



TVS STANDARD 1B, 2B, 2BPG & 3BPG NEEDLE SCALERS



OPERATION & MAINTENANCE



OPERATION

General Information

Before operating, performing maintenance or repairing the TVS Needle Scaler this manual must be read and understood by the operator, if in any doubt, ask your supervisor before using this equipment.

Local safety regulations must be followed at all times. Failure to follow these instructions could result in damage to the Scaler and/or personal injury.

Trelawny SPT Limited disclaims all responsibility for damage to persons or objects arising as a consequence of incorrect handling of the tool, failure to inspect the tool for damage or other faults that may influence the operation prior to starting work, or failure to follow the safety regulations listed or applicable to the job site.

The tool is primarily designed for the removal & containment at source, paint, heavy rust, and scale; it can also be used for the removal of laitance from concrete. It can be used both indoors and out.

This tool must not be used in a fixture.

Air Supply

The compressed air must be free from water and dirt. The installation of a filter/regulator/lubricator air preparation set (with moisture trap) adjacent to the tool is **strongly recommended**.

Always clear the air hose before connecting to the tool. Ensure that no moisture (condensation) is present in the air hose.

Ensure that a minimum 10mm (3/8") bore air hose is used and that all couplings are secure, leak free and in good condition.

Limit the length of air hose to 10M (33ft). Where extra length is necessary, for each additional 15M (50ft) of air hose used, the pressure drop is approximately 0.21bar (3psi).

For safe and efficient operation the correct operating pressure is 6.2bar (90 psi).

Do not let the operating pressure fall below 5.5bar (80p.s.i.) or rise above 6.9bar (100 psi) absolute maximum.

Preferably, the compressor should be able to supply a minimum of 4.7 L/s (10 cfm) free air delivery.

In particularly cold weather it is recommended that a proprietary anti-freeze lubricating oil is used.

Lubrication

Oil the tool daily before use. Put a few drops of one of the following zinc free air tool lubricants through the air inlet.

SHELL S22 or R10
CASTROL Hyspin ZZ32

See also the section on AIR SUPPLY for further information and recommendations.

Safety

Always, read through these instructions first before use.

Do-

Be aware that this tool is not electrically insulated.

Wear Personal Protective Equipment including safety goggles, footwear, ear defenders and gloves. In some environments it will be necessary to wear

facemasks or breathing apparatus.

Be aware that this tool can create dust and flying debris.

Keep hands and clothing away from moving parts.

Store this tool in a secure and dry environment.

Be aware of others working around you.

Ensure that this tool is lubricated daily.

Always observe safe-working practices at all times.

Do not-

Allow the tool to run unattended.

Modify this tool in any way, as this will invalidate the warranty and could lead to serious injury.

Allow the tool to run continuously whilst not in contact with the surface being prepared.

Use the tool if you become tired, this can lead to physical strain or injuries; where practical; use a spring balance to take the weight of the tool.

Hold the exposed needles, whilst the tool is in use, this could cause vibration damage to the hands.

Use this tool in potentially explosive environments.

Drag this tool by the air hose.

Use petrol (gasoline), thinners or any other high flash point solvent to clean the tool.

Please note: Unrestrained hoses can whip dangerously if they become detached.

Care must be taken to avoid damaging or tripping over the trailing air hose.

Risk of Hand-arm Vibration injury

These tools may cause Hand-arm Vibration Syndrome injury if their use is not adequately managed.

We advise you to carry out a risk assessment and to implement measures such as; limiting exposure time [i.e. actual trigger time, not total time at work], job rotation, ensuring the tools are used correctly, ensuring the tools are maintained according to our recommendations, and ensuring that the operators wear personal protective equipment [PPE] particularly gloves and clothing to keep them warm and dry.

Employers should consider setting up a programme of health surveillance to establish a benchmark for each operator and to detect early symptoms of vibration injury.

We are not aware of any PPE that provides protection against vibration injury by attenuating vibration emissions.

See 'Specifications' section for vibration emission data.

Further advice is available from our Technical Department.

We strongly advise you to visit the Health & Safety Executive website <http://www.hse.gov.uk/vibration> This site provides excellent advice and information on HAV and it includes a Hand-arm Vibration Exposure Calculator that is easy to use to work out the daily vibration exposure for each of your operators.

Starting work

Please note:

The carbon steel needles provided with these tools are not intended for use in a potentially explosive atmosphere.

Prior to operating the tool check: -

That all fittings are secure, free from leaks and air hoses are in good condition.

