OPERATION INSTRUCTION & SERVICE MANUAL

Stinger Tool	PAGE:	1 of 24
	RELEASE DATE:	02/06/2020
	APPROVED BY:	O.Webster
	REVISION:	1

Revision	Comments	Approved By	Release Date:
1	First Release	OW	02/06/2020

WARNING

This user manual contains important information. Ensure that the user manual is read and thoroughly understood before operating the product. This manual is not intended to replace company safety policies or procedures.

- The user manual must be made available to all personnel that will operate and maintain the equipment.
- It is the responsibility of the employer to ensure that this user manual and contents are made available.
- Failure to read, understand and follow the procedures & warnings contained herein could lead to **property damage, severe personal injury, or death**.
- The Stinger Tool is used as part of a bigger assembly of components that together control or direct fluids under pressure. It is critical that operators and personnel in the vicinity are thoroughly trained in the proper installation, operation, safe handling, and maintenance of these products.
- It is crucial, both for the longevity of the product and to ensure safe operation, that the Stinger Tool is used and maintained properly.
- The MSWP should never be exceeded. Doing so could result in damage to property, release of fluids, sever personal injury or fatality.
- The working temperature range should never be exceeded. Doing so could result in damage to property, release of fluids, sever personal injury or fatality.
- Stinger Tool components that are deemed to have been damaged should be immediately removed from use and repaired or replaced.
- Never position yourself or allow somebody else to position themselves in the path of the exit flow of the Stinger Tool. If a tool becomes plugged or stops working under no circumstances should you ever look into the end the ports to check for debris, blockage or for any other reason. **Doing so could result in sever personal injury or fatality.**

These warnings and the information contained in this manual are not considered to be exhaustive and a risk assessment / hazard analysis should always be completed by the End User to identify additional hazards. Where there is any doubt over any aspect of the installation, operation, maintenance, inspection, repair or disposal of any JIQ product, the advice of JIQ should be sought.

TABLE OF CONTENTS

GENERAL INFORMATION

H2S SERVICE MODEL:

JIQ-10258	15k Stinger Tool W/ 1”-14 UN Crossover
JIQ-10261	7/8”-14 UN Female Crossover
C-10396	½” NPT Pin Adaptor
C-10395	¾-16 UNF Pin Adaptor
C-10412	1”-14 UN Test Cap

REBUILD KIT:

JIQ-10263	Re-build kit
C-10409	Replacement Retainer Segments
JIQ-10264	Crossover Additional Elastomer Kit

DESCRIPTION

The JIQ Manufacturing Ltd Stinger Tool allows for routine bleeding and testing of Wellhead fittings. The tool is supplied as a complete kit to allow for stinging operations on most Christmas Tree and Wellhead adaptor spools. Stinger Tools are suitable for Sour Gas Service according to NACE MR-01-75 / ISO 15156 and are supplied with full material traceability, certification and embedded RFID asset tracking technology. Inconel 718 is utilised throughout to ensure a long and safe service life. The JIQ Stinger Tool utilises a unique non-rotating, 1-piece Pin design which maximises seal life and ensures a positive retraction of the Pin when re-seating check valves. The modular design also allows for easy installation and removal of the Stinger Tool without the need to remove manifold hoses. Two ¼" high-pressure Autoclave ports are included to offer a safe and versatile means of monitoring and bleeding pressure.

INSTALLATION

WARNING

Prior to installing this product, the following warnings should be read and fully understood. Installation should only be carried out by technicians with the relevant experience and after receiving suitable training. Prior to operation the installation should be checked and approved by supervisor / foreman after considering the information contained herein.

- The Stinger Tool will be supplied in appropriate packaging from the factory. This is designed to prevent damage during transport and it is recommended that this is reused for transporting to and from field locations.
- Proper lifting technique should always be used to prevent personal injury and damage caused by dropping. PPE (steel toe safety shoes/boots) should be worn when manually handling product.
- Couplings of different sizes and pressure codes should never be mixed even if they appear to make-up correctly. **Doing so could result in property damage, release of fluids, severe personal injury or fatality.**
- Couplings & fittings should be cleaned, inspected for damage and lightly oiled before and after each use.
- The Stinger Tool should be flushed clean with water after each stage / use.
- Consideration should be given to ensure the tool is suitably anchored to prevent movement / severe vibration / excessive loading in use. Venting to atmosphere of gas of fluids containing gas can result in the assembly *whipping* violently. JIQ recommends the use of whip-checks.
- Where fluid under pressure must be vented to atmosphere, great care should be taken to ensure that the exit flow stream is not likely to cause damage or injury either directly or by throwing of objects picked up by the exit stream.
- Local environmental practices must always be adhered to when venting fluids to atmosphere. Particular care must be taken when venting fluids that are flammable or explosive.
- Fluid velocities more than 42 ft/s [12.8 m/s] are not recommended as rapid erosion is likely at high velocities.
- Components of different service types should never be mixed. Always ensure that the service type and maintenance interval is appropriate for the intended fluids and velocities.
- The end user Design and construction must ensure:
    - That due consideration is given to the risk of fatigue due to vibrations in pipes.
    - That, where fluids of Group 1 [refer to product classification in the Pressure Equipment Directive 97/23/EC (PED) and/or the Pressure Equipment Regulations SI/1999/2001 (PER)] are contained in the piping, appropriate means are provided to isolate “take-off” pipes the size of which represents a significant risk.

