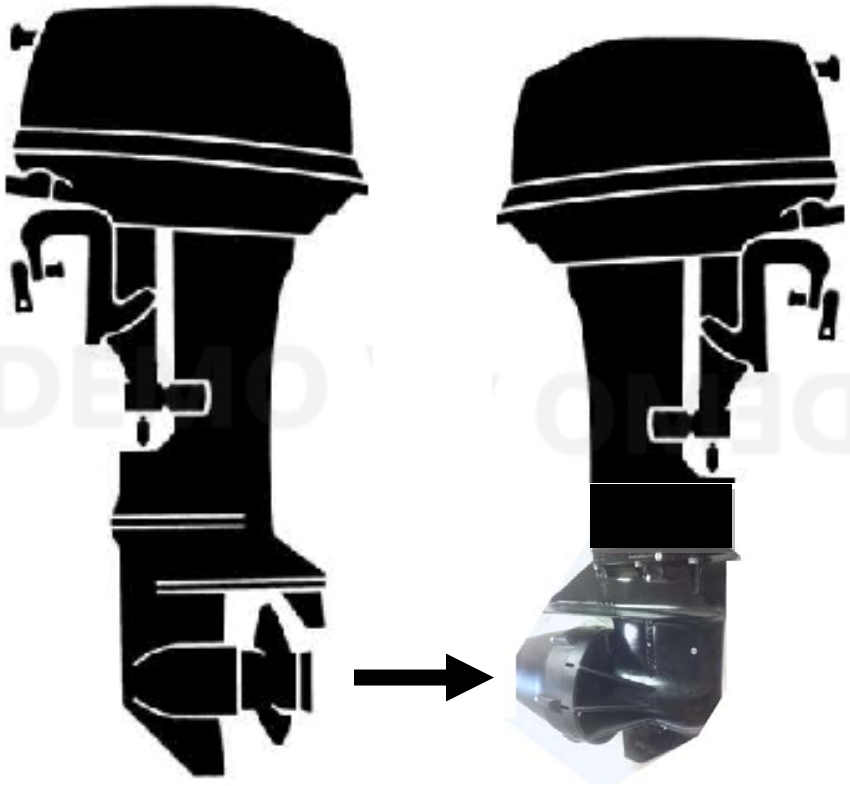
Safety Jet ***(Propeller to Pump Jet) Kit***

2018

Raider Safety Jet Owner's Manual



Safety Jet – 40 Horsepower

RO-SJ-40

Owner's Manual

Raider Outboards, Inc.
1855 Shepard Drive
Titusville, FL 32780
Telephone: (321) 383-9585

CONTENTS

If any issues arise during installation or testing feel free to call Raider Outboards (321) 383-9585.

1.0 Introduction to Safety Jet

The Safety Jet was developed specifically for the military training purposes insuring divers and personnel are protected against propeller injuries. The Safety Jet has proven excellent capabilities when used in "brown water" environments – like floods, or simply to provide protection for wildlife that would come in contact with a conventional propeller. The Safety Jet has two different models. This manual outlines the RO-SJ-40 which fits the Raider 40 HP outboard motor.

The Safety Jet has patented mechanical designs that allow it to be a "bolt on" assembly allowing the interchange between propeller and Safety Jet. You can also return to a propeller whenever you decide. This Safety Jet model will fit Mercury, Nissan and Tohatsu outboards.

Advantages of the Safety Jet:

- Faster to plane than propeller
- Steering is more dynamic
- Heavy load capacity
- Ability to operate in grass areas
- Operates well in debris waterways
- Safety for wildlife and people

Disadvantages of the Safety Jet:

- Loss of top end (speed) by as much as 15%

Picture below shows Safety Jet attached to the lower lower unit.

Extended tines to deflect debris from entering impeller.

Exhaust is ported to outside of Safety Jet reducing drag and insuring no exhaust enters into water ways.

Safety Jet is secured by tines; two bolts, and interlock between lower unit and Safety Jet.

Safety Jet was "wear" ring that can be replaced if damaged by sand.

2.0 Serial Number Location: Found inside Stator. (P/N RO-SJ-40)

Serial Number

The Raider RO-SJ-40 is a specially manufactured outboard motor jet pump for use on the Raider 40 HP outboard motor and can also fit other outboards including Mercury and Nissan.

