

# BIODIESEL FUEL METER DM100-01-BD



## 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.

### Important Information

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

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.

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.



#### 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).

### 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.

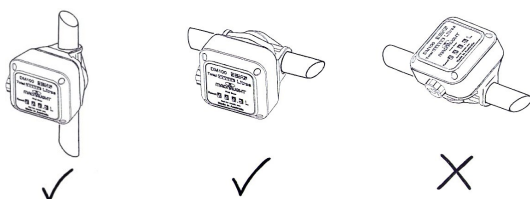
Inspect seals and connections for leaks weekly when using flammable liquids.

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

### Installation Procedure

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)

## Maintenance Procedures

### 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

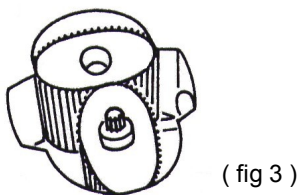
- 1) Clean all components before reassembly.

#### 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).



- 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.

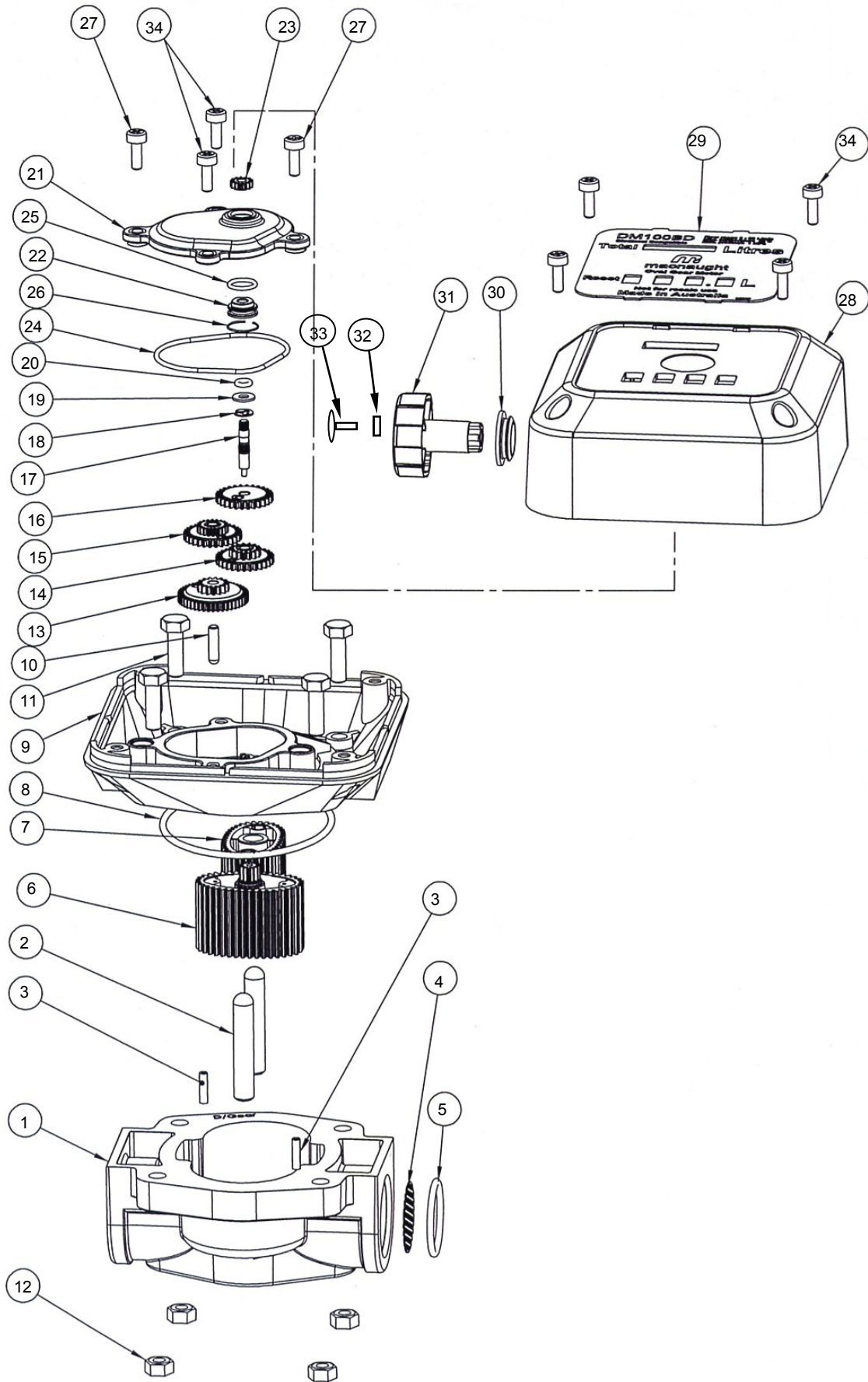
- 12) Rotate the register assembly to the desired position.