PRESSURE AND TEMPERATURE RATINGS

WARNING

This section contains important information. Ensure that it is read and thoroughly understood before operating the product. Failure to fully heed the information could result in property damage, release of fluids, sever personal injury or fatality.

- The maximum safe working pressure rating is stamped on the tool and listed in the relevant section of this manual. **The MSWP should never be exceeded. Doing so could result in damage to property, release of fluids, sever personal injury or fatality.**
- It is recommended that a pressure relief valve, functioning correctly and set appropriately, is incorporated into the assembly to prevent over-pressuring of the components.
- The working temperature range is stamped on the tool and listed in the relevant section of this manual. The working temperature range should never be exceeded. Doing so could result in damage to property, release of fluids, sever personal injury or fatality.
- The JIQ Stinger Tool is not intended to provide operational function when exposed to fire.
- The JIQ Stinger Tool is not designed for sustained pressure surges / water hammer effects in excess of the MSWP.

PRESSURE:

The JIQ Stinger Tool has been designed with a maximum working pressure rating of **15,000 psi [1,034 bar].** Every new stinger is subjected to a factory acceptance pressure test of 1.5x the MSWP for a minimum 15-minute duration.

Maximum working pressure (MSWP) should never be exceeded.

TEMPERATURE:

The elastomers and Stinger tool have been designed and undergone extensive testing to offer a wide operating temperature range of **-4 – 275°F [-20 – 135°C]**.

The temperature rating is limited by the seal choice. It is therefore essential that the end user takes into consideration fluid composition and pressures when considering suitability for an application. If in doubt the advice of JIQ Engineering Department should be sought. The JIQ Stinger Tool utilises high-quality elastomers that have undergone extensive testing. Only JIQ supplied replacement elastomers should be used when re-dressing a JIQ Stinger Tool in order to maintain the wide operating range and trouble-free function.

1.0 HANDLING

1.1 Stinger tools will be delivered in accordance with the requirements specified in the customers purchase order.

1.2 Each stinger tool will be fitted with protective plastic plugs in the ports. The plugs should be retained and re-used to prevent debris ingress or damage to the ports during storage and transportation.

1.3 On receipt of the delivery all Stinger Tools should be checked to ensure they have not been damaged in transit – if so notify the carrier.

1.4 If the Stinger Tool is not to be used immediately, it should be stored, with all protective covers in place, in a cool dry environment. Water repellent grease or equivalent should be applied if considered necessary. If the Stinger Tool is to be stored for an extended length of time, please seek the advice of JIQ Engineering Department to ensure correct storage conditions are maintained.

1.5 Care should be taken to ensure all aspects of health and safety are observed when handling.

2.0 TESTING

2.1 All JIQ Stinger Tools are given a factory acceptance test equal to 1.5x MSWP (maximum safe working pressure) prior to delivery.

2.2 An appropriate test cap should be used to conduct a pressure test to 1x MSWP anytime the Stinger Tool has been disassembled or between coupling changes.

2.3 Test caps are available from JIQ Manufacturing Ltd for this purpose.

2.4 The stated MSWP should never be exceeded.

3.0 PRIOR TO USE

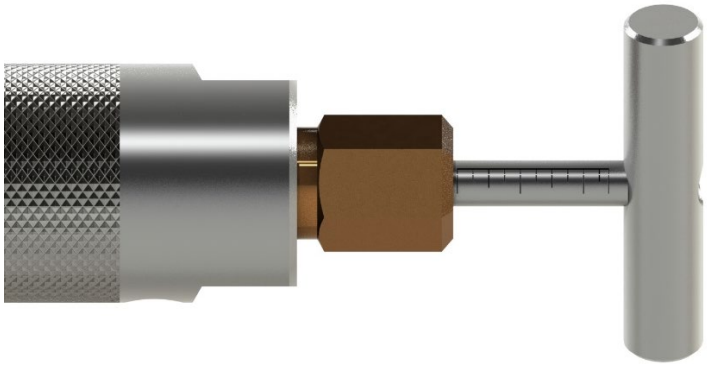
3.1 Ensure that the Stinger Tool has the correct pressure rating for the application.

3.2 Visually examine the threaded ports in the side of the body, the female interface thread, and the sealing O-ring for damage. If damage is present the Stinger Tool should not be used and the advice of JIQ Engineering Department should be sought.

Note: It may be appropriate that the Stinger Tool, as a piece of portable pressure test equipment, be serviced on at least an annual basis.

3.3 Check that the Stinger Tool stem moves freely along its entire travel by operating the handle both ways.

3.4 Ensure that the stem is in the fully retracted position by turning the handle anticlockwise until etched scale on the Stem is zeroed.



3.5 Remove the protective cap with care from the bleed fitting. Verify that the ball within the fitting is retaining any trapped internal pressure.

3.6 Identify the fitting type and size and measure the depth of the ball in the valve using the supplied Vernier callipers. Verify the correct coupling is installed on the Stinger Tool.

