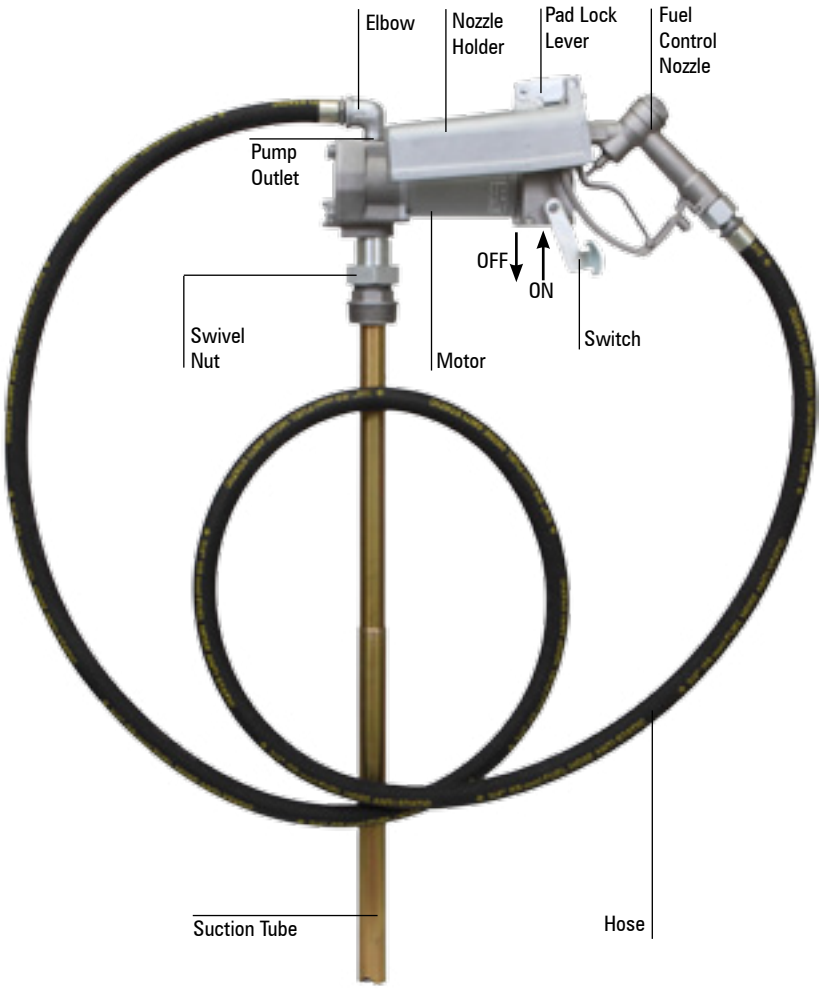
INSTRUCTION MANUAL S1590, Rev C

Electric Fuel Pump

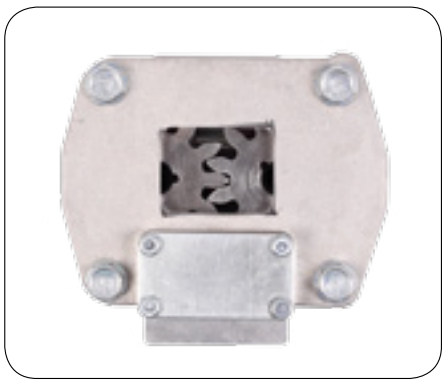
FPM

FPM-12, FPM-12/HF, FPM-24, FPM-115, FPM-220

Congratulations on purchase of this World Class Electric Fuel Pump!



This is an Electric Fuel Pump. Pump uses 2 Sintered Powder Metal gears for suction & is designed for use with Gasoline, Diesel, E15 Fuel, Kerosene, Bio Diesel (B20) etc. In ideal laboratory conditions, pump dispenses up to 15 GPM (57 LPM) at the pump outlet. The actual discharge varies depending on fuel being used, temperature, Hose Length, power supply etc.



