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Applicable additional manuals:
None

Aerospace Group
Conveyance Systems Division

Carter® Ground Fueling

Maintenance & Repair Manual

7” Emergency Breakaway Fuel Coupling

Model 64191

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Maintenance, Overhaul & Test Instructions
Eaton's Carter® Brand Model 64191
7" Emergency Breakaway Coupling

1.0 Introduction

This service manual is provided as a guideline for users of the 7" Breakaway Fuel Coupling P/N 64191. The coupling was designed to provide a safe and environmentally friendly means for various forms of ship-to-ship refueling applications.

2.0 Description

Eaton's Carter® brand Model 64191 Emergency Breakaway Coupling is a 7 inch quick connect and disconnect fuel coupling system that features an emergency breakaway function. It was developed in conjunction with the Canadian Navy to facilitate a safe, simple and spillage free fueling operation at sea. The coupling meets or exceeds all the requirements of the latest NATO Replenishment At Sea Coupling Specification. It is designed to be used Abeam or Astern "lay on deck" with a Hudson Reel and standard 6 or 7 inch hose.

The Model 64191 coupler assembly consists of two halves, the Probe and the Receiver. The Probe is available for Abeam or Astern refueling applications as part number 64191-1 (reference Section 3.0 for available options). The Probe is normally connected to the fuel supply hose on the supply vessel. The Receiver is part number 64191-2 (reference SM64191-2 for maintenance and repair of the unit) and is normally installed on the piping to the receiving vessel's tanks. The Probe is designed to mate with the hose coupling in accordance with MIL-C-24356 with female version on the Probe. The Receiver is designed to mate with hose coupling in accordance MIL-C-24356 with the male version on the Receiver.

In preparation for refueling at sea, the Probe (weighing 68 pounds without fuel) is manually connected to the Receiver by simply pushing the Probe into the Receiver. Latching of the Probe to the Receiver is spring assisted and fully automatic. Under normal conditions (Hose, Probe, Receiver, and tank fill line are NOT full of fuel and pressurized), the pushing force required to engage the Probe and start the latching process is approximately 50 pounds.

NOTE: Neither the Probe nor the Receiver should be completely flooded with fuel during the connection. A "full hydraulic lock" greatly increases the force required to engage the Probe.

Following the completion of the refueling, the disconnection can be achieved by pulling back on the actuating collar of the Probe. Disconnecting the Probe from the Receiver is spring assisted and fully automatic. The initial disconnection force required is approximately 10 pounds of pulling force on the actuating collar of the Probe. The Probe is equipped with a sleeve dry break and the Receiver is equipped with a piston dry break, which automatically opens or closes during the engagement or disengagement process resulting in an almost spillage free fueling operation.

NOTE: Eaton's specification for this coupling system allows for a maximum of 100 cc of interface leakage during the disconnection.

The coupling system also functions as an emergency breakaway coupling when the connected assembly is subjected to a tensile load of 1100 pounds through the fueling hose. This feature is designed to eliminate the risk of fuel spillage from a hose rupture or mechanical failure while refueling at sea. When the coupling is subjected to a breakaway load, the Probe and Receiver halves separate and the related sleeve and piston drybreak will close. This secures the fuel in each half resulting in almost no spillage. The breakaway force of 1100 pounds is constant and independent of the internal fuel pressure. This emergency breakaway function is fully automatic and can be achieved without any human interaction. Upon breakaway, in an emergency situation, the Probe and Receiver halves can be re-connected manually. This is the same as a normal fueling operation; without any repair to the coupling and without the use of any tools. The refueling operation can be resumed immediately.

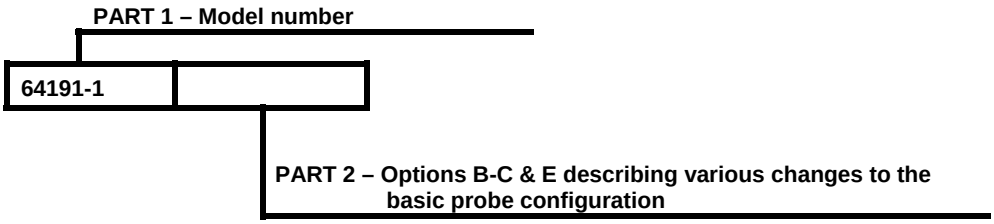
3.0 Table of Options

Model 64191 7" Emergency Breakaway Fuel Coupling consists of two parts, the Probe, 64191-1 and the Receiver, 64191-2. Several options are available for each of the two parts, as shown below:

64191-1 Probe

The basic unit, 64191-1 is available with options to customize it to meet specific requirements as listed in the table below. The various options, when compatible, may be combined and listed following the part number 64191-1 to achieve a complete unit.

The part number consists of two basic parts as illustrated below:



PART 2

Option Letter	Description	Option Letter	Description
Standard	Probe Handle	C	Adds 6" Sight Glass Adapter
B	Adds Protective Probe Cap	E	Adds Nose Cone Assembly

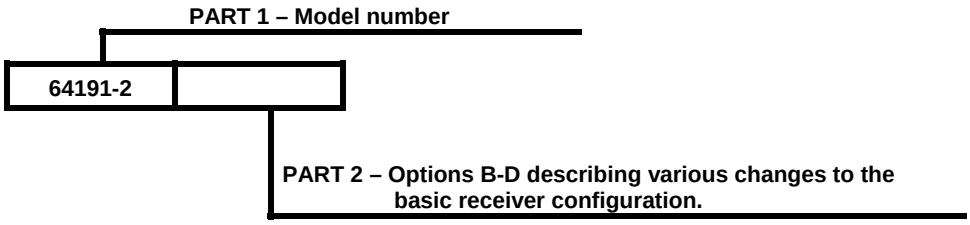
Notes: Astern fueling operations will require option E to be added to the basic Probe configuration.

Example: 64191-1BC is a Probe with protective cap and 6" sight glass adapter.

64191-2 Receiver

The basic unit, 64191-2 is available with options to customize it to meet specific requirements as listed in the table below. The various options, when compatible, may be combined and listed following the part number 64191-2 to achieve a complete unit.

The part number consists of two basic parts as illustrated below:



PART 2

Option Letter	Description	Option Letter	Description
B	Adds Adapter Cap	D	Adds 6" ANSI Flange Adapter
C	Adds 6" Adapter		

Notes: The basic unit comes with a 7 inch outlet adapter. Options C or D will reduce the outlet adapter to 6 inches.

Example: 64191-2BD – A receiver with protective cap and 6" ANSI flange adapter.

4.0 Operation

4.1 Connection

The Probe, weighing 68 pounds, can be handled by one refueling technician (easily by two refueling technicians) under normal operating conditions. Normal operating conditions are defined as when the supply hose, Probe, Receiver, and tank fill line are NOT full of fuel and pressurized. During connection, providing space for the retained fuel during latching process greatly reduces the required connection force. As long as the Receiver discharge pipe valve is not closed, the fuel is allowed to drain into the vessel's receiving tank during the connection process and only 50 pounds of force will be required to initiate the latching process.

4.1.1 To couple the Probe to the Receiver, remove the protective caps from both halves and insert the conical end of the Probe into the concaved opening of the Receiver. During this engagement process align the Probe and the Receiver on the same center-line or axis.

4.1.2 When the Probe is inserted into the Receiver, the interface seal between the two halves will engage prior to the dry break in either half opening, this will prevent external spillage of residual fuel from inside the fueling system.

4.1.3 Continue to push the Probe against the Receiver. This will open the dry breaks, actuate the detent pins and initiate the automatic latching process. The dry break in the Receiver and Probe will open simultaneously. Since the Probe is installed on the fuel supply hose, the opening sequence allows the residual fuel in the hose to move directly into the receiver tank providing smooth operation of the coupling system.

4.1.4 When the detent pins are fully actuated, the actuating collar on the Probe is automatically spring-energized to close towards the Receiver completing the latching of the two halves.

The constant push force required to complete the latching process is about 50 pounds. If the process requires significantly more force, check to ensure that there is no restriction between the Receiver and tank fill line, such as a closed service valve.

As the actuating collar springs into the latched position, there will be a slight spring relief shock felt and a distinct metal impact noise heard indicating the completion of the latching process. At this time, the dry breaks on both halves are fully opened for a full flow pathway and fueling can begin.

4.2 Disconnection

Before disconnection of the Probe, allow time for the residual fuel in the supply hose to drain into the receiving tank.

NOTE: The receiving piping should be fitted with a vacuum breaker or a manual valve that can be opened to balance the piping pressure to the atmosphere.

4.2.1 To disconnect the Probe from the Receiver, apply a pulling force of 10 pounds to retract the collar on the Probe.

4.2.2 This pulling action releases the detent pins, then the dry break sleeve and piston in each half will start to close. As the dry breaks are closing, the spring will literally push the two halves apart.

4.2.3 The Probe and Receiver dry break will close simultaneously, stopping the flow of fuel into the Receiver and the receiving tank allowing the fuel in the Receiver to drain into the receiving tank.