3.7 Using the recommended lubricants as per the maintenance section of this document, apply a smear of suitable grease to the check valve thread and, depending on coupling type, sealing O-ring.

3.8 Screw the Stinger Tool onto the check valve thread. Straight thread couplings should be made-up to approximately "Two hands tight", or a torque of 12 ft lbs, which should be sufficient to ensure a seal. Tapered thread couplings should be made up using PTFE tape and to appropriate torque ratings.

3.9 Connect suitable equipment to the threaded ports to allow control or verification of the intended procedure, e.g. Gauging to confirm pressure evacuation.

3.10 With the Stinger Tool connected to the system a function test should be performed to verify that test fluid can pass through all components within the system:

3.10.1 The procedure should include pumping fluid from one port to the other and not just bleeding pressure from one port. This will confirm proper function of any check valves and the Stinger Tool that comprise the system.

4.0 TO STING OUTER CHECK VALVE

4.1 Rotate the Stinger Tool handle clockwise until the scale on the Stem indicates that the desired stick-out has been obtained, as per the depth measured in step 3.6.

4.2 Rotate the handle clockwise 5-6 turns to unseat the ball sufficiently to allow any trapped fluid or gas to vent, or to allow fluid to be injected into the cavity.

4.3 The outer check valve is now stung.

5.0 TO STING DOUBLE CHECK VALVE

5.1 Continue to rotate the handle clockwise, until resistance is felt (the stem contacting the check valve face).

5.2 Continuing turning the handle clockwise to unseat the inner check valve. *Note: The scale on the Stem can be used to determine the Pin stick-out length.*

5.3 Both check valves are now stung.

6.0 TO REMOVE STINGER TOOL

6.1 Hold the body firmly with one hand to prevent the body turning, rotate the handle anticlockwise until the scale on the stem indicates that the Pin has been fully retracted.

6.2 Rotate the handle ½ revolution clockwise. The check valve / check valves should now be closed and any pressure in the system can be bled.

6.3 Verify that the Check Valve has seated, no leaks, and that all pressure within the Stinger Tool has been bled.

6.4 Unscrew the Stinger Tool from the check valve, ensuring that the check valve remains in place. Ensure that the O-ring has been retained within stinger tool (where applicable, dependent on coupling).

6.5 Replace the protective cap onto the check valve.

INSPECTION, MAINTENANCE AND REPAIR

WARNING

The following section contains important information, the following warnings should be read and fully understood. Inspection, maintenance and repair should only be carried out by technicians with the relevant experience and after receiving suitable training.

- The Stinger Tool should never be disassembled under pressure. Doing so can cause property damage, release of fluids, serious injury or death.
- Never attempt to disassemble any part of the tool in-situ where there is a risk of the presence of pressure.
- PPE is recommended (gloves and safety glasses) when undertaking these tasks, as highlighted in this manual.
- It is recommended to flush clean using water. Where cleaning solvents are to be used to aid in the removal of debris & grease care must be taken to ensure these chemical products are compatible and safe for the intended use. In particular the use of acidic or caustic chemicals is not recommended for cleaning purposes as doing so can result in rapid wear and decreased lifespan.
- If there is any doubt over the condition of components they should be replaced or the advice of JIQ Engineering Department should be sought.
- Never attempt or allow a weld repair to be attempted on any components.
- Damaged components must be replaced.
- Any alteration to the components is prohibited.
- Only JIQ parts should be used in the assembly of JIQ Stinger Tools. Never assemble using components from another manufacturer as although they may appear to fit and function in the same way they have not been designed and manufactured to work together in harmony.

The Stinger Tool has been designed using carefully selected materials to offer the best combination of safety, strength, durability and ease of use. Applications generally involve the handling of high-pressure fluids that are generally corrosive. As such proper maintenance is vital in ensuring a long, trouble-free working life of your JIQ Stinger Tool. Maintenance intervals given in this user manual are recommendations. More frequent cleaning, greasing and inspection will extend the life of the tool. It is crucial that factors including the temperature, composition and pressure of fluids and the general working environment / application that the tool is to be used in are fully considered by the end user when identifying maintenance intervals.

Failure to correctly maintain and regularly inspect the condition of the Stinger Tool will result in premature failure. This can lead to unnecessary expense and presents a danger to personnel, property, and the environment.

MAINTENANCE

WARNING

- It is crucial, both for the longevity of the product and to ensure safe operation, that the Stinger Tool is used and maintained properly.
- When deciding on a maintenance interval the type of service, working temperature, fluid velocity, fluid composition and environment should all be considered.
- Flushing the tool with clean fresh water between each operation / stage will greatly enhance the lifespan of the product.
- Only ever use the recommended greases and re-greasing procedure as stated in this manual.
- Use only the recommended grease and greasing procedures:

For lubrication of Seals:	Molykote 55 O-ring Grease
For assembly of mating threads:	Molyslip MLC
For securing of set screws:	Loctite 243

