

**81977
HEAVY DUTY
AIR HYDRAULIC RIVETER**

OPERATION MANUAL



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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 materials, concrete, wood, plastic, leather, canvas and more. The applications are widely used in the production and repairs of aircraft, automobiles & vehicles, boats, building construction, 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 on, 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.
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 workpiece 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 workpiece is 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 workpieces 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 and disconnect tool from air supply 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 whipcheck 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 line 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 (8) and lock nut (9), the head (2) and working nosepiece (1), and the spent mandrel container (24).
11. Do not operate the tool without firmly locking the oil screw plug & sealing washer (14 & 13), oil cylinder end cap (22), noise silencer lock nut (28), valve end cap (46), air cylinder end cap (53) and air inlet end cap (55).
12. Be sure to properly adjust the JAW CASE ASSEMBLY DISTANCE to be 65±0.5 mm.
13. The Operating Air Pressure shall not exceed 7.0 bar or 100 psi.
14. Excessive priming of hydraulic oil in the tool should be avoided.
15. After setting each blind rivet, the spent mandrel must be cleared out into the spent mandrel container (24) by tilting head (2) upwards, so that the spent mandrels shall be not jammed in the tool after setting the next blind rivet.
16. Take care to ensure the mandrel's sharp end and spent mandrels are not to create any hazards.
17. Ensure that noise silencer (27) 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 (61) 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 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** 14,700N or 3,300 lbf, and equips with interchangeable **5 or 4 standard nosepieces with size mark** for setting 3.0/3.2 - 6.4 mm or 1/8" - 1/4" commercial blind rivets in all materials (aluminum, copper, steel and stainless steel), also can set 4.8/5.0, 6.4 mm or 3/16", 1/4" structural blind rivets in all materials. **The optional 4.8/5.0, 6.4 mm or 3/16", 1/4" *monobolt nosepieces** for setting 4.8/5.0, 6.4 mm or 3/16", 1/4" *monobolt blind rivets are available on request.
NOTE: *monobolt is a registered trade mark of AVDEL.
2. Innovative **Shock-Reducer Design** to minimize hand fatigue.
3. Innovative **Noise Silencer Design** for working pleasure.
4. Patented **Rivet Size Hole Gauge Design™** to eliminate choosing wrong size blind rivet and working nosepiece.
5. Smart **Nosepieces Storage Design™** to avoid losing nosepieces.
6. Smart **Twin Air Inlets** to meet individual operating hobby, such as the right-handed operators or left-handed operators.
7. Convenient **Oil Refill Hole Design** for quickly refilling the shortage of hydraulic oil.
8. New **Spent Mandrel Container** to protect operator's eyes and keep working places clean.
9. **Oil Cylinder Body** and **Air Cylinder Body** are made of high strength aluminum alloy, and **Oil Cylinder Inner** and **Air Cylinder Inner** all have wear-resistant mirror finish for minimum roughness.
10. **Oil Piston Rod** and **Air Piston Rod** all have hard chrome plating and wear-resistant mirror finish for speedy motion.
11. High grade **Steel Alloy Key Parts** (Jaws, Jaw Cases, etc.) with advanced heat treatment for strength and durability.
12. Valuable **Powder Coating** finish for nice looking and better scratch-resistant.

6. SPECIFICATIONS

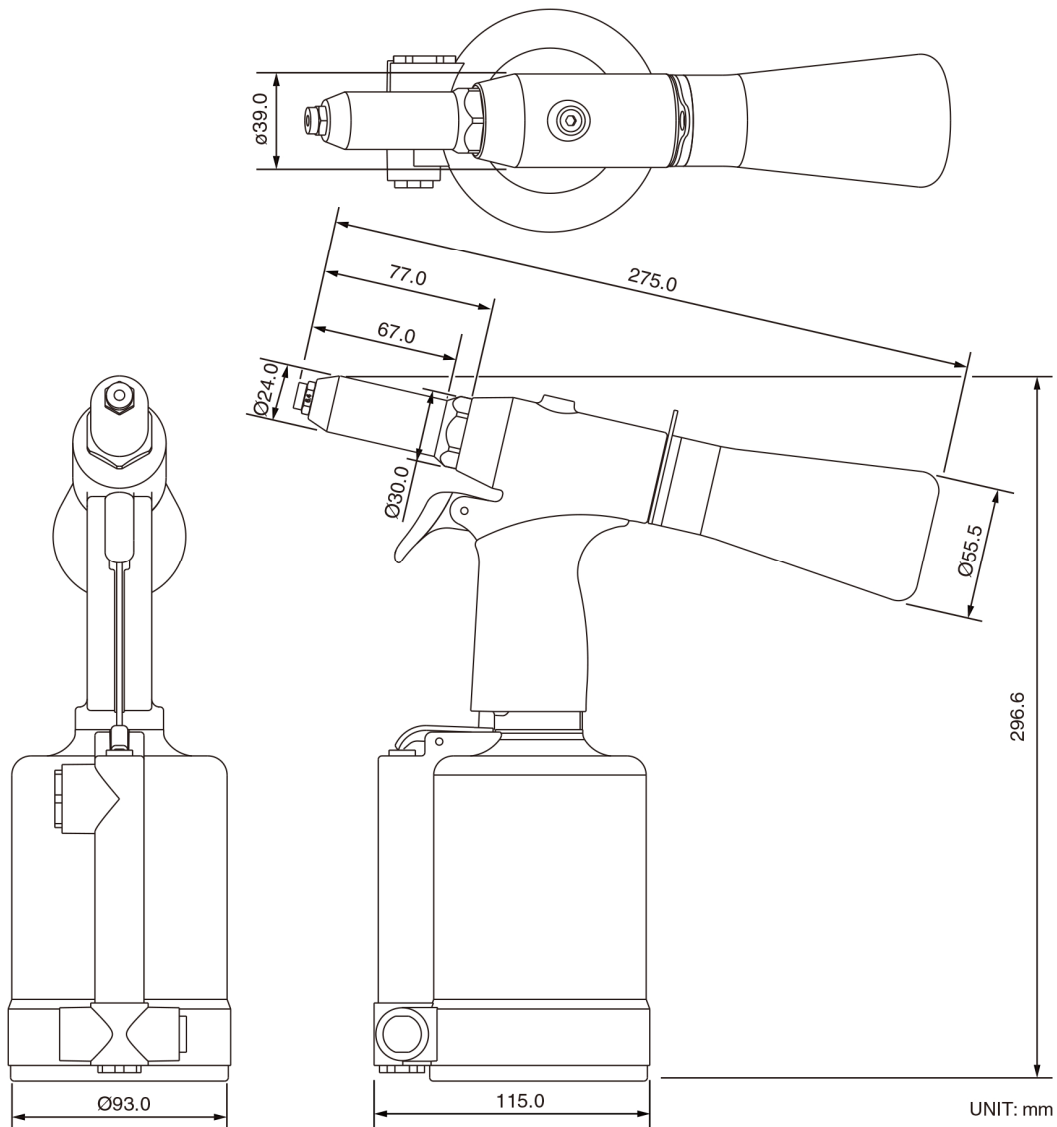
1. **Traction Force:** 14,700 N or 3,300 lbf at 6.3 bar or 90 psi compressed air pressure.
2. **Stroke:** 15.8 mm or 0.62".
3. **Working Compressed Air Pressure:** 6.0 - 7.0 bar or 85 - 100 psi.
4. **Air Consumption Per Rivet:** Approx. 2.64 NLPR (NL Per Rivet), 0.44 Liter compressed air per rivet, 0.016 Cuft compressed air per rivet.
5. **Hydraulic Oil, ISO VG-46 or VG-32:** Approx. 40 ml.

