

Pneumatic Wire Thread Installation Tool Instruction Manual

3500-MIP1 and 3500-MIP2



Introduction

This leaflet contains instructions for the correct use of Wire Thread pneumatic installation tools and should be read in its entirety prior to using the installation tool.

For your safety

- keep clear of the front end assembly during operation to avoid contact with the sharp edge of the mandrel and rotating parts.
- Ensure long hair and loose clothing do not become entangled in moving parts.
- Air tools should not be held in close proximity to the body or face whilst connected to an air supply.
- Ensure air lines are not a tripping hazard.
- Do not adjust or dismantle tool whilst connected to an air supply.
- Ensure tool is disconnected from the air supply and stored in clean dry conditions when not in use.
- Avoid operator fatigue by ensuring the tool is positioned to minimise stretching or reaching and that operators are seated when using tool for extended periods of time.
- Ensure that the front-end assembly is adjusted and secured to the air motor assembly prior to completing the air circuit.

Check that the contents of this box include

- Air motor and adaptor - adaptor collar has a left hand thread.

You will also need

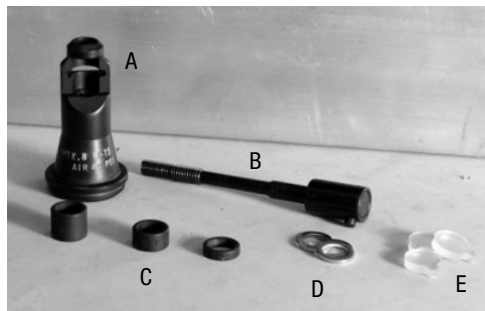
- A front-end assembly appropriate to the Wire Thread Inserts you wish to install.
- An air supply providing air pressure up to 100psi (7 bar) incorporating a filtered and lubricated air regulator. Your air supply should also incorporate an isolating switch to stop the air supply to the tool and connectors/couplings.
- PTFE tape should be wound around the threaded end of the air connector prior to screwing into air tool to ensure a good seal.
- If tool is to be used with a work arm assembly please ensure that the instructions supplied with that equipment are read in conjunction with these instructions.

Front-end assembly

The front-end assembly is used in conjunction with the pneumatic installation tool to aid the installation of Wire Thread Inserts. The front-end assembly winds a mandrel through the insert (1.0D, 1.5D or 2.0D) and through the pre-winder nozzle. When the insert emerges from the nozzle the diameter has been reduced (pre-wound) to facilitate easy entry into the prepared and threaded hole in the parent material.

The front-end assembly consists of two main components

- Nozzle
- Mandrel



- A Nozzle
 - B Mandrel
 - C Thickness spacers
 - D Shim washers
 - E Cushions
- (for use in the adaptor of an ARO® brand pneumatic tool only)

Three different mandrel types are used depending on the size of the inserts being installed.

Check that the front-end assembly pack also contains 2 or 3 thickness spacers (to suit different length inserts) and a least 3 shim washers. Wire Thread Inserts should be installed 3/4 to 1-1/2 pitches below the surface of a countersunk hole or 1/4 to 1/2 coil below the surface of a flush hole. The Wire Thread Insert must be fully engaged with the thread in the hole throughout its length.

Separate mandrel from nozzle by rotating the mandrel anti-clockwise until the mandrel disengages. You can now assemble the correct combination of spacers and shims (if necessary) between the clutch seat and nozzle.

Identify the length of the insert to be installed and select spacers to adjust insertion depth eg: for 1.0D inserts select the longest spacer - the longer the insert the shorter the required spacer. Once the spacers and shims have been positioned on the shaft of the mandrel lubricate the mandrel thread with light machine oil and wind the mandrel through the nozzle. Locate the mandrel pin in the slot of the driving spline (inside the adaptor case) and slide the front end assembly into the case. Tighten the retaining ring (anti-clockwise) finger tight only - over tightening will restrict free movement of the mandrel, possibly resulting in damage. **The mandrel should always be wound through the nozzle so that the threaded section is fully disengaged prior to assembling the tool.**



Front end assembly with longest spacer to suit 1.0D insert.