7.0 MAINTENANCE PROCEDURE

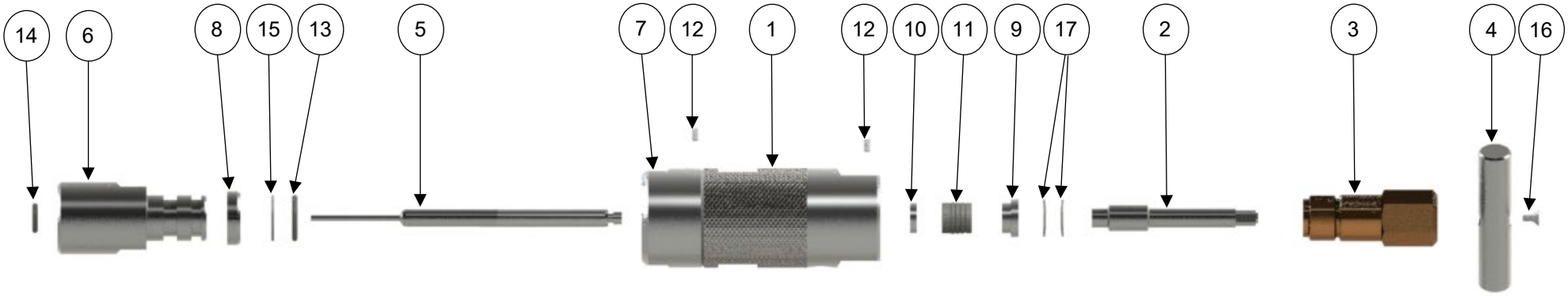
1.1. Between each make-up clean and visually inspect the threads on the Crossovers and ports for damage as per section 3 of this manual. Lightly coat the threads with oil after cleaning to prevent corrosion and ease thread make-up.

1.2. After each job / stage, flush the tool with clean water. Use only the recommended greases and do not mix grease types.

1.3. After each job / stage, clean the OD of the tool with clean water.

1.4. The Stinger Tool is supplied with Nylon thread / port protectors. These should be kept and re-used to prevent debris ingress between make-ups.

1.5. The Stinger Tool should always be stored with the Pin retracted to prevent damage or injury.



BILL OF MATERIALS

Item No.	Qty	Description
1	1	Stinger Body
2	1	Stem
3	1	Bonnet
4	1	Handle
5	1	Pin
6	1	1”-14 UN Crossover
7	1	Retainer Nut
8	1 set	Retainer Segments
9	1	Top Hat
10	1	Packing Washer
11	1	Seal Stack
12	2	Socket HD Set Screw
13	1	O-ring
14	1	O-ring
15	1	O-ring Back-Up
16	1	Socket HD CSK Screw

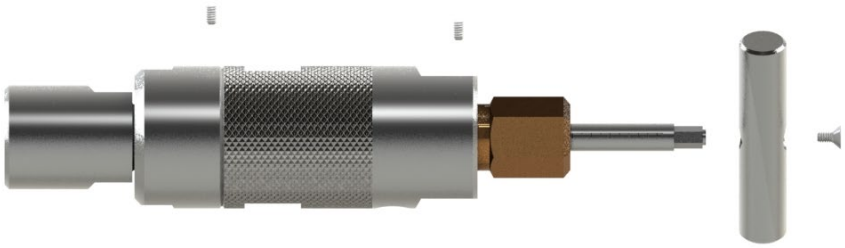
DISASSEMBLY

WARNING

- The Stinger Tool should never be disassembled under pressure. Doing so can cause property damage, release of fluids, serious injury or death.
- Never attempt to disassemble any part of the Stinger Tool in-situ where there is a risk of the presence of pressure.

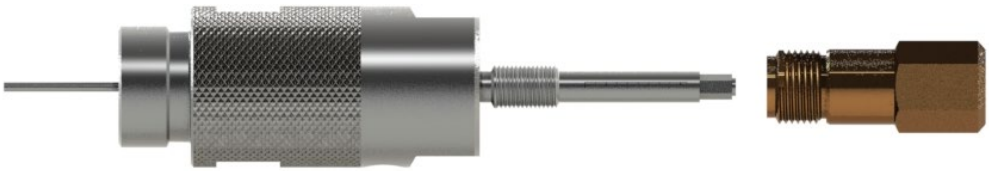
8.0 DISASSEMBLY

8.1 Using a hex key remove the countersunk set screw (16), remove the Handle (4) and keep to one side to be re-used. Remove the 2-off set screws (12) and retain for reassembly.

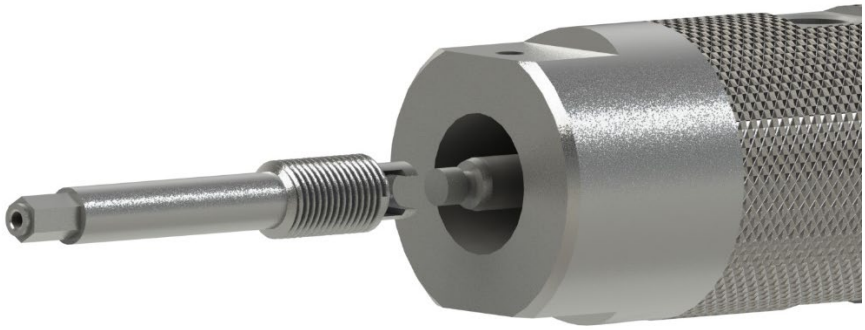


8.2 Back-off the Retainer Nut (7) threads and withdraw the subassembly from the Stinger Body (1).

8.3 Using an 7mm open spanner to hold the Stem (2) by the external hex profile back-off the Bonnet (3) and remove from the Stinger Body (1).

