

PIONEER
OIL TOOLS LIMITED

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*REVERSE CIRCULATION
JUNK BASKETS*

REVERSE CIRCULATION JUNK BASKETS



INTRODUCTION

The Pioneer Reverse Circulation Junk Basket, with its reverse flow valve, can recover small junk and debris efficiently and effectively in a single trip.

The special reverse flow feature creates a vortex back through the centre of the basket encouraging all loose and dislodged junk to pass into the barrel through the catcher. Junk embedded in the bottom formation can be core milled, the mill cuttings and the core itself being removed by the tool.

The Pioneer Reverse Circulation Junk Basket is ideally suited to the recovery of tools lost through the rotary, pieces of wireline, particles of slips, bit cones and the general accumulation of junk, which can impede the progress of drilling.

By substituting the Pioneer Magnet Insert for the catcher, the tool is readily converted into a Reverse Circulation Fishing Magnet with all the reverse flow advantages of the junk basket.

The tool can also be used for drilling full gauge holes or hole reaming with the cuttings being retained in the basket.

“QUALITY + DELIVERY IS OUR PRIORITY”

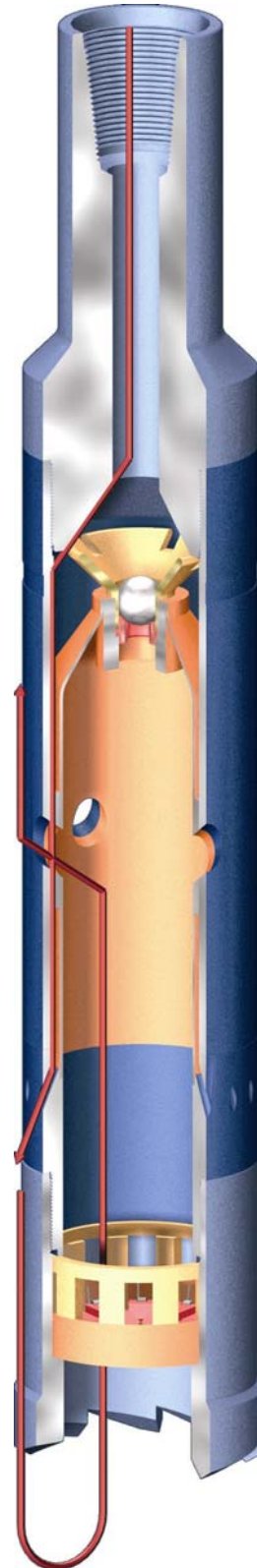
REVERSE CIRCULATION JUNK BASKETS

PRINCIPLE OF OPERATION

Circulation fluid is pumped down through the fishing string to the junk basket. With the reverse flow valve open, the fluid has a free passage through the tool to condition the mud and the hole.

When the reverse flow valve is actuated, the fluid is diverted through high-pressure jet holes around the outer circumference close to the bottom of the tool. These jets wash down the wall of the bore and down past the milling shoe carrying cuttings away.

The fluid returns up through the tool carrying the cuttings and junk past the catcher into the barrel. The vortex effect induced by the outside to inside flow path of the fluid creates the superior efficiency this tool has over other types of junk baskets. The fluid exits the tool through a series of vent holes above the jets leaving the junk trapped in the barrel. By nature of its design, the tool will drain all fluid from the string, even when there is a core choking the barrel, thus enabling a dry string to be pulled.

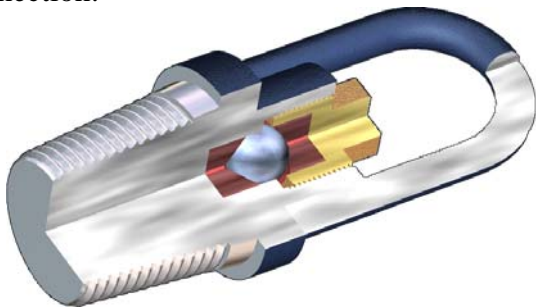


REVERSE CIRCULATION JUNK BASKETS

ASSEMBLY

The Pioneer Reverse Circulating Junk Basket is comprised of four main sections: the Top Sub, the Barrel (incorporating the reverse flow valve assembly), the Catcher and the Shoe.

The **Top Sub** serves to connect the tool to the fishing string and can be supplied with the top connection required. This should be specified at the time of ordering. A lifting bail containing a compartment to store the reverse flow valve-actuating ball is supplied to suit the Top Sub connection.

