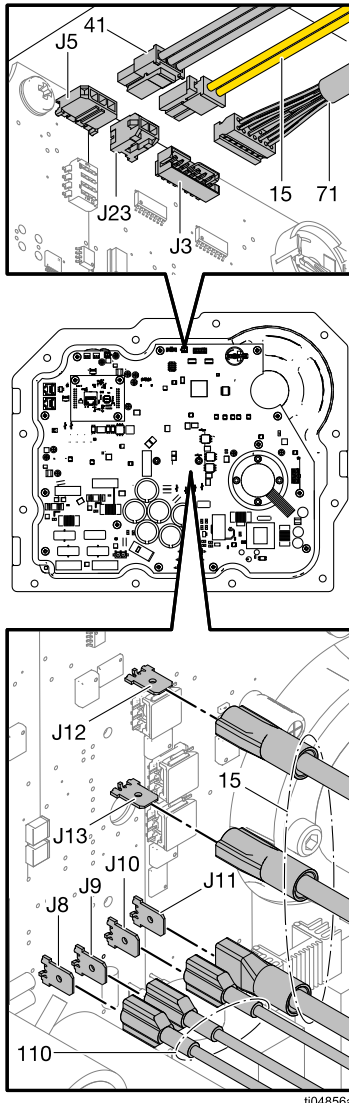


FIG. 35

FIG. 36:

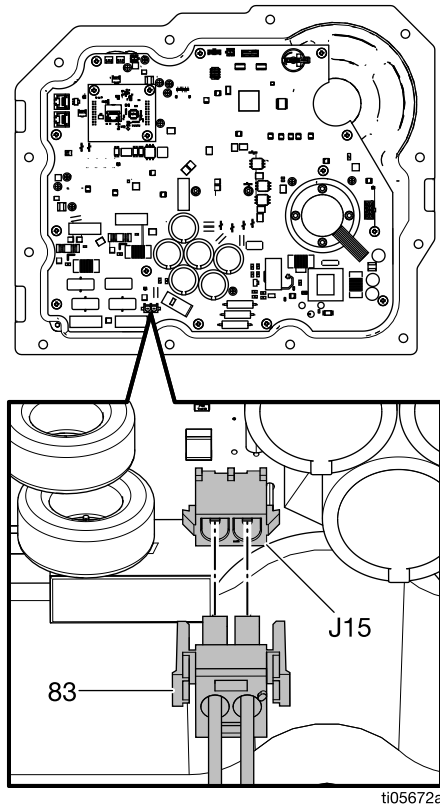


FIG. 37

***NOTE:** DC Link inductor is only installed on 5HP models. For 3HP models verify jumper is installed in this location.

2. Set the electronics cover and control board aside.

Install the New Control Board

1. Toggle the Dip Switches.

To calibrate the unit, you must toggle two dip switch on the control board. DIP switch 1 will calibrate the encoder and DIP switch 2 will calibrate the stroke. These switches located on the upper control board to calibrate the unit. Reset either dip switch by toggling it to the opposite state. This signals the control board that a replacement part has been installed. The next time the unit is powered, it runs an automatic calibration sequence.

NOTE: If you are performing more than one repair procedure, the dip switch only needs to be toggled into the opposite state once.

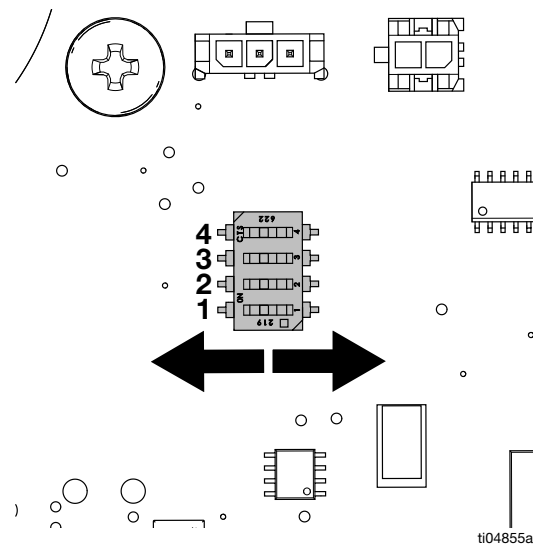


FIG. 38: Dip Switch




2. Plug the position sensor (J5), encoder (J3), motor temperature sensor (J23), Ethernet (107), motor wires (J10, J11, J12), AC input wires (J8, J9, J10), and DC Link inductor* (J15).
3. Ensure all wires are placed in a location that do not interfere with the installation of the cover to the main house.
4. Verify not wires are pinched between the cover and main housing surface.