4.2.4 After Probe closure, the Receiver dry break remains slightly open until the interface seal between the two halves is at the edge of disengagement. This progressive closure allows air to be ingested into the interface cavity between the two halves from the vent valve in the Receiver piping. This ingested air also helps to balance the atmospheric pressure to facilitate ease of manual separation of the coupling. Disconnection without this pressure equalization may require significantly more force to separate the two halves until the pressure suction has been broken.

4.2.5 Continuing to pull the two halves apart will disengage the interface seal and complete the disconnection. A force of approximately 20 pounds will fully separate the Probe from the Receiver. Reinstall the protective caps to protect the seals and seal surfaces from dirt and/or damage.

5.0 Disassembly - 64191-1 Probe

5.1 Prior to disassembly the Probe should be removed from hose and placed on a suitable working surface with the hose inlet side down. Referring to the exploded parts view, figure 2.0 during disassembly will be helpful.

5.2 It is not necessary to remove Probe Handle during the disassembly process unless it is being replaced.

5.3 To begin, retract Sleeve (2A-4) and hold in the retracted position by inserting the Teflon Rod through one of the openings in the Valve Body (2A-9). The Teflon Rod is part of the tool kits offered as either KD64191-4 or KD64191-8. Refer to Section 11.0 for more information.

5.4 Remove eight Screws (2A-2*A) from the top of the Piston Retainer (2A-1) and set aside for reuse.

5.4.1 To break the seal between the Piston Retainer (2A-1) and the Gasket (2A-3) it may be necessary to use a wooden mallet to apply upward momentum to the sealing edge of the Piston Retainer (2A-1). Do not use metal tools to strike or pry these two pieces apart as this could permanently damage the sealing surface of the Piston Retainer (2A-1). Remove Gasket (2A-3) and discard.

5.5 Retract Sleeve (2A-4) enough to remove the piece of Teflon and guide the Sleeve (2A-4) and Spring Cover (2A-5) off over the top of the Valve Body (2A-9). This will allow for the removal of the Probe Valve Spring (2A-6) and the Spring Retainer (2A-7).

5.6 Remove eight Screws (2A-2*B) securing the Valve Body (2A-9) to the Coupling Body (2A-15) and set aside for reuse. Lift out Valve Body (2A-9) and carefully remove the energized Cup Seal (2A-8) before setting aside. Seal (2A-8) should be discarded. Remove O-ring (2A-10) from the groove in the Coupling Body (2A-15) and discard.

5.7 Reverse the Coupling Body (2A-15) on the working surface so that the hose inlet side is visible. Remove and discard O-ring (2A-30) from the groove in the inlet side of the Female Adapter (2A-29).

5.8 Remove eight Screws (2A-2*D) from the Female Adapter (2A-29) and set aside for reuse. With the Female Adapter (2A-29) removed and set aside, the O-ring (2A-16(*B)) can be removed from the inlet side of the Coupling Body (2A-15) and discarded. **Stop!** Read next section before moving forward.

IMPORTANT NOTE:

Please read through the complete Spring removal process (through paragraph 5.9.4) before continuing with the actual disassembly.

EXTREME CAUTION!:

The breakaway spring (2A-25) is under 1000 pounds of compression! With the retaining ring (2A-28) removed, only the spring compression tool is securing the spring in place. Failure to adhere to these procedures could result in serious physical injury or even death.

5.9 Install Spring Compression Tool TF64191-2 on the Connector (2A-24). Begin by placing the Spring Compression Tool Base (5-1) inside the outlet end of the Connector (2A-26) with Threaded Shaft (5-4) extending through and exiting the inlet side of Connector (2A-26). Place Spring Compression Plate (5-5) through Threaded Shaft (5-4) and rest on top of the Spring Retaining Ring (2A-26). Thread Washer (5-3) and Spring Compression Handle (5-2) onto Threaded Shaft (5-4) until snug against Spring Compression Plate. Ensure that the Spring Compression Plate (5-5) is not resting on Retaining Ring (2A-28) and is fully seated on Spring Retaining Ring (2A-26). Now the Spring Compression Tool (5) is now fully installed.

5.9.1 Ensure that (2A-24) is properly secured before compressing the Breakaway Spring.

5.9.2 Begin compressing Breakaway Spring (2A-25) by turning Spring Compression Handle (5-2) clockwise. Gradually tighten until Retaining Ring (2A-28) is fully visible from top to bottom and 360 degrees around.

5.9.3 Install TF64191-3 Retaining Ring Shroud over the inlet to the Coupling Body (2A-15). Remove the Retaining Ring (2A-28) by catching the cut edge of the ring with the blade of a screwdriver to force the edge from the groove in the body. Use the flat edge of the screwdriver blade between the layers of the ring to “walk” the ring out of its groove and up over the Retaining Ring Shroud. Set Retaining Ring (2A-28) aside for reuse. Remove Retaining Ring Shroud.

CAUTION:

Do not lean over tool fixture while loosening the Spring Compression Handle. Accidental injury or death may occur in the event of a failure.

5.9.4 Gradually turn Spring Compression Handle (5-2) counter clockwise to decompress the Breakaway Spring (2A-25). Once all compression is off the Breakaway Spring (2A-25) the spring compression tool can be removed from the Connector (2A-24).

5.10 Remove Spring Retaining Ring (2A-26), but before setting it aside, remove and discard O-ring (2A-27).

5.11 Remove Breakaway Spring (2A-25) and set aside for later use.

5.12 Remove and discard second O-ring (2A-16*B) from the Coupling Body (2A-15).

5.13 Using the Probe Handle, apply a slight upward pulling force to dislodge the Connector (2A-24) from the Coupling Body (2A-15) and carefully guide Connector (2A-24) over and clear of the actuating collar springs. Set Connector (2A-24) aside.

5.14 Remove Spacer (2A-23), Actuating Spring (2A-22) and the Stayback Spring (2A-21) and set aside.

5.15 Remove and discard third O-ring (3-16*A).

5.16 Inspect nylon Body Bumper (2A-17) for any severe nicks or wear. If it does not need replacing then it is not necessary to remove it during disassembly.

5.17 Reverse the direction, of the partially disassembled Probe to where the hose inlet end is resting on the working surface.

5.17.1 Remove six Screws (2A-20) from Actuating Collar Assembly (2A-19) and set aside for reuse. Move the Actuating Collar (2A-19) up and down to dislodge the Lug Ring Retainer (2A-18) from underneath the Actuating Collar (2A-19). Now the Actuating Collar (2A-19) can be carefully disengaged from the Coupling Body (2A-15) and lowered to the work surface.

NOTE: The fifteen Locking Lugs (2A-14) will fall away from the Coupling Body (2A-15) during this process. Care should be taken not to lose or damage the lugs with the Actuating Collar during its removal.

5.17.2 Remove the Lug Wire (2A-11) from the Coupling Body (2A-15) by locating the gap in the wire and carefully prying it away from the body enough to get a finger underneath and guide it up and over the Coupling Body. Care should be given during removal not to stretch or deform the Lug Wire in any way as it will be reused. If the three Stayback Detents (2A-13) did not fall away from the Coupling Body during removal of the Lug Wire, they may now be removed and set aside.

Disassembly of the basic Probe assembly 64191-1 is now complete. All parts should be wiped clean and inspected for damage.

6.0 Disassembly - 64191-2 Receiver

6.1 If Receiver is equipped with Option B Protection Cap (4-B), remove it by unscrewing Screw (2B-2*B) from the Housing (2B-10). Set the Screw (2B-2*B) and Option B Cap aside for reuse.

6.2 Begin the disassembly slightly compressing the Piston (2B-5) to relieve the load on the Male Adapter (2B-3) then remove the eight Screws (2B-2*A) from the Male Adapter (2B-3) and set aside for reuse.

6.3 Slowly remove the Male Adapter (2B-3) from the assembly while relieving the compression on the piston Spring (2B-7).

6.3.1 Remove and discard the O-ring (2B-1) from the interior groove in the Male Adapter (2B-3).

6.3.2 Remove and discard the O-ring (2B-4) from the shoulder on backside of Male Adapter (2B-3) and set the adapter aside.

6.4 Carefully lift the Piston (2B-5) from the piston Spring (2B-7).

6.4.1 The Cup Seal (2B-6) can now be removed from the Piston (2B-5) and discarded.

6.5 Carefully remove the piston Spring (2B-7) from the Spring Guide (2B-8) inside the receiver Housing (2B-10) and set aside.

6.6 Using both thumbs, catch the inside lip of the Piston Guide (2B-8) and lift it from the Housing (2B-10). Remove and discard O-ring (2B-9) from the bottom of the Piston Guide (2B-8).

6.7 Reverse the partially disassembled unit so the inlet side is resting on the work surface.

6.7.1 Remove the eight Screws (2B-2) securing the Adapter Housing (2B-12), Option C or Option D to the receiver Housing (2B-10), and set aside for reuse.