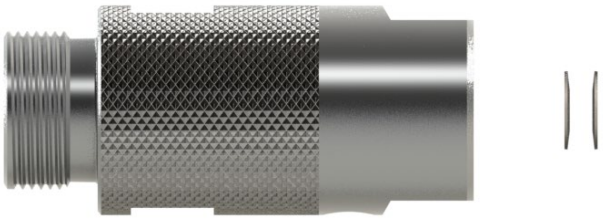


8.4 Un-hook the Stem (2) from the Pin (5). *Note: It may be necessary to pull the subassembly upwards for the top of the Pin to clear the Stinger Body (1).*



8.1 Withdraw the Pin (5) from the Stinger Body (1). *Note: use a folded piece of lint-free cloth between the top of the Pin and your thumb and push the Pin downwards through the Stinger Body. If necessary, a 5/16" dia parallel punch may be used to push the Pin through the Seal Stack in the Stinger Body. Extreme care must be exercised to ensure that the seal bore in the ID of the Stinger Body is not scratched which could result in the scrapping of the Stinger Body.*

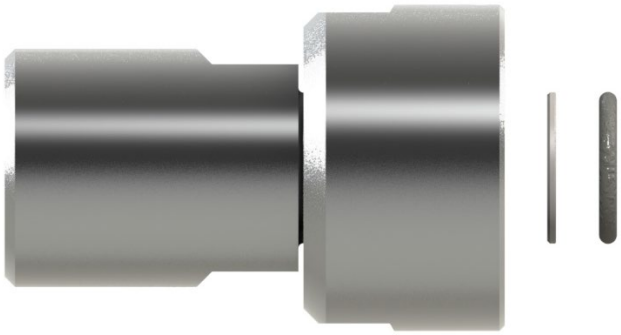
8.2 Using and O-ring hook remove the Disc Springs (17) from the Stinger Body (1).



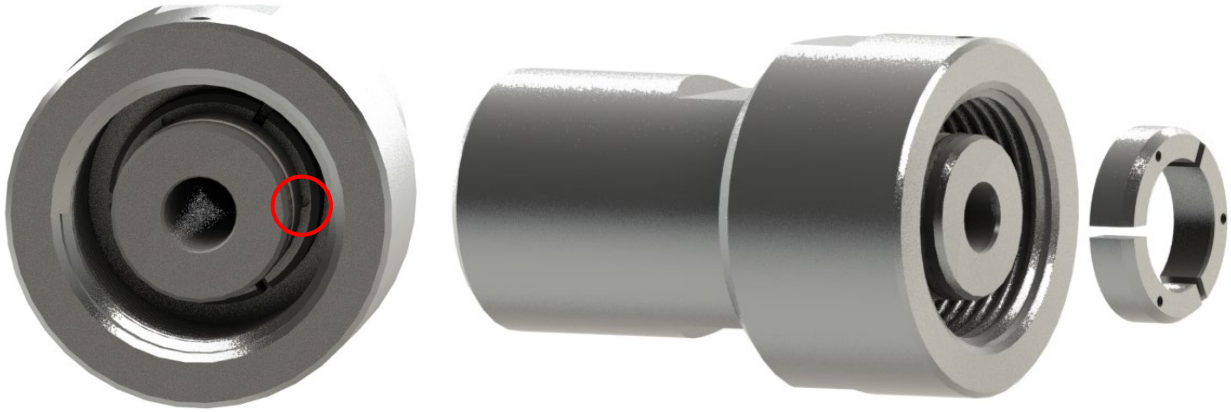
8.3 Remove the Top Hat (9), Seal Stack (11) and Packing Washer (10) from the Stinger Body (1). *Note: extreme care must be exercised to ensure that the seal bore in the ID of the Stinger Body is not scratched which could result in the scrapping of the Stinger Body.*

8.1 To disassemble the Crossover Sub-assembly:

8.1.2 Using an O-ring hook remove the O-ring (13) and O-ring Backup (15) from the Crossover (6). *Note: extreme care must be exercised to ensure that the seal surface on the O-ring groove is not scratched which could result in the scrapping of the Crossover.*



8.1.3 Using an O-ring hook, remove each of the 3-off Retainer Segments (8) from the OD groove in the Crossover (6). *Note: holes are provided to assist with removal of the Retainer Segments as highlighted below.*



8.1.4 Withdraw the Retainer Nut (7) from the Crossover (6).

8.1.5 Using an O-ring Hook, remove the O-ring (14) from the face groove on the Crossover (6). *Note: extreme care must be exercised to ensure that the seal surfaces in the face groove of the Crossover are not scratched which could result in the scrapping of the Crossover.*

INSPECTION

WARNING

- Inspection should only be carried out by competent personnel who are suitably experienced and trained.
- Never attempt to inspect any Stinger Tool in situ or when fully or partly assembled, or if access is likely to be an issue.
- If there is any doubt over the condition of components they should be replaced or the advice of JIQ Engineering Department should be sought.
- Never attempt or allow a weld repair to be attempted on any components.
- Damaged components must be replaced.
- Any alteration to the Stinger Tool or components is prohibited.

