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DM100-01-BD BIODIESEL FUEL METER

INSTRUCTION MANUAL

INTRODUCTION

Thank you for purchasing a Macnaught DM100-01-BD Positive Displacement Bio-diesel Fuel Meter.

This oval gear fuel meter is ideally suited for use in applications such as, gravity feed, in line or with the range of Macnaught electric fuel pumps.

Please read and retain this instruction manual to assist you in the operation and maintenance of this quality product.

GENERAL INFORMATION

This manual will assist you in operating and maintaining your new DM100-01-BD Fuel Meter and will help ensure many years of dependable performance and trouble free operation.

If you experience problems with this product, refer to the Maintenance and Trouble Shooting sections of this manual or contact your local Macnaught Service Centre.



IMPORTANT INFORMATION

Macnaught recommends, that as added protection to your equipment you install a Macnaught fuel filter assembly in line before the inlet of your DM Fuel Meter. Contact your local Macnaught distributor for further details.



CAUTION

Observe precautions against fire or explosion when dispensing flammable liquid. Do not operate the meter in the presence of any source of ignition including running of hot engines, lighted cigarettes or gas or electric heaters.

Ensure that you follow all the correct earthing and grounding procedures before use.

Inspect seals and connections for leaks weekly when using flammable liquids.

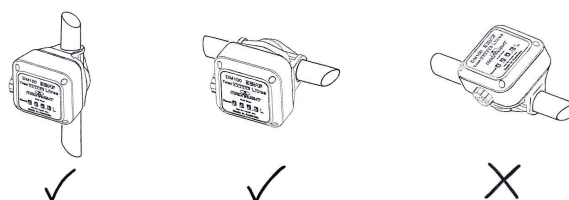
Do not use teflon tape on any connections when using flammable liquid.

INSTALLATION

1) Ensure the meter is installed so the flow of the liquid is in the direction of the arrows embossed on the meter body.



2) The meter can be installed in any orientation as long as the meter shafts are in a horizontal plane. (see fig 2 for correct installation) The register assembly may be rotated to suit the individual installation.



(fig 2)

Note: Incorrect installation can cause premature wear of components.

3) Do not over tighten connections.

REGISTER ROTATION

- 1) Unscrew 4 screws (32) holding the register assembly (26).
- 2) Carefully remove complete register assembly (26) from the register base (9).
- 3) Rotate the register assembly to the desired position.
- 4) Carefully re-fit the register assembly to the meter body.



Caution

Do not force the register assembly when re-fitting to the register base. Ensure that both the register drive gear and meter drive gear are properly engaged before replacing the register screws, or damage may occur.

5) Replace the 4 register screws (32).

METER DISASSEMBLY

1) Disconnect fluid supply to the meter, and release line pressure before disassembly.

2) Unscrew 4 screws (32) holding the register assembly.

3) Carefully lift off the complete register assembly (26) from the register base (9).

4) Remove the 4 gear box cover screws (25,32) and carefully remove the gear box cover assembly (16-23), o'ring (24) and gears (13,14,15) from the gear box.

NOTE: The gear (23,16) on the gear box cover assembly should not be removed. If there is any wear or damage the complete gear box cover assembly should be replaced.

5) Remove the 4 hex bolts (11) holding the register base (9) to the meter body (1), remove the meter body o'ring (8) and both rotors (6,7).

Check all components for wear or damage and replace as required.

METER REASSEMBLY

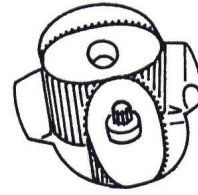
1) Clean all components before reassembly.

NOTE:

The rotor with the drive pinion (6) must be fitted to the side of the meter body, which has D/Gear marked on the meter body, (see fig 3).

2) Replace the rotors (6,7) so as they are at 90° to each other, (see fig 3). Check the rotor rotation by turning either of the rotors. If the rotors are not in mesh correctly or do not move freely remove one of the rotors and replace it correctly at 90° to the other rotor. Recheck the operation of the rotors.

3) Insert o'ring (8) into o'ring groove on the register base (9).



(fig 3)

4) Carefully align the spring pins (3) on the meter body (1) to the spring pin holes on the register base (9).