6.7.2 Remove and discard O-ring (2B-11).

6.8 If Option B Protection Cap is present, remove and discard O-ring (3-2).

Disassembly of basic Receiver unit 64191-2 is now complete.

7.0 Inspections and Troubleshooting of Leaks

The Breakaway Coupling Assembly halves should be periodically inspected and tested to ensure the equipment is in satisfactory working condition.

7.1 Periodic Inspections - **64191-1 Probe**

The dry break sealing surfaces of the Probe shall be visually inspected for scratches and any surface imperfections. Damage to the Piston Retainer surface can cause leakage during the fueling process.

7.1.1 The actuating collar of the Probe shall be inspected for deformation. A severely deformed actuating collar could prevent the Probe from being connected to the Receiver. Minor surface damage to the exterior of the actuating collar, such as localized impact marks or scratches are to be expected and are acceptable.

7.1.2 Check for missing or fractured latching lugs in the Probe. Missing latching lugs indicate the fueling Probe is severely damaged and should not be used until repaired.

7.1.3 The Probe shall be periodically hydrostatic pressure tested in the disconnected condition for any evidence of damage or leakage. Refer to Section 8.0 of this manual. Repair or replace seals and components as necessary in accordance with this service manual. Hydrostatic pressure tests shall be conducted at 5 psig and 180 psig.

7.1.4 The Probe shall periodically undergo connection and disconnection tests to a slave Receiver of good condition. Failure to function properly during these tests indicates damage to the Probe. Overhaul should be performed in accordance with this manual.

7.2 Flow Paths and Leaks

Use Figure 5 to identify leak paths & possible failed seals.

7.2.1 If fluid is continuously leaking from the “Breathing Hole” located in the Female Adapter (2A-29), it would most likely be caused by an O-ring failure. Three O-rings should be considered suspect if this occurs; first the O-ring (2A-27) located on the Spring Retainer Ring (2A-26); second & third either of the O-rings (2A-16) located just ahead of and just behind the Retaining Ring’s (2A-28) groove on Coupling Body (2A-15).

7.2.2 If the third remaining O-ring (2A-16), located nearest to the nylon Body Bumper (2A-17) were to fail, the leakage would appear from the inside diameter of the Actuating Collar (2A-19) out through the Locking Lug’s (2A-15) cavity on the outer diameter of the Coupling Body (2A-9).

7.2.3 If fluid is leaking from the inside diameter of the Coupling Body (2A-9), from between the Spring Cover (2A-5) and Sleeve (2A-4), the source of the leak could be either the Seal Cup (2A-8) or the O-ring (2A-10).

7.2.4 If leakage is observed at the gasket between the Piston Retainer (2A-1) and the Sleeve (2A-4) and/or from around the Screws (2A-2) in the Piston Retainer (2A-1), the Gasket (2A-3) may need to be replaced. However, the Sleeve (2A-4) should be checked for damage at the gasket sealing surface. It is advisable to check the running torque of the Screws (2A-2) securing the Piston Retainer (2A-1), as they may need to be replaced or tightened. Refer to 8.17.2 for torque and installation requirements.

NOTE: If there is a leakage while connected and under flow from the mating point between the Probe and Receiver, the failed O-ring is most likely the O-ring (2B-1) on the Receiver 64191-2. See section 64191-2, paragraph 7.5.1.

7.3 Overhaul Inspections

7.3.1 During the overhaul process, all components should be visually inspected for cracks, excessive wear, damage or distortion, which could inhibit proper function and movement of the part.

7.3.2 Replace any parts identified as damaged with new Carter Ground Fueling parts.

7.3.3 Ensure that parts identified as re-useable are free of old grease, debris and/or contaminants prior to and during reassembly.

7.3.4 The 64191-1 Probe is a robust assembly and with normal use, secured stowage, and the protective covers in place when not in use; few external parts and fewer internal parts should exhibit the kind of wear that would necessitate replacement. Items most likely to need replacing would include:

- O-rings
- Gaskets
- Seals
- Lug wire, lugs, detents
- Screws
- Sleeve

Refer to Section 11.0 of this manual for tabulated parts index, overhaul kit information and their components. This includes test fixtures and tools available to maintain the basic unit and its options.

7.3.5 Items of particular note during visual inspection include:

7.3.5.1 Lugs (2A-15)-If any Lug appears worn, cracked or damaged in any way, replace it with a new one.

7.3.5.2 Stayback Detent (2A-13)-If any Detent appears worn, cracked or damaged in any way, replace it with a new one.

7.3.5.3 Lug Wire (2A-11)-If Lug Wire is deformed or show signs of uneven wear, replace with a new one.

7.3.5.4 Sleeve (2A-4)-The Sleeve has two sealing surfaces, which damage to either can be the cause of leaks. Inspect both visually and by feel, the inside diameter of the Sleeve and the outside diameter of the shoulder on the outlet side of Sleeve. Both surfaces should be smooth and free of nicks and abrasions. Replace if necessary.

7.3.5.5 Spring Retainer Ring (2A-26)-Retainer Ring has two sealing surfaces, which damage to either can be the cause of leaks. Inspect both visually and by feel, the inside diameter of the Ring and the outside diameter of the shoulder on the Ring. Both surfaces should be smooth and free of nicks, and abrasions. Replace if necessary.

7.4 Periodic Inspections - **64191-2 Receiver**

The dry break sealing surface of the Receiver shall be visually inspected for scratches and any surface imperfections. Damage can cause leakage during the fueling process.

7.4.1 Perform a visual inspection of the outside diameter of the Male Adapter (2B-3) where the locking lugs of the 64191-1 Probe (Probe) latch onto the Receiver. Damage can cause leakage or a disconnection during the fueling process.

7.5 Flow Paths and Leaks

7.5.1 If there is leakage while connected and under flow from the mating point between the Probe and Receiver, the failed O-ring is most likely the Receiver O-ring (2B-1).

7.5.2 If there is leakage from the breath hole (located near where the receiver clamps to the vessel's piping), the Cup Seal (2B-6) has failed.

7.5.3 If the Cup Seal (2B-6) or O-ring (2B-9) fails, the Receiver will leak at the backside of the outlet of the Receiver where it clamps to the receiving vessel's piping.

7.5.4 If O-ring (2B-11) fails, the Receiver unit will leak from in between the Housing (2B-10) and the adapter connected to the receiving vessel piping.

7.6 Overhaul Inspections

During the overhaul process, all components should be visually inspected for cracks, excessive wear, damage or distortion, which could inhibit the proper function and movement of the part.

7.6.1 Replace any parts identified as damaged with new Carter Ground Fueling parts.

7.6.2 Ensure that parts identified as re-useable are free of old grease, debris and/or contaminants prior to and during reassembly.

7.6.3 The 64191-2 Receiver is a robust assembly and with normal use and the protective covers in place when not in use; few external parts and fewer internal parts should exhibit the kind of wear that would necessitate replacement. Items most likely to need replacing would include:

- O-rings
- Seals
- Screws
- Male Adapter

Refer to Section 10.0 of this manual for tabulated parts index, overhaul kit information and their components. This includes test fixtures and tools available to maintain the basic unit and its options.

7.6.4 Items of particular note during visual inspection include:

7.6.4.1 Piston (2B-5)-The outside diameter of the piston is a sealing surface and should be inspected for nicks and abrasions, which can be the cause of leaks. Replace if necessary.

7.6.4.2 Piston Guide (2B-8)-The inside diameter of the piston guide is a sealing surface (for the Piston (2B-5) OD) and should be inspected for nicks, and abrasions which can be the cause of leaks. Replace if necessary.

8.0 Reassembly - 64191-1 Probe

8.1 During reassembly it is recommended that a light coating of petroleum jelly be used on all new O-rings and seals being installed. Excessive amounts of grease can have a harmful effect on parts and their proper function and should be avoided.

8.2 Begin reassembly by placing the Valve Body (2A-9) on the work surface with slots facing upward. Place a lightly lubricated Cup Seal (2A-8) over the outlet (slotted) side of the Valve Body (2A-9) with the "spring" side of the seal visible. Ensure the cup seal groove on the body is clean and free of any debris. Using the seal Installation Sleeve Tool TF64191-4, guide the energized seal into the groove on the Valve Body (2A-9). A light coating of petroleum jelly to the installation sleeve may be helpful. Afterward, run a finger around the full circumference of the seal to ensure proper seating and force out any excess petroleum jelly. Wipe away any excess with a clean lint free cloth or rag. Remove the Installation Sleeve Tool.

8.3 Turn the Valve Body (2A-9) over and install new O-ring (2A-10) over the shoulder protruding from the flange at the inlet. Apply an additional coating of petroleum jelly to the O-ring (2A-10) once it is in place to prevent cutting upon installation of Valve Body (2A-9).