9.0 INSPECTION

9.1 Clean all surfaces with isopropyl alcohol or similar degreaser.

9.2 Visual inspect all threads for any signs of damage, including; tearing, galling, cross-threading or over-torqueing.

9.3 Check all the seal surfaces for damage such as scratches, gouges, or pitting. Pay particular attention to the seal surface finish on the Pin (5) and the seal bore in the Stinger Body (1).

9.4 Visual inspect the remaining parts for any damage.

9.5 Place the Pin (5) on a flat surface and slowly roll it to inspect the length for straightness.

9.6 Inspect the end of the Stem (2) for damage caused by over-torqueing. The hex should not appear twisted.

9.7 Re-assemble the Pin (5) and Stem (2) and check for proper engagement of the turned / milled profiles. There should be no signs of twisting, bending or any other damage.

9.8 Any parts found to have been damaged should be replaced with new JIQ replacement components. The advice of JIQ Engineering Department can be sought if required.

9.9 Light surface corrosion can be removed using an emery cloth or Scotchbrite.

9.10 If the Stinger Tool is not to be immediately re-assembled the components should be given a light coating of oil (WD-40 or similar) and placed into sealed bags to prevent corrosion.

9.11 It is recommended to always replace the Elastomers with new items from a Rebuild Kit when reassembling the Stinger Tool.

ASSEMBLY

WARNING

Re-assembly should only be undertaken by suitably trained competent personnel. For best results and minimum down time JIQ recommends replacement of all kit components. It is recommended to wear gloves and safety glasses. The following advice should also be heeded during reassembly:

- Use only the recommended grease and greasing procedures:

  For lubrication of Seals: Molykote 55 O-ring Grease

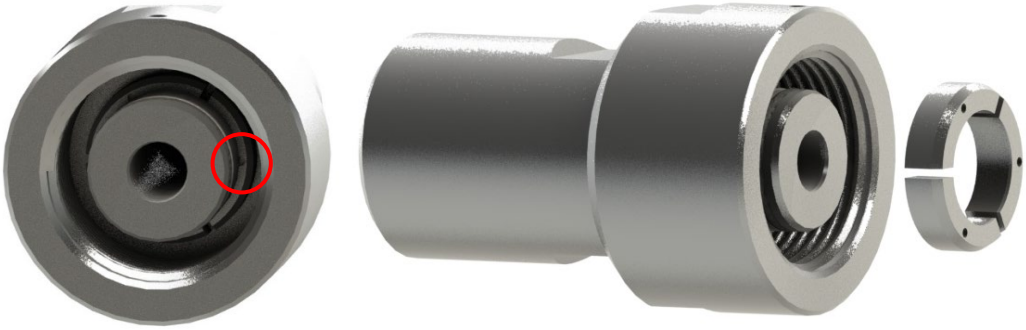
  For assembly of mating threads: Molyslip MLC
- Loctite 243 should be used on the Set Screw threads.
- If re-using parts, thoroughly clean all seal surfaces using emery cloth or Scotchbrite to remove any surface rust / contamination.
- Visually check all components and remove any contaminants & debris.
- Under no circumstances should components from other manufacturers be mixed-and-matched.
- If there is any doubt over the condition of components they should be replaced or the advice of JIQ Engineering Department should be sought.
- Never use any parts that have attempted to be weld repaired.
- Damaged components should be replaced.
- Any alteration to the components is prohibited.

10.0 ASSEMBLY

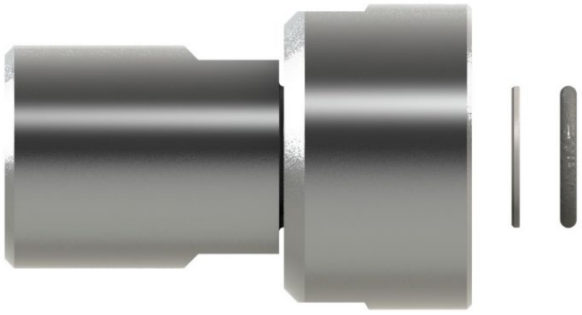
10.1 Install the O-ring (14) into the face groove.