Inside of Pump

Pump Comes in 4 Power Ratings

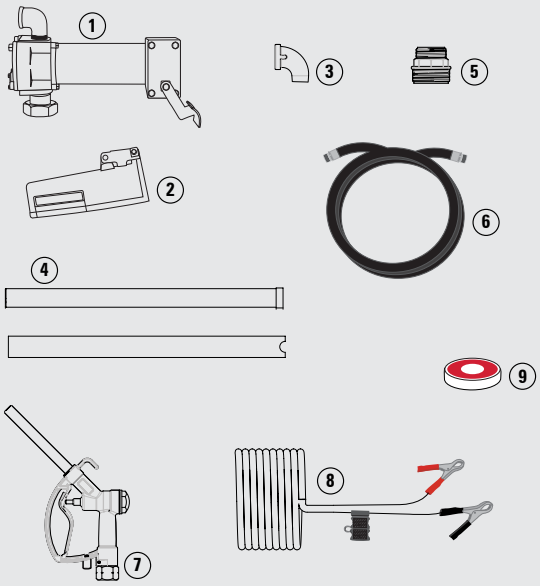
- 12V DC
- 24V DC
- 115V AC, 60 Hz.
- 220V AC, 50/ 60 Hz

Rating is marked on the pump motor.
Pump uses an Explosion Proof motor & the motor is UL , cUL, ATEX & IECEx listed.

PUMP CONSTITUENTS

1. Pump & Motor Assembly
2. Nozzle Holder
3. Elbow
4. Suction Tube (2 parts)
5. Bung Nut
6. Hose Assembly (12' Long x ¾" ID Anti Static Hose)
7. Fuel Control Nozzle
8. Power Cord complete with Fuse & Clamps*
9. Teflon Tape

*Only included on DC pumps.
AC pumps are supplied without power cord.