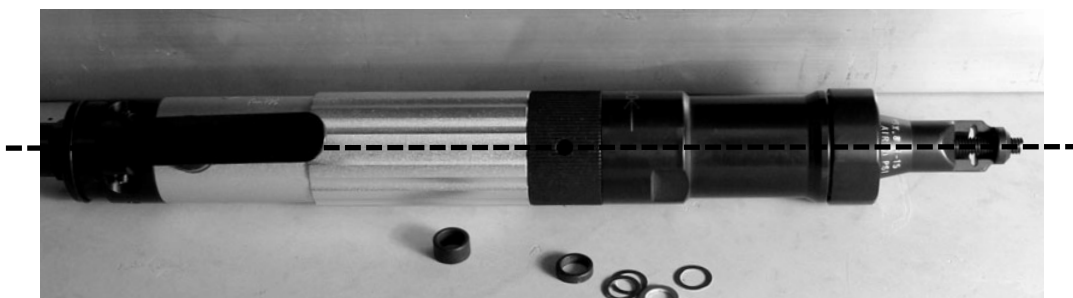
Front end assembly with longest spacer to suit 1.0D insert and shim washer.



Finished front end assembly with mandrel wound through the pre-winder nozzle.



Locate mandrel pin in the slot of the driving spline and slide the front end assembly into the case.



Ensure the front end assembly insert chamber opening is aligned with the trigger of the air motor. Final adjustments may still need to be made (using shim washers) to ensure that the inserts are installed to the optimum depth.

Recommended air pressures

Insert size – inch	#2	#3	#6	#8	#10	1/4"	5/16"	3/8"	7/16"	1/2"
Insert size – metric	M2.0-2.2	M2.5	M3.0	M3.5	M4.0-4.5	M6.0-7.0	M8.0	M10.0	M11.0	M12.0
Recommend pressure – psi	25	25-30	25-30	40	45	50-60	60	70	70-80	90
Recommended pressure – bar	1.7	1.7-2.0	1.7-2.0	2.8	3.0	3.5-4.1	4.1	4.8	4.8-5.5	6.2

The pressures shown in this table may differ from those indicated on the front-end assembly. It is generally best to initially select the lowest suggested pressure and increase the pressure in incremental steps until the optimum air pressure is found. The optimum air pressure and installation speed is a function of parent material of the work piece, operator proficiency and the type of Wire Thread Insert being installed. Air pressure is best adjusted without an insert in the chamber of the front-end assembly. Whilst depressing and releasing the trigger on the air tool and adjusting the regulator the air pressure gauge can be observed to check that it provides a constant reading during free running of the air tool. The tool must be kept clear of face and body during adjustment.

Tool operation

Ensure the work area is clear and well lit to enable efficient installation and adjustment. When using small inserts the use of a workshop magnifying glass may be useful - especially during initial depth adjustment. Place a Wire Thread Insert into the chamber, ensure the tang end is facing down (nearest the nose end of the pre-winder). If using strip feed inserts slide the lead edge through the slot ensuring the tang faces downward and push or pull the strip through until the insert locates into the chamber.

Hold the tool securely with a relaxed grip, finger (or thumb) over the trigger. Do not hold the tool too tightly as this may result in the mandrel failing to self centre and may also lead to unnecessary operator fatigue. Hold the tool perpendicular to the workpiece, place the nozzle of the tool on the tapped hole and depress the trigger. The motor will drive forward and wind the mandrel through the Wire Thread Insert into the nozzle. Continue pressing the trigger and hold the nozzle against the threaded hole. The insert will be wound into the thread and the tool may shudder as the insert makes contact with the leading threads in the tapped hole. Maintain the position of the tool with the trigger depressed until the insert reaches the pre-set depth at which time the tool will stall (the tool will stall if using a telescoping or solid mandrel - if using a clutch mandrel a clicking noise will be heard). Release the trigger and the tool will automatically wind the mandrel out of the installed insert - do not lift the tool from the workpiece until the mandrel has completely wound back into the tool. Installation is complete and the air will shut off. Check that the Wire Thread Insert has been installed to the correct depth. Fine adjustment of insert depth is achieved by adding shim washers (to reduce installation depth) or by removing shim washers (to increase installation depth) until the optimum depth is achieved.