6. **Noise Level:**
 Sound pressure level: 78.6 dB(A)
 Sound power level: 89.6 dB(A)
 Uncertainty : K = 3dB
7. **Vibration:**
 Hand-arm vibration value: Less than 2.5 m/s²
 Uncertainty : K = 1.5 m/s²
8. **Air Inlet:** 1/4" PT or 1/4" PF or 1/4" NPT or other specified thread.
9. **Hose Size:** Inner dia. 10 mm or 3/8".
10. **Net Weight:** Approx. 2.11 kg / 4.64 lb.
11. **Standard Parts:** 5 or 4 Standard Nosepieces (1A, 1B, 1C, 1D, 1E, or 1A, 1B, 1C, 1E), Spare Jaws (4), Spent Mandrel Container (24), Brush (56), 2 Service Tools (57, 58), Hydraulic Oil Injector (59, without Oil), Hydraulic Oil Bottle (60, without Oil).
12. **Optional Parts:** *Monobolt Nosepiece 4.8/5.0 mm or 3/16" (1F), 6.4 mm or 1/4" (1G).
13. **RIVETING CAPACITY:**

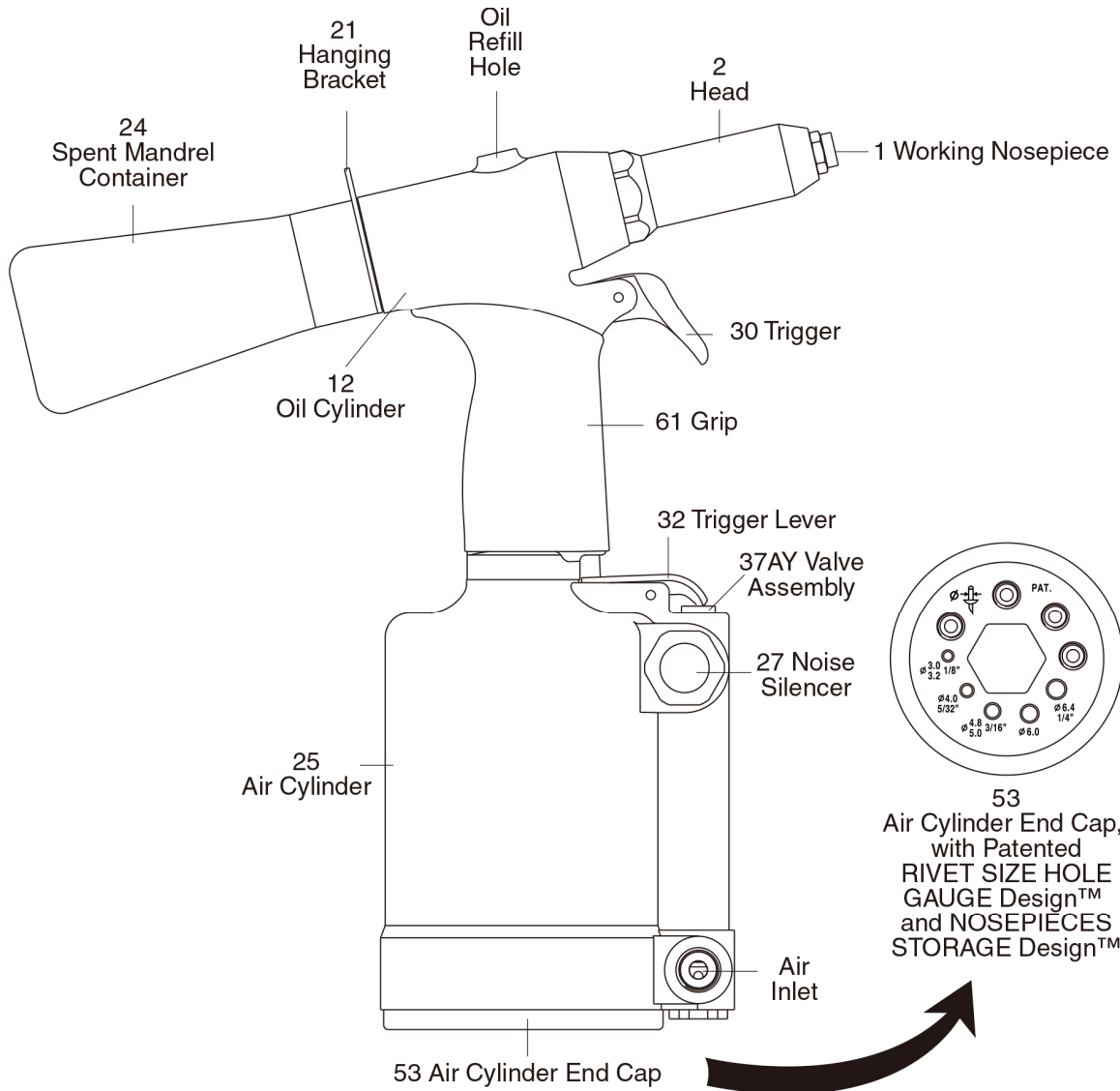
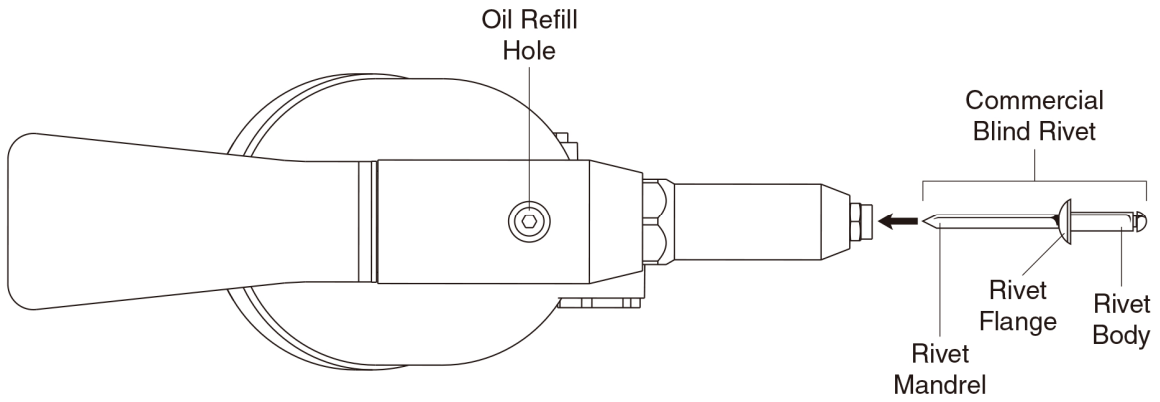
 Rivet Diameter	Ø 3.0/3.2mm	Ø 4.0mm	Ø 4.8/5.0mm	Ø 6.0mm	Ø 6.4mm	Structural Rivets	Structural Rivets
	Ø 1/8"	Ø 5/32"	Ø 3/16"		Ø 1/4"	Ø 4.8/5.0mm, Ø 3/16"	Ø 6.4mm, Ø 1/4"
Aluminum	●	●	●	●	●	●	●
Copper, Steel	●	●	●	●	●	●	●
Stainless Steel / Inox	●	●	●	●	●	●	●

Remark: Work pieces hole diameter should be 0.1 mm or 0.004" larger than rivet diameter. Use *Monobolt Nosepiece to set *Monobolt Blind Rivets, use Standard Nosepieces to set other Structural Blind Rivets and Commercial Blind Rivets. *Monobolt is a registered trade mark of AVDEL.