Reset the Dip Switch

To calibrate the unit, you must toggle a dip switch on the control board. There are two dip switches located on the upper control board to calibrate the unit. Reset either dip switch by toggling it to the opposite state. This signals the control board that a replacement part has been installed. The next time the unit is powered, it runs an automatic calibration sequence.

NOTE: If you are performing more than one repair procedure, the dip switch only needs to be toggled into the opposite state once.

Reinstall the Electronics Cover

				
<p>Be sure that no wires are pinched between the electronics cover and the motor housing. Pinched wires may damage the control board and will impair explosion-proof safety.</p>				

1. Reinstall the electronics cover onto the center housing.
2. Using a 6 mm hex wrench, install the 12 bolts.

NOTE: Ensure that the lock washers are still in place.

3. Torque the bolts to 22 ft-lb (30 N•m).

Apply Power to the Unit

1. Apply power to the unit to start the automatic calibration process. The motor output shaft runs up and down over the course of several minutes. Halfway through the automatic calibration process, the motor output shaft pauses as it moves to the next step.
2. Ensure that the automatic calibration process is complete before you continue.

Reattach the Pump Lower

1. Jog the output shaft on the pump lower and reconnect the coupling nut.
2. Torque to the proper level according to the appropriate pump manual.

Encoder Replacement Kit 2004276



Overview

The E-Flo DCi uses the encoder for two purposes:

- The encoder informs the control board where the motor is in its mechanical rotation and uses that information to properly control the motor torque.
- The encoder controls stroke length by allowing the control board to count the number of complete motor rotations.

Remove the Electronics Cover

NOTICE

To avoid equipment damage, carefully support the cover when removing the last bolt. Hold the cover horizontally and take care that the wires are not pulled tight.

1. Follow **Prepare to Remove the Rack**, page 9
2. Follow the instructions in **Prepare for Repair**, page 8.
3. Using a 6 mm hex wrench, remove the 20 bolts that hold the electronics cover.

4. Support the cover after the bolts are removed to prevent excess strain on the wires inside the E-Flo DCi.

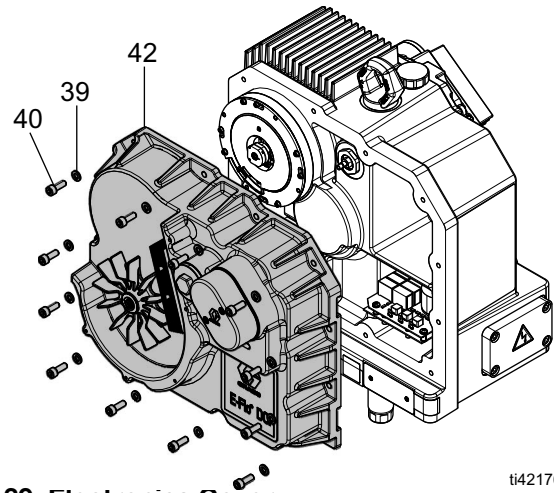


FIG. 39: Electronics Cover

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Remove the Encoder

1. Unplug the cable from the encoder (76).

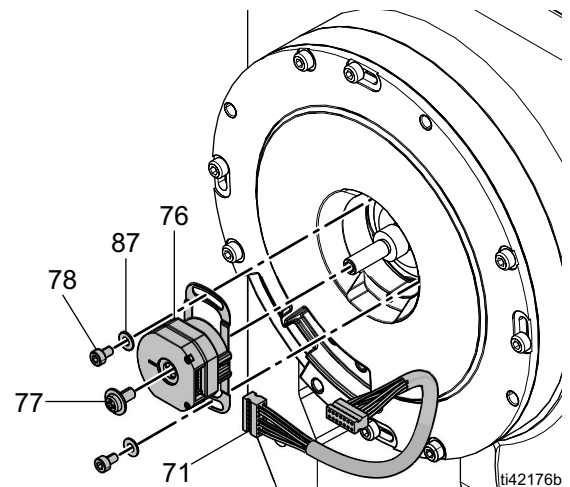


FIG. 40: Encoder

ti42176b

71	Encoder cable
76	Encoder
77	Pan screw
78	Fastener, M3x.5 5mm Length
87	Flat Washer, Flat, M3 DIN 125

- Using a phillips screwdriver, remove pan screw (77) from encoder shaft.
- Using a hex wrench, remove the two encoder mounting screws (78) and washers (87).
- Pull the encoder off the rotor shaft.

