IMPACT SELECTOR, INC.

REDUCE THE RISK

XCALIBUR

2-3/4” E-LINE

# Level 1
# Field Operations Manual

# CONFIDENTIAL & PROPRIETARY INFORMATION

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# IMPACT SELECTOR

## REDUCE THE RISK

IMPACT SELECTOR, INC.

XCALIBUR 2-3/4" E-LINE

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REDUCE THE RISK

# INTRODUCTION

Impact Selector, Inc. (“ISI”) manufactures, rents, and leases a comprehensive line of technologically advanced mechanical impact tools for open-hole and cased-hole wireline operations. These jars allow for more efficient and safer operations in even the harshest environments by virtually eliminating the risk of a stuck string and the staggering costs associated with stripovers, fishing, and rig downtime.

All ISI wireline jars employ patented or patent-pending technology which utilizes stored energy to maximize impact ratios. When line tension surpasses a preset load-limit (indicating a stuck condition), the tool activates and releases stored energy to deliver the initial impact. Usually, this impact – intensified by the multiplying effect of the jar's Weight Forward™ design, and assisted by the elasticity of the wireline cable – frees the tool string. If not, the operator simply decreases line tension to re-latch the tool instantly under its own weight. An Impact Selector tool can be repeatedly reset in seconds for an unlimited number of activation cycles until the stuck string is freed.

## Features

- All-mechanical design – Not affected by downhole temperature or pressure.
- HP/HT Rating – Available 500 deg F and 25,000 psi ratings.
- Safety First – No build up of pressures when the tool is brought back to the surface.
- Use of stored energy – Uses kinetic energy in conjunction with wireline stretch to achieve a “superior” impact ratio.
- Designed for maximum moving mass at top of impact tool to apply superior forces to stuck tools.
- Variable Overpull Setting – Multiple release adjustments for tool string, wireline, and borehole conditions for optimum performance.
- Fully adjustable on the surface, and even while in the tool string.
- Resets downhole under its own weight for unlimited activation cycles.

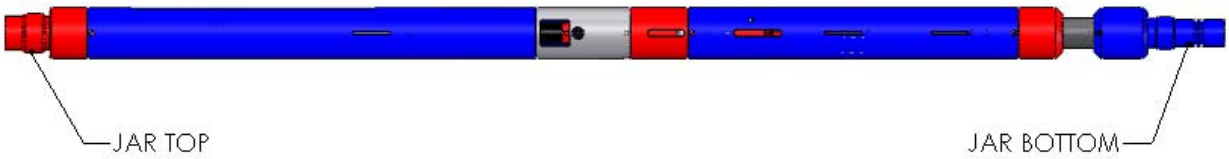
## 2-3/4" E-LINE XCALIBUR SPECIFICATIONS

| | |
|---|---|
| **Diameter** | 2-3/4 inches |
| **Length, Retracted** | 64 inches |
| **Length, Extended** | 70-3/8 inches |
| **Approximate Weight** | 65 lbs |
| **Temperature Rating** | 400 degrees F[1] |
| **Pressure Rating** | 25,000 psi |
| **Field Adjustability** | 400 to 1,700 lbs[2] |
| **Total Stroke** | 6-3/8 inches |
| **Power Stroke** | 4-13/16 inches |

1 - Available 500 degrees F available by special request
2 - Higher pre-sets available by special request

## SCOPE OF XCALIBUR MANUAL

- All references made to jars or components are considered to be with the jar oriented so that the top of the jar is on the left and the bottom of the jar on the right.
- All components take their location in relation to the jar in this position.
- The jar contains Cal-G or GO-type connections. The top of the jar is referred to as the box end. The bottom of the jar is the pin end.



# SETTING CONSIDERATIONS

## Factors to Consider:

- Max safe pulling weight of the cable
- Weight of the cable in the well-bore at target depth
- Pull-out tension or “weak point” at the cable head
  *(A good rule of thumb is a preset of half of this figure unless well conditions indicate a lower preset release tension)*
- Remember that E-Line jars are typically run at the uppermost position with the bulk of the weight below the jar

Example:

*Preset to a release tension of 400 lbs*
*Tool string weight below the jar is 500 lbs*

The jar will not close while hanging in open air, but if fluid viscosity is sufficient it may close during the run in the hole and operate at a lower preset than that required to hold the jar closed on the surface. Slacking off weight allows the jar to relatch.

