

# **BATo AR-102**

*Industrial*

## ***PNEUMATIC-HYDRAULIC RIVET TOOL***

*With Forged Aluminum and  
Quick-Change Jaw Case Assembly*

### **OPERATION MANUAL**



TÜVRheinland  
CERTIFIED



*Original Instructions*

## 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" commercial blind rivets in all materials (aluminum, copper, steel and stainless steel), also can set 4.8/5.0 mm or 3/16" structural blind rivets in all materials. 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 **Quick-Change Type Jaw Case System** for fast cleaning or replacing inside parts (Jaws, Jaw Pusher, etc.) just by hand without any wrenches.
3. Innovative **Shock-Reducer Design™** to minimize hand fatigue.
4. Innovative **Noise Silencer Design™** for working pleasure.
5. Patented **Rivet Size Hole Gauge Design™** to eliminate choosing wrong size blind rivet and working nosepiece.
6. Smart **Nosepieces Storage Design™** to avoid losing nosepieces.
7. Smart **Twin Air Inlets** to meet individual operating hobby, such as the right-handed operators or left-handed operators.
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

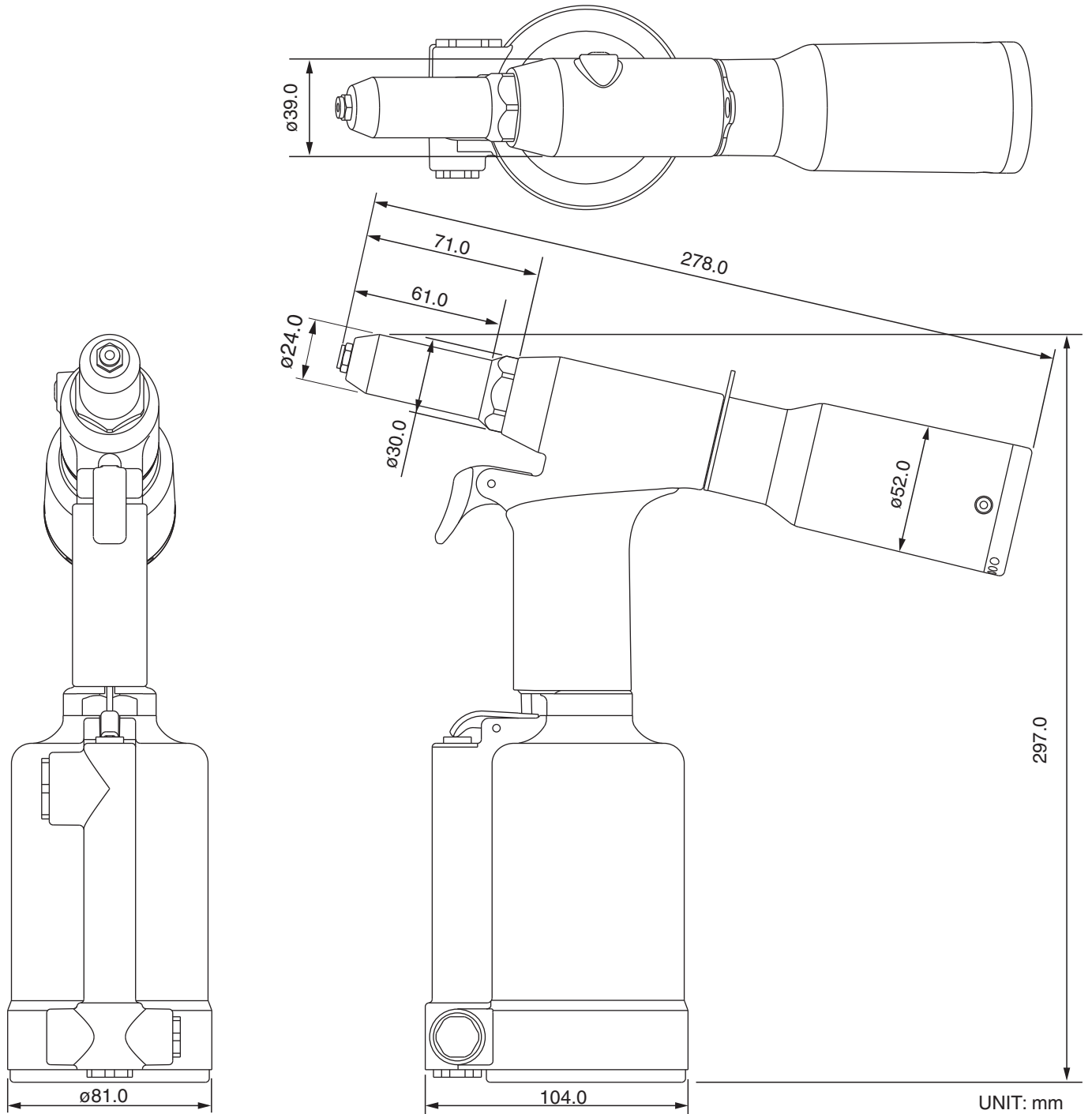
1. **Traction Force:** 9,000 N at 6.2 bar or 2,000 lbf at 90 psi compressed air pressure
2. **Stroke:** 18 mm or 0.71"
3. **Working Compressed Air Pressure:** 5.5 - 6.5 bar or 80 - 95 psi
4. **Air Consumption:** Approx. 2.4 liters per rivet or 0.08 cuft per rivet.
5. **Hydraulic Oil, ISO VG-32 or VG-46:** Approx. 40 ml
6. **Working Temperature:** 0 - 40 °C or 32 - 104 °F.
7. **Noise Level:**  
Sound Pressure Level,  $L_{PA}$ : 76.9 dB(A)  
Uncertainty:  $K_{PA}$  = 3.0 dB  
  
