

Instruction Manual



T51 Installation Tool

Hydro-Electric Power Tool

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Warranty

The ninety day warranty herein expressed shall be the exclusive warranty on items manufactured by seller and shall be in the place and stead of any other warranty, expressed or implied, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

Seller shall not be liable for any loss or damage resulting from delays or non-fulfilment or orders owing to strikes, fires, accidents, transportation companies or for any reason or reasons beyond the control of seller or its suppliers.

All warranty claims must be submitted to the seller in writing, within 90 days from date of shipment, and no returns will be accepted without written permission.

Other provisions hereof notwithstanding, seller shall not be liable for any loss of business profits or any incidental or consequential damages incurred by Buyer or any third person in connection with the items or use thereof, however caused.

Tool Warranty

Seller expressly disclaims any warranty express or implied, as to the condition, design, operation, merchantability or fitness for use of any tool, or part(s) thereof not manufactured by seller. The only warranties made with respect to such tool or part(s) thereof are those made by the manufacturer thereof and seller agrees to cooperate with buyer in enforcing such warranties when such action is necessary. Seller agrees to repair or replace F.O.B. seller's plant, any tool or part(s) thereof manufactured by it and proved to seller to be defective due to faulty workmanship or material.

Safety Rules

This instruction manual must be read with particular attention to the following safety rules, by any person installing, operating, or servicing this tool.

- 1 Do not use outside the design intent.
- 2 Do not use equipment with this tool/machine other than that recommended by Avdel UK Limited.
- 3 Any modification undertaken by the customer to the tool/machine shall be the customer's entire responsibility.
- 4 Always disconnect the tool from the HydraPac before attempting to adjust, remove or fit the nose assembly.
- 5 Do not operate a tool/machine if directed towards any person(s).
- 6 Always adopt a firm footing or a stable position before operating the tool/machine.
- 7 If cycling the tool without the nose assembly, care must be taken to avoid contact with the pintail ejector pin and not to trap the fingers in between the anvil retainer (T514) and the collet adaptor (T517).
- 8 Ear protection must be worn by the operator and others in the vicinity as noise levels exceed the permitted maximum. For values see technical specifications on page 5.
- 9 Do not fit flexible hoses rated at less than 10 000 psi (69 mPa) working pressure.
- 10 The operating pressure shall not exceed 8000 psi (55.2 mPa).
- 11 Care shall be taken to ensure that spent pintails are not allowed to create a hazard.
- 12 When using the tool, the operator and others in the vicinity are recommended to wear safety glasses.
- 13 Take care to avoid entanglement of loose clothes, ties, long hair, cleaning rags etc. in the moving parts of the tool.
- 14 The tool should be kept clean and dry for the best possible grip.
- 15 When carrying the tool from place to place keep hands away from the trigger to avoid inadvertent start up.

CAUTIONS

AVDEL RECOMMENDS THAT ONLY HYDRAPAC UNITS BE USED TO DRIVE INSTALLATION TOOLS, AS OTHER MAKES OF HYDRAULIC POWER UNITS MAY NOT OPERATE AT THE SAFE DESIGNED WORKING PRESSURES.

ENSURE THAT THERE IS ADEQUATE CLEARANCE FOR THE TOOL OPERATOR'S HANDS BEFORE PROCEEDING.

DO NOT ABUSE THE TOOL BY DROPPING OR USING IT AS A HAMMER.

KEEP DIRT AND FOREIGN MATTER OUT OF THE HYDRAULIC SYSTEMS OF THE TOOLS AS THIS WILL CAUSE THE TOOL AND HYDRAPAC TO MALFUNCTION

