RIVTEC AR50M-V (Air-Grip 2V)

Industrial

PNEUMATIC-HYDRAULIC RIVET TOOL

With Vacuum System, Forged Aluminum Alloy and Quick-Change Jaw Case Assembly

OPERATION MANUAL

CE

Original Instructions

PAGE INDEX

1. INTENDED USE

1. This pneumatic-hydraulic rivet tool is designed to be driven by the appropriate compressed air pressure for quickly fastening the work pieces together firmly with a suitable size blind rivet on one-side work. The work pieces to be fastened are various, such as metals, concrete, wood, plastic, leather, canvas and more. The Forged Aluminum Alloy Hydraulic Cylinder has super strength and excellent durability. The Vacuum System can suck the mandrel of blind rivet into working nosepiece and automatically eject spent mandrel into visible spent mandrel container after setting blind rivet. The applications are widely used in the production and repairs of aircraft, automobiles & vehicles, boats, building construction, electric/electronic appliances, even the DIY work, etc.
2. This pneumatic-hydraulic rivet tool is designed and produced primarily for the professional users, the non-professional users must read the operation manual thoroughly, and consult the manufacturer, authorized local agent or distributor for real understanding. A half hour long hands-on training session with qualified personnel is essential and strongly recommended before using this tool.

2. GLOSSARY OF TERMS AND SYMBOLS

: READ MANUAL carefully prior to using this tool.

: HEARING PROTECTION IS REQUIRED when using this tool.

: EYE PROTECTION IS REQUIRED when using this tool.

: HAND PROTECTION IS REQUIRED when using this tool.

3. SAFETY PRECAUTIONS

3.1 SAFETY PRECAUTIONS

1. For multiple hazards, read and understand the safety instructions before installing, operating, repairing, maintaining, changing accessories, or working near the assembly power tool. Failure to do so can result in serious bodily injury.
2. Only qualified and trained operators should install, adjust or use the assembly power tool.
3. Do not modify this assembly power tool. Modifications can reduce the effectiveness of safety measures and increase the risks to the operator.
4. Do not discard the safety instructions; give them to the operator for reference at any time.
5. Do not use the assembly power tool if it has been damaged.
6. Tools shall be inspected periodically to verify that the ratings and markings required, by this part of ISO 11148 are legibly marked on the tool, and that listed in this manual. The employer/user shall contact the manufacturer to obtain replacement marking labels when necessary.

3.2 PROJECTILE HAZARDS

1. Disconnect the assembly power tool from the energy source when changing inserted tools or accessories.
2. Be aware that failure of the work pieces or accessories or even of the inserted tool itself can generate high-velocity projectiles.
3. Always wear impact-resistant eye protection during operation of the tool. The grade of protection required should be assessed for each use.
4. The risks to others should also be assessed at this time.
5. Ensure that the work pieces and the slide switch of swivel air fitting (71) are securely fixed.
6. Check that the means of protection from ejection of fastener and/or stem is in place and is operative.
7. There is possibly forcible ejection of installation mandrels from the front of the assembly power tool.

3.3 OPERATING HAZARDS

1. Use of the tool can expose the operator's hands to hazards, including crushing, impacts, cuts and abrasions and heat. Wear suitable gloves to protect hands.
2. Operators and maintenance personnel shall be physically able to handle the bulk, weight and power of the tool.
3. Hold the tool correctly; be ready to counteract normal or sudden movements and have both hands available.
4. Maintain a balanced body position and secure footing.
5. Release the start-and-stop device in the case of an interruption of the energy supply.
6. Use only oils and lubricants recommended by the manufacturer.
7. Avoid unsuitable postures, as it is likely for these positions not to allow counteracting of normal or unexpected movement of the tool.
8. If the assembly power tool is fixed to a suspension device, make sure that the fixation is secure.
9. Beware of the risk of crushing or pinching if nose equipment is not fitted.

3.4 REPETITIVE MOTIONS HAZARDS

1. When using an assembly power tool, the operator can experience discomfort in the hands, arms, shoulders, neck or other parts of the body.
2. While using an assembly power tool, the operator should adopt a comfortable posture whilst maintaining a secure footing and avoiding awkward or off-balance postures. The operator should change posture during extended tasks; this can help avoid discomfort and fatigue.
3. If the operator experiences symptoms such as persistent or recurring discomfort, pain, throbbing, aching, tingling, numbness, burning sensations or stiffness, these warning signs should not be ignored. The operator should tell the employer and consult a qualified health professional.

3.5 ACCESSORY HAZARDS

1. Disconnect the assembly power tool from the energy supply before changing the inserted tool or accessory.
2. Use only sizes and types of accessories and consumables that are recommended by the manufacturer of assembly power tools; do not use other types or sizes of accessories or consumables.

3.6 WORKPLACE HAZARDS

1. Slips, trips and falls are major causes of workplace injury. Be aware of slippery surfaces caused by use of the tool and also of trip hazards caused by the air line or hydraulic hose.
2. Proceed with care in unfamiliar surroundings. There can be hidden hazards, such as electricity or other utility lines.
3. The assembly power tool is not intended for use in potentially explosive atmospheres and is not insulated against contact with electric power.
4. Ensure that there are no electrical cables, gas pipes, etc., which can cause a hazard if damaged by use of the tool.

3.7 NOISE HAZARDS

1. Exposure to high noise levels can cause permanent, disabling hearing loss and other problems, such as tinnitus (ringing, buzzing, whistling or humming in the ears). Therefore, risk assessment and the implementation of appropriate controls for these hazards are essential.
2. Appropriate controls to reduce the risk may include actions such as damping materials to prevent work pieces from “ringing”.
3. Use hearing protection in accordance with employer's instructions and as required by occupational health and safety regulations.
4. Operate and maintain the assembly power tool for non-threaded mechanical fasteners as recommended in the instruction handbook, to prevent an unnecessary increase in the noise level.
5. Select, maintain and replace the consumable/inserted tool as recommended in the instruction handbook, to prevent an unnecessary increase in noise.
6. If the power tool has a silencer, always ensure that it is in place and in good working order when the power tool is being operated.

3.8 VIBRATION HAZARDS

1. Exposure to vibration can cause disabling damage to the nerves and blood supply of the hands and arms.
2. Wear warm clothing when working in cold conditions and keep your hands warm and dry.
3. If you experience numbness, tingling, pain or whitening of the skin in your fingers or hands, stop using the assembly power tool, tell your employer and consult a physician.
4. Support the weight of the tool in a stand, tensioner or balancer, because a lighter grip can then be used to support the tool.

3.9 SAFETY INSTRUCTIONS FOR PNEUMATIC/PNEUMATIC-HYDRAULIC POWER TOOLS

1. Air under pressure can cause severe injury:
   (1) Always shut off air supply, drain hose of air pressure, disconnect tool from air supply by switching off slide switch and pull out air inlet fittings when not in use, before changing accessories or when making repairs;
   (2) Never direct air at yourself or anyone else.
2. Whipping hoses can cause severe injury. Always check for damaged or loose hoses and fittings.
3. Cold air shall be directed away from hands.
4. Whenever universal twist couplings (claw couplings) are used, lock pins shall be installed and Whip Check Safety Cables shall be used to safeguard against possible hose-to-tool or hose-to-hose connection failure.
5. Do not exceed the maximum air pressure stated on the tool.
6. Never carry an air tool by the hose.
7. The limitations of environmental conditions on Tool are the temperature 0 - 40 ˚C (32 - 104 ˚F), and Tool can not be used in the water.
8. Tool weight over 2.0 kg or 4.4 lb is suggested to be supported by two hands, one hand to hold handle grip and the other hand to support the bottom of Tool, whilst lifting or operating Tool.

4. SAFETY INSTRUCTIONS

1. The tool must be checked and maintained in a safe working condition at all times.
2. Do not use the tool outside the intent of design and use.
3. Do not dismantle the tool without prior reference to this manual.
4. Any modification to the tool and tool parts shall be prohibited.
5. Always use original spare parts to ensure safe operation and satisfactory performance.
6. Be sure to disconnect the tool from air supply before attempting to adjust, change nosepiece or dismantle tool's parts.
7. For safety work, the operator and other persons in the vicinity are always required to wear the safety goggles to protect against spent mandrel ejection.
8. Be sure to adopt a firm footing or stable position before and during operating the tool.
9. Do not point the tool towards any person(s) or operator.
10. Do not operate the tool without firmly installing the jaw case assembly (3AY) including front jaw case (3), rear jaw case (7), lock washer (10), lock nut (11), the head (2), working nosepiece (1), the spent mandrel safe protector (33), and the spent mandrel container (35).
11. Do not operate the tool without firmly locking the oil screw plug & sealing washer (16 & 15), front end cap (24), noise silencer lock nut (42), valve end cap (61), air cylinder end cap (68), mini air fitting (36) and air inlet end cap (70), swivel air fitting with on/off slide switch (71).
12. Be sure to properly adjust the JAW CASE ASSEMBLY DISTANCE to be 60±0.5 mm.
13. The Operating Air Pressure shall not exceed 6.5 bar or 95 psi.
14. Excessive priming of hydraulic oil in the tool should be avoided.
15. After setting each blind rivet, the spent mandrel is automatically ejected into the spent mandrel container (35) by Vacuum System, so that the spent mandrels shall be not jammed in the tool after setting the next blind rivet. When not operating tool for a long while, always switch off the slide switch of swivel air fitting (71) in order to save air consumption.
16. Take care to ensure the mandrel's sharp end and spent mandrels are not to create any hazards.
17. Ensure that noise silencer (41) and vent holes do not become blocked or covered, and that air hose is always in good condition.
18. Always keep the tool and grip (72) dry and clean for the best possible grip and operation.
19. Take care to avoid entanglement of loose clothes, ties, long hair, cleaning rags, etc. in the moving parts of the tool.
20. When carrying the tool from place to place, always keep hands away from the trigger (45/45L) to avoid inadvertent start up.
21. Take care to use the tool. Do not drop the tool. Do not use the tool as a hammer or other uses that will damage and wear the tool.
22. The tool should be examined at regular intervals for function and damage. Any question regarding the correct operation of tool and operator safety should consult the manufacturer, authorized local agent or distributor.

