

GE Oil & Gas
Drilling & Surface

Sondex* Wireline

Addressable Downhole Release Tool

ADR001 2¹/₈"

Operation & Maintenance Manual



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* Denotes a trademark of the General Electric Company

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0 ABOUT THIS MANUAL

0.1 Manual History

Date	Issue	Description	Auth	Chk	App
24/01/13	A	Initial Release	CW	JR/ PW/ AM/ SL	PR
08/04/13	B	Drawing AD-43103 updated. Section 5.2.6 Disassemble the Fishing Neck updated. Explosion hazard warnings added.	CW/ BES	JS/PR	PR

0.2 References

Below are the manuals/links required for use in conjunction with this manual:

- Refer to www.weerohsinfo.com.
- Addressable Downhole Release Surface Panel ([MN-ADRP001](#)).
- Earth Safety Clamp for non-Ultrawire™ tools ([MN-TSC001](#)).

0.3 Technical Help

For further technical help contact GE Oil & Gas Technical Services as follows:

Address: GE Oil & Gas
Building X107
Range Road
Cody Technology Park
Farnborough
Hampshire
GU14 0FG
United Kingdom

Telephone: +44 (0)1252 862200
Fax: +44 (0)1252 862349
Web: www.geoilandgas.com/downholetechnology

0.4 Feedback

Please help us to improve future issues of this manual by adding your comments or corrections to www.geoilandgas.com/downholetechnology, referencing the document number.

Thank you.

Photographs and sketches are for illustration purposes only. Depending on the tool model that you have, certain features or dimensions can differ from those shown.

Documents from external sources (i.e.: MSDS) either supplied with or referenced to in this manual, are considered the latest version at the time the manual was issued. However, the document can be altered by the external source without prior notice to Sondex Wireline Ltd.

1 OVERVIEW

The Addressable Downhole Release tool (ADR) is a digitally controlled, remotely operated tool that can be separated into two pieces on command.

Upon separation, one of the pieces remains attached to the wireline, while the other is left behind in the well and acts as a fishing neck for string retrieval operations. Both components of the separated tool are fully sealed, to protect the tools above and below in the toolstring from being flooded with well fluid.

Up to four individual ADR tools can be run in one toolstring and operate from a dedicated ADR control panel, with a GE Oil & Gas customised RS-232 communication protocol called WLINK. RS-232 is the standard for serial binary single-ended data and control signals used commonly in computer serial ports. In this case, the ADR telemetry measurements can be monitored through the use of a laptop.

The ADR tool can be separated completely at the surface, internally inspected and then reconnected as required by the operator prior to well operations. This surface inspection does not require any complex reset procedure or replacement parts to be fitted and is encouraged as a part of the pre-logging procedures.

1.1 Applications

Typically, ADRs are used in highly deviated well operations and/or when perforation charges are to be detonated. In both applications, there is an elevated risk of tools in the string becoming stuck down hole.

Note:

The ADR **MUST NOT** be used with Perforating Guns unless separated by an appropriately rated Select Fire or Isolation device (for example, a diode switch or an ADS002 - Addressable Downhole Switch).

In deviated operations, when a toolstring becomes stuck, additional tension to the wireline is not always an effective method to free the toolstring. The majority of the tension can be wasted, purely to overcome the friction between the wireline and the inside curvature of the well bore. Hence, the cable break strain can be reached at surface, with little or no tension at the toolstring.

When perforation charges are used, the perforation canister can deform during the explosion and can become wedged in the well bore and require large forces to free it.

In both cases, when one or more ADRs are present in the toolstring above the stuck tool, the ADR can be released and the tools above the ADR retrieved safely to surface, before a fishing tool on a heavy duty cable, coiled tubing or drill pipe is sent down the well to retrieve the other stuck tools.



Figure 1-1 ADR001:
Connected (Left), Released (Right)

GE Oil & Gas would recommend a typical deviated well perforation toolstring from the cable head downwards, to consist of:

- ADR - Tractor - ADR - CCL - ADS - Shock sub - Perforating Guns.

1.2 Interface & Tool Combinations

The ADR can be run with Mechanical Intervention Tools, with up to four ADRs present in the toolstring, all addressed correctly. It can be run also as an Addressable Cable Head Release on a Production Logging toolstring, where the ADR would be positioned between the Cable Head and the XTU. The ADR **CANNOT** be positioned below the XTU as the XTU will block communication between the ADRP and the ADR.

Note: The ADR **MUST NOT** be used with Perforating Guns unless separated by an appropriately rated Select Fire or Isolation device (for example, a diode switch or an ADS002 - Addressable Downhole Switch).

1.3 Specifications

Table 1-1 ADR001 Specifications

Parameter	Specification	Remarks
Temperate Limits	-20°C to 177°C (-4°F to 350°F)	---
Pressure Limits	20,000psi (137.9MPa)	---
Diameter	2 ¹ / ₈ " (55mm)	---
Shipping Length	29.2" (741.1mm)	Thread protectors fitted
Make-up Length	25.37" (644.3mm)	---
Weight	19.6lb (8.9kg)	---
Operational Voltage:		
Range	-50 to -80VDC	Continuous
Current Consumption	62mA	Continuous
	28mA	Standby
End Threads:		
Top	1 ³ / ₁₆ " 12 UN TPI GO ends female	---
Bottom	1 ³ / ₁₆ " 12 UN TPI GO ends male	---
End Connectors:		
Top	4mm single conductor male pin	---
Bottom	4mm single conductor female socket	---
Multi-Tool Capability	Up to four ADRs in each toolstring	---
Fishing Load (Pre-separation)	10,000lbf (44,482 N)	---
Fishing Load (Post-Separation)	20,000lbf (88,964 N)	---
Time for Release Operation	3 Minutes	---
Time to Reconnect	3 Minutes	---

Table 1-1 ADR001 Specifications *(continued)*

Parameter	Specification	Remarks
Fishing Tool Recommendations	BDK 2" Nominal HD Pulling Tool #7422-A4 with modified ADR001 core	---
Telemetry	GE Oil & Gas custom WLINK	---

Figure 1-2 ADR Specifications



Parameter	Specification	Remarks
Vibration Qualification	5g (15 to 500Hz), 20 sweeps	---
Shock Qualification	1000g 0.5ms half-sine	---

2 SAFETY

In normal use, there are some specific safety instructions to safely handle GE Oil & Gas equipment. The information in this section must be followed in addition to your specific Company and Local Rules & Regulations (Directives).

Personnel must be qualified to operate or service this equipment. When the equipment is not installed, commissioned, used and maintained in accordance with the specifications of GE Oil & Gas, protection will likely be impaired.

When GE Oil & Gas equipment is incorporated with other equipment into a system, the safety of that system is then the responsibility of the person who assembles the system.

When the warning symbols  or  are displayed on the equipment, the manual **MUST** be consulted to understand fully any potential hazards and required safety precautions before the equipment is used or serviced.

2.1 Hazardous Areas and 'Hot Work'



WARNING!

HAZARDOUS AREAS AND 'HOT WORK!'

Under certain circumstances or failure modes this equipment can become a potential source of ignition.

It can be used only in Safe Areas and cannot be used in classified Hazardous Areas ('Zoned' areas) unless a approved system of work is in place (for example, Hot Work Permit) and applicable precautionary measures have been followed (for example, monitor for gas leaks, site inspection, equipment to fight fires, work procedures).

This must be done in accordance with local and national legislation with regard to the use of electrical equipment in potentially explosive atmospheres.

2.2 Explosion Hazard



WARNING!

USE WITH PERFORATING GUNS

Electric detonators and initiators can be run below the ADR001 **ONLY** when separated by an appropriately rated Select Fire or Isolation device (for example, a diode switch or an ADS002 - Addressable Downhole Switch).

In all cases the toolstring and the procedures **MUST** comply with the latest edition of API RP67.

2.3 Hazardous Substances

2.3.1 WELL FLUID



WARNING!

WELL FLUID!

When the tool has been recovered from the well it could be contaminated with Well Fluid residues. These Well Fluids can contain irritants and/or poisonous gases.

Well Fluids could contain:

- Hydrogen Sulphide (H₂S).
- Carbon Dioxide (CO₂).

Wear protective glasses/goggles.

Wear protective gloves.

DO NOT operate, service or store contaminated tools in an enclosed area.

Consult the Well Operator for the relevant safety information, precautions and data sheets on the listed or any other contaminants.

Refer to [Section 2.3.2, Disposal of Hazardous Substances](#).



WARNING!

TOXIC!

Inhalation of Well Fluid gases can be toxic and can cause breathing difficulties and effects on the nervous and cardiovascular systems.

Contact with eyes or skin can cause irritation.



WARNING!

FLAMMABLE!

DO NOT use near open flames, sparks or high-heat sources.

DO NOT smoke!



WARNING!

ENVIRONMENTAL HAZARD!

Well Fluid is very dangerous to the environment.

DO NOT release Well Fluid into drains or other aquatic discharges/water courses.

2.3.2 DISPOSAL OF HAZARDOUS SUBSTANCES

All hazardous substances **MUST** be disposed of in accordance with the relevant MSDS/SDS, Local Rules & Regulations (Directives) and International Rules & Regulations (Directives).

2.4 Electrical Hazard



WARNING! ELECTRICAL HAZARD!
To protect operators during the maintenance and the service of the downhole tools when powered via a dummy logging cable, make sure the Tool Safety Clamp (*P/N: KITB-Earth Clip* for non-Ultrawire™ tools or *P/N: KITB-Earth Clip* for non-Ultrawire™ tools) is attached to the toolstring and correctly grounded. Refer to the Tool Safety Clamp manual (*MN-TSC001*).



WARNING! ELECTRICAL HAZARD!
There are hazardous voltages in the equipment. Do not touch the exposed electrical connections or wires as they can be at a dangerous potential.

2.5 Stored Energy



WARNING! STORED ENERGY!
Some GE Oil & Gas logging tools have components/areas that can store energy. This energy can be released without warning and can present a potential hazard to personnel.

Read to *Section 5.1, Trapped Pressure Tool Disassembly* and take the precautions recommended. When in doubt contact *GE Oil & Gas Technical Services* for further advice.

2.5.1 TRAPPED PRESSURE SAFETY PRECAUTIONS



WARNING! TRAPPED PRESSURE!
Spaces in GE Oil & Gas logging tools can retain trapped pressure after a downhole leakage. As this pressure can be released without warning, always:

- Follow the instructions in the manual.
- If trapped pressure is suspected, inform *GE Oil & Gas Technical Services* IMMEDIATELY of the situation and to obtain additional advice when required.
- Make sure all trapped pressure has been removed from the tool before it is transported.

Wear a protective face shield.
Wear a protective apron.

Logging tools are subjected to harsh conditions downhole. High hydrostatic-pressure, high temperature, shock, vibration and contact with corrosive substances can all contribute to possible leaks into sealed Housings. Leak paths include but are not limited to:

- Permeation through the seals.
- Seal failures.
- Hairline cracks in welds.

During the deployment of a tool downhole, one or more of the above failure conditions can lead to a fluid/gas leak into the cavities of the tool. The leakage paths are rarely completely reversible and so a proportion of the fluid/gas is likely to be retained (trapped) inside the tool as it is recovered from the well. In some cases the quantity, composition and pressure of the trapped fluid/gas will present a significant safety hazard in terms of stored potential energy.

Trapped pressure in a tool represents a significant hazard as the tool is handled immediately after it is removed from a well. The hazard continues to exist during the subsequent transportation, storage, repair and service operations. In extreme conditions, the tool could explode! Therefore, all precautions must be taken to mitigate injury to the operator and nearby personnel.

Listed below are some signs that indicate the tool could contain trapped pressure:

- Telemetry failures downhole.
- Signs of mechanical damage.
- Unusual seepage of fluid, bubbles or gas out of the tool.
- Tools that have been fished.
- Tools that have been downhole for extended periods.
- Hard to undo Housings or Split Nuts.

When there are signs of trapped pressure, read first [Section 4.4, Post-Logging: Toolstring Disassembly](#) and then [Section 5.1, Trapped Pressure Tool Disassembly](#) in the order shown to mitigate hazards.

2.5.1.1 REMEMBER

- 1 **DO NOT** point parts of the tool (that can become projectiles) at either yourself or others.
- 2 **DO NOT** release the pressure by the removal of filler plugs or other small plug items, unless the tool manual shows different instructions (refer to [Section 5.1, Trapped Pressure Tool Disassembly](#)) that this is the correct method to release the trapped pressure.
- 3 **DO NOT** ignore the risk of trapped pressure and return the tool to its transport case. The tool can explode at any time due to sudden mechanical shock or changes in atmospheric pressure. This could be dangerous with some methods of transport. For example, when the tool is transported in an aircraft.
- 4 **DO NOT** open the tool in a confined or enclosed space. There is a possibility of toxic chemical release.
- 5 **DO NOT** install the Thread Protectors to the ends of the tool.

2.5.1.2 Recommended Precautions to Follow

- 1 **Always** wear Personal Protective Equipment (PPE) - hard toe boots, safety glasses and fluid resistant gloves are a minimum.
- 2 **Always** put (in a prominent position) a noticeable warning indicator on the tool (marker pen, sticky label, etc.) to tell others that the tool could contain trapped pressure.
- 3 **Always** let the tool stand in a cordoned-off safe area (outdoors is recommended) with hazard signs to indicate the potential hazard that can be read from a safe distance, for a minimum of 24hrs (where possible, let the tool stand for a longer period). Pressure can leak out slowly and (with a sufficient period) the tool pressure will decrease to a less dangerous and more manageable level.
- 4 **Always** make all colleagues and other operators in the area know that the tool could contain trapped pressure.
- 5 **Always** give a sufficient period for the tool to cool down to the ambient temperature. Fluids (especially gases) have more stored potential energy at a high temperature than at ambient temperature. When the tool is allowed to cool down, it will decrease this potential energy.
- 6 **Always** know that the Well Fluid in the tool could be hazardous or toxic. For example, it could contain Hydrogen Sulphide (H₂S). Take all necessary precautions to prevent harm to operators. Therefore, disassemble the tool outdoors and monitor for toxic chemicals.

- 7 **Always** know that the Well Fluid in the tool could be a flammable gas or mist. Disassemble the tool away from sources of ignition.
- 8 **Always** make sure the suspect tool is disassembled until all inner volumes have been made safe and free of pressure.
- 9 Refer to [Section 4.4, Post-Logging: Toolstring Disassembly](#).

2.6 Danger from Machinery

2.6.1 WEIGHT



WARNING!

HEAVY EQUIPMENT!

The equipment and some associated subassemblies are heavy. Care **MUST** be taken when the equipment is lifted, moved or maintained.

GE Oil & Gas recommends the use of correct apparatus to lift the equipment in accordance with local directives and safety standards.

Make sure all heavy items are supported correctly at all times.

Wear applicable Personal Protective Equipment (PPE) for the task to be undertaken.

Refer to the specification table in the relevant manual for the equipment weight.

2.7 Irritants

The necessary precautions to use, store or discard an irritant are:

- **ALWAYS** refer to the applicable Material Safety Data Sheet (MSDS) for the irritant.
- **DO NOT** allow the irritant to come into contact with the skin or your eyes.
- **DO NOT** ingest or allow the irritant to come into contact with the mouth.

When the disposal of a chemical or other substance is necessary, it **MUST** be in accordance with all Local Rules & Regulations (Directives) for the country where the disposal is to occur. When not available, then International Rules & Regulations (Directives) **MUST** be followed.

2.7.1 LIQUID-O-RING® TYPE 101 LUBRICANT



IRRITANT!

LIQUID-O-RING® TYPE 101 LUBRICANT

Wear approved protective gloves.

Wear approved protective goggles/glasses.

Wash hands after use.

For further safety information, refer to the manufacturer's/supplier's Material Safety Data Sheet (MSDS).

2.7.2 DOW CORNING® 3140 RTV COATING



IRRITANT!

DOW CORNING® 3140 RTV COATING

Wear approved protective gloves.

Wash hands after use.

For further safety information, refer to the manufacturer's/supplier's Safety Data Sheet (MSDS).



2.7.3 DOW CORNING® 3145 RTV ADHESIVE/SEALANT



IRRITANT!

DOW CORNING® 3145 RTV ADHESIVE/SEALANT

Wear approved protective gloves.

Wash hands after use.

For further safety information, refer to the manufacturer's/supplier's Safety Data Sheet (MSDS).



2.7.4 DOW CORNING® MOLYKOTE® HP-870 GREASE



IRRITANT!

DOW CORNING® MOLYKOTE® HP-870 GREASE

Wear approved protective gloves.

Wear approved protective goggles/glasses.

Wash hands after use.

For further safety information, refer to the manufacturer's/supplier's Material Safety Data Sheet (MSDS).



WARNING!

ENVIRONMENTAL HAZARD!

Dow Corning® Molykote® HP-870 Grease is very toxic to aquatic organisms.

DO NOT release Dow Corning® Molykote® HP-870 Grease into drains or other aquatic discharges/water courses.

2.7.5 DIESEL/PARAFFIN/KEROSENE FUEL

**IRRITANT!****DIESEL/PARAFFIN/KEROSENE FUEL!**

Wear protective gloves.

Wear protective goggles/glasses.

Wash hands after use.

For further safety information, refer to the manufacturer's/supplier's Safety Data Sheet (MSDS) for diesel fuel from your supplier.

**WARNING!****FLAMMABLE!****DO NOT** use near open flames, sparks or high-heat sources.**DO NOT** smoke!**WARNING!****ENVIRONMENTAL HAZARD!****DO NOT** release into drains or other aquatic discharges/water courses.

2.8 Tool Integrity

2.8.1 GREASES AND SEALANTS

**CAUTION!****GREASES AND SEALANTS!**

Electrical failure can occur when some greases and sealants are used. Those that contain a volatile content can produce gases in the tool when heated.

The correct greases and lubricants **MUST** be used in the maintenance of all GE Oil & Gas downhole equipment. Some threads are internal and do not stop the ingress of grease into the tool. **DO NOT** use too much grease. **DO NOT** use copper loaded greases unless specified in the related tool manual.

2.8.2 SEAL MAINTENANCE

**CAUTION!****SEAL INTEGRITY!**

Tool function relies on seal integrity.

Remove, discard and replace, when damaged and at recommended service intervals. Refer to [Section 7.1.3, Seal Replacement Recommendations](#).

2.8.3 FLUID/GAS INGRESS

**CAUTION!****FLUID/GAS INGRESS!**The Split Nuts/Tool Joints **MUST** be tightened correctly and fully to prevent fluid/gas ingress.

The tool is designed to be used in a hostile environment. This is only possible when:

- All seals are installed correctly.
- All Split Nuts/Tool Joints have been tightened correctly and fully.

Failure to complete the above can result in the ingress of fluids or corrosive gases that could damage the tool. Where there is fluid/gas ingress the tool could contain trapped pressure. This trapped pressure can be dangerous when not released in a procedure approved for the tool. Refer to [Section 5.1, Trapped Pressure Tool Disassembly](#) for the correct procedure to release trapped pressure and to [Section 2.5.1, Trapped Pressure Safety Precautions](#).

2.9 Connection to the Toolstring

2.9.1 BEND STRESSES DURING RIG UP/RIG DOWN



CAUTION!

BEND STRESSES!

When the tool is not supported correctly, it can be subjected to bend stresses that exceed its design limit.

To prevent damage to the tool/toolstring:

- GE Oil & Gas recommends the tool/toolstring is assembled/disassembled with the use of a riser or a lubricator. When not possible, Rig Up/Rig Down the toolstring vertically.
- **DO NOT** move an assembled long or heavy toolstring between the horizontal and the vertical positions.
- **DO NOT** lift long or heavy tools/toolstring by the cable head to manoeuvre it or for transportation purposes.
- Make sure the tool is supported sufficiently when serviced.

2.10 Electrostatic Discharge (ESD).



CAUTION!

ELECTROSTATIC DISCHARGE!

The tool contains electronic circuits and devices that can suffer permanent damage when exposed to electrostatic discharge (ESD).

ALL ESD precautions must be taken to prevent electrostatic discharge damage to the electronics during tool maintenance.

2.11 Hot Equipment Surfaces



WARNING!

HOT SURFACES!

In some circumstances or failure modes, the equipment can become hot.

Wear suitable protective gloves.



2.12 WEEE Disposal Information



CAUTION!

ELECTRICAL EQUIPMENT DISPOSAL!

Disposal of electrical equipment must be in accordance with Local/International Rules and Regulations. They will recommend the collection framework available to return, recycle and treatment of electrical wire and components.

For more information refer to: www.weerohsinfo.com/.

2.13 EMC Classification

**CAUTION!****EMC CLASSIFICATION**

This is a Class A product. In a domestic environment this product can cause radio interference in which case the user can be required to take adequate measures.

2.14 Transportation and Storage

**WARNING!****WELL FLUID!**

Refer to [Section 2.3.1, Well Fluid](#).

Where the equipment is supplied in a carry tube and/or flight case, GE Oil & Gas recommend that the equipment is stored and transported in that carry tube and/or flight case for protection.

The tool must be stored and transported with the threads and O-Rings greased lightly with Liquid-O-Ring® ([P/N: LOR101](#)) and the Thread Protectors fitted.

DO NOT subject the equipment to excessive shock and/or vibration.

3 THEORY OF OPERATION

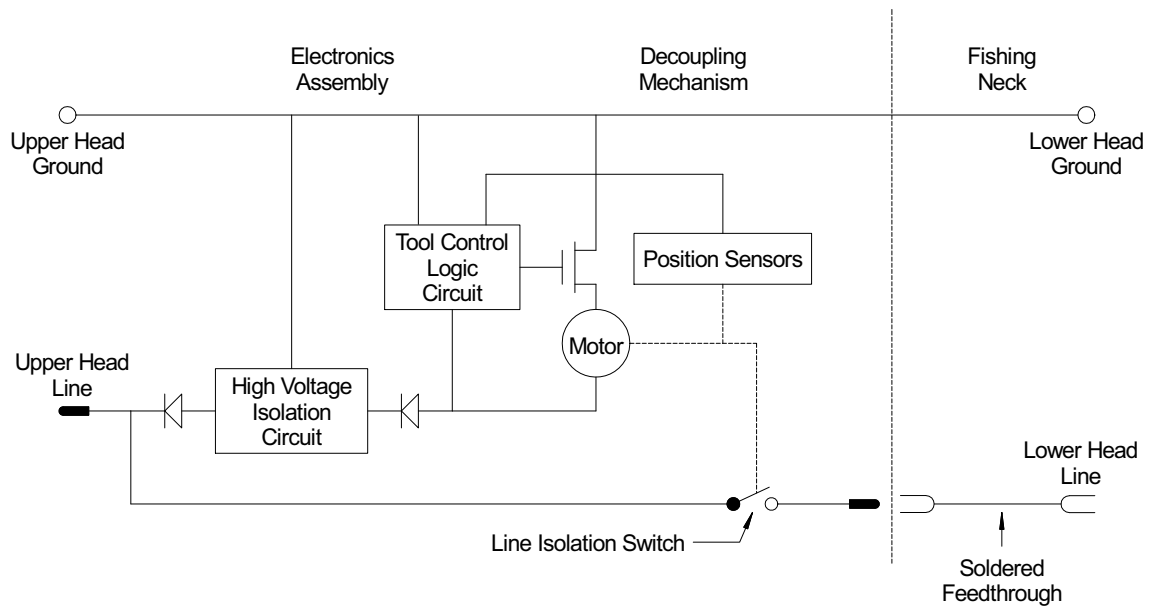


Figure 3-1 ADR001 Block Diagram

3.1 Description

3.1.1 MECHANICAL

The ADR is a remotely operated, reusable Addressable Release Tool. When deployed, the ADR separates into two discreet sections. The upper section remains attached to any tools fitted above the ADR and to the wireline to enable these tools to be retrieved in the usual manner. The lower section remains in the well attached to any tools below the ADR and is fitted with a Fishing Neck to enable toolstring retrieval operations. Both components of the separated tool are sealed fully to protect the tools above and below in the toolstring from being flooded with well fluid.