10.2 Slide the Retainer Nut (7) over the end of the Crossover (6).

10.1 Install the 3-off Retainer Segments (8) into the OD groove at the back of the Crossover (6). *Note: a smear of grease on the faces of the Segments will help to hold them in the correct position. Ensure that the segments are installed in the correct orientation with the blind holes facing the open end of the Retainer Nut (7).*

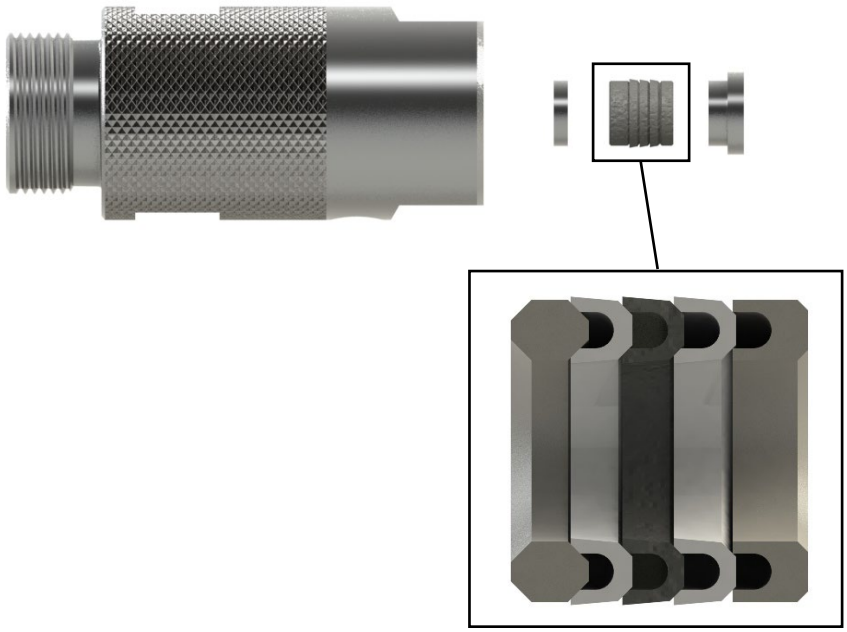


10.2 Install the O-ring Backup (15) and O-ring (13) into the OD groove on the Crossover (6).



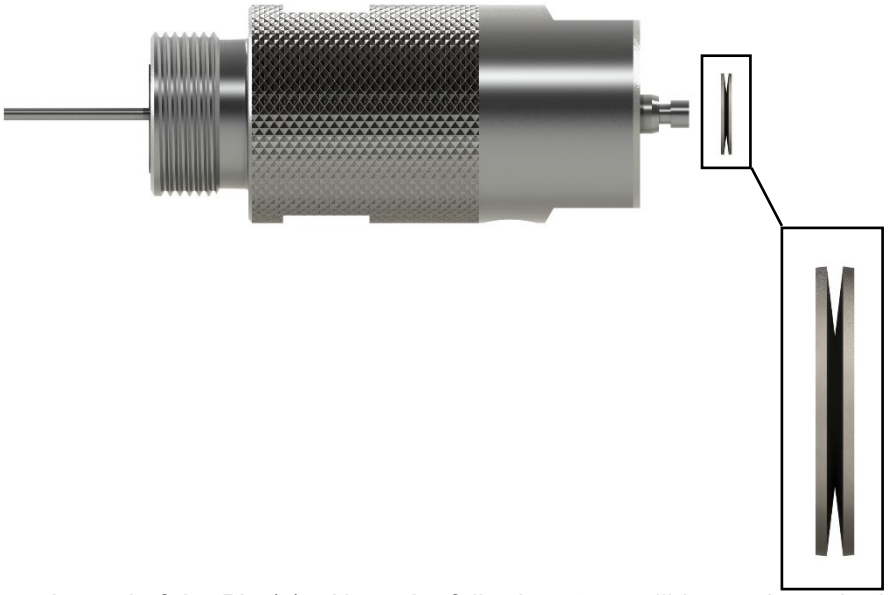
Note: the correct final installation is as shown in the image below with the O-ring (13) closest to the end face of the Crossover (6) and the O-ring Backup (15) towards the rear part of the O-ring groove. The O-ring Backup should be installed with the convex face towards the O-ring.

10.3 Insert the Packing Washer (10), Seal Stack (11) and Top Hat (9) into the seal bore in the ID of the Stinger Body (1). *Note: ensure that the Seal Stack is installed in the correct order and orientation. The chevrons should be oriented so that they point out of the top of the Stinger Tool.*

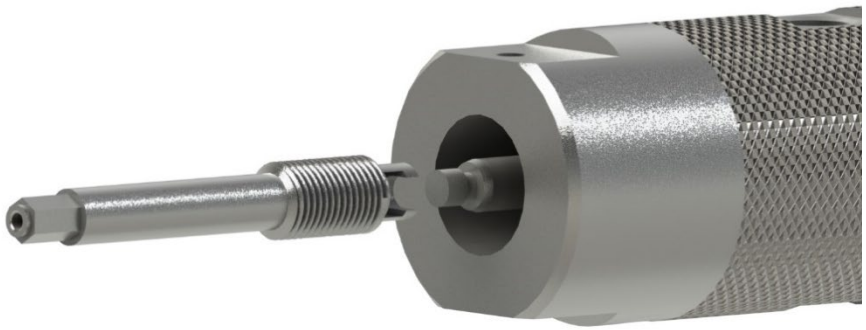


10.4 From the bottom-end of the Stinger Boy (1) insert the Pin (5), passing through the Seal Stack (11) and continue pushing the Pin inwards until it extends beyond the opening at the top-end of the Stinger Body. *Note: this procedure can be eased by temporarily installing the Bonnet (3) into the Stinger Body, which will assist in keeping the Seal Stack in place. Care must be taken to remove the Bonnet once the Pin passes through the Seal Stack otherwise damage may occur to the ID threads.*