- 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.

# Spare Part Diagram



## Spare Part Listing

Item	Description	Qty	Overhaul Kit	Spares Kit
1	METER BODY	1		
2	DOWEL PINS	2		ME046S (G), ME021S (Rp), ME036S (NPT)
3	SPRING PINS	2		ME046S (G), ME021S (Rp), ME036S (NPT)
4	STRAINER	1	DM100-1BDK	ME046S (G), ME021S (Rp), ME036S (NPT)
5	O-RING VITON	1	DM100-1BDK	ME046S (G), ME021S (Rp), ME036S (NPT)
6	ROTOR WITH PINION	1		ME023S
7	ROTOR	1		ME023S
8	O-RING VITON	1	DM100-1BDK	ME019S
9	REGISTER BASE	1		ME019S
10	DOWEL PIN	1		ME019S
11	HEW SCREW M6 X 20	4		N75S
12	NUT M6	4		N75S
13	1ST GEAR	1		ME035BDS (LITRE), ME035BDUS (US GAL)
14	2ND GEAR	1		ME035BDS (LITRE), ME035BDUS (US GAL)
15	3RD GEAR	1		ME035BDS (LITRE), ME035BDUS (US GAL)
16	4TH GEAR	1		ME035BDS (LITRE), ME035BDUS (US GAL)
17	OUTPUT SHAFT	1		ME035BDS (LITRE), ME035BDUS (US GAL)
18	CIRCLIP	1		ME035BDS (LITRE), ME035BDUS (US GAL)
19	WASHER	1		ME035BDS (LITRE), ME035BDUS (US GAL)
20	O-RING VITON	1	DM100-1BDK	ME035BDS (LITRE), ME035BDUS (US GAL)
21	GEARBOX COVER	1		ME035BDS (LITRE), ME035BDUS (US GAL)
22	BUSH	1	DM100-1BDK	ME035BDS (LITRE), ME035BDUS (US GAL)
23	GEAR	1		ME035BDS (LITRE), ME035BDUS (US GAL)
24	O-RING VITON	1	DM100-1BDK	ME035BDS (LITRE), ME035BDUS (US GAL)
25	O-RING VITON	1	DM100-1BDK	ME035BDS (LITRE), ME035BDUS (US GAL)
26	WIRE CLIP	1	DM100-1BDK	ME035BDS (LITRE), ME035BDUS (US GAL)
27	SCREW M4 X 16	2		N65S
28	REGISTER ASSY	1		ME041BDS (LITRE), ME041BDUS (US GAL)
29	FACIA PLATE	1		ME041BDS (LITRE), ME041BDUS (US GAL)
30*	WEATHER SEAL	1	DM100-1BDK	ME041BDS (LITRE), ME041BDUS (US GAL)
31*	KNOB	1		ME041BDS (LITRE), ME041BDUS (US GAL)
32*	WASHER	1		ME041BDS (LITRE), ME041BDUS (US GAL)
33*	SCREW	1		ME041BDS (LITRE), ME041BDUS (US GAL)
34	SCREW M4 X 12	6		ME041BDS (LITRE), ME041BDUS (US GAL)
*Note that items 30 to 33 inclusive are available in kit ME025S				



## Troubleshooting 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)

## Product Specifications

Accuracy	+/- 1" of Reading
Type	Oval Gear
Flowrate	3 - 80 Litre/min (0.8-21 US Gal/min)
Maximum Pressure	1000kPa / 145psi / 10 Bar
Suitable for use with	Bio Diesel
Reset-able Totalizer	999.9 Lt or Gal
Non-Reset-able Total	999999 Lt or Gal
Wetted Components	Aluminium, Mild Steel
	Acetal, Viton, Polyetherimide Resin
Port Threads	1" Rp
	1" NPT
	1" BSP.F (G)
Minimum Gravity Head	550mm



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