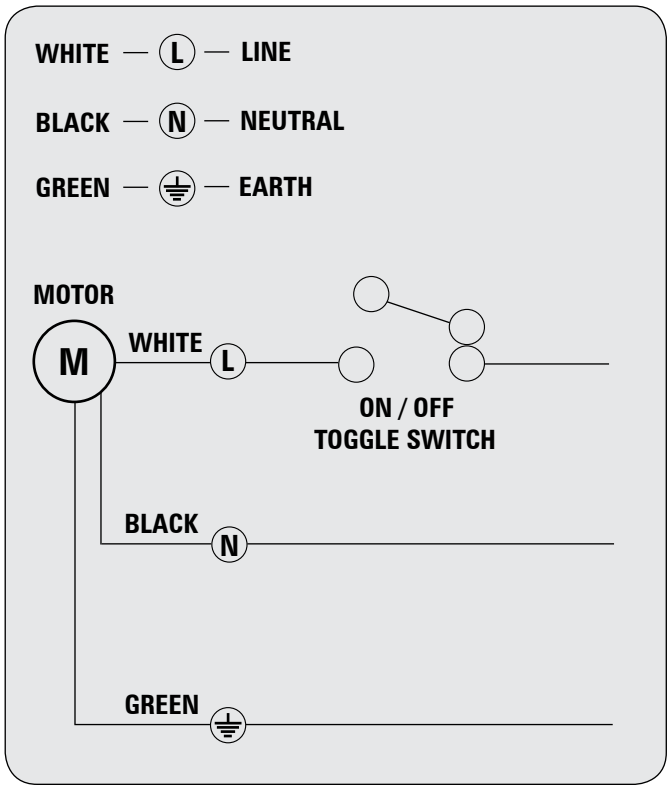


ELECTRICAL INSTALLATION - AC & DC MOTORS

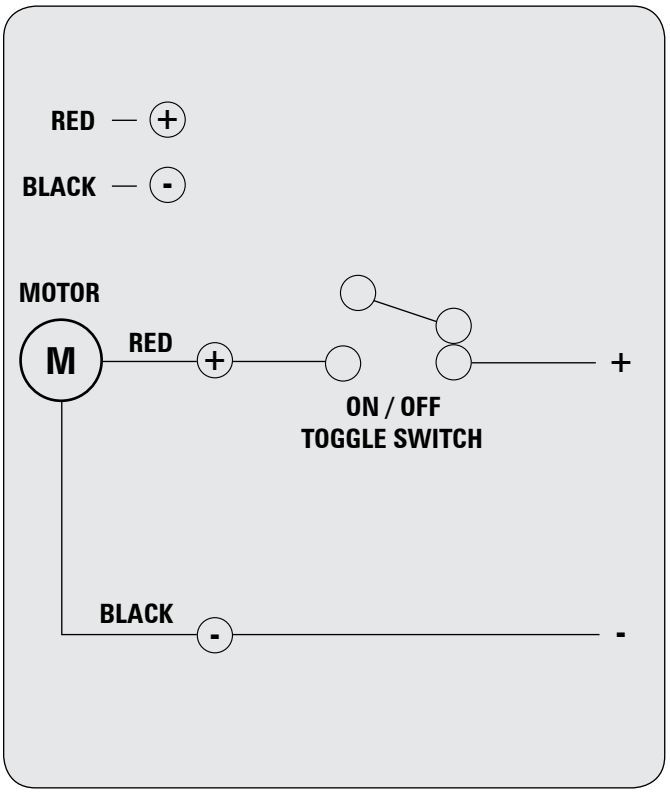
Cable systems and accessories should be installed in positions that prevent them from being subject to mechanical damage, corrosion, chemical attack, heat and other detrimental environmental conditions. Selection of the wiring system and cable type must consider these influences and where exposure to such conditions are avoidable, protective measures such as minimizing the risk of mechanical damage by the use of appropriate armoured cable types should be considered.

Filed wiring shall comply with requirement stated article 501 in National Electrical Code (NEC) for Class I, Division 1 Location.

ELECTRICAL DIAGRAM FOR AC MOTOR



ELECTRICAL DIAGRAM FOR DC MOTOR



ASSEMBLY & INSTALLATION

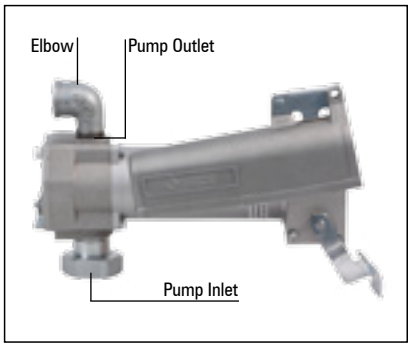
Ensure tank / drum being used is clean & free of welding slag. Ensure the tank is vented to allow air into the tank as fuel is being pumped out. Failure to provide a vent will cause priming problems

1. Wrap around Teflon tape on the following male threaded joints. This will ensure a leak-proof connection

   - Male Threads on the Elbow
   - Male Threads on the Fitting ends of the Hose
   - Male threads between the 2 Suction Tube parts
   - Male threads on the Suction tube end that fits into the pump inlet

2. Assemble the Nozzle Holder with the pump. In order to do so, open the 2 bolts on top of the On / Off Switch. Remove the bolts & re-attach along with the nozzle holder

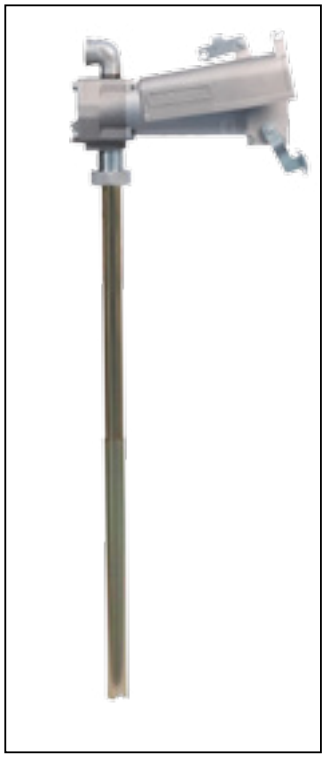
3. Now Fasten the Elbow into the pump outlet & hand tighten. Once you can no longer hand tighten, take a wrench & tighten the elbow by about ½ a turn.