We would like to point out that proper operation can only be assured on the condition that this manual is read through in its entirety and installation is correctly performed and the maintenance routines described in this manual are followed. Should difficulty arise with the Safety Jet, please follow the troubleshooting procedures listed at the end of this manual. For any issues, contact ***www.raideroutboards.com.***

NOTICE: DANGER/WARNING/CAUTION/Note
Understand this Owner's Manual and follow all of the instructions shown. Of particular importance is information preceded by the words "DANGER," "WARNING," "CAUTION," and "Note." Always pay special attention to such information to ensure safer and trouble-free installation and operation of the Safety Jet at all times.

⚠ DANGER

Failure to observe could result in serious injury or death.

⚠ WARNING

Failure to observe could result in serious injury or death.

YOUR RAIDER OUTBOARD MOTOR SAFETY JET

PRE-DELIVERY CHECK
Insure all physical aspects of the Raider Outboard Safety Jet RO-SJ-40 looks undamaged. All parts and part numbers are shown in this manual – with pictures.

3.0 Limited Warranty

Raider Outboards Safety Jet is fully guaranteed against defective materials and workmanship for the period from the date of purchase for one year. The limited warranty will not apply to the normal wear and tear of parts, adjustments, tune-ups, maintenance items or damage caused by:

1) Rock/Coral impact damage
2) Damage or accidents from collisions, contact with foreign objects
3) Growth of marine organisms on motor surfaces
4) Any other careless use or operation issues

CAUTION
Failure to observe installation instructions could result in minor personal injury; product or property damage.

4.0 Safety Instructions when removing propeller:

1. EMERGENCY STOP SWITCH
The stop switch must be in the off position when working on the Safety Jet.

2. DISCONNECT BATTERY

3. REMOVE SPARK PLUG WIRES

WARNINGS
As the operator/driver of the boat with Safety Jet, you are responsible for the safety of those aboard and those in other crafts around yours. Therefore you should possess thorough knowledge of correct operation of the boat and the Safety Jet. To learn about the correct operation and maintenance of the Safety Jet, please read through this manual carefully. Instruct people that could come in contact with the Safety Jet to make a fist. The hand cannot come in contact with the Safety Jet if this is done.

It is very difficult for a swimmer floating in the water to take evasive action should he or she see a power boat with Safety Jet heading in his/her direction, even at a slow speed. Therefore, when your boat is in the immediate vicinity of people in the water to be picked up care should be used. The Safety Jet option (jet pump) is especially useful for swimmers pickup and for training purposes.

⚠ WARNING
Boats are rated and certified in terms of their maximum horsepower and weight of outboard, and this is shown on the boat's certification plate. Do not equip your boat/RIB with an outboard that exceeds this limit. The Safety Jet will add weight to the outboard motor. Do not operate the engine until it has been securely mounted on the motor in accordance with the instructions.

SERIOUS INJURY IS LIKELY IF A PERSON IN THE WATER MAKES CONTACT WITH A MOVING BOAT, SAFETY JET HOUSING OR ANY SOLID DEVICE RIGIDLY ATTACHED TO A BOAT.

Any people that could possibly come in contact with the Safety Jet should be directed to make a fist that will protect any part of the body from being injured by the internals of the Safety Jet.

5.0 SERVICING, REPLACEMENT PARTS & LUBRICANTS.

The Safety Jet requires minimum servicing. Any Safety Jet part can be ordered independently. No lubricants are required during operation as water acts as the lubricant. Servicing is required if cracks appear or unusual noises are heard or boat performance is noticeably different. If a noticeable power loss occurs a replaceable wear ring could be the cause.