8.4 With the inlet side of the Coupling Body (2A-15) resting on the work surface. Brush a thin coating of petroleum jelly on the O-ring groove in the center of the body where the O-ring (2A-10) will be seated. Carefully install the Valve Body (2A-9) with the O-ring (2A-10) facing downward. Be sure the Valve Body (2A-9) is square on the Coupling Body (2A-15) and apply just enough downward pressure to seat the O-ring (2A-10).

8.4.1 Align bolt pattern on the Valve Body with the bolt pattern on the Coupling Body and secure with eight Screws (2A-2*B) tightening each incrementally in a star pattern. Final torque on the screws should be 57 ± 5 in.- lbs. (66.0 ± 6.0 kg-cm). Caution should be taken not to damage Cup Seal (2A-8) when tightening screws.

8.5 Reverse the direction of the partially reassembled unit so the Probe outlet is resting on the work surface.

8.5.1 Locate the Spring Pin (2A-12) in the Lug Wire groove on the Coupling Body (2A-15) and carefully install the Lug Wire (2A-11) so that the Spring Pin (2A-12) is between the two ends of the Lug Wire (2A-11).

8.5.2 Using the Spring Pin (2A-12) as the starting reference point, skip over the groove to its right and install the first Stayback Detent (2A-13) in the second groove. The detent looks like an "F". Hook the top of the "F" over the Lug Wire (2A-11) and slide the top of the Stayback Detent to the back side of the Lug Wire and down. Count over six grooves and install the second Stayback Detent (2A-13), then counting over another six grooves install the third and final Stayback Detent (2A-13).

8.5.3 Install the fifteen Locking Lugs (2A-14) in the remaining grooves. The Locking Lugs (2A-14) are installed on the front side and are hooked over the top of the Lug Wire (2A-11). Use the Latching Lug Assembly Tool TF64191-1 or a large rubber band to hold the Locking Lugs (2A-14) in place and in the open or disconnected position (they will flare out away from the coupling body).

8.5.4 Install Lug Retainer Ring (2A-18) long side down over the assembly until it is resting on top of the Locking Lugs (2A-14). Remove the Latching Lug Assembly Tool TF64191-1 or, if using a large rubber band, cut and remove the rubber band.

8.5.5 Apply a light coating of petroleum jelly to the inside circumference of the Actuating Collar Assembly (2A-19). With the hose inlet side up, carefully guide the Actuating Collar (2A-19) over the assembly. It should rest firmly and evenly on top of the Lug Ring Retainer (2A-18).

8.6 If nylon Body Bumper (2A-17) was removed during disassembly, install the Body Bumper (2A-17) now. Use four Screws (2A-2*B). Final torque on the screws is only 25 ± 3 in.-lb. (29.0 ± 3.5 kg-cm), therefore hand tighten them first, then adjust to final torque.

8.7 NOTE: Ensure that the three O-ring grooves and the Retaining Ring groove on the Coupling Body 15) are clean and free of any debris.

8.7.1 Install first lightly lubricated O-ring (2A-16*A) into the O-ring groove nearest the nylon Body Bumper (2A-17). After installation, brush another light coating of petroleum jelly around the circumference of the O-ring.

8.8 Install Stayback Spring (2A-21). It should rest in the recessed area in the top of the Lug Ring Retainer (2A-18).

8.9 Carefully install the Actuating Spring (2A-22) over and to the outside of the Stayback Spring (2A-18).

8.10 Install the Spacer (2A-23) on top of the Stayback Spring (2A-21), groove side down, so that the Stayback Spring is in the groove.

8.11 With the hose inlet side up, guide the Connector (2A-24) over the top of the assembly. Looking through the inside area of the Connector, ensure the Spacer (2A-23) rests in the connector's cavity designed to align and keep the springs in place.

8.11.1 The weight of the Connector will assist in compressing the two springs. Continue guiding the Connector down until it seats over the O-ring (2A-16*A).

8.11.2 Continue to hold the Connector down, swivel the Connector to align its bolt pattern with the Actuating Collar (2A-19). Install the six Screws (2A-20), gradually tightening each around the collar. Final torque is 25 ± 3 in.-lb. (29.0 ± 3.5 kg-cm).

8.12 Install the second O-ring (2A-16*A) in the groove just above the slots visible in the Coupling Body (2A-15). Brush another light coating of petroleum jelly around the circumference of the O-ring after installation.

8.13 Insert the Breakaway Spring (2A-25) into the area between the Connector (2A-24) and the Coupling Body (2A-15).

8.13.1 Place the Spring Retainer Ring (2A-26) long side down over the Breakaway Spring (2A-25). Ensure the O-ring groove is clean and free of any debris.

8.13.2 Install a lightly lubricated O-ring (2A-27) into the O-ring groove of Spring Retainer Ring (2A-26). Brush a light coating of petroleum jelly around the OD circumference of the O-ring and the shoulder, as well as the ID of the Retainer Ring.

8.13.3 Apply a thin coating of petroleum jelly to the rim and ID edge of the Connector (2A-24) to help the Spring Retainer Ring (2A-26) pass during the compressing of the Breakaway Spring (2A-25).

8.13.4 **WARNING: Exercise extreme care while compressing the Breakaway Spring (2A-25). Failure to do so could result in serious personal injury or even death.**

Install Spring Compression Tool TF64191-2 on the Connector (2A-24). Begin by placing the Spring Compression Tool Base (5-1) inside the outlet end of the Connector (2A-26) with Threaded Shaft (5-4) extending through and exiting the inlet side of Connector (2A-26). Place Spring Compression Plate (5-5) through Threaded Shaft (5-4) and rest on top of the Spring Retaining Ring (2A-26). Thread Washer (5-3) and Spring Compression Handle (5-2) onto Threaded Shaft (5-4) until snug against Spring Compression Plate.

Ensure that the Spring Compression Plate (5-5) is fully seated on Spring Retaining Ring (2A-26). Now the Spring Compression Tool TF64191-2 is now fully installed.

8.13.5 Ensure that (2A-24) is properly secured before compressing the Breakaway Spring.

8.13.6 Begin compressing Breakaway Spring (2A-25) by turning Spring Compression Handle (5-2) clockwise. Gradually tighten until Retaining Ring (2A-28) groove is fully visible from top to bottom and 360 degrees around.

NOTE: Particular care must be given during the compression process while the Spring Retainer Ring (2A-26) is clearing the inside diameter of the Connector (2A-24). Spring Compression Plate (4-2) should be kept as level as possible while tightening the Compression Handle (5-2) to keep from damaging the Probe inlet.

8.13.7 When the Breakaway Spring (2A-25) is fully compressed, install TF64191-3 Retaining Ring Shroud over the inlet to the Coupling Body (2A-15). Install the Retaining Ring (2A-28) by catching the bottom edge of the ring with the blade of a screwdriver or hand to force the edge into the groove in the body. Use the flat edge of the screwdriver blade or fingers between the layers of the ring to "walk" the ring down the Retaining Ring Shroud and into its groove.

CAUTION:

Ensure the retaining ring rests fully in its groove before removing the Compression Spring Tool TF64191-2.

Remove the Retaining Ring Shroud TF64191-3.

8.13.8 Gradually turn Spring Compression Handle (5-2) counter clockwise to decompress the Breakaway Spring (2A-25). Once all compression is retained by the Spring Retaining Ring (2A-26) the spring compression tool can be removed from the Connector (2A-24).

8.14 Install third and last lightly lubricated O-ring (2A-16*B) in uppermost O-ring groove of Coupling Body (2A-15). Apply another light coating of petroleum jelly around the circumference of the O-ring after installation.

8.15 Lightly lubricate the ID of the Female Adapter (2A-29) and install over the assembled unit. Align holes to match the bolt pattern on the Connector (2A-24).

8.15.1 Install the eight Screws (2A-2*D) and torque to 57 ± 5 in.- lbs. (66.0 ± 6.0 kg-cm).

8.15.2 Ensure O-ring groove in the inlet of the adapter is clean and free of any debris.

8.15.3 Install lightly lubricated O-ring (2A-30) in the O-ring groove in the Female Adapter (2A-29).

8.16 Reverse the direction of the assembled unit so the hose inlet side is resting on the work surface.

8.16.1 Insert the Spring Retainer (2A-7) over the top of the Valve Body (2A-9). Pay particular attention to the direction of insertion. Correctly installed, the spring guide recess should be visible from above.

8.16.2 Install Probe Valve Spring (2A-6) over the Valve Body (2A-9) so that the lowest spring coil rests in the spring guide's groove in the Spring Retainer's (2A-7) lowest inside diameter.

8.16.3 Ensure Sleeve (2A-4) is nested inside the Spring Cover (2A-5) and install both over the Probe Valve Spring (2A-6).

8.16.4 Use the Sleeve (2A-4) to compress the Spring (2A-6) enough to be able to insert the Teflon Rod from the tool kit through one of the openings in the Valve Body (2A-9) to hold Sleeve (2A-4) in the retracted position.