ADRs are used typically in highly deviated well operations and/or when perforation charges are to be detonated. In both applications, there is an elevated risk of tools in the toolstring to be stuck down hole.

When one or more ADRs are present in the toolstring above the stuck tool, an ADR can be selected as appropriate and released. The tools above the ADR can then be retrieved safely to the surface, before a fishing tool on a heavy duty cable, coiled tubing or drill pipe is sent down the well to retrieve the other stuck tools.

3.1.2 ELECTRICAL

In normal operation, the ADR passes power and telemetry signals straight through to the tools fitted below it. However, when it is necessary to deploy the ADR, the wireline is disconnected from the logging system and connected to the Addressable Release Tool Control Panel (ADRP). The ADRP is used then to deploy the selected ADR and release the toolstring. This process isolates also the power and the telemetry from the bottom connector so that the line does not get shorted when exposed to well fluid and enables communication with the tools above the ADR to be resumed (when required) and allows also any other ADRs fitted above the released ADR to be deployed when required. The release and the connection of the ADR requires a precise sequence of user inputs on the panel. These inputs are timed and the timings must be followed carefully.

The purpose of the sequence and the timings is to prevent an accidental trigger of the release sequence. The tool will release **ONLY** with a deliberate command from the operator. It is recommended that the user reads through the instructions in the ADRP Manual ([MN-ADRP001](#)) to understand completely the timing sequence before an attempt is made to operate the tool.

When connected, the ADRP power will be present at the lower tool joint of the ADR. The ADR001 is powered with approximately -55VDC to -65VDC and this voltage is passed also through the ADR001 to any devices connected below it. Furthermore, whilst the ADR panel is connected to the wireline and powered up, any mains surges or transients from the rig or the logging-unit power-supply can be passed through the ADR001.

In order to avoid accidental perforation when off-depth, the above electrical characteristics must be considered in the configuration of the ballistic equipment below the ADR001. In **ALL** cases, the toolstring and the procedures **MUST** comply with the latest edition of API RP67.

4 OPERATIONAL PROCEDURE

4.1 Pre-Logging: Tool Checks



IRRITANT!

LIQUID-O-RING® TYPE 101 LUBRICANT!

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).



WARNING!

ELECTRICAL HAZARD!

Refer to [Section 2.4, Electrical Hazard](#).



CAUTION!

FLUID INGRESS!

Refer to [Section 2.8.3, Fluid/Gas Ingress](#).

Reference:	General Assembly	AD-09719
	Decoupling Mechanism Assembly	AD-411050

As part of the routine pre-logging tests of the ADR, it is expected that the tool will be released, inspected and reconnected at surface, prior to a run down hole. A major safety hazard can be created should the tool be re-connected incorrectly after inspection. This can arise in these instances:

- i. The tool is not allowed to motor to the fully latched position before the panel is switched off.
- ii. The Fishing Neck ([item 2](#), 09719) is not inserted fully before the reconnection is commenced.
- iii. The Fishing Neck ([item 2](#), 09719) begins to slide out before the reconnection is complete.
- iv. There is mechanical damage to any of the latch components inside the ADR.

In any of these cases, the tool can appear to be connected fully after motoring. However, when the tool is then raised vertically, the Fishing Neck ([item 2](#), 09719) (complete with any tools attached below it) can drop suddenly out of the ADR. **This could be fatal to an operator beneath!**



CAUTION!

USE OF TOOL!

NEVER use the ADR001 as a lift device.

Check **ALWAYS** the tool is engaged fully by a check of the LED display on the control panel, by a visual check for the correct alignment of the parts (see [Figure 4-1](#)) and by a tug on the two halves of the tool to try and separate them by hand.



Fishing Neck inserted fully



Fishing Neck not inserted

Figure 4-1 The Fishing Neck inserted fully and not inserted

There are a number of checks that should be undertaken before this tool is put into operation. These include:

- i. Electrical Checks - test for impedance and the insulation of the tool.
- ii. Power up the tool.
- iii. Perform a mechanical inspection that should include a check of the Tool Release Mechanism.
- iv. Operational Checks - these should include the release and the connection of the Fishing Neck to check it before the tool is put into operation and to test the Fishing Neck prior to operation.

4.1.1 ELECTRICAL CHECKS



WARNING!

ELECTRICAL HAZARD!

Do not touch the chassis or the housing when powered. It can be at a high potential in case of a loss of a return circuit.

Make sure the Tool Safety Clamp (P/N: [KITB-EARTH CLIP](#)) is attached correctly to the toolstring.

Reference: Decoupling Mechanism Assembly [AD-411050](#)
 Fishing Neck Assembly [AD-43103](#)

- 1 Make sure the upper and the lower electrical connectors (([item 7](#), 42997) & ([item 1](#), 43103)) are clean, dry and undamaged.
- 2 Use a Digital Volt Meter (DVM) to measure the insulation between the Upper Female MonoConn Connector and the upper body of the tool. Typically, it should be more than 1M Ω .
- 3 Use a Digital Volt Meter (DVM) to measure the insulation between the Lower Male Connector and the body of the Fishing Neck. Typically, it should be more than 1M Ω .
- 4 When the Fishing Neck is attached and the tool is motored to the **Connected** position, use a multimeter to measure the through resistance between the upper line socket and the lower line pin. Typically, it should be less than 0.5 Ω .

4.1.2 MECHANICAL CHECKS



WARNING!

ELECTRICAL HAZARD!

Do not touch the chassis or the housing when powered. It can be at a high potential in case of a loss of a return circuit.

Make sure the Tool Safety Clamp (P/N: [KITB-EARTH CLIP](#)) is attached correctly to the toolstring.



IRRITANT!

LIQUID-O-RING® TYPE 101 LUBRICANT

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).

Reference: General Assembly [AD-09719](#)
 Decoupling Mechanism Assembly [AD-411050](#)
 Fishing Neck Assembly [AD-43103](#)

- 1 Check the tool for tightness and signs of damage by inspection of the Latching Housing Mechanism ([item 5](#), 411050), Switches Housing ([item 6](#), 411050), Electronics Pressure Housing ([item 5](#), 09719) and all other joints. Refer to [Section 5.2, Service](#).

- 2 Should the ADR have been in storage or is in the **Connected** position after maintenance has occurred but before the tool is put into operation, connect it to the ADRP and motor the tool to the **Released** position. Refer to [MN-ADRP001](#) for instructions.
- 3 The Fishing Neck ([item 2](#), 09719) should be removed, inspected and reattached. Should there be any damage, refer to [Section 5.2.6, Disassemble the Fishing Neck](#) and contact [GE Oil & Gas Technical Services](#).
- 4 Before re-fitment of the Fishing Neck ([item 2](#), 09719), check the Fishing Neck O-Rings ([items 7 & 8](#), 43103) and replace when damaged or worn. Refer to [Section 7.1.3, Seal Replacement Recommendations](#).
- 5 Should it not have been done already, check, clean and apply Liquid-O-Ring® type 101 ([P/N: LOR101](#)) to two lower O-Ring seals ([item 8](#), 43103), that are exposed when the Thread Protector ([item 3](#), 09719) is removed. Replace the O-Rings when damaged or worn. Refer to [Section 7.1.3, Seal Replacement Recommendations](#).
- 6 To reattach the Fishing Neck, insert it into the Latching Housing Mechanism ([item 5](#), 411050) and push it in then make sure it is fully seated as shown in [Figure 4-1](#). Use the ADRP motor the ADR to the **Connected** position.
- 7 Release and remove the Fishing Neck ([item 2](#), 09719) and then re-insert and connect it two or three times to be sure it operates correctly.
- 8 After the Fishing Neck ([item 2](#), 09719) has been motored to the **Connected** position for the last time, switch off the ADRP, disconnect the ADR from the wireline and/or toolstring and perform [Steps 2 & 4](#) of [Section 4.1.1, Electrical Checks](#) one last time. Refer to [MN-ADRP001](#).

4.2 Connection to the Toolstring



WARNING! USE WITH PERFORATION GUNS
Refer to [Section 2.2, Explosion Hazard](#).

It is possible to have up to four ADRs in a toolstring, provided they are all set to different tool addresses. Refer to the next section and to the ADRP manual ([MN-ADRP001](#)) for instructions how to set the ADR address. ADRs should be inserted into the toolstring as required. Generally, it is recommended that an ADR is fitted above a Perforating Gun and (when required) a second ADR fitted below the cable head.

4.2.1 SET THE TOOL ADDRESS

The ADRP will support up to four ADRs in a toolstring, each ADR is controlled independently from the ADRP. It is essential that each ADR is set to a different tool address (1 to 4). Refer to the ADRP manual ([MN-ADRP001](#)) for instructions how to set the ADR address.

Note: MAKE SURE YOU KNOW THE ADDRESS AND THE POSITION IN THE TOOLSTRING OF EACH ADR.

4.3 Logging

4.3.1 LOGGING SPEED

[Table 4-1](#) is for guidance only and must be used in conjunction with local policy and specific well site conditions both downhole and at surface. The table below is appropriate for near vertical wells and must be adjusted when in deviated wells. The use of a Head Tension Unit is highly recommended.

Note: Do not exceed the calculated safe working load of your selected weak point. When in doubt, use a head tension unit, especially in deviated wells where calculation from surface tension is less accurate.

Table 4-1 Logging Guidance

Depth (ft)	Speed Pulling Out of Hole	Speed Running in Hole
In/out of catcher (pressure rig up only)	Dead slow or manual.	
30 to 150	30ft/min	
150 to 400	60ft/min	
>400 clear cased hole	Surface tension not to exceed 120% of tension when tool stationary. Speed not to exceed 150ft/min.	Surface tension must not be less than 80% of tension when tool stationary. Speed not to exceed 150ft/min.
>400 clear open hole	Surface tension not to exceed 130% of tension when tool stationary. Speed not to exceed 150ft/min.	Surface tension must not be less than 70% of tension when tool stationary. Speed not to exceed 150ft/min.
Convergence with potential obstacles ^a	30ft/min	
Logging Data	Do not exceed the above speeds. Recommended speed is <30ft/min.	

^a. For example: Reduced diameters, Gas Lift Mandrels, fluid levels, Valves, Tubing Shoes, Packers, Cross Overs and other Downhole equipment.

4.3.2 ABORT A RELEASE OPERATION

Should an ADR release need to be aborted for any reason (it was initiated in error or the incorrect ADR was selected), complete the instructions below:

1. Depress the green confirmation button. See [Figure 4-2](#).



Figure 4-2 Depress the green confirmation button to abort an operation

2. The Light Emitting Diode (LED) will acknowledge the operation is to be aborted.



Figure 4-3 Status of operation that shows as “User Abort”

- 3 The panel will reset automatically.
- 4 **DO NOT ATTEMPT TO MOVE THE TOOLSTRING** until the ADR has been motored back to the **Connect** position or (when required) the release procedure can be resumed. Refer to the ADRP manual ([MN-ADRP001](#)) for instructions.

4.4 Post-Logging: Toolstring Disassembly

These checks should be carried out in the order listed after the ADR has been used:

- i. [Check for Trapped Pressure](#) that includes a check of the Pressure Relief Valve.
- ii. [Tool Deployed \(Released\)](#).
- iii. [Tool Not Deployed \(Not Released\)](#).
- iv. [Tool Partially Deployed \(Released\)](#).

4.4.1 CHECK FOR TRAPPED PRESSURE



WARNING!

TRAPPED PRESSURE!

Refer to [Section 2.5.1 Trapped Pressure Safety Precautions](#).

When any of the circumstances that follow are encountered or it is suspected that the tools have leaked, then you must proceed as if the tools contain trapped, pressurised fluid/gas until otherwise determined. The characteristics and circumstances for trapped pressure are:

- Telemetry failures downhole.
- Signs of mechanical damage.
- Unusual seepage of fluid, bubbles or gas out of the tool.
- Tools that have been fished.
- Tools that have been downhole for extended periods.
- Hard to undo Housings or Split Nuts.

4.4.1.1 Check of the Pressure Relief Valve

Reference: Decoupling Mechanism Assembly [AD-411050](#)

Within the ADR there are two separate areas that can contain Trapped Pressure:

- The Electronics Section.
- The Decoupling Mechanism.

In the event of a tool failure, the Decoupling Mechanism will release trapped pressure by means of a Pressure Relief Valve ([item 31](#), 411050). The Electronics Section will release trapped pressure from the tool joint during toolstring disassembly via the upper Female Monoconn Connector ([item 7](#), 42997).

When the ADR has not been deployed (released), before disassembly of the toolstring, the Pressure Relief Valve ([item 31](#), 411050) should be checked to make sure it is still in the set position or has been activated (refer to [Figure 4-4](#)).



Figure 4-4 The Pressure Relief Valve seated (left) and activated (right)

The Pressure Relief Valve is designed to relieve automatically any trapped pressure inside the Latching Housing Mechanism ([item 5](#), 411050) **ONLY** and **DOES NOT** include the Electronics Section of the tool. This is essentially because the Latching Dogs ([item 3](#), 43103) cannot sustain high pressure inside this section of the tool, without a mechanical failure. During operation, failure of the Latching Dogs would result in the release of the lower part of the toolstring at any time as the toolstring is pulled out of hole or at surface. The Pressure Relief Valve is designed to bleed when the pressure inside the tool exceeds 100psi (0.7MPa) that of the external pressure. Release of the Pressure Relief Valve is completely automatic and requires no user intervention. Refer to [Section 5.2.3, Decoupling Mechanism Disassembly](#) for information about how to maintain the Pressure Relief Valve.

4.4.1.2 Relief of Trapped Pressure at the Tool Joints

To relieve the trapped pressure at the tool joint, complete these steps:

- 1 Place a rag over the tool joint. This will diffuse any jet of gas or fluid that can emerge from the tool joint.
- 2 Unscrew **SLOWLY** the tool joint. Should there be trapped pressure inside the tool joint, the tool joint can well be tighter than usual and require more torque than normal to undo.
- 3 At some point, well before the threads of the tool joint disengage, fluid or gas release will occur. As soon as gas seepage is heard or fluid appearance is noted, cease **IMMEDIATELY** to unscrew the tool joint and allow the pressure to dissipate before the joint is unscrewed further. This way, the pressure load on the tool joint can be retained safely by the threads that remain engaged.
- 4 Once the operator is satisfied that no more fluid or gas seepage is evident, resume to unscrew **SLOWLY** the tool joint. When further gas seepage or fluid appearance is noted, cease **IMMEDIATELY** to unscrew and allow the pressure to dissipate.
- 5 Repeat these steps until all trapped pressure within the tool joint is released.
- 6 For other tools, refer to the relevant Section of their Operation & Maintenance Manual.

4.4.1.3 Check the Upper Female MonoConn Connector

Reference: Electronics Assembly [AD-42997](#)

After disconnection of the ADR from the tool above, check the position of the Female Monoconn Connector ([item 7](#), 42997) in the top of the ADR. Should it be pushed out against the Internal Retaining Ring ([item 12](#), 42997) (or in extreme circumstances it has dislodged the Internal Retaining Ring) check both the ADR and the tool that was fitted above the ADR for signs of leakage or pressure damage and service the tools as appropriate. Refer to [Section 5, Mechanical Description](#).

4.4.2 TOOLSTRING DISASSEMBLY**IRRITANT!**

LIQUID-O-RING® TYPE 101 LUBRICANT

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).

Reference: General Assembly [AD-09719](#)
 Electronics Assembly [AD-42997](#)
 Fishing Neck Assembly [AD-43103](#)

4.4.2.1 ADR Deployed (Released)

When the ADR has been deployed (released) the complete tool will need to be stripped down and serviced in the workshop.

Both the Decoupling Mechanism ([item 1](#), 42997) and the lower Fishing Neck section ([item 2](#), 09719), once retrieved, will need to be stripped down and cleaned thoroughly and any exposed seals and electrical connectors replaced. Refer to [Section 5.2.3, Decoupling Mechanism Disassembly](#) and [Section 5.2.6, Disassemble the Fishing Neck](#).

Clean the well fluid from the outside of the tool before the toolstring is disassembled:

- 1 Make sure that well fluid does not reach the Electrical Connectors ([item 7](#), 42997 & [item 1](#), 43103), when possible disassemble the toolstring in a horizontal way.
- 2 Check that the upper Female Monoconn Connector ([item 7](#), 42997) is seated correctly (refer to [Section 4.4.1.3, Check the Upper Female MonoConn Connector](#)).
- 3 Do not reconnect the Fishing Neck ([item 2](#), 09719) until the tool has been serviced fully. Service the Decoupling Mechanism (refer to [Section 5.2.3](#)) and the Fishing Neck (refer to [Section 5.2.6](#)) and replace parts as required that have been exposed to well fluid.
- 4 Replace all primary seals. Refer to [Section 7.1.3, Seal Replacement Recommendations](#).
- 5 Reconnect the Fishing Neck ([item 2](#), 09719) and verify that it latches correctly.
- 6 Clean and grease the top and the bottom tool threads and the associated O-Rings with Liquid-O-Ring® type 101 ([P/N: LOR101](#)) and refit the thread protectors.

4.4.2.2 ADR Not Deployed (Not Released)

When the ADR has not been deployed (released) in the well, it should be cleaned and serviced after each run, with all primary O-Rings replaced. For seal replacements, refer to [Section 5, Mechanical Description](#) and [Section 7.1.3, Seal Replacement Recommendations](#).

Provided no faults have been found with the tool, then routine checks should be performed, refer to [Section 4.1, Pre-Logging: Tool Checks](#). Refer to [Section 7, Extended Checks](#) for recommended service routines and complete these checks:

- 1 Clean the well fluid from the outside of the tool before the toolstring is disassembled.
- 2 Check the Pressure Relief Valve is seated correctly (refer to [Section 4.4.1.1, Check of the Pressure Relief Valve](#)).
- 3 Make sure well fluid does not reach the Electrical Connectors ([item 7](#), 42997 & [item 1](#), 43103). When possible, disassemble the toolstring when it is in an horizontally position.s
- 4 Check the upper Female Monoconn Connector ([item 7](#), 42997) is seated correctly (refer to [Section 4.4.1.3, Check the Upper Female MonoConn Connector](#)).
- 5 Release and remove the Fishing Neck ([item 2](#), 09719) and check the Dog Latches ([item 1](#), 43103) for signs of wear.
- 6 Replace all Primary seals. [Section 7.1.3, Seal Replacement Recommendations](#).
- 7 Reconnect the Fishing Neck and verify that it latches correctly.
- 8 Clean and grease the top and bottom tool threads and associated O-Rings with Liquid-O-Ring® type 101 (P/N: [LOR101](#)) and refit the thread protectors.

4.4.2.3 ADR Partially Deployed (Released) Downhole

Should the release process for the ADR be started and then aborted, use extreme caution when the toolstring is retrieved from the well.

Note: DO NOT ATTEMPT TO MOVE THE TOOLSTRING UNTIL THE ADR HAS BEEN MOTORED TO EITHER THE **CONNECTED** POSITION OR THE **RELEASED** POSITION.

Even when the ADRP reports that the tool has reconnected correctly, there can be some uncertainty this is the case. Should the Latching Dogs **not** have re-engaged fully the toolstring below the ADR could be released at any time.

It is possible also that some well fluid has entered the ADR and be retained inside the Decoupling Mechanism ([item 1](#), 42997). Check the status of the Pressure Relief Valve ([item 31](#), 411050) before the tool is handled, refer to [Section 4.4.1](#).

Should there be any sign well fluid has entered the Decoupling Mechanism ([item 1](#), 42997), the tool **must** be serviced as if it had been deployed fully (released) as described in [Section 4.4.2.1](#), otherwise it should be serviced as described in [Section 4.4.2.2](#).

4.5 Transportation and Storage



WARNING!

WELL FLUID

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).



WARNING!

LIQUID-O-RING® TYPE 101 LUBRICANT

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).

Store with end threads lightly greased with Liquid-O-Ring® (*P/N: LOR101*) and with water tight thread protectors fitted.

The tool should be transported to site in the transport case provided.

Do not subject extreme shock, drop or hit with a hard object.

5 MECHANICAL DESCRIPTION

The ADR consists of four main sections:

- The Electronics Chassis Assembly (contains the two main PCBs: the High Voltage Isolation Board and the Logic Board).
- Motor Assembly and Leadscrew.
- Switches Housing and Decoupling Mechanism (contains the Line Isolation Switch and status sensing for the Decoupling Mechanism).
- Fishing Neck Assembly.

To deploy the ADR, the Motor drives the Decoupling Mechanism via the Leadscrew to the **Released** position, this releases the Dog Latches in the Fishing Neck and simultaneously isolates the line connection to the Fishing Neck and therefore any tools below the Fishing Neck. The Fishing Neck can then be detached from the rest of the ADR.

The ADR could be returned from a run in a well in a variety of states that can include:

- The toolstring being retrieved from the well without the need to deploy the ADR.
- The ADR has been deployed and the lower section fished.
- The ADR was partially deployed and is not able to support fully the weight of the toolstring as it is removed from the well.
- The ADR failed and can contain trapped, pressurised well fluid.

Note: Make sure the Post Logging Checks have been carried out before the ADR is dismantled (refer to [Section 4.4, Post-Logging: Toolstring Disassembly](#)).

The tool should be cleaned after each run and when it has been in storage. All primary O-Rings should be replaced and lubricated with Liquid-O-Ring® type 101 (P/N: LOR101). Refer to [Section 7.1.3, Seal Replacement Recommendations](#) and [Section A.5 Kit Details](#) for the kits to be used during the different phases of cleaning and maintenance.

Before maintenance procedure is performed, make sure the work surface is stable and suitable tool supports (for example, V-blocks) are available to hold the tool in place as shown in [Figure 5-1](#).



Figure 5-1 The ADR Tool on Vee-Blocks

5.1 Trapped Pressure Tool Disassembly



WARNING!

TRAPPED PRESSURE!

Refer to [Section 2.5.1, Trapped Pressure Safety Precautions](#).

Reference: Electronics Assembly [AD-42997](#)
 Decoupling Mechanism [AD-411050](#)

Note: Where tools are fitted either above or below the ADR, refer to [Section 4.4.1.1, Check of the Pressure Relief Valve](#) and [Section 4.4.1.2, Relief of Trapped Pressure at the Tool Joints](#) for instructions about how to remove safely these tools before you proceed.

5.1.1 TRAPPED PRESSURE IN THE ELECTRONICS ASSEMBLY

Trapped Pressure in the Electronics Section is relieved at the toolstring disassembly stage when the tool fitted above the ADR is removed. Any trapped pressure in the Electronics Section will push the Female Monoconn Connector ([item 7](#), 42997) out against the Internal Retaining Ring ([item 12](#), 42997) and break the O-Ring seal to allow the trapped pressurised gas/fluid to escape. In extreme circumstances, the trapped pressure can be sufficient to dislodge the Internal Retaining Ring and push the Female Monoconn Connector all the way out of the tool.