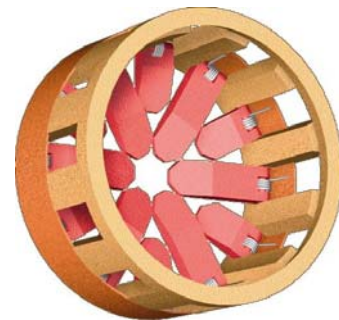


Lifting Bail

The **Barrel** consists of two concentric tubular sections completely sealed at the lower end to form an annular cavity. Entry to the bore of the inner section is through the reverse flow valve, which is assembled at the top end.

High-pressure jet holes connect the annular cavity to the lower end of the outer tubular section and are angled to direct the jets downward. The return vents, which are angled upwards, pass from the inner to the outer section through sealing pads which keep downward and upward flows separate. The Barrel is assembled to the Top Sub by means of a box thread on the outer section. The Reverse Flow Valve is a check valve consisting of a steel ball, a ball guide and valve seat. The ball guide is screwed into a housing on the inner barrel and retains the valve seat in position. Both the guide and seat can be readily removed for maintenance or replacement.

The **Catcher**, which is manufactured from Teflon-coated steel, is a free fit inside the shoe. This permits the catcher to remain stationary while the tool is rotating during coring operations, thus preventing damage or breakage to the fingers. The fingers, which are spring loaded, are opened by the passage of junk into the barrel and close to prevent the junk falling out. The Catcher is a non-riveted assembly to ease redressing, though it is advisable to carry spare catchers on site.



Catcher

The **Shoe** contains the catcher and is screwed on to the lower end of the barrel. Various types of shoe can be supplied depending on the type of cutting action required. They may be manufactured with hardened steel cutting teeth, or with Pioneer TC Alloy carbide hard-faced teeth. Hard facing is strongly recommended where any degree of milling is to be carried out.



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ADDITIONAL EQUIPMENT

MILL SHOES

Many operators of milling equipment have their own preference as to the geometric form of milling cutters and shoes. This is based on experience, hole conditions and the type of junk to be removed. Recognising this, Pioneer offer the shoes below as standard forms, but would be pleased to design and manufacture other forms to meet customer's specific requirements.

Type 'A' Mill Shoes are supplied as standard with the junk basket assembly. They are manufactured from high quality alloy steel and are specially heat-treated to harden the teeth. The teeth are angled from the bore and O.D. to produce a high penetration point in the centre. The body of the shoe is reduced behind the teeth to allow free cutting on the O.D.

Type 'B' has the same geometrical form as type 'A'. The teeth however are hard faced with Pioneer TC Alloy. This is a composition of sharp, graded particles of tungsten carbide bonded with a heavy-duty nickel-bronze matrix. This shoe is ideally suited where irregular junk may have to be milled to allow free entry into catcher.

Type 'C' is hard faced with TC Alloy on the bore, the outside diameter and the flat bottom, and is ideally suited to take core samples as well as milling junk for entry into the catcher.

A Finger Shoe assembly can be run in place of a Mill Shoe and Catcher when the junk to be retrieved is oversize for the catcher or when the junk is lying free on the bottom of the hole. The long fingers of the shoe encircle the junk when the tool is lowered to the hole bottom. Continued application of weight and rotation deforms the fingers into the centre below the junk trapping it in the barrel. Finger shoes are easy to replace on site and it is advisable to hold spare fingers sections (Type F) for mounting to the finger body.