6.0 MAINTENANCE

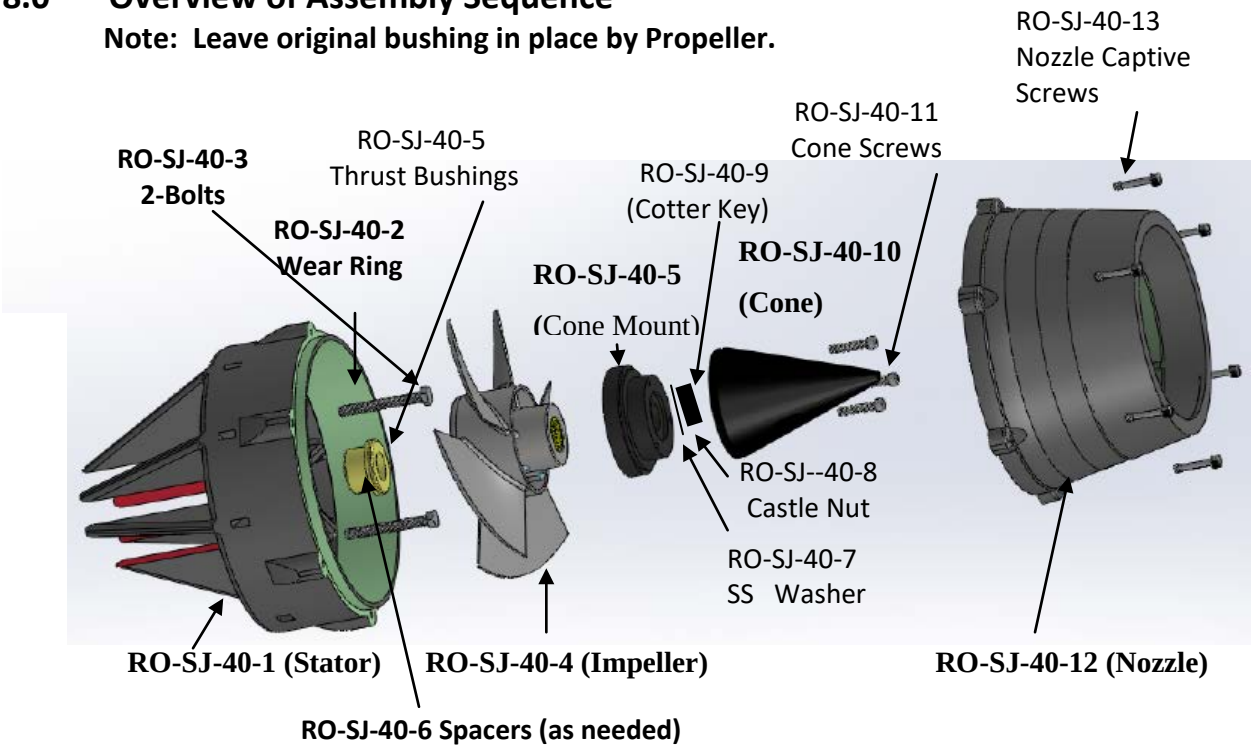
Periodic inspection is important. The Safety Jet is subjected to air drops; submersion and other abuse typical outboards never receive. The most critical maintenance, after missions, is to wash down the motor to remove salt with water and dry. When used in salt water the motor should run on fresh water for a minimum of five minutes with "water muffs" attached to a hose. Salt-Away is an excellent product to spray down both Safety Jet and boat and run through hose. Look at Safety Jet for fish line or other debris after mission.

7.0 Safety Jet RO-SJ-40 - Specifications

ITEM	RO-SJ-40
Overall length	15 inches (cone)
Overall width	9 inches
Overall height	9 inches
Weight	15 lbs.
Transom length	Long or Short Shaft
Exhaust System	Through Hub diverted to 360 deg. Side Exhaust
Cooling System	Water
Lubrication system	Water
Lower Unit Spline	12
Trim Angle	Maintain to surface to water

8.0 Overview of Assembly Sequence

Note: Leave original bushing in place by Propeller.



9.0 Names of Parts and Part Numbers - RO-SJ-40

P/N: RO-SJ--40-1 STATOR

The STATOR bolts on the lower unit; has six extended fins to minimize debris from entering the Safety Jet. It stops and transfers normal exhaust through hub gases to side exhausts. It is made of aluminum for strength.

P/N: RO-SJ-40-2 Wear Ring

Internal to the Stator is a "plastic" wear ring. This ring provides a buffer from sand and debris between stator and impeller. If performance declines simple replace the wear ring.

P/N: RO-SJ-40-3 Bolts

Two stainless steel bolts 8 x 1.25 x 70 mm with 13 mm heads are provided. Retain your original bolts with your propeller as they are shorter and you will need them if you decide to return to the propeller.

P/N: RO-SJ--4 IMPELLER

Impeller is stainless steel and moves water through the pump. The impeller is very sharp on the leading edge – be careful when handling. The impeller "flat" side is installed onto the shaft first.