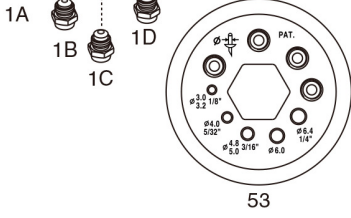
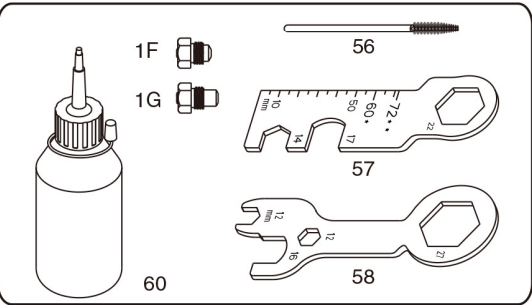
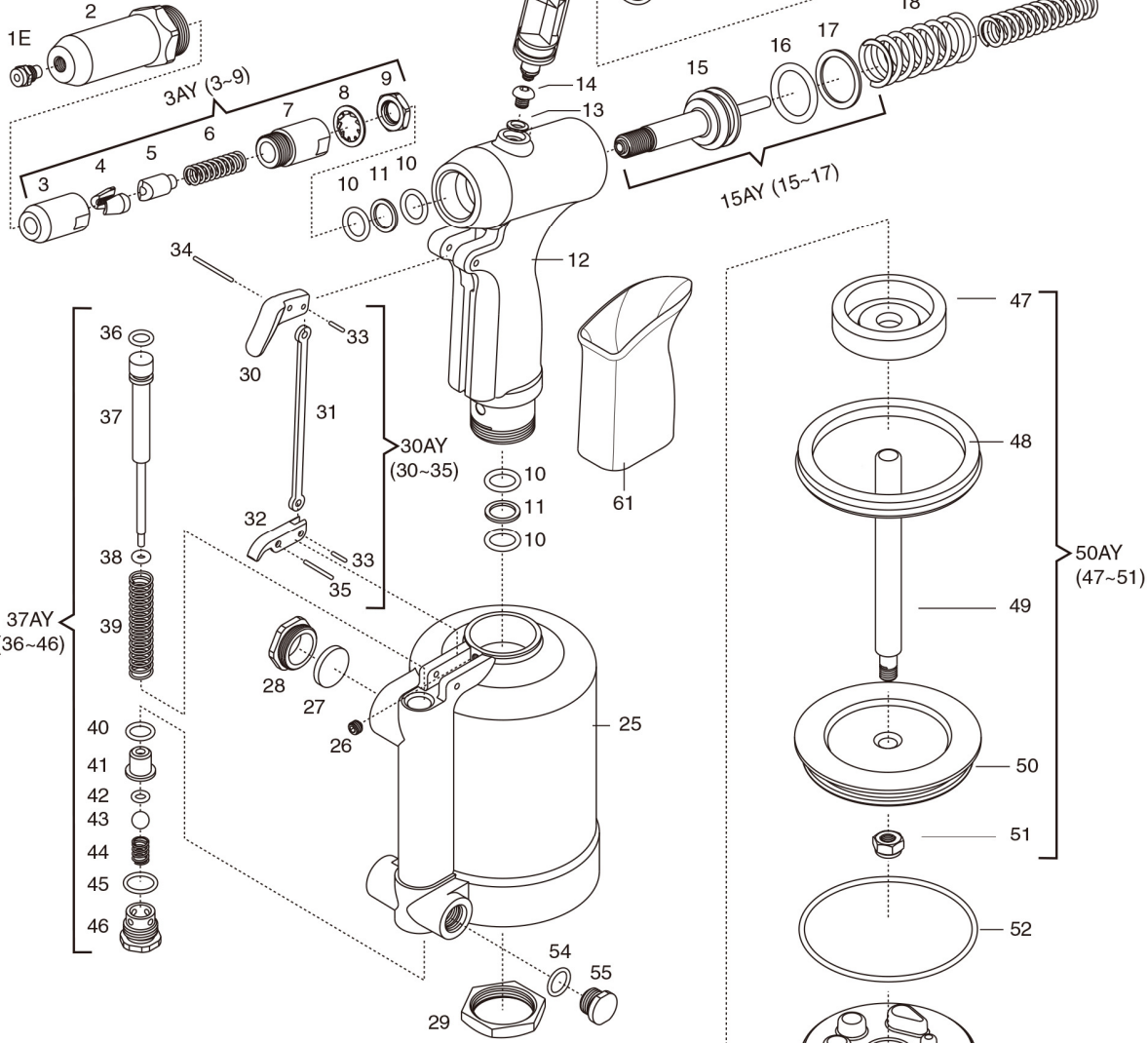
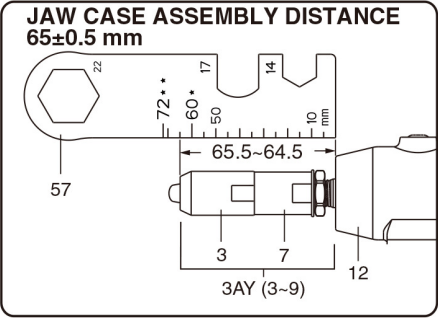
7. DIMENSIONS