Wherever possible the installation depth should be checked and adjusted using a test block rather than by using a production component. If the trigger is released prematurely during installation the insert may only be partially installed. Keep your finger (or thumb) off the trigger until the mandrel has full rewind and the air has shut off. If the insert becomes trapped inside both the nozzle and the workpiece turn off the air supply and unscrew the collar of the retaining ring - remember it is a left hand thread! The tool end should then be spiralled to the left pulling upward gently to unwind the insert from the tool. When the insert is completely disengaged from the tool the insert should be eased from the workpiece coil by coil using pliers. If the tool is removed from the face of the workpiece too quickly but the insert is fully installed the mandrel may rotate but not rewind back into the tool - DO NOT attempt to push the end of the mandrel up with your finger to re-engage. Try using the tool in the upside down position to re-engage the mandrel. Alternatively you may gently tap the tool mandrel downwards on the workbench surface with finger (or thumb) clear of the trigger. If both these methods are not successful switch off the air supply and re-engage the mandrel manually.

Mandrel should be lightly lubricated at regular intervals for ease of use and to extend tool life.



Place wire thread insert into chamber and ensure the tang end is facing down (nearest the nose end).



You are now ready to place the nozzle of the tool on the tapped hole and install the insert.

Disassembly

Clutch – to loosen the housing (53) turn clockwise with a 26mm open ended wrench, adjustable wrench or pliers. Remove the driving spline (38) and the start bar (13).

Motor – Use a padded vice or soft jaw chuck of appropriate diameter to hold the casing. Then loosen the housing (31) by turning the rear plate (51) anti-clockwise using soft jaw pliers or an adjustable pin wrench. Pull off the end plate cylinder (19) and rotor (16).

Assembly

Re-assemble in reverse order to disassembly.

Operating information

The tool has a normal operating sound pressure level of 71.5db. The vibration acceleration of the handle is less than 2.5m/s².

No load rotation is 900RPM (approx.).

Lubrication

The tool should be checked at regular intervals whose frequency should be determined by the operating environment, usage and storage conditions.

Air motor lubrication – turbine oil such as Mobile Turbine No.32, Shell Turbine No.32 or equivalent.

Clutch and bearing – high quality grease such as Shell Alvania No.2, Mobil Plex or equivalent.

ALWAYS . . .

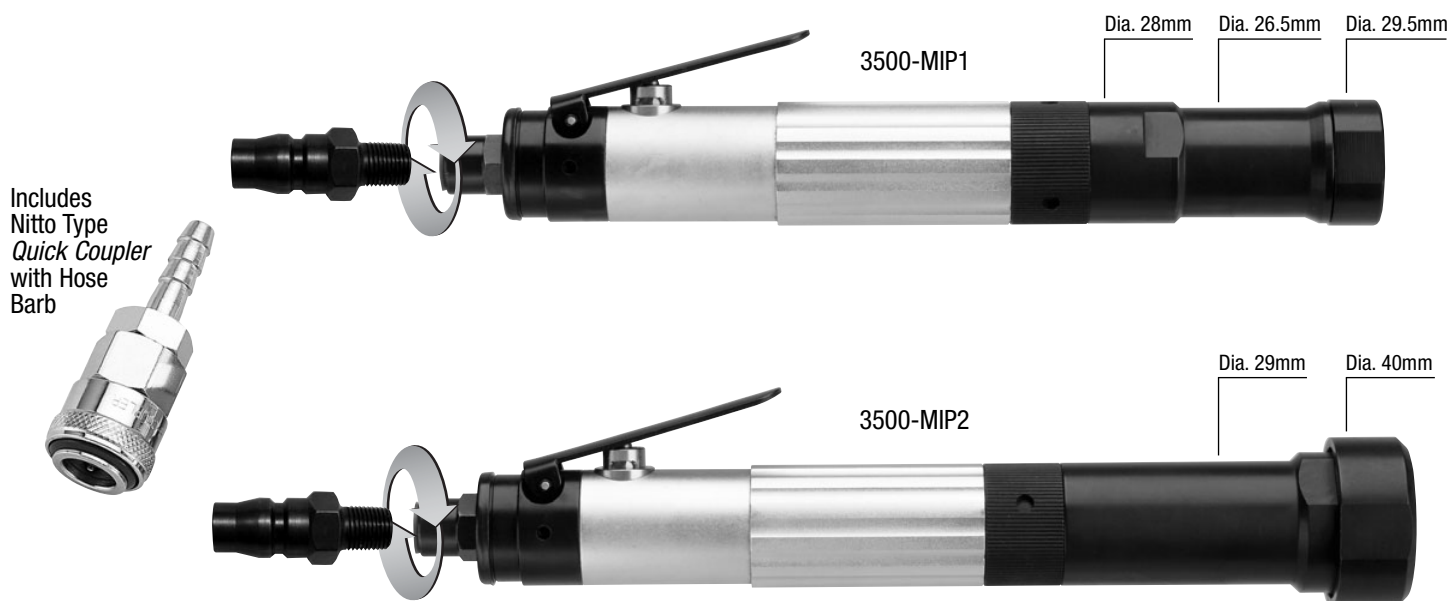
Ensure the mandrel is wound through the nozzle so that the threaded section is fully disengaged prior to assembling the tool, changing mandrels or adjusting the length.