5. FEATURES

1. This pneumatic-hydraulic rivet tool features **powerful traction force** 9,000 N at 6.2 bar or 2,000 lbf at 90 psi compressed air pressure, and equips with interchangeable **4 standard nosepieces with size mark** for setting 2.4 ~ 4.8/5.0 mm or 3/32˝ ~ 3/16˝ standard/commercial blind rivets in all materials (aluminum, copper, steel and stainless steel). This pneumatic-hydraulic rivet tool also can set 4.0, 4.8/5.0 mm or 5/32", 3/16" structural blind rivets and High Strength Structural (HSS) blind rivets. The optional 4.8/5.0 mm or 3/16˝ Structural ★**Monobolt Nosepiece is available on request.** The optional 4.0, 4.8/5.0 mm or 5/32", 3/16" ***HSS Nosepieces are available on request.**
2. Innovative **Vacuum System** to suck the mandrel of blind rivet into working nosepiece and automatically eject spent mandrel into visible spent mandrel container after setting blind rivet, that can accelerate operation speed and is ideal for mass production. The special **Vacuum ON/OFF Switch** can adjust the vacuum force or shut off the Vacuum System, therefore **this Air Rivet Tool can set rivet either With or Without Vacuum System.** Before setting small size 2.4 & 3.0/3.2 mm or 3/32" & 1/8" Blind Rivets, the Vacuum Tube must be installed into the Rear Jaw Case for perfect ejection of Spent Mandrel (See the 11.11).
3. Innovative **Quick-Change Type Jaw Case Assembly** for fast cleaning or replacing inside parts (Jaws, Jaw Pusher, etc.) just by hand without any wrenches.
4. Innovative **Shock-Reducer Design™** to minimize hand fatigue.
5. Innovative **Noise Silencer Design™** for working pleasure.
6. Patented **Rivet Size Hole Gauge Design™** to eliminate choosing wrong size blind rivet and working nosepiece.
7. Smart **Nosepieces Storage Design™** to avoid losing nosepieces.
8. Convenient **Oil Refill Hole Design™** for quickly refilling the shortage of hydraulic oil.
9. New **Spent Mandrel Container** for visible check, and to protect operator's eyes and keep working places clean.
10. **Oil Cylinder Body** are made of **super strength forged aluminum alloy** and Air Cylinder Body are made of high strength aluminum alloy, **Inner walls all have wear-resistant mirror finish** for durability.
11. **Oil Piston Rod** and **Air Piston Rod** all have **hard chrome plating and wear-resistant mirror finish** for speedy motion.
12. High grade **Steel Alloy Key Parts** (Jaws, Jaw Cases, etc.) with advanced heat treatment for strength and durability.
13. **Forged Aluminum Alloy Oil Cylinder with titanium color finish** and **Powder Coating finish on Aluminum Alloy Air Cylinder** for valuable looking and better scratch-resistance. **Laser Logo** to add Tool value.
14. **PAHs-Free (non-toxic to hand skin) Soft Plastic Hand Grip** for comfortable and safe operation.

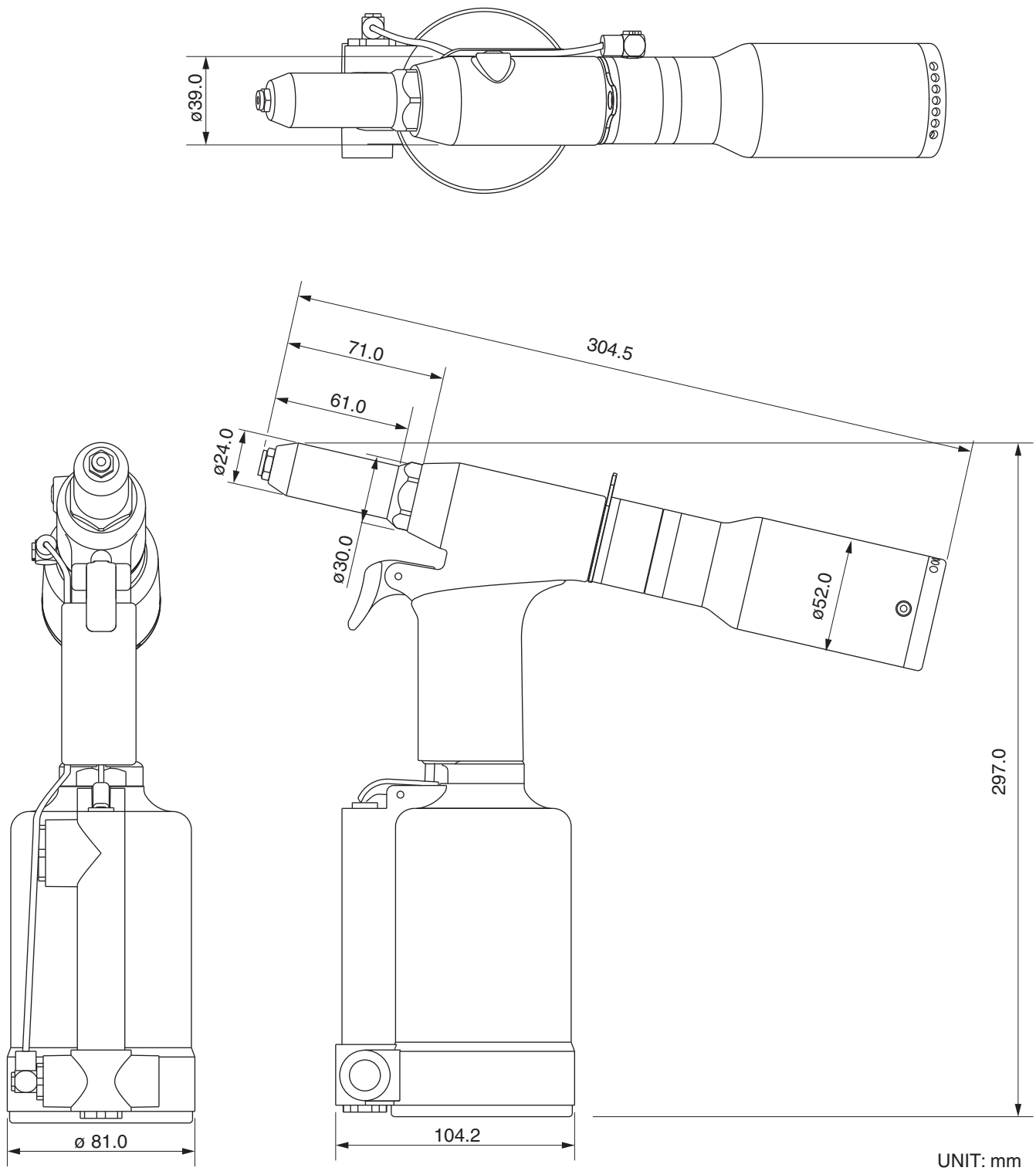
6. SPECIFICATIONS

1. **Traction Force:** 9,000 N at 6.2 bar or 2,000 lbf at 90 psi compressed air pressure (without vacuum)
2. **Stroke:** 18 mm or 0.71˝
3. **Working Compressed Air Pressure:** 5.5 - 6.5 bar or 80 - 95 psi
4. **Air Consumption:** Approx. 2.4 liters per rivet or 0.08 cuft per rivet. NOTE: The air consumption of Vacuum System is not included.
5. **Hydraulic Oil, ISO VG-32 or VG-46:** Approx. 40 ml
6. **Working Temperature:** 0 - 40 ˚C or 32 - 104 ˚F.
7. **Noise Level:**
   Sound Pressure Level, L_{PA}: 72.2 dB(A)
   Uncertainty: K_{PA}= 3.0 dB
   Sound Power Level, L_{WA}: 83.2 dB(A)
   Uncertainty: K_{WA}= 3.0 dB
   Vibration:
8. Hand-arm vibration value: Less than 2.5 m/s²
   Uncertainty : K = 1.5 m/s²
9. **Air Inlet:** 1/4˝ PT or 1/4˝ NPT or other specified thread
10. **Hose Size:** Inner diameter 8 or 10 mm, 5/16˝ or 3/8˝
11. **Net Weight:** Approx. 2.09 kg or 4.61 lb
12. **Standard Parts:** 4 Standard Nosepieces (1A, 1B, 1C, 1D), Spare Jaws (4), Spent Mandrel Container (35), Swivel Air Fitting with On/Off Slide Switch (71), Brush (73), 2 Service Tools (74, 75), Hydraulic Oil Injector (77, without Oil), Hydraulic Oil Bottle (76, without Oil), Vacuum Tube (17A)
13. Optional Parts: *HSS Nosepiece 4.0 mm or 5/32" (1E), *HSS Nosepiece 4.8/5.0 mm or 3/16" (1F) , ★Monobolt Nosepiece 4.8/5.0 mm or 3/16˝ (1G)
14. **RIVETING CAPACITY:**

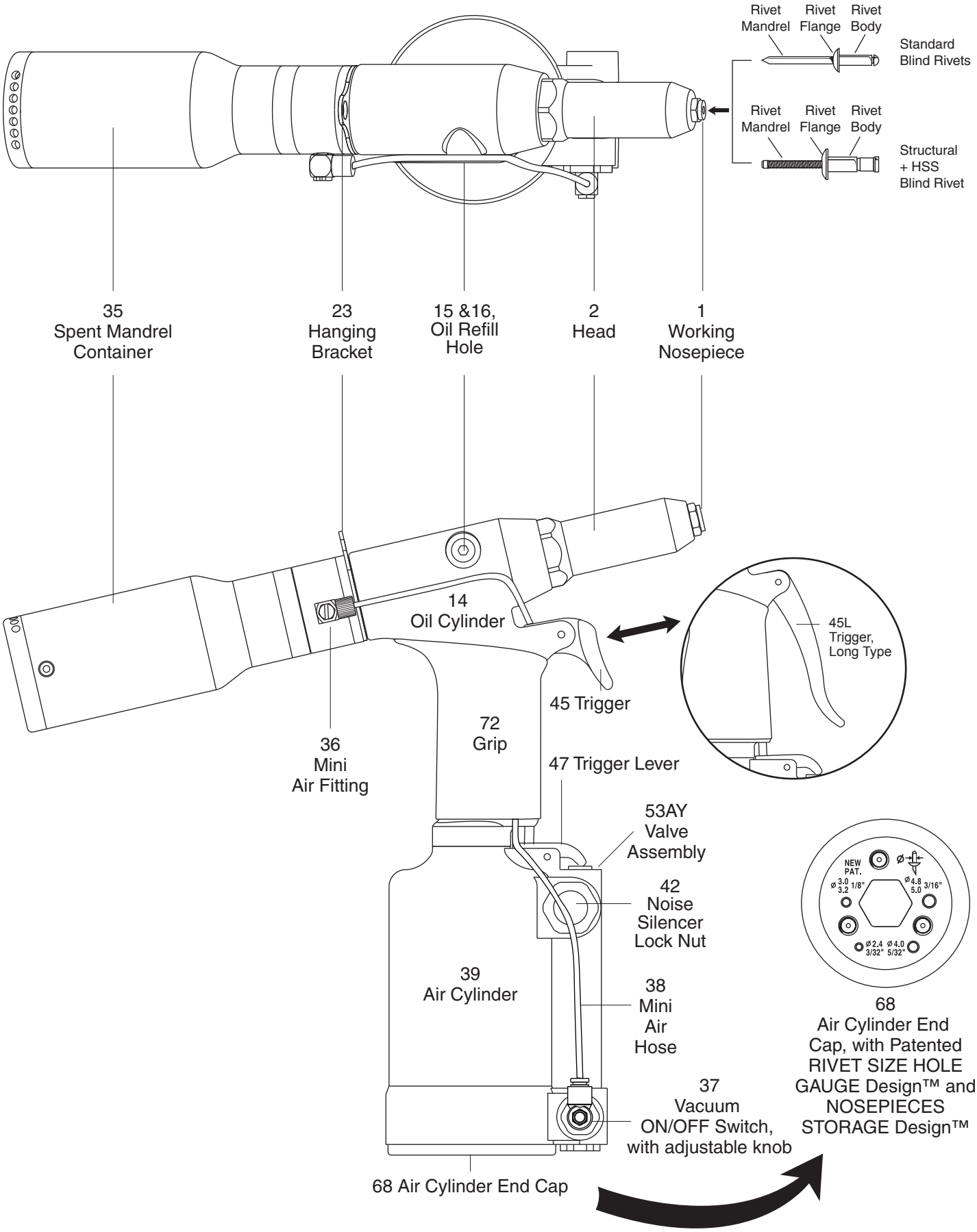
Rivet Material / Rivet Diameter	Aluminum	Steel	Stainless Steel (Inox)
2.4 mm or 3/32˝	●	●	●
3.0/3.2 mm or 1/8˝	●	●	●
4.0 mm or 5/32˝	●	●	●
4.8/5.0 mm or 3/16˝	●	●	●
4.0 mm or 5/32˝ Structural Rivets	●	●	●
4.8/5.0 mm or 3/16˝ Structural Rivets	●	●	●

Remarks:
- Use Standard Nosepieces to set Standard Blind Rivets and other Structural Blind Rivets.
- Use HSS Nosepieces to set High Strength Structural (HSS) Blind Rivets. The Mandrel diameter of HSS Blind Rivets is approximate 0.25 mm or 0.01˝ bigger than that of Standard Blind Rivets.
- Use ★Monobolt Nosepieces to set ★Monobolt Blind Rivets.
- ★Monobolt and *Interlock are the registered trade marks of AVDEL.
- When setting small size 2.4 & 3.0/3.2 mm or 3/32" & 1/8" Blind Rivets, the Vacuum Tube (17A) must be installed into the Rear Jaw Case (7) for perfect ejection of Spent Mandrel (See the 11.11).