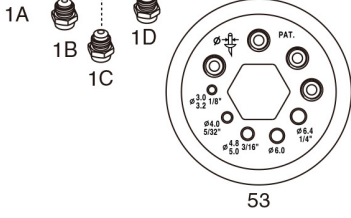
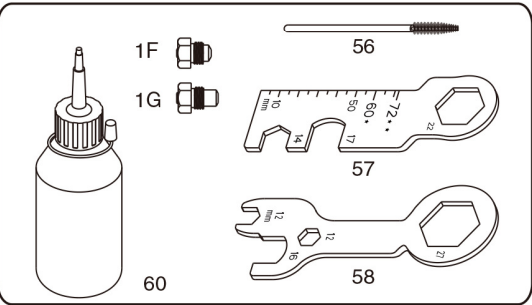
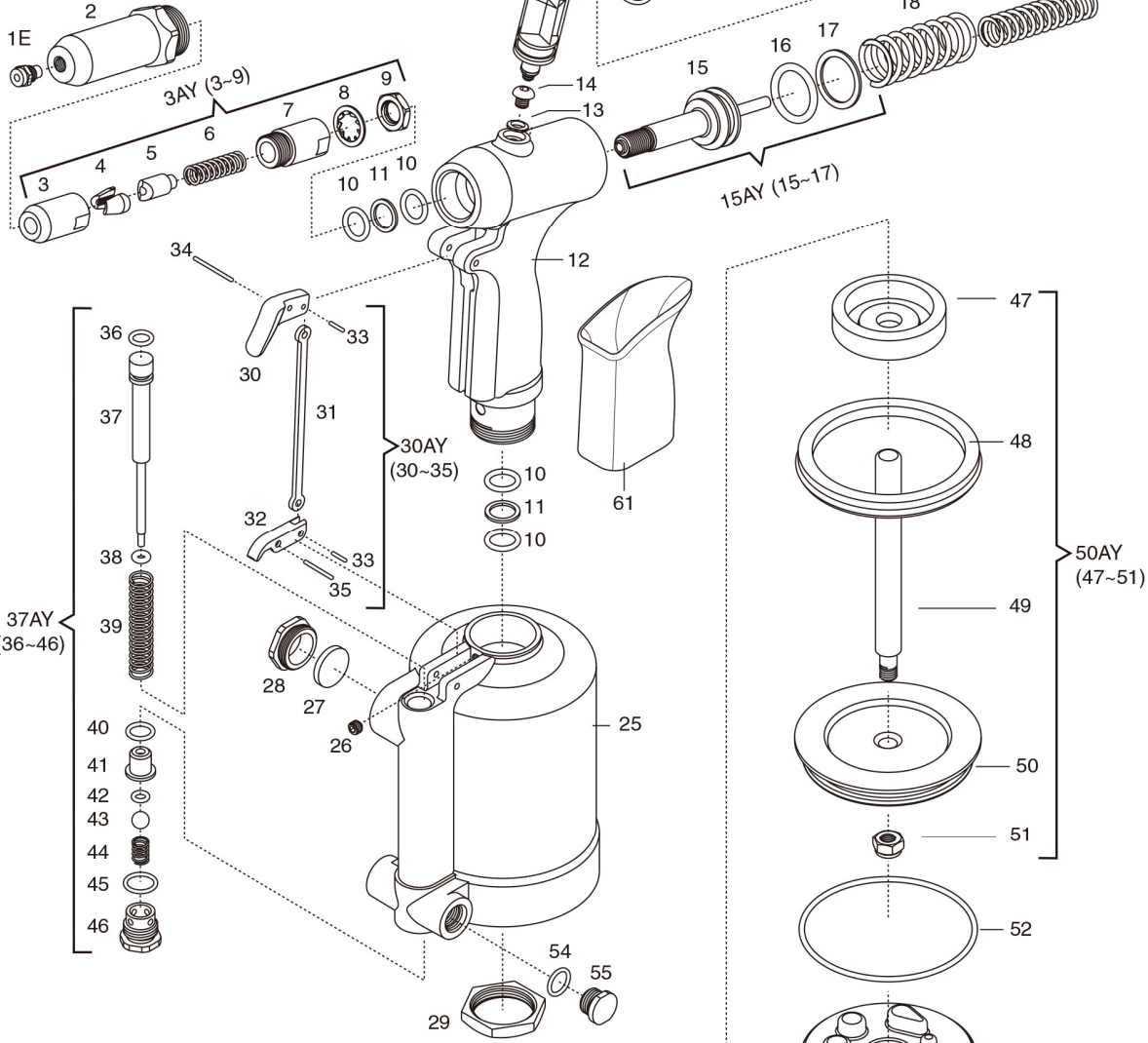
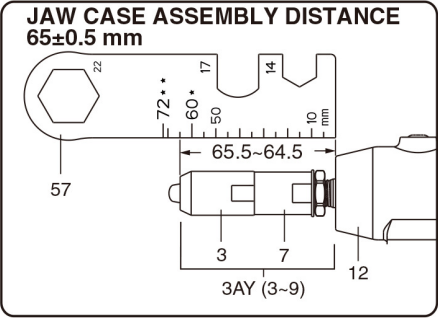
8. MAIN PARTS



9. PARTS LIST



9. PARTS LIST



NO.	PART NAME	NO.	PART NAME
• 1A	NOSEPIECE, 3.0/3.2mm or 1/8"	30	TRIGGER
• 1B	NOSEPIECE, 4.0mm or 5/32"	31	TRIGGER LINK
• 1C	NOSEPIECE, 4.8/5.0mm or 3/16"	32	TRIGGER LEVER
• 1D	NOSEPIECE, 6.0mm	• 33	LINK PIN, UPPER & LOWER
• 1E	NOSEPIECE, 6.4mm or 1/4"	• 34	TRIGGER PIN
• 1F	OPTIONAL ★ MONOBOLT NOSEPIECE, 4.8/5.0 mm or 3/16"	• 35	LEVER PIN
• 1G	OPTIONAL ★ MONOBOLT NOSEPIECE, 6.4 mm or 1/4"	30AY	TRIGGER ASSEMBLY (30~35)
2	HEAD	• 36	VALVE PUSHER UPPER O-RING
3	FRONT JAW CASE	37	VALVE PUSHER
• 4	JAWS (2-PC TYPE)	• 38	VALVE PUSHER LOWER O-RING
• 5	JAW PUSHER	39	VALVE PUSHER SPRING
• 6	JAW PUSHER SPRING	• 40	VALVE SLEEVE O-RING
7	REAR JAW CASE	41	VALVE SLEEVE
8	LOCK WASHER	• 42	VALVE BALL O-RING
9	LOCK NUT	43	VALVE BALL
3AY	JAW CASE ASSEMBLY (3~9)	44	VALVE SPRING
• 10	OIL CYLINDER O-RING	• 45	VALVE END CAP O-RING
• 11	OIL CYLINDER BACK-UP RING	46	VALVE END CAP