P/N: RO-SJ-40-5 CONE MOUNT

The Cone Mount is inserted over the impeller and provides the base of connecting the cone.

P/N: RO-SJ-40-6 THRUST BUSHING

The Thrust Bushing supports the load of the impeller thrust.

P/N: RO-SJ-40-7 STAINLESS STEEL WASHER

Spacers are used to shim out Stator to insure impeller does not rub on the stator. Spacers' are.010 thick.

P/N: RO-SJ-40-8 CASTLE NUT

The Castle Nut is installed with the open spaces at the top. Torque to 18 ft. /lbs. The split pin (cotter key) is inserted through the shaft and top of castle nut.

P/N: RO-SJ-40-9 SPLIT PIN/COTTER KEY

A cotter key (split pin) is provided. This stainless steel split pin is 7/64 x 1 inch long.

P/N: RO-SJ-40-10 CONE

The Cone provides a means to produce thrust in the Safety Jet. This plastic piece is shaped for performance and also stops anyone from getting injured through the back of the Safety Jet.

P/N: RO-SJ-40-11 (3) CONE SCREWS (¼ x20 x 1.25) 3/16 " Allen Head Cap

The Cone Screws fasten the Cone to the Cone Mount. Tighten to 6 ft/lbs.

P/N: RO-SJ-40-12 NOZZLE

The Nozzle was designed to produce the thrust and maintain a barrier between the spinning impeller. A series of fixed internal fins are located in the nozzle to counter the rotation of the water coming off of the impeller.

P/N: RO-SJ-40-13 (6) NOZZLE CAPTIVE SCREWS 1" – 3/16"

The Nozzle screws are fixed with lock washers should be tightened to 6 ft/lbs.

NOTE: All parts can be independently ordered.

CAUTION
Before removing the propeller, remove the spark plug ca s from the spark plugs for safety. Disconnect battery.

10. INSTALLATION INSTRUCTIONS

This document guides the proper installation or service of the Raider Safety Jet RO-SJ-40 Kit onto your outboard motor. Improper installation or servicing of the Raider product could result in damage to the Safety Jet, outboard motor or personal injury to those installing or operating the product.

NOTE: After completing installation, place these instructions, propeller and bolts in a secure place for future use in the event you want to return to the propeller.

Installation will not require the use of special OEM mounting hardware when assembling the Safety Jet. Use only hardware provided by Raider or your outboard motor OEM. Anodic rim tab or anodic plate on your existing motor can be left intact. There should not be a clearance issue between the anodic trim plate and Safety Jet.

RAIDER RO-SJ-40 INSTALLATION

1. Remove existing propeller

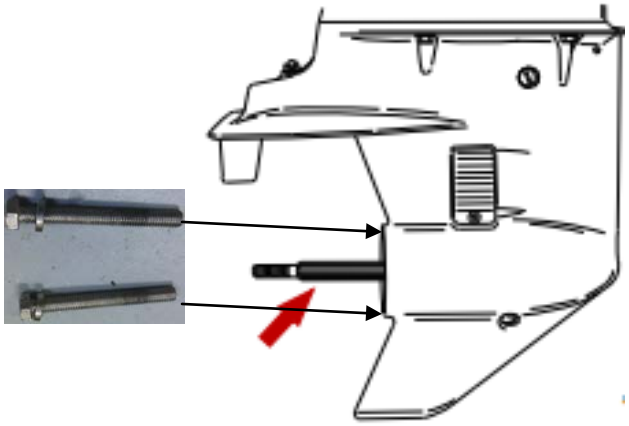
Keep two bolts when you go back to propeller

A. Remove existing propeller and all brass spacers.

B. Remove (2) 13mm bolts from bearing cap. (see drawing - keep)

(Note: Retain noted hardware for re-installation of propeller.

C. Grease prop shaft – Synthetic (while propeller off – good practice)



D. Use Thrust Bushing from propeller

Leave on shaft the Thrust Bushing that comes on the Raider.

Install stator (P/N: RO-SJ-40-1). Stator will be snug fit on the Raider Lower Unit. Slide over shaft.