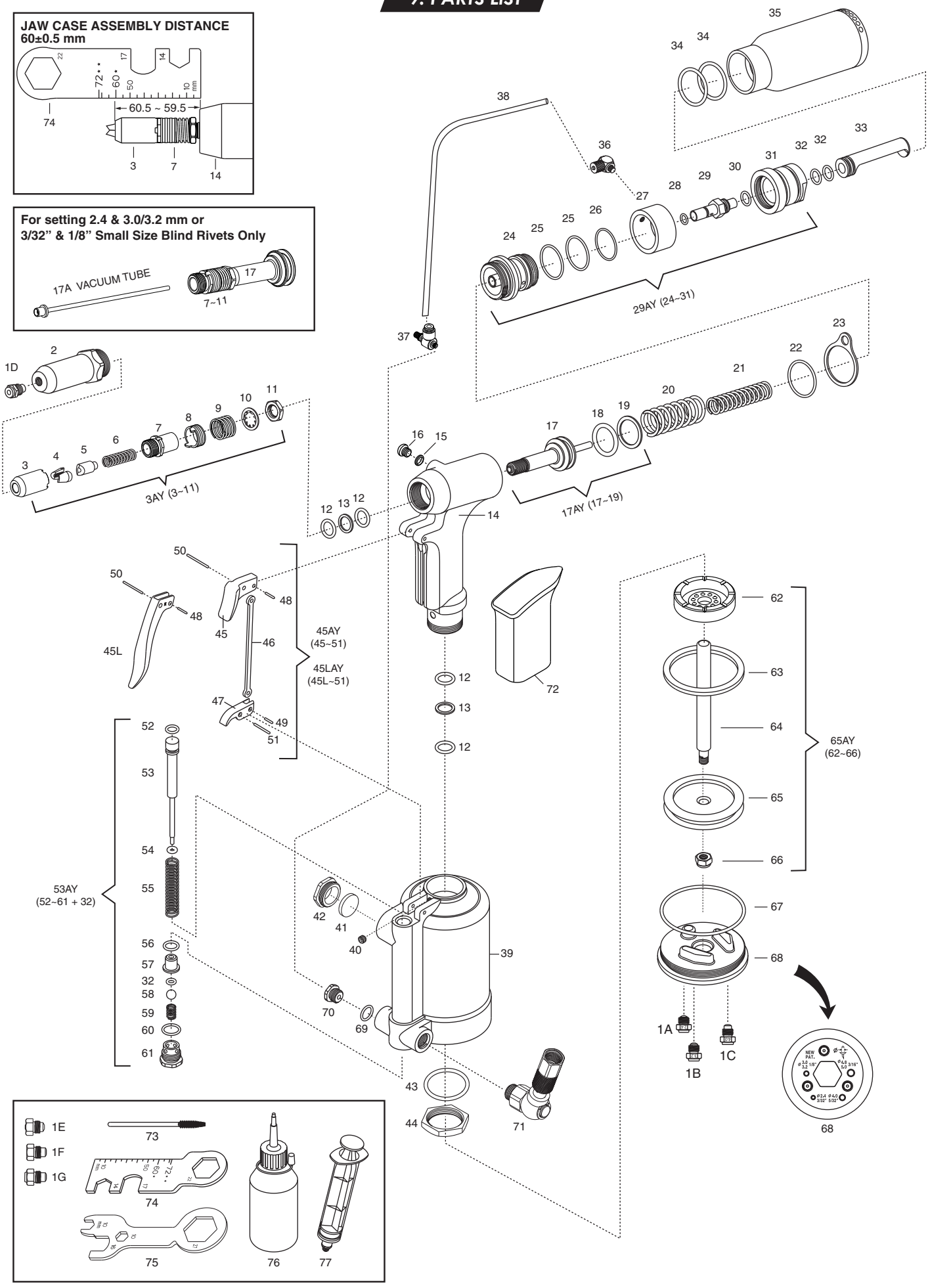
7. DIMENSIONS



8. MAIN PARTS


Rivet Mandrel
Rivet Flange
Rivet Body
Standard Blind Rivets
Rivet Mandrel
Rivet Flange
Rivet Body
Structural + HSS Blind Rivet
35 Spent Mandrel Container
23 Hanging Bracket
15 &16, Oil Refill Hole
2 Head
1 Working Nosepiece
14 Oil Cylinder
45L Trigger, Long Type
45 Trigger
72 Grip
36 Mini Air Fitting
47 Trigger Lever
53AY Valve Assembly
42 Noise Silencer Lock Nut
39 Air Cylinder
38 Mini Air Hose
37 Vacuum ON/OFF Switch, with adjustable knob
68 Air Cylinder End Cap
NEW PAT.
68 Air Cylinder End Cap, with Patented RIVET SIZE HOLE GAUGE Design™ and NOSEPIECES STORAGE Design™

9. PARTS LIST


JAW CASE ASSEMBLY DISTANCE
60±0.5 mm
60.5 ~ 59.5
74
3
7
14
For setting 2.4 & 3.0/3.2 mm or
3/32" & 1/8" Small Size Blind Rivets Only
17A VACUUM TUBE
17
7~11
29AY (24~31)
3AY (3~11)
17AY (17~19)
45AY
(45~51)
45LAY
(45L~51)
45L
53AY
(52~61 + 32)
65AY
(62~66)
1A
1B
1C
1D
1E
1F
1G
68
75
76
77

NO.	PART NO.	PART NAME	NO.	PART NO.	PART NAME
• 1A	AG2V-01A	Standard Nosepiece, 2.4 mm or 3/32”	37	AG2V-37	Vacuum ON/OFF Switch, with adjustable knob
• 1B	AG2V-01B	Standard Nosepiece, 3.0/3.2 mm or 1/8”	• 38	AG2V-38	Mini Air Hose
• 1C	AG2V-01C	Standard Nosepiece, 4.0 mm or 5/32”	39	AG2V-39	Air Cylinder
• 1D	AG2V-01D	Standard Nosepiece, 4.8/5.0 mm or 3/16”	• 40	AG2V-40	Positioning Screw
• 1E	AG2V-01E	Optional *HSS Nosepiece, 4.0 mm or 5/32”	• 41	AG2V-41	Noise Silencer
• 1F	AG2V-01F	Optional *HSS Nosepiece, 4.8/5.0 mm or 3/16”	42	AG2V-42	Noise Silencer Lock Nut
• 1G	AG2V-01G	Optional ★Monobolt Nosepiece, 4.8/5.0 mm or 3/16”	• 43	AG2V-43	Lock Nut O-Ring
2	AG2V-02	Head	• 44	AG2V-44	Oil Cylinder Lock Nut
3	AG2V-03	Front Jaw Case, Quick-Change Type	▲45	AG2V-45	Trigger
• 4	AG2V-04	Jaws, 2-PC Type	45L	AG2V-45L	Trigger, Long Type (Option)
• 5	AG2V-05	Jaw Pusher	46	AG2V-46	Trigger Link
• 6	AG2V-06	Jaw Pusher Spring	47	AG2V-47	Trigger Lever
7	AG2V-07	Rear Jaw Case, Quick-Change Type	• 48	AG2V-48	Upper Link Pin
8	AG2V-08	Lock Ring, Quick-Change Type	• 49	AG2V-49	Lower Link Pin
• 9	AG2V-09	Lock Ring Spring, Quick-Change Type	• 50	AG2V-50	Trigger Pin
10	AG2V-11	Lock Washer	• 51	AG2V-51	Lever Pin
11	AG2V-10	Lock Nut	45AY	AG2V-45AY	Trigger Assembly (45~51)
3AY	AG2V-3AY	Jaw Case Assembly (3~11), Quick-Change Type	45LAY	AG2V-45LAY	Trigger Assembly (45L~51), Long Type (Option)
• 12	AG2V-12	Oil Cylinder O-Ring	• 52	AG2V-52	Valve Pusher Upper O-Ring
• 13	AG2V-13	Oil Cylinder Back-Up Ring	53	AG2V-53	Valve Pusher
14	AG2V-14	Oil Cylinder	• 54	AG2V-54	Valve Pusher Lower O-Ring
• 15	AG2V-15	Sealing Washer	• 55	AG2V-55	Valve Pusher Spring
16	AG2V-16	Oil Screw Plug	• 56	AG2V-56	Valve Sleeve O-Ring
17	AG2V-17	Oil Piston	57	AG2V-57	Valve Sleeve
•17A	AG2V-17A	Vacuum Tube, for setting small size Blind Rivets only	• 58	AG2V-58	Valve Ball
• 18	AG2V-18	Oil Piston O-Ring	• 59	AG2V-59	Valve Spring
• 19	AG2V-19	Oil Piston Back-Up Ring	• 60	AG2V-60	Valve End Cap O-Ring
17AY	AG2V-17AY	Oil Piston Assembly (17~19)	61	AG2V-61	Valve End Cap
• 20	AG2V-20	Large Return Spring	53AY	AG2V-53AY	Valve Assembly (52~61+32)
• 21	AG2V-21	Small Return Spring	• 62	AG2V-62	Buffer Ring
• 22	AG2V-22	Hanging Bracket O-Ring	• 63	AG2V-63	Air Piston Ring
23	AG2V-23	Hanging Bracket	64	AG2V-64	Air Piston Rod
24	AG2V-24	Front End Cap	65	AG2V-65	Air Piston
• 25	AG2V-25	Front End Cap Middle O-Ring	66	AG2V-66	Air Piston Lock Nut
• 26	AG2V-26	Front End Cap Rear O-Ring	65AY	AG2V-66AY	Air Piston Assembly (62~66)
27	AG2V-27	Rotor	• 67	AG2V-67	Air Cylinder End Cap O-Ring
• 28	AG2V-28	Vacuum Valve Front O-Ring	68	AG2V-68	Air Cylinder End Cap, With Patented Rivet Size Hole Gauge Design™ and Nosepieces Storage Design™
29	AG2V-29	Vacuum Valve			
• 30	AG2V-30	Vacuum Valve Rear O-Ring	• 69	AG2V-69	Air Inlet End Cap O-Ring
31	AG2V-31	Rear End Cap	70	AG2V-70	Air Inlet End Cap
29AY	AG2V-29AY	Vacuum Valve Assembly (24~31)	71	AG2V-71	Swivel Air Fitting, with ON/OFF Slide Switch
• 32	AG2V-32	O-Ring, for Spent Mandrel Safe Protector, also for Valve Ball O-Ring	72	AG2V-72	Grip
			• 73	AG2V-73	Brush
• 33	AG2V-33	Spent Mandrel Safe Protector	• 74	AG2V-74	Wrench 7222
• 34	AG2V-34	Rear End Cap O-Ring	• 75	AG2V-75	Wrench 2710
• 35	AG2V-35	Spent Mandrel Container	• 76	AG2V-76	Oil Bottle (without Oil)
36	AG2V-36	Mini Air Fitting	• 77	AG2V-77	Hydraulic Oil Injector (without Oil)