12	OIL CYLINDER	37AY	VALVE ASSEMBLY (36~46)
13	SEALING WASHER	47	BUFFER RING
14	OIL SCREW PLUG	• 48	AIR PISTON RING
15	OIL PISTON	49	AIR PISTON ROD
• 16	OIL PISTON O-RING	50	AIR PISTON
• 17	OIL PISTON BACK-UP RING	51	AIR PISTON LOCK NUT
15AY	OIL PISTON ASSEMBLY (15~17)	50AY	AIR PISTON ASSEMBLY (47~51)
• 18	LARGE RETURN SPRING	• 52	AIR CYLINDER END CAP O-RING
• 19	SMALL RETURN SPRING	53	AIR CYLINDER END CAP, with Patented RIVET SIZE HOLE GAUGE Design™ and NOSEPIECES STORAGE Design™
20	HANGING BRACKET O-RING		
21	HANGING BRACKET	• 54	AIR INLET END CAP O-RING
22	OIL CYLINDER END CAP	55	AIR INLET END CAP
23	OIL CYLINDER END CAP O-RING	• 56	BRUSH
• 24	SPENT MANDREL CONTAINER	• 57	WRENCH 22
25	AIR CYLINDER	• 58	WRENCH 27-12
26	LOCK SCREW	• 59	HYDRAULIC OIL INJECTOR, NO OIL
• 27	NOISE SILENCER	• 60	OIL BOTTLE, NO OIL
28	NOISE SILENCER LOCK NUT	61	GRIP
29	OIL CYLINDER LOCK NUT		

REMARKS: 1) • Means wearing parts or possible missing parts.
2) Order Example: AR203-04 Jaws (2-PC Type), 5 sets.
3) ★ Monobolt is a registered trademark of AVDEL.