Specifications

Intent of use

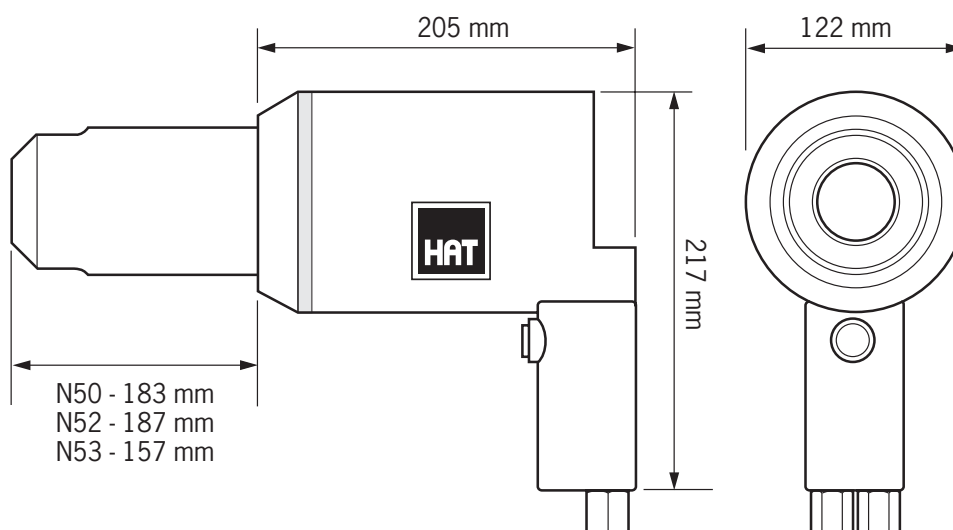
The T51 Installation Tool is basically a Piston and Cylinder Assembly. When coupled Hydraulically and Electrically to a compatible Hydraulic Power Source and the relevant Nose Assembly is attached, it is then used to install No. 22 and 28 Lockbolts in various configurations in Industrial Environments.

NOSE NUMBER	FASTENER
No. 50	No. 25 Hydraloc
No. 52	No. 28 Hydraloc
No. 53	No. 22 Hydraloc

Tool Specification

Length	205 mm	8.07 in
Body Diameter	122 mm	4.30 in
Height	217 mm	8.54 in
Weight	18 kg	39.7 lbs
Stroke	65 mm	2.56 in
Pull pressure	55.2 mPa	8000 PSI
Return Pressure	20.7 mPa	3000 PSI
Hydraulic Oil	ISO VG 46 OR EQUIVALENT	
Fastener Range	Hyaloc No. 22, 25, 28	
Noise Level	126.2 dB(A)	
Sound Power	100.9 dB(A)	
Vibration	8.6 m/sec ³	

Tool Dimensions



Putting into Service

IMPORTANT
Read the safety rules on page 4 carefully

Tool Specifications

When both hoses and control cord are connected to the Hydrapac, the pull and return cycles of the tool are controlled by depressing and releasing the trigger switch located in the handle respectively.

When the switch is depressed the solenoid valve located in the Hydrapac is energised and directs the pressurised oil flow to the pull side of the piston in the tool. This also allows the oil in the return side of the tool to return to the tank. The piston/collet assembly now moves towards the rear of the tool allowing the cushion to push the follower and jaws forward. If a Hydraloc pin has been inserted in the nose for assembly, the jaw set will clamp onto the pintail and assembly will commence.

The cycle of installation will first clamp the joint to be fastened and then as the anvil continues to move forward the collar will be swaged into the locking grooves of the pin. At the end of the swaging cycle the anvil will come hard up against the joint and as movement continues the pintail will be broken off.

The trigger switch must be released immediately after pin break occurs. Releasing the trigger switch will cause the solenoid to de-energise and reverse the flow of pressurised oil.

Pressurised oil will now flow into the return side of the installation tool with the oil in the pull side returning to the tank.

The forward movement of the piston/collet assembly firstly ejects the installed fastener from the anvil and as the forward movement continues, the jaw release mechanism will cause the jaws to open and release the broken off pintail, which will then be ejected.

When the piston returns to the fully forward position the pressure build up in the system will cause the Hydrapac to go into idle mode. This keeps the installation tool in the forward position. Once the pintail has been ejected from the nose, the tool is ready for the next installation.

Please note that with all Hydrapacs there is a built in "Sleep Mode" which in effect means that the electric motor will automatically switch off if the trigger switch is not operated for approximately 25 seconds. The Hydrapac will automatically start up on depression of the tool trigger switch.

Preparation for Use

- Attach the proper nose assembly to tool per instructions on the nose assembly data sheet.
- Ensure the Hydrapac is not running.
- Connect hoses and the control cord to the Hydrapac.
- Start the Hydrapac. Depress and release the trigger switch a few times to almost the full stroke of the tool to circulate hydraulic fluid. Observe action of tool. Check for fluid leaks and ensure that in the idler mode the piston is in the fully forward position.

Operating Instructions

To install a Hydraloc Fastener

- Check work and remove excessive gap. (Gap is the space between components of the Joint. Gap is excessive if not enough pintail sticks through the collar for the nose assembly jaws to grab onto.)
- Put Hydraloc pin into hole.
- Slide Hydraloc collar over pin. (The bevelled end of the collar must be towards the nose assembly and tool.)
- Push nose assembly onto pin until the nose assembly anvil stops against the collar. Tool and nose assembly must be held at right angles (90°) to the work.
- Depress tool trigger switch to start installation cycle.
- When the forward motion of the nose assembly anvil stops and the pintail breaks off, release the switch. The tool will go into its return stroke and push off the installed fastener. At the end of the return stroke the jaws will release the expended pintail which can be removed by tilting the tool down.
- Once the expended pintail has been ejected, the tool and nose assembly is ready for the next installation cycle.