That the air pressure is correct for this tool 6.2 bar (90 p.s.i.).

Put a few drops of a recommended lubricant into the air inlet of the tool.

To operate the tool, which is dependant on the type of lever fitted, for those fitted with a safety lever, first push thumb button forwards and then for both styles of lever, pull the lever towards the hand grip to start the tool, then apply the Chisel or Needles to the surface being prepared.

Note: Several types of Chisel are available for the Chisel Scaler to suit the job in hand.

To switch off, simply release the throttle lever.

It is advisable that gloves and personal protective equipment be worn when using this tool.

(See previous section on Risk of Vibration Injury).

Take care to avoid tripping over or damaging the air hose.

Safe use of this tool requires a solid stance and secure foothold, the tool may be used in other postures but care must be taken to ensure the operator adopts a firm and stable position.

Maintain contact with the work surface with sufficient pressure to keep the tool from bouncing off the surface.

Handled correctly Trelawny Needle/Chisel Scalers will work quickly and efficiently.

Excessive operator pressure will not improve the tools efficiency but could cause premature tool failure and increase operator fatigue.

It could also increase the vibration emission level.

MAINTENANCE

Never allow the tool to run continuously whilst not in contact with the surface being prepared.

Maintenance

Only a competent person, in a suitably equipped workshop, must carry out maintenance.

Disconnect the tool from the air supply before carrying out any maintenance or any of the operations in the next sections.

Clean all debris from the exterior of the tool.

For safe efficient running and at intervals of no more than 100hrs or if operation becomes sluggish, dismantle and clean with highly refined paraffin. Immediately after cleaning, thoroughly oil the tool with one of the recommended lubricants.

Changing Needles

Before changing or replacing needles, disconnect the air supply to the tool. Loosen the Cap Head Screw (30) on the Intermediate Tube (28) and remove the Tube Assembly, taking care not to allow the internal components to fall out.

Please note:

Take note when disassembling how all the parts inside the Intermediate Tube (28) fit together as wrong assembly will result in damage to the tool.

Remove the Needle Holder (25) and Anvil (24) as an assembly from the Intermediate Tube, check that the Return Spring (27) fitted inside the Intermediate Tube is in good condition.

Remove the Needles from the Needle Holder and replace with new Needles as per the illustration.

On assembly ensure that the small diameter of the Anvil (24) fits inside the Needle Holder (25).

Place the Return Spring over the Needles and fit the assembly into the Intermediate Tube.

Fully screw/push the Tube Assembly onto the Body/Cover.

Note: The 2BPG has a grip thread.

Position the boss underneath and tighten the Allen Screw (30).

As the Needles wear, adjust the Vacuum Tube by loosening the Allen Screw and adjusting the Tube so that when the tool is running approximately 10 - 20mm of Needle protrudes from the Front Vacuum Cuff and then retighten the Allen Screw.

Pointed tip needles

Sharpened to a nail point, these are most effective in breaking through very hard scale on surfaces where some surface indentation is permissible - or where keying (i.e. profile) of the surface is desirable.

Pointed tip needles are available in 3mm and 4mm only.

Chisel tip needles

These are general purpose needles, flattened to a chisel like blade and are most effective in the removal of thicker material, while leaving a less pitted surface than the Pointed tip needles but still giving some surface indentation (i.e. profile).

Chisel tip needles are available in 3mm only.

Flat tip needles

Machined to a flat tip, these needles will leave slight marking (i.e. profile) on the surface; the 2mm needles can have a burnishing effect. 2mm Needles are recommended for use on thin gauge metals and any surface where light treatment is desired.

Flat tip needles are available in three sizes - 2mm, 3mm and 4mm.

SEE SPECIFICATION SECTION FOR QUANTITIES.

Fitting the Chisel Holder

(Non TVS)

Before fitting the Chisel Holder (31), disconnect the tool from the air supply, slacken the pinch bolt on the Needle Holder Assembly and remove the assembly, taking care not to allow the internal components to fall out.

To fit the Chisel Holder (31) ensure that the pinch bolt (30) on the Chisel Holder (31) is loose, screw the Chisel Holder (31) fully on to the Cylinder (10) or Body (13).

Then unscrew to position the boss underneath.

Turn the knurled collar on the Chisel Holder (31) until the retaining ball is fully visible; insert the Chisel (32) aligning the rebate with the ball.