Sound Power Level,  $L_{WA}$ : 87.9 dB(A)  
Uncertainty:  $K_{WA}$  = 3.0 dB
8. **Vibration:**  
Hand-arm vibration value: Less than 2.5 m/s<sup>2</sup>  
Uncertainty : K = 1.5 m/s<sup>2</sup>
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. 1.89 kg or 4.17 lb
12. **Standard Parts:** 4 Standard Nosepieces (1A, 1B, 1C, 1D), Spare Jaws (4), Spent Mandrel Container (26), Brush (61), 2 Service Tools (62, 63), Hydraulic Oil Injector (65, without Oil), Hydraulic Oil Bottle (64, without Oil)
13. **Optional Parts:** \*Monobolt Nosepiece 4.8/5.0 mm or 3/16" (1E), \*HSS Nosepiece 4.0 mm or 5/32" (1F), \*HSS Nosepiece 4.8/5.0 mm or 3/16" (1G).
14. **RIVETING CAPACITY:**

Rivet Diameter \ Rivet Material	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	●	●	●

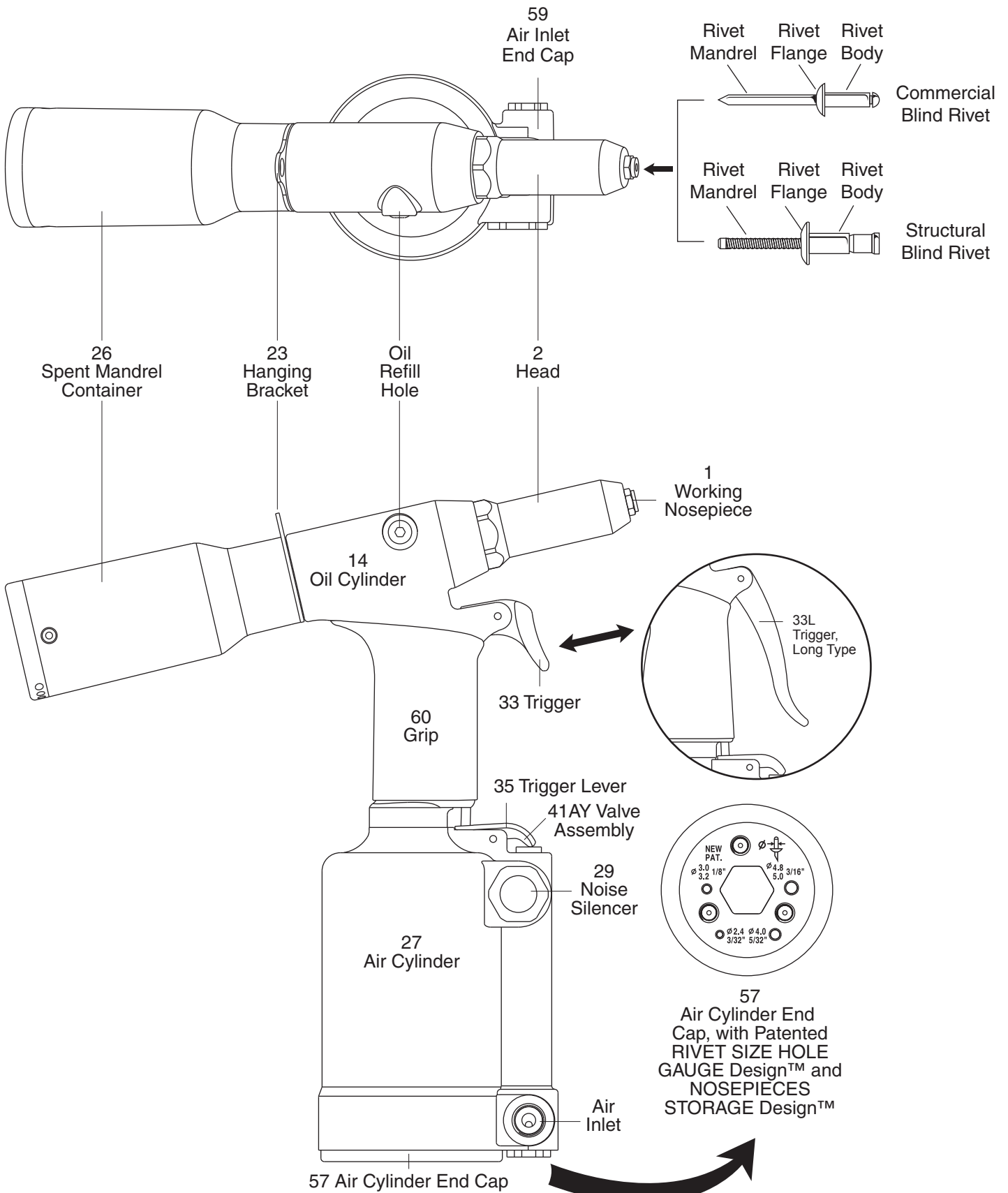
### Remarks:

- Use Standard Nosepieces to set Standard/Commercial 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 0.25mm or 0.01" bigger than that of Standard/Commercial Blind Rivets.
- Use \*Monobolt Nosepieces to set \*Monobolt Blind Rivets.
- \*Monobolt is a registered trade mark of AVDEL.