CAUTION
DO NOT ATTEMPT TO BREAK OFF A PINTAIL WITHOUT THE INSTALLATION OF A COLLAR AS THIS WILL CAUSE THE UNSECURED PORTION OF THE HYDRALOC PIN TO EJECT FROM THE NOSE AT A HIGH SPEED AND FORCE.

IMPORTANT
Nose assembly parts must be assembled clean and dry. Do Not lubricate with oil or grease.

Fitting Instructions

N50 for No. 25 (1") Fasteners

Ensure the installation tool piston rod is in the fully forward position.

Assemble the end cap, cushion, follower and jaws by "stacking" vertically in that order.

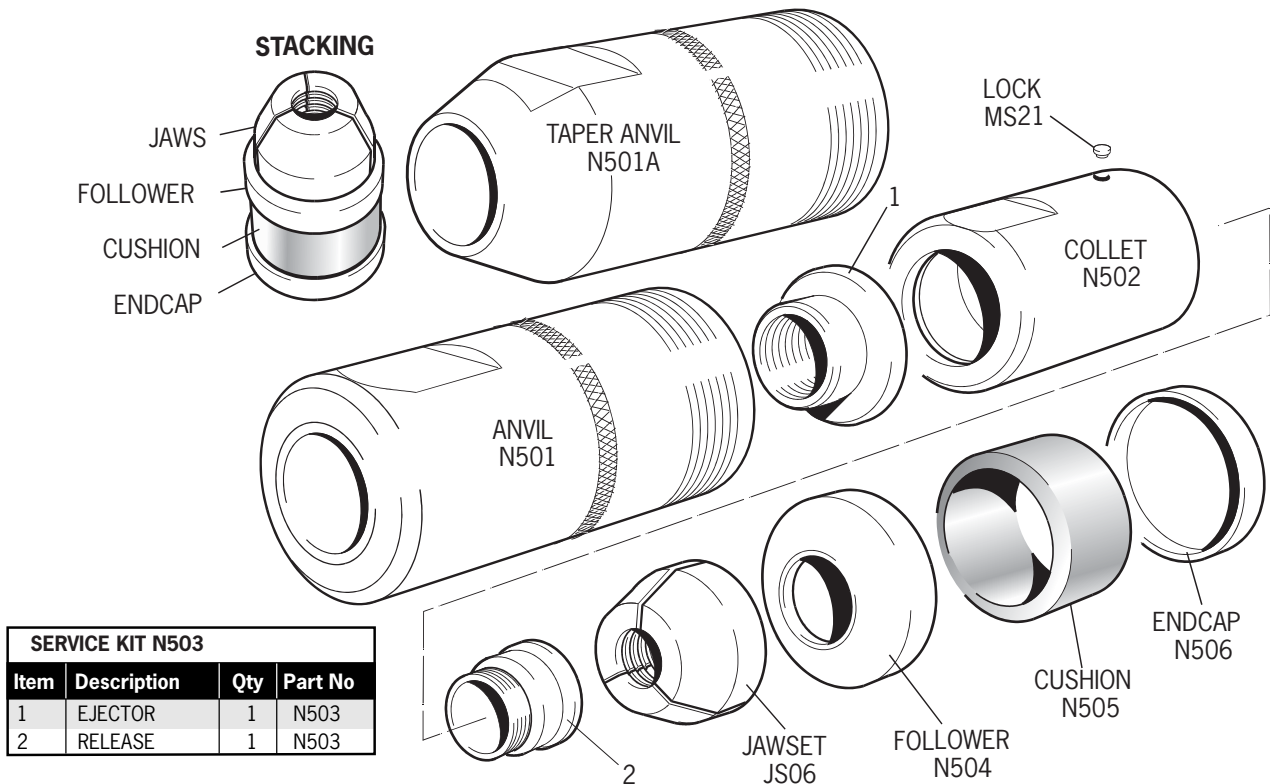
Place the collet over the stack, slide to the end of the bench or table and with a finger, push the stack to the front of the collet.

With the tool in the vertical position, screw the collet onto the piston rod until it is flush with the end of the collet adaptor. Rotate the collet in either direction until the collet lock situated in the side of the collet slots into the nearest groove on the collet adaptor. The lock should be flush with the exterior of the collet.