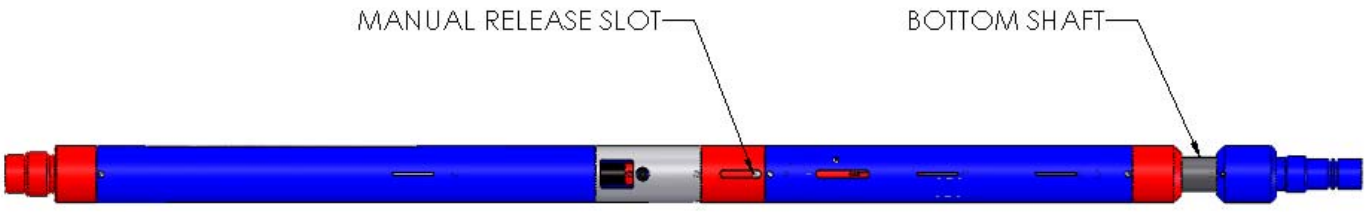
## XCALIBUR MANUAL RELEASE – LATCH TEST

**Warning!!** Do not place your hand or fingers along the shaft when re-engaging; **to do so might cause injury!** This is a potential pinch point.

**Caution!!** Do not perform this operation with the jar hanging in the tool string with tool string weight below it. To do so may cause a sudden jolt against the cable-head or rope-socket resulting in a possible separation of the tool string and wireline.

1. Locate the release slot in the center connector.
2. Insert a tool (screwdriver, punch, etc.) in the slot and engage the release sleeve.

3. With an upward movement, hold the release sleeve up, grasp the bottom sub and pull downward; this will release the latch mechanism.
4. To re-engage the latch, push upward on the bottom sub. You will not be able to pull the lower shaft out again unless you first repeat steps 1,2 & 3.



## ELECTRICAL TEST

Using a 1,000V meg-meter, connect leads to upper and lower conductors to check for continuity. The typical reading ranges from 4 to 8 OHM. To check for leaks beyond the maximum allowed, take one lead off and touch it to the body, or any bare metal surface.

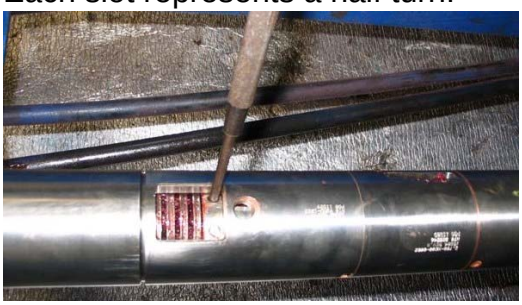
## SETTING PROCEDURE

The XCALIBUR may be preset prior to load out or in the field. If necessary, it may be adjusted in the field.

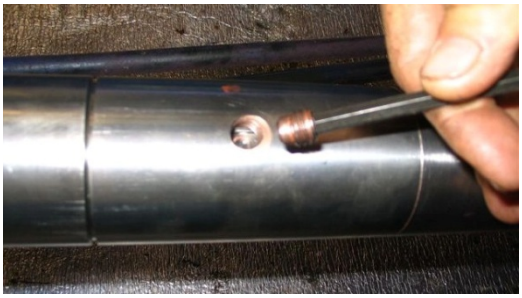
1. Remove the adjustment screw.

2. If necessary, rotate the adjustment cover (IS203) 180° to align the adjustment windows.

3. If unsure of the current setting, rotate the adjustment sleeve (IS207) to the left (down in these pictures) until bottomed out. When rotated to the right, the first slot reached on the adjustment sleeve is the zero turn setting.
4. Reference the supplied calibration sheet for the preferred setting and corresponding number of turns.
5. Rotate the adjustment sleeve to the right to increase the number of turns. Each slot represents a half turn.



6. Once the desired setting is reached, rotate the adjustment cover 180° back to cover the adjustment window.
7. Replace the adjustment screw. It should be flush with the tool Outside Diameter.



8. After setting the jar, a latch test can be performed prior to installing the jar in the tool string. Please refer to the XCALIBUR MANUAL RELEASE – LATCH TEST (Ref. Pg.5) to perform the test. This test will ensure that the latch is functioning properly, but will not verify the actual tool setting.

