

INSTRUCTION MANUAL
REDBACK CURRENT METER
MODEL RB1



QUALITY SYSTEM
ISO: 9001
CERTIFIED

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INTRODUCTION

The Hyquest Solutions Red Back current meter is our new generation of Type “AA” current meter. It allows the measurement of water flow in streams, open canals, pressure pipes, lakes and seas to a fine degree of accuracy and repeatability; this is due to its advanced contact switching system and interchangeable impact resistant bucket system that provides trouble free operation.

The meter is made to be used in the most extreme environments and ensures reliable field service for many years.

The Red Back is supplied in a kit which is affordable and user friendly, allowing the operator to measure water flow using a simple traditional method.

OPERATION

The standard operation of the current meter is used in conjunction with a wading rod and a current meter counter. This method requires the user to stand in the stream and observe the velocities of the flow at different depths across the streams.

The current meter can be fitted with a stabiliser tail fin which is attached to a hanger bar and Columbus gauging weight in sizes of 7, 15, 23, 34, 45, 68, 90 or 135 Kg. This assembly is suspended from a gauging winch with armoured signal cable.

Hyquest Solutions provides a range of counters to suit the RedBack. The models available are as follows:

Model CMC20A is a basic counter which can be set to count pulses for a specific time period (10-200 secs). The counter stops when the time period has elapsed and shows a digital reading for the number of pulses. A rating table is used to convert number of pulses to velocity.

Model CMCsp current meter counter with direct velocity reading, in-built Bluetooth module for connection to a Palm™ top or field PC, fixed measuring interval from 10 to 90 secs.

Model PVD100 same functions as the CMCsp but supplied in plastic case and neck straps.

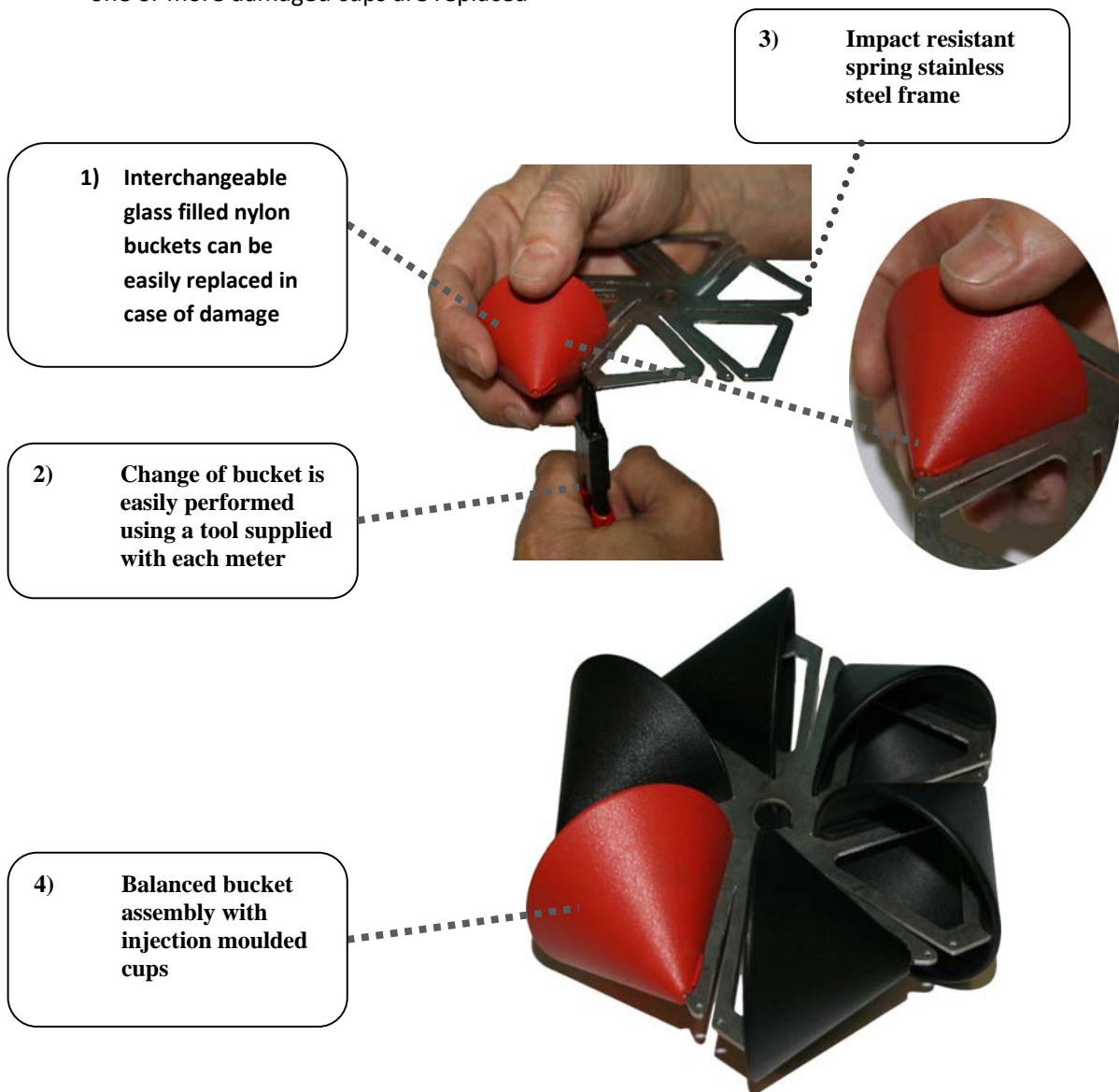
The HydroMate CMC3 is the top of the range Current Meter Counter with a touch screen facility and direct velocity reading. This counter allows up to 32 current meter calibration formulas to be entered so that direct calculation of river flow can be achieved. The HydroMate CMC3 can store data for up to 30 sites with 30 verticals per site and 11 points per vertical. The CMC3 software can be easily upgraded as new features are made available.