4. Take the Bung Nut & fasten it onto the 2" opening on the Drum/ Tank. Bung Nut has a large 2" thread & a small 1-1/2" thread. 2" thread goes into the drum/ tank, whereas the 1-1/2" thread is for connecting bung to the pump

5. In case the Bung Nut does not fit onto your drum/ tank, use a Drum Bung Converter. Note that bung supplied with the pump has 2" Pipe threads

6. Connect the two halves of the Suction Tube. Suction tube is designed for use with tanks / drums which are 36" (914 mm) deep & has a total connected length of 34" (865 mm). In case you are installing the pump on a tank that is deeper, you would have to get a standard 1" dia. tube with 1" NPT threads on one end. Suction tubes longer than 5' (1.52 m) require a foot valve (not provided) at the bottom of the tube to prevent loss of prime. For shallower drums, cut the suction tube to the desired length. Ensure that there is about 2" (50 mm) gap between the bottom of the tank/drum & inlet of the suction tube allowing for easy entry of fuel into the tube. Now connect the Suction Tube to the pump inlet. Hand tighten



7. Lift the Pump from the motor. Be careful as the assembly is heavy. Insert suction tube into the drum through the 2" opening on the drum. Use the Swivel Nut mounted at the pump inlet to fasten onto the Bung Nut. Hand tighten

8. Take the Fuel being dispensed & pour it into the pump outlet, until completely filled. This will ensure that the gear chamber stays lubricated & makes it easier for the pump to prime

9. Take the Hose Assembly & connect the threaded end onto the Elbow at the pump outlet. Hose has a hex nut at the threaded end which can be tightened to the elbow using a wrench

10. Connect the other end of the Hose to the Fuel Control Nozzle

11. Connect Power cord to source of power & switch it ON

12. The pump is now ready for use

PRIMING

All pump models using the supplied 34" (865mm) suction tube should prime within 10 seconds after pump is turned on. Pumps installed at a height upto 5' (1.52 m) may have difficulty in priming. Follow the procedure below to initiate priming. Pumps installed at a suction height above 5' (1.52m) may have difficulty in holding prime. It is recommended that a foot valve with ball check (not supplied with the pump) be added to the bottom of the suction tube to maintain prime

1. Remove the Elbow from the pump outlet
2. Pour fuel being pumped into the pump outlet until completely filled
3. Re-assemble the Elbow back into the pump outlet & turn the pump on. Pump should get primed in less than 10 seconds
4. If pump still does not gain prime, check for any major leaks in the system. If no leaks are found , then the pump is mechanically defective & should be reported back to your Distributor

PUMP OPERATION

1. Remove Nozzle from the Nozzle Holder. The On\ Off switch can be Switched ON only once the nozzle is removed from the nozzle holder

2. Nozzle should be facing the container into which Fuel is to be dispensed

3. Pump On/Off Switch Lever is located under the nozzle holder. Move switch lever ON & simultaneously open the Nozzle

Pump in ON Position

4. In less than 10 seconds, the pump will be primed & fuel will start dispensing from the Nozzle

5. Dispensing Action can be stopped by closing the Nozzle, with the pump still ON. This however must not be done for more than 5 minutes. **DO NOT operate the pump for more than 30 minutes continuously in 1 hour**

6. It is best practice to Switch Lever in the OFF position to stop dispensing

7. **The pump must never be run dry (no media in the drum) as that can possibly cause irreparable damage to the motor**

8. Once Dispensing is completed, switch off the Lever & disconnect power supply to the pump

9. Store the Nozzle Back into the Nozzle Holder

WARNING
Do not use curb pump auto nozzle with this pump. Contact your distributor for auto nozzles for use with electric fuel pumps

MAINTENANCE

1. Clean Inlet Strainer after every 50 hours of operation

2. Inlet strainer is easily accessible without having to dis-assemble the pump. Strainer is installed just above the pump inlet & can be accessed by removing the 4 bolts on the side of the pump holding the Strainer cover