Slide the anvil over the collet and screw into the anvil adaptor until it is firm.

Note: There is a locking 'O' Ring which will create a resistance to the final few turns of the anvil. It is imperative that the anvil be hand tightened up against the rear locking face.

Correct installation of the nose assembly can be gauged by the free movement of the correct size pintail through the assembled jaws in the nose.



Dismantling the Nose Assembly

- Unscrew the anvil.
- Unscrew the collet.
- Remove the components.
- Clean and check all components in particular the jaw set.

IMPORTANT
Nose assembly parts must be assembled clean and dry. Do Not lubricate with oil or grease.

Fitting Instructions

N52 for No. 28 (1 1/8") Fasteners

Ensure the installation tool piston rod is in the fully forward position.

Assemble the end cap, cushion, follower and jaws by "stacking" vertically in that order.

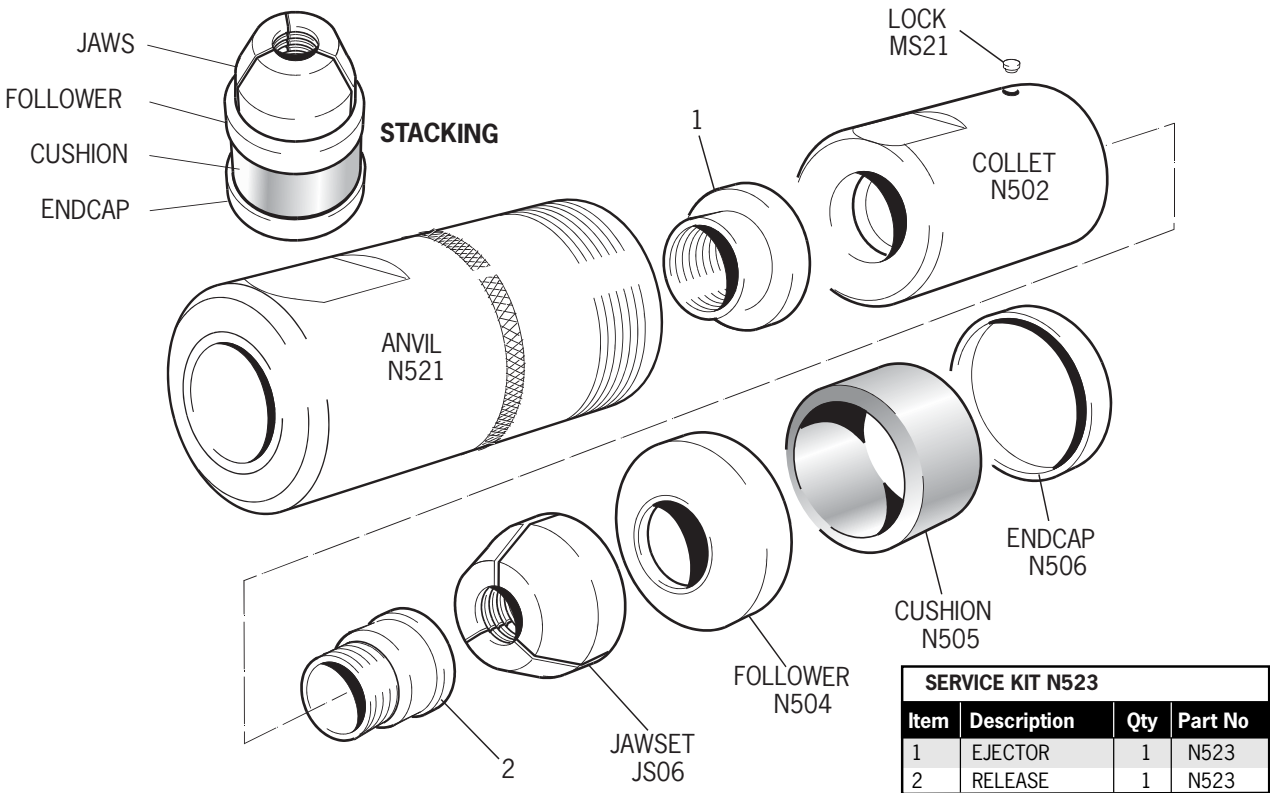
Place the collet over the stack, slide to the end of the bench or table and with a finger, push the stack to the front of the collet.

With the tool in the vertical position, screw the collet onto the piston rod until it is flush with the end of the collet adaptor. Rotate the collet in either direction until the collet lock situated in the side of the collet slots into the nearest groove on the collet adaptor. The lock should be flush with the exterior of the collet.