MAINTENANCE

RedBack Meter Maintenance

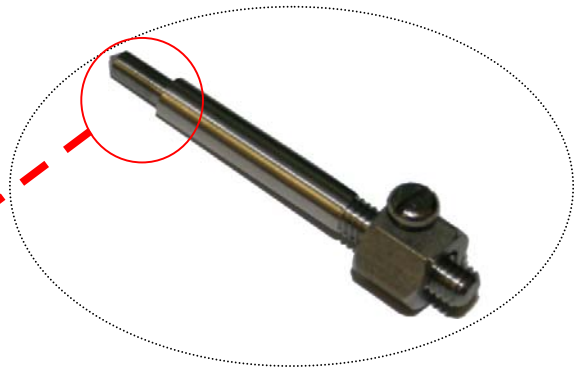
The advantages of the RedBack over the traditional bucket meter can be summarised as follows:

- a) Flexible spring stainless steel frame which can resist force; where traditional stainless steel frame will bend slightly causing frame assembly to be out of balance, hence drift in calibration results
- b) Glass filled nylon interchangeable buckets are used instead of the traditional nickel plated brass bucket which if dented, will cause bad performance and inaccurate measurement. Moulded glass filled nylon buckets are identical in size, weight, hence calibration is maintained even if one or more damaged cups are replaced



- c) Advanced magnet/reed switch assembly provides superior performance and reliability; unlike traditional bucket meter cats whisker switch assemblies the RedBack reed switch is maintenance free.
- d) The pivot assembly is made from 316G Stainless Steel and has a Tungsten Carbide tip. The bearing plate is also made up of a similar metal. Hence, the turning motion is not affected by friction ensuring a low starting velocity and accuracy.

5) **Tungsten Carbide tipped pivot; eliminating the need for re-grinding of the tip**



- e) Low maintenance and cost effective; The RedBack cost is incomparable to its accuracy +/-1%.