Handle with care, keep clean and lubricate all moving parts.

It is generally best to initially selected the lowest suggested pressure and increase the pressure in incremental steps until the optimum air pressure is found. Excessive air pressure will shorten tool life.

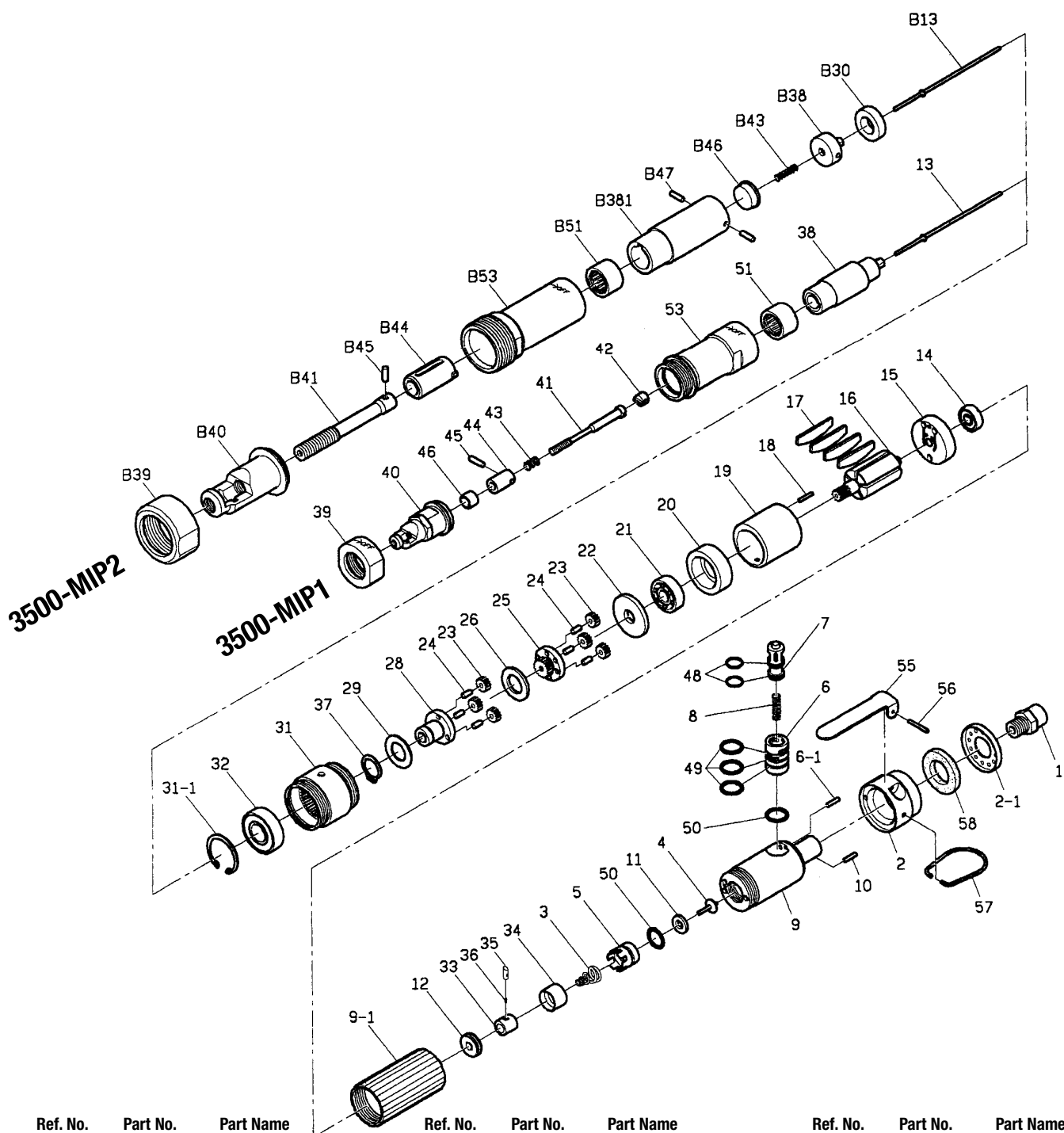
IMPORTANT . . .