Should the Female Monoconn Connector ([item 7](#), 42997) appear to have been displaced (that is, pushed against the Internal Retaining Ring ([item 12](#), 42997) or ejected completely) it should be considered the tool has leaked and the Electronics section should be dismantled and serviced. Refer to [Section 4.4.1.2, Relief of Trapped Pressure at the Tool Joints](#).

5.1.2 TRAPPED PRESSURE IN THE DECOUPLING MECHANISM

Verify the state of the Pressure Relief Valve ([item 31](#), 411050). When the valve has popped out (see [Figure 5-2](#)), it is possible well fluid has been in the Decoupling Mechanism ([item 1](#), 42997). However, should the Pressure Relief Valve ([item 31](#), 411050) have been activated, the operator can be confident there is no trapped pressure within the Decoupling Mechanism section of the tool ([item 5](#), 411050). When the Pressure Relief Valve has been activated it will be necessary to find the source of the leak and to service the ADR as if it had been deployed.

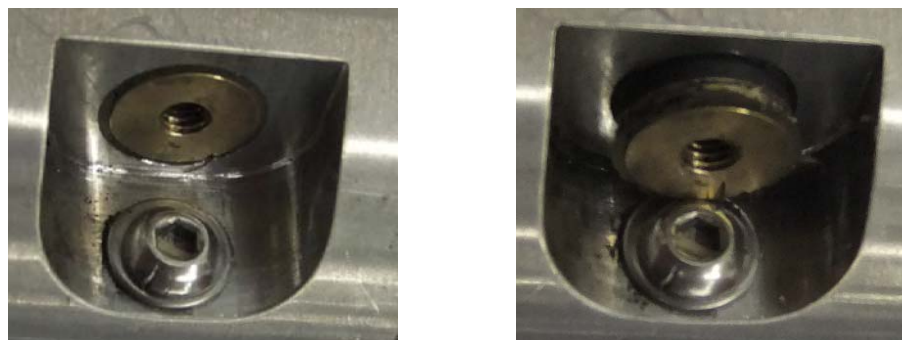


Figure 5-2 The Pressure Relief Valve seated (left) and activated (right)

5.2 Service

Should the tool have been deployed, a thorough check and clean is required and includes O-Ring and secondary seal changes, to make sure any well fluid is purged from the tool and will not cause electrical short circuits when the tool is rebuilt.

Should the tool have not been deployed or has stood idle for longer than the recommended time, a full O-Ring and seal service should be completed in accordance with [Section 7.1.3, Seal Replacement Recommendations](#).

5.2.1 SEPARATION OF THE ELECTRONICS & FISHING NECK

Reference:	Addressable Downhole Release Assembly	AD-09719
	ADR Decoupling Mechanism	AD-411050
	Fishing Neck Assembly	AD-43103

- 1 Should they be fitted, remove the thread protectors ([items 3 & 4](#), 09719). Check the environmental O-Ring Seal in the Male Thread Protector ([item 4](#), 09719) and replace when necessary.
- 2 Screw a power adapter into the top of the ADR and connect it to the ADRP through the use of the line out cable and Dummy Logging Cable (DLC).
- 3 Motor the tool to the **Released** position. Refer to the ADRP Manual for instructions ([MN-ADRP001](#)).
- 4 Switch the mains power to the ADRP off and disconnect the line from the ADR.
- 5 Remove the power adapter from the tool.
- 6 Pull the Fishing Neck ([item 2](#), 09719) out of the Latching Mechanism Housing ([item 5](#), 411050). This gives access to the primary O-Rings ([items 7 & 8](#), 43103) on the Fishing Neck.



Figure 5-3 Removal of the Fishing Neck from the ADR

Should the tool malfunction due to an inability to communicate with the ADRP, a faulty motor, or other problem, then complete these steps:

- i. With the use of a C-spanner (to hold the Switches Housing - [item 6](#), 411050) and a spanner, unscrew the Latches Mechanism Housing ([item 5](#), 411050) by five or six complete turns.
- ii. With the use of a flat bladed screwdriver positioned in the slot between the Fishing Neck ([item 2](#), 09719) and Latching Mechanism Housing ([item 5](#), 411050), apply moderate pressure. It should be possible now to extract the Fishing Neck from the Latching Mechanism Housing.



Figure 5-4 Removal of the Latching Mechanism Housing

- 7 The Latching Mechanism Housing ([item 5](#), 411050) can now be removed, use a C-spanner to hold the Switches Housing ([item 6](#), 411050) and use a spanner to unscrew and remove the Latches Mechanism Housing. This gives access to the primary O-Rings ([item 40](#), 411050) on the lower section of the Switches Housing.
- 8 Should no further disassembly be required, then clean and check the Back-up Rings ([item 29](#), 411050), fit new O-Rings ([item 40](#), 411050) and lubricate them both with Liquid-O-Ring® type 101 ([P/N: LOR101](#)).
- 9 Refit the Latching Mechanism Housing ([item 5](#), 411050).

5.2.2 ELECTRONICS DISASSEMBLY

Reference:	Addressable Downhole Release Assembly	AD-09719
	ADR Decoupling Mechanism	AD-411050
	Electronics Assembly	AD-42997

When the tool is run in a well, under certain failure conditions, trapped, pressurised gas/well fluid could be experienced in the Electronics Assembly. This would be released at the toolstring disassembly stage, push the Female MonoConn Connector out against the Internal Spiral Retaining Ring ([items 7 & 12](#), 42997) at the top of, the Electronics Chassis. Refer to [Section 5.1.1, Trapped Pressure in the Electronics Assembly](#) for more details.

To service the Electronics, complete these steps:

- 1 With the use of a C-spanner to hold the Switches Housing ([item 6](#), 09719), use a spanner to unscrew and remove the Electronics Pressure Housing ([item 5](#), 09719). This gives access to the primary O-Rings ([item 41](#), 411050) on the upper part of the Switches Housing.
- 2 Discard the two Primary O-Rings ([item 41](#), 411050) on the upper section of the Switches Housing ([item 6](#), 411050), then clean and check the two Back-up Rings ([item 28](#), 411050) and replace when necessary.
- 3 Check and clean the O-Ring Seal ([item 8](#), 42997) and the Back-up Ring ([item 11](#), 42997). Replace the two with new components when necessary. Refer to [Section 7.1.3, Seal Replacement Recommendations](#).
- 4 Clean and check the condition of the Canted Coil Spring and Thrust Ring ([items 10 & 6](#), 42997) and should they be damaged, replace when necessary.
- 5 Should no further disassembly be required, fit the new O-Ring seals and refit the Electronics Pressure Housing ([item 5](#), 09719).

5.2.2.1 Access to the PCBs

- 1 Remove the Kapton® Tape (P/N: T004-00092) that holds the wires and the PCBs to the Electronics Chassis (item 4, 42997).
- 2 To service the Female Monoconn Connector (item 7, 42997), Soldered Feedthrough Assembly and/or the Conductor Ring (items 1 & 2, 411050) only the HV Isolation Board (item 2, 42997) needs to be removed. To service the Motor Assembly (item 9, 411050) the two boards will need to be removed.

To remove the PCBs, complete these steps:

- i. On the Controlled Programmed PCB (item 3, 42997), unscrew and remove the five Skt Cap Hd Screws (item 13, 42997) and five Crinkle Washers (item 16, 42997).
 - ii. On the HV Isolation PCB (item 2, 42997), unscrew and remove the seven Skt Cap Hd Screws (item 13, 42997) and seven Crinkle Washers (item 16, 42997). Two Transistor Bushes (item 5, 42997) are located on the ends nearest the ADR Motor Assembly (item 9, 411050) and should be checked once removed and replaced when damaged.
- 3 Should it be necessary to replace either of the PCBs, refer to [Section 5.2.4.2, PCB Replacement](#) for instructions.
 - 4 Should the ADR Motor Assembly (item 9, 411050) need to be replaced, refer to [Section 5.2.5, Service the Motor and Leadscrew Assemblies](#).

5.2.2.2 Service the MonoConn Connector

- 1 The Female MonoConn Connector (item 7, 42997) does not need to be removed unless it is damaged from trapped pressure, or the O-Ring (item 9, 42997) needs to be checked and replaced.

To do this see [Figure 5-5](#) and complete these steps:

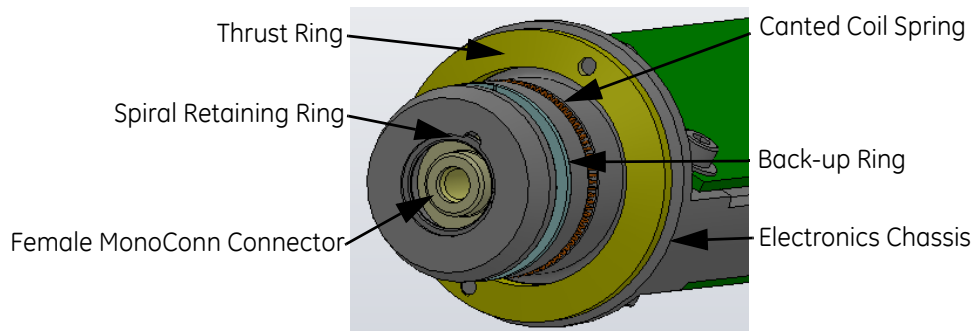


Figure 5-5 View from top of Electronics Chassis

- i. Use a small screwdriver to remove the Internal Spiral Retaining Ring (item 12, 42997).
- ii. Before the Female MonoConn Connector (item 7, 42997) can be removed, it is necessary to remove the High Voltage (HV) Isolation PCB (item 2, 42997) should it not be removed already (refer to [Section 5.2.2.1, Access to the PCBs](#)) so that the wires attached to the rear of the Female Monoconn Connector can be guided through the bulkhead. **DO NOT** attempt to remove the Female Monoconn Connector without doing this as the wires will be damaged.
- iii. Remove the Kapton® Tape (P/N: T004-00092) that holds the wires to the Electronics Chassis.
- iv. Screw a 30mm long M4 screw into the threaded recess in the bottom of the Female Monoconn Connector (item 7, 42997) and pull gently the Female Monoconn Connector (item 7, 42997) out of the Electronics Chassis (item 4, 42997) and take care not to snag any of the through wires. See [Figure 5-6](#).

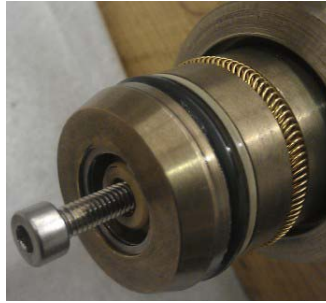


Figure 5-6 Remove the Female MonoConn Connector

- v. Check the O-Ring (*item 9*, 42997), clean and lubricate with Liquid-O-Ring® type 101 (*P/N: LOR101*) and when necessary, replace with new.
 - vi. Should the O-Ring (*item 9*, 42997) be the only item serviced, there is no requirement to unsolder the wires. Remove the O-Ring and gently ease a new O-Ring over the Female Monoconn Connector (*item 7*, 42997) and lubricate with Liquid-O-Ring® type 101 (*P/N: LOR101*), then go to *Step x*.
 - vii. Should the Female MonoConn Connector (*item 7*, 42997) be damaged and need to be replaced, unsolder (use *SN100C*) the wires at the back of the Female MonoConn Connector.
 - viii. Place a new piece of heatshrink sleeve over the wires and solder (use *SN100C*) the wires onto the new MonoConn Connector (*item 7*, 42997). Refer to the ADR Wiring Diagram (*WD-42997*). Should the Soldered Conductor Ring Assembly require to be serviced make sure this is done before the throughwire is soldered back to the MonoConn Connector. Refer to *Section 5.2.3.2, Service the Soldered Feedthrough Assembly & Soldered Conductor Ring*.
 - ix. Clean away any flux residue and shrink down the heatshrink over the solder joint.
 - x. Fit the connector back into the Electronics Chassis (*item 4*, 42997) and pull carefully the wires back through the bulkhead during this operation.
 - xi. Refit the Internal Spiral Retaining Ring (*item 12*, 42997).
 - xii. Should no further maintenance be required on the tool, tape the wires to the chassis (use Kapton® tape (*P/N: T004-00092*) so that the PCBs can be refitted without trapping any wires or stress to the PCBs. Refit the HV Isolation PCB (*item 2*, 42997) and secure the Skt Cap Hd Screws, Transistor Isolating Bushes and Washers (*items 13, 5 and items 16 & 15*, 42997) as detailed in the assembly drawing (*AD-42997*). Should the Transistor Isolating Bushes be damaged, replace with new.
2. When no further access to the Electronics section is required, check and (when necessary) replace the O-Rings ((*item 8*, 42997) & (*item 41*, 411050)) and Back-up Rings ((*item 11*, 42997) & (*item 28*, 411050)), then refit the Electronics Pressure Housing (*item 5*, 09719).
 3. Check the insulation to make sure no wires have been trapped. The insulation measurements from the MonoConn Socket to the Electronics Pressure Housing (*item 5*, 09719) are shown below:
 - Positive to MonoConn Socket = >2MΩ.
 - Negative to MonoConn Socket = >500KΩ.
 4. Should the ADR Motor Assembly (*item 9*, 411050) or the Soldered Conductor Ring (*item 2*, 411050) need to be replaced, refer to *Section 5.2.5, Service the Motor and Leadscrew Assemblies* or *Section 5.2.3, Decoupling Mechanism Disassembly*, respectively.

5.2.3 DECOUPLING MECHANISM DISASSEMBLY



IRRITANT! LIQUID-O-RING® TYPE 101 LUBRICANT
Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).

Reference: Decoupling Mechanism Assembly **AD-411050**

- 1 Remove the Latching Mechanism Housing ([item 5](#), 411050) should it not already have been removed, and clean. Refer to [Section 5.2.1, Separation of the Electronics & Fishing Neck](#).

To remove the Latching Mechanism Housing ([item 5](#), 411050), it can be necessary to clamp the Electronics Assembly section of the tool in a vice (use soft jaws to prevent damage to the ADR Housing) and use a rubber hammer to tap gently the Latching Mechanism Housing while it is pulled. This is especially likely to be the case should the tool be unable to motor to the **Released** position and the Fishing Neck is released by unscrewing the Housing (refer to [Section 5.2.1](#)).
- 2 Discard the two Primary O-Ring Seals ([item 40](#), 411050) on the Switches Housing ([item 6](#), 411050), then clean, check and replace when necessary the two Back-up Rings ([item 29](#), 411050).
- 3 Clean and check the condition of the Canted Coil Spring ([item 43](#), 411050) fitted inside the Latching Mechanism Housing ([item 5](#), 411050) and should it be damaged, replace when necessary.
- 4 On the Latching Mechanism Housing ([item 5](#), 411050), check the condition of the Pressure Relief Valve ([item 31](#), 411050) and replace the primary O-Ring ([item 36](#), 411050).

To do this, complete these steps:

- i. Completely remove the Button Headed Screw ([item 51](#), 411050) from the Latching Mechanism Housing ([item 5](#), 411050).



Figure 5-7 Remove the Grub Screw from the Pressure Relief Valve

- ii. Insert an M3 screw into the thread in the Pressure Relief Valve ([item 31](#), 411050) and carefully pull on the screw to extract the valve fully from the Housing.



Figure 5-8 Remove the Pressure Relief Valve

- iii. Replace the O-Ring ([item 36](#), 411050) and grease it lightly with Liquid-O-Ring® type 101 ([P/N: LOR101](#)).

- iv. Verify the condition of the Anti Extrusion Ring ([item 32](#), 411050) and replace it if it is damaged or worn.
- v. Always replace the Cantled Coil Spring ([item 35](#), 411050) every time the valve is removed from the Latching Mechanism Housing ([item 5](#), 411050).
- vi. Make sure the Pressure Relief Valve hole is clean and free from debris and that the seal bores are in good condition. This includes a check to make sure the fine surface texture of the bores is intact. Should the bores be scratched or damaged, the Housing can have to be replaced.
- vii. Re-insert the valve fully into the Latching Mechanism Housing ([item 5](#), 411050) until the Cantled Coil Spring ([item 35](#), 411050) clicks into place and the top of the valve is flush with the counterbore in the Housing.
- viii. Re-insert the Button Headed Screw until it is tight ([item 51](#), 411050). See [Figure 5-7](#).

5.2.3.1 Service the Decoupling Mechanism



IRRITANT! LIQUID-O-RING® TYPE 101 LUBRICANT
Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).



WARNING! DIESEL/PARAFFIN/KEROSENE FUEL!
Refer to [Section 2.7.5, Diesel/Paraffin/Kerosene Fuel](#).

Reference:	General Assembly	AD-09719
	Decoupling Mechanism Assembly	AD-411050

Should the Fishing Neck have been deployed, the O-Rings ([items 26, 30 & 39](#), 411050) will be considered Primary O-Rings and as such must be replaced along with the Soldered Feedthrough Assembly ([item 1](#), 411050) which will have been exposed to well fluid. To check the seals on the lower end of the Decoupling Mechanism, disassemble the tool down as far as the Seal Cartridge ([item 16](#), 411050). The Soldered Feedthrough Assembly will need to be dismantled, cleaned and reassembled with a new Soldered Feedthrough Assembly and O-Rings replaced. To do this see [Figure 5-9](#) and complete the tasks below.

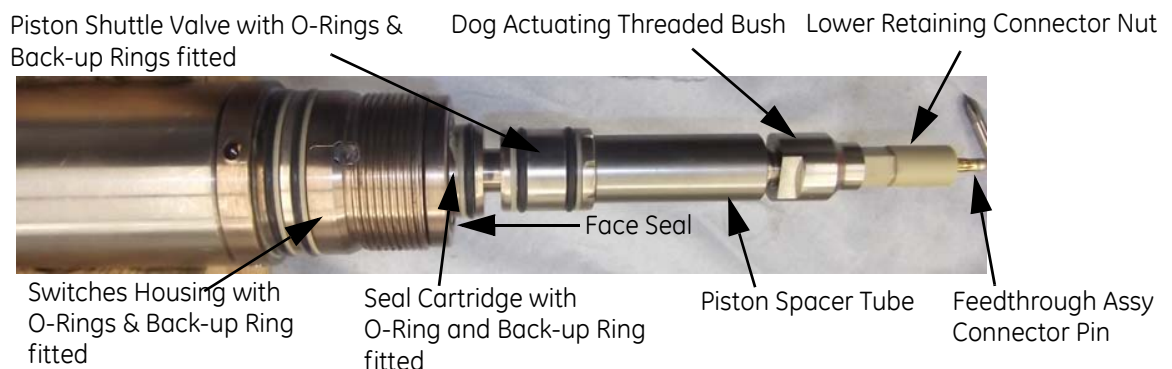


Figure 5-9 Decoupling Mechanism

Note: Check that the Face Seal ([item 38](#), 411050) of the Seal Cartridge ([item 16](#), 411050) is still seated in its recess in the Seal Cartridge, if not look inside the Latching Mechanism Housing ([item 5](#), 411050) for it. Occasionally it can stick to the inside face of the Latching Mechanism Housing.

Note: Should the Threaded Dog Actuating Bush and Piston Shuttle Valve ([items 20 & 25](#), 411050) show any signs of scouring or wear from water jetting they will need to be replaced. Water jetting is caused when a jet of fluid that contains debris, slices through the tool at high velocity and pressure. The process is the same as water erosion but accelerated and concentrated to a greater level.

Symptoms of scouring or wear from water jetting to check for include:

- The primary O-Rings will be damaged and the secondary seals will need to be checked for damage.
 - Threaded Dog Actuating Bush and the Piston Shuttle Valve (*items 20 & 25*, 411050) will have braided and need to be replaced.
 - The Latching Housing Mechanism (*item 5*, 411050) can have some erosion due to the velocity and pressure of the fluid that rushes into and around the outside of the tool.
- 1 Take care not to damage the Feedthrough Assembly (*item 1*, 411050), use a 15mm spanner to hold the Dog Actuating Bush (*item 20*, 411050) while a 10mm spanner is used to unscrew the Lower Retaining Connector Nut (*item 15*, 411050). See *Figure 5-10*.



Figure 5-10 Remove the Lower Retaining Connector Nut

- 2 Use a 15mm spanner to remove the Threaded Dog Actuating Bush (*item 20*, 411050) and slide off the Piston Tube Spacer (*item 34*, 411050) from the Actuating Shaft (*item 4*, 411050). Clean thoroughly these and the Lower Connector Retaining Nut (*item 15*, 411050) through the use of clean paper or a rag, as shown in *Figure 5-11*. Should the ADR have been deployed in well fluid you need to use paraffin or diesel to clean these parts satisfactorily. Should the Threaded Dog Actuating Bush (*item 20*, 411050) show any signs of wear or erosion, a new Threaded Dog Actuating Bush must be fitted.



Figure 5-11 Clean the Lower Retaining Connector Nut

- 3 Slide off the Piston Shuttle Valve (*item 25*, 411050) and Seal Cartridge (*item 16*, 411050). Clean and check the Piston Valve Shuttle (*item 25*, 411050), Seal Cartridge (*item 16*, 411050) and Switches Housing (*item 6*, 411050). Should the Piston Shuttle Valve show any signs of wear or erosion a new Piston Shuttle Valve must be fitted.

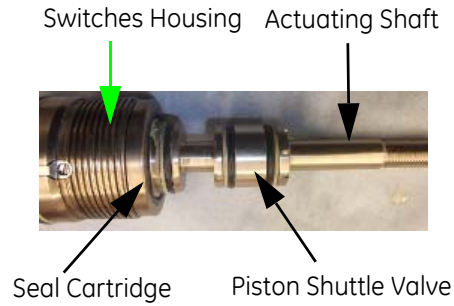


Figure 5-12 The Seal Cartridge & Piston Shuttle Valve

- 4 Clean, check and replace, the two O-Rings ([item 39](#), 411050) fitted on the Piston Shuttle Valve ([item 25](#), 411050).
- 5 Clean and check the Back-up Rings ([item 26](#), 411050) and when necessary replace with new.
- 6 Remove the Seal Cartridge ([item 16](#), 411050) and clean, check and replace, the O-Rings ([items 37 & 38](#), 411050) and the Back-up Ring ([item 30](#), 411050).

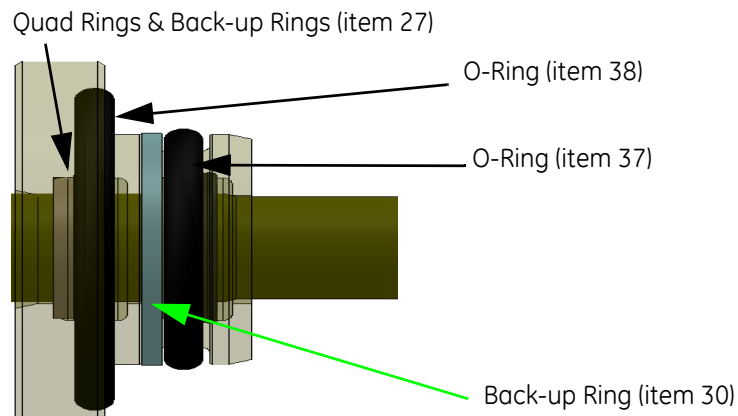


Figure 5-13 Transparent View of Seal Cartridge with seals

- 7 Check, clean and lubricate with Liquid-O-Ring® type 101 ([P/N: LOR101](#)), and when necessary replace, the two Quad Rings and two Back-up Rings ([items 42 & 27](#), 411050) on the inside of the Seal Cartridge ([item 16](#), 411050).
- 8 Check the condition of the Insulating Washer ([item 23](#), 411050) and Canted Coil Spring ([item 44](#), 411050).