MAINTENANCE

A key concept in maintaining the accuracy of a current meter is to keep it in the same good condition as when it was obtained from the manufacturer or when it was last calibrated. In order to do so, cleaning the meter after use is essential.

After a day of use in the field

1. The pivot, magnet and reed switch chamber should be removed and cleaned using the supplied current meter oil, apply a small droplet to the upper and lower bearing surfaces. (Do not use “3-in-1” type oil; this type of oil will solidify when exposed to water.)
2. Using a magnifying glass a visual inspection should be carried out to ensure the bearing surface is not wearing or damaged. The pivot tip should feel sharp as opposed to dull or rounded. It should not be a burr detectable visually or by fingernail.
3. The pivot should be always adjusted to the right position by setting the locknut and then securely tightening the lock screw.
4. After oiling and replacing the pivot and the magnet/reed switch housing, ensure the meter is turning freely and comes to a smooth and gradual stop. The meter should not have any undue vibration when rotating. Apply oil to the bearing and pivot if vibration occurs as described in step 1.

Before use in the field

1. Inspect the meter carefully and perform a spin test visually observing the rotation. If the meter is turning freely and comes to a smooth and gradual stop, then the meter is ready for use. However, if the meter fails to spin freely cleaning and adjustment is required to ensure proper operation.

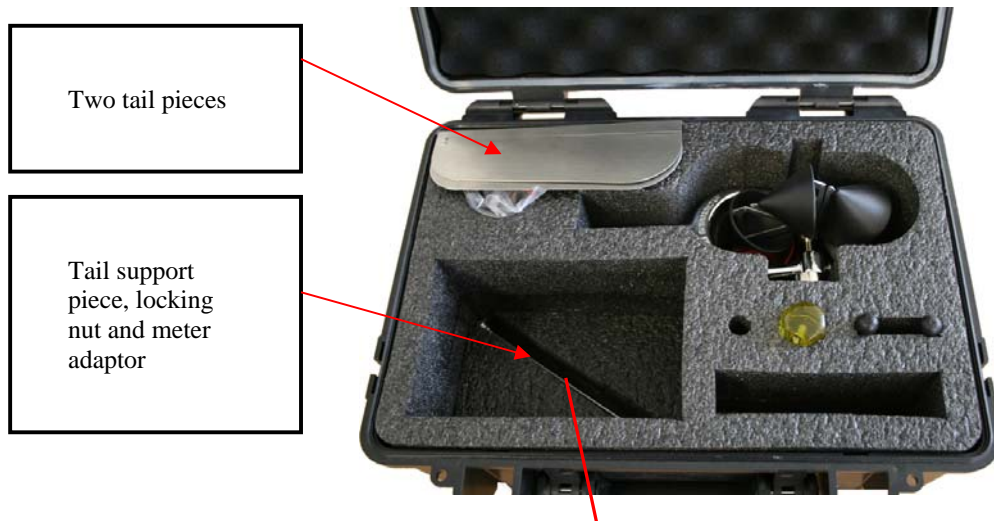
Inactive meter

1. Prior to the meter being stored, it should have been disassembled, inspected and cleaned as described. In case the period of storage is less than 5 weeks, the meter can be used without any additional maintenance other than a spin test.
2. If the meter was stored for a longer period of time, it is advisable to first clean the meter and then spin test before use.

ASSEMBLING THE TAIL FIN

This instruction manual provides graphical instructions on how to assemble the tail fin.