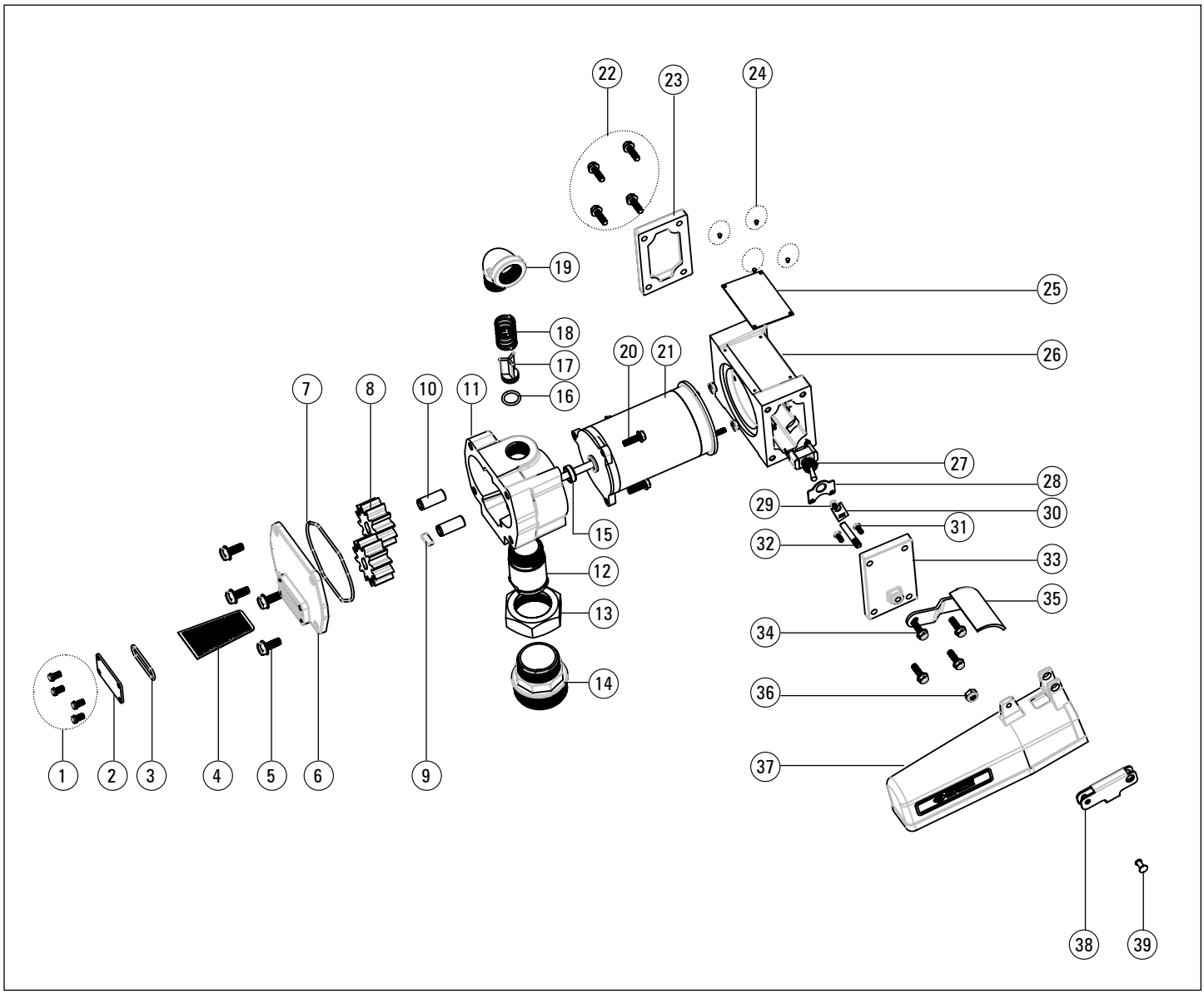
3. Remove & clean strainer

4. If strainer is excessively dirty, clean tank to protect pump and the equipment being fuelled

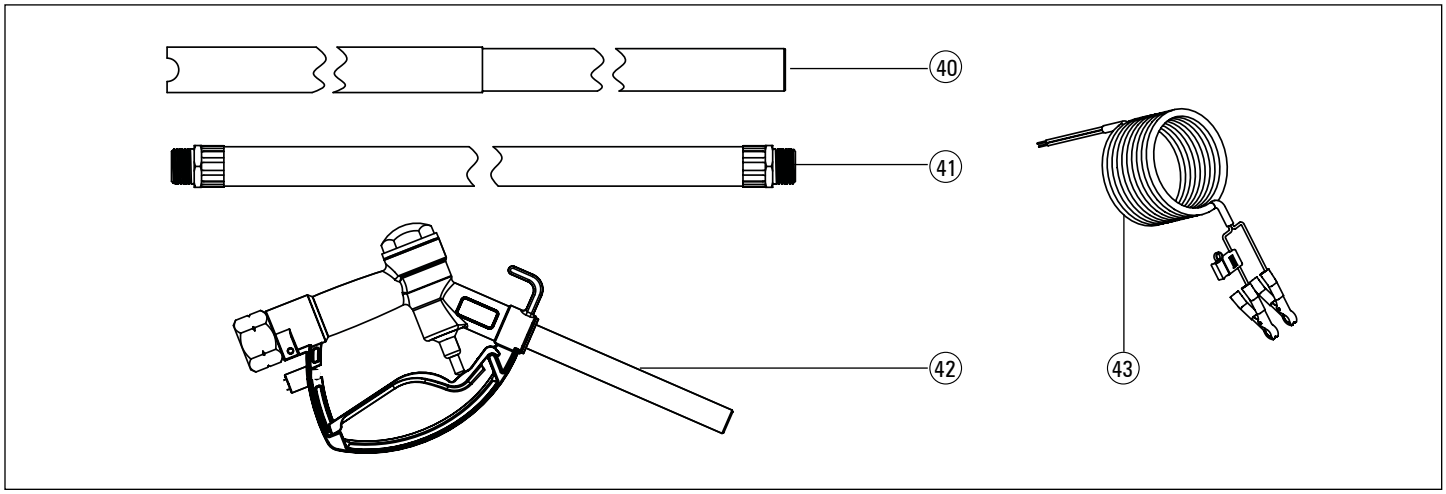
5. After cleaning strainer, replace strainer & cover. Make sure cover seal is in place

PARTS DRAWING FOR FPM-12, FPM-12/HF, FPM-24, FPM-115, FPM-220

PUMP ASSEMBLY



HOSE, SUCTION TUBE, POWER CABLE & FUEL CONTROL NOZZLE ASSEMBLY



PARTS LIST FOR FPM-12, FPM-12/HF, FPM-24, FPM-115, FPM-220

PUMP ASSEMBLY

REFERENCE NUMBER	DESCRIPTION	QUANTITY
1	Thread Forming Bolt M4	4
2	Cover (Strainer)	1
3	O-Ring	1
4	Strainer	1
5	Thread Forming Bolt M8	4
6	Housing Cover	1
7	O-Ring	1
8	Gear	2
9	Key Gear	1
10	Shaft (Gear)	2
11	Housing (Machined)	1
12	Fitting (Bung)	1
13	Swivel Nut	1
14	Bung Adaptor	1
15	Seal (Metal Inserted)	1
16	O-Ring (Viton)	1
17	Bypass Valve	1
18	Spring (Bypass Valve)	1
19	Elbow	1
20	Thread Forming Bolt M6	9
21	Electrical Motor	1
22	Thread Forming Bolt M4	4
23	Electrical Cover (M/C)	1
24	Drive Screw U Type	4
25	Label	1
26	Electrical Housing (M/C)	1
27	On Off Toggle Switch (SPST) with Spade Terminal (15 AMPS, 250V)	1
28	Bracket (Switch)	1
29	Screw (CAM)	2
30	Cam (Switch)	1
31	Thread Forming Bolt Screw M4	2
32	Shaft (Lever)	1
33	Switch Cover (M/C)	1
34	Thread Forming Bolt M6	4
35	Lever	1
36	Nylock Nut	1
37	Cover Nozzle	1
38	Lock	1
39	Rivet	1
HOSE, SUCTION TUBE, POWER CABLE & FUEL CONTROL NOZZLE ASSEMBLY		
40	Suction Tube	1
41	Hose Assembly	1
42	Fuel Control Nozzle	1
43	Power Cable Assembly (Only for DC Pumps)	1