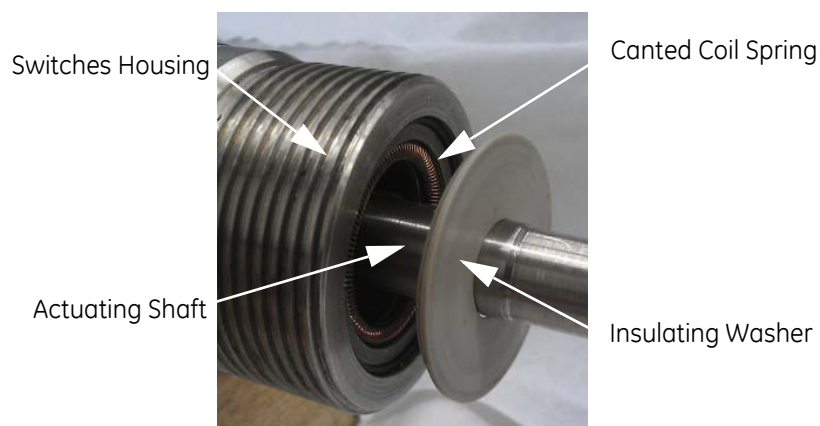


Figure 5-14 The Insulating Washer & Canted Coil Spring

- 9 The Hall Effect Sensor Assembly is set up and sealed in place by Sondex Wireline Ltd. Instructions to service and/or replace this are not covered in this manual. Should a fault be experienced with the Hall Effect Sensor Assembly ([item 3](#), 411050) or the Fishing Neck ([item 2](#), 09719) does not connect/latch correctly, contact [GE Oil & Gas Technical Services](#).

Should the ADR have been deployed in a well, continue with the instructions below, otherwise it is not likely that further disassembly is required. Refer to [Section 5.2.3.3, Decoupling Mechanism Reassembly](#).

5.2.3.2 Service the Soldered Feedthrough Assembly & Soldered Conductor Ring

After deployment in a well, it is critical for the reliable operation of the ADR that the Soldered Feedthrough Assembly and Soldered Conductor Ring ([items 1 & 2](#), 411050) are replaced.

To do this, complete these steps:

- 1 Unscrew the Csk Hd Slotted Screw ([item 50](#), 411050) from the Alignment Key ([item 8](#), 411050) which secures the Soldered Feedthrough Assembly ([item 1](#), 411050) within the Switches Housing ([item 6](#), 411050).
- 2 Remove the Anti-Rotation Key ([item 8](#), 411050).
- 3 Unscrew the Actuating Shaft ([item 4](#), 411050) which includes the Soldered Feedthrough Assembly, from the Actuating Leadscrew ([item 12](#), 411050).
- 4 Remove the two Skt Hd Cap Screws ([item 33](#), 411050), Serrated Lock Washers ([item 55](#), 411050) from the Contact Ring ([item 21](#), 411050).
- 5 Remove the two Insulating Bushes ([item 22](#), 411050) from the Mounting Feedthrough Spool ([item 19](#), 411050).

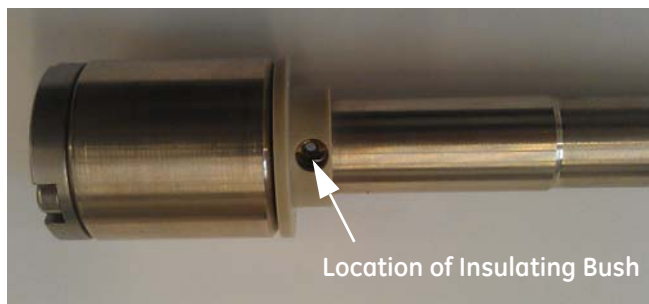


Figure 5-15 Insulating Bushes removed from the Mounting Feedthrough Spool

- 6 Pull carefully, the Soldered Feedthrough Assembly ([item 1](#), 411050) out of the Actuating Shaft ([item 4](#), 411050), clean the Actuating Shaft thoroughly and replace the Soldered Feedthrough Assembly with new (see [KITF-ADR001](#)).

Note:

Should the ADR have been deployed in well fluid you need to use paraffin or diesel to clean these parts satisfactorily. Be careful when it is removed as the Feedthrough Assembly can be tight due to the O-Rings. This will also cause the Nipple Contact Insulator ([item 24](#), 411050) to fall out of the Actuating Shaft.

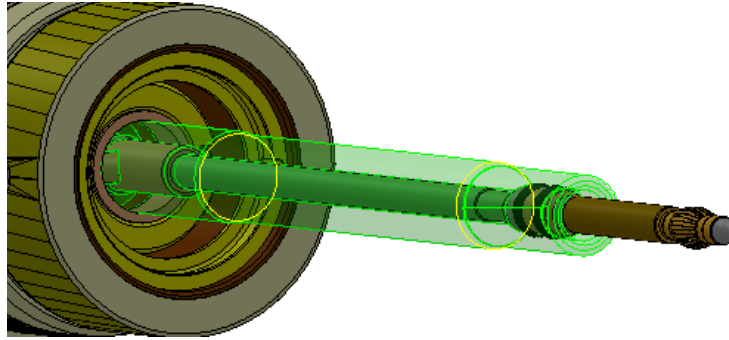


Figure 5-16 Transparent view of the Soldered Feedthrough Assembly in the Shaft

Note: Make sure all parts are cleaned thoroughly before reassembly!

- 7 Reassemble the Soldered Feedthrough Assembly and Actuating Shaft (*items 1 & 4*, 411050).

To do this, complete these steps:

- i. Insert the Nipple Contact Insulator (*item 24*, 411050) onto the Soldered Feedthrough Assembly (*item 1*, 411050).
- ii. Lubricate the O-Rings (*P/N: 99006*, KITF-ADR001) on the Soldered Feedthrough Assembly (*item 1*, 411050) with Liquid-O-Ring® type 101 (*P/N: LOR101*) before fitment.
- iii. Then insert the new Soldered Feedthrough Assembly into the Actuating Shaft (*item 4*, 411050).
- iv. With the use of a small screwdriver, align the holes in the Actuating Shaft (*item 4*, 411050) with the ones in the Nipple Contact Insulator (*item 24*, 411050) and with the threaded hole through the end of the Soldered Feedthrough Assembly. Then refit the Mounting Feedthrough Spool (*item 19*, 411050) and align with the holes on the Actuating Shaft and reinsert the two Insulating Bushes (*item 22*, 411050).



(Above) The Nipple Contact Insulator not aligned



(Above) The Spool Feedthrough Mounting fitted and holes aligned

Figure 5-17 Installation of the Soldered Feedthrough Assembly

- v. Refit the Contact Ring (*item 21*, 411050), with the two Serrated Washers and Skt Hd Cap Screws (*items 55 & 33*, 411050). Do not overtighten the screws. Their torque setting should be 0.3Nm.

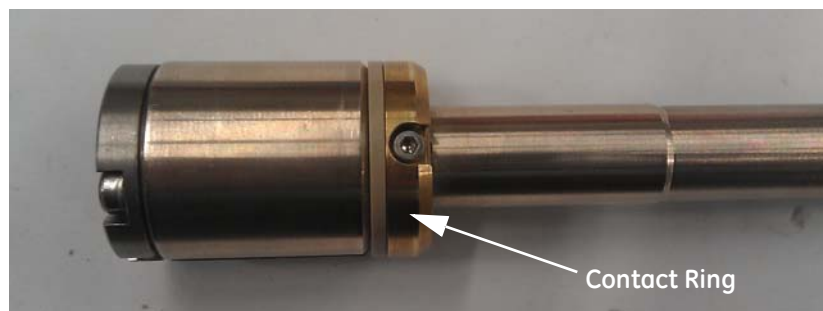


Figure 5-18 Installation of the Contact Ring onto the Actuating Shaft

- 8 To remove the Soldered Conductor Ring Assembly ([item 2](#), 411050), make sure the throughwire from the MonoConn Connector ([item 7](#), 42997) is unsoldered, refer to [Section 5.2.2.2, Service the MonoConn Connector](#) and wiring diagram ([WD-42997](#)). Then, remove the Electronics Housing and unscrew the HV Isolation PCB, should it not already be removed. Refer to [Section 5.2.2.1, Access to the PCBs](#) and complete the tasks below:
 - i. Pull gently the Soldered Conductor Ring Assembly ([item 2](#), 411050) from the Switch Mounting Sleeve ([item 18](#), 411050) and feed the wire through from the Electronics Section during the operation.
 - ii. Slide back the PTFE Sleeve to expose the wiring and unsolder (use [SN100C](#)) the throughwire from the Soldered Conductor Ring Assembly ([item 2](#), 411050).
 - iii. Replace the Soldered Conductor Ring Assembly ([item 2](#), 411050) with new.

Note: DO NOT use excessive solder as this can stop the PTFE Sleeve to slide back over the Soldered Conductor Rod or stop the assembly being put back into the tool.

- i. With reference to the wiring diagram ([WD-42997](#)), feed the throughwire to the MonoConn Connector and resolder the wire to the MonoConn Connector. Refer to [Section 5.2.2.2, Service the MonoConn Connector](#).
- ii. Solder (use [SN100C](#)) the throughwire onto the new Soldered Conductor Ring Assembly ([item 2](#), 411050) and clean away any flux residue.
- iii. Slide the PTFE Sleeve back over the solder joint and along the Conductor Rod right up to the Outer Contact Ring itself, so as to insulate the Conductor Rod where it passes through the Switches Housing ([item 6](#), 411050).
- iv. Slide gently, the Soldered Conductor Ring Assembly ([item 2](#), 411050) back into its recess and pull the wire through from the Electronics Section during the operation. Take care not to snag or damage the PTFE insulator sleeve.

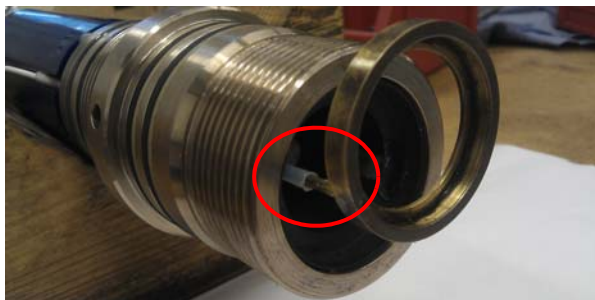


Figure 5-19 Alignment & fitment of the Soldered Conductor Ring

- 9 Complete an insulation check after fitment of the Soldered Conductor Ring ([item 2](#), 411050). This will make sure the PTFE Sleeve has not been damaged during the refit and that there is no shorting to the Switches Housing ([item 6](#), 411050). The measurements of the insulation to the Switches Housing ([item 6](#), 411050) should be:
 - Positive to Upper Connector = >2M Ω .
 - Negative to Upper Connector = >500K Ω .

5.2.3.3 Decoupling Mechanism Reassembly

**IRRITANT!**

LIQUID-O-RING® TYPE 101 LUBRICANT

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).Reference: Decoupling Mechanism Assembly [AD-411050](#)

To check that the Actuating Mechanism has been reassembled correctly and to make sure that the ADR latches when 'connected', it is necessary to be able to motor the ADR through the use of the ADRP. It is advisable that any service of the Electronics Section and Motor Assembly is carried out before the Actuating Mechanism is refitted. Refer to [Section 5.2.5, Service the Motor and Leadscrew Assemblies](#) & [Section 5.2.8, Connect the Fishing Neck and the Decoupling Mechanism to the Electronics Assembly](#) as required.

To reassemble the Decoupling Mechanism, complete these steps:

- 1 Replace the PCBs and Electronics Pressure Housing ([item 5](#), 09719). Refer to [Section 5.2.4.2, PCB Replacement](#).
- 2 Do an insulation check to make sure that no wires were trapped under the PCBs. The measurements from the Top Connector to Housing should be:
 - Top Connector +ve probe to Housing -ve probe: >2MΩ.
 - Top Connector -ve probe to Housing +ve probe: >500KΩ.
- 3 Screw the Actuating Shaft ([item 4](#), 411050) into the Actuating Leadscrew ([item 12](#), 411050) within the Mounting Sleeve ([item 18](#), 411050), until it is approximately half-way in (about 9 or 10 turns). Rotate the Actuating Shaft ([item 4](#), 411050) to align the slot with the Anti-Rotation Keyhole in the Switches Housing ([item 6](#), 411050).
- 4 To lock the Actuating Shaft ([item 4](#), 411050) in place, refit the Anti-Rotation Key ([item 8](#), 411050) in the Switches Housing ([item 6](#), 411050) and secure it in place with the Csk Hd Screw ([item 50](#), 411050).
- 5 Refit the Canted Coil Spring ([item 44](#), 411050) and Insulating Washer ([item 23](#), 411050).
- 6 See [Figure 5-9](#) and reassemble the bottom of the tool by completion of these tasks:
 - i. Refit the Quad Ring and Back-up Ring Seals ([items 42 & 27](#), 411050) to the Seal Cartridge ([item 16](#), 411050) and lubricate with Liquid-O-Ring® type 101 ([P/N: LOR101](#)).
 - ii. Refit the O-Ring and Back-up Ring Seals ([items 30, 37 & 38](#), 411050) to the Seal Cartridge, lubricate with Liquid-O-Ring® type 101 ([P/N: LOR101](#)). Then slide the Seal Cartridge ([item 16](#), 411050) onto the Actuating Shaft ([item 4](#), 411050). Make sure the Canted Coil Spring and Insulating Washer ([items 14 & 23](#), 411050) remain in place by sliding the Seal Cartridge tight against the Switches Housing ([item 6](#), 411050). There is a lip on the inside of the Switches Housing that helps keep the Canted Coil Spring in place.



Figure 5-20 Insulating Washer, Canted Coil Spring and Seal Cartridge

- iii. Lubricate the O-Rings and Back-up Rings (*items 39 & 26*, 411050) with Liquid-O-Ring® type 101 (*P/N: LOR101*), then refit them to the Piston Shuttle Valve (*item 25*, 411050). Replace the Back-up Rings when worn or damaged.



Figure 5-21 Fitting the Piston Shuttle Valve

- iv. Fit the Piston Shuttle Valve (*item 25*, 411050) onto the Actuating Shaft (*item 4*, 411050), make sure the castellations are face down-hole (away from the Switches Housing (*item 6*, 411050)).
- v. Fit the Piston Spacer Tube (*item 34*, 411050) and use a 15mm spanner, fit the Actuating Dog Threaded Bush (*item 20*, 411050), tighten to a torque value of 50Nm. When tight the Piston Spacer Tube should still be free to move up and down the Shaft.
- vi. Fit the Lower Connector Retaining Nut (*item 15*, 411050) and use a 10mm spanner and hand-tighten, while the Actuating Dog Bush is held with the 15mm spanner.

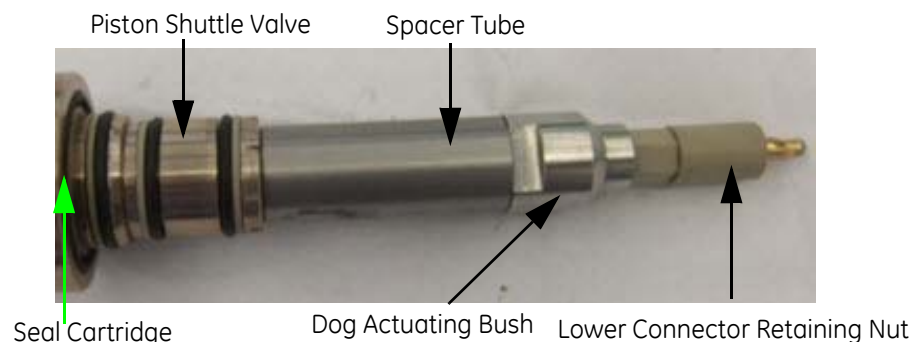


Figure 5-22 Lower-end of Actuating Shaft

- 7 Motor the ADR to the **Connected** position (refer to *MN-ADRP001* for instructions on how to connect and motor the ADR) and verify the position of the Piston Shuttle Valve (*item 25*, 411050).
 - i. Make sure that the Piston Shuttle Valve (*item 25*, 411050) is pushed up towards the Switches Housing (*item 6*, 411050).
 - ii. Check the distance from the joint between the Electronics Housing (*item 5*, 09719) and the Switches Housing (*item 6*, 411050) to the lower end of the Piston Shuttle Valve (*item 25*, 411050) is approximately 108mm. Should this not be correct verify that the Decoupling

Mechanism has been reassembled correctly and contact [GE Oil & Gas Technical Services](#) for assistance.



Figure 5-23 Measure the distance from the Joint to the Piston Shuttle Valve

- 8 Fit the Canted Coil Spring ([item 43](#), 411050) inside the Latching Housing Mechanism ([item 5](#), 411050).
- 9 Replace and lubricate the Primary O-Rings ([item 40](#), 411050) and Back-up Rings ([item 29](#), 411050) on the Switches Housing ([item 6](#), 411050) with Liquid-O-Ring® type 101 ([P/N: LOR101](#)).
- 10 Should it be necessary, check and service the Pressure Relief Valve. Refer to [Step i.](#) of [Section 5.2.3, Decoupling Mechanism Disassembly](#).
- 11 Refit the Latching Housing Mechanism ([item 5](#), 411050) to the Switches Housing ([item 6](#), 411050).

5.2.4 REPLACE THE PCBs

Reference: Addressable Downhole Release Assembly [AD-09719](#)
 ADR Electronics Assembly [AD-42997](#)

The Electronics Assembly should not need to be disassembled further, however, should the PCBs ([items 2 & 3](#), 42997) need replacement, remove the Electronics Pressure Housing ([item 5](#), 09719), then unscrew the PCBs. Below are instructions about how to do this:

5.2.4.1 Access the PCBs

Should the PCBs not be accessible already, refer to [Section 5.2.2.1, Access to the PCBs](#).

5.2.4.2 PCB Replacement

Unsolder the wires from the PCB that needs replacement (*items 2 & 3*, 42997), then inspect and replace the PCB Assemblies (*items 2 & 3*, 42997) as required.

To do this, complete these steps:

- 1 Remove the PCB to be replaced (refer to [Section 5.2.2.1, Access to the PCBs](#)) by unsoldering (use [SN100C](#)) the wires to the PCBs, refer to [WD-42997](#) for connection details.
- 2 Remove the PCB(s) that require replacement and replace with new.
- 3 Check the wiring details against the wiring diagram ([WD-42997](#)), then re-solder (use [SN100C](#)) the wires to the PCBs and clean away any flux residue.
- 4 Should no further maintenance be required on the tool, tape the wires to the Electronics Chassis (*item 4*, 42997) so that the PCB (*items 2 & 3*, 42997) can be refitted without trapping any wires or stress to the PCB. Refit the HV Isolation PCB (*item 2*, 42997) and secure the Skt Cap Hd Screws, Transistor Isolating Bushes and Washers (*items 13, 5 & 16*, 42997) as detailed in the assembly drawing ([AD-42997](#)). Should the Transistor Isolating Bushes be damaged, replace with new.

Note: Make sure the Serrated Washers (*item 15*, 42997) are fitted to the Skt Cap Hd Screws (*items 13 & 14*, 42997) that hold the Solder Tags (*item 17*, 42997) in place, otherwise the ADR can have a poor ground connection to the chassis.

- 5 Should no further access to the Electronics Section be required, check, clean and lubricate with Liquid-O-Ring® type 101 (*P/N: LOR101*) and replace the Primary O-Rings (*items 40 & 41*, 411050) and check the condition of the Back-up O-Rings (*item 28 & 29*, 411050) and replace when worn or damaged. Check the secondary O-Ring on the Electronics Chassis (*item 8*, 42997). Refer to [Section 5.2.2, Electronics Disassembly](#), then refit the Electronics Pressure Housing (*item 5*, 09719).
- 6 Use a multimeter to check the insulation and continuity. The measurements below are approximate:

Insulation to Housing:

- Positive to Upper Connector = >2MΩ.
- Negative to Upper Connector = >500KΩ.

5.2.5 SERVICE THE MOTOR AND LEADSCREW ASSEMBLIES

**IRRITANT!**

LIQUID-O-RING® TYPE 101 LUBRICANT

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).**IRRITANT!**

DOW CORNING® 3145 RTV COATING

Refer to [Section 2.7.3, Dow Corning® 3145 RTV Adhesive/Sealant](#).**IRRITANT!**

DOW CORNING® MOLYKOTE® HP-870 GREASE

Refer to [Section 2.7.4, Dow Corning® Molykote® HP-870 Grease](#).

Reference:	Addressable Downhole Release Assembly	AD-09719
	ADR Electronics Assembly	AD-42997
	ADR Decoupling Mechanism Assembly	AD-411050

This section describes how to remove the Motor Assembly for replacement or to gain access to the Actuating Leadscrew and Pre-load Bearing Nut ([items 12 & 7](#), 411050), these can have incurred pressure and damage to the threads and must from time to time be removed, cleaned thoroughly, checked and replaced when damaged.

To change the ADR Motor Assembly and to check the Actuating Leadscrew and Pre-load Bearing Nut ([items 9, 12 & 7](#), 411050), complete these steps:

- 1 To access the Motor and Leadscrew assemblies it is first necessary to remove the PCBs (refer to [Section 5.2.2, Electronics Disassembly](#)). Should the ADR Motor Assembly ([item 9](#), 411050) need to be replaced in the field, unscrew the PCBs to gain access to the four screws ([item 14](#), 42997) that secure the Electronics Chassis ([item 4](#), 42997) to the ADR Motor Assembly ([item 9](#), 411050). See [Figure 5-24](#).

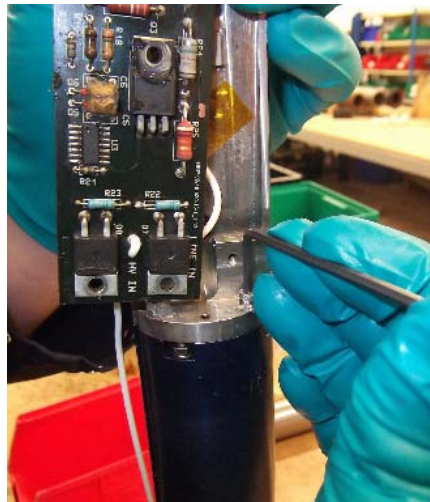


Figure 5-24 Access to the Motor Assembly

- 2 Should the Motor Assembly need to be replaced, unsolder the two wires from the ADR Motor Assembly ([item 9](#), 411050) to the Control Programmed PCB ([item 3](#), 42997) and refer to [WD-42997](#) for wiring details.

Note: When the Motor Assembly is not being replaced with a new one, it is best to leave the wires connected to the PCB but take extreme care not to damage the PCBs.

- 3 Remove any Kapton® tape that hold the wires to the Motor Assembly ([item 9](#), 411050) and the four Skt Cap Hd Screw and Serrated Washers ([items 14 & 15](#), 42997) that secure the Electronics Chassis ([item 4](#), 42997) to the Decoupling Mechanism Assembly ([item 1](#), 42997).