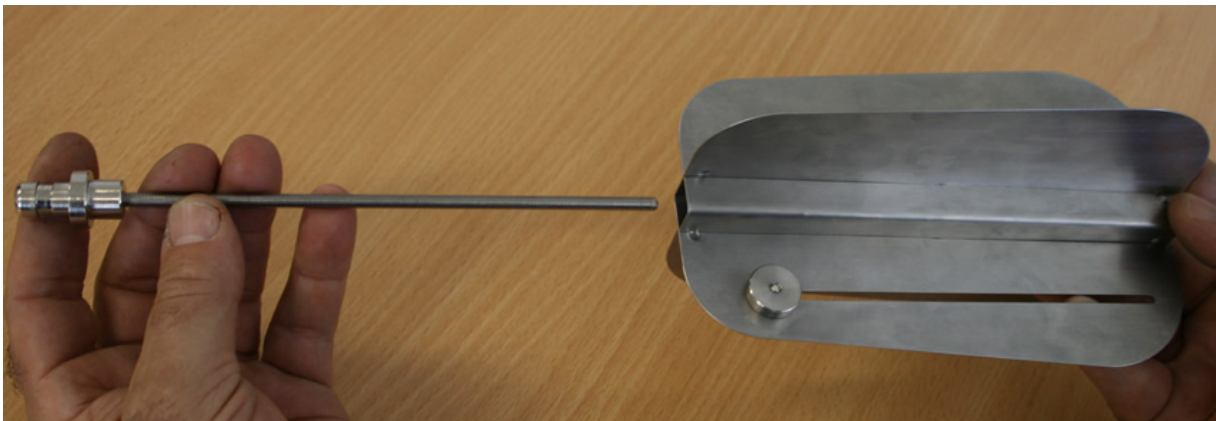
Step1. Open the case and locate the tail pieces



Step2. Assemble the tail pieces together as shown below



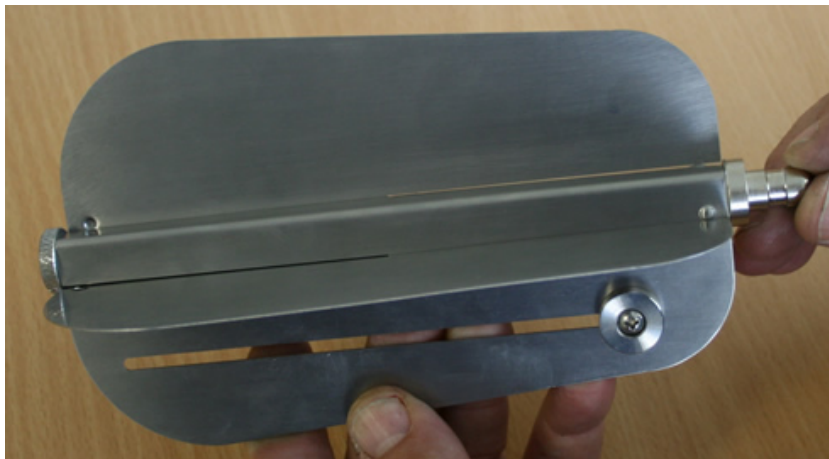
Step3. Assemble the tail pieces to the tail support as shown below



Step4. Tighten the locking nut as shown



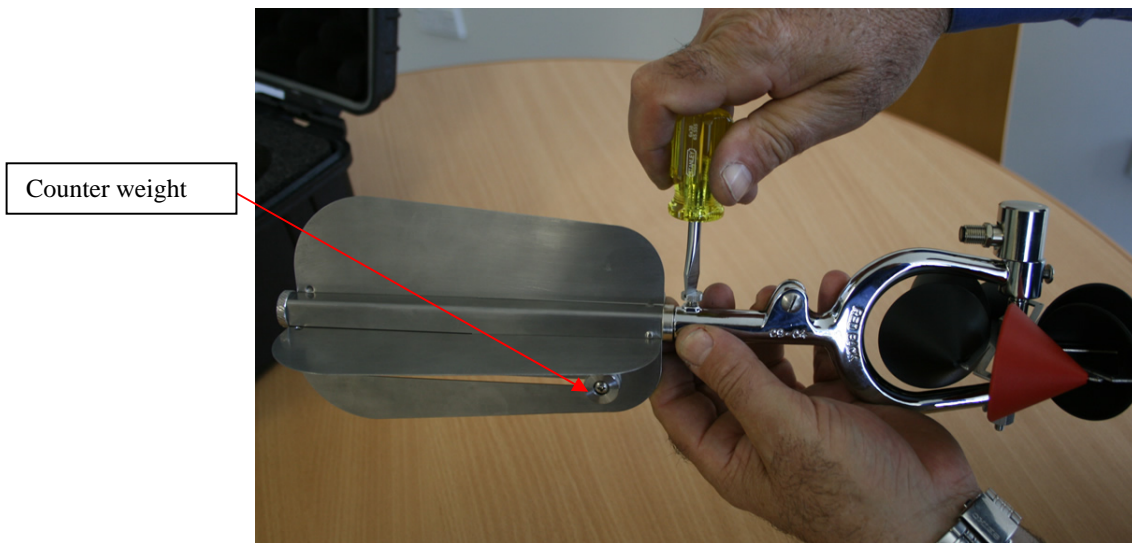
Step5. Ensure the adaptor is jammed tight against the tail pieces