8.17 Install a new Gasket (2A-3) over the top of the shoulder of the Valve Body (2A-9).

8.17.1 Install the Piston Retainer (2A-1) over the Gasket (2A-3). Ensure it is firmly seated, evenly covering the Gasket (2A-3). The Gasket (2A-3) should seat well inside the lip if the Piston Retainer (2A-1).

8.17.2 Install the eight Screws (2A-2*A) incrementally in a repeating star pattern to set the gasket before final torque is accomplished. Once Piston Retainer (2A-1) is secure and the Gasket (2A-3) is set, the final torque of Screws (2A-2) should be 90 ± 10 in.-lb. (104 ± 12.0 kg-cm).

8.18 Retract the Sleeve (2A-4) enough to remove the Teflon Rod and release.

Reassembly of basic Probe assembly 64191-1 is complete and ready for testing. If immediate testing will not occur, cover the Probe's hose inlet with a protective covering and place the Dust Cap Option B over the outlet of the Probe to prevent contamination.

9.0 Reassembly - 64191-2 Receiver

9.1 During reassembly it is recommended that a light coating of petroleum jelly be used on all new O-rings and seals being installed.

9.2 Begin reassembly by ensuring the O-ring groove in the Adapter Housing (2B-12) Option C or Option D is clean and free of any debris.

9.2.1 Place a lightly lubricated O-ring (2B-11) into the O-ring groove of Adapter Housing (2B-12) Option C or Option D and then brush an additional coating of petroleum jelly on the installed O-ring.

Note: The additional petroleum jelly will ensure that the O-ring does not move during reassembly.

9.3 With the inlet side of receiver Housing (2B-10) resting on the work surface, install the Adapter Housing (2B-12) Option C or Option D using the eight Screws (2B-2). Tighten the Screws (2B-2) in a crisscross pattern. Final torque shall be 57 ± 5 in.- lbs. (66.0 ± 6.0 kg-cm).

9.4 Reverse the partially assembled unit so the outlet side is resting on the work surface.

9.4.1 Install a lightly lubricated O-ring (2B-9) into the O-ring groove in the base of the Piston Guide (2B-8), brushing an additional coating of petroleum jelly on the installed O-ring from the interior and exterior of the Piston Guide (2B-8).

9.4.2 From the inside diameter, use both thumbs to hold the Piston Guide (2B-8) and lower it through the inlet side of the receiver Housing (2B-10). The O-ring in the base should seat firmly over the boss in the adapter housing.

9.5 Insert the piston Spring (2B-7) into the shouldered area of the base of the Piston Guide (2B-8).

9.6 Ensure the grooves in the Piston (2B-5) are clean and free of any debris.

9.6.1 Carefully install a new lightly lubricated, spring energized Cup Seal (2B-6) into the groove nearest the outlet end of the Piston (2B-5) with the "spring" side facing up toward the concave end of the Piston (2B-5).

9.6.2 Lightly lubricate the ID of the Piston Guide (2B-8). Place the Piston (2B-5) over the piston Spring (2B-7).

9.7 Install a lightly lubricated O-ring (2B-1) into the O-ring groove in the interior groove the base of the Male Adapter (2B-3) and then brush an additional coating of petroleum jelly on the installed O-ring.

9.7.1 Install a lightly lubricated O-ring (2B-4) around the shoulder protruding from the base of the Male Adapter (2B-3), brushing an additional coating of petroleum jelly on the installed O-ring.

9.7.2 Place the Male Adapter (2B-3) over the Piston (2B-5) and apply enough downward force to compress the piston Spring (2B-7). Fully seat the adapter into the housing and align the bolt pattern of the two pieces. Continue to hold with at least one hand.

9.7.3 Install the eight Screws (2B-2*A). Tighten the Screws (2B-2*A) in a crisscross pattern (hand tight only). Then further tighten, a few turns at a time, until final specified torque is achieved. Final torque shall be 57 ± 5 in.- lbs. (66.0 ± 6.0 kg-cm).

9.8 If Option B Protection Cap was present and removed during disassembly, clean the O-ring groove in the interior of the cap and install a lightly lubricated O-ring (3-2). Secure the assembly to the receiver by installing Screw (2B-2*B) through the eyelet on the Cable (2B-14) and into the threaded hole in the base area of the receiver Housing (2B-10). Final torque shall be 57 ± 5 in.- lbs. (66.0 ± 6.0 kg-cm).

Reassembly of basic Receiver unit 64191-2 is now complete.

10.0 Testing

Leakage testing should be performed at a standard ambient temperature of 75°F $\pm$ 15°F in both disconnected and connected positions.

10.1 Test Fluid

Fluid in accordance with MIL-C-7024 shall be used unless otherwise noted.

10.2 Leakage Testing-Disconnected

The 64191-1 Probe, in the disconnected condition shall be subjected to a fluid pressure of 300 psig for three minutes and leakage checked.

The 64191-2 Receiver, in the disconnected condition shall be subjected to a fluid pressure of 300 psig for three minutes and leakage checked.

10.2.1 Leakage Testing-Connected

The 64191-1 will need to be connected to a 64191-2 Receiver or slave -2 Receiver.

The 64191-1 Probe shall be connected to the -2 Receiver and subjected to fluid pressure of 300 psig for three minutes and leakage checked. There shall be no evidence of disconnection and no evidence of damage or leakage.

If leakage is observed during testing of the 64191-1 Probe, refer to Section 7.0 of this manual for the discussion on Flow Paths and Leakage (probable causes).

11.0 Illustrated Parts Catalog

TABLE 1.0
64191-1 7" Emergency Breakaway Probe

Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr
2A	1	222070	Retainer, Piston	1	All	-
	2	NAS1351N4-10	Screw(s)	28	All	6
	3	222071	Gasket	1	All	10
	4	222073	Sleeve	1	All	-
	5	222072	Cover, Spring	1	All	-
	6	222074	Spring, Valve, Probe	1	All	-
	7	222090	Retainer, Spring	1	All	-
	8	M-15702	Seal, Cup	1	All	10
	9	222069	Body, Valve	1	All	-
	10	222207-161	O-ring	1	All	10
	11	221748	Lug, Wire	1	All	-
	12	92383A202	Pin, Spring S.S	1	All	-
	13	221738	Detent, Stayback	3	All	-
	14	221739	Lug, Locking	15	All	-
	15	221732	Body, Coupling	1	All	-
	16	222207-256	O-ring	3	All	30
	17	221733	Body, Bumper	1	All	-
	18	221737	Ring, Lug Retainer	1	All	-
2A	19	47660	Actuating Collar Assy	1	All	-
	20	LP57U02J8	Screw(s)	6	All	2
	21	222241	Spring, Stayback	1	All	-
	22	221735	Spring, Actuating	1	All	-
	23	222064	Spacer	1	All	-
	24	221731	Connector	1	All	-
	25	221730	Spring, Breakaway	1	All	-
	26	221729	Ring, Spring Retainer	1	All	-
	27	222207-267	O-ring	1	All	10
	28	WS-600S16	Ring, Retaining	1	All	-
	29	221728	Adapter, Female	1	All but C	-
	30	222212-442	O-ring	1	All	10
	31	222244	Circular Handle	1	All	-
	32	222245	Circular Handle Bracket	3	All	
	33	222246	Circular Handle Spoke	3	All	
	34	NAS1149-C0632R	Washer	3	All	
	35	GF16997-107	3/8-16 Screw	3	All	
	2	NAS1351N4-10	Screw(s)	6	All	-
	Option B	47562	Cap, Protection (Female Half)	1	B	-
1, 3	Option C	47688	Adapter Assy 6" with Sight Glass	1	C	-
	1	222087	Adapter	1	C	-
	2	222207-028	O-ring	1	C	10
	3	222094	Spacer, Window	2	C	-
	4	222095	Window	1	C	-
	5	222207-223	O-ring	1	C	10
	6	222091	Cover, Sight Glass	1	C	-
	7	222212-438	O-ring	1	C	10
1	Option E	47659	Nose Cap Assy (Astern Refueling)	1	E	-
	1	222012	Nose Cone	1	E	-
	2	222013	Screw(s)	4	E	-

Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr
4	1	222209	Retainer, Screw Rod	1	KD-4	-
	2	221985	Plate, Spring Compression	1	KD-4	-
	3	47725	Screw Rod	4	KD-4	-
	4	GF9882-10	Nut	4	KD-4	-
	5	GF960C416	Washer	4	KD-4	-