Note: One of the screws also has a solder tag ([item 17](#), 411050) under it.

- 4 Carefully rotate the Electronics Chassis ([item 4](#), 42997) from the ADR Motor Assembly ([item 9](#), 411050) take care not to damage the wires. See [Figure 5-25](#).



Figure 5-25 Rotate the Electronics Chassis from the Electronics Mount Sleeve

- 5 Use a 5.5mm ratchet or a spanner to remove the Hex Nuts and Serrated Lock Washers ([items 52 & 53](#), 411050). See [Figure 5-26](#).



Figure 5-26 Remove the Hex Nuts with a Ratchet

- 6 Pull carefully the ADR Motor Assembly ([item 9](#), 411050) off the Motor Mounting Studs ([item 14](#), 411050). See [Figure 5-27](#).



Figure 5-27 The Motor Mounting Studs

- 7 Use pliers to grip the unthreaded part of the stud shaft and unscrew carefully and remove the four Motor Mounting Studs ([item 14](#), 411050), take care not to damage the surface of the stud shafts. The Pre Load Bearing Nut ([item 7](#), 411050) is now accessible.
- 8 The Pre-load Bearing Nut and the Actuating Leadscrew ([items 7 & 12](#), 411050), should be checked for wear and tear. When necessary, remove and replace. See [Figure 5-28](#).



Figure 5-28 Remove the Pre-load Bearing Nut

To do this, complete these steps:

- i. Remove the Leadscrew (*item 12*, 411050) complete with four Thrust Washers (*item 45*, 411050) and two Thrust Needle Roller Bearings (*item 47*, 411050), the lower Thrust Washer can lodge inside the Switches Housing, gently pries it out with a small screwdriver.

Note: Should the Decoupling Mechanism (*item 1*, 411050) have been dismantled and the Actuating Shaft (*item 4*, 411050) removed, then the Leadscrew can simply be withdrawn otherwise the Leadscrew will need to be unscrewed from the Actuating Shaft through the use of the Leadscrew Tool (*P/N: 410249*).

- ii. To service the upper set of two Thrust Washers and the Thrust Needle Roller Bearing (*items 45 & 47*, 411050) on the Leadscrew it is necessary to first remove the Spring Roll Pin (*item 48*, 411050) from the Actuating Leadscrew (*item 12*, 411050).
- 9 Check, clean and replace when worn or damaged, the Actuating Leadscrew (*item 12*, 411050), Thrust Washers and Thrust Needle Roller Bearings (*items 45 & 47*, 411050) and grease the bearings with Dow Corning Molykote® HP870 Grease (*P/N: HP870*) and reassemble them onto the Leadscrew then fit a new Spring Roll Pin (*item 48*, 411050). Make sure that the Spring Roll Pin is fitted centrally in the Leadscrew shaft.
 - 10 Lightly grease the two lower Thrust Washers and the Thrust Needle Roller Bearings (*items 45 & 47*, 411050) with Dow Corning Molykote® HP870 Grease (*P/N: HP870*) and reassemble them onto the Leadscrew.
 - 11 Lightly grease the Leadscrew thread with Dow Corning Molykote® HP870 Grease (*P/N: HP870*) and insert it into the Switches Housing (*item 6*, 411050).

Note: Should the Decoupling Mechanism (*item 1*, 42997) have been dismantled and the Actuating Shaft (*item 4*, 411050) removed, then the Actuating Leadscrew (*item 12*, 411050) can simply be pushed into the housing otherwise the Actuating Leadscrew will need to be screwed into the Actuating Shaft by about 9 or 10 turns through the use of the Leadscrew Tool (*P/N: 410249*).

- 12 Lightly grease the Pre-load Bearing Nut thread (*item 7*, 411050) with Dow Corning Molykote® HP870 Grease (*P/N: HP870*) and screw it into the Switches Housing (*item 6*, 411050) to retain the Leadscrew (*item 12*, 411050) and tighten to a torque value of 40Nm.
- 13 Refit the four Motor Mounting Studs (*item 14*, 411050) to the Switches Housing (*item 6*, 411050), then carefully tighten the studs by gripping the none threaded section with pliers, take care not to damage the surface of the stud shaft. See *Figure 5-29*.



Figure 5-29 Tighten the Studs

- 14 Refit the ADR Motor Assembly or replace with new when required, make sure the Spring Roll Pin ([item 48](#), 411050) is located in the slot in the top of the Mounting Sleeve ([item 18](#), 411050).
- 15 Make sure the wires are correctly placed and align the Leadscrew ([item 12](#), 411050) with the coupling on the Motor Assembly ([item 9](#), 411050). See [Figure 5-30](#).

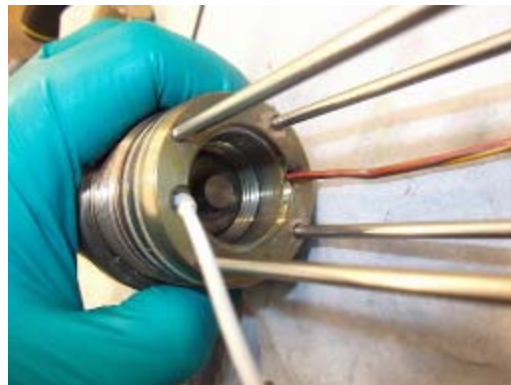


Figure 5-30 Align the Leadscrew with the Motor Coupling

- 16 Slide the Motor Assembly ([item 9](#), 411050) back into the Switches Housing ([item 6](#), 411050). See [Figure 5-31](#).



Figure 5-31 The Globe Gearmotor modification

- 17 Fit the Washers ([item 53](#), 411050) and Hex Nuts ([item 52](#), 411050) onto the Motor Mounting Studs ([item 14](#), 411050) to secure the Motor Assembly in place. Tighten the Nuts to 1.5Nm.
- 18 Secure the Electronics Chassis ([item 4](#), 42997) to the ADR Motor Assembly ([item 9](#), 411050) with the four Serrated Washers and Cap Hd Screws ([items 14 & 15](#), 411050). Don't forget to refit the Earth tag underneath one of the screws.
- 19 Refit and secure the PCBs to the Electronics Chassis ([item 4](#), 42997). Refer to [Section 5.2.4, Replace the PCBs](#). Align the wires that run down to the Decoupling Mechanism and lay them flat along the outside of the Motor Housing.
- 20 Check the O-Rings and Back-up Rings ([items 28, 29, 40 & 41](#), 411050) on the Switches Housing ([item 6](#), 411050). Refer to [Section 7.1.3, Seal Replacement Recommendations](#).

- 21 Refit the Electronics Pressure Housing ([item 5](#), 09719).
- 22 Use a multimeter check the insulation from the top connector to the housing:
 - Top Connector +ve probe to Housing -ve probe: >2MΩ.
 - Top Connector -ve probe to Housing +ve probe: >500KΩ.

5.2.6 DISASSEMBLE THE FISHING NECK



IRRITANT! LIQUID-O-RING® TYPE 101 LUBRICANT
Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).

Reference:	General Assembly	AD-09719
	Fishing Neck Assembly	AD-43103
	Monoconn Assembly	AD-43107

When the ADR has been deployed, the Fishing Neck ([item 2](#), 09719) will have been exposed to well fluid. It will need to be thoroughly cleaned, exposed O-Rings and electrical connectors will need to be replaced. **DO NOT** reconnect the Fishing Neck to the ADR until all parts of the tool have been fully serviced. To service the Fishing Neck:

- 1 Remove the thread protectors (when fitted) and make sure the tool is connected to the ADRP via a Dummy Logging Cable (DLC) and motored to the **Released** position. Refer to the ADRP Manual for instructions ([MN-ADRP001](#)).

Should the Fishing Neck still be connected to the tool, remove the Fishing Neck from the Electronics Assembly. Refer to [Section 5.2.1, Separation of the Electronics & Fishing Neck](#).
- 2 Discard the Primary O-Rings ([items 7 & 8](#), 43103), then check the Back-up Rings ([items 6 & 12](#), 43103) and replace both when necessary. Refer to [Section 7.1.3, Seal Replacement Recommendations](#).
- 3 Clean and check the Back-up Rings ([items 6 & 12](#), 43103). When damaged, replace with new as required. Refer to [Section 7.1.3, Seal Replacement Recommendations](#).
- 4 Remove the Dog Pivot Pins ([item 4](#), 43103) from the Fishing Neck. The Dog Latchings ([item 3](#), 43103) will fall free from the tool. Replace these when worn.



Figure 5-32 The Fishing Neck with Dog Latchings fitted



Figure 5-33 The Dog Latchings

5.2.6.1 Replace the Soldered MonoConn Assembly

Should the ADR have been deployed in a well, the Soldered MonoConn Assembly ([item 1](#), 43103) will need to be replaced. To do this:

- 1 Use a small screwdriver to remove the Retaining Ring ([item 10](#), 43103) from its groove around the edge of the Soldered MonoConn Assembly ([item 1](#), 43103) and the groove in the Lower Sub ([item 3](#), 43103).



Figure 5-34 Remove the Circlip

- 2 Gently push on the 4mm pin to push the Soldered MonoConn Assembly ([item 1](#), 43103) up through to remove the connector from the Fishing Neck. Should it be stuck, put the Fishing Neck in a vice and use a rubber hammer to tap gently the MonoConn Soldered Assembly free from the Fishing Neck.



Figure 5-35 Remove the Connector

- 3 Clean the contact area and body of the Soldered MonoConn Assembly ([item 1](#), 43103) which is the metal part that has been inside the Lower Retaining Insulator Connector ([item 5](#), 43103). Replace it when the Fishing Neck is exposed to well fluid (see [KITF-ADR001](#)).
- 4 Should the same Soldered MonoConn Assembly be refitted, replace the O-Ring ([item 13](#), 43103) on the Soldered MonoConn Assembly ([item 1](#), 43103) and lubricate it with Liquid-O-Ring® type 101 ([P/N: LOR101](#)).

5.2.6.2 Service the Lower Connector Retaining Insulator

- 1 Remove the Circlip ([item 9](#), 43103) from the bottom end of the Fishing Neck and remove the Lower Connector Retaining Insulator ([item 5](#), 43103), it should fall free from the tool but can need to be prised out with a small screwdriver.



Figure 5-36 Remove the Circlip from the Bottom End of the Fishing Neck

- 2 The Fishing Neck should be thoroughly cleaned and de-greased before reassembly.
- 3 Clean and reinsert the Lower Retaining Insulator Connector ([item 5](#), 43103) into the Fishing Neck, make sure the slot in the insulator lines up with the anti-rotation pin in the Fishing Neck.
- 4 Fit the Circlip ([item 9](#), 43103) to hold the Insulator Connector ([item 5](#), 43103) in place and fit the Coiled Pin ([item 11](#), 43103).
- 5 Lubricate the O-Ring ([item 4](#), 43107) on the Soldered MonoConn Assembly ([item 1](#), 43103) with Liquid-O-Ring® type 101 ([P/N: LOR101](#)).
- 6 Tip the tool onto its bottom-end and slip the Soldered MonoConn Assembly ([item 1](#), 43103) back into the Fishing Neck.
- 7 The stud on the edge of the Soldered MonoConn Assembly ([item 1](#), 43103) needs to line up with the cut out in the Fishing Neck. Failure to do so will break the insulator.
- 8 Use a suitable Drift to push the Soldered MonoConn Assembly ([item 1](#), 43103) into the Fishing Neck. The face of the MonoConn Soldered Assembly should be below the Spiral Retaining Ring groove.
- 9 Should the Internal Spiral Retaining Ring ([item 10](#), 43103) be unstretched or new, strain it so that it sits like a coiled spring (this makes it a lot easier to fit). See [Figure 5-37](#).



Figure 5-37 Strained Internal Spiral Retaining Ring

- 10 Drop the Internal Spiral Retaining Ring ([item 10](#), 43103) inside the Fishing Neck and rotate it until it rests on top of the Soldered MonoConn Assembly ([item 1](#), 43103). To do this, start with

the lower tip of the Internal Spiral Retaining Ring and ease it into place. Push it gently around the spiral of the groove. See [Figure 5-38](#).

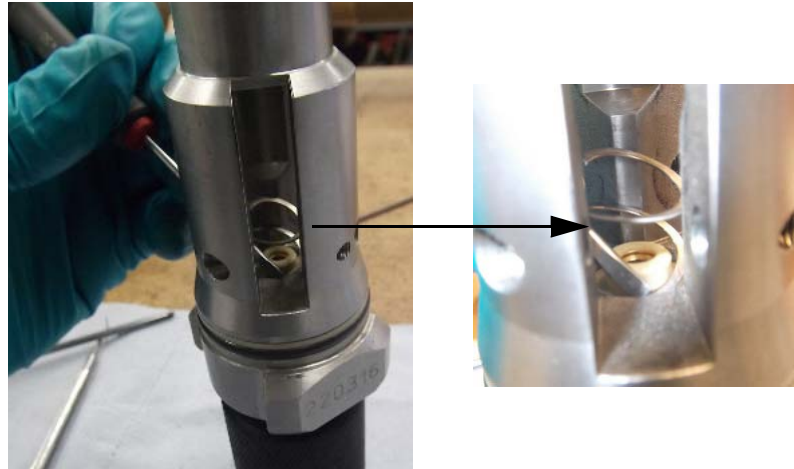


Figure 5-38 Fit the Internal Spiral Retaining Ring

5.2.7 REFIT THE LATCHING DOGS



IRRITANT!

LIQUID-O-RING® TYPE 101 LUBRICANT

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).

Reference:	Addressable Downhole Release Assembly	AD-09719
	Fishing Neck Assembly	AD-43103
	Monoconn Assembly	AD-43107

Clean the Latching Dogs and check for wear and replace all when required. To do this:

- 1 Place the Latching Dogs ([item 3](#), 43103) onto the Fishing Neck.
- 2 Align the Latching Dogs with the location holes in the Fishing Neck and then screw the Latching Dogs into place with the Dog Pivot Pins ([item 4](#), 43103). See [Figure 5-39](#).



Figure 5-39 Alignment and fitment of the Latching Dogs

- 3 On the Lower Sub ([item 2](#), 43103), fit the Back-up Rings ([item 6 & 12](#), 43103) and O-Rings ([items 7 & 8](#), 43103) and lubricate them with Liquid-O-Ring® type 101 ([P/N: LOR101](#)).

5.2.8 CONNECT THE FISHING NECK AND THE DECOUPLING MECHANISM TO THE ELECTRONICS ASSEMBLY

Before the Fishing Neck is re-connected to the rest of the ADR, make sure the rest of the tool has been serviced. This is especially critical should the tool have been deployed in a well.

- 1 Connect the ADR to the ADRP via a Dummy Logging Cable ([DLC006](#)).
- 2 Motor the tool to the **Released** position. Refer to the ADRP manual ([MN-ADRP001](#)) for instructions. Then switch off and disconnect the ADRP line out cable from the ADR.
- 3 Re-insert the Fishing Neck ([item 2](#), 09719) into the tool and motor the tool to the **Connect** position. Make sure the lobes sit in the cut outs and are fully inserted. See [Figure 5-1](#).
- 4 Reconnect the line out cable to the tool and motor the tool to the **Connect** position. Refer to the ADRP manual ([MN-ADRP001](#)) for instructions.

Note: This can be a tight fit. When this is so, stand the tool on end, on a suitable surface to enable sufficient force to be applied, and push the Fishing Neck fully home.

- 5 Switch off and disconnect the ADRP line out cable from the ADR.
- 6 Use a multimeter to check the insulation and continuity of the through wires.
Insulation to Housing:
 - Positive to Upper Connector = $>2M\Omega$.
 - Negative to Upper Connector = $>500K\Omega$.Continuity (Fishing Neck fitted and in the **Connected** position):
 - Upper Connector to Lower Connector = 0.5Ω
- 7 Connect the ADR to the ADRP and then motor the ADR to the **Released** position but do not remove the Fishing Neck ([item 2](#), 09719).
- 8 Before any measurements are taken, switch the mains power off and disconnect the ADR from the ADRP.
- 9 Check the Upper Connector ([item 7](#), 42997) to Lower Connector ([item 1](#), 43103) measurement is now open circuit.
- 10 Motor to the **Connected** position.
- 11 Check that the Upper Connector to Lower Connector measurement is $<0.5\Omega$.
- 12 Refit the Thread Protectors ([items 3 & 4](#), 09719).

6 ELECTRICAL DESCRIPTION

6.1 ADR Tool

Reference: ADR Wiring Diagram [WD-42997](#)

The tool contains two main PCB assemblies and the motor switch mechanism. Isolation from high or positive wireline voltages is provided by the HV Isolation PCB 87471. Control and monitoring of the tool is performed by the Logic PCB assembly 87476 (414345 when programmed). In addition the position of the switch mechanism is detected by Hall Effect Sensor mounted on a Hall Sensor PCB assembly. (The Hall Effect Sensor is not field serviceable and is not covered in this manual.)

6.1.1 HV ISOLATION CIRCUIT BOARD

Reference: HV Isolation Board (PCB 414343) [CD-87471](#)

6.1.1.1 Line Isolation Circuit

The Line Isolation Circuit is intended to isolate the ADR electronics from the wireline when the voltage on the line is outside the range 0 (zero) to -80VDC. It has to be able to withstand up to ± 1500 VDC or AC for short periods at full rated temperature, while maintaining that isolation sufficiently to prevent the ADR from powering up in any way. The circuit consists of three similar cascaded modules. Each module has a threshold detector, based around a CMOS inverter IC (U1, U2 & U3). When the line voltage is sufficiently high, the voltage across the resistor (R4, R11, R19) the gate is turned on. The result is that the MOSFET pass transistor (Q1, Q2 & Q3) is turned off, thus isolating the ADR circuit from the line. The resistor and diode (R3/D1, R10/D3 & R18/D5) provide local power for the CMOS Inverter ICs (U1, U2 & U3) while the zener diode (D2, D4 & D6) prevent excessively high voltages from reaching the logic IC inputs. The resistor chain R1, R7, R14, R24 and is used in all the other lists of component identification. R25 bias the transistor cascade, such that they share the line voltage equally. Resistors R2, R3, R8, R9, R15, R16 & R17 provide resistance in the voltage dividing chains, according to the level of the module in the cascade. D7 prevents operation in the presence of any positive voltage and D12, R23 protect the circuit in the event of a failure of D7.

6.1.2 LOGIC CIRCUIT BOARD

Reference: Logic Circuit Board (PCB 414345) [CD-87476](#)

6.1.2.1 Power Supply

Power regulation for the tool logic is provided by D5 via the current source around Q1 and Q2. The current source is set at 10mA. Positive voltages are blocked by D6 and F1 provides protection in the event of catastrophic failure.

6.1.2.2 Downlink Receiver

Downlink voltage pulses are detected on the wireline by C1 and C2. U1f and U1b are configured as comparators with the threshold set by R4 - R7. The resultant logic level pulses are decoded by U3a & U5a and the data-stream passed to the processor U2.

6.1.2.3 Uplink Driver

Current pulses are placed on the wireline by connecting resistors R19 and R18 between wireline and armour using Q11 & Q12 as switches. Note that in normal operation Q12 is normally on and is turned off to generate a negative current pulse.

6.1.2.4 Motor Control Bridge

The motor is controlled in a bi-directional way via a conventional H-bridge configured around MOSFETs Q3 - Q6 with appropriate level shifting. In addition a separate MOSFET Q10 is used to isolate the bridge. In operation a hardware watchdog circuit based around Q14 has to be continually triggered by the PIC processor in order to keep the logic level signals to the bridge active. Should the processor stop running for any reason the bridge will fail.

6.1.2.5 Processor

All control and monitoring functions are performed by a microcontroller U2 clocked at 4MHz. In circuit re-programming is implemented via SK1. In the event that the microcontroller detects a fault condition it goes to a low current state and remains in an infinite wait loop waiting for power-on-reset.

7 EXTENDED CHECKS

7.1 Preventative Maintenance

**IRRITANT!**

LIQUID-O-RING® TYPE 101 LUBRICANT

Refer to [Section 2.7.1, Liquid-O-Ring® type 101 Lubricant](#).**IRRITANT!**

DOW CORNING® 3140 RTV COATING

Refer to [Section 2.7.2, Dow Corning® 3140 RTV Coating](#).**IRRITANT!**

DOW CORNING® 3145 RTV ADHESIVE/SEALANT

Refer to [Section 2.7.3, Dow Corning® 3145 RTV Adhesive/Sealant](#).**CAUTION!**

SEAL INTEGRITY!

Refer to [Section 2.8, Tool Integrity](#).

During regular maintenance, the primary O-Ring seals should be changed after each run, with the secondary seals being checked and replaced only when required. Refer to [Section 5, Mechanical Description](#) and [Section 7.1.3, Seal Replacement Recommendations](#). The ADR should only need to be stripped thoroughly and cleaned when the tool has been released in the well and parts exposed to well fluid have to be replaced. However, periodically the tool should have various parts checked. This can be performed during regular maintenance.

7.1.1 MECHANICAL

7.1.1.1 General Checks

- 1 Remove dirt and old grease from pressure housing threads and the seals.
- 2 Seals that have become hardened or damaged **MUST** be replaced. Apply fresh grease to the threads and seals as required. Refer to [Section 7.1.3, Seal Replacement Recommendations](#).
- 3 Apply fresh grease to the seals and threads, where necessary.
- 4 Carry out a general inspection, check the points listed below as a minimum:
 - Replace or repair damaged wires.
 - Wires that are loose or likely to be damaged during reassembly must be secured.
 - Damaged components must be replaced.
 - Heat or chemical damage (discoloured components) must be replaced.
 - Incorrect thread grease or excessive quantity must be removed, refer to [Section 2.8, Tool Integrity](#).
 - Connectors must be clean and any damaged/loose pins must be replaced.
 - Screws/nuts/components/connectors must be secure.

Note: When RTV3140 (P/N: [T006-03140](#)) or RTV3145 (P/N: [T006-03145](#)) is used to secure loose components, it must be cured fully before the Pressure Housing is replaced.

7.1.1.2 Every Five to Six Jobs

During regular maintenance, the items below should be checked and when necessary, replaced:

- 1 Replace when damaged, the Isolating Bush Transistors ([item 5](#), 42997) and refit to the HV Isolating PCB ([item 2](#), 42997).
- 2 Replace the Serrated Lock and Crinkle Washers ([item 15 & 16](#), 42997) on the PCB boards when damaged and refit with the use of the Cap Hd Skt Screws ([item 13 & 14](#), 42997). Refer to [Section 5.2.5, Service the Motor and Leadscrew Assemblies](#).
- 3 Check the tightness of the screws for the PCBs ([items 13 & 14](#), 42997). When screws are damaged, replace with new.
- 4 Check and tighten the screws for the ADR Decoupling Mechanism listed below and refer to [Section 5.2.3, Decoupling Mechanism Disassembly](#):
 - The two Skt Cap Hd Screws ([item 33](#), 411050) that fit into the Contact Ring ([item 2](#), 411050).
 - The three Skt Cap Hd Screws ([item 49](#), 411050) that hold the Retaining Nut Cap ([item 17](#), 411050) in the Actuating Shaft ([item 4](#), 411050).
 - The Grub Screw ([item 51](#), 411050) on the Pressure Relief Valve ([item 31](#), 411050).
 - The Hex Nuts ([item 52](#), 411050) that are on the end of the Motor Mounting Studs ([item 14](#), 411050).
 - The screw ([item 54](#), 411050) that is fitted at the bottom of the Switch Housing ([item 6](#), 411050).