Slide the anvil over the collet and screw into the anvil adaptor until it is firm.

Note: There is a locking 'O' Ring which will create a resistance to the final few turns of the anvil. It is imperative that the anvil be hand tightened up against the rear locking face.

Correct installation of the nose assembly can be gauged by the free movement of the correct size pintail through the assembled jaws in the nose.



Dismantling the Nose Assembly

- Unscrew the anvil.
- Unscrew the collet.
- Remove the components.
- Clean and check all components in particular the jaw set.

IMPORTANT
Nose assembly parts must be assembled clean and dry. Do Not lubricate with oil or grease.

Fitting Instructions

N53 for No. 22 (7/8") Fasteners

Ensure the installation tool piston rod is in the fully forward position.

Assemble the end cap, cushion, follower and jaws by "stacking" vertically in that order.

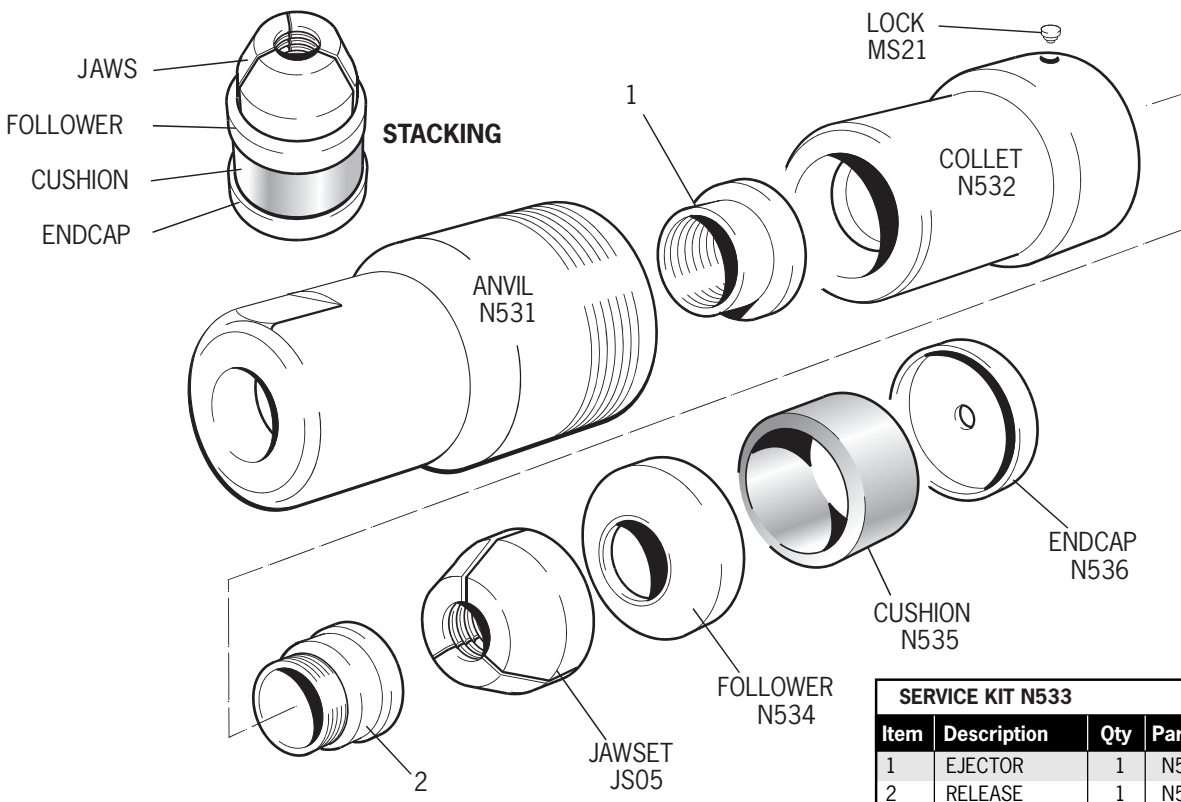
Place the collet over the stack, slide to the end of the bench or table and with a finger, push the stack to the front of the collet.

With the tool in the vertical position, screw the collet onto the piston rod until it is flush with the end of the collet adaptor. Rotate the collet in either direction until the collet lock situated in the side of the collet slots into the nearest groove on the collet adaptor. The lock should be flush with the exterior of the collet.

Slide the anvil over the collet and screw into the anvil adaptor until it is firm.

Note: There is a locking 'O' Ring which will create a resistance to the final few turns of the anvil. It is imperative that the anvil be hand tightened up against the rear locking face.