10.5 SUSPENSION DEVICE

The hanging bracket (21) 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

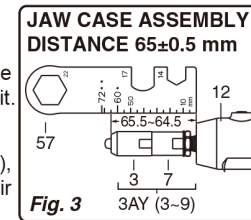
1. Make sure that the spent mandrel container (24) is fitted by pushing to the oil cylinder end cap (22) firmly.
2. Ensure that the correct working nosepiece (1) suitable for the prepared hole of work pieces is fitted to the head (2) firmly.
3. Connect the tool to the compressed air supply system.
4. Insert the rivet mandrel of blind rivet into the working nosepiece (1) of head (2), and then insert the rivet body of blind rivet into the prepared hole of work pieces to be fastened.
5. Fully depress the trigger (30) 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, move tool and push working nosepiece (1) to touch rivet flange, then depress the trigger again to break off rivet mandrel.
6. Release the trigger (30) 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 (24).
7. The fastening cycle is completed, and the tool is ready for setting next same size blind rivet.

11. MAINTENANCE

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

11.1 DAILY CHECKS

1. If no 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 air hoses and air couplings.
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 the tool. If there is an air filter, drain it.
4. Check the JAW CASE ASSEMBLY DISTANCE that meets the specification 65 ± 0.5 mm. (Fig. 3)
5. Carefully check and firmly tighten the jaw case assembly (3AY), working nosepiece (1), head (2), oil screw plug (14), oil cylinder end cap (22), noise silencer lock nut (28), valve end cap (46), air cylinder end cap (53), air inlet end cap (55) and air inlet fitting before daily operation.
6. Check to empty the spent mandrels. Be sure to fit the spent mandrel container (24) to the oil cylinder end cap (22) firmly.
7. Check to ensure the trigger (30) operation is normal.



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 (56) to clean these parts and dip them into oil for lubrication. For better lubrication, lightly apply the moly-lithium grease 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, 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 (28), take out the noise silencer (27) to clean it. See 11.6 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

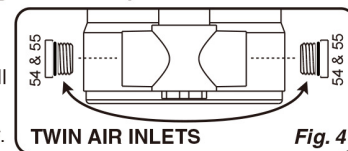
When the spent mandrels fill over 70% capacity of the spent mandrel container (24), pull out the spent mandrel container (24) and empty the spent mandrels. Finally, make sure to fit the spent mandrel container (24) back to the tool firmly.

WARNING: Overfilling spent mandrels causes the tool to malfunction.

11.4 EXCHANGE THE AIR INLET FITTING TO THE TWIN AIR INLETS (Fig. 4)

The Twin Air Inlets Design offer to meet individual operating hobby, such as the right-handed operators or left-handed operators.

1. Disconnect the tool from the compressed air supply system.
2. Use the wrench to unscrew the air inlet end cap (55) along with the o-ring (54), install the air inlet fitting to the preferable air inlet.
3. Fasten the air inlet end cap (55) along with the o-ring (54) to the vacant air inlet firmly.

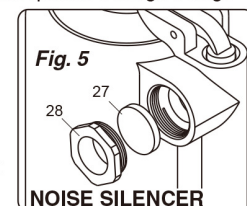


11.5 CLEAN AND REPLACE THE NOSEPIECES

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 (53), 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 (53).

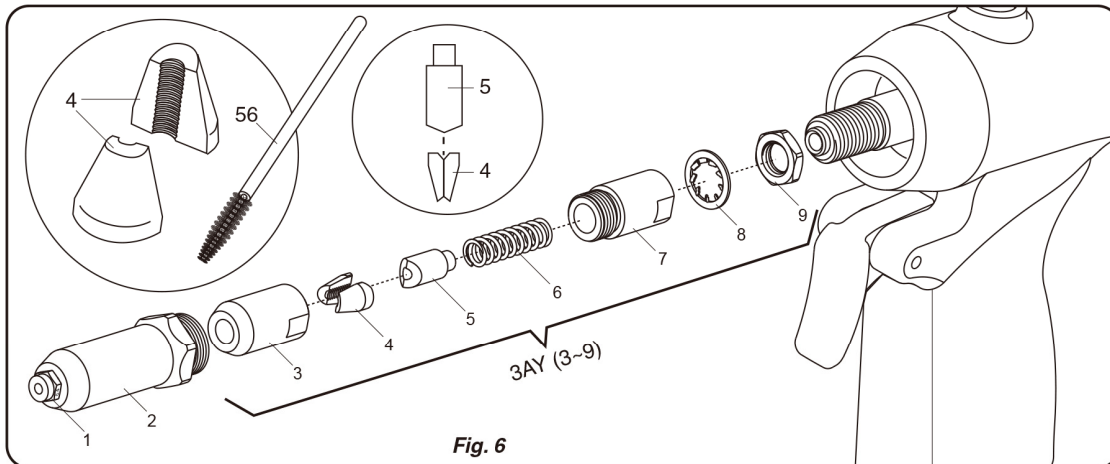
11.6 CLEAN AND REPLACE THE NOISE SILENCER (Fig. 5)

1. Disconnect the tool from the compressed air supply system.
2. Unscrew the noise silencer lock nut (28), take out the noise silencer (27) and clean it. If the noise silencer (27) is blocked or covered badly, replace it.
3. Reverse the above step to reassemble these two parts. Ensure that the noise silencer lock nut (28) is fastened firmly.