REMARKS:

1) **• Means wearing parts or possible missing parts.**
2) **Part No. 45 Trigger is the Standard Part, Part No. ▲45L Trigger Long Type is the Optional Part for choice.**
3) **Order Example: AG2V-04 Jaws 2-PC Type, 5 sets.**
4) ***HSS Nosepieces are for setting High Strength Structural (HSS) Blind Rivets.**
5) **★Monobolt Nosepiece is for setting ★Monobolt Blind Rivets.**
6) **Part No. 44 Oil Cylinder Lock Nut needs to replace a new one after repeated fastening 3 ~ 4 times.**
7) **Part No. 43 Lock Nut O-Ring needs to replace a new one when dismantling Part No. 44 Oil Cylinder Lock Nut.**
8) **Part No. 17A Vacuum Tube is for setting small size 2.4 & 3.0/3.2 mm or 3/32” & 1/8” Blind Rivets only.**

10. OPERATION INSTRUCTIONS

10.1 SETTING AND TESTING

1. The tool is well assembled and tested before delivery; however, the necessary setting and testing are still strongly suggested before operating tool. Carefully read this **OPERATION INSTRUCTIONS 10.2 - 10.5** to check the setting of tool, follow the **10.6 OPERATION PROCEDURE** to do the pilot test before operating tool.
2. The compressed air pressure should be in the suggested working range; tool's working nosepiece size, blind rivet size and work pieces' hole diameter must be well matched, so that the pilot test can verify the fastening work is correct or not.

10.2 COMPRESSED AIR SUPPLY SYSTEM

1. This pneumatic-hydraulic rivet tool is operated with compressed air at an optimum air pressure of 6.2 bar or 90 psi.
2. This pneumatic-hydraulic rivet tool is recommended to connect with COMPRESSED AIR SUPPLY SYSTEM (Fig. 1) including air compressor, main air supply line, air preparation unit (air filter, air pressure regulator with gauge, air lubricator) and air hose. These should be fitted within 3 meters or 10 feet from air pressure regulator to the tool to ensure maximum tool life and minimum tool maintenance.
3. The air pressure regulator is used to adjust the operating air pressure not to exceed the maximum operating air pressure 6.5 bar or 95 psi.
4. The air hose should resist a minimum 150% of maximum operating air pressure (6.5 bar or 95 psi) produced in the COMPRESSED AIR SUPPLY SYSTEM, that is to resist the highest air pressure 10 bar or 145 psi. The air hose should be oil resistant, and have an abrasion resistant exterior. The air hose must have a minimum inner diameter of 8 mm or 5/16″. Be sure to expel the accumulated dirt and water from air pipeline before connecting air hose to the tool.

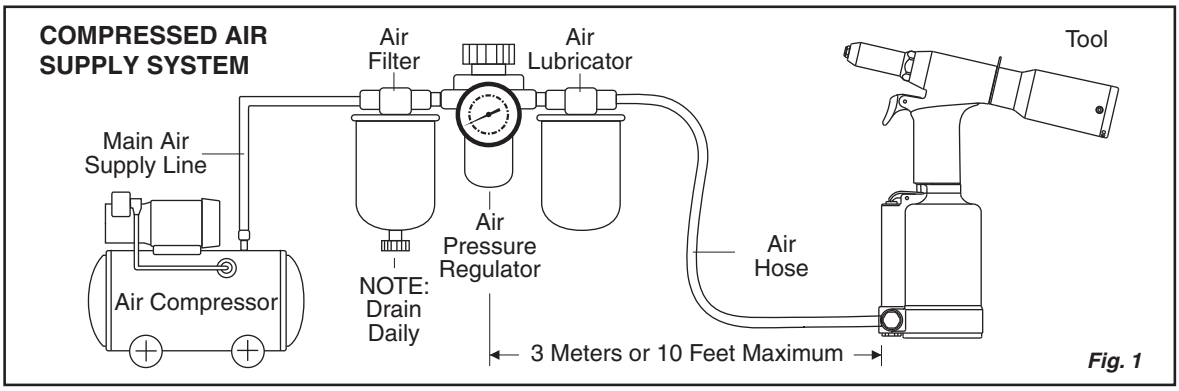


Fig. 1

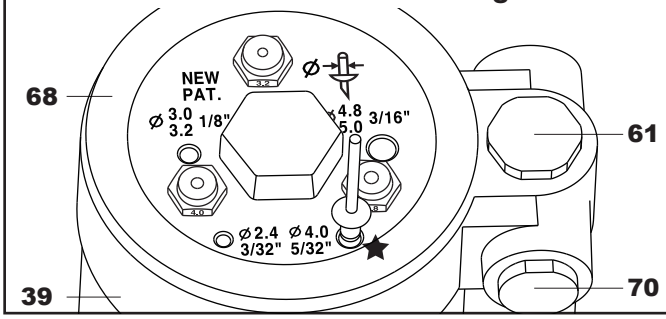
10.3 PRINCIPLE OF OPERATION

1. This pneumatic-hydraulic rivet tool is designed to quickly fasten the work pieces together firmly with a suitable size blind rivet by depressing the trigger (45/45L) to suck the compressed air into the air cylinder (39), to activate the air piston assembly (65AY) upwards, to drive hydraulic oil, to force the oil piston assembly (17AY) backwards, to drive the jaw case assembly (3AY) backwards to deform rivet body and break off the rivet mandrel with the minimum vibration, eventually the work pieces are fastened together firmly. Above fastening process is completed in one second.
2. After setting blind rivet, release the trigger (45/45L) to stop fastening rivet, the powerful return springs (20 & 21) push the oil piston assembly (17AY) and jaw case assembly (3AY) forwards to drive hydraulic oil and to release spent mandrel, to push the air piston assembly (65AY) downwards to the original position, the air is therefore expelled from the air cylinder (39) to the air exhaust through the noise silencer (41) with low noise. When releasing trigger (45/45L), in the meantime the Vacuum System automatically ejects the spent mandrel into the spent mandrel container (35). The fastening cycle is completed, and the tool is ready for setting the next blind rivet.

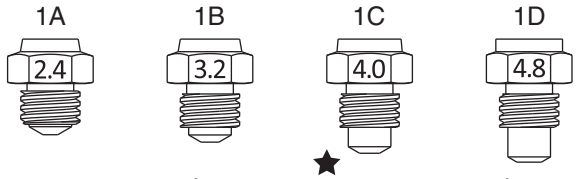
10.4 SELECT AND EXCHANGE THE NOSEPIECES

1. Disconnect the tool from the compressed air supply system.
2. Choose the correct size working nosepiece (1).
   NOTE: The patented RIVET SIZE HOLE GAUGE Design™ at the bottom of air cylinder end cap (68) provides a great assistance of checking the rivet body diameter of the blind rivet to be fastened, find out the size (for example ★Ø4.0 mm or 5/32″) marked beside the hole gauge, then choose the matched size nosepiece (for example ★Ø4.0 mm or 5/32″) as the working nosepiece (1), so as **to prevent spent mandrel from being stuck in tool after setting blind rivet** (Fig. 2).
3. Use wrench 2710 (75) to exchange nosepieces (1). Unscrew the replaced nosepiece (1) from the head (2) and choose the matched size nosepiece (for example ★Ø4.0 mm or 5/32″) from the Nosepieces Storage Design™ at the bottom of air cylinder end cap (68).
4. Install the matched size nosepiece (for example★Ø4.0 mm or 5/32″) as the working nosepiece (1) into the head (2) firmly, and fasten the replaced nosepiece to the Nosepieces Storage Design™ at the bottom of air cylinder end cap (68).

Patented RIVET SIZE HOLE GAUGE Design™, and NOSEPIECES STORAGE Design™



NOSEPIECES WITH SIZE MARK, Metric Size and Inch Size



2.4mm	3.0/3.2mm	4.0mm	4.8/5.0mm
3/32"	1/8"	5/32"	3/16"

Fig. 2

10.5 SUSPENSION DEVICE

The hanging bracket (23) is designed for hanging the tool to the suspension device of assembly line to decrease the physical strain placed on the operator by the weight of tool.

10.6 OPERATING PROCEDURE WITH VACUUM SYSTEM OR WITHOUT VACUUM SYSTEM

NOTE: The delivered Tool is already switched on the Vacuum System.

1. **Make sure that the spent mandrel safety protector (33) and spent mandrel container (35) are fitted by pushing to the front end cap (24) firmly, the swivel air fitting with on/off slide switch (71) is fastened firmly to the air inlet of tool.**
2. **Ensure the correct working nosepiece (1) suitable for the prepared hole of work pieces is installed firmly to the head (2).**
3. **Connect the tool to the compressed air supply system, switch on the slide switch of swivel air fitting (71) to start the riveting work (Fig. 3).**
4. **With Vacuum System: Please firstly check the 11.11 HOW TO INSTALL THE VACUUM TUBE (17A) BEFORE SETTING SMALL SIZE BLIND RIVETS.** The Vacuum System can suck the mandrel of blind rivet into working nosepiece (1) and automatically eject spent mandrel into visible spent mandrel container (35) after setting blind rivet. The Vacuum System can accelerate operation speed that is ideal for mass production.
   Turn the knob of the vacuum on/off switch (37) counterclockwise to switch on the vacuum system, the vacuum force can be adjusted to the optimum condition (Fig. 4).