Install the Encoder

- Place the encoder connector cable (AE).
- Slide the new encoder onto the rotor shaft.
- Install encoder mounting screws (78) and washers (87). Torque encoder mounting screws (78) to 8-9 in-lb.
- Apply small amount of blue (medium) thread locker to pan screw (77). Install pan screw (77) onto rotor shaft. Torque to 8-9 in-lb (1 N•m)

Recalibrate Unit

To calibrate the unit, you must toggle a dip switch on the control board. There are two dip switches located on the upper control board to calibrate the unit. Reset either dip switch by toggling it to the opposite state. This signals the control board that a replacement part has been installed. The next time the unit is powered, it runs an automatic calibration sequence.

NOTE: If you are performing more than one repair procedure, the dip switch only needs to be toggled into the opposite state once.

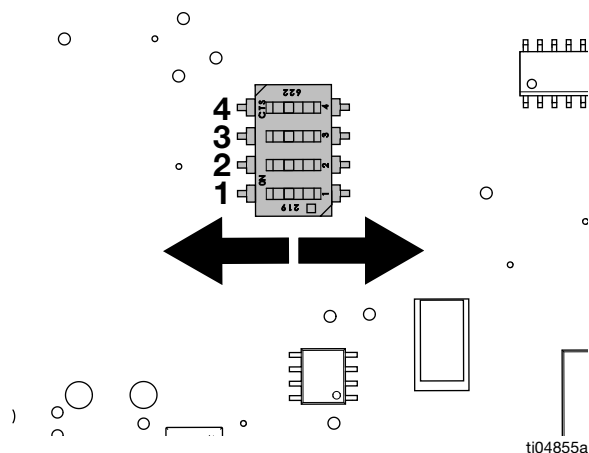


FIG. 41

Reinstall the Electronics Cover

Be sure that no wires are pinched between the electronics cover and the motor housing. Pinched wires may damage the control board and will impair explosion-proof safety.				

- Reinstall the electronics cover onto the center housing.
- Using a 6 mm hex wrench, install the 10 bolts.

NOTE: Ensure that the lock washers are still in place.

- Torque the bolts to 15-20 ft-lb (20-27 N•m) .

Reinstall the Motor Shroud

- Reinstall the motor shroud (37).
- Apply a small amount of blue (medium) thread locker to screws (28 and 60). Ensure spacers (59) are located underneath motor shroud (37), between motor shroud and motor housing.
- Torque screws 28 and 60 to 8-9 in-lb (1 N•m).