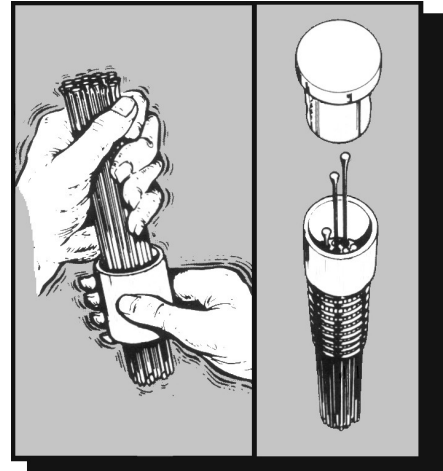
Position the midpoint of the rebate on the shank of the Chisel (32) with the retaining ball and turn the collar half a turn to lock the Chisel (32) in place.

Tighten the pinch bolt (30) using a 6mm AF Allen key. To release the Chisel (32), rotate the knurled collar until the retaining ball is fully visible and remove the Chisel (32).

Fitting of the Needle Scaler Attachment

Before fitting the Needle Scaler Attachment, disconnect the air supply from the tool, slacken the pinch bolt on the Chisel Holder and remove Chisel Holder.

Assemble the component parts of the Needle Scaler attachment in the following order; insert the Needles (26) into the Needle Holder (25),



Hold the needles loosely and shake the holder, needles will fall into location holes

The correct position of parts when changing needles

place the Spring (27) over the Needles, insert the Anvil (24), small diameter first, into the Needle Holder (25), then place the assembly into the Intermediate Tube (28).

Check the service layout for clarification. Screw the assembly fully onto the Cylinder (10) or Body (13) and tighten the pinch bolt (30) using a 6mm AF Allen key.

Slide the Front Tube (29) on to the Intermediate Tube (28) until approximately 25mm (1") of Needle protrudes from the Front Tube (29). Tighten the pinch bolt (30) using a 6mm AF Allen key.

Dismantling

Remove all deposits from outside of the Needle/Chisel Scaler and disconnect the tool from the air hose.

Slacken the pinch bolt on the Needle Holder Assembly or Chisel Holder and carefully unscrew from the Body/Cylinder.

Take care not to allow the internal components to fall out of the Needle Holder Assembly.

All Valve Body Servicing

Clamp the Valve Body (6) firmly in a vice, using the flats provided, and with the Throttle Lever (7) upper most.

Using a 3mm diameter pin or punch and small hammer, remove the Throttle Lever Roll Pin (8), and remove the Throttle Lever (7).

Rotate the Valve Body (6) 180 degrees in the vice to gain access the Valve Cap (1). Unscrew the Valve Cap (1) using a screwdriver, check the Valve Cap O' Ring (2) for signs of deterioration, remove the Spring (3), push out the Valve Stem (4) and remove the valve seat O' Ring (5).

Check the Valve Stem (4) and O' Ring (5) for wear.

Piston and Cylinder removal

To remove the Piston (9) or Cylinder from each of the three styles of Needle/Chisel Scaler, refer to the specific instructions below.

SERVICING

Hold the Cylinder (10) firmly in a vice, using the flats provided and with the Valve Assembly uppermost, unscrew the cover (14) from the cylinder (10).

The Cylinder (10) has been secured with a retaining compound and may require a sharp blow on the handle using a rubber mallet to break this bond.

Remove the two O'Ring seals (11) and (12) and the Piston (9).

Inspect all components for signs of wear, particularly the small bore of the Cylinder, replace components as necessary.

Assembly

Before any assembly takes place, ensure all parts are clean and are coated in a thin film of recommended air tool lubricant.

It is strongly recommended that all the O' Rings and any other worn parts that show signs of wear be replaced using only genuine Trelawny spares.

All Valve Body Assemblies

Clamp the Valve Body firmly in a vice, using the flats provided, and with the threaded hole uppermost.

Insert the valve seat O' Ring (5) into Valve Body (6), followed by the Valve Stem (4), Spring (3), then the Valve Cap (1) complete with its O' Ring (2), tighten the Valve Cap (1) with a screwdriver.

Rotate assembly 180 degrees in the vice.

Using a 3mm diameter pin punch locate and align the Throttle Lever (7) in position, then drive in the Throttle Lever Roll Pin (8) into the pin location.

Piston and Cylinder Assembly

To assemble the Scaler with a new Piston (9) or Cylinder (10), refer to the specific instruction for each style.

Fit two new O'Rings (11) and (12) onto the Cylinder (10).

Insert the Piston (9), small diameter first into the bore.