## 7. DIMENSIONS

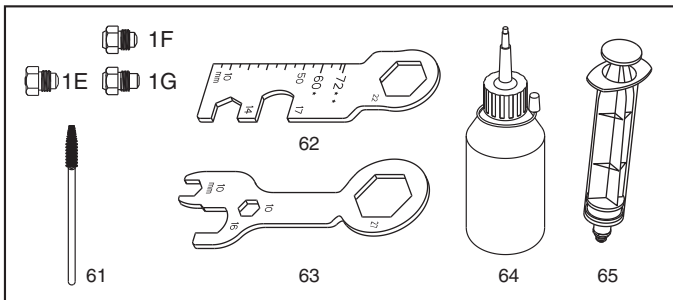
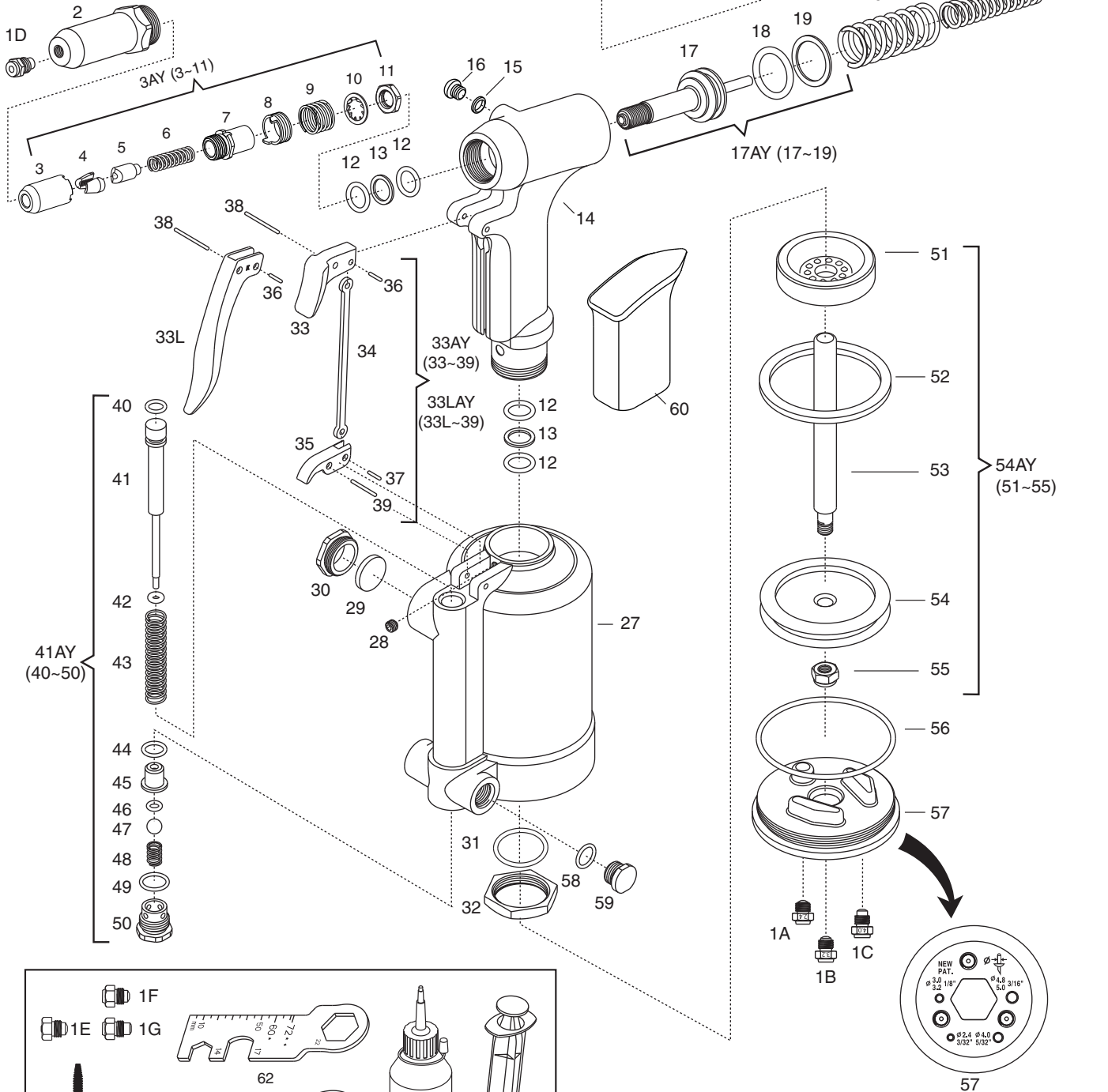
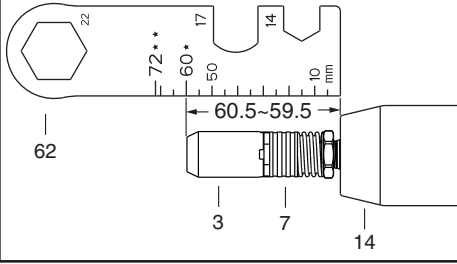