Apply Power to the Motor

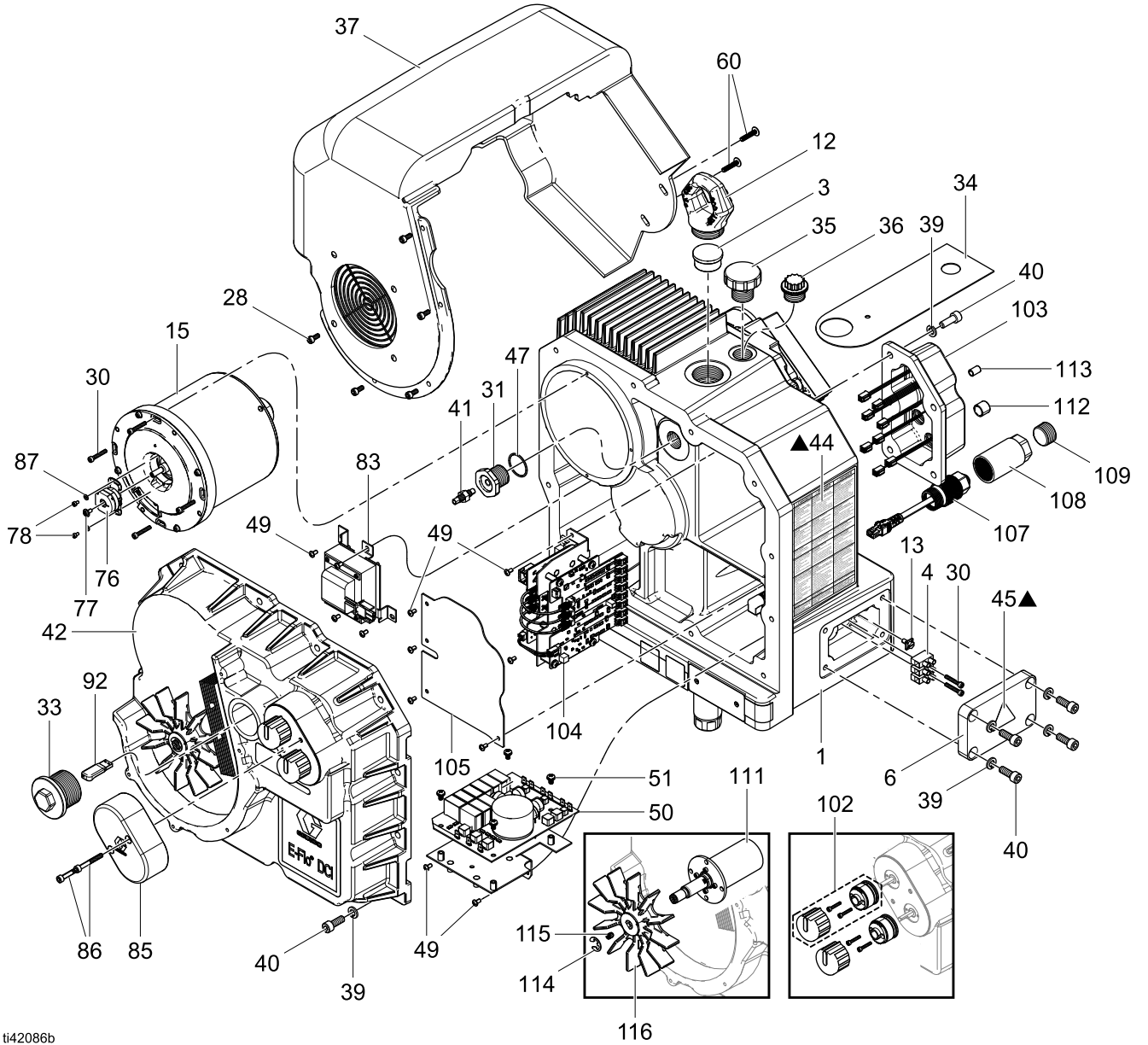
- Apply power to the motor to start the automatic calibration process.
- Wait for the motor to go through the calibration sequence.
- Ensure that the automatic calibration process is complete before you continue.

Reattach the Pump Lower

- Jog the output shaft on the pump lower and reconnect the coupling nut.
- Torque to the proper level according to the appropriate pump manual.