With clean, dry and oil free threads apply a bead of Loctite 243 or similar adhesive to the central portion of the Cylinder (10) threads.

Screw the Cylinder (10) fully into the Cover Assembly (14) by hand.

Then holding the Cylinder in a vice using the flats provided, tighten fully by hand, then, using a rubber mallet, tap lightly on the handle until tightened fully.

Noise and Vibration

UK employers should be aware of their duties under the Health & Safety at Work Act 1974 and the guidance given regarding hand arm vibration in the H.S.E. publication "Control the risks from hand-arm vibration" INDG175 (rev2).

(Single copies are available F.O.C. See H.S.E. web site www.hse.gov.uk)

Employers in the rest of the world should be aware of their duties and responsibilities as specified in local regulations.

The employer is responsible for assessing the risk to the employee under actual working conditions.

Noise level measured in accordance with EN ISO 15744: 1999

Risk of Hand Arm Injury

Because of various factors, the range of vibration emission during intended use of these tools are expected to be between 15m/s² and 47m/s² dependent on the tool purchased. The vibration is dependent on the task, the operators grip, and feed force employed etc.

Vibration measured in accordance with:-

EN ISO 28927 and EN ISO 20643

Declared vibration emission values were obtained under laboratory conditions in compliance with the above stated standards and do not necessarily represent values obtained in service.

Disposal

When the tool and its accessories are taken out of service for disposal, it is recommended that:-

They are rendered unusable to prevent improper re-use. They are dismantled into component form, segregated according to material composition and disposed of using waste recycling processes specified by local regulations.

Note:

Flammable material such as plastic, rubber or composite materials must NOT be incinerated but should be subject to normal industrial waste disposal processes.

Machinery Directive Information

This tool has been designed and produced in accordance with the following directive:

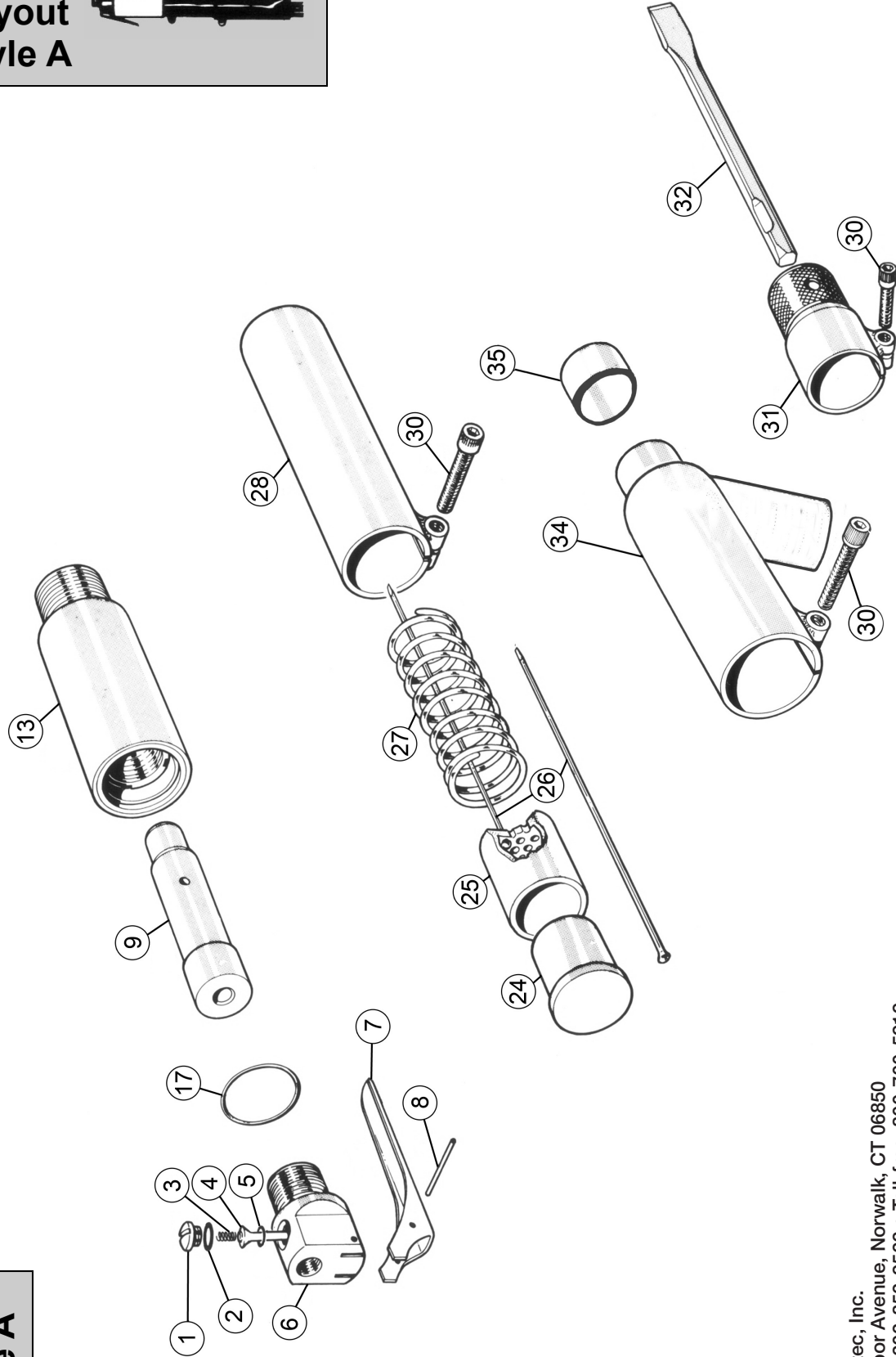
2006/42/EC Machinery Directive

and applicable harmonised standard:
EN ISO 1 1148-4:2010

EXPLODED VIEW

1B & 2B TVS ONLY INLINE NEEDLE SCALER

Service
Layout
Style A



Service
Layout
Style A

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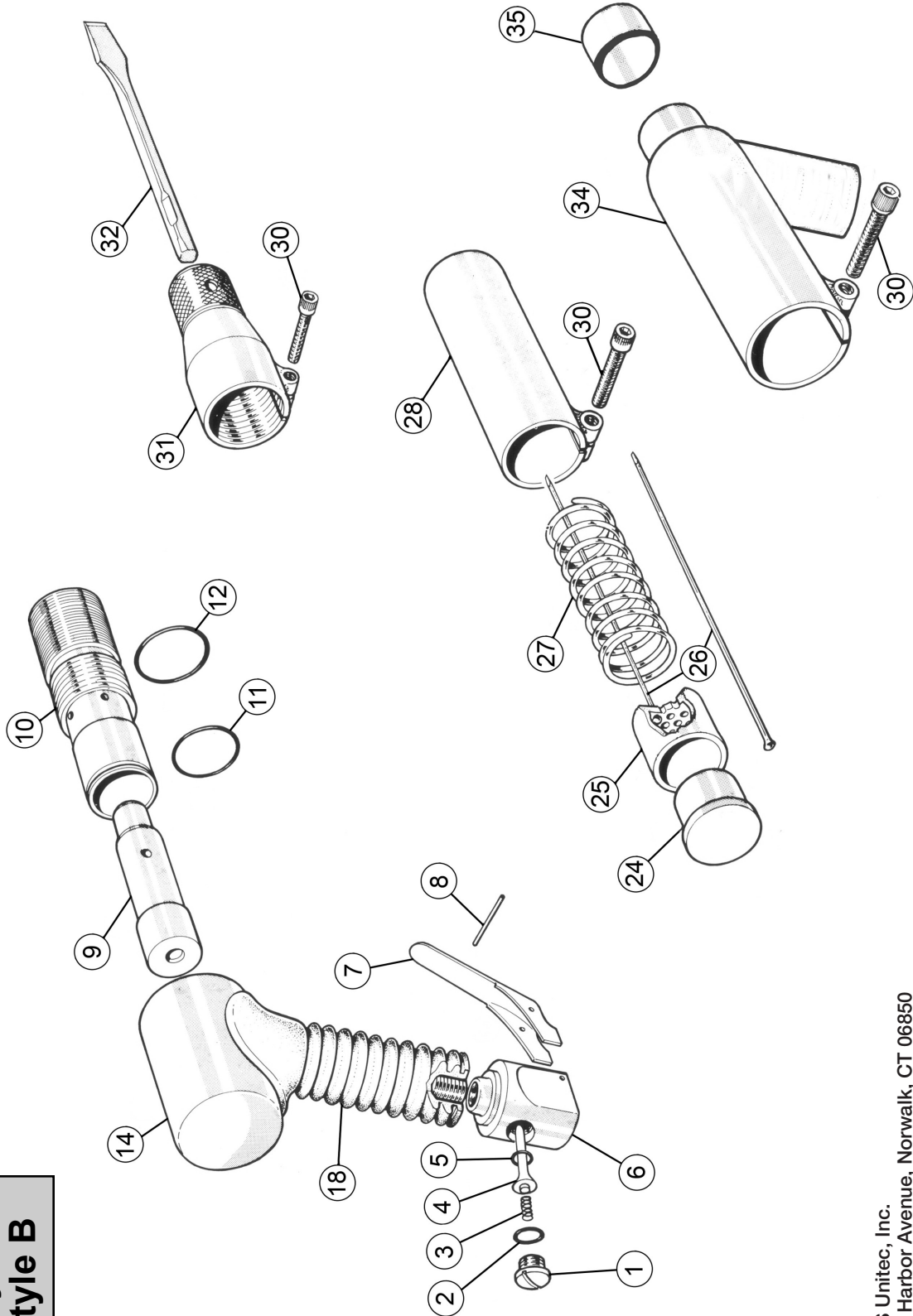
1B & 2B TVS PARTS LIST