Type A Mill Shoe



Type B Mill Shoe



Type C Mill Shoe



Type F Mill Shoe

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WINDOW SUBS

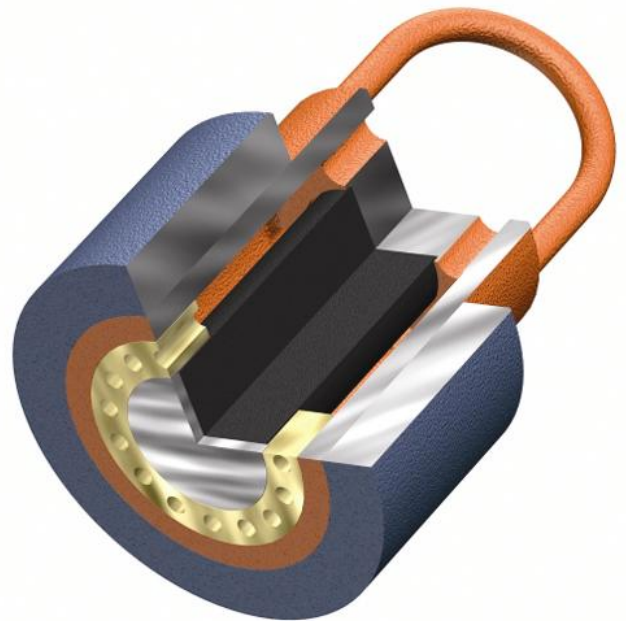
A Window Sub can be mounted on the top of the fishing string below the Kelly and is used to introduce the steel ball into the string. To order, please specify OD, top and bottom connections.



Window Sub

FISHING MAGNET

A Pioneer Junk Basket Magnet Insert can be used in the place of the Catcher, whereupon the tool is converted from a junk basket to a fishing magnet with all the reverse circulation advantages of the basket. In this format, the tool is ideally suited to the removal of small steel cuttings encountered when milling or sizing. The Magnet Insert is a very useful accessory in any junk basket package.



Junk Basket Magnet Insert



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OPERATION

Connect the Junk Basket to the string and run to within 5-10 feet of the hole bottom. Turn on the circulating fluid and run for a few minutes in the through-flow condition to disperse any mud accumulated during the run in. Stop the pumps and introduce the steel ball into the string, remembering to replace the plug if a window sub is used. Restart the circulation pumps, rotate and lower the string onto the junk. Continue to mill until the required length of core is reached (approx. 12"). Turn off the pumps and rotation and pull up on the string. The pulling will cause the fingers to penetrate the core assisting in breaking it free. To remove the core, unscrew the Shoe and Catcher and flush out.

NOTE: - Care should always be taken to ensure the actuating ball diameter is less than the drift diameter of the tool joints in use.

MAINTENANCE

Pioneer products are manufactured from quality materials and are designed to give long and useful service. To obtain this long service however, it is essential that tools are dismantled, thoroughly cleaned and inspected after every operation.

Particular attention should be paid to flushing out the annular cavity and jet holes, the Catcher, the Shoe and the valve assembly. The Catcher should be inspected for damage. Damaged fingers should be replaced.

On reassembly, the Catcher should be free to rotate in the Shoe. Return the steel ball to its compartment in the Lifting Bail, and fit the Lifting Bail to the Top Sub to protect the top connection. Paint or inhibit the assembly for long storage.

Pioneer operates a full spare parts system, and spares may be obtained by quoting the tool assembly number, serial number and a description of the part required.

SELECTION

When ordering the largest tool to suit the hole size should be selected.

To order, specify: -

1. The assembly number
2. The top connection (type and size)
3. Type of Shoe and OD
4. Any additional equipment.

RECOMMENDED SPARES

Pioneer recommends that the following spares be maintained with each tool. Two each: Catchers, Shoes, and steel balls. One each: ball guide and valve seat.

SPECIAL ORDERS

Pioneer is pleased to design and manufacture tools to suit customers' specific requirements. For information on this and other tools in Pioneer's range, contact our sales office for immediate assistance.