Parts

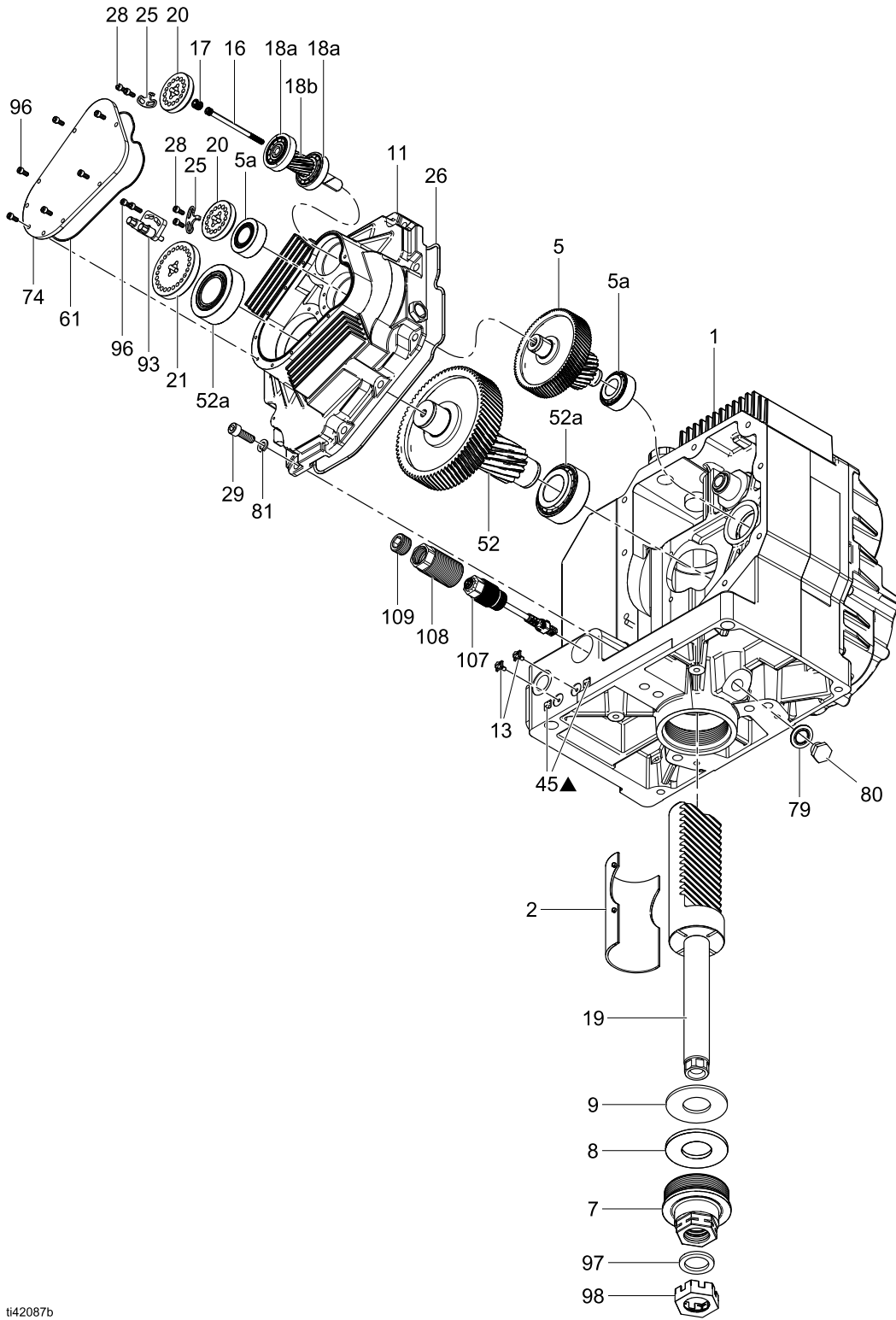
DCI Motor YM1152 Page 1 of 2



ti42086b

FIG. 42

DCI Motor YM1152 Page 2 of 2



ti42087b

FIG. 43

DCI Motor Parts List

NOTE: This supply unit is to be used for the single heat model.

Ref.	Part	Description	Qty.
001	-----	HOUSING, machining main, EFLO-DCI	1
002o	19Y398	Rack Bearing	1
003	-----	BUMPER, machined	1
004	-----	BLOCK, terminal	1
005o	19Y422	GEAR, assy, 1st stage	1
006	16H090	COVER, electronics, painted	1
007xo	19Y401	BEARING, shaft, assy	1
008xo	19Y402	Bumper, lower	1
009xo	19Y403	WASHER, support	1
011	-----	COVER, machined, gearbox, EFLO-DCI	1
012	-----	RING, lift, SST 1 9/16 THRD	1
013	-----	SCREW, ground M5-.8X12mm	3
014	-----	SIGHTGLASS	1
015	-----	MOTOR, EFLO, M165	1
016o	-----	Bolt, Pinion	1
017o	2009547	Set Screw, Pinion	1
018o	-----	SHAFT, motor, gear, assy	1
018ao	-----	PINION	1
018bo	-----	RACE, tapered	2
019xo	19Y513	RACK, assembly, HF, EFLO-DCI	1
020o	20A231	ADJUSTER, bearing, 1st, stage, DCI	2
021o	20A348	ADJUSTER, bearing, 2nd, stage, DCI	1
023	-----	PLATE, blank, aluminum	1
024	-----	RIVET, pop	2
025o	20A681	LOCK, adjuster, bearing	3
026o	20A687	GASKET, O-ring, molded	1
028	-----	SCREW, SHCS, M5-.8X12mm, Class 8.8, Zinc plated	17
029	-----	SCREW, SHCS, M10-1.5X30mm, Class 12.9, Zinc plated	17
030	-----	SCREW, SHCS, M4-.7X25mm Class 12.9, Electroless Nickel	10
031	-----	ADAPTER, hall, high force	6
032❖	20A781	COVER, electronic, EFLO-DCI, 3 HP, 5 HP	1
033❖	20A500	PLUG, port, USB	1
034	-----	LABEL, hang tag, replace oil cap	1
035	15H525	CAP. fill	1
036	-----	CAP, plug, threaded	1
037	-----	SHROUD, fan, assembly, EFLO-DCI	1