Item	Part No	Description	Item	Part No	Description
Common Components			27	712.1001	Spring - Compression
1	615.3021	Valve Cap	28	416.1092	Intermediate Tube (Includes item 30)
2	809.0139	O' Ring – Valve Cap	30	806.0825	Cap Head Screw
3	712.3022	Valve Spring	31	419.1241	Chisel Holder 1/2" Square
4	618.3022	Valve Stem	34	418.1199	Vacuum Take-off
5	809.0089	O' Ring – Valve Seat	35	731.1103	Flat Cuff
8	813.0108	Roll Pin		731.1101	Corner Cuff
26	442.1107	Pack of 2000 2mm Needles (Flat Tip)		446.1010	Service Kit (Inc. 9,17,24,25,27 & 1 Set Needles)
	452.1110	Pack of 100 2mm Needles (Flat Tip)			
	443.2107	Pack of 1000 3mm Needles (Chisel Tip)			
	443.1107	Pack of 1000 3mm Needles (Flat Tip)			
	443.3107	Pack of 1000 3mm Needles (Pointed Tip)	2B TVS Unique Components		
	443.1307	Pack of 500 3mm Needles (Beryllium Copper)	6	423.2021	Valve Body (inc 1-8) 1/4" BSP Thread
	453.2110	Pack of 100 3mm Needles (Chisel Tip)	7	716.3000	Throttle Lever
	453.1110	Pack of 100 3mm Needles (Flat Tip)	9	612.2001	Piston
	453.3110	Pack of 100 3mm Needles (Pointed Tip)	13	411.2002	Body
	453.1310	Pack of 100 3mm Needles (Beryllium Copper)	17	809.5179	O'Ring
	444.2107	Pack of 500 4mm Needles (Chisel Tip)	24	610.2091	Anvil
	444.1107	Pack of 500 4mm Needles (Flat Tip)	25	601.2093	Needle Holder 3mm
	444.3107	Pack of 500 4mm Needles (Pointed Tip)		601.2092	Needle Holder 2mm
	454.2105	Pack of 50 4mm Needles (Chisel Tip)	26	412.1151	6 x Needle Sets 2mm (Flat Tip)
	454.1105	Pack of 50 4mm Needles (Flat Tip)		413.2119	6 x Needle Sets 3mm (Chisel Tip)
	454.3105	Pack of 50 4mm Needles (Pointed Tip)		413.1119	6 x Needle Sets 3mm (Flat Tip)
32	704.1101	Chisel 1/2" Square 7" Long x 3/4" Blade		413.3119	6 x Needle Sets 3mm (Pointed Tip)
	704.1103	Chisel 1/2" Square 7" Long x 2 3/4" Blade		403.1319	1 x Needle Set 3mm (Beryllium Copper - Flat Tip)
	704.1106	Chisel 1/2" Square Brick Rake	27	712.2001	Spring - Compression
	704.1110	Chisel 1/2" Square 7" Long Spark Resistant 2 " Blade	28	416.2099	Intermediate Tube (Includes item 30)
	704.2105	Chisel 1/2" Square 7" Long Cranked x 1 3/8" Blade	30	806.0830	Cap Head Screw
			31	419.2241	Chisel Holder 1/2" Square
1B TVS Unique Components			34	418.2199	Vacuum Take-off
6	423.1021	Valve Body (inc 1-8) 1/4" BSP Thread	35	731.2103	Flat Cuff
7	716.3021	Throttle Lever		731.2101	Corner Cuff
9	612.1001	Piston		446.1020	Service Kit (Inc. 9,17,24,25,27 & 1 Set Needles)
13	411.1002	Body			
17	809.0249	O'Ring			
24	610.1091	Anvil			
25	601.1093	Needle Holder 3mm			
	601.1092	Needle Holder 2mm		Extras	
26	412.1129	6 x Needle Sets 2mm (Flat Tip)		719.1000	3/8" Bore Hose 10 Metre
	413.2112	6 x Needle Sets 3mm (Chisel Tip)		719.3000	3/8" Bore Hose 30 Metre
	413.1112	6 x Needle Sets 3mm (Flat Tip)		805.0601	6mm Allen Key for Caphead Screws
	413.3112	6 x Needle Sets 3mm (Pointed Tip)		819.2375	Adapter 1/4" BSP to 3/8" Hose Stem
	403.1312	1 x Needle Set 3mm (Beryllium Copper - Flat Tip)			