11.7 CHECK, CLEAN AND REPLACE THE INNER PARTS OF THE JAW CASE ASSEMBLY (3AY), AND THE JAWS (4)

1. Disconnect the tool from the compressed air supply system.
2. Unscrew the head (2) by the wrench 27-12 (58), dismantle the jaw case assembly (3AY) by the wrench 22 (57) and wrench 27-12 (58).
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 (56) to clean the front jaw case (3), teeth of jaws (4), jaw pusher (5), jaw pusher spring (6) and rear jaw case (7) (Fig.6) Dip these parts into oil for lubrication. For better lubrication, lightly apply the moly-lithium grease on the back side of jaws (4) and on the inner slope of front jaw case (3).



5. Reassemble the lock nut (9) and put back the lock washer (8), reassemble the rear jaw case (7) adjacent to the lock washer (8), then put the jaw pusher spring (6) into the rear jaw case (7).
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.6), then fasten these parts to the rear jaw case (7) firmly by the wrench 22 (57) and wrench 27-12 (58). Make sure that the lock nut (9) is still not fastened firmly.
7. Use the wrench 22 (57) to check and adjust the lock nut (9) to the recommended jaw case assembly distance 65 ± 0.5 mm (Fig. 3), at the same time tighten the rear jaw case (7) and the lock nut (9) firmly by the wrench 22 (57) and wrench 27-12 (58). Finally, use the wrench 27-12 (58) to reassemble the head (2) firmly.
8. Connect the tool to the compressed air supply system. It is suggested to depress the trigger (30) twice to adjust the inner parts of jaw case assembly (3AY) moving to the normal position, so that the blind rivet mandrel can be inserted into the working nosepiece (1) smoothly.

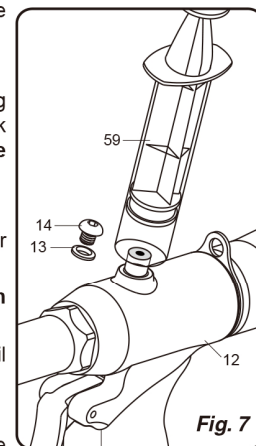
11.8 REFILL HYDRAULIC OIL THROUGH THE OIL REFILL HOLE (Fig. 7)

When the shortage of hydraulic oil causes to decrease the stroke, the normal stroke can be recovered by filling the hydraulic oil into the oil refill hole on the top of oil cylinder (12).

WARNING:

- Always wear the safety goggles during operation.
- Be sure to disconnect the tool from the compressed air supply system before unscrewing the oil screw plug (14).
- Make sure to tighten the oil screw plug (14) firmly after refilling oil.

1. Connect the tool to the compressed air supply system, depress the trigger (30) twice to move the inner oil piston assembly (15AY) and air piston assembly (50AY).
2. Disconnect the tool from the compressed air supply system.
3. Push the piston of the hydraulic oil injector (59) forwards to the end, and then immerse the fitting of hydraulic oil injector (59) 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 (59). Make sure that the hydraulic oil injector (59) contains no air bubbles in the oil.
4. Carefully unscrew the oil screw plug (14) and remove the sealing washer (13).
5. Gently rotate to screw the fitting of hydraulic oil injector (59) into the oil refill hole of oil cylinder (12) firmly.
6. Depress the piston of hydraulic oil injector (59) forwards to inject oil until the piston can not move further.
7. Gently unscrew to remove the fitting of hydraulic oil injector (59) from the oil refill hole of oil cylinder (12). Wipe away the spilt oil, if any.
8. Restore the sealing washer (13), and tighten the oil screw plug (14) firmly.
9. Reconnect the tool to the compressed air supply system, depress the trigger (30) twice, the normal stroke is recovered.

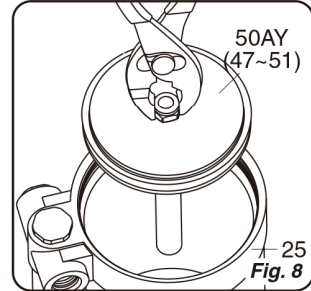


11.9 REPLACE THE O-RINGS, BACK-UP RINGS, RETURN SPRINGS AND HYDRAULIC OIL

- After considerable times of application, the o-rings and back-up rings of oil cylinder (12) and air cylinder (25), return springs (18 & 19), also the hydraulic oil should be replaced.

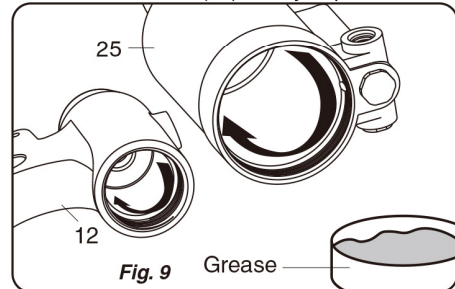
- The hydraulic oil is suggested to use ISO VG-46 or VG-32 that are popular in market.