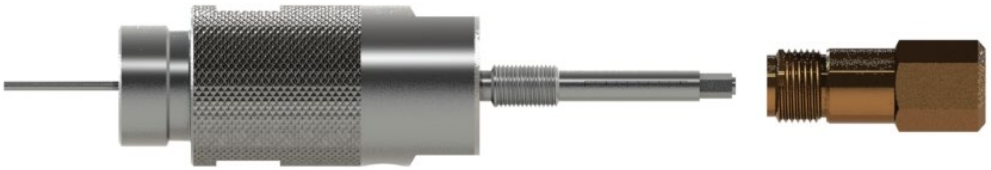
10.5 Install the Disc Springs (17) by sliding them over the OD of the Pin (5). *Note: it is possible to install the Disc Springs in the wrong orientation which could result in premature failure of the Seal Stack (11). Ensure that the Disc Springs are installed as shown.*



10.6 Hook the Stem (2) on to the end of the Pin (5). *Note: the following steps will be made easier if after attaching the Stem to the Pin the sub-assembly is pushed inwards so that the Stem is located inside the Stinger Body so as to prevent it from un-hooking.*



10.7 Slide the Bonnet (3) over the Stem (2) and simultaneously make-up the two threads between the Stem and the Stinger Body (1). A 7mm open spanner can be used to prevent turning of the Stem when making-up the Bonnet to the Stinger Body. *Note: it may prove necessary to start the thread between the Stem and Bonnet prior to the Stinger Body threads. This is acceptable but care must be taken to ensure that the Stem does not become detached during the make-up.*



10.8 During initial assembly by JIQ a spot drill is used to create a recess for the Set Screw (12) to engage with. The Bonnet (3) should only be tightened as much as necessary to ensure proper alignment between the recess and the tapped hole. *Note: overtightening of the Bonnet will increase seal friction making the Stinger Tool difficult to operate and will reduce the lifespan of the Seal Stack (11).*

10.9 Install the Crossover (6) sub-assembly by inserting it into the lower end of the Stinger Tool and making up the threads between the Retainer Nut (7) and the Stinger Body (1). *Note: care should be exercised to ensure that the O-ring (13) and O-ring Backup (15) are not damaged.*

10.10 Install the 2-off Set Screws (12), insert the Handle (4) on to the Stem (2) by lining up the hex profile and secure using the Countersunk Set Screw (16).

11.0 EXCHANGING ADAPTORS

11.1 Ensure that the Pin (5) is in the fully retracted position as indicated by the scale on the Stem (2). *Note: this can also be confirmed by turning the handle in an anti-clockwise direction until the Stem bottoms-out in the Bonnet (3).*

11.2 Back-off but do not completely remove the Set Screw (12) from the Retainer Nut (7) and withdraw the Crossover (6) sub-assembly from the Stinger Body.

11.3 Install the plastic blanking plug in the Retainer Nut (7) for safe storage.

11.4 If required, install a new O-ring (13) and O-ring Backup (15) into the OD groove on the coupling.

11.5 Slide the coupling sub-assembly over the Pin (5) taking care to ensure that no bending force is applied at any time. Push the coupling sub-assembly into Stinger Body (1). *Note: care should be exercised to ensure that the O-ring (13) and O-ring Backup (15) are not damaged.*

11.6 Slide the Retainer Nut (7) over the coupling and make-up the threads with the Stinger Body (1).

11.7 Install the Set Screw (12) to secure the Retainer Nut (7).

STINGER TOOL TESTING

WARNING

The stated MSWP should not be exceeded. **Doing so can result in release of fluids, property damage, severe injury or fatality.**

All air must be bled from the Stinger Tool and test apparatus prior to conducting any pressure testing. Failure to remove all air can result in sever injury or death and damage to the tool. Pressure caps and plugs of the correct size & type and meeting or exceeding the Stinger Tool maximum working pressure rating must be used. The test apparatus must appropriate for the testing and be rated to meet or exceed the maximum working pressure rating and in well maintained condition. **Failure to heed these warnings could result in release of fluids, property damage, severe injury or fatality.**

12.0 STINGER TOOL TESTING:

12.1 The Stinger Tool should be pressure tested after exchanging couplings or following partial disassembly.

12.2 Prior to conducting any pressure testing ensure that the recommended inspection procedure has been followed (see Section 9.0).

12.3 Fit an appropriate Test Cap to the Coupling. *Note: JIQ supply test caps for each coupling type. Consult JIQ for the appropriate part numbers and ordering.*

12.4 With the Test Cap installed make-up test hoses to each of the high-pressure ports in the Stinger Body (1).

12.5 Verify that test fluid can freely pass through the Stinger Tool by pumping into one port and observing returns from the opposite port.

12.6 Increase the applied pressure to the MSWP.

12.7 Upon stabilisation lock-in and hold the test pressure for a minimum of 15-minutes.

12.8 Acceptance criteria = no visible leakage or drop in pressure over the 15-minute hold period is less than 1% of the applied pressure.

12.9 Slowly bleed the applied pressure.