PUMP SPECIFICATION

	FPM-12	FPM-12/HF	FPM-24	FPM-115	FPM-220
Description	Heavy Duty 12V DC	High Flow 12V DC	Heavy Duty 24V DC	Heavy Duty 115V AC	Heavy Duty 220V AC
Flow Rate*	Up to 15 GPM (57 LPM)	Up to 20 GPM (76 LPM)	Up to 15 GPM (57 LPM)	Up to 15 GPM (57 LPM)	Up to 15 GPM (57 LPM)
Explosion Proof Motor	1/7 HP 12V DC	1/7 HP 12V DC	1/7 HP 24V DC	1/8 HP 115V AC, 60 Hz.	1/8 HP 220V AC, 50/60 Hz.
Amp draw from Battery	12 Amp	15 amp	6 amp	1.7 Amp	1 Amp
Internal Bypass Valve	Yes	Yes	Yes	Yes	Yes
Suction Pipe	2 pc threaded	2 pc threaded	2 pc threaded	2 pc threaded	2 pc threaded
Hose	¾" x 12' Anti Static Hose	1" x 12' Anti Static Hose	¾" x 12' Anti Static Hose	¾" x 12' Anti Static Hose	¾" x 12' Anti Static Hose
Tank Adaptor	2" Threaded	2" Threaded	2" Threaded	2" Threaded	2" Threaded
Inlet	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT
Outlet	¾" NPT	1" NPT	¾" NPT	¾" NPT	¾" NPT
Dispensing Nozzle	¾" Manual with Swivel	1" Manual with Swivel	¾" Manual with Swivel	¾" Manual with Swivel	¾" Manual with Swivel
Battery Cable (2 wire)	15'	15'	15'	NA	NA
*** measured in lab conditions at pump outlet using Diesel with vehicle engine switched on**					

WETTED COMPONENTS
Aluminium, Steel, Cast Iron, Nylon, NBR, Zinc, Viton, Polypropylene

RECOMMENDED USE
Gasoline, Diesel, E15 Fuel, Kerosene, Bio Diesel (B20)

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Motor runs but pump will not prime	Motor rotation wrong. (12 VDC and 24 VDC units only)	Check wiring instructions for possible problems
	Missing relief valve o-ring seal (16)	Remove gear cover (6), inspect seal, replace if missing or damaged
	Sheared drive key (9)	Remove cover (6) and inspect key, replace if worn or sheared
	Dirt under by-pass valve (17) or seal (16)	Remove cover (6) and inspect, clean or replace if damaged
	Strainer seal (3) leaking	Inspect and replace if damaged
	Suction height too high to prime	See Priming Pump, page 5
	Worn or damaged gears (8)	Remove cover (6) and inspect gears. Replace if worn or damaged
	Fuel level low	Refill tank
	Cover seal (7) damaged	Replace if worn or damaged
	Inlet strainer (4) clogged	Remove and clean or replace
	Air leak in suction tube (40)	Inspect all joints in suction tube. Make sure all joints in suction tube are sealed and that there are no cracks from over-tightening
	Air lock in system	This may occur if filter or meter or automatic shut-off nozzle is used. If this occurs, fill pump and meter with fuel through top of pump
	Motor does not run at proper speed	Check electric connections. Check supply voltage for proper voltage level
	Curb Pump Auto Nozzle used	Change to Auto Nozzle for use with Electric Fuel Pumps
Unit pumps but output flow is low	Clogged inlet strainer (4)	Clean or replace
	Air leak in suction tube (40)	Check to make sure all joints in suction tube are sealed and that there are no cracks
	Suction tube (40) too close to tank bottom	Suction tube must have a 2 in. (50 mm) minimum clearance
	Tank empty	Refill tank
	Tank not vented	Tank must be vented to atmosphere
	Worn or damaged gears (8)	Remove cover (6) and inspect gears. Replace if worn or damaged
	Damaged motor (21)	Replace motor
	Clogged suction tube (40), hose (41) or nozzle (42)	Inspect and clean
	Curb Pump Auto Nozzle used	Change to Auto Nozzle for use with Electric Fuel Pumps
Motor stalls when nozzle is closed	Bypass relief valve (17) stuck	Inspect relief valve, making sure poppet is free. Replace if damaged
	Low supply voltage	Check supply voltage
	Gears (8) damaged and binding	Inspect gears. Gears should turn freely. Replace if damaged
	Faulty motor (21)	Replace motor
Fuel leaking in motor mount	Faulty or damaged motor shaft seal (15)	Replace shaft seal
	Operating pump extended time with nozzle closed	Do not exceed 5 minutes of operation with nozzle closed
	Motor shaft worn	Replace motor if shaft has worn in seal area
Motor overheating	Gears (8) binding	Check to make sure gears turn freely on shaft
	Operating pump extended time with nozzle closed	Do not exceed 5 minutes of operation with nozzle closed
	Clogged inlet strainer (4)	Clean or replace, see Maintenance, page 5
	Clogged suction tube (40), hose (41) or nozzle (42)	Inspect and clean if required
	Operating pump more than 30 minutes continuous duty	Limit operation to 30 minutes per hour
Switch will not turn pump on	Blown fuse	Replace fuse. 30 amp automotive fuse
	Electrical problem	Check that supply voltage is proper and getting to pump
	Defective switch (27)	Check and replace if defective
	Mechanical problem	Check switch actuator cam. Cam should be actuating the switch
	Damaged or defective motor (21)	Check motor, replace if damaged or defective