## 8. MAIN PARTS



## 9. PARTS LIST

### JAW CASE ASSEMBLY DISTANCE 60±0.5 mm



NO.	PART NO.	PART NAME	NO.	PART NO.	PART NAME
• 1A	AR102-01A	Standard Nosepiece, 2.4 mm or 3/32"	• 32	AR102-32	Oil Cylinder Lock Nut
• 1B	AR102-01B	Standard Nosepiece, 3.0/3.2 mm or 1/8"	33	AR102-33	Trigger
• 1C	AR102-01C	Standard Nosepiece, 4.0 mm or 5/32"	▲ 33L	AR102-33L	Trigger, Long Type (Option)
• 1D	AR102-01D	Standard Nosepiece, 4.8/5.0 mm or 3/16"	34	AR102-34	Trigger Link
• 1E	AR102-01E	Optional ★ Monobolt Nosepiece, 4.8/5.0 mm or 3/16"	35	AR102-35	Trigger Lever
• 1F	AR102-01F	Optional 4.0 HSS Nosepiece for High Strength Structural (HSS) Blind Rivet, 4.0 mm or 5/32"	• 36	AR102-36	Upper Link Pin
			• 37	AR102-37	Lower Link Pin
• 1G	AR102-01G	Optional 4.8 HSS Nosepiece for High Strength Structural (HSS) Blind Rivet, 4.8/5.0 mm or 3/16"	• 38	AR102-38	Trigger Pin
			• 39	AR102-39	Lever Pin
2	AR102-02	Head	33AY	AR102-33AY	Trigger Assembly (33~39)
3	AR102-03	Front Jaw Case, Quick-Change Type	▲ 33LAY	AR102-33LAY	Trigger Assembly (33L~39), Long Type (Option)
• 4	AR102-04	Jaws, 2-PC Type	• 40	AR102-40	Valve Pusher Upper O-Ring
• 5	AR102-05	Jaw Pusher	41	AR102-41	Valve Pusher
• 6	AR102-06	Jaw Pusher Spring	• 42	AR102-42	Valve Pusher Lower O-Ring
7	AR102-07	Rear Jaw Case, Quick-Change Type	43	AR102-43	Valve Pusher Spring
8	AR102-08	Lock Ring, Quick-Change Type	• 44	AR102-44	Valve Sleeve O-Ring
9	AR102-09	Lock Ring Spring, Quick-Change Type	45	AR102-45	Valve Sleeve
10	AR102-10	Lock Washer	• 46	AR102-46	Valve Ball O-Ring
11	AR102-11	Lock Nut	47	AR102-47	Valve Ball
3AY	AR102-3AY	Jaw Case Assembly (3~11), Quick-Change Type	48	AR102-48	Valve Spring
• 12	AR102-12	Oil Cylinder O-Ring	• 49	AR102-49	Valve End Cap O-Ring
• 13	AR102-13	Oil Cylinder Back-up Ring	50	AR102-50	Valve End Cap
14	AR102-14	Oil Cylinder	41AY	AR102-41AY	Valve Assembly (40~50)
15	AR102-15	Sealing Washer	• 51	AR102-51	Buffer Ring
16	AR102-16	Oil Screw Plug	• 52	AR102-52	Air Piston Ring
17	AR102-17	Oil Piston	53	AR102-53	Air Piston Rod
• 18	AR102-18	Oil Piston O-Ring	54	AR102-54	Air Piston
• 19	AR102-19	Oil Piston Back-up Ring	55	AR102-55	Air Piston Lock Nut
17AY	AR102-17AY	Oil Piston Assembly (17~19)	54AY	AR102-54AY	Air Piston Assembly (51~55)
• 20	AR102-20	Large Return Spring	• 56	AR102-56	Air Cylinder End Cap O-Ring
• 21	AR102-21	Small Return Spring	57	AR102-57	Air Cylinder End Cap, With Patented Rivet Size Hole Gauge Design™ and Nosepieces Storage Design™
• 22	AR102-22	Hanging Bracket O-Ring			
23	AR102-23	Hanging Bracket	• 58	AR102-58	Air Inlet End Cap O-Ring
24	AR102-24	Oil Cylinder End Cap	59	AR102-59	Air Inlet End Cap
• 25	AR102-25	Oil Cylinder End Cap O-Ring	• 60	AR102-60	Grip
• 26	AR102-26	Spent Mandrel Container	• 61	AR102-61	Brush
27	AR102-27	Air Cylinder	• 62	AR102-62	Wrench 7222
• 28	AR102-28	Positioning Screw	• 63	AR102-63	Wrench 2710
• 29	AR102-29	Noise Silencer	• 64	AR102-64	Oil Bottle (without Oil)
30	AR102-30	Noise Silencer Lock Nut	65	AR102-65	Hydraulic Oil Injector (without Oil)
• 31	AR102-31	Lock Nut O-Ring			

**REMARKS:** 1) • Means wearing parts or possible missing parts.  
2) Part No. 33 Trigger is the Standard Part, Part No. ▲ 33L Trigger Long Type is the Optional Part for choice.  
Order Example: AR102-04 Jaws 2-PC Type, 5 sets.  
4) ★ Monobolt is a registered trademark of AVDEL.

5) \* HSS Nosepieces are for setting High Strength Structural (HSS) Blind Rivets.  
6) Part No. 32 Oil Cylinder Lock Nut needs to replace a new one after repeated fastening 3 ~ 4 times.  
7) Part No. 31 Lock Nut O-Ring needs to replace a new one when dismantling Part No. 32 Oil Cylinder Lock Nut.