Correct installation of the nose assembly can be gauged by the free movement of the correct size pintail through the assembled jaws in the nose.



Dismantling the Nose Assembly

- Unscrew the anvil.
- Unscrew the collet.
- Remove the components.
- Clean and check all components in particular the jaw set.

Maintenance

Dismantling Instructions

IMPORTANT

Be sure the Hydrpac is turned off before removing tool or nose.

- Uncouple the two Hydraulic Hoses **27** and disconnect the Control Cord **25**.
- Unscrew and remove the Anvil by hand.
- Unscrew the Collet and remove the inner assembly by hand.
- Loosen the Grub Screw **18** using a 5 mm Allen Key.
- Unscrew the Anvil Retainer **2**.
- Place a tray under tool to catch the oil.
- If a hand pump is available, connect to female coupling and slowly pump Piston **13** out of Cylinder **19**.
- Otherwise clamp the Piston **13** in a soft jawed vice and tap the Cylinder **19** backwards with a soft mallet.
- Remove the Brass Plug **8** by inserting a sharp object (eg a small screwdriver) into the keyway and levering out the Plug.
- Unscrew the Collet Adaptor **9** (the Nylon Plug **8** will shear).
- Remove the Gland **5**.
- Inspect and replace 'O' Rings and Back-up Rings if necessary (Service Kit **29**).
- Remove the Ejector Pin **14** by pushing it out of the back of the Piston **13**.
- Unscrew the Screw **10** in front of the Piston **13** using a 6 mm Allen Key and remove Back-up Ring **11** and 'O' Ring **12**.

Item numbers in **bold** refer to the general assembly drawing and parts list on pages 12-13.

Maintenance

Assembling the Tool

Examine and replace all worn parts. Fit a new Service Kit **29**.

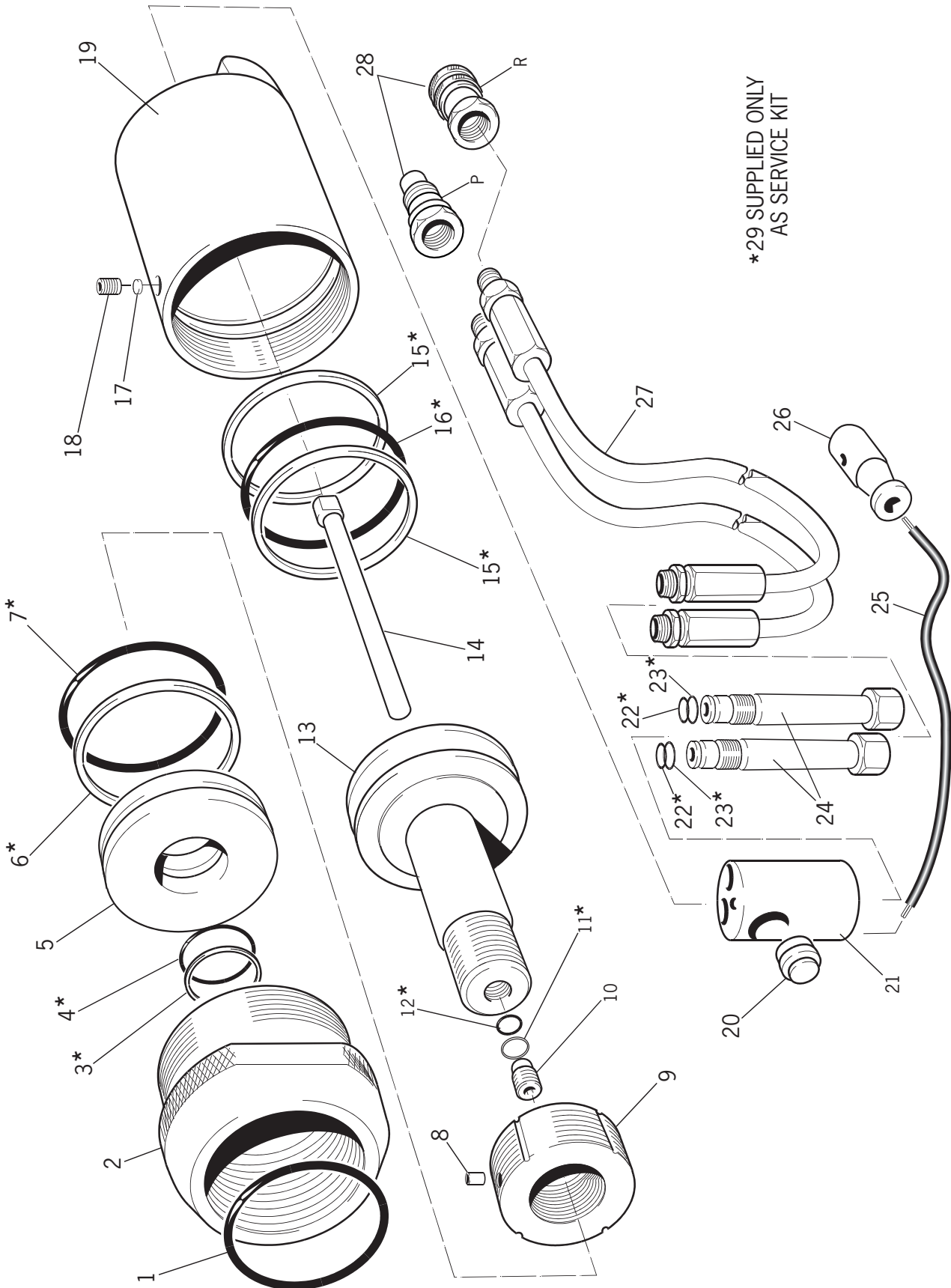
- Apply hydraulic oil to all 'O' rings, back-up rings and contact surfaces before fitting.
- Fit new 'O' Rings **4, 7** and Back-up Rings **3, 6** to the Gland **5**.
- Fit 'O' Ring **16** and Back-up Rings **15** to Piston **13**.
- Fit new 'O' Ring **12** and Back-up Ring **11** into the Piston **13** and secure with the Screw **10** using a 6 mm Allen Key.
- Insert the Ejector Pin **14** into the Piston **13** ensuring it protrudes at the front of the piston.
- Install the Piston **13** into the Cylinder **19**.
- Install the Gland **5**.
- Install the Anvil Retainer **2**.
- Re-clamp the Grub Screw **18** using a 5 mm Allen Key.
- Refit the Collet Adaptor **9**.
- Align the hole with the Keyway.
- Insert the Nylon/Brass Plug **8**.
- Bleed the Tool.