7.1.1.3 Annual Checks

Annually the tool should be cleaned and serviced thoroughly. Below are items that should be checked and where necessary, replaced:

- 1 Check and replace when worn, the canted coil springs (listed below) on the ADR Decoupling Mechanism and Electronics Assembly:
 - ([items 43 & 44](#), 411050).
 - ([item 10](#), 42997).
- 2 Re-grease the Leadscrew and the Leadscrew Bearings ([items 12 & 13](#), 411050) with Dow Corning® Molykote HP870 (*P/N: HP870*). Refer to [Section 5.2.5, Service the Motor and Leadscrew Assemblies](#).
- 3 Check the condition of the Dog Latches ([item 3](#), 43103) and replace when worn. Refer to [Section 5.2.6, Disassemble the Fishing Neck](#).
- 4 Check for wear and erosion damage from water jetting and replace where necessary the Threaded Dog Actuating Bush ([item 20](#), 411050) and the Piston Shuttle Valve ([item 25](#), 411050). Refer to [Section 5.2.5, Service the Motor and Leadscrew Assemblies](#).

7.1.2 ELECTRICAL

**WARNING!****ELECTRICAL HAZARD!**Refer to [Section 2.4, Electrical Hazard](#).

Refer to [Section 4.2, Connection to the Toolstring](#) and complete these checks with a multimeter where necessary:

- 1 Perform a visual inspection of the electronics for debris, damaged components and wires.
- 2 Connect the ADR to the ADRP via a Dummy Logging Cable ([DLC006](#)) and motor the tool. Disconnect the ADRP before any electrical checks are performed.
- 3 Check continuity of through wires. The Upper Connector to Lower Connector should be checked for an Open Circuit when in the **Released** position and a Short Circuit (<0.5Ω) when in the **Connected** position.
- 4 Check insulation of end connectors. The Upper Connector insulation to Housing (should be checked in the **Connected** position so that the whole line wire is checked right down to the Lower Connector). The measurements should be:

Insulation to Housing:

- Positive to Upper Connector = 2MΩ.
 - Negative to Upper Connector = >500KΩ.
- 5 Check the tool operation current and motoring current. These are 62mA when run continuously and 28mA when in standby mode.

7.1.3 SEAL REPLACEMENT RECOMMENDATIONS

Reference:	Decoupling Mechanism Assembly	AD-411050
	Fishing Neck Assembly	AD-43103
	MonoConn Assembly	AD-43107

Refer also: [Section 4.4, Post-Logging: Toolstring Disassembly](#).

GE Oil & Gas recommend that all the primary seals are replaced after every run or six months when the tool is not in use.

Secondary seals should be replaced under these situations:

- 25 runs or sooner when damaged.
- one year when not in use.
- when the tool is run in a well with temperatures >150°C (302°F).
- when exposed to H₂S or CO₂.

Anti-Extrusion Rings (Back-up Rings) should be cleaned and checked every time the seals are replaced. It is recommended that they are replaced every 25 runs or sooner when damaged. Refer to [Section Appendix C, Installation of Anti-Extrusion Rings](#) for the correct fit of the Anti-Extrusion Rings.

Primary Seals:

- One O-Ring ([item 36](#), 411050) - Pressure Relief Valve.
- Two O-Rings ([item 40](#), 411050) - Switch Housing.
- Two O-Rings ([item 41](#), 411050) - Switch Housing.
- One O-Ring ([item 7](#), 43103) - Fishing Neck.
- Two O-Rings ([item 8](#), 43103) - Fishing Neck.

Primary Seals upon Release:

These seals are generally considered secondary seals, as they are not normally exposed to well fluid, but upon release of the Fishing Neck these seals become the primary means of sealing the tool from well fluid.

- Two O-Rings ([item 1](#), 411050) - Soldered Feedthrough Assembly. Replacement O-Rings can be found in [KITF-ADR001](#).
- One O-Ring ([item 37](#), 411050) - Seal Cartridge.
- Two O-Rings ([item 39](#), 4110500) - Piston Shuttle Valve
- One O-Ring ([item 38](#), 411050) - Seal Cartridge.
- Two Quad Rings ([item 42](#), 411050) - Seal Cartridge.

Secondary Seals, Anti-Extrusion Rings (Back-up Rings), Quad Rings and T-Seals:

- One O-Ring ([item 8](#), 42997) - Electronics Assembly
- One O-Ring ([item 9](#), 42997) - Electronics Assembly
- One Back-up Ring ([item 11](#), 42997) Electronics Assembly
- Two Back-up Rings ([item 26](#), 411050) - Piston Shuttle Valve.
- Two Back-up Rings ([item 27](#), 411050) - Seal Cartridge.
- Two Back-up Rings ([item 28](#), 411050) - Seal Cartridge (Quad Rings).
- Two Back-up Rings ([item 29](#), 411050) - Switch Housing.
- One Back-up Ring ([item 30](#), 411050) - Seal Cartridge
- One Anti-Extrusion Ring ([item 32](#), 411050) - Pressure Relief Valve.
- One Back-up Ring ([item 6](#), 43103) - Fishing Neck.
- Two Back-up Rings ([item 12](#), 43103) - Fishing Neck.

Environmental O-Rings such as those in the Male Thread Protector ([item 4](#), 09719).

7.1.4 LIFE EXPECTANCY OF THE ELECTRONICS

At 150°C (302°F), significant electronic failures are expected after 4000hrs typical use, hence PCB replacement must be considered at this point. Every additional 10°C (18°F) halves the time. The life expectancy of the electronics is also reduced by vibration and corrosive gas inside the chassis. Visual inspection and logs of previous history is recommended, but is unlikely to predict premature failure. Tools that are suspected of reliability problems due to age or unusual log response can be heated to 120°C (248°F), which would not normally age the electronics, and afterwards subjected to moderate vibration. A moderately hard blow from a wooden hammer is recommended.

DO NOT USE METAL HAMMERS.

7.1.5 HEAT TESTS ABOVE 120°C (248°F)

Generally this is not recommended since it shortens tool life expectancy. A heat test can be required for contractual reasons, because the tool has been out of use for a long period or is for a job with an unusually high well temperature. The test must be carried out slightly above expected well temperature only and the tool must not be kept at temperature for more than one hour. Do not exceed the maximum rated temperature for the tool.

7.2 Troubleshooting

Refer to [Section 5, Mechanical Description](#) and [Appendix B, Drawings & Parts Lists](#).

An Oscilloscope, Multimeter and other basic test equipment will be required.

Table 7-1 ADR Troubleshooting Checklist

Symptom	Possible Fault	Assembly
Initial Inspection	<p>Check for:</p> <ul style="list-style-type: none"> Damaged wires Damaged components Electrical components shorting to chassis Heat or chemical damage (discoloured components) Incorrect thread grease or excessive quantity, refer to Section 2.8, Tool Integrity. Also check all fixings are tight. 	AD-09719
Excessive Tool Current	<p>Check for trapped or shorted wires.</p> <p>Disconnect line connection to Processor Board to isolate fault to Processor Board or HV Isolation Board. Replace or fault find faulty PCB.</p>	AD-42997 WD-42997
Little or no tool current	<p>Check for broken wiring or feedthroughs at both ends of the tool.</p> <p>Check that the HV Isolation Board is operating correctly, the line out voltage should be present with a head voltage of between 0 and -95V DC nominal.</p> <p>Check for the presence of 4.6 to 5.2VDC on the Control PCB by measuring the voltage across D5.</p>	AD-42997 WD-42997
Excessive Motor Current	<p>Check the Pre-Load Bearing Nut (item 7, 411050) and Leadscrew Bearings (items 12, 45 & 47, 411050) are free and move correctly.</p> <p>Check the motor's condition. Should the motor/gearbox be noisy it can be excessively worn.</p> <p>Check the sliding Piston Shuttle Valve (item 25, 411050) moves freely and the Decoupling Mechanism moves up and down the Actuating Shaft (item 4, 411050) freely.</p> <p>Remove the motor and connect it to a bench PSU. Replace it if motor current is in excess of 100mA with no load at 50VDC.</p>	AD-411050

Table 7-1 ADR Troubleshooting Checklist (continued)

<p>Motor Does Not Run</p>	<p>Check for broken or damaged wires to the motor.</p> <p>Check the motor drive MOSFETs on the Programme Control PCB (Q3 to Q6) by measuring the voltage between Red and Black motor terminations - it should be approximately equal to tool head voltage during motor run period.</p> <p>Remove the motor and connect it to a bench PSU. The output shaft should turn at 1 to 2rps at 50VDC and should continue to turn even at low voltages.</p>	<p>AD-411050</p>
<p>No communication between tool and panel</p>	<p>Check the wiring to the upper head.</p> <p>Isolate the HV Isolation PCB and apply the line connection directly to the Logic PCB. Should this be successful, fault find or replace the HV Isolation PCB.</p>	<p>AD-42997</p> <p>WD-42997</p>
<p>ADR connects and disconnects correctly but fails to report its status</p>	<p>Return to GE Oil & Gas. Refer to Technical Help.</p>	

APPENDIX A EQUIPMENT & SPARES**A.1 Main Equipment**

Part No	Description	Qty	Remarks
ADR001	Addressable Downhole Release Tool (2 1/8")	1	---

A.2 Ancillary Equipment

Part No	Description	Qty	Remarks
ADRP001	Addressable Downhole Release Panel	1	---
DLC006	Dummy Logging Cable	1	---

A.3 Maintenance Equipment**A.3.1 CONSUMABLES**

Part No	Description	Qty	Remarks
LOR101	Liquid-O-Ring® type 101 Lubricant	1	5oz pot
LOR101L	Liquid-O-Ring® type 101 Lubricant	1	16oz pot
T006-03140	Dow Corning® 3140 RTV	1	90ml tube
T006-03145	Dow Corning® 3145 RTV	1	90ml tube
T004-00092	Kapton Tape (25mm Width)	1	Roll (length 33m)
N/A	Dow Corning® Molykote HP870	N/A	Not available from GE Oil & Gas
N/A	SN100C Flux Cored Solder Wire	N/A	Not available from GE Oil & Gas

A.3.2 SERVICE TOOLS

Part No	Description	Qty	Remarks
91296	Tool Kit for 2 1/8" tools	1	---
410249	ADR Assembly Tool	1	---
KITB-Earth Clip or KITB-UW-Earth Clip	Tool Safety Clamp	1	Refer to Tools Safety Clamp manual (MN-TSC001)

A.4 Recommended Spares

Part No	Description	Qty	Remarks
KITB-ADR001	Basic Spares Kit	1	---
KITO-ADR001	O-Ring Spares Kit	1	---
KITR-ADR001	Recommended Spares Kit	1	(For every 25 Runs)
KITF-ADR001	ADR Post Flooding Spares Kit	1	---

A.5 Kit Details

PARTS LISTING	
Part	Issue
91296	C
Description	
TOOL KIT ALL 2 ¹ / ₈ TOOLS SX AND GO	

PARTS LIST					
Item	Part No	Description	Qty	Units	Remarks
0001	91108	Spanner Open Ended 1 7/8x 1 11/16	2	EA	
0002	91023	Spanner C (50 - 80, 2 3/4) (WAS 91065)	2	EA	
0003	10038	Spanner Box 3/8 x 5/16 Modified	2	EA	
0004	91028	Spanner O/E 3/8x5/16	1	EA	
0005	93876	Spanner Single Open End 18mm	1	EA	
0006	91029	Key, Hex Metric (Set)	1	EA	
0007	91030	Punch Pin Parallel set	1	EA	
0008	00615	Assy Spanner PKJ	1	EA	
0009	91293	Screwdriver Parallel tip (3 0 x 75)	1	EA	
0010	91105	Toolroll With SX Badge Large Black	1	EA	
0011	91104	Screwdriver Parallel tip (5 5 x 200)	1	EA	
0012	91103	Pliers Circlip 812 Chrome/Van	1	EA	
0013	91102	Pliers Mini Flat Nose 5 Inch	1	EA	
0014	10037	Bar Tommy	2	EA	
0015	10051	Kemlon tool Sondex - 4BA Hex Socket	1	EA	
0016	91280	Hammer, 4oz ball pein	1	EA	
0017	91131	Pin C Spanner 2 5	1	EA	
0018	91551	Spanner open ended 1	1	EA	

PARTS LISTING	
Part	Issue
KITB-Earth Clip	
A	
Description	
EARTH CLIP ASSY	

PARTS LIST					
Item	Part No	Description	Qty	Units	Remarks
0001	20272	EARTH CLIP ASSY	2	EA	
0002	20279	G CLAMP 4" MODIFIED FOR EARTHING	1	EA	
0003	91676	LARGE EARTH BONDING CLIP - 140mm LONG	1	EA	
0005	W029-0GNYW	Wire PVC, Flexible Type BK, 84/0.3, Gn/Y	1	M	
0006	J089-00001	Yellow Crimp Terminal, M6 Ring	6	EA	
0007	93158	Scr Pan Hd Sltd M6x12mmLG SS-A2 (DIN 85)	1	EA	
0008	93060	Washer Plain M6 SS-A2 DIN125 Form A	2	EA	
0009	91675	WASHER SHAKEPROOF M6 -SS	2	EA	

PARTS LISTING	
Part	Issue
KITB-UW-Earth Clip	
C	
Description	
Earth Clip Assy, UW	

PARTS LIST					
Item	Part No	Description	Qty	Units	Remarks
0001	42703	ASSEMBLY UW TOOLS SAFETY CLAMP	1	EA	
0002	20279	G CLAMP 4" MODIFIED FOR EARTHING	1	EA	
0003	91676	LARGE EARTH BONDING CLIP - 140mm LONG	1	EA	
0004	J001-40004	CON_CRIMP TERM M4 AC 1 240V 10A 70 C^	1	EA	
0005	416390	WIRE_PV_12AWG_1K5V_G/Y_1036 X 0.07_GS^	5	M	
0006	J089-00001	Yellow Crimp Terminal, M6 Ring	1	EA	
0007	93158	Scr Pan Hd Sltd M6x12mmLG SS-A2 (DIN 85)	1	EA	
0008	93060	Washer Plain M6 SS-A2 DIN125 Form A	1	EA	
0009	91675	WASHER SHAKEPROOF M6 -SS	1	EA	
0010	CM-TSC001	MANUALS FOR TOOL SAFETY CLAMPS	1	EA	
0011	416371	CABLE STRAIN RELIEF CLAMP	1	EA	
0012	A016-012M7	TBG_H/SHNK SLV_12.7MM POLYOLEFIN+ADHSV	0.02	M	
0013	93796	Scr Skt Csk Hd M6x16mmLG SS-A2(DIN 7991)	1	EA	

PARTS LISTING	
<i>Part</i>	<i>Issue</i>
KITB-ADR001	A
<i>Description</i>	
ADR Spares Kit	

PARTS LIST					
<i>Item</i>	<i>Part No</i>	<i>Description</i>	<i>Qty</i>	<i>Units</i>	<i>Remarks</i>
0001	KITO-ADR001	ADR O-Ring Kit	1	EA	
0002	410084	RING BACKUP FOR 118 O RING	4	EA	
0003	43121	BACK UP RING SIZE 128 INTERNAL	3	EA	
0004	43122	RING BACK UP SIZE 133 INTERNAL	2	EA	
0005	42996	RING ANTI EXTRUSION SIZE 112	2	EA	
0006	42995	RING ANTI EXTRUSION SIZE 116	2	EA	
0007	410039	ring anti extrusion size 008 ext	1	EA	
0008	93899	CANTED COIL SPRING SIZE REF 209	1	EA	
0009	93898	CANTED COIL SPRING SIZE REF 126	1	EA	
0010	410035	spring canted coil size ref 006 ss	1	EA	
0011	91808	Spring Canted Coil	1	EA	
0012	93285	Scr Grb Skt Hd M3x10mmLG SS-A2 (DIN 916)	1	EA	

PARTS LISTING	
<i>Part</i>	<i>Issue</i>
KITR-ADR001	A
<i>Description</i>	
ADR 25 Run Spares Kit	

PARTS LIST					
<i>Item</i>	<i>Part No</i>	<i>Description</i>	<i>Qty</i>	<i>Units</i>	<i>Remarks</i>
0001	KITO-ADR001	ADR O-Ring Kit	4	EA	
0002	43060	Valve Pressure Relief ADR	1	EA	
0003	F002-0002A	Fuse, 2A Antisurge (T) Glass, 20mm x 5mm	10	EA	

PARTS LISTING	
<i>Part</i> KITF-ADR001	<i>Issue</i> A
<i>Description</i> ADR Post Flooding Spares Kit	

PARTS LIST					
Item	Part No	Description	Qty	Units	Remarks
0001	KITB-ADR001	ADR Basic Spares Kit	1	EA	
0002	43107	ASSEMBLY SOLDERED MONOCONN	1	EA	
0003	99012	O-ring 012 Viton 90	1	EA	
0004	43108	ASSEMBLY SOLDERED FEEDTHROUGH	1	EA	
0005	99006	O-ring 006 Viton 90	2	EA	
0006	42975	NUT CONNECTOR RETAINING LOWER	1	EA	
0007	93893	RING RETAINING INT. SPIRAL 14mm SS	1	EA	

PARTS LISTING	
<i>Part</i> KITO-ADR001	<i>Issue</i> A
<i>Description</i> ADR O-Ring Kit	

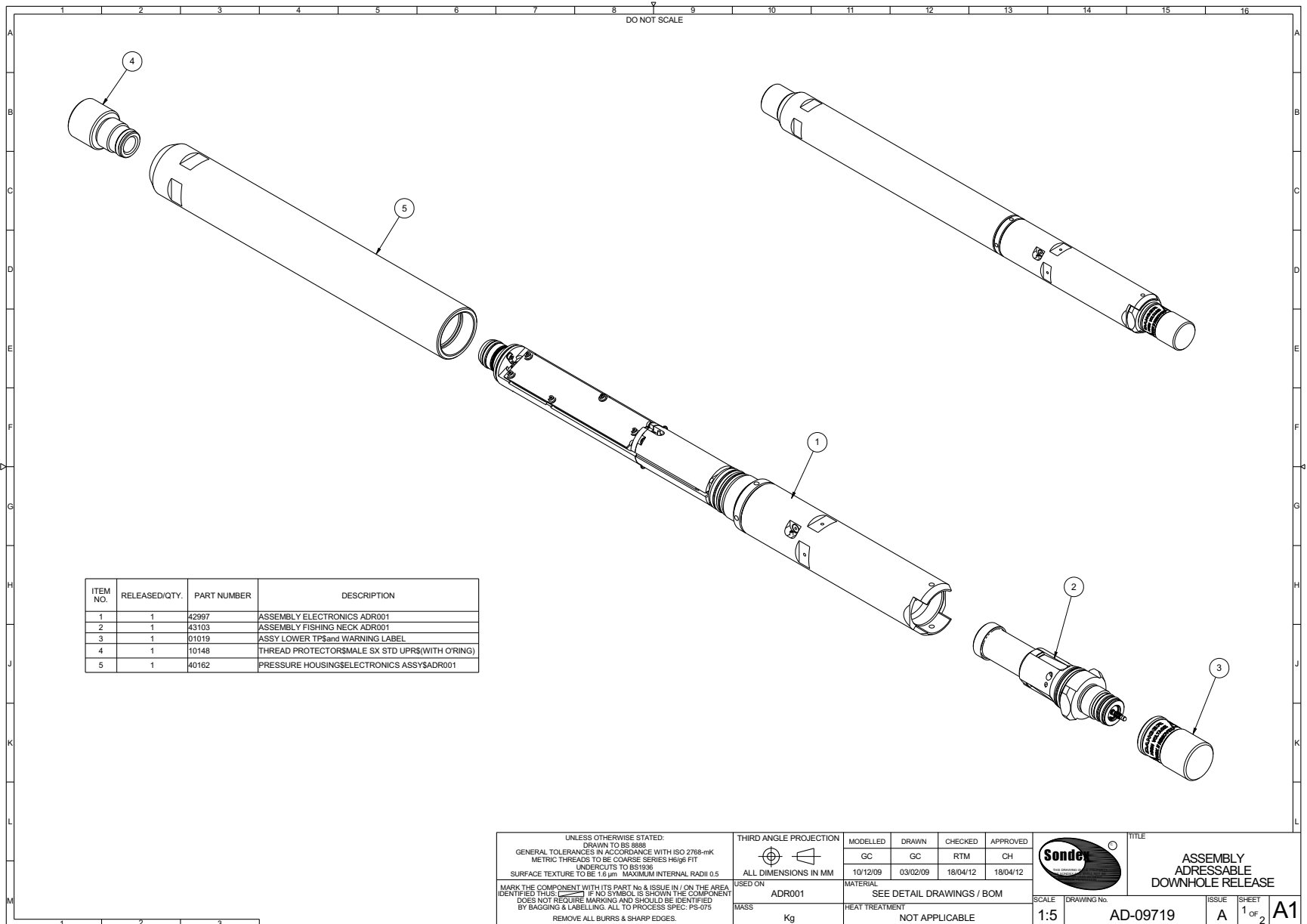
PARTS LIST					
Item	Part No	Description	Qty	Units	Remarks
0001	99008	O-ring 008 Viton 90	1	EA	
0002	99116	O-ring 116 Viton 90	3	EA	
0003	99118	O-ring 118 Viton 90	4	EA	
0004	99124	O-ring 124 Viton 90	1	EA	
0005	99128	O-ring 128 Viton 90	3	EA	
0006	99131	O-ring 131 Viton 90	2	EA	
0007	410696	QUAD RING SEAL 112 SIZE 70 SHORE	2	EA	

APPENDIX B DRAWINGS & PARTS LISTS**B.1 Mechanical Drawings**

Description	Drawing	Parts List
Addressable Downhole Release Assembly	AD-09719-A	See Drawing
ADR001 Electronics Assembly	AD-42997-C	See Drawing
ADR Decoupling Mechanism Assembly	AD-411050-C	See Drawing
ADR001 Fishing Neck Assembly	AD-43103-D	See Drawing
ADR Soldered Monoconn Assembly	AD-43107-B	See Drawing