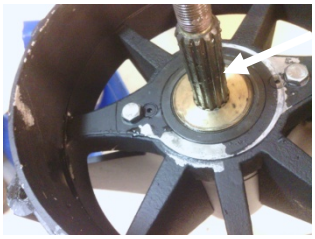
Installation Ring – P/N RO-SJ-R40-20

The installation ring provides correct alignment when installing the Safety Jet. After sliding the Stator (shown above) on the shaft – fit the installation or alignment ring inside the stator. Two of the holes in the alignment ring positioned over the bolts; tighten the two bolts (alternately) to 18-20 ft. pounds. With a wood or mallet handle tap out the alignment ring after tightening bolts. This process insures impeller is correctly aligned within .025-0 thousands tolerance.

Note: Only one alignment ring is required for multi-installations.

E. Slide #3 thrust bushing - Spacer (P/N: RO-SJ-40-5) on shaft

Insure about .060 clearances between #3 thrust bushing and impeller. You may have to use spacers SJ-001-40-6 to bring out thrust bushing #3.



F. Install (P/N RO-SJ-40-2) - 13mm X 70mm Bolts (torque 10 ft/lbs.)

Insure Bellville Washers are on each bolt.

G. Install (P/N RO-SJ-40-3) - stainless steel impeller, boss side up, spin to ensure clearance. Slight rubbing is acceptable between stator and impeller, it will seat in during operation. This will fit tight inside the "plastic" wear ring installed inside stator.

H. Install (P/N: RO-SJ-40-4) Cone Base

I. Install (P/N: RO-SJ--40-7) 316 Stainless Steel washer

J. Install (P/N: RO-SJ-40-8) Castle nut (prop nut). Torque to 18 ft/lbs.

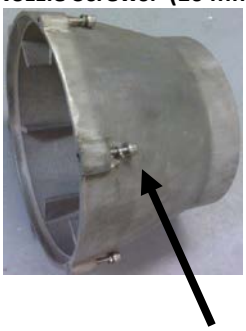
K. Install (P/N: RO-SJ-40-9) split pin. (Stainless Steel 7/64 x 1 inch long)

L. Install (P/N: RO-SJ-40-10) Cone onto Cone Spacer Adapter

3 – ¼ - 20 Cap Bolt with Lock washers.
Tighten (P/N SJ-040-11) with 3/16
Allen Head to 6 ft/lbs.

M. Place (P/N: RO-SJ-40-12) Nozzle on stator.

Tighten (P/N: SJ-001-40-13) (6) Nozzle Screws. (10 mm – torque to "snug." Use 3/16 T- Handle.



N. RO-SJ-40-13. Tighten Nozzle Captive Screws

When installing Safety Jet - do the following:

Lubricate the propeller shaft splines with Anti-Corrosion Grease Propeller or Teflon/synthetic grease.

11.0 After installation of Safety Jet

Performance:

The Safety Jet installation results in the operation of an outboard motor similar to that operated with a propeller. You will notice some differences in the steering and boat operation, depending upon the boat or Rubber Inflatable Boat (RIB). The Safety Jet turns in a tighter radius than a propeller with no cavitation. You will notice quicker initial plane of the boat; however, you will lose approximately 12-15 percent speed on top end. For full thrusts the best results are when the trim angle of the outboard with the Safety Jet is parallel to the surface of the water. The Safety Jet has uniquely designed extended tines that divert objects from entering the jet pump. The stainless steel impeller makes the Safety Jet optimized to go through debris; grass and is excellent for beaching the craft.

SAFETY:

The Safety Jet was developed to provide safety during training. The Safety Jet eliminates the prospect of being injured by a rotating propeller. Any contact with the Safety Jet would be the stator or nozzle which is less a threat**. It is difficult but not impossible to insert hands into the Safety Jet front or back; even though protection is provided. It is important young children not stick their hands into these chambers.** When in the water near a Safety Jet clench hands into fists and cross arms over your head to minimize impact.

12. TROUBLE SHOOTING

Issue	Fix
Boat Not Planning correctly	Trim Angle Setting. Move pin at motor mount to set Safety Jet parallel to surface of water.
Noise in Safety Jet.	Loose Bolts. Recheck two bolts in lower unit to torque.
Power Loss	Check plastic wear ring to insure tight fit

13. Tools Required

1. 3/16 “T” Handle Allen (Provided in kit)
2. 13 mm Deep Hex Socket
3. Needle Nose Pliers
4. Torque Wrench
5. Water proof grease (provided)
6. Stator Alignment Ring (provided) (P/N RO-SJ-R40-20)