   Without Vacuum System: Do Not Install the Vacuum Tube (17A).
   Turn the knob of vacuum on/off switch (37) clockwise to shut off the vacuum system (Fig. 4).
5. **Insert the mandrel of blind rivet into the working nosepiece (1) of head (2) completely. Note The vacuum system can help to suck the mandrel of blind rivet into the working nosepiece (1) of head (2).**
6. **Lightly depress the trigger (45/45L) to break off the mandrel of blind rivet and deform the rivet body, the work pieces are firmly fastened together at the same time. If more than one depress is required, release trigger (45/45L) and move tool to press working nosepiece (1) to touch rivet flange, then depress trigger (45/45L) again to break off the mandrel of blind rivet.**
7. **Release the trigger (45/45L) and remove the working nosepiece (1) from the fastened work pieces. Note The Vacuum System can automatically eject the spent mandrel into the spent mandrel container (35).**
   Note Under No Vacuum condition: Tilt head (2) upwards to drop the spent mandrel into the spent mandrel container (35).
8. **The fastening cycle is completed, and the tool is ready for setting next same size blind rivet.**
9. **When stopping operation, be sure to switch off the slide switch of swivel air fitting (71) (Fig. 3).**

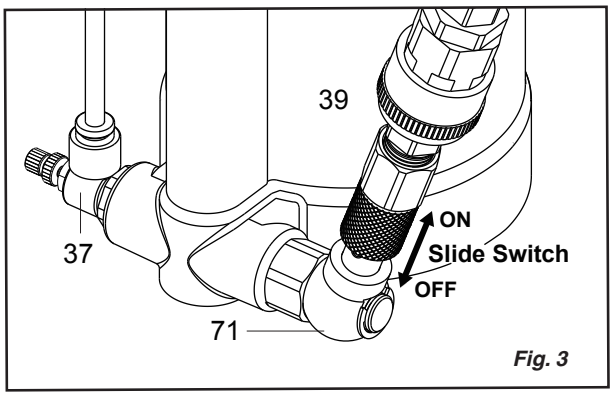


Fig. 3

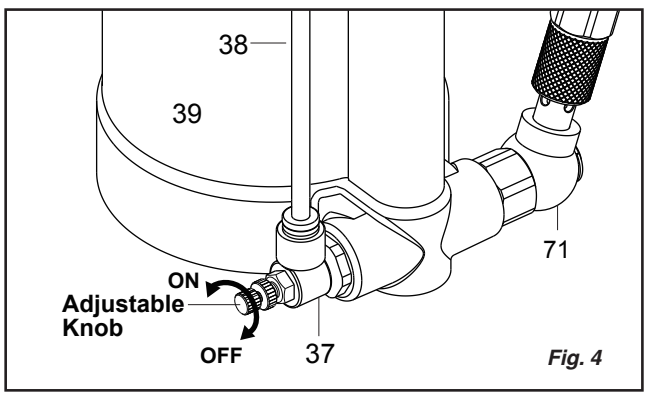


Fig. 4

11. MAINTENANCE

[WARNING]
Always disconnect the tool from the COMPRESSED AIR SUPPLY SYSTEM before maintaining the tool.

11.1 DAILY CHECKS

1. If no air lubricator is fitted on the compressed air supply system, it is suggested to pour a few drops of the light lubricating oil into the air inlet fitting of tool before daily operation. If the tool is in continuous use, the air inlet fitting should be lubricated every two or three hours.
2. Check for air leaks. If damaged, replace the mini air fitting (36), air hoses (38), and swivel air fitting with on/off slide switch (71).
3. If there is no air filter on the compressed air supply system, bleed the air line to clear the accumulated dirt or water before connecting the air hose to tool. If there is an air filter, drain it.
4. Check the JAW CASE ASSEMBLY DISTANCE that meets the specification 60±0.5 mm (Fig. 5).
5. Carefully check and firmly tighten the jaw case assembly (3AY), working nosepiece (1), head (2), oil screw plug (16), front end cap (24), rear end cap (31), noise silencer lock nut (42), valve end cap (61), air cylinder end cap (68), air inlet end cap (70), swivel air fitting with on/off slide switch (71) before daily operation.
6. Check to empty the spent mandrels. Be sure to fit the spent mandrel container (35) to the front end cap (24) firmly.
7. Check to ensure the trigger (45/45L) operation is normal.

JAW CASE ASSEMBLY DISTANCE 60±0.5 mm

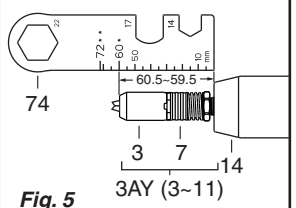


Fig. 5

11.2 WEEKLY CHECKS

1. Dismantle to clean the jaw case assembly (3AY) with special attention to the jaws (4), jaw pusher (5) and jaw pusher spring (6). Use the brush (73) to clean these parts and dip them into oil for lubrication. For better lubrication, lightly apply the thin lubricant oil on the back side of jaws (4) and on the inner slope of front jaw case (3) before reassembly. If jaws (4) and jaw pusher (5) get worn out, and jaw pusher spring (6) becomes shorter or twisted seriously that result in malfunction, replace them. **NOTE:** If the tool is operated frequently, it is suggested to clean the jaw case assembly (3AY) daily.
2. Unscrew the noise silencer lock nut (42), and take out the noise silencer (41) to clean it. See 11.5 for detailed operation.
3. Check the oil leaks and the air leaks in the compressed air supply system.

11.3 EMPTY THE SPENT MANDREL CONTAINER

[WARNING] Overfilling spent mandrels causes the tool to malfunction.

When the spent mandrels fill over 70% capacity of the spent mandrel container (35), pull out the spent mandrel container (35) and empty the spent mandrels. Finally, make sure to fit the spent mandrel container (35) back to the tool firmly.

11.4 CLEAN AND REPLACE THE NOSEPIECES

1. Disconnect the tool from the compressed air supply system.
2. Unscrew the working nosepiece (1) from the head (2), also unscrew other nosepieces from the Nosepieces Storage Design™ at the bottom of the air cylinder end cap (68), clean these nosepieces. Check and replace any worn nosepieces.
3. Fasten the working nosepiece (1) back to the head (2) firmly, and store other nosepieces to the Nosepieces Storage Design™ at the bottom of the air cylinder end cap (68).

11.5 CLEAN AND REPLACE THE NOISE SILENCER (Fig. 6)

1. Disconnect the tool from the compressed air supply system.
2. Unscrew the noise silencer lock nut (42), take out the noise silencer (41) and clean it. If the noise silencer (41) is blocked or covered badly, replace it.
3. Reverse the above step to reassemble these two parts. Ensure that the noise silencer lock nut (42) is fastened firmly.

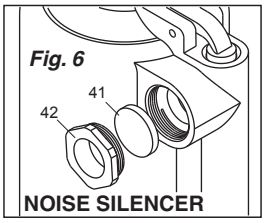


Fig. 6

11.6 CHECK, CLEAN AND REPLACE THE INNER PARTS OF THE QUICK-CHANGE TYPE JAW CASE ASSEMBLY (3AY), AND THE JAWS (4). NOTE: Often clean and lubricate Jaws to prolong operation life. (Fig. 9)

1. **Disconnect the tool from the compressed air supply system.**
2. Unscrew the head (2) with the wrench 2710 (75), **dismantle the quick-change type jaw case assembly (3AY) by hand as per the following steps: Pull back the lock ring (8) to let the tenons of lock ring (8) separate from the slots of front jaw case (3), hold the lock ring (8) and turn the front jaw case (3) counterclockwise to separate the front jaw case (3) from the rear jaw case (7) (Fig. 7).** If necessary, dismantle the rear jaw case (7) with the wrench 7222 (74) and wrench 2710 (75). Now the inner parts can be checked. WARNING: Operator must put on gloves during operation to avoid hurting fingers.

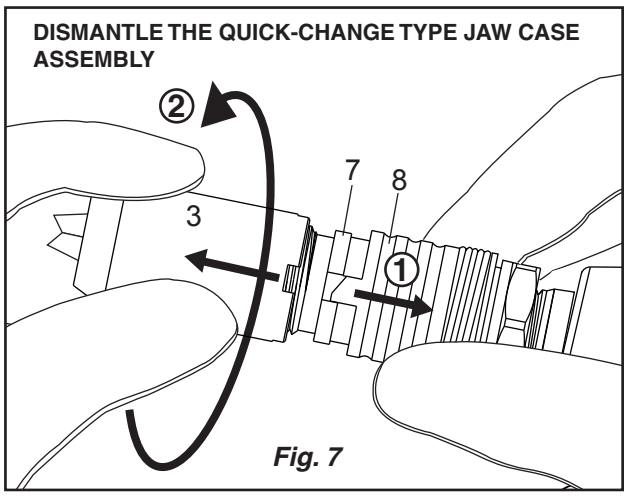


Fig. 7

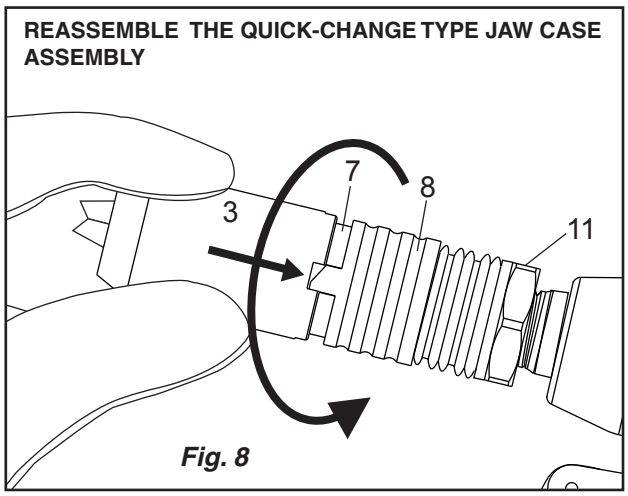


Fig. 8

3. **Check all inner parts. Any worn or damaged parts and twisted jaw pusher spring (6) should be replaced. Pay attention to check the teeth of jaws (4), and replace new jaws (4) if the teeth are worn out. Also pay attention to the jaw pusher (5) and jaw pusher spring (6). Replace them if they are seriously worn out or become shorter or twisted.**
4. Use the brush (73) to clean the front jaw case (3), teeth of jaws (4), jaw pusher (5), jaw pusher spring (6), and rear jaw case (7) (Fig. 9). Dip these parts into oil for lubrication. For better lubrication, lightly apply the thin lubricating oil on the back side of jaws (4) and on the inner slope of front jaw case (3). **Thoroughly cleaning the teeth of jaws (4) and lubricating jaws (4) with thin lubricating oil can prolong the operation life of jaws (4).**
5. Reassemble the lock nut (11), put back the lock washer (10), reassemble lock ring (8) and lock ring spring (9) back onto rear jaw case (7) adjacent to the lock washer (10). Then, put the jaw pusher spring (6) into the rear jaw case (7) (Fig.9).
6. Carefully put the jaws (4) into the front jaw case (3) and put the jaw pusher (5) to fit the jaws (4) properly (Fig. 9). Then, insert the rear part of jaw pusher (5) into the front hole of jaw pusher spring (6), **and use a hand to fasten these parts (3 ~6) in the front jaw case (3) and rear jaw case (7) firmly by turning the quick-change type front jaw case (3) clockwise all the way until the slots of front jaw case (3) accept the tenons of lock ring (8) with 3 ~ 4 click sounds. Finally the front jaw case (3) can not move backward any more, and the front jaw case (3) is firmly fastened with the rear jaw case (7) (Fig.8).** Make sure that the lock nut (11) is still not fastened yet.
7. **Use the wrench 7222 (74) to check and adjust the lock nut (11) to the recommended jaw case assembly distance 60±0.5 mm (Fig. 5).** At the same time, tighten the rear jaw case (7) and the lock nut (11) firmly with the wrench 7222 (74) and wrench 2710 (75). Finally, use the wrench 2710 (75) to fasten the head (2) firmly.
8. Connect the tool to the compressed air supply system. It is suggested to depress the trigger (45/45L) twice to adjust the inner parts of jaw case assembly (3AY) to the normal position, so that the blind rivet mandrel can be inserted into the working nosepiece (1) smoothly.