REPLACEMENT & SERVICE PARTS PROGRAM FOR ELECTRIC FUEL PUMPS

REPLACEMENT PARTS PROGRAM

REFERENCE # FROM OIPM	GROZ PART #	DESCRIPTION
21A	MOT/FPM/12	Motor, 12V DC
21B	MOT/FPM/12/HF	Motor, 12V DC HF
21C	MOT/FPM/24	Motor, 24V DC
21D	MOT/FPM/115	Motor, 115V AC, 60 Hz
21E	MOT/FPM/220	Motor, 220V AC, 60 Hz
14	ADP/BNG/FPM/12	Bung Adaptor
40	FPM/2R/N	Suction Tube
41A	SA/HOS/FPM/12	Hose Assembly
41B	SA/HOS/FPM/12/HF	Hose Assembly, HF
42A	SA/FCN/S/3-4/FPM/N	Fuel Control Nozzle
42B	SA/FCN/S/0-1/FPM/N	Fuel Control Nozzle, HF

SERVICE PARTS PROGRAM

KIT PART #	KIT DESCRIPTION	CONSTITUENT PART #	CONSTITUENT DESCRIPTION	CONSTITUENT REFERENCE FROM OIPM	QTY. PER KIT
FPM/KIT/SK	Seal Kit	ORG/BS154	O Ring	7	1
		ORG/V/BS809	O Ring (Viton)	16	1
		ORG/BS126	O Ring	3	1
		SEL/FPM/12	Seal (Metal Inserted)	15	1
FPM/KIT/GK	Gear Kit	GEAR/FPM/12	Gear	8	2
		KEY/GEAR/FPM/12	Key (Gear)	9	1
FPM/KIT/SA/DC	Switch Assembly Kit for DC Pumps	CAM/SWH/FPM/12	Cam (Switch)	30	1
		CVR/NZL/FPM/12	Cover (Nozzle)	37	1
		LVR/FPM/12	Lever	35	1
		BKT/SWH/FPM/12	Bracket (Switch)	28	1
		SCR/CAM/FPM/12	Screw (CAM)	29	2
		SFT/LVR/FPM/12	Shaft (Lever)	32	1
		CVR/SWH/FPM/12	Switch Cover (M/C)	33	1
		NN/M6/RP-G	Nylock Nut	36	1
		LOC/FPM/12	Lock	38	1
		RVT/FPM/12	Rivet	39	1
		TFS/M4/FPM/12	Thread Forming Bolt Screw M4	31	2
		SWH/FPM/12	On Off Toggle Switch for DC Pumps	27	1
FPM/KIT/SA/AC	Switch Assembly Kit for AC Pumps	CAM/SWH/FPM/12	Cam (Switch)	30	1
		CVR/NZL/FPM/12	Cover (Nozzle)	37	1
		LVR/FPM/12	Lever	35	1
		BKT/SWH/FPM/12	Bracket (Switch)	28	1
		SCR/CAM/FPM/12	Screw (CAM)	29	2
		SFT/LVR/FPM/12	Shaft (Lever)	32	1
		CVR/SWH/FPM/12	Switch Cover (M/C)	33	1
		NN/M6/RP-G	Nylock Nut	36	1
		LOC/FPM/12	Lock	38	1
		RVT/FPM/12	Rivet	39	1
		TFS/M4/FPM/12	Thread Forming Bolt Screw M4	31	2
		SWH/FPM/115	On Off Toggle Switch for AC Pumps	27	1
FPM/KIT/PC	Power Cable Assembly Kit	SA/PCLE/FPM/12/HF	Power Cable	43	1

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