REVERSE CIRCULATION JUNK BASKETS

Junk Basket

Assembly No	Barrel OD	Preferred Hole	Maximum Catch	Assembly Weight
RC 0363	3 ⁵ / ₈ "	3 ³ / ₄ " – 4"	2 ¹ / ₄ "	39 kg
RC 0400	4"	4 ¹ / ₈ " – 4 ¹ / ₂ "	2 ¹ / ₂ "	45 kg
RC 0450	4 ¹ / ₂ "	4 ⁵ / ₈ " – 5"	3 ¹ / ₁₆ "	49 kg
RC 0488	4 ⁷ / ₈ "	5 ¹ / ₈ " – 5 ¹ / ₂ "	3 ⁹ / ₁₆ "	58 kg
RC 0513	5 ¹ / ₈ "	5 ⁵ / ₈ " – 6"	3 ³ / ₄ "	65 kg
RC 0575	5 ³ / ₄ "	6 ¹ / ₈ " – 6 ¹ / ₂ "	4 ¹³ / ₃₂ "	84 kg
RC 0625	6 ¹ / ₄ "	6 ⁵ / ₈ " – 7 ³ / ₈ "	4 ³ / ₄ "	108 kg
RC 0700	7"	7 ¹ / ₂ " – 8 ¹ / ₄ "	5 ¹ / ₈ "	133 kg
RC 0788	7 ⁷ / ₈ "	8 ³ / ₈ " – 9 ¹ / ₂ "	6"	170 kg
RC 0913	9 ¹ / ₈ "	9 ⁵ / ₈ " – 10 ⁵ / ₈ "	7 ¹ / ₁₆ "	200 kg
RC 1013	10 ¹ / ₈ "	10 ³ / ₄ " – 11 ⁵ / ₈ "	7 ⁵ / ₈ "	261 kg
RC 1100	11"	11 ³ / ₄ " – 12 ¹ / ₂ "	8 ¹ / ₄ "	302 kg
RC 1188	11 ⁷ / ₈ "	12 ⁵ / ₈ " – 13 ⁵ / ₈ "	8 ¹ / ₂ "	362 kg
RC 1300	13"	13 ³ / ₄ " – 16"	9 ¹³ / ₁₆ "	423 kg
RC 1500	15"	16" – 17 ¹ / ₂ "	11"	710 kg

Additional Equipment

Assembly No	Shoe Type 'B'	Shoe Type 'C'	Finger Shoe Assembly	Magnet Insert Assembly
RC 0363	RC 0363-02B	RC 0363-02C	RC 0363-02D	RC 0363-23
RC 0400	RC 0400-02B	RC 0400-02C	RC 0400-02D	RC 0400-23
RC 0450	RC 0450-02B	RC 0450-02C	RC 0450-20D	RC 0450-23
RC 0488	RC 0488-02B	RC 0488-02C	RC 0488-02D	RC 0488-23
RC 0513	RC 0513-02B	RC 0513-02C	RC 0513-02D	RC 0513-23
RC 0575	RC 0575-02B	RC 0575-02C	RC 0575-02D	RC 0575-23
RC 0625	RC 0625-02B	RC 0625-02C	RC 0625-02D	RC 0625-23
RC 0700	RC 0700-02B	RC 0700-02C	RC 0700-02D	RC 0700-23
RC 0788	RC 0788-02B	RC 0788-02C	RC 0788-02D	RC 0788-23
RC 0913	RC 0913-02B	RC 0913-02C	RC 0913-02D	RC 0913-23
RC 1013	RC 1013-02B	RC 1013-02C	RC 1013-02D	RC 1013-23
RC 1100	RC 1100-02B	RC 1100-02C	RC 1100-02D	RC 1100-23
RC 1188	RC 1188-02B	RC 1188-02C	RC 1188-02D	RC 1188-23
RC 1300	RC 1300-02B	RC 1300-02C	RC 1300-02D	RC 1300-23
RC 1500	RC 1500-02B	RC 1500-02C	RC 1500-02D	RC 1500-23



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Replacement Parts RC0363 - RC0513

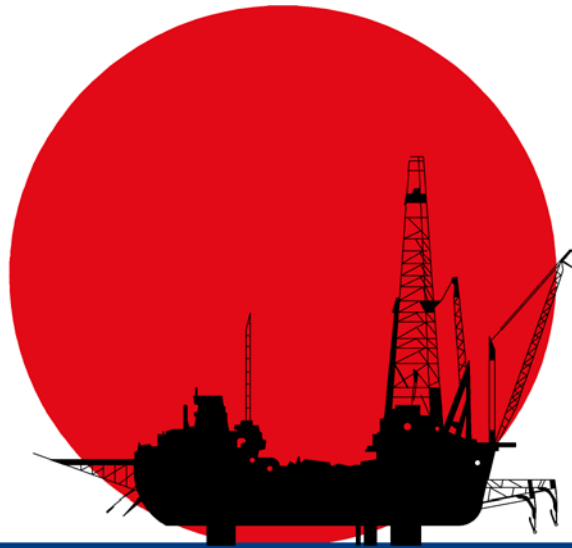
Assembly No	RC 0363	RC 0400	RC 0450	RC 0488	RC 0513
Lifting Bail	RC 0363-13	RC 0363-13	RC 0450-13	RC 0450-13	RC 0513-13
Top Sub	RC 0363-01	RC 0400-01	RC 0450-01	RC 0488-01	RC 0513-01
Barrel Assembly	RC 0363-24	RC 0400-24	RC 0450-24	RC 0488-24	RC 0513-24
Ball Guide	RC 0363-05	RC 0363-05	RC 0450-05	RC 0450-05	RC 0513-05
Valve Seat	RC 0363-07	RC 0363-07	RC 0450-07	RC 0450-07	RC 0513-07
Steel Ball Part No	RC 0363-19	RC 0363-19	RC 0450-19	RC 0450-19	RC 0513-19
Steel Ball Dia.	1 ⁵ / ₁₆ "	1 ⁵ / ₁₆ "	1 ¹ / ₈ "	1 ¹ / ₈ "	1 ³ / ₈ "
Catcher Assembly	RC 0363-20	RC 0400-20	RC 0450-20	RC 0488-20	RC 0513-20
Type A Shoe	RC 0363-02A	RC 0400-02A	RC 0450-02A	RC 0488-02A	RC 0513-02A
Finger Shoe Body	RC 0363-02E	RC 0400-02E	RC 0450-02E	RC 0488-02E	RC 0513-02E
Finger Shoe	RC 0363-02F	RC 0400-02F	RC 0450-02F	RC 0488-02F	RC 0513-02F