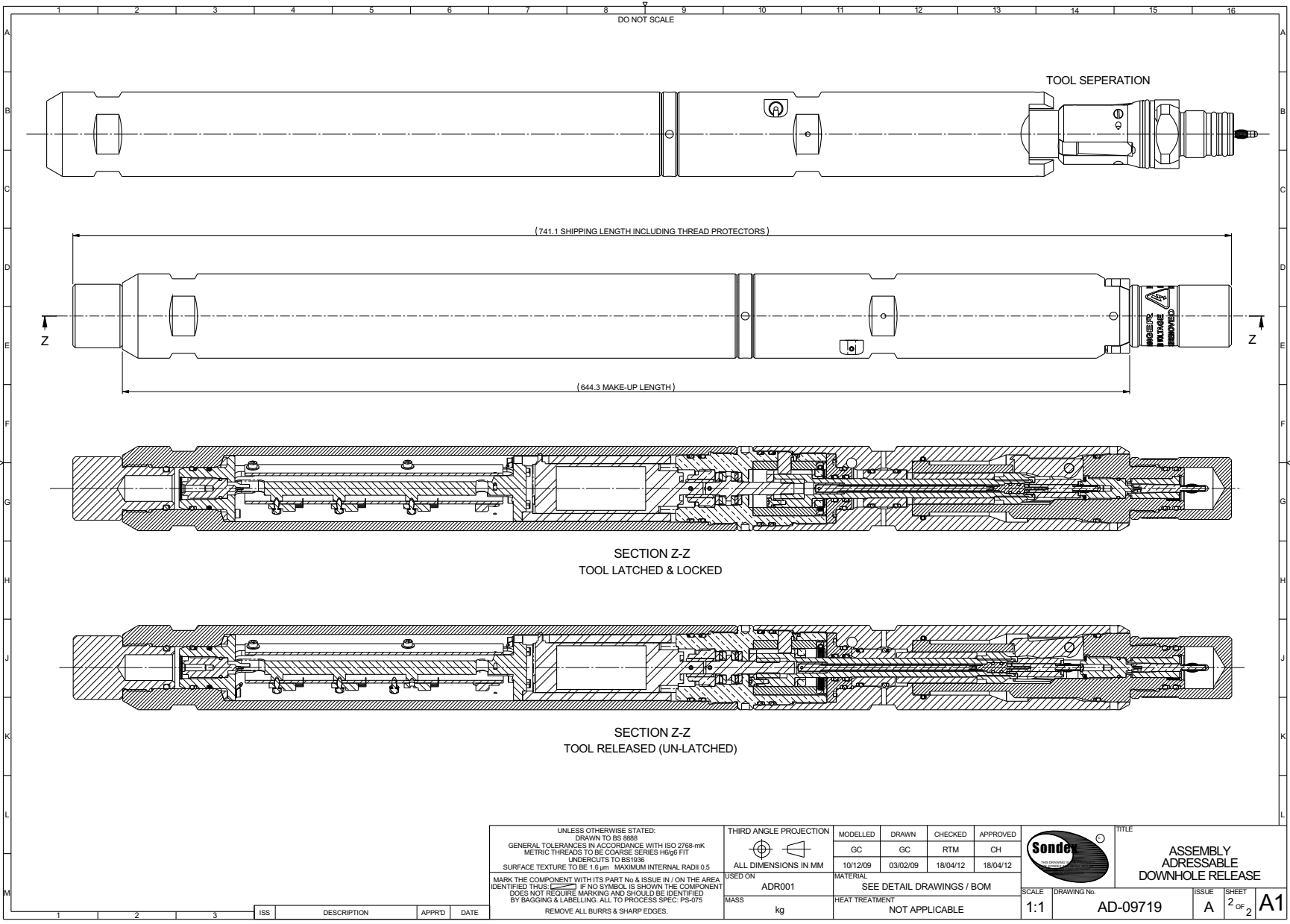
B.2 Electrical Drawings

Description	Type	Drawing
ADR Wiring Diagram	Wiring Diagram	WD-42997-A
ADR Logic Board	Circuit Diagram	CD-87476-B
ADR HV Isolation PCB	Circuit Diagram	CD-87471-B

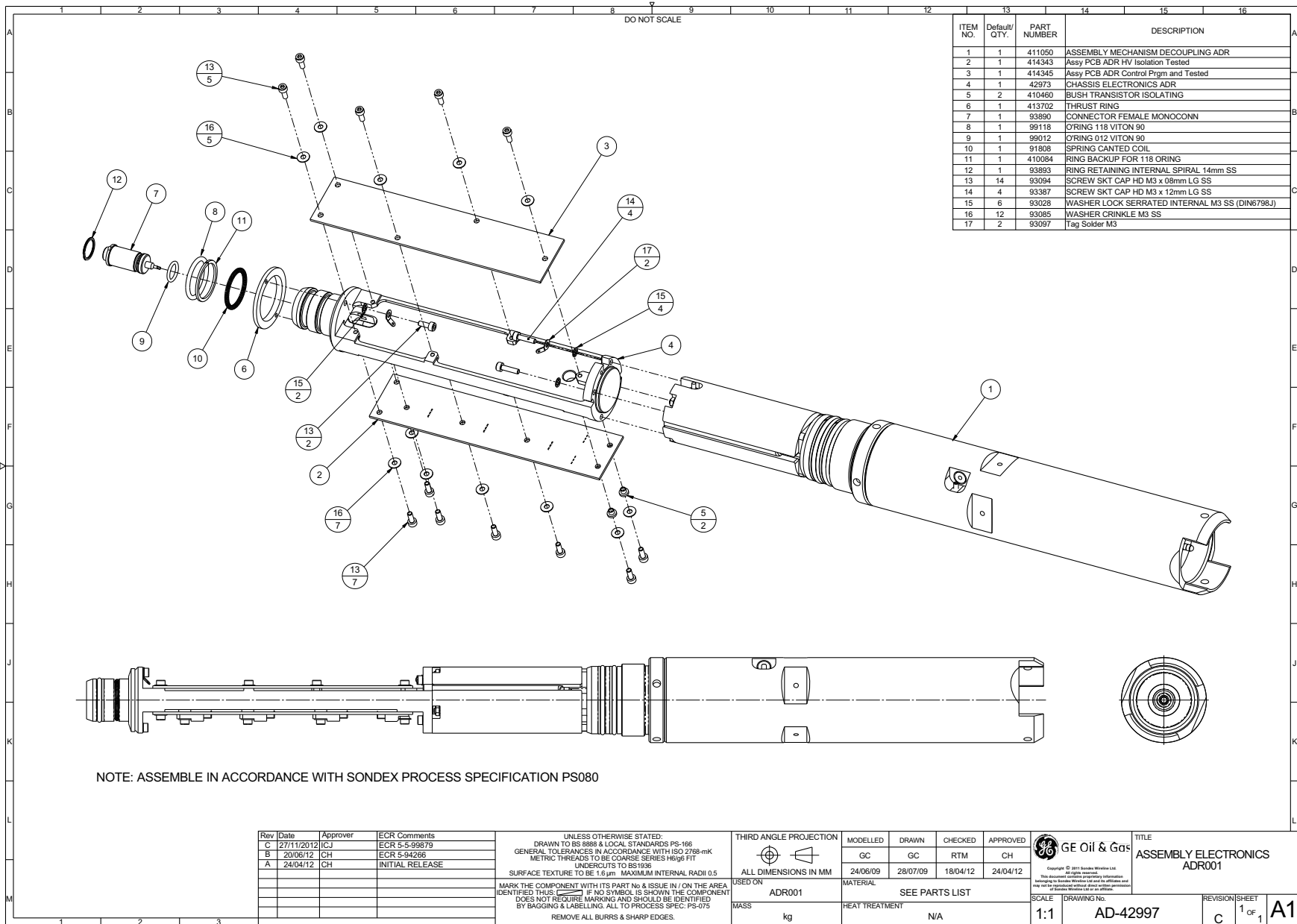


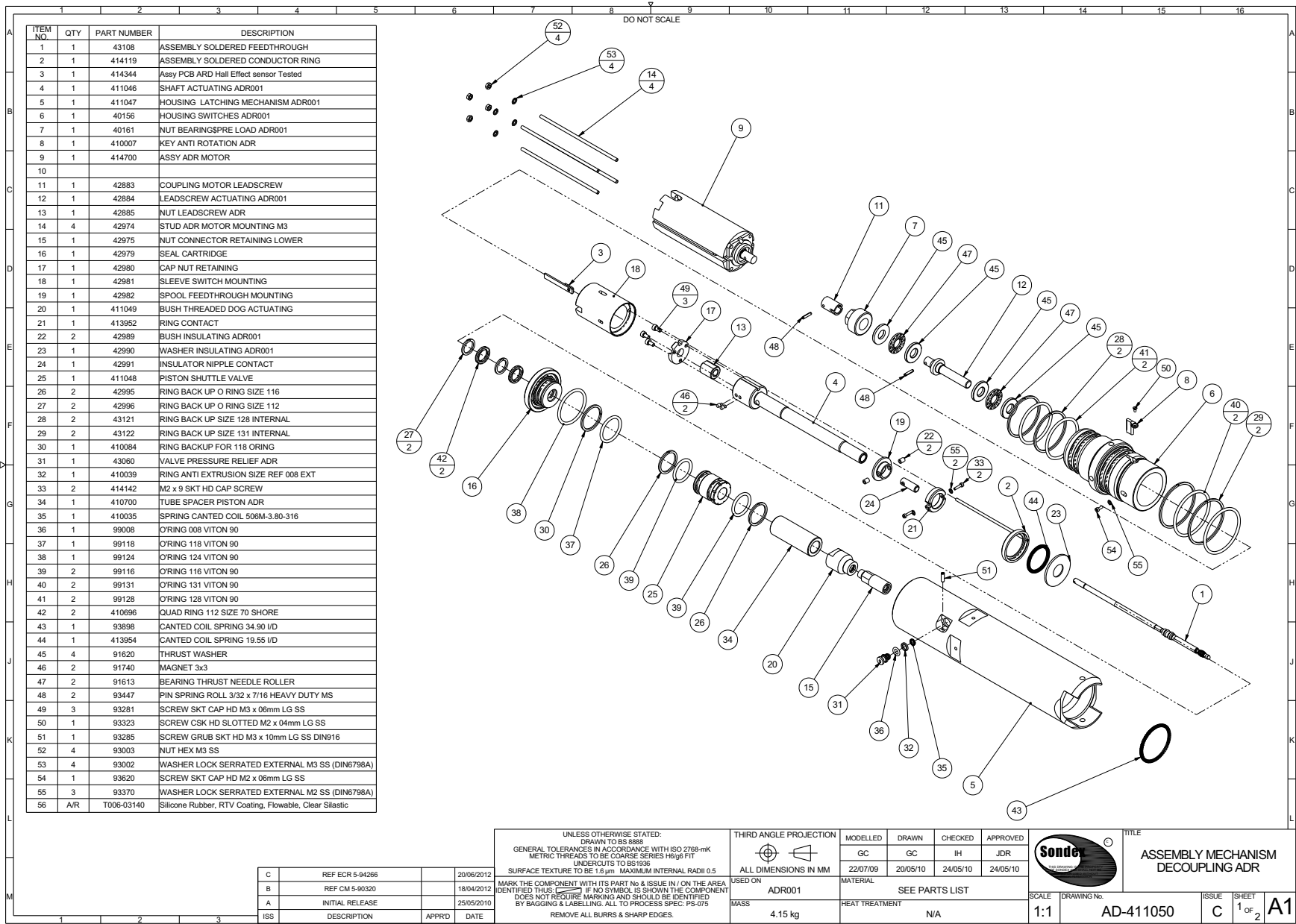
ITEM NO.	RELEASED/QTY.	PART NUMBER	DESCRIPTION
1	1	42997	ASSEMBLY ELECTRONICS ADR001
2	1	43103	ASSEMBLY FISHING NECK ADR001
3	1	01019	ASSY LOWER TPS and WARNING LABEL
4	1	10148	THREAD PROTECTORS MALE SX STD UP(S) (WITH O'RING)
5	1	40162	PRESSURE HOUSING ELECTRONICS ASSY ADR001

UNLESS OTHERWISE STATED: DRAWN TO BS 8888 GENERAL TOLERANCES IN ACCORDANCE WITH ISO 2768-mK METRIC THREADS TO BE COARSE SERIES H6/g6 FIT UNDERCUTS TO BS1136 SURFACE TEXTURE TO BE 1.6 µm MAXIMUM INTERNAL RADII 0.5				THIRD ANGLE PROJECTION ALL DIMENSIONS IN MM				MODELLED GC 10/12/09	DRAWN GC 03/02/09	CHECKED RTM 18/04/12	APPROVED CH 18/04/12		TITLE ASSEMBLY ADDRESSABLE DOWNHOLE RELEASE
MARK THE COMPONENT WITH ITS PART No & ISSUE IN / ON THE AREA IDENTIFIED PLUS IF NO SYMBOL IS SHOWN THE COMPONENT DOES NOT REQUIRE MARKING AND SHOULD BE IDENTIFIED BY BAGGING & LABELLING. ALL TO PROCESS SPEC: PS-075 REMOVE ALL BURRS & SHARP EDGES.				USED ON ADR001	MATERIAL SEE DETAIL DRAWINGS / BOM				SCALE 1:5	DRAWING No. AD-09719	ISSUE A	SHEET 1 OF 2	A1



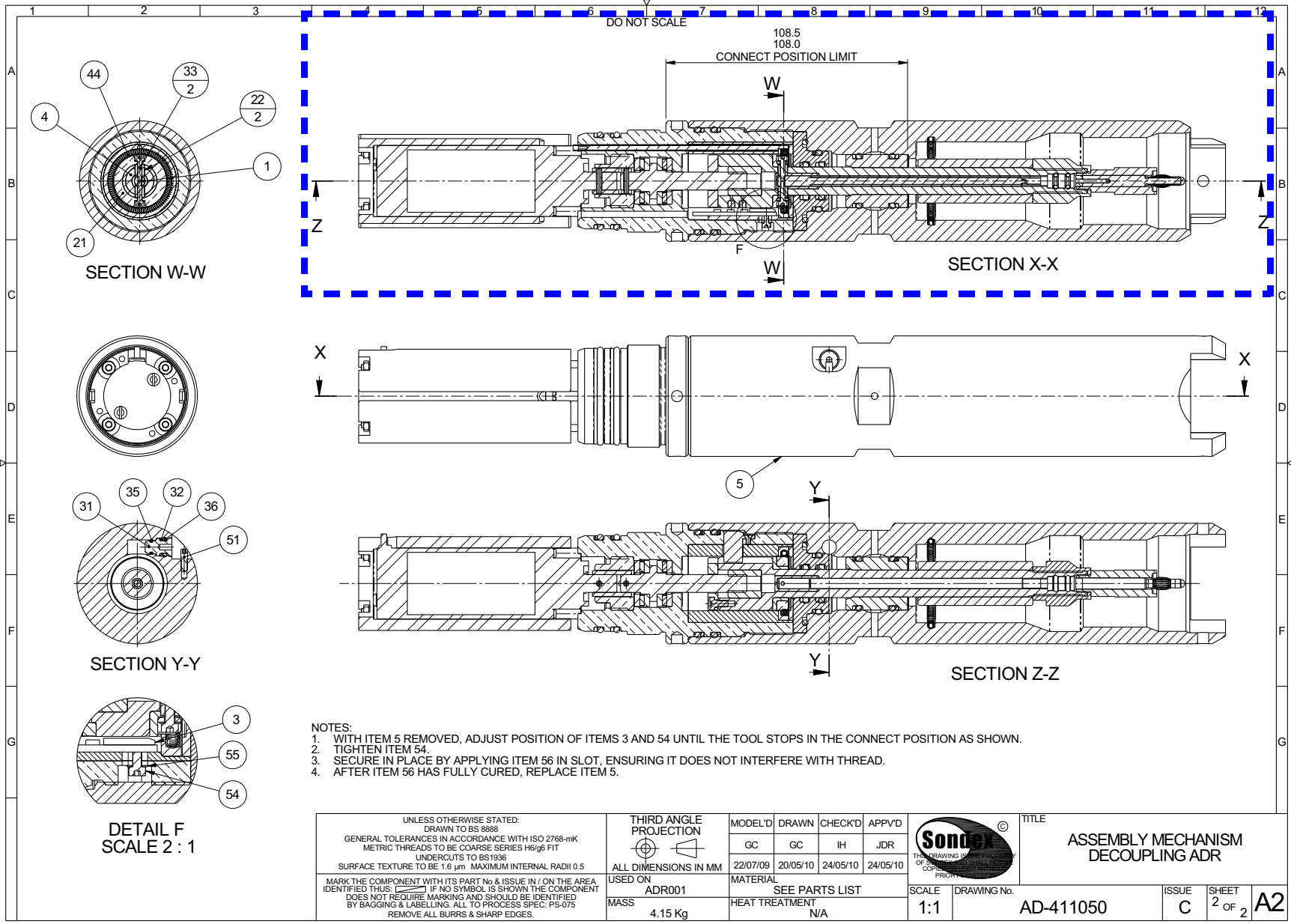
UNLESS OTHERWISE STATED: DRAWN TO BS 8888 GENERAL TOLERANCES IN ACCORDANCE WITH ISO 2768-mK METRIC THREADS TO BE COARSE SERIES H6/g6 FIT UNDERCUTS TO BS 1336 SURFACE TEXTURE TO BE 1.6 µm MAXIMUM INTERNAL RADII 0.5 MARK THE COMPONENT WITH ITS PART No & ISSUE IN / ON THE AREA IDENTIFIED THUS: IF NO SYMBOL IS SHOWN THE COMPONENT DOES NOT REQUIRE MARKING AND SHOULD BE IDENTIFIED BY BAGGING & LABELLING. ALL TO PROCESS SPEC: PS-075 REMOVE ALL BURRS & SHARP EDGES.	THIRD ANGLE PROJECTION 	MODELLED GC	DRAWN GC	CHECKED RTM	APPROVED CH		TITLE ASSEMBLY ADRESSABLE DOWNHOLE RELEASE
	USED ON ADR001	MATERIAL SEE DETAIL DRAWINGS / BOM	10/12/09	03/02/09	18/04/12		
MASS kg	HEAT TREATMENT NOT APPLICABLE	ISSUE A		SHEET 2 OF 2		A1	





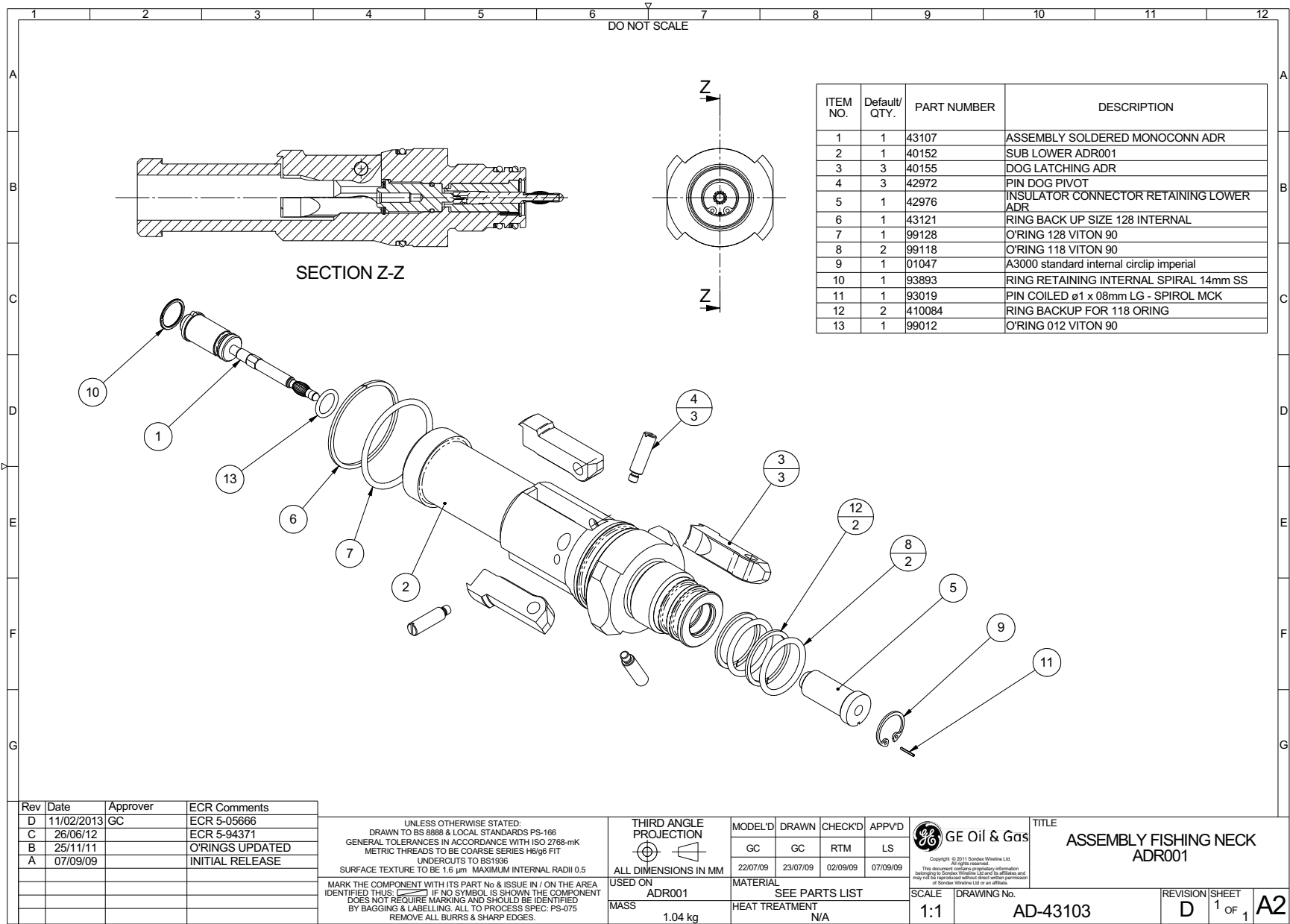
ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	43108	ASSEMBLY SOLDERED FEEDTHROUGH
2	1	414119	ASSEMBLY SOLDERED CONDUCTOR RING
3	1	414344	Assy PCB ARD Hall Effect sensor Tested
4	1	411046	SHAFT ACTUATING ADR001
5	1	411047	HOUSING LATCHING MECHANISM ADR001
6	1	40156	HOUSING SWITCHES ADR001
7	1	40161	NUT BEARINGSPRE LOAD ADR001
8	1	410007	KEY ANTI ROTATION ADR
9	1	414700	ASSY ADR MOTOR
10			
11	1	42883	COUPLING MOTOR LEADSCREW
12	1	42884	LEADSCREW ACTUATING ADR001
13	1	42885	NUT LEADSCREW ADR
14	4	42974	STUD ADR MOTOR MOUNTING M3
15	1	42975	NUT CONNECTOR RETAINING LOWER
16	1	42979	SEAL CARTRIDGE
17	1	42980	CAP NUT RETAINING
18	1	42981	SLEEVE SWITCH MOUNTING
19	1	42982	SPOOL FEEDTHROUGH MOUNTING
20	1	411049	BUSH THREADED DOG ACTUATING
21	1	413952	RING CONTACT
22	2	42989	BUSH INSULATING ADR001
23	1	42990	WASHER INSULATING ADR001
24	1	42991	INSULATOR NIPPLE CONTACT
25	1	411048	PISTON SHUTTLE VALVE
26	2	42995	RING BACK UP O RING SIZE 116
27	2	42996	RING BACK UP O RING SIZE 112
28	2	43121	RING BACK UP SIZE 128 INTERNAL
29	2	43122	RING BACK UP SIZE 131 INTERNAL
30	1	410084	RING BACKUP FOR 118 ORING
31	1	43060	VALVE PRESSURE RELIEF ADR
32	1	410039	RING ANTI EXTRUSION SIZE REF 008 EXT
33	2	414142	M2 x 9 SKT HD CAP SCREW
34	1	410700	TUBE SPACER PISTON ADR
35	1	410035	SPRING CANTED COIL 506M-3.80-316
36	1	99008	O'RING 008 VITON 90
37	1	99118	O'RING 118 VITON 90
38	1	99124	O'RING 124 VITON 90
39	2	99116	O'RING 116 VITON 90
40	2	99131	O'RING 131 VITON 90
41	2	99128	O'RING 128 VITON 90
42	2	410696	QUAD RING 112 SIZE 70 SHORE
43	1	93898	CANTED COIL SPRING 34.90 I/D
44	1	413954	CANTED COIL SPRING 19.55 I/D
45	4	91620	THRUST WASHER
46	2	91740	MAGNET 3x3
47	2	91613	BEARING THRUST NEEDLE ROLLER
48	2	93447	PIN SPRING ROLL 3/32 x 7/16 HEAVY DUTY MS
49	3	93281	SCREW SKT CAP HD M3 x 06mm LG SS
50	1	93323	SCREW CSK HD SLOTTED M2 x 04mm LG SS
51	1	93285	SCREW GRUB SKT HD M3 x 10mm LG SS DIN916
52	4	93003	NUT HEX M3 SS
53	4	93002	WASHER LOCK SERRATED EXTERNAL M3 SS (DIN6798A)
54	1	93620	SCREW SKT CAP HD M2 x 06mm LG SS
55	3	93370	WASHER LOCK SERRATED EXTERNAL M2 SS (DIN6798A)
56	A/R	T006-03140	Silicone Rubber, RTV Coating, Flowable, Clear Silastic