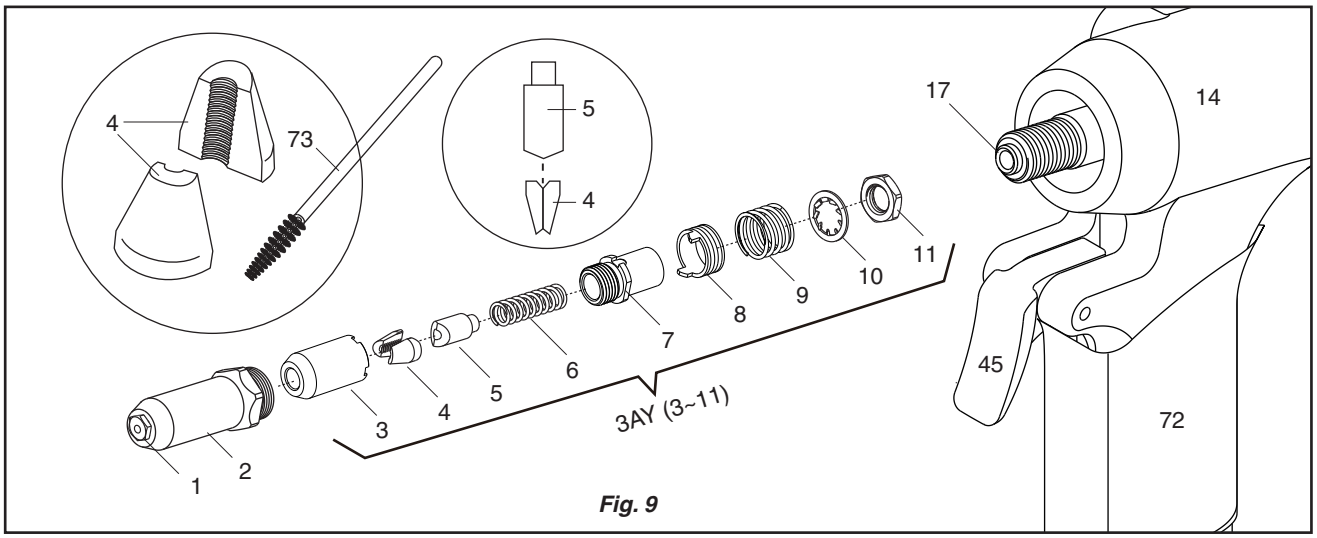


Fig. 9

11.7 REFILL HYDRAULIC OIL THROUGH THE OIL REFILL HOLE (Fig. 10)

When the shortage of hydraulic oil causes the decrease of stroke, the normal stroke can be recovered by filling the hydraulic oil into the oil refill hole on the side of oil cylinder (14).

[WARNING]

- **Always wear the safety goggles during operation.**
- **The hydraulic oil is suggested to use ISO VG-32 or VG-46 that are popular in market.**
- **Be sure to disconnect the tool from the compressed air supply system before unscrewing the oil screw plug (16).**
- **Make sure to tighten the oil screw plug (16) firmly after refilling oil.**

1. Connect the tool to the compressed air supply system, depress the trigger (45/45L) twice to move the inner oil piston assembly (17AY) and air piston assembly (65AY).
2. **Disconnect the tool from the compressed air supply system.**
3. Push the piston of the hydraulic oil injector (77) forwards to the end, and then immerse the fitting of hydraulic oil injector (77) in the new hydraulic oil and slowly pull the piston backwards to suck the new hydraulic oil around 25 ml into the hydraulic oil injector (77). **Make sure that the hydraulic oil injector (77) contains no air bubbles in the oil.**
4. Firstly pull out the spent mandrel container (35), and then lay the Tool flat and let **Oil Refill Hole** upward. **Carefully unscrew the oil screw plug (16) and remove the sealing washer (15).**
5. **Gently rotate to screw the fitting of hydraulic oil injector (77) into the oil refill hole of oil cylinder (14) firmly.**
6. **Depress the piston of hydraulic oil injector (77) forwards to inject oil until the piston can not move further.**
7. Gently unscrew to remove the fitting of hydraulic oil injector (77) from the oil refill hole of oil cylinder (14). Wipe away the spilt oil, if any.
8. **Restore the sealing washer (15), and carefully tighten the oil screw plug (16) firmly.**
9. Reconnect the tool to the compressed air supply system, and depress the trigger (45/45L) twice. Then, the normal stroke is recovered.

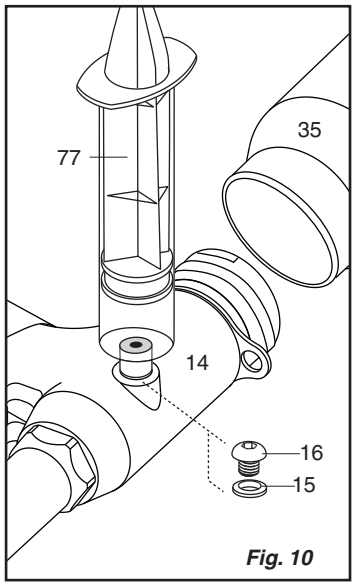


Fig. 10

11.8 REPLACE THE HYDRAULIC OIL ONLY

- **After considerable times of operation, the hydraulic oil should be replaced.**
- **The hydraulic oil is suggested to use ISO VG-32 or VG-46 that are popular in market.**

1. **Disconnect the tool from the compressed air supply system.**
2. Use the wrench 7222 (74) to unscrew the air cylinder end cap (68) & o-ring (67), use a pair of pliers to clamp the air piston lock nut (66) and slowly pull out the air piston assembly (65AY) in a straight line (Fig. 11). **Be careful not to scratch the air piston rod (64) and the inner wall of air cylinder (39). Drain the dirty hydraulic oil out of the tool through the air cylinder (39).**
3. Clean and grease the inner wall of air cylinder (39) (Fig. 12), and also clean and grease the air piston ring (63).
4. **Put the tool upside-down, and use the oil bottle (76) loaded with new hydraulic oil to refill into the oil cylinder (14) through the air cylinder (39) until oil is flushed with the upper oil cylinder o-ring (12) (Fig. 13). Make sure not to overfill oil, and rest for a while until the oil stops releasing air bubbles.**
5. Use a pair of pliers to clamp the air piston lock nut (66) and slowly plug the air piston assembly (65AY) in a straight line into the oil cylinder (14) through the oil cylinder lock nut (44) (Fig. 11). Then, depress the air piston assembly (65AY) 2 ~ 3 times. Repeat above steps to check again the oil level, and add a little hydraulic oil if necessary, but not to add too much oil.Finally reassemble the air cylinder end cap (68) & o-ring (67) with the wrench 7222 (74).

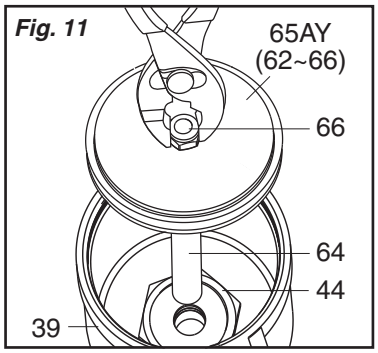


Fig. 11

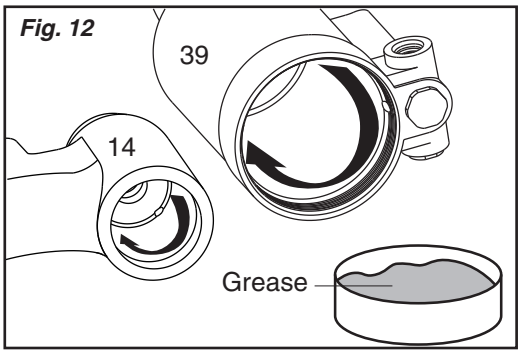


Fig. 12

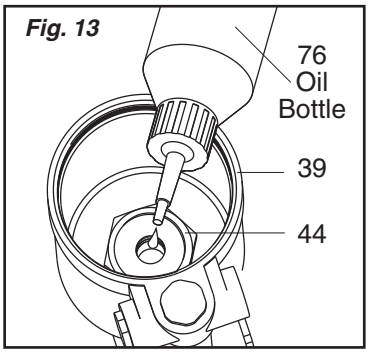


Fig. 13

11.9 REPLACE THE OIL CYLINDER, AIR CYLINDER, MINI AIR FITTINGS, MINI AIR HOSE, O-RINGS, BACK-UP RINGS, RETURN SPRINGS AND HYDRAULIC OIL TOGETHER

• After considerable times of operation, oil cylinder (14) and air cylinder (39) as well as their O-rings and back-up rings, return springs (20 & 21), also the hydraulic oil should be replaced.

• The hydraulic oil is suggested to use ISO VG-32 or VG-46 that is popular in market.