Table 2
64191-2 7” Emergency Breakaway Receiver

Fig.	Item	Part Number	Description	Units/ Assy	Option	Spares/10 Units/Yr
2B	1	222208-437	O-ring	1	All	10
	2	NAS1351N4-10	Screw(s)	17	All	4
	3	222068	Adapter, Male	1	All	-
	4	222207-165	O-ring	1	All	10
	5	222066	Piston	1	All	-
	6	M-15702	Seal, Cup	1	All	10
	7	222075	Spring	1	All	-
	8	222067	Guide, Piston	1	All	-
	9	222207-120	O-ring	1	All	10
	10	222065	Housing	1	All	-
	11	222207-171	O-ring	1	All	10
	12	222096	Adapter, Housing 7” (STD)	1	All but C or D	-
	13	GF51844-63	Sleeve, Swedge	1	All	-
2A	14	BC71	Terminal-Crimp Type	1	All	-
	15	82499-0500	Cable	1	All	-
1	Option B	47563	Cap, Protection (Male Half)	1	B	-
3	1	221783	Cap	1	B	-
	2	222207-370	O-ring	1	B	10
	3	GF51844-63	Sleeve, Swedge	2	B	-
	4	82499-750	Cable	1	B	-
	5	220235	Spring, Protection Cap Assy	1	B	5
1, 2B	Option C	222097	Adapter, Housing 6”	1	C	-
1, 2B	Option D	222102	Adapter, Housing 7” Flanged	1	D	-

TABLE 3.0
Test Fixtures

Test Fixture No.	Part Number	Description	Units	Contained in Kit
TF64191-1	-	Latching Lug Assembly Tool	1	KD-4 & KD-8
TF64191-2	-	Tool, Spring Compression	1	KD-4 & KD-8
	47749	Welded Spring Assy	1	KD-4 & KD-8
	47751	Welded Screw Assy	1	KD-4 & KD-8
	98029A036	Washer	1	KD-4 & KD-8
	94815A117	Nut	1	KD-4 & KD-8
	92428A110	Handle	1	KD-4 & KD-8
	222250	Spring Compression Plate	1	KD-4 & KD-8
TF64191-3	-	Shroud, Retainer Ring Removal	1	KD-4 & KD-8
TF64191-4	-	Sleeve, Seal Installation	1	KD-4 & KD-8
TF64191-5	-	Test Fixture, 7” Male Adapter	1	KD-4
	222210	Male Adapter	1	KD-4
	GF24356-70-SC	Split Clamp, 7”	1	KD-4
TF64191-6	-	Test Fixture, 7” Female Adapter	1	KD-5
	222211	Female Adapter	1	KD-5
	GF24356-70-SC	Split Clamp, 7”	1	KD-5
	222212-442	O-ring	1	KD-5
TF64191-7	-	Hand Tool Kit	1	KD-4 & KD-8
	-	T Handle, 3/16 Hex	1	KD-4 & KD-8
	-	T Handle, 5/32 Hex	1	KD-4 & KD-8
	-	Box Type Ratchet Wrench, 7/16 Hex	4	KD-4 & KD-8
	-	Ratchet Wrench, 3/8 SQ. Drive	1	KD-4 & KD-8
	-	Wrench Extension, 3/8 SQ. X 8” Long	1	KD-4 & KD-8
	-	Socket Driver, Ball Hex, Long 3/16”, 3/8 SQ	1	KD-4 & KD-8
	-	Socket Driver, Ball Hex, Long 1/4”, 3/8 SQ	1	KD-4 & KD-8
	-	Torque Wrench With 0-100 In-Lb gage, 3/8 SQ	1	KD-4 & KD-8
	-	Pointed Nose Pick, 90 Degree	1	KD-4 & KD-8
	-	Screw Driver, 1/8 Inch Blade	1	KD-4 & KD-8
	-	Petroleum jelly grease, Castrol Braycote 236, 1 Lb	1	KD-4 & KD-8
	23620	Rod, Teflon	1	KD-4 & KD-8
TF64191-8	-	Hand Tool Kit	1	KD-5, KD-9 & KD-10
	-	T Handle, 3/16 Hex	1	KD-5, KD-9 & KD-10
	-	Socket Driver, Ball Hex, Long 3/16”, 3/8 SQ. Drive	1	KD-5, KD-9 & KD-10
	-	Torque Wrench w/ 0-100 In-Lb gage, 3/8 SQ. Drive	1	KD-5, KD-9 & KD-10
	-	Pointed Nose Pick, 90 Degree	1	KD-5, KD-9 & KD-10
	-	Petroleum Jelly, Castrol Braycote 236, 1 Lb Can	1	KD-5, KD-9 & KD-10
TF64191-9	-	Test Fixture, 6” Male Adapter	1	KD-8
TF64191-10	-	Test Fixture, 6” Female Adapter	1	KD-9
TF64191-11	-	Test Fixture, Flange	1	KD-10

TABLE 4.0
Torque Specifications

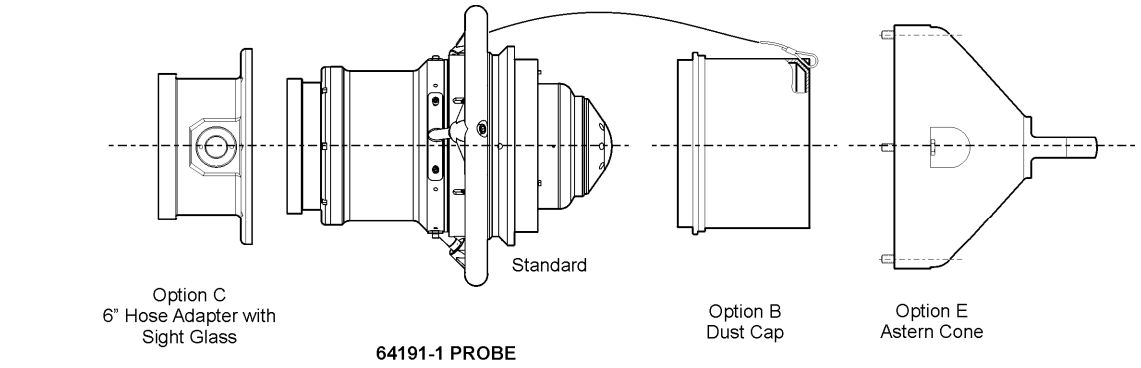
Fig.	Item	Part Number	Description	Torque in.-lb.
2A	2 (*A)	NAS1351N4-10	Screw(s)	90 ± 10 in.-lb. (104 ± 12.0 kg-cm)
2A	2 (*B)	NAS1351N4-10	Screw(s)	25 ± 3 in.-lb. (29.0 ± 3.5 kg-cm)
2A	2 (*C)	NAS1351N4-10	Screw(s)	57 ± 5 in.- lbs. (66.0 ± 6.0 kg-cm)
2A	20	LP57U02J8	Screw(s)	25 ± 5 in.-lb. (29.0 ± 6.0 kg-cm)
2B	2	NAS1351N4-10	Screw(s)	57 ± 5 in.- lbs. (66.0 ± 6.0 kg-cm)

Part Number	Description
KD64191-1	Kit – Contains all soft goods (seals) and other necessary parts to overhaul a 64191-1 Probe assembly with 7inch female coupling inlet as standard option. Contains items – 2A-3, 2A-8, 2A-10, 2A-16, & 2A-27.
KD64191-2	Kit – Contains all soft goods (seals) and other necessary parts to overhaul a 64191-1 Probe assembly with Option C 6” sight glass. Contains items – 2A-3, 2A-8, 2A-10, 2A-16, 2A-27, 3-2, & 3-5.
KD64191-3	Kit – Contains all soft goods (seals) to maintain a 64191-2 Receiver assembly (all outlet options). Contains items – 2B-1, 2B-4, 2B-8, 2B-9, 2B-11 & 3-2.
KD64191-4	Kit – Contains Test Fixtures and tools to overhaul a 64191-1 Probe assembly with 7inch female coupling inlet at standard option. Contains items – TF64191-1, -2, -3, -4, -5 & -7 (Refer to Table 2.0 for more specific contents).
KD64191-5	Kit – Contains test fixture overhaul/assembly tool kit for 64191-2 Receiver assembly with 7 inch male coupling inlet as standard option. Contains items –TF64191-6 & TF64191-8 (Refer to Table 3.0 for more specific contents).
KD64191-6	Kit – Contains recommended spare parts list for the 64191-1 Probe assembly that might be subjected to service damage. Contains items – 2A-2, 2A-4, 2A-11, 2A-13, 2A-14, & 2A-20.
KD64191-7	Kit – Contains recommended spare parts list for the 64191-2 Receiver assembly that might be subjected to service damage. Contains items – 2B-2B & 2B-3.
KD64191-8	Kit – Contains Test Fixtures and tools to overhaul a 64191-1 Probe assembly with Option C 6” sight glass. Contains items – TF64191-1, -2, -3, -4, -7 & -9 (Refer to Table 2.0 for more specific contents).
KD64191-9	Kit – Contains test fixture overhaul/assembly tool kit for 64191-2 Receiver with 6 inch male coupling inlet-Option C. Contains items – TF64191-8 & TF64191-10 (Refer to Table 3.0 for more specific contents).
KD64191-10	Kit – Contains test fixture overhaul/assembly tool kit for 64191-2 Receiver assembly with flanged inlet Option D. Contains items – TF64191-8 & TF64191-11 (Refer to Table 3.0 for more specific contents).

1. The recommended spare parts shown above are the number required to support 10 Units for one year. In addition it is advisable to keep a spare 64191-1 Probe assembly and 64191-2 Probe to interchange with any unit in the field that may exhibit a problem.