EXPLODED VIEW

2BPG & 3BPG TVS PISTOL GRIP NEEDLE SCALER

Service
Layout
Style B



Service
Layout
Style B

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2BPG & 3BPG TVS ONLY PARTS LIST

Item	Part No	Description	Item	Part No	Description
Common Components			27	712.2001	Spring - Compression
1	615.3021	Valve Cap	28	416.2099	Intermediate Tube TVS (Includes item 30)
2	809.0139	O' Ring – Valve Cap	30	806.0830	Cap Head Screw
3	712.3022	Valve Spring	31	419.2241	Chisel Holder 1/2" Square
4	618.3022	Valve Stem	34	418.2199	Vacuum Take-off
5	809.0089	O' Ring – Valve Seat	35	731.2103	Flat Cuff
6	616.3021	Valve Body 1/4" BSP Thread		731.2101	Corner Cuff
	423.3021	Valve Body Assembly (inc items 1-8) 1/4" BSP Thread		446.1025	Service Kit (Inc. 9,17,24,25,27 & 1 Set Needles)
7	716.3000	Throttle Lever			
8	813.0108	Roll Pin			
18	717.3101	Rubber Grip			
26	442.1107	Pack of 2000 2mm Needles (Flat Tip)	3BPG TVS Unique Components		
	452.1110	Pack of 100 2mm Needles (Flat Tip)	9	612.3001	Piston
	443.2107	Pack of 1000 3mm Needles (Chisel Tip)	10	613.3101	Cylinder
	443.1107	Pack of 1000 3mm Needles (Flat Tip)	11	809.0289	O'Ring (Small Dia)
	443.3107	Pack of 1000 3mm Needles (Pointed Tip)	12	809.0299	O'Ring (Large Dia)
	443.1307	Pack of 500 3mm Needles (Beryllium Copper)	13	425.3100	Cover
	453.2110	Pack of 100 3mm Needles (Chisel Tip)	24	610.3011	Anvil
	453.1110	Pack of 100 3mm Needles (Flat Tip)	25	601.3003	Needle Holder 3mm
	453.3110	Pack of 100 3mm Needles (Pointed Tip)		601.3002	Needle Holder 2mm
	453.1310	Pack of 100 3mm Needles (Beryllium Copper)	26	412.1165	6 x Needle Sets 2mm (Flat Tip)
	444.1107	Pack of 500 4mm Needles (Flat Tip)		413.2128	6 x Needle Sets 3mm (Chisel Tip)
	444.3107	Pack of 500 4mm Needles (Pointed Tip)		413.1128	6 x Needle Sets 3mm (Flat Tip)
	454.1105	Pack of 50 4mm Needles (Flat Tip)		413.3128	6 x Needle Sets 3mm (Pointed Tip)
	454.3105	Pack of 50 4mm Needles (Pointed Tip)		403.1328	1 x Needle Set 3mm (Beryllium Copper - Flat Tip)
32	704.1101	Chisel 1/2" Square 7" Long x 3/4" Blade	27	712.3001	Spring - Compression
	704.1103	Chisel 1/2" Square 7" Long x 2 3/4" Blade	28	416.3138	Intermediate Tube (Includes item 30)
	704.1106	Chisel 1/2" Square Brick Rake	30	806.0830	Cap Head Screw
	704.1110	Chisel 1/2" Square 7" Long Spark Resistant 2" Blade	31	419.3341	Chisel Holder 1/2" Square
	704.2105	Chisel 1/2" Square 7" Long Cranked x 1 3/8" Blade		419.3541	Chisel Holder 5/8" Hexagon
			34	418.3039	Vacuum Take-off
2BPG TVS Unique Components			35	731.3103	Flat Cuff
9	612.2001	Piston		731.3101	Corner Cuff
10	613.2101	Cylinder		446.1035	Service Kit (Inc. 9,17,24,25,27 & 1 Set Needles)
11	809.0249	O'Ring (Small Dia)			
12	809.0269	O'Ring (Large Dia)			
13	425.2100	Cover		Extras	
24	610.2091	Anvil		719.1000	3/8" Bore Hose 10 Metre
25	601.2093	Needle Holder 3mm		719.3000	3/8" Bore Hose 30 Metre
	601.2092	Needle Holder 2mm		805.0601	6mm Allen Key for Caphead Screws
26	412.1151	6 x Needle Sets 2mm (Flat Tip)		819.2375	Adapter 1/4" BSP to 3/8" Hose Stem
	413.2119	6 x Needle Sets 3mm (Chisel Tip)			
	413.1119	6 x Needle Sets 3mm (Flat Tip)			
	413.3119	6 x Needle Sets 3mm (Pointed Tip)			
	403.1319	1 x Needle Set 3mm (Beryllium Copper - Flat Tip)			