1. **Disconnect the tool from the compressed air supply system, and then pull out spent mandrel container (35) from rear end cap (31).**
2. Use the wrench 2710 (75) to unscrew the head (2), and use the wrench 7222 (74) and wrench 2710 (75) to separate the complete quick-change type jaw case assembly (3AY) from the front male thread of oil piston (17).
3. Use the wrench 7222 (74) to unscrew the air cylinder end cap (68) & o-ring (67), then use a pair of pliers to clamp the air piston lock nut (66) and slowly pull out the air piston assembly (65AY) in a straight line (Fig. 11). **Be careful not to scratch the air piston rod (64) and the inner wall of air cylinder (39). Drain the dirty hydraulic oil out of the oil cylinder (14) through the air cylinder (39).**
4. **Check and replace the worn buffer ring (62), air piston ring (63), and air cylinder end cap o-ring (67). Also check and replace the worn or scratched air piston rod (64) and the damaged air piston (65). Finally, check the air piston lock nut (66) and lock it firmly.**
5. Firstly, press the lock ring of vacuum on/off switch (37) around the mini air hose (38) and pull out the mini air hose (38). Use a pair of pliers to lock the mini air fitting (36), use another a pair of pliers to unscrew a lock nut and put out the mini air hose (38); now the mini air hose (38) is dismantled, but the mini air fitting (36) is still fixed to the rotor (27). Use a long stem socket wrench 35 mm to unscrew the oil cylinder lock nut (44) along with a lock nut o-ring (43), and then use a suitable diameter pin carefully to punch out the lever pin (51) to separate the trigger lever (47) from air cylinder (39). Carefully use a hex wrench 3 mm to unscrew the positioning screw (40), and then vertically pull the oil cylinder (14) out of the air cylinder (39) with care, the lock nut o-ring (43) is jumped out from the thread of oil cylinder (14). Check and replace the worn or scratched air cylinder (39) on the inner wall, also check and replace the worn or damaged air inlet end cap o-ring (69), vacuum on/off switch (37) and mini air hose (38). Pay special attention the oil cylinder lock nut (44) should be replaced after repeated fastening 3 ~ 4 times. The lock nut o-ring (43) should be replaced each time after dismantling oil cylinder lock nut (44).
6. Pull out the spent mandrel container (35), then remove rear end cap o-rings (34) and spent mandrel safe protector & o-rings (33 & 32). Use a wrench 27 mm to dismantle the rear end cap (31) to remove vacuum valve assembly (29AY) from oil cylinder (14), remove hanging bracket o-ring (22) and hanging bracket (23) from the front end cap (24), take out the large & small return springs (20 & 21), and slowly press the threaded end of oil piston (17) to take out the oil piston assembly (17AY) from the rear end of oil cylinder (14). Pay special attention to dismantle the oil cylinder (14), do not let the strong force of large & small return springs (20 & 21) jump out to hurt people. Be careful not to scratch the rod of oil piston (17) and the inner wall of oil cylinder (14). Check and replace the worn or damaged o-rings (22, 32, 34) of the above-mentioned parts (23, 33, 35).
7. Use a wrench 30 mm and a wrench 27 mm to dismantle the front end cap (24) and the rear end cap (31), take out rotor (27) from the front end cap (24), check and replace the worn front end cap middle o-rings (25) and front end cap rear o-ring (26). Use a socket wrench 14 mm and a wrench 27 mm to unscrew the vacuum valve (29) from the rear end cap (31), check and replace the worn vacuum valve front o-ring (28) and vacuum valve rear o-ring (30).
8. Check and replace the worn oil cylinder o-rings (12) and oil cylinder back-up rings (13) in the front part and lower part of oil cylinder (14), as well as the oil piston o-ring (18) and oil piston back-up ring (19). Check and replace the worn or scratched oil piston rod (17) and oil cylinder (14). Also check and replace the weak or broken large & small return springs (20 & 21).
9. Clean and grease around the inner walls of oil cylinder (14) and air cylinder (39) (Fig. 12), the oil piston o-ring (18) and air piston ring (63).
10. Reverse above steps to reassemble the vacuum valve (29) back to the rear end cap (31), put rotor (27) back to the front end cap (24), and then use a wrench 30 mm and a wrench 27 mm to fasten the front end cap (24) to the rear end cap (31) firmly.
11. Reverse above steps to reassemble the oil piston assembly (17AY) and large & small return springs (20 & 21) along with hanging bracket (23) and hanging bracket o-ring (22) into the rear end of oil cylinder (14), carefully depress the vacuum valve assembly (29AY) to screw into oil cylinder (14) firmly, finally install the spent mandrel container (35). **Pay special attention to the strong force of large & small return springs (20 & 21) which might jump out to hurt people.**
12. Reverse above steps to reassemble the oil cylinder (14) and air cylinder (39) together by aligning and using a hex wrench 3 mm to fasten the Positioning Screw (40) carefully, put a new lock nut o-ring (43) onto the thread of oil cylinder (14) and carefully move it (43) down to touch the top of air cylinder (39), and then fasten the oil cylinder lock nut (44) firmly with a long stem socket wrench 35 mm. And then reassemble the trigger lever (47) back to the air cylinder (39) by punching the lever pin (51) into the original pin holes carefully. Plug the mini air hose (38) back to the mini air fitting (36) and fasten lock nut firmly to hold the mini air hose (38); fasten the vacuum on/off switch (37) back to the air inlet end cap (70) and plug another end of mini air hose (38) back to the vacuum on/off switch (37).
13. Put the tool upside-down, and use the oil bottle (76) loaded with new hydraulic oil to refill into the oil cylinder (14) through the air cylinder (39) until the oil is flushed with the upper oil cylinder o-rings (12) (Fig. 13). Make sure not to overfill oil, and rest for a while until the oil stops releasing air bubbles.
14. Use a pair of pliers to clamp the air piston lock nut (66) and slowly plug the air piston assembly (65AY) in a straight line into the oil cylinder (14) through the oil cylinder lock nut (44) of air cylinder (39) (Fig. 11), then depress the air piston assembly (65AY) 2 ~ 3 times. Finally, use a wrench 7222 (74) to fasten the air cylinder end cap (68) & o-ring (67).

15. Use the wrench 7222 (74) and wrench 2710 (75) to reassemble the complete quick-change type jaw case assembly (3AY) back to the front male thread of oil piston (17) (Fig. 9), and then use the wrench 7222 (74) and wrench 2710 (75) to adjust and lock the jaw case assembly distance to 60±0.5 mm (Fig. 5). Finally, fasten the head (2) to the tool. Ensure that the vacuum valve assembly (29AY) is fastened firmly, the quick-change type jaw case assembly (3AY) and head (2) are all fastened firmly, and the spent mandrel container (35) is fitted well.

11.10 DISMANTLE AND REPLACE THE PARTS OF THE TRIGGER ASSEMBLY (45AY/45LAY) AND THE VALVE ASSEMBLY (53AY) (Fig. 14)

1. **Disconnect the tool from the compressed air supply system.**
2. Firstly use a suitable diameter pin carefully to punch out the lever pin (51) to separate the trigger lever (47) from air cylinder (39), and use a suitable diameter pin carefully to punch out the trigger pin (50) to separate trigger (45/45L) from oil cylinder (14), and then to punch out the lower link pin (49) to separate trigger link (46) from trigger lever (47). Finally, pull out the trigger (45/45L) connected with trigger link (46) and upper link pin (48) from the front upper side of grip (72). Check and replace any worn parts of the trigger assembly (45AY/45LAY).
3. Dismantle the valve assembly (53AY) by unscrewing valve end cap (61), and carefully take out valve assembly (53AY) from two ends. Check and replace any worn parts of the valve assembly (53AY), such as O-rings (52, 54, 56, 32, 60), springs (55, 59), etc.
4. Reverse above steps, firstly reassemble the valve assembly (53AY), and then to reassemble the trigger assembly (45AY/45LAY) by pluging the trigger (45/45L) connected with trigger link (46) and upper link pin (48) into the front upper side of grip (72), and punch the trigger pin (50) into the original pin holes of oil cylinder (14) and trigger (45/45L), then carefully punch the lower link pin (49) into the original pin holes of trigger link (46) and trigger lever (47).
5. Finally, reassemble the trigger lever (47) back to the air cylinder (39) by punching the lever pin (51) into the original pin holes of air cylinder (39) and trigger lever (47) carefully. Now the reassembly process is completed.

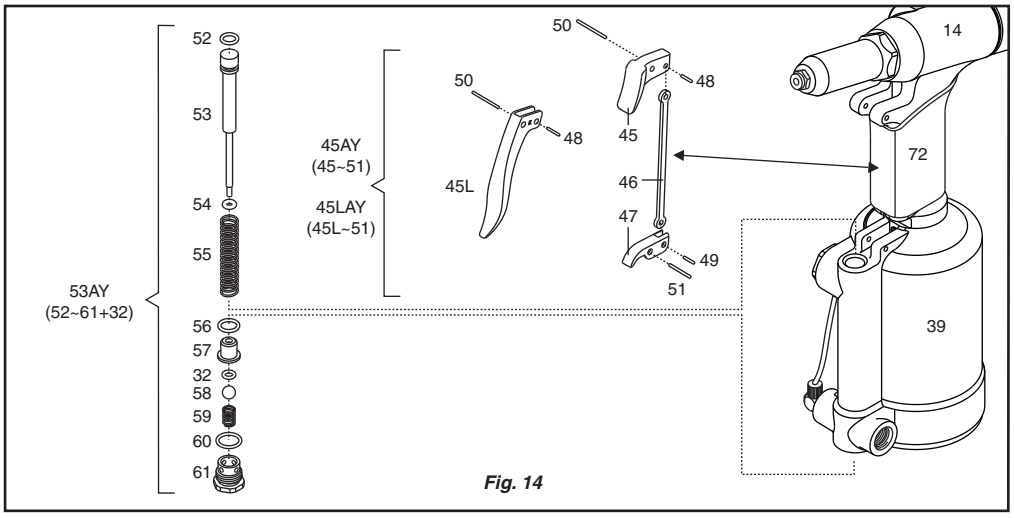


Fig. 14

11.11 HOW TO INSTALL THE VACUUM TUBE (17A) BEFORE SETTING SMALL SIZE BLIND RIVETS

It is strongly suggested to install the Vacuum Tube (17A) before setting small size 2.4 & 3.0/3.2 mm or 3/32" & 1/8" blind rivets to ensure perfect ejection of spent mandrel into the Spent Mandrel Container after setting blind rivets.

1. **Firstly switch off the slide switch of swivel air fitting (71) to stop riveting work.**
2. **Dismantle head (2) from tool, turn to separate quick-change type front jaw case (3) from rear jaw case (7), finally remove jaws (4), jaw pusher (5) and Jaw pusher spring (6) from the inside of rear jaw case (7).**
3. **Insert vacuum tube (17A) into rear jaw case (7) completely.**
4. **Assemble jaw pusher spring (6), jaw pusher (5) and jaws (4) into rear jaw case (7), lock well quick-change type front jaw case (3) back to rear jaw case (7), finally install head (2) back to tool. Now the vacuum tube (17A) is installed and ready for operation.**
5. **Go back to P. 10 and follow the 10.6 OPERATING PROCEDURE WITH VACUUM SYSTEM, item 4 With Vacuum System, to continue the operating procedure.**

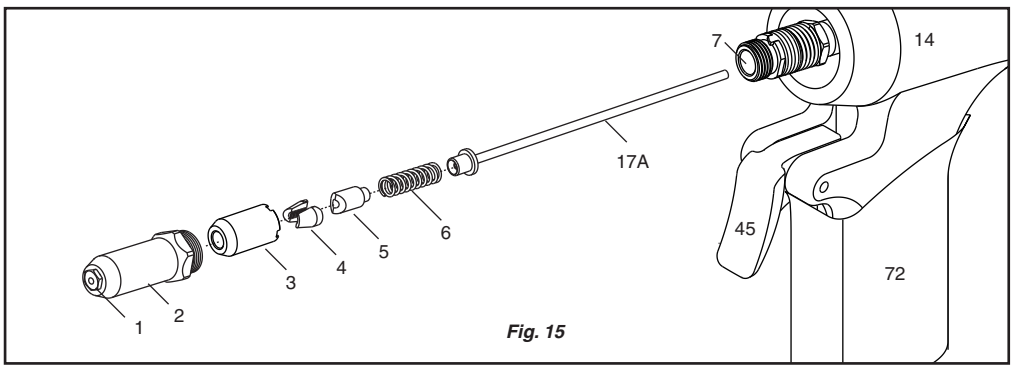


Fig. 15

12. TROUBLESHOOTING

12.1 MALFUNCTION: Blind Rivet Mandrel fails to insert into Working Nosepiece (1)

Possible Causes:	Solutions:
Wrong size Working Nosepiece (1)	Change a correct size Working Nosepiece (1)
Loose Working Nosepiece (1)	Tighten Working Nosepiece (1)
Dust accumulated in Nosepiece (1)	Clean Nosepiece (1)
Worn Nosepiece (1)	Replace a new Nosepiece (1)
Loose Head (2)	Tighten Head (2)
Improper assembly of Jaw Case Assembly (3AY)	Reassemble Jaw Case Assembly (3AY)
Dust accumulated in Jaw Case Assembly (3AY)	Clean and lubricate Jaw Case Assembly (3AY) Parts
Worn Jaw Pusher (5)	Replace a new Jaw Pusher (5)
Weak or broken Jaw Pusher Spring (6)	Replace a new Jaw Pusher Spring (6)
Weak or broken Return Springs (20 & 21)	Replace new Return Springs (20 & 21)
Insufficient Jaw Case Assembly Distance	Adjust to normal Distance 60±0.5 mm
Air Piston Assembly (65AY) stuck in Air Cylinder (39)	See below 12.6 Solutions
Spent Mandrels jammed in the Tool	Clean to eject Spent Mandrels
Spent Mandrel Container (35) is full	Empty Spent Mandrel Container (35)