Step6. Assemble the Tail assembly to the RedBack Current Meter



Step7. Tighten the tail screw using the supplied screw driver



Note:

Once the meter is submersed into the water, the user can balance the RedBack Current Meter using the counter weight balance attached to the tail assembly.

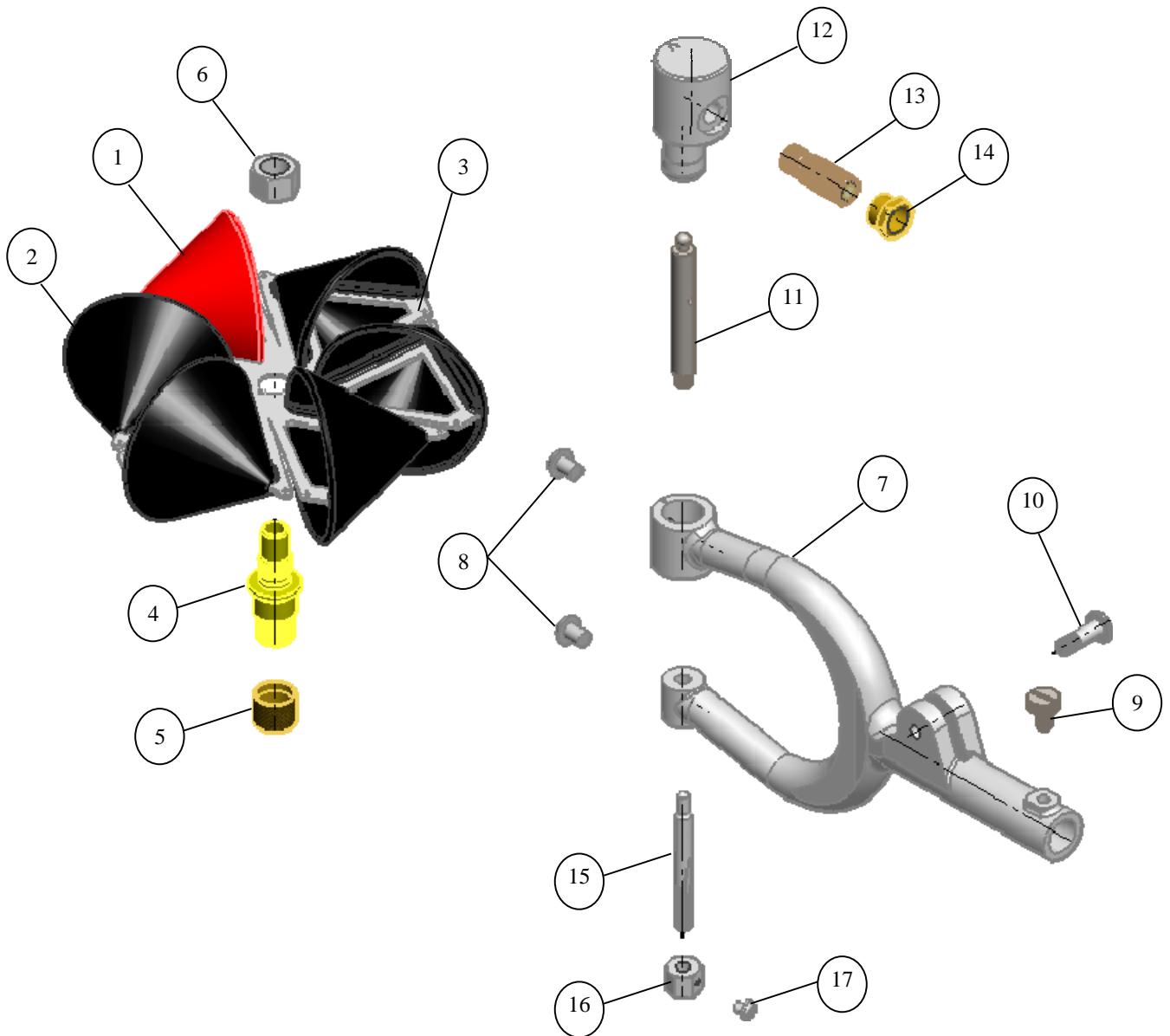
SERVICE AND RECALIBRATION

HS recommends that the RedBack current meter should be recalibrated every 300 hours of use or once a year, whichever comes first (see Hyquest Solutions calibration certificate for details).

SPECIFICATIONS

Construction:	<ul style="list-style-type: none">- Cast brass body, nickel plated- 6 Durable glass filled nylon buckets- Stainless steel bucket wheel frame- Stainless steel pivot with tungsten carbide tip
Operating Velocity Range:	0.025 m/sec to 8 m/sec
Reed Switch:	Encapsulated reed switch
Output Signal:	<ul style="list-style-type: none">- Voltage free digital signal- 1 full revolution of bucket assembly produces one pulse- Converted to direct velocity reading when used in conjunction with our PVD100, CMCsp or PVD200
Overall Accuracy:	$\pm 1 \%$
Calibration:	<ul style="list-style-type: none">- Meter supplied with batch calibration certificate- Individual meter calibration available on request; additional cost applies
Calibration Method If Calibration is requested:	<ul style="list-style-type: none">- Performed in accordance with AS3778.6.3/ISO 3455 standard- Up to 3 line fit- Supplied with calibration and a rating table- Calibrated over full velocity range
Carry Case:	Heavy duty case with durable moulded foam
Basic Kit:	<ul style="list-style-type: none">- Bucket Meter- Screw driver- 2.5 m connecting lead- Calibration certificate and table- 30 mls of current meter oil- CD Instruction Manual
Optional:	<ul style="list-style-type: none">- Wading rods available (20mm x 1.8m long) in canvas carry bag- Adaptor for 20mm rods (Part No. WR18)<li style="text-align: center;">Or- Metric or Imperial Top Set Rods Model (TSR)
Dimensions:	Length 500mm Width 390mm Height 190mm
Mass:	approx 5 kg