To Bleed the Tool:

- Couple the short Tool Hoses directly onto a Hydrapac or compatible Hydraulic Power Source.
Note: Do not use long extension Hoses as these will prevent the air from escaping into the Hydrapac.
- Plug in a Hydrapac Test Trigger.
- Position the Tool so that the Piston Rod side faces vertically up.
- Cycle a few times.
- Reverse the vertical position and cycle again.

Item numbers in **bold** refer to the general assembly drawing and parts list on pages 12-13.

General Assembly of T51 Installation Tool



Parts List for T51 Installation Tool

T51 INSTALLATION TOOL PARTS LIST				
ITEM	PART N°	DESCRIPTION	QTY	SERVICE KIT
1	R236	'O' RING	1	*
2	T514	ANVIL RETAINER	1	
3	B222	BACK-UP RING	1	*
4	R341	'O' RING	1	*
5	T513	GLAND	1	
6	B240	BACK-UP RING	2	*
7	R240	'O' RING	1	*
8	M522	NYLON/BRASS PLUG	1	
9	T517	COLLET ADAPTOR	1	
10	T519	SCREW	1	
11	I010	BACK-UP RING	1	*
12	R010	'O' RING	1	*
13	T512	PISTON	1	
14	T518	EJECTOR PIN	1	
15	B341	BACK-UP RING	2	*
16	R341	'O' RING	1	*
17	MS10	PAD	1	
18	GS29	GRUB SCREW	1	
19	T511	CYLINDER	1	
20	I11142	TRIGGER SWITCH	1	
21	T516	HANDLE	1	
22	R012	'O' RING	2	*
23	B341	BACK-UP RING	2	*
24	T515	HANDLE STEM	2	
25	C106	CONTROL CORD	1	
26	C112	MALE PLUG	1	
27	HS02	HYDRAULIC HOSE	2	
28	HS01	QUICK COUPLER SET	1	
29	SK51	SERVICE KIT	1	*

* 'O' Rings and Back-up Rings only supplied in Service Kit SK51

Servicing the Tool

Daily

- Check for oil leaks.
- Check the stroke of tool.
- Check for worn anvil indicated by score marks on the installed collar. This can also be confirmed by referring to the installed data in the fastener catalogue. Excessive wear can cause the anvil to rupture.
- Check function of pull pressure safety valve.

Weekly

- Dismantle and clean the nose assembly especially the jaws.
- Check for oil leaks.

Every 1200 working hours (at least once a year)

The tool should be completely dismantled and worn components replaced including 'O' rings and back-up rings.