5) Replace the 4 hex screws (11) and nuts (12) and tighten firmly.

6) Insert gear (13) marked L1(Litre) or Q1 (Quart) onto the shaft (10) located in the gear box.

7) Place the gear (14) marked L2 (Litre) or Q2 (Quart) on top of gear 1. The hole in gear 2 (14) should be positioned to align with the output shaft hole in the gear box.

8) Place the gear (15) marked L3 (Litre) or Q3 (Quart) onto the same shaft (10) as gear 1 (13).

9) Insert the gearbox cover o'ring (24) into the o'ring groove on the gear box cover (21)

10) Fit the gear box cover assembly by carefully inserting the output shaft (17) through gear 2 (14), and into the output shaft hole in the gear box.

11) Fit the 4 gear box cover screws (25,23) and tighten securely.

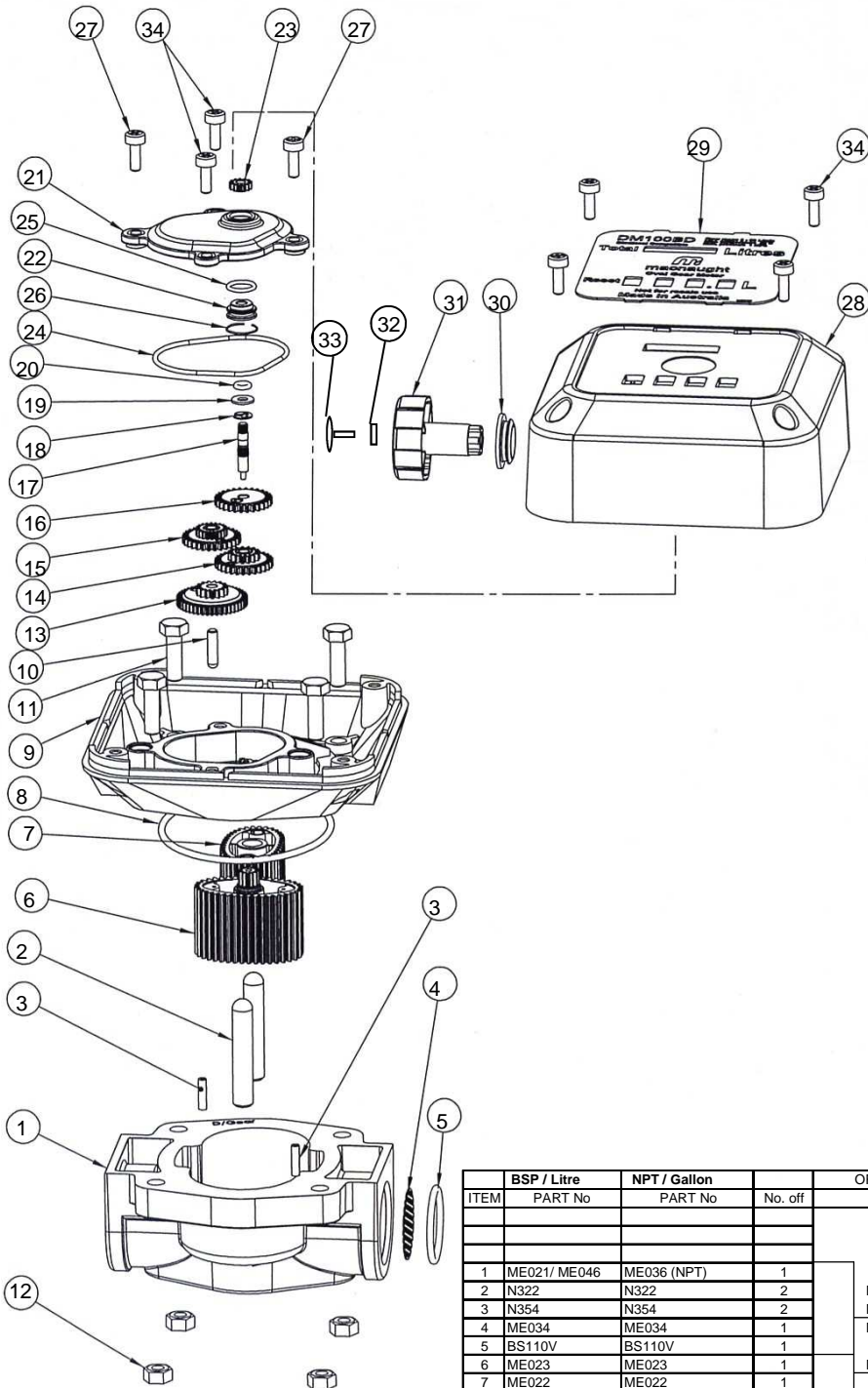
12) Rotate the register assembly to the desired position.