2. As the environment aboard ship and at sea can be a cause for more rapid deterioration and wear of parts and components, the user may be inclined to apply a heavier, more viscous, grease as a protective-exterior coating for the Probe and its components. However, heavier grease can accumulate and hold debris that can prevent the actuating spring in the collar’s cavity from retracting properly, making connection of the Probe to the receiver difficult or impossible. Because of this, **heavy grease is not to be used under any circumstances. Use light oil only.**

12.0 Illustrated Figures



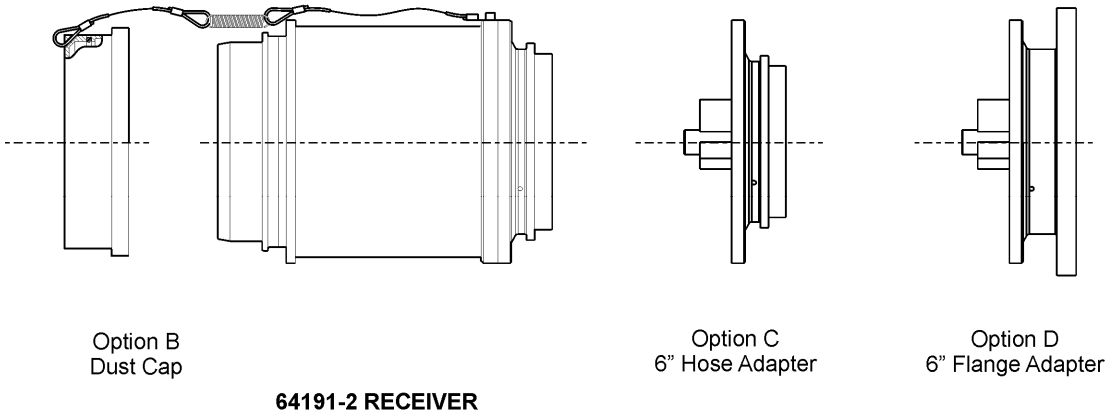


Figure 1
7" Emergency Breakaway Probe & Receiver with Options

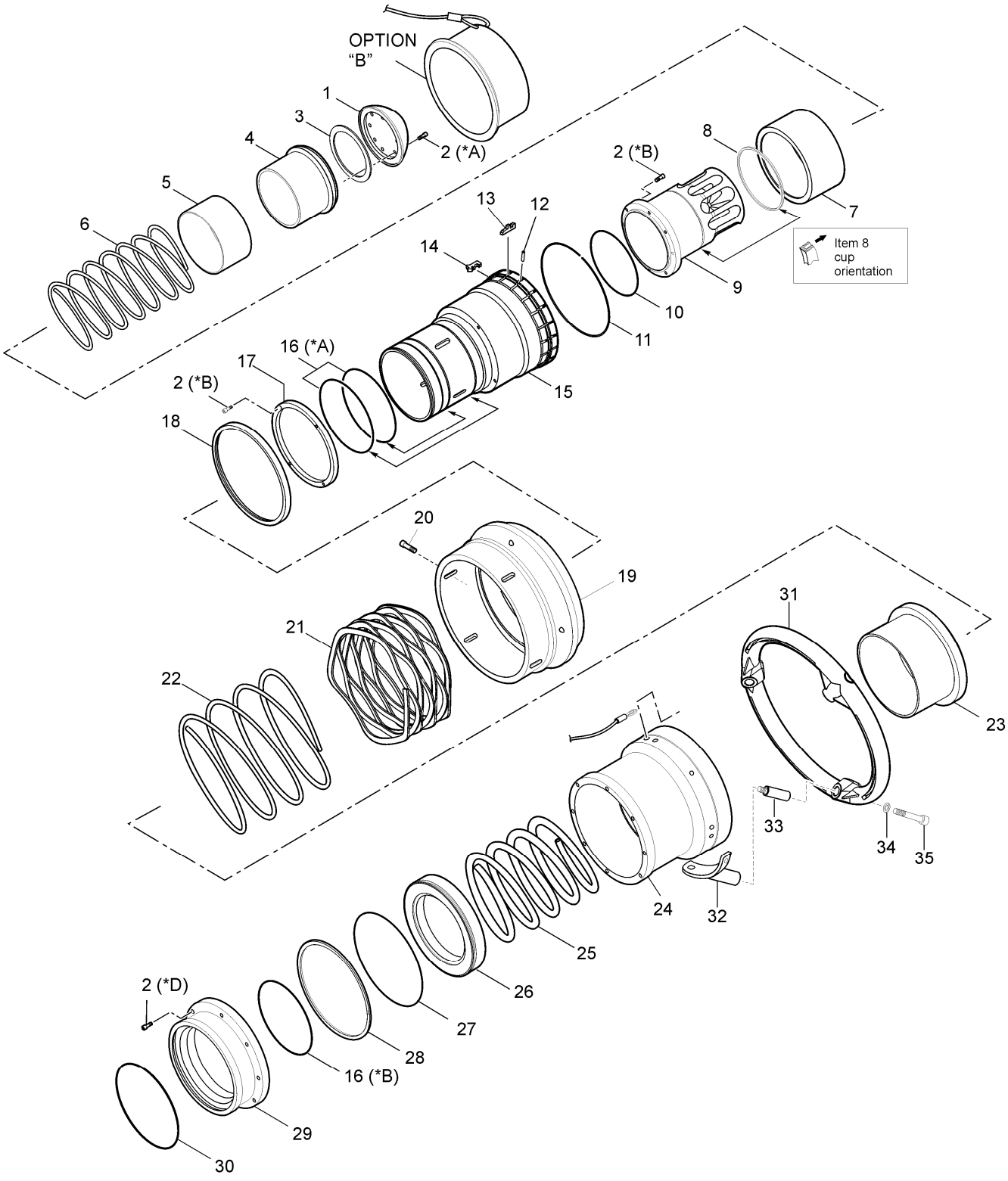


Figure 2A
64191-1 7" Emergency Breakaway Probe
(Probe)

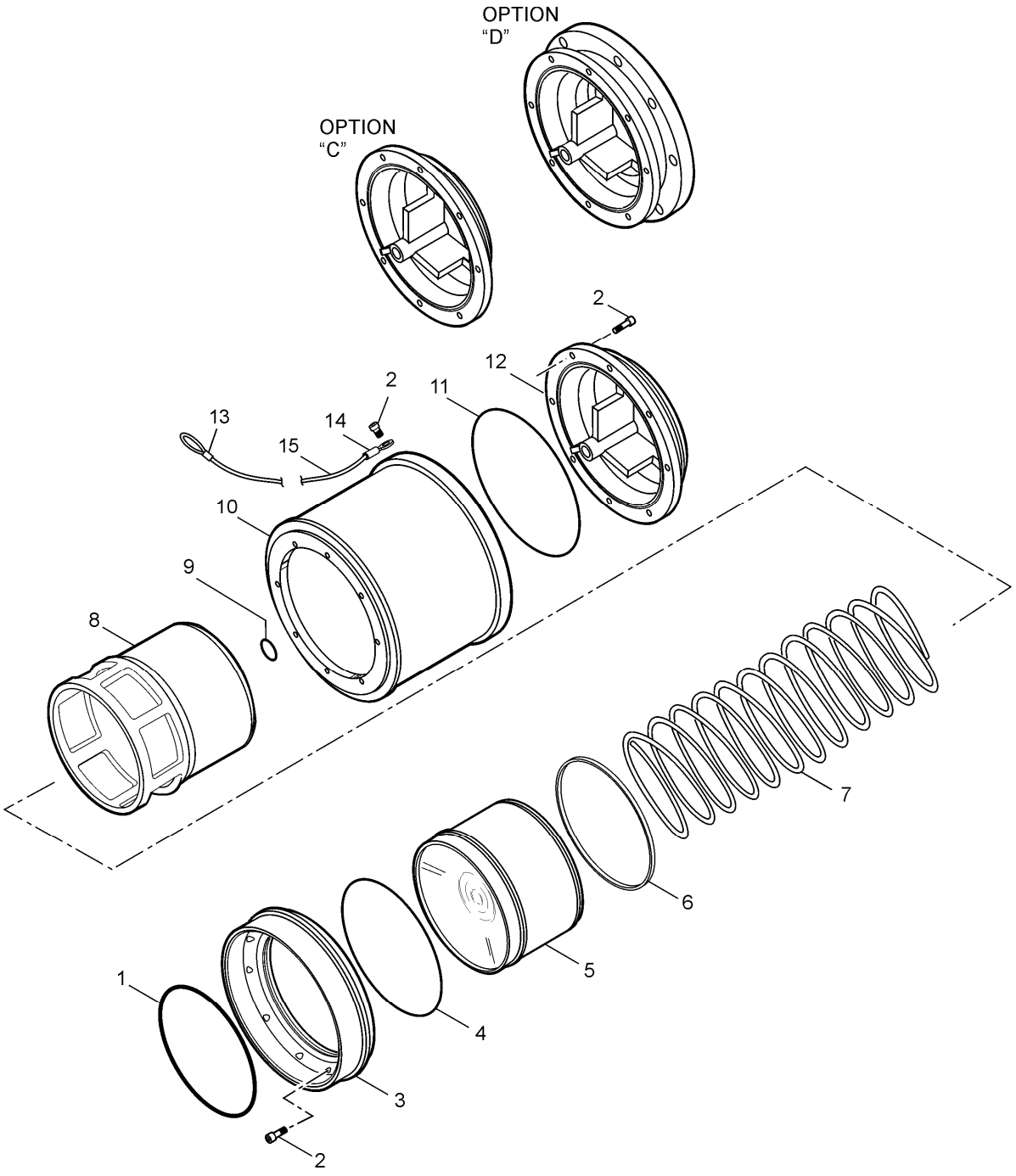


Figure 2B
64191-2 7” Emergency Breakaway Receiver
(Receiver)