12.2 MALFUNCTION: Tool fails to bite or break Blind Rivet Mandrel

Possible Causes:	Solutions:
Wrong size Working Nosepiece (1)	Change a correct size Working Nosepiece (1)
Dust accumulated in Jaws (4)	Clean and lubricate Jaws (4)
Worn or broken Jaws (4) and Jaw Pusher (5)	Replace new Jaws (4) and Jaw Pusher (5)
Weak or broken Jaw Pusher Spring (6)	Replace a new Jaw Pusher Spring (6)
Loose Front Jaw Case (3) and Rear Jaw Case (7)	Tighten Front Jaw Case (3) and Rear Jaw Case (7)
Dust accumulated in Jaw Case Assembly (3AY)	Clean and lubricate Jaw Case Assembly (3AY) Parts
Loose Head (2)	Tighten Head (2)
Dust accumulated in Head (2)	Clean the inside of Head (2)
Low Air Pressure or Air Pressure lost	Check Compressed Air Supply System, adjust Air Pressure to in specification, check if Slide Switch of Swivel Air Fitting (71) is fully switched on, check Air Cylinder (39) leak and replace it if necessary, clean Air Cylinder (39) inside, clean or replace Air Piston Ring (63) and O-Rings (67, 69)
Hydraulic Oil Pressure lost	Insufficient Oil and refill Oil, check Oil Cylinder (14) leak and replace it if necessary, replace all O-Rings (12, 18, 22) and Back-Up Rings (13, 19)
Exceed Tool's Capacity	Use more powerful Tool

12.3 MALFUNCTION: Spent Mandrel can't be ejected after setting Blind Rivet

Possible Causes:	Solutions:
Did not switch on Slide Switch of Swivel Air Fitting (71)	Switch on Slide Switch of Swivel Air Fitting (71)
Did not turn on Vacuum ON/OFF Switch (37)	Turn on Vacuum ON/OFF Switch (37)
Did not install Vacuum Tube (17A) when setting small size 2.4 & 3.0/3.2 mm or 3/32" & 1/8" Blind Rivet	Install Vacuum Tube (17A) as per the 11.11 instructions
Wrong size Working Nosepiece (1)	Change a correct size Working Nosepiece (1)
Dust accumulated in Jaw Case Assembly (3AY)	Clean and lubricate Jaw Case Assembly (3AY) Parts
Spent Mandrels jammed in Tool	Clean to eject Spent Mandrels
Spent Mandrel Container (35) is full	Empty Spent Mandrel Container (35)
Air Piston Assembly (65AY) stuck in Air Cylinder (39) and fails to return to its normal position	See below 12.6 Solutions

12.4 MALFUNCTION: Slow Cycle

Possible Causes:	Solutions:
Low Air Pressure	Check Compressed Air Supply System, adjust Air Pressure to in specification, check if Slide Switch of Swivel Air Fitting (71) is fully switched on, check Air Cylinder (39) leak and replace it if necessary, clean Air Cylinder (39) inside, clean or replace Air Piston Ring (63) and O-Rings (67, 69)
Dust accumulated in Jaw Case Assembly (3AY)	Clean and lubricate Jaw Case Assembly (3AY) Parts
Dust accumulated in Head (2)	Clean the inside of Head (2)

12.5 MALFUNCTION: No operation after triggering (Stroke lost), or more than one operation of trigger (45/45L) to fasten Blind Rivet (Stroke decreased)

Possible Causes:	Solutions:
Rivet Body is too long	Check suitable Rivet Body length to match work pieces' thickness. It is nothing to do with Stroke of Tool
Low Air Pressure	Check Compressed Air Supply System, adjust Air Pressure to in specification, check if Slide Switch of Swivel Air Fitting (71) is fully switched on, check Air Cylinder (39) leak and replace it if necessary, clean Air Cylinder (39) inside, clean or replace Air Piston Ring (63) and O-Rings (67, 69)
Improper assembly of Jaw Case Assembly (3AY)	Reassemble Jaw Case Assembly (3AY)
Dust accumulated in Jaw Case Assembly (3AY)	Clean and lubricate Jaw Case Assembly (3AY) Parts
Dust accumulated in Jaws (4)	Clean and lubricate Jaws (4)
Worn or broken Jaws (4), Jaw Pusher (5), Jaw Pusher Spring (6)	Replace new Jaws (4), Jaw Pusher (5), Jaw Pusher Spring (6)
Overlong Jaw Case Assembly Distance	Adjust to normal Distance 60±0.5 mm
Insufficient Hydraulic Oil leads to Stroke decreased	Refill Hydraulic Oil, see 11.7 Solutions
Air bubbles in Hydraulic Oil	Suck air bubbles from Oil Refill Hole by Hydraulic Oil Injector (77), or bleed Oil from Air Cylinder (39), and refill New Hydraulic Oil
Oil Cylinder (14) leaks	See below 12.7 solutions
Improper assembly of Valve Assembly (53AY)	Reassemble Valve Assembly (53AY)
Worn O-Rings in Valve Assembly (53AY)	Replace all O-Rings (52, 54, 56, 32, 60)

12.6 MALFUNCTION: Slow operation or no operation of Air Piston Assembly (65AY) in Air Cylinder (39)

Possible Causes:	Solutions:
Improper assembly of Valve Assembly (53AY)	Reassemble Valve Assembly (53AY)
Worn O-Rings in Valve Assembly (53AY)	Replace all O-Rings (52, 54, 56, 32, 60)
Improper assembly of Air Piston Assembly (65AY)	Reassemble Air Piston Assembly (65AY)
Worn Air Piston Ring (63) and Buffer Ring (62)	Replace Air Piston Ring (63) and Buffer Ring (62)
Low Air Pressure	Check Compressed Air Supply System, adjust Air Pressure to in specification, check if Slide Switch of Swivel Air Fitting (71) is fully switched on, check Air Cylinder (39) leak and replace it if necessary, clean Air Cylinder (39) inside, clean or replace Air Piston Ring (63) and O-Rings (67, 69)
Noise Silencer (41) blocks air exhaust	Clean or replace a new Noise Silencer (41)
Weak or broken Return Springs (20 & 21)	Replace new Return Springs (20 & 21)

12.7 MALFUNCTION: Oil Cylinder (14) leaks Hydraulic Oil

Possible Causes:	Solutions:
Oil Cylinder (14) damaged	Replace a new Oil Cylinder (14)
Improper assembly of O-Rings (12, 18, 22) and Back-Up Rings (13, 19) in front & rear ends of Oil Cylinder (14)	Reassemble O-Rings (12, 18, 22) and Back-Up Rings (13, 19) in front & rear ends of Oil Cylinder (14)
Worn O-Rings (12, 18, 22) and Back-Up Rings (13, 19) in front & rear ends of Oil Cylinder (14)	Replace new O-Rings (12, 18, 22) and Back-Up Rings (13, 19) in front & rear ends of Oil Cylinder (14)

12.8 MALFUNCTION: Air Cylinder (39) and Noise Silencer (41) leak Hydraulic Oil

Possible Causes:	Solutions:
Improper assembly of O-Rings (12) and Back-Up Ring (13) in lower end of Oil Cylinder (14)	Reassemble O-Rings (12) and Back-Up Ring (13) in lower end of Oil Cylinder (14)
Worn O-Rings (12) and Back-Up Ring (13) in lower part of Oil Cylinder (14)	Replace new O-Rings (12) and Back-Up Ring (13) in lower end of Oil Cylinder (14)
Worn Lock Nut O-Ring (43)	Replace New Lock Nut O-Ring (43)

12.9 MALFUNCTION: Valve Assembly (53AY) and Noise Silencer (41) leak Air

Possible Causes:	Solutions:
Improper assembly of Valve Assembly (53AY)	Reassemble Valve Assembly (53AY), and depress trigger (45/45L) several times
Worn O-Rings (52, 54, 56, 32, 60) in Valve Assembly (53AY)	Replace new O-Rings (52, 54, 56, 32, 60) in Valve Assembly (53AY)
Weak Springs (55, 59) in Valve Assembly (53AY)	Replace new Springs (55, 59) In Valve Assembly (53AY)

12.10 MALFUNCTION: Air Inlet and Swivel Air Fitting with ON/OFF Slide Switch (71) leak Air

Possible Causes:	Solutions:
Wrong thread size of Swivel Air Fitting with ON/OFF Slide Switch (71)	Change thread size of Swivel Air Fitting with ON/OFF Slide Switch (71) to the correct thread size
Swivel Air Fitting with ON/OFF Slide Switch (71) damaged	Replace a new Swivel Air Fitting with ON/OFF Slide Switch (71)
Air Inlet thread damaged	Tap Air Inlet thread and wrap Tape Seal around male thread of Swivel Air Fitting with ON/OFF Slide Switch (71)

12.11 MALFUNCTION: Mini Air Fitting (36), Vacuum ON/OFF Switch (37) and Mini Air Hose (38) leak Air

Possible Causes:	Solutions:
Mini Air Fitting (36), Vacuum ON/OFF Switch (37) and Mini Air Hose (38) got loose	Tighten Mini Air Fitting (36) and Vacuum ON/OFF Switch (37), pull out Mini Air Hose (38) and plug it (38) into Mini Air Fitting (36) and Vacuum ON/OFF Switch (37) again
Mini Air Fitting (36), Vacuum ON/OFF Switch (37) and Mini Air Hose (38) damaged	Replace new Mini Air Fitting (36), Vacuum ON/OFF Switch (37) and Mini Air Hose (38)

13. DISPOSAL

The disposal of tool and hydraulic oil shall be in accordance with local environmental regulations.

14. PATENTS

USA 8,650,731 **Germany 20 2010 008 658.2** **Australia 099203542**

Russia 102549 **Taiwan M 385417** 中国 实用新型专利 **ZL 2010 2 0148358.6**

15. EC DECLARATION OF CONFORMITY

CE

EC DECLARATION OF CONFORMITY

We: **Karat Industrial Corporation**

54, Wu Chyuan 7th Road, Wu Gu District, New Taipei City 24890, Taiwan

declare in sole responsibility that the equipment

Equipment : PNEUMATIC-HYDRAULIC RIVET TOOL

Model/ Serial No. : AR-180, AR-180G, AR-180S, AR-180SG, AR-210, ARV-210, AR-211, ARV-211, AR-212, ARV-212, Air-Grip 2 AR-102, Air-Grip 2, AR-102, Air-Grip 2V ARV-102, Air-Grip 2V, ARV-102, Air-Grip 3 AR-260, Air-Grip 3, AR-260, Air-Grip 3V ARV-260, Air-Grip 3V, ARV-260, Air-Grip 3S AR-240, Air-Grip 3S, AR-240, Air-Grip 3SV ARV-240, Air-Grip 3SV, ARV-240, Air-Grip 4 AR-230, Air-Grip 4, AR-230, Air-Grip 4V ARV-230, Air-Grip 4V, ARV-230, Air-Grip 4H AH-250, Air-Grip 4H, AH-250

to which this declaration applies, complies with these normative documents:

- **Machinery Directive: 2006/42/EC**

and conforms to the following EN standards,

- **EN ISO 12100: 2010**
- **EN ISO 11148-1:2011**

Authorized representative established within the EU (if applicable):

Company Name:

Company Address:

Person responsible for compiling the technical file established within the EU:

Name, Surname:

Address:

Note : This declaration becomes invalid, if technical or operational modifications are introduced without the manufacturers consent.

David Chang

Mr. David Chang / General Manager

KARAT INDUSTRIAL CORPORATION

January 2020, Taiwan