13) Carefully re-fit the register assembly (26) to the meter body. Fit 4 screws (32) and tighten firmly.

14) Press the reset button to reset the batch total to zero

15) Test the meter by turning the rotors with a finger or by applying low air pressure. (No more than a good breath) to the inlet port of the meter. This will confirm the meter is operating correctly and that the number wheels are ascending.

PARTS DIAGRAM



PARTS LIST

ITEM	BSP / Litre		NPT / Gallon		ORDER FOR REPLACEMENT		DESCRIPTION
	PART No	PART No	No. off	PART / SET	KIT. REF		
				DM100-1BDK (A)			SEAL KIT
1	ME021/ ME046	ME036 (NPT)	1				METER BODY
2	N322	N322	2	ME046s - BSP.F (G)			DOWEL PINS
3	N354	N354	2	ME021s - BSP.PL (RP)			SPRING PINS
4	ME034	ME034	1	ME036s (NPT)	A		STRAINER
5	BS110V	BS110V	1		A		O'RING (Viton)
6	ME023	ME023	1	ME023s			ROTOR with DRIVE PINION
7	ME022	ME022	1				ROTOR
8	BS150V	BS150V	1		A		O'RING (Viton)
9	ME019	ME019	1	ME019s			REGISTER BASE
10	N352	N352	1				DOWEL PIN
11	N75	N75	4	N75s			HEX SCREW (M6 X 20)
12	N202	N202	4				NUT (M6)
13	ME027	ME015	1				1st GEAR
14	ME028	ME016	1				2nd GEAR
15	ME029	ME031	1				3rd GEAR
16	ME030	ME032	1	ME035BDs (Litre)			4th GEAR
17	ME014	ME014	1	incl 2x item 25, 2 x item 32			OUTPUT SHAFT
18	N266	N266	1	ME035BDUS (US Gal)			CIRCLIP
19	N138	N138	1	incl 2x item 25			WASHER
20	BS007V	BS007V	1		A		O'RING (Viton)
21	ME035BD	ME035BD	1				GEAR BOX COVER
22	ME054	ME054	1		A		BUSH
23	ME012	ME012	1				GEAR
24	BS032V	BS032V	1		A		O'RING (Viton)
25	OR9x1.5V	OR9x1.5V	1		A		O'RING (Viton)
26	ME056	ME056	1		A		WIRE CLIP
27	N65	N65	2	N65s incl 2 x item 32			SCREW (M4 X 16)
28	ME041s (Litre)	ME041US (US Gal)	1				REGISTER ASSEMBLY
29	ME017BD (Litre)	ME020BD (US Gal)	1				FACIA PLATE
30	ME033	ME033	1	ME025s			WEATHER SEAL
30	ME025	ME025	1				KNOB
32	N118	N118	1				WASHER
33	N30	N30	1				SCREW
34	N70	N70	6				SCREW (M4 X 12)

TROUBLE SHOOTING GUIDE

TROUBLE	CAUSE	REMEDY
Fluid will not flow through the meter	a) Foreign matter blocking the rotors (6,7)	a) Dismantle the meter and clean the rotors (6,7) (Fit an in line strainer)
	b) Strainer (4) is blocked	b) Clean strainer (4)
	c) Damaged rotors (6,7)	c) Replace rotors (6,7)
	e) Connections over tightened	e) Re-adjust connections
Reduced flow through the meter	Strainer partially blocked (4)	Clean strainer (4)
Meter reading inaccurate	a) Flow rate is either too high or too low	a) Adjust flow rate (refer to specifications)
	b) Excess wear caused by incorrect installation	b) Check meter body (1) register base (9) and rotors (6,7) for wear or damage.(Replace as required)
Fluid flows but no reading on the meter	a) Drive gear loose (23)	a) Replace gear box cover assembly (16-23)
	b) Rotor (6) drive gear damaged	b) Replace rotor (6)
	c) Gearbox gears (13-16) damaged	c) Replace damaged gears
	d) Register gears damaged	d) Replace register assembly
Fluid leaks into the register assembly	Damaged o'ring (20) or o'ring (24)	Replace gear box cover assembly (13-23) or o'ring (24)