## RUNNING THE XCALIBUR

Between runs the jar should be visually inspected to insure that:

A. All set screws are still in place and tight
B. All connections are tight

## DEVIATED WELLS

When running in highly deviated wells or heavy mud weights the following minimum weights should be above the jar for optimum performance.

| Deviation | Minimum Weight |
|---|---|
| 0°- 20° | 10 – 20 lbs |
| 21° - 40° | 21 – 30 lbs |
| 41°- 60° | 31 – 65 lbs |

For perforating operations, a weight bar should be ran below the jar in order to help separate the jar from a possible debris field.

## AVERAGE WIRELINE CABLE WEIGHT PER 1,000 FEET

| | **7/32”** | **1/4”** | **9/32”** | **5/16”** |
|---|---|---|---|---|
| **Camesa** | 94-100 lbs | 120-127 lbs | 153-167 lbs | 188-206 lbs |
| **Rochester** | 92-96 lbs | N/A | 153-158 lbs | 183-193 lbs |
| **Vector** | 100-109 lbs | 118-123 lbs | N/A | 195-203 lbs |

## SINKER BAR WEIGHT REQUIREMENTS

$$W_t = \frac{\pi \times D_i^2 \times P_{wh}}{4B_f} - T_w$$

**Given:**

$W_t$ = Weight required at balance point. Additional weight is needed to overcome friction and to obtain downward motion.

$D_i$ = Cable diameter

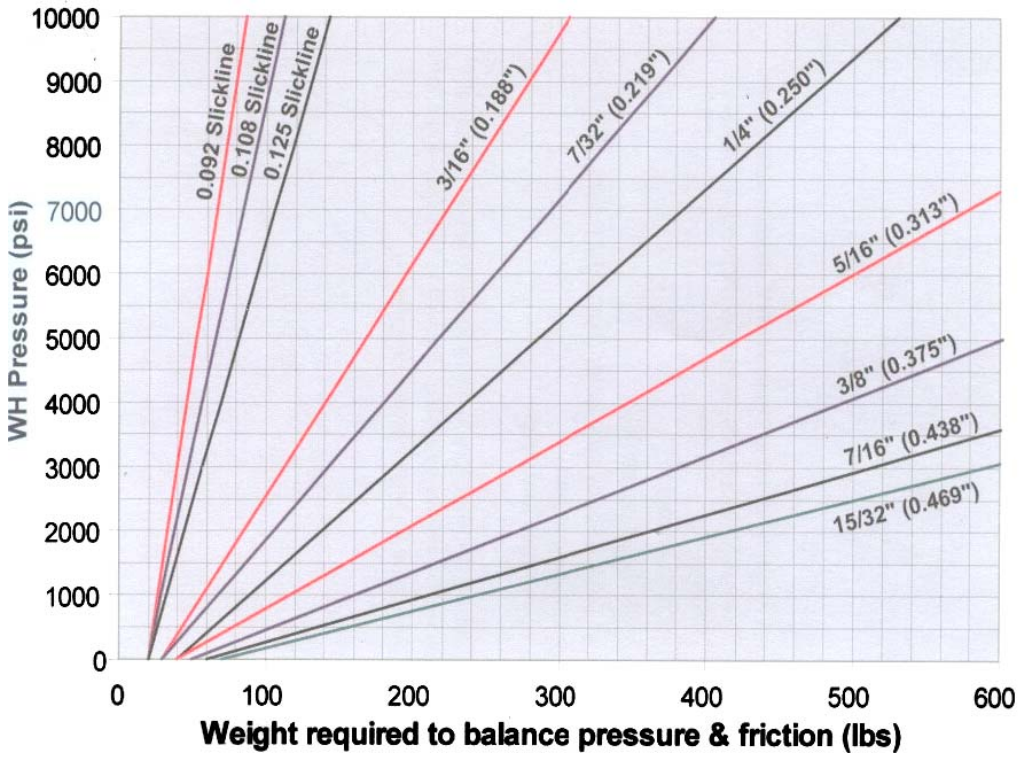
$P_{wh}$ = Wellhead pressure

$B_f$ = Well fluid buoyancy factor (from fluid weight, pressure & buoyancy chart)

$T_w$ = Downhole tool weight

In some cases, all the factors to determine the sinker bar weight required may not be readily available. Therefore, the following charts can be used to determine an approximate amount.

### Sinker Bar Weight vs. WHP



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## NOTES