UNLESS OTHERWISE STATED: DRAWN TO BS 8888 GENERAL TOLERANCES IN ACCORDANCE WITH ISO 2768-mK METRIC THREADS TO BE COARSE SERIES H9/g9 F11 SURFACE TEXTURE TO BE 16.0µm MAXIMUM INTERNAL RADII 0.5		THIRD ANGLE PROJECTION ALL DIMENSIONS IN MM	MODELLED GC	DRAWN GC	CHECKED IH	APPROVED JDR		TITLE ASSEMBLY MECHANISM DECOUPLING ADR															
MARK THE COMPONENT WITH ITS PART No & ISSUE IN / ON THE AREA IDENTIFIED THUS [] IF NO SYMBOL IS SHOWN THE COMPONENT DOES NOT REQUIRE MARKING AND SHOULD BE IDENTIFIED BY BAGGING & LABELLING. ALL TO PROCESS SPEC: PS-075 REMOVE ALL BURRS & SHARP EDGES.		USED ON ADR001	MATERIAL HEAT TREATMENT	SEE PARTS LIST N/A				SCALE 1:1	DRAWING NO. AD-411050														
<table border="1"> <tr><td>C</td><td>REF ECR 5-94266</td><td></td><td>20/06/2012</td></tr> <tr><td>B</td><td>REF CM 5-90320</td><td></td><td>18/04/2012</td></tr> <tr><td>A</td><td>INITIAL RELEASE</td><td></td><td>25/05/2010</td></tr> <tr><td>ISS</td><td>DESCRIPTION</td><td>APPRD</td><td>DATE</td></tr> </table>		C	REF ECR 5-94266		20/06/2012	B	REF CM 5-90320		18/04/2012	A	INITIAL RELEASE		25/05/2010	ISS	DESCRIPTION	APPRD	DATE	MASS 4.15 kg	ISSUE C		SHEET 1 OF 2		A1
C	REF ECR 5-94266		20/06/2012																				
B	REF CM 5-90320		18/04/2012																				
A	INITIAL RELEASE		25/05/2010																				
ISS	DESCRIPTION	APPRD	DATE																				



- NOTES:
1. WITH ITEM 5 REMOVED, ADJUST POSITION OF ITEMS 3 AND 54 UNTIL THE TOOL STOPS IN THE CONNECT POSITION AS SHOWN.
 2. TIGHTEN ITEM 54.
 3. SECURE IN PLACE BY APPLYING ITEM 56 IN SLOT, ENSURING IT DOES NOT INTERFERE WITH THREAD.
 4. AFTER ITEM 56 HAS FULLY CURED, REPLACE ITEM 5.

UNLESS OTHERWISE STATED: DRAWN TO BS 8888 GENERAL TOLERANCES IN ACCORDANCE WITH ISO 2768-mK METRIC THREADS TO BE COARSE SERIES H9/g6 FIT UNDERCUTS TO BS1836 SURFACE TEXTURE TO BE 1.6 µm MAXIMUM INTERNAL RADII 0.5	THIRD ANGLE PROJECTION ALL DIMENSIONS IN MM	MODEL'D	DRAWN	CHECK'D	APP'V'D	TITLE ASSEMBLY MECHANISM DECOUPLING ADR	
		GC	GC	IH	JDR		
MARK THE COMPONENT WITH ITS PART No & ISSUE IN / ON THE AREA IDENTIFIED THUS: IF NO SYMBOL IS SHOWN THE COMPONENT DOES NOT REQUIRE MARKING AND SHOULD BE IDENTIFIED BY BAGGING & LABELLING. ALL TO PROCESS SPEC. PS-075 REMOVE ALL BURRS & SHARP EDGES.	USED ON	MATERIAL			SCALE	DRAWING No. AD-411050	
	ADR001	SEE PARTS LIST			1:1		
MASS	4.15 Kg	HEAT TREATMENT			N/A	ISSUE	SHEET
						C	2 OF 2
							A2



Rev	Date	Approver	ECR Comments
D	11/02/2013	GC	ECR 5-05666
C	26/06/12		ECR 5-94371
B	25/11/11		O'RINGS UPDATED
A	07/09/09		INITIAL RELEASE

UNLESS OTHERWISE STATED:
 DRAWN TO BS 8888 & LOCAL STANDARDS PS-166
 GENERAL TOLERANCES IN ACCORDANCE WITH ISO 2768-mK
 METRIC THREADS TO BE COARSE SERIES H6/g6 FIT
 UNDERCUTS TO BS1936
 SURFACE TEXTURE TO BE 1.6 µm MAXIMUM INTERNAL RADII 0.5

MARK THE COMPONENT WITH ITS PART No & ISSUE IN / ON THE AREA IDENTIFIED THUS: IF NO SYMBOL IS SHOWN THE COMPONENT DOES NOT REQUIRE MARKING AND SHOULD BE IDENTIFIED BY BAGGING & LABELLING. ALL TO PROCESS SPEC: PS-075 REMOVE ALL BURRS & SHARP EDGES.

THIRD ANGLE PROJECTION

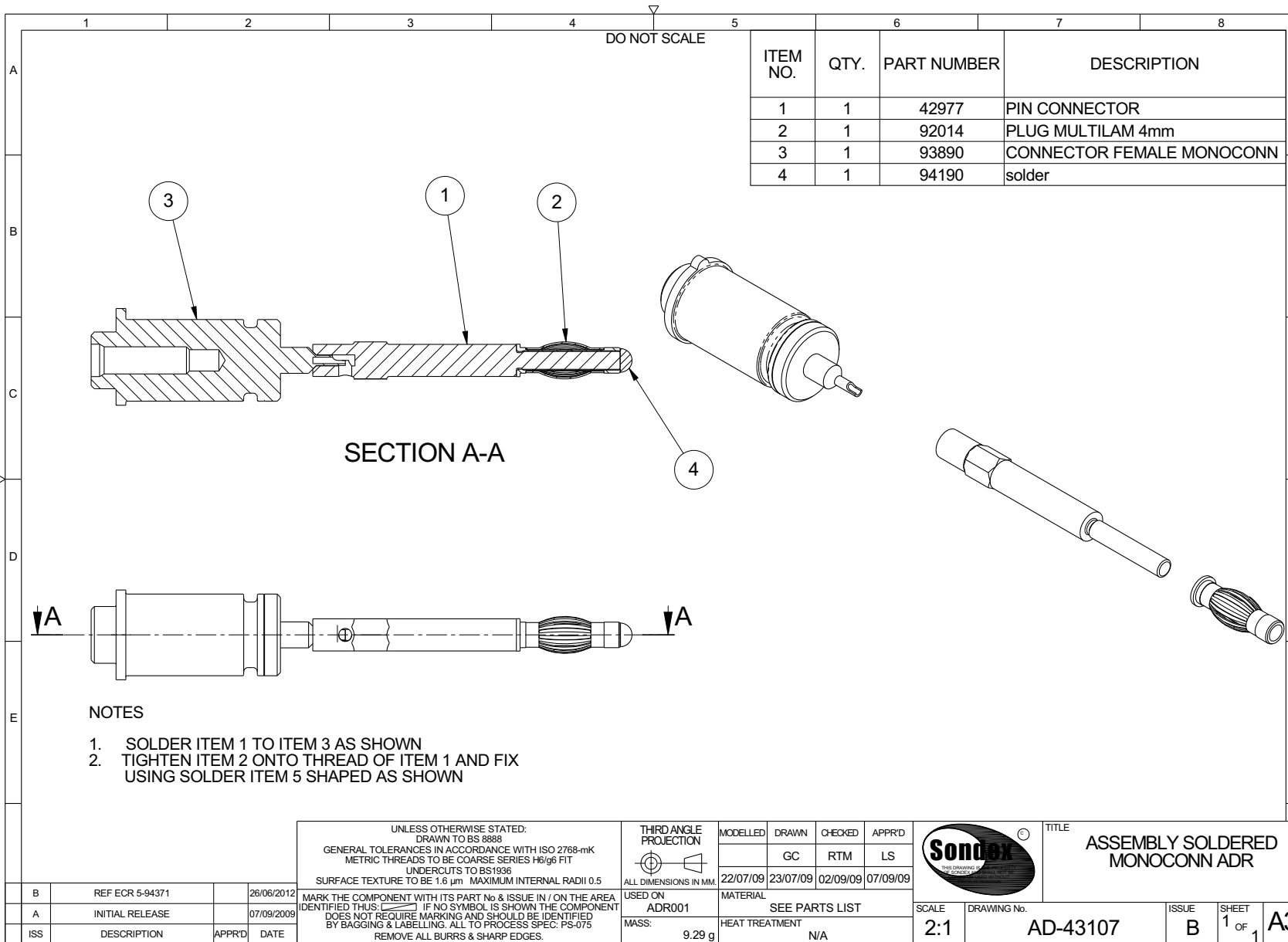
 ALL DIMENSIONS IN MM
 USED ON ADR001
 MASS 1.04 kg

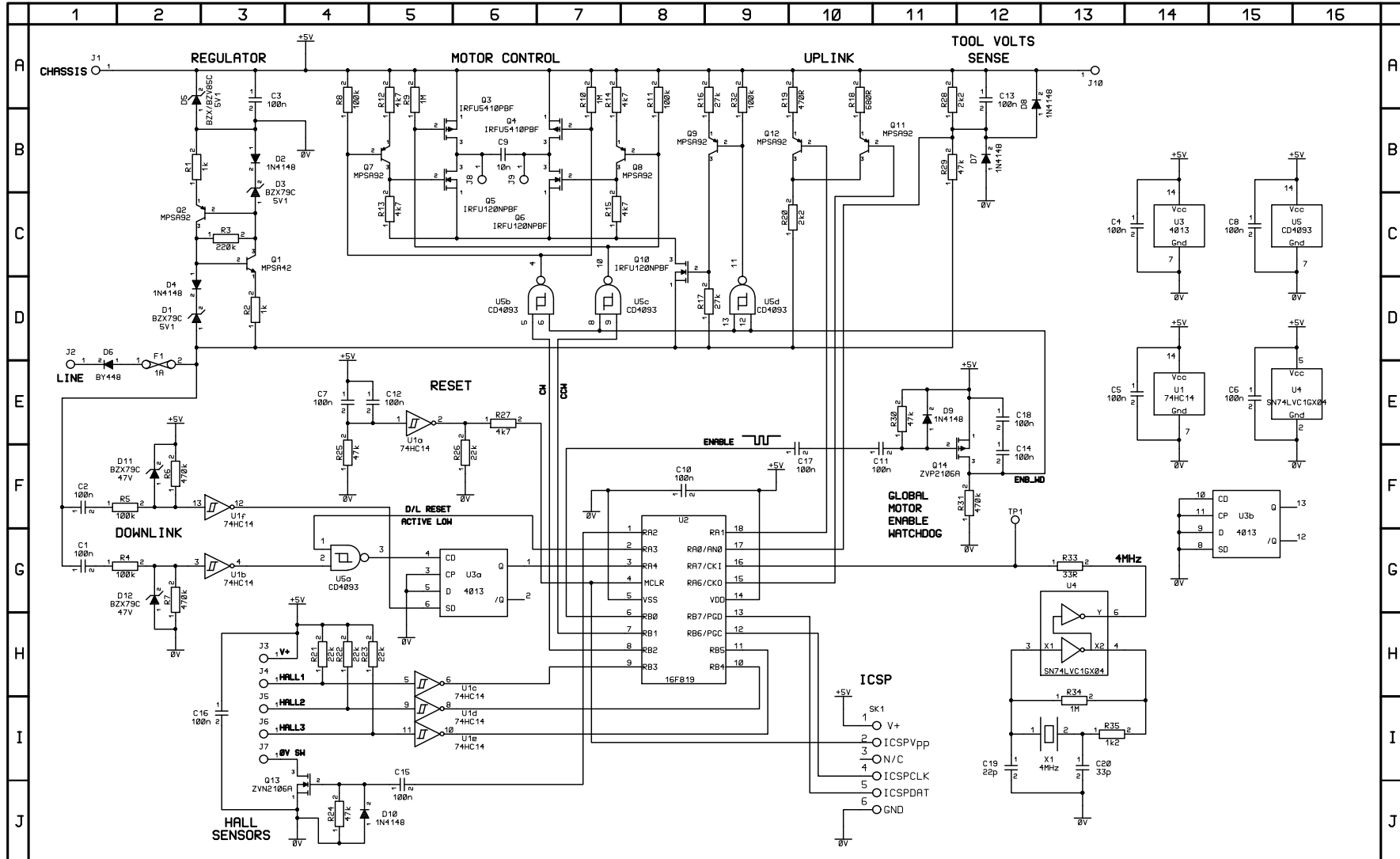
MODEL'D	DRAWN	CHECK'D	APPV'D
GC	GC	RTM	LS
22/07/09	23/07/09	02/09/09	07/09/09

MATERIAL SEE PARTS LIST
 HEAT TREATMENT N/A

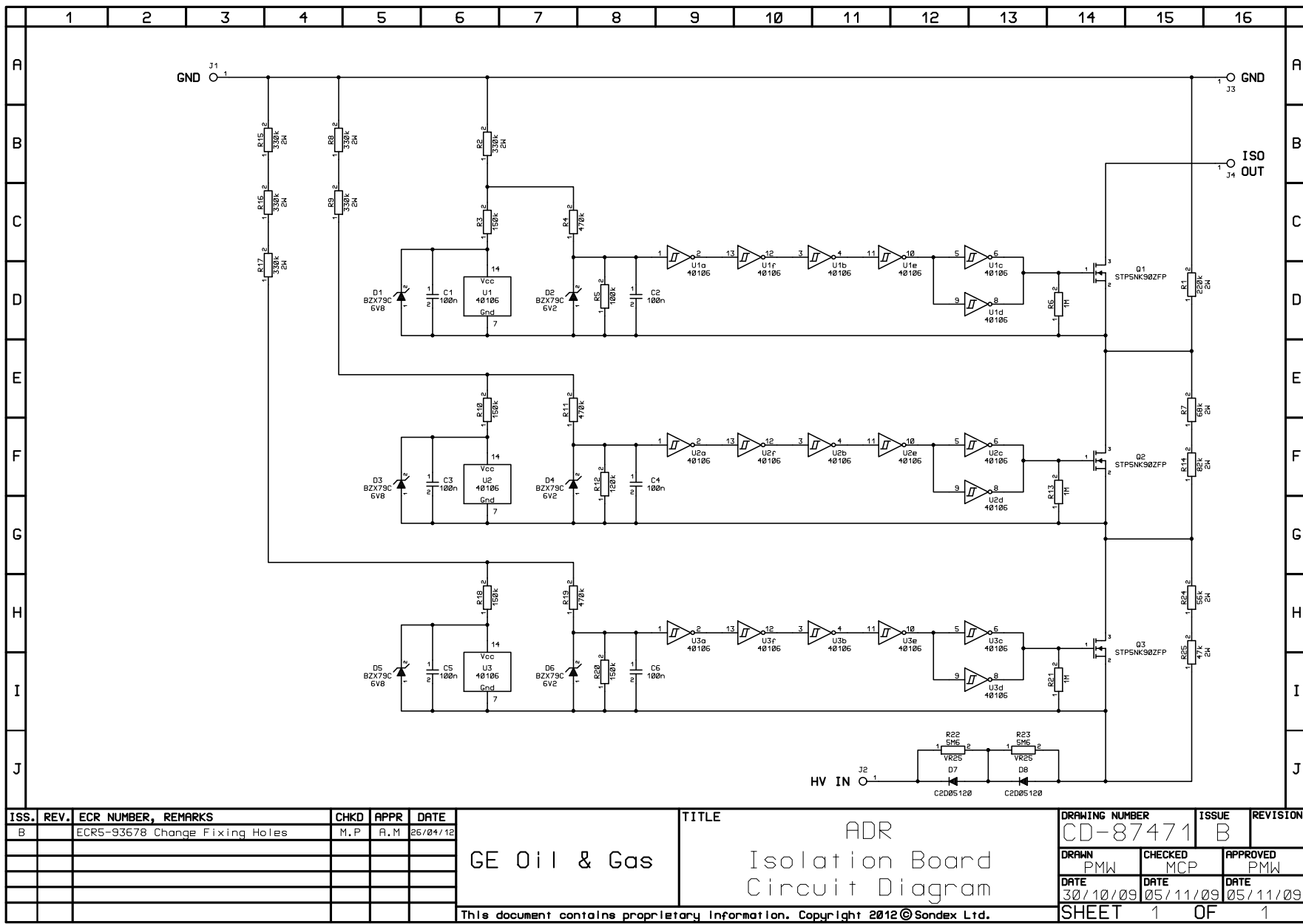
GE Oil & Gas
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TITLE	SCALE	DRAWING No.	REVISION	SHEET
ASSEMBLY FISHING NECK ADR001	1:1	AD-43103	D	1 OF 1





ISS.	REV.	ECR NUMBER, REMARKS	CHKD	APPR	DATE	TITLE	DRAWING NUMBER	ISSUE	REVISION
A	00	1st Release			16/09/08	SONDEX LTD FORD LANE, BRAMSHILL, HOOK, HAMPSHIRE, RG27 0RH, ENGLAND TEL: +44 (0) 118 932 6755 FAX: +44 (0) 118 932 6704	CD-87476	B	
B		ECRS-88078 Revise oscillator & min holes	AM	AM	07/12/11				
						Logic Board ADR Circuit Diagram	DRAWN PMW	CHECKED AM	APPROVED AM
							DATE 16/09/08	DATE 07/12/11	DATE 07/12/11
						This document contains proprietary information. Copyright 2001 © Sondex Ltd.	SHEET 1	OF 1	1



APPENDIX C INSTALLATION OF ANTI-EXTRUSION RINGS

At high temperatures O-Rings become very soft and with corresponding high pressures they begin to extrude into the gap between the housing and the bore. Eventually this can lead to failure and a subsequent tool flood. To prevent this, Anti-Extrusion Rings have been added to some seals on this tool, both static and dynamic. These rings are made of plastic and have been designed to prevent extrusion of the O-Ring into the gap.

Note: Anti-Extrusion Rings are often referred to as back-up rings, particularly when used with standard O-Rings.

When a single Anti-Extrusion Ring is used, it must always be fitted on the side AWAY from well pressure (see [Figure C-1](#) below).

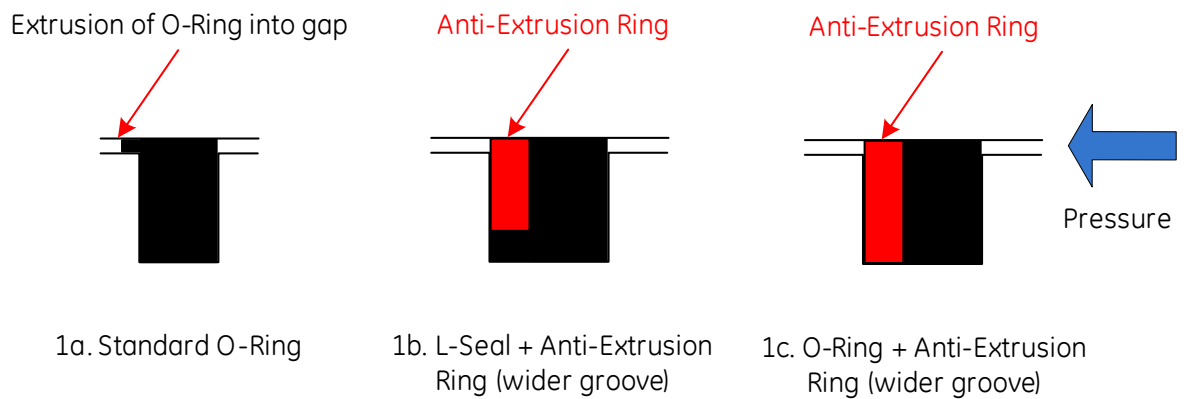


Figure C-1 Installation of a single Anti-Extrusion Ring

When two Anti-Extrusion Rings are used, they must be positioned one on each side of the O-Ring (see [Figure C-1](#) below).

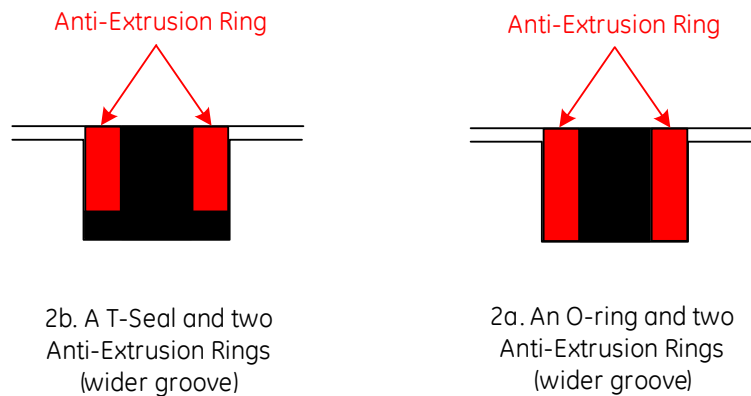


Figure C-2 Installation of two Anti-Extrusion Rings

Anti-Extrusion Rings are scarf cut to allow assembly. Make sure the gap between the scarf cut is no more than 1mm.

Make sure that the Anti-Extrusion rings are concentric in their groove and are seated uniformly.

Note: Due to the increased friction, joints that contain anti-extrusion rings will be slightly harder to tighten up than previously with just the O-Rings. However, do **NOT** force the joint together. This indicates part of the anti-extrusion ring has caught on either the bore or the lead-in chamfer and excessive force can damage the ring and/or the seal. Slowly back off the joint, check the seating of the anti-extrusion ring and retighten.

APPENDIX D WINCHMAN'S GUIDE

See also [Section 4.3, Logging](#).

D.1 RUNNING IN HOLE

When running in hole, remember these steps:

- 1 Run in at required speed.
- 2 Slow down to pass through restrictions.
- 3 For memory jobs, stop the run in 10 minutes **BEFORE** tool is due to open.

D.2 PULLING OUT OF HOLE

When pulling out of hole, remember these steps:

- 1 For memory jobs, start pulling out 10 minutes **AFTER** the tool has opened.
- 2 **DO NOT** run back in the hole while tool is open.
- 3 When it is required to unwind the cable, use a cable clamp to prevent the tool string running back in the hole.

D.3 LOGGING PROFILE

No	Real Time	Log Time	Logging Speed	Open/Close
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Figure D.1 Logging Profile

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