SPECIFICATION

Model Type		1B TVS ONLY	2B TVS ONLY	2BPG TVS ONLY	3BPG TVS ONLY
Piston Diameter		18mm (0.17")	23.5mm (0.925")	23.5mm (0.925")	28.6mm (1.125")
Piston Stroke		30.0mm (1.18")	35.6mm (1.4")	35.6mm (1.4")	39.0mm (1.535")
Blows per Minute		3800	3000	3000	2200
Air Consumption (1/4"BSP Air Inlet)		1.42lps (3.0cfm)	2.6lps (5.5cfm)	2.6lps (5.5cfm)	3.8lps (8.0cfm)
Handle type		Straight	Straight	Pistol Grip	Pistol Grip
Overall Length - Needle Scaler		343mm (13.5")	375mm (14.75")	315mm (12.4")	343mm (13.5")
Overall Length - Chisel Scaler (NON TVS)		313mm (12.3")	343mm (13.5")	260mm (10.2")	339mm (13.4")
Nett Weight - Needle Scaler		1.6kg (3.5lbs)	2.6kg (5.7lbs)	2.6kg (5.7lbs)	3.7kg (8.2lbs)
Nett Weight - Chisel Scaler (NON TVS)		1.5kg (3.3lbs)	2.0kg (4.4lbs)	2.0kg (4.4lbs)	3.0kg (6.6lbs)
Quantity of Needles	2mm	29	51	51	65
	3mm	12	19	19	28
	4mm	-	-	-	19
Noise Level Lpa db(A) - Needle Scaler		97.4	100.3	100.3	101.5
Noise Level Lpa db(A) - Chisel Scaler (NON TVS)		85.9	85.6	85.6	92.1
Noise Level Lwa db(A) - Needle Scaler		110.4	113.3	113.3	114.5
Noise Level Lwa db(A) - Chisel Scaler (NON TVS)		98.9	98.6	98.6	105.1
Vibration Level AEQ - Needle Scaler H1* (k)**		8.5	9.3	12.3	19.0
Vibration Level AEQ - Needle Scaler H2* (k)**		7.4	12.5	15.0	27.6
Vibration Level AEQ - Chisel Scaler H1* (k)** (NON TVS)		8.2	17.4	22.4	25.6
Vibration Level AEQ - Chisel Scaler H2* (k)** (NON TVS)		8.2	19.5	32.2	33.7

H1* Indicates that the test was taken at the primary handgrip location, next to the throttle lever.

H2* Indicates that the test was taken at the secondary handgrip position.

(k) ** Equals the factor of uncertainty, which allows for variations in measurement and production. Vibration Data figures are tri-axial, which gives the total vibration emission. Because of various factors, the range of vibration from these tools may vary between -0% +40%. The vibration is dependent on the task, the operators grip and feed force employed etc.

NOTE: The above vibration levels were obtained from tri-axial measurements to comply with the requirements of "The Control of Vibration at Work Regulations 2005" and the revisions to the (8662) now EN ISO 28927-9:2005 and EN ISO 20643:2005 series of standards. These values are at least 1.4 times larger than the values obtained from single axis measurements.

*Based on European Union Council Directive 2002/44/EC (Physical Agents (Vibration) Directive) and applicable harmonised standard: EN ISO 1 1148-4:2012

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Use only genuine Trelawny spares.

The use of non-Trelawny spare parts invalidates the warranty.



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