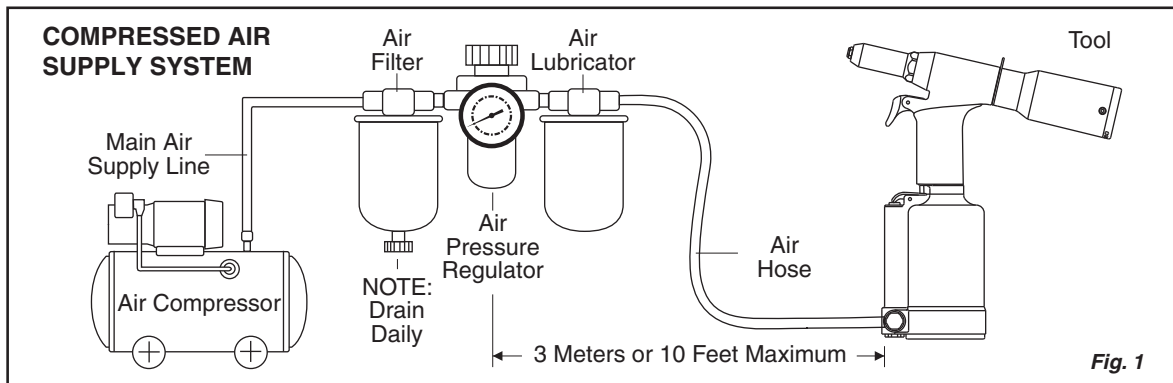
## 10. OPERATION INSTRUCTIONS

### 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.



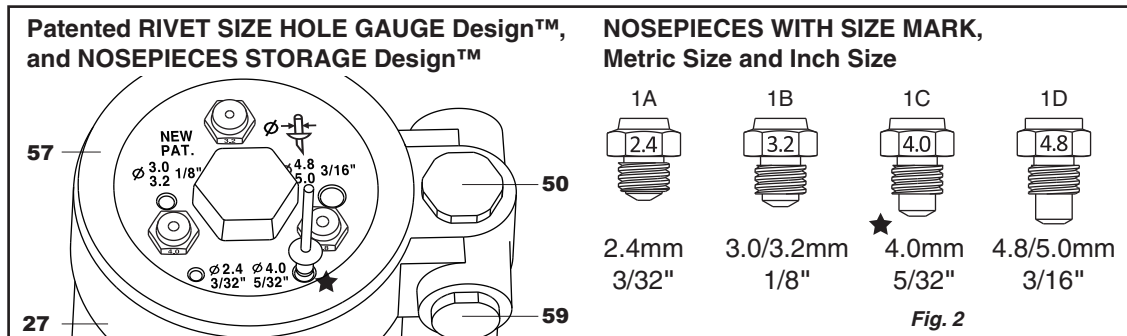
### 10.3 PRINCIPLE OF OPERATION

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 (33/33L) to suck the compressed air into the air cylinder (27), to activate the air piston assembly (54AY) 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 (33/33L) 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 (54AY) downwards to the original position, the air is therefore expelled from the air cylinder (27) to the air exhaust through the noise silencer (29) with low noise. Finally tilt the head (2) upwards to drop the spent mandrel into the spent mandrel container (26). 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 (57) 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 (63) 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 (57).
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 (57).



## 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

1. Make sure that the spent mandrel container (26) is fitted by pushing to the oil cylinder end cap (24) firmly.
2. Ensure that the correct working nosepiece (1) suitable for the prepared hole of work pieces is fitted to the head (2) firmly.
3. Connect the tool to the compressed air supply system.
4. Insert the rivet mandrel of blind rivet into the working nosepiece (1) of head (2), and insert the rivet body of blind rivet into the prepared hole of work pieces to be fastened.
5. Lightly depress the trigger (33/33L) to break off the rivet mandrel and deform rivet body, the work pieces are firmly fastened together at the same time. If more than one depress is required, release trigger (33/33L) and move tool and push working nosepiece (1) to touch rivet flange, then depress the trigger (33/33L) again to break off rivet mandrel.
6. Release the trigger (33/33L) and move the working nosepiece (1) from the fastened work pieces, tilt head (2) upwards to drop the spent mandrel into the spent mandrel container (26).
7. The fastening cycle is completed, and the tool is ready for setting next same size blind rivet.