Ref.	Part	Description	Qty.
038	-----	GLAND, hazloc, 1/2 in. NPT	1
039❖	104572	WASHER, lock spring	16
040❖	20B001	SCREW, SHCS, M8-1.25X22mm, Class 12.9, Zinc plated	16
041❖	24W120	SENSOR, stroke, position	1
042	-----	Electronic cover	1
043❖	-----	LABEL, product, E-FLO, DCI	1
044▲	-----	LABEL, warning, E-FLO, DCI	1
045▲	-----	LABEL, warning	1
047	-----	O-RING, 024 buna-n	1
048	-----	BRACKET, EMC, board, EFLO-DCI	1
049	-----	SCREW, Pan Head, 8-23X.312, Zinc Plated	6
050	-----	BOARD, assy, E-FLO DCI filter	
051	-----	Screw, Pan head with Washer, M5-.8 X 6mm, Zinc Plated	8
052o	19Y423	GEAR, assy, stage, 2.5HP, EFLO	1
055+	2007670	LUBRICANT, oil, gear	.5
059	-----	Spacer, M5 X 6mm, Polyethylene	2
060	-----	Screw, Flanged, M5-.8 X 25mm, Class 10.9, Black Oxide	2
061o	20A630	GASKET, cover, adjuster, bearing	1
065	-----	CABLE, assy, [power]	1
071★	19Y400	CABLE, encoder	1
073	-----	STRAP, tie, wiring	1
074	-----	COVER, painted, adjuster, bearing	1
075	-----	ARTWORK, identification, E-FLO, DCI	1
076★	19Y519	ENCODER, quantum, 60 pole	1
077★	114993	Screw, Panhead, M4-.7 X 8mm, Class 4.8, Zinc Plated	1
078★	20B557	Screw, SHCS, M5-.5 X 5mm, Class 12.9, Zinc Plated	2
079+	17T713	WASHER, sealing	1
080+	17Z201	PLUG, oil, drain	1
081	-----	WASHER, lock	10
082	-----	PIN, dowel	1
083	-----	INDUCTOR, assembly, EFLO-DCI, 5HP	1
084	-----	CLAMP, ferrite	2
085◆	20A749	COVER, lock, knob, EFLO-DCI	1
086◆	18H015	Screw, SHCS, M5-.8 X 40mm, 316 Stainless Steel	2
087★	-----	WASHER, flat, M3 DIN 125	2

Parts

Ref.	Part	Description	Qty.
092❖ ✿	19Y500	FLASH, drive, 8GB SANDISK	1
093o	200245 4	PLATE, assy, retainer	1
096	-----	Screw, SHCS, M5-.8 X 16mm, Class 8.8, Zinc Plated	8
097-	161569	SEAL, wiper, felt	1
098-	200426 5	CAP, wiper	1
102	16U113	Knob replacement kit	2
106✿		Jumper	1

✘ *Included in Rack Replacement Kit 2004535*

▲ *Replacement safety labels, tags, and cards are available at no cost.*

❖ *Included in Board Replacement/E-cover-5HP Kit 2004279*

★ *Included in DCI encoder Kit 2004276*

✚ *Included in Oil Kit 20A933*

◆ *Included in Knob Cover Replacement Kit 20A749*

- *Included in Felt Wiper Kit 2004266*

o *Included in Gear and Rack Kit (2009668)*

✿ *Included in Board Replacement/E-cover-3HP Kit 2004323*

Technical Specifications

E-Flo DCi Motor		
YM1032 and YM1034	3 HP, 380–480 VAC, 3 phase, 50/60 Hz, 3.4 kVA	
YM1052 and YM1054	5 HP, 380–480 VAC, 3 phase, 50/60 Hz, 5.7 kVA	
Maximum force	U.S.	Metric
YM1032 and YM1034	4400 lbf	19572 N
YM1052 and YM1054	7800 lbf	34696 N
Maximum Potential Fluid Pressure		
YM1032 and YM1034	670000/v (volume of lower in cc) = psi	46200/v (volume of lower in cc) = bar
YM1052 and YM1054	1190000/v (volume of lower in cc) = psi	82000/v (volume of lower in cc) = bar
Maximum continuous cycle rate	20 cycles per minute	
Power inlet port size	3/4–14 npt(f)	
Ambient temperature range	32–104°F	0–40°C
Maximum fluid temperature	Refer to your pump manual.	
Sound data	Less than 75 dB(A)	
Oil capacity	2.0 quarts	1.9 liters
Oil specification	Graco Part Number 20A933 ISO 460 silicone-free high-pressure synthetic gear oil	
Weight	163 lb	74 kg

California Proposition 65

CALIFORNIA RESIDENTS

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Original instructions. This manual contains English. MM 3A8815

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Revision C, March 2026