Replacement Parts RC0575 - RC0913

Assembly No	RC 0575	RC 0625	RC 0700	RC 0788	RC 0913
Lifting Bail	RC 0513-13	RC 0625-13	RC 0625-13	RC 0788-13	RC 0913-13
Top Sub	RC 0575-01	RC 0625-01	RC 0700-01	RC 0788-01	RC 0913-01
Barrel Assembly	RC 0575-24	RC 0625-24	RC 0700-24	RC 0788-24	RC 0913-24
Ball Guide	RC 0513-05	RC 0513-05	RC 0700-05	RC 0700-05	RC 0913-05
Valve Seat	RC 0513-07	RC 0513-07	RC 0700-07	RC 0700-07	RC 0913-07
Steel Ball Part No	RC 0513-19	RC 0513-19	RC 0700-19	RC 0700-19	RC 0913-19
Steel Ball Dia.	1 ³ / ₈ "	1 ³ / ₈ "	1 ¹¹ / ₁₆ "	1 ¹¹ / ₁₆ "	2 ¹ / ₄ "
Catcher Assembly	RC 0575-20	RC 0625-20	RC 0700-20	RC 0788-20	RC 0913-20
Type A Shoe	RC 0575-02A	RC 0625-02A	RC 0700-02A	RC 0788-02A	RC 0913-02A
Finger Shoe Body	RC 0575-02E	RC 0625-02E	RC 0700-02E	RC 0788-02E	RC 0913-02E
Finger Shoe	RC 0575-02F	RC 0625-02F	RC 0700-02F	RC 0788-02F	RC 0913-02F

Replacement Parts RC1013 - RC1500

Assembly No	RC 1013	RC 1100	RC 1188	RC 1300	RC 1500
Lifting Bail	RC 0913-13	RC 0913-13	RC 0913-13	RC 0913-13	RC 0913-13
Top Sub	RC 1013-01	RC 1100-01	RC 1188-01	RC 1300-01	RC 1500-01
Barrel Assembly	RC 1013-24	RC 1100-24	RC 1188-24	RC 1300-24	RC 1500-24
Ball Guide	RC 0913-05	RC 0913-05	RC 0913-05	RC 0913-05	RC 0913-05
Valve Seat	RC 0913-07	RC 0913-07	RC 0913-07	RC 0913-07	RC 0913-07
Steel Ball Part No	RC 0913-19	RC 0913-19	RC 0913-19	RC 0913-19	RC 0913-19
Steel Ball Dia.	2 ¹ / ₄ "	2 ¹ / ₄ "	2 ¹ / ₄ "	2 ¹ / ₄ "	2 ¹ / ₄ "
Catcher Assembly	RC 1013-20	RC 1100-20	RC 1188-20	RC 1300-20	RC 1500-20
Type A Shoe	RC 1013-02A	RC 1100-02A	RC 1188-02A	RC 1300-02A	RC 1500-02A
Finger Shoe Body	RC 1013-02E	RC 1100-02E	RC 1188-02E	RC 1300-02E	RC 1500-02E
Finger Shoe	RC 1013-02F	RC 1100-02F	RC 1188-02F	RC 1300-02F	RC 1500-02F



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