SPECIFICATIONS

Accuracy	+ / - 1% of Reading
Type	Oval Gear
Flowrate	3 Ltr -80 Ltr (0.8 - 21.1 US Gal) per minute
Maximum Pressure	1000kPa / 145psi / 10 Bar
Suitable for use with :	Bio-Diesel, Diesel, Petrol, and oils up to 1000cps
Resettable Totalizer	999.9 (ltr or gal)
Non-Resettable Totalizer	999999 (ltr or gal)
Wetted Components	Aluminium, Viton, Mild Steel PEI Resin, Acetal
Port Threads (female)	1" BSP.PL (RP) 1"NPT 1"BSP.F (G)
Minimum Gravity Head	550mm



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macnaught warranty

- Macnaught Pty Ltd ("Macnaught") warrants that all products manufactured by Macnaught and/or supplied by Macnaught under the "Macnaught" brand, excluding M-Series positive displacement meters ("Meters") and components subject to wear, will be free from any defects caused by faulty materials or workmanship ("Warranty") for a period of 5 years from the date of purchase of the product.
 - For products (excluding Meters) which carry the "Macnaughtdesign" endorsement, an additional Warranty period of 5 years applies to all mechanical components (excluding electronic and electrical components), giving a total Warranty period of 10 years.
 - For Meters, the Warranty period is 12 months from the date of purchase of the product.
 - For components contained in all products which are usually subject to wear from normal operation of the products (such as o-rings, seals, springs, hoses and batteries), the Warranty period is 12 months from the date of purchase of the relevant product.
 - For products and components which are not manufactured by Macnaught and are supplied by Macnaught under a brand name other than "Macnaught", the Warranty period is the longer of 12 months from the date of purchase of the relevant product and the period of the manufacturer's warranty.
 - The warranties contained in clauses 1, 2, 3, 4 and 5 above are conditional on the purchaser, during the relevant Warranty period:
 - delivering to Macnaught a detailed notice setting out full details of any defect in any product and details of the date and place of purchase (together with copies of purchase receipts and/or other supporting documents), and
 - at the purchaser's own cost, returning the defective product to the nearest authorised Macnaught service centre.
 - Subject to compliance by the purchaser with clause 6, Macnaught shall, at its option, repair or replace any product or component found defective by its inspection by reason of faulty materials or workmanship of Macnaught.
 - This Warranty does not cover the failure of products, parts or components which, in the sole judgment of the Macnaught, arises other than from faulty materials or workmanship of Macnaught, including misuse, abrasion, corrosion, negligence, accident, substitution of non-Macnaught parts, unauthorised modification, improper use, storage or handling, faulty installation or tampering by the purchaser or any third party.
 - If Macnaught's inspection discloses no defect in material or workmanship, repair or replacement and return (at Macnaught's sole option) will be made at customary charges, which will be advised to the purchaser.
 - Macnaught's liability and the purchaser's rights under this Warranty shall be limited to the repair or replacement of defective products or components and particular, shall not extend to any direct, special, indirect or consequential damage or losses of any other warranties.
 - The foregoing Warranty supersedes, voids and is in lieu of any other warranties.
- This Warranty does not form part of, nor does it constitute, a contract between Macnaught and the end-user or purchaser. It is additional to any warranty given by the seller of the products. This Warranty does not exclude, limit, restrict or modify the non-excludable rights or remedies conferred upon the end-user or purchaser, or the non-excludable duties or liabilities imposed on the seller or Macnaught, by Part V, Division 2, 2A, and Part VA of the Trade Act 1974 (Commonwealth) or other rights conferred on the end-user or purchaser or duties or liabilities imposed upon Macnaught.