Service Tools

- Open Ended Flat Spanners - 17, 19, 24
- Allen Keys - 5 mm, 6 mm
- 150 mm Engineers Vice with Jaw Guards
- Hydraulic Hand Pump if Available

Hydraulic Oil General Safety Data

First Aid

SKIN:

Under normal conditions skin irritation will not occur, contaminated skin should however be washed thoroughly with soap and water. Launder contaminated clothing.

ORAL:

If swallowed and person is conscious give water or milk. Do not induce vomiting unless on advice of medical personnel. Take person to nearest medical centre.

EYES:

Flush immediately with water for several minutes

DISPOSAL:

Remove all spills with inert absorbent material. Ventilate spill area. Place contaminated materials in a disposable container and dispose in a manner consistent with local regulations.

Fire

FLASH POINT: 200°C.

Extinguish with either dry chemical, foam or carbon dioxide. Do not enter confined space without self contained breathing apparatus.

Handling

Use barrier cream or oil resistant gloves.

Storage

Undercover and consistent with local regulations for inflammable material.

Fault Diagnosis

Symptom	Possible Cause	Remedy	Page Ref
Tool fails to operate	Inoperative Hydrapac	Check power supply to Hydrapac	
	Loose or disconnected control cord	Check for loose or broken wires	
	Defective switch assembly	Replace switch assembly	
	Faulty hydraulic hose couplings	Replace faulty couplings	
Tool leaks hydraulic oil	Depending on what leaks occur, defective or worn 'O' rings, loose hydraulic hose connections at tool	Check and replace 'O' rings and back-up rings, or tighten hydraulic hose	
Hydraulic oil overheats	Restriction in hydraulic line	Check couplings and replace if necessary	
1			
Tool operates erratically and fails to install fastener properly	Low or erratic hydraulic pressure supply	See Hydrapac instruction manual	
	Defective or excessively worn piston, 'O' ring and back-up rings and back-up rings in tool	Replace 'O' ring and back-up rings	
	Excessive wear or scoring of sliding surface of tool parts	Check and replace defective parts	
2			
Pull grooves on fastener pintail stripped during pull stroke	Operator not pushing nose completely onto fastener pintail before operating tool	Instruct operator in proper installation methods	
	Incorrect fastener length	Use correct length fastener	
	Worn or damaged jaw segments	Check and replace jaw set	
	Metal chips accumulated in pull grooves of jaw segments	Clean jaw segments	
	Excessive sheet gap	Eliminate excessive gap	
Collar of Hydraloc fastener not completely swaged	Improper tool operation	See 2	
	Worn anvil in nose	Check and replace anvil	
Tool "hang up" on swaged collar	Improper tool operation	See 1	
	Hydrapac in idler mode	Switch Hydrapac off and on and restart by depressing trigger switch	
Pintail of fastener fails to break	Pull grooves on fastener stripped	See 2	
	Improper tool operation	Instruct operator in correct tool operation	

continued overleaf

Fault Diagnosis

Symptom	Possible Cause	Remedy	Page Ref
Jaw segments do not maintain proper position in collet	Improper operation of jaw follower	Check internal parts of the collet for wear i.e. jaws, follower, cushion and end cap. Clean before reassembling	
Hydraulic couplers leak oil	Defective or worn 'O' ring in coupler body	Replace 'O' ring and back-up ring	
Pintail fails to release	Incorrect assembly of Nose	See Instructions pages	7, 8, or 9

Notes

Notes

Declaration of Conformity

We, Avdel UK Limited, Watchmead Industrial Estate, Welwyn Garden City, Herts, AL7 1LY
declare under our sole responsibility that the product:

Model: T51

Serial No.

to which this declaration relates is in conformity with the following standards:

EN ISO 12100 - parts 1 & 2

BS EN ISO 8662 - part 6

BS EN ISO 3744

ISO EN 792 part 13 - 2000

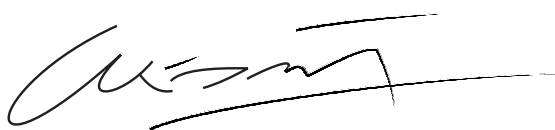
BS EN ISO 11202

BS EN 982

BS EN 983

following the provisions of the Machine Directive 89/392/EC

(as amended by Directive 91/368/EC, 93/44/EC as superceded by 98/37/EC and 93/68/EC)



A. Seewraj - Product Engineering Manager - Automation Tools

Date of issue



**This box contains a power tool which is in
conformity with Machines Directive
89/392/EEC. The 'Declaration of Conformity'
is contained within.**



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