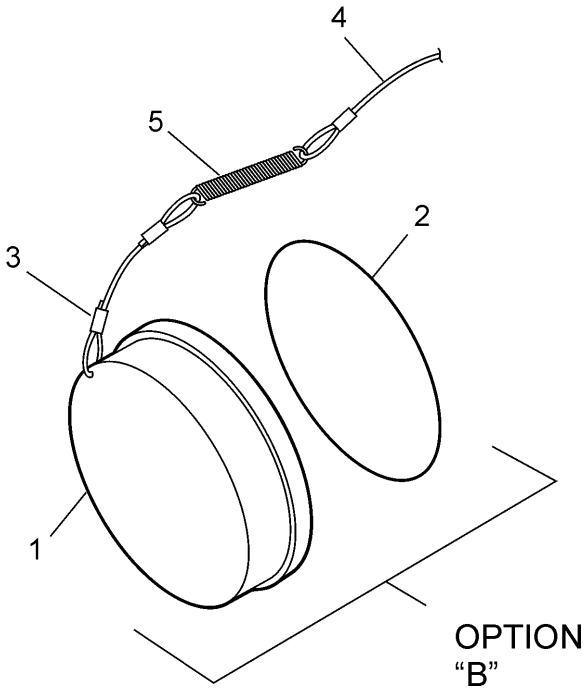


Figure 3
7” Emergency Breakaway Receiver- Protection Cap Female
Option B

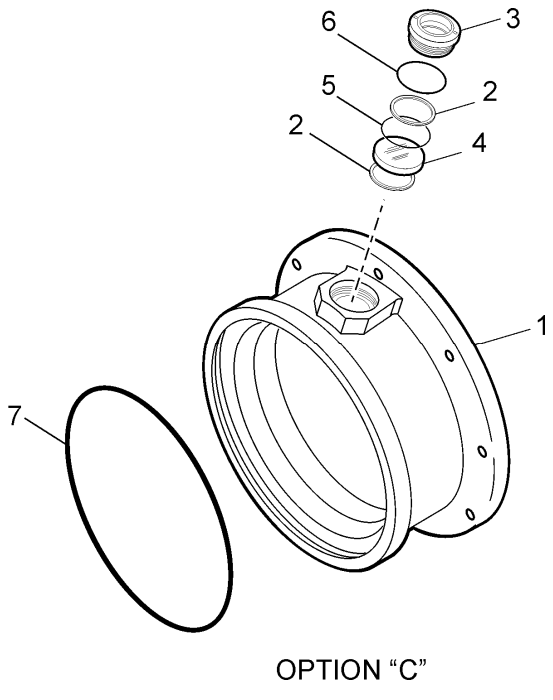


Figure 4
7” Emergency Breakaway Probe- 6” Sight Glass Adapter
Option C

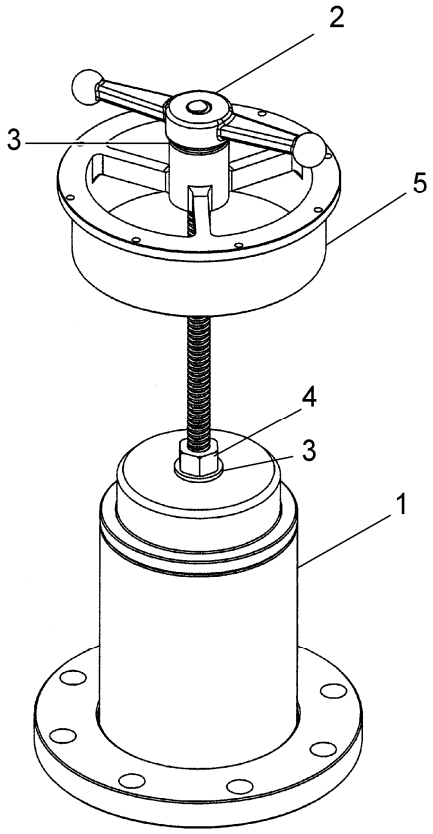


Figure 5
Spring Compression Tool- TF64191-2

Refer to section 7.0
See paragraphs as indicated for inspection and troubleshooting details

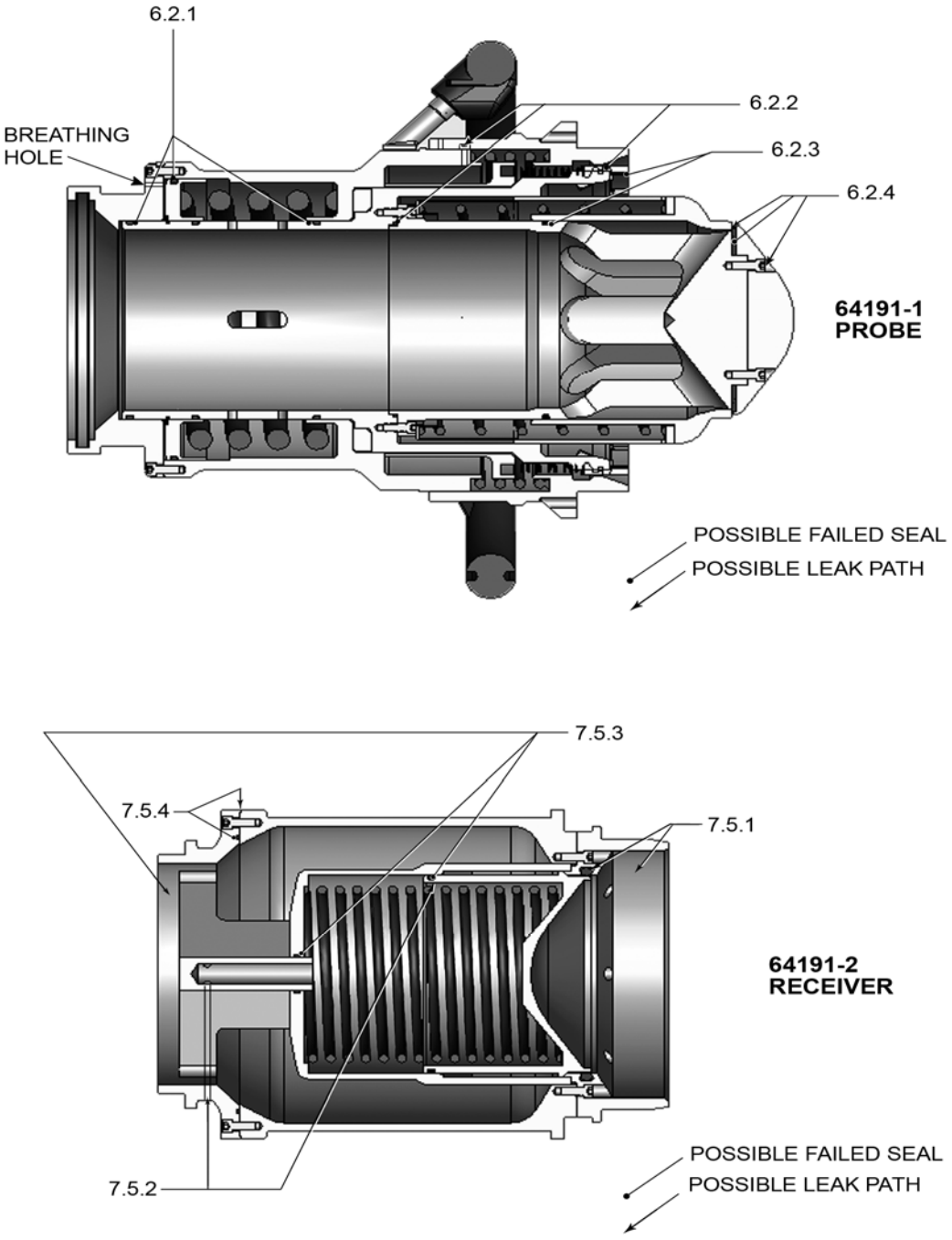


Figure 6
Inspections & Troubleshooting Leaks

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