METER PART LIST

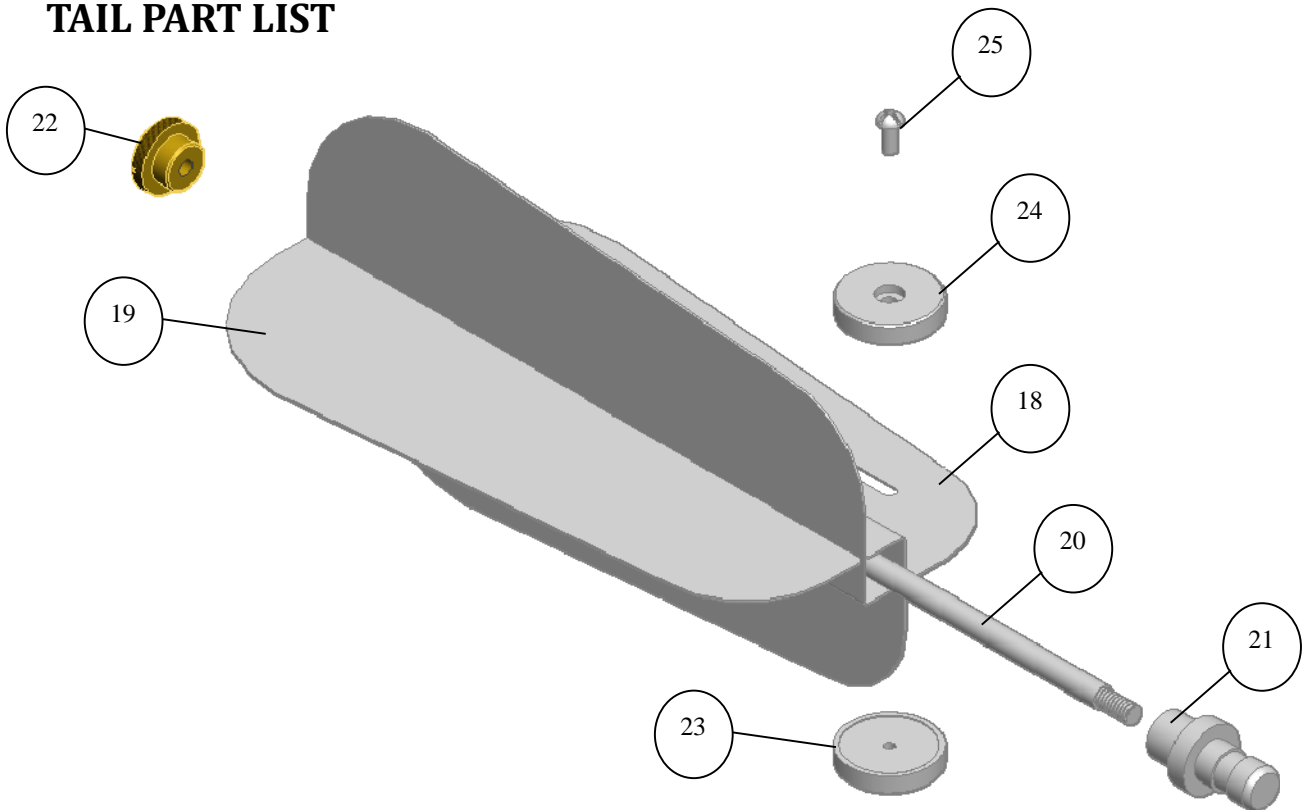


No.	PART NAME	DESCRIPTION	QUANTITY
1	BUK01-01R	RED BUCKET	1
2	BUK01-01B	BLACK BUCKET	5
3	BUK01-02	BUCKET WHEEL	1
4	BUK05-01/02/03/06	BEARING CARRIER WITH BEARING INCLUDED	1
5	BUK05-04	RAISING NUT	1
6	BUK05-05	HUB NUT	1
7	BUK03-01	MAIN BODY	1
8	SC022-74	SLOT HD SCREW	2

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9	BUK03-03	TAIL SCREW	1
10	BUK03-02	HANGER BAR SCREW	1
11	BUK06-01/02	CONTACT SHAFT WITH MAGNET	1
12	BUK07-01	MAGNET & REED SWITCH CHAMBER	1
13	BUK07-02	REED SWITCH	1
14	PYG10-06	REED SWITCH HEX NUT	1
15	BUK04-02	PIVOT	1
16	BUK04-01	PIVOT ADJUSTING NUT	1
17	SC022-73	PIVOT SCREW	1

TAIL PART LIST



No.	PART NAME	DESCRIPTION	QUANTITY
18	BUK08-01	TAIL PIECE – COUNTER WEIGHT SIDE	1
19	BUK08-02	TAIL PIECE	1
20	BUK08-03	BODY SUPPORT ROD	1
21	BUK08-04	TAIL ADAPTOR	1
22	BUK08-05	TAIL LOCKING NUT	1
23	BUK08-06	COUNTER WEIGHT	1
24	BUK08-07	COUNTER WEIGHT NUT	1
25	SC022-08	COUNTER WEIGHT SCREW	1