Front end assembly silicone cushions are only for use in the adaptor of an ARO® brand pneumatic tool.



Specifications

Model	Free Speed	Weight		OAL		Air Inlet	Air Hose		Air Consumption	
	RPM	lb	kg	inch	mm	inch NPT	inch	mm	ft3/min	m3/min
3500-MIP1	900	1.8	0.8	10	250	1/8	1/4	6.4	7	0.2
3500-MIP2	900	2.2	1.0	10-1/10	265	1/8	1/4	6.4	7	0.2



Ref. No.	Part No.	Part Name
3500-MIP1 and 3500-MIP2		
1	9090-28	Air Inlet (1/8" NPT)
2	0142-090	Exhaust Deflector
2-1	0140-092	Deflector Cap
3	9070-106	Spring (Cone)
4	0150-041	Shut Off Valve
5	0150-050	Control Air Valve
6	0150-021	Reverse Valve
6-1	9032-12	Needle Pin
7	0150-020	Reverse Trigger
8	9070-206	Spring
9	0150-010	Casing
9-1	0140-011	Outer Casing
10	9032-010	Needle Pin
11	0150-352	Spacer
12	0150-011	Cap Screw
14	9020-695	Ball Bearing
15	0140-110	Rear Plate
16	0140-130	Rotor
17	0140-140	Blade
18	9041-010	Pin
19	0140-120	Cylinder
20	0140-111	Front Plate
21	9020-626	Ball Bearing
22	0140-116	Spacer
23	0140-240	Planet Gear
24	9032-010	Needle Pin
25	0140-250	Gear Cage & Gear
26	0140-256	Spacer
27	0140-241	Planet Gear
28	0140-230	Gear Cage
29	0140-236	Spacer

Ref. No.	Part No.	Part Name
3500-MIP1 and 3500-MIP2		
31	0140-220	Internal Gear
31-1	9050-R22	R Type Holder
32	9020-EE3	Ball Bearing
33	0150-364	Control Pin Seat
34	0150-362	Control Ring
35	0150-361	Control Pin
36	9070-004	Spring
37	9050-C37	C Type Holder
48	9069-903	O Ring
49	9061-111	O Ring
50	9061-111	O Ring
55	0102-032	Trigger Lever
56	9043-18	Needle Pin
57	0350-080	Suspension Ring
58	0140-091	Muffler Filter
3500-MIP1 only		
13	0150-040	Start Bar
38	0150-365	Driving Spline
39	0150-612	Pre-winder Retainer
51	902H-K17	Needle Bearing
53	0150-310	Clutch Casing

Ref. No.	Part No.	Part Name
3500-MIP1 Front Assembly and Parts		
40	—	Front End Assembly Nozzle
41	—	Mandrel
42	—	Clutch
43	—	Spring
44	—	Clutch Seat
45	—	Needle Pin
46	—	Shim

Ref. No.	Part No.	Part Name
3500-MIP2 Only		
B13	0151-040	Start Bar
B30	0151-351	Washer
M38	0151-365	Driving Spline
B381	0151-368	Driving Outer
B39	0151-612	Prewinder Retainer
B43	9070-301	Spring
B46	0151-367	Bumper Washer
B47	9043-10	Spring Pin
B51	902H-K22	Needle Bearing
B53	0151-310	Clutch Casing

Ref. No.	Part No.	Part Name
3500-MIP2 Front Assembly and Parts		
B40	—	Front End Assembly Nozzle
B41	—	Mandrel
B44	—	Mandrel Sleeve
B45	—	Pin