1. Disconnect the tool from the compressed air supply system.
2. Unscrew the air cylinder end cap (53) & o-ring (52) with the wrench 27-12 (58), use a pair of pliers to slowly pull out the air piston assembly (50AY) in a straight line (Fig.8). **Be careful not to scratch the air piston rod (49) and the inner wall of air cylinder (25). Drain the dirty hydraulic oil out of the tool.**
3. **Check and replace the worn buffer ring (47), air piston ring (48) and air cylinder end cap o-ring (52). Also check and replace the worn air piston rod (49) and the damaged air piston (50). Finally, check the air piston lock nut (51) and lock it firmly.**



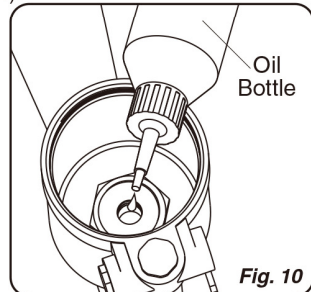
4. Use the wrench 27-12 (58) to unscrew the head (2), only separate the rear jaw case (7) from the lock nut (9) and lock washer (8) by the wrench 22 (57) and wrench 27-12 (58).
5. Carefully dismantle the oil cylinder end cap (22), remove the hanging bracket (21) and hanging bracket o-ring (20), and then take out the large & small return springs (18 & 19), slowly press the threaded end of oil piston (15) to take out the oil piston assembly (15AY). **Pay special attention to dismantle the oil cylinder end cap (22), not to let the strong force of large & small return springs (18 & 19) jump out to hurt people. Be careful not to scratch the rod of oil piston (15) and the inner wall of oil cylinder (12).** Check and replace the weak or broken return springs (18 & 19).

6. Firstly use a long stem socket 35 mm to unscrew the oil cylinder lock nut (29), use a suitable diameter pin carefully to punch out the lever pin (35), and then carefully use a hex wrench 3 mm to unscrew the lock screw (26), finally separate the oil cylinder (12) from the air cylinder (25).
7. **Check and replace the worn oil cylinder o-rings (10), oil cylinder back-up rings (11), oil piston o-ring (16), and oil piston back-up ring (17). Also check and replace the worn oil piston (15).**



8. Grease the inner walls of oil cylinder (12) and air cylinder (25) (Fig. 9), also grease the oil piston o-ring (16) and air piston ring (48). Reverse above steps to reassemble the oil cylinder (12) and air cylinder (25) together by aligning and using a hex wrench 3 mm to fasten the lock screw (26), and then fasten the oil cylinder lock nut (29) by a long stem socket 35 mm. Finally reassemble the trigger lever (32) back to the air cylinder (25) by punching the lever pin (35) into the original pin holes carefully.
9. Reassemble the oil piston assembly (15AY), large & small return springs (18 & 19), oil cylinder end cap (22) along with hanging bracket (21) and hanging bracket o-ring (20), and the spent mandrel container (24).

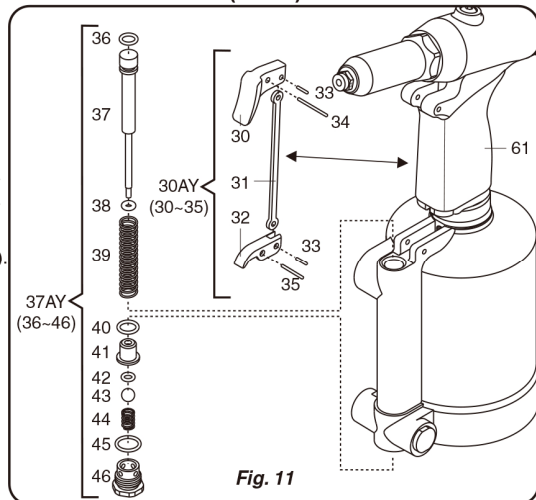
10. **Put the tool upside-down, use the oil bottle (60) to refill new hydraulic oil into the oil cylinder (12) through the air cylinder (25) until oil is flush with the upper oil cylinder o-ring (10) (Fig. 10). Make sure not to overfill oil, and rest for a while until the oil stops releasing air bubbles.**



11. Use a pair of pliers to clamp the air piston lock nut (51), and then slowly plug the air piston assembly (50AY) in a straight line into the oil cylinder (12) through the oil cylinder lock nut (29) (Fig. 8). Finally reassemble the air cylinder end cap (53) & o-ring (52) with the wrench 27-12 (58).
12. Use the wrench 22 (57) and wrench 27-12 (58) to reassemble the lock nut (9), lock washer (8) and rear jaw case (7) together (Fig.6), then use the wrench 22 (57) and wrench 27-12 (58) to adjust and lock the jaw case assembly distance to 65 ± 0.5 mm (Fig.3), finally fasten the head (2) to the tool. Ensure that the oil cylinder end cap (22) is fastened firmly, the spent mandrel container (24) is fitted well, the jaw case assembly (3AY) and head (2) are all fastened firmly.

11.10 DISMANTLE AND REPLACE THE PARTS OF THE TRIGGER ASSEMBLY (30AY) AND THE VALVE ASSEMBLY (37AY) (Fig. 11)

1. **When doing the above 11.9 replacement, it is suggested to do this 11.10 replacement at the same time. Follow the 11.9 steps 1 - 6 to separate the oil cylinder (12) from the air cylinder (25).**
2. The lever pin (35) has been dismantled in the above 11.9 step 6, then dismantle the trigger assembly (30AY) by using a suitable diameter pin carefully to punch out the trigger pin (34) and lower link pin (33), finally pull out the trigger (30) connected with trigger link (31) and upper link pin (33) from the upper side of grip (61). Check and replace any worn parts of the trigger assembly (30AY).
3. Finally dismantle the valve assembly (37AY) by unscrewing valve end cap (46), carefully take out valve assembly (37AY) from two ends, check and replace any worn parts of the valve assembly (37AY), such as o-rings, springs, etc.
4. Firstly reverse above steps to reassemble valve assembly (37AY), then plug the trigger (30) connected with trigger link (31) and upper link pin (33) into the upper side of grip (61), and punch the trigger pin (34) and lower link pin (33) into the original pin holes, then follow 11.9 steps 8 - 12 to reassemble the trigger assembly (30AY) and whole AR-203 tool.



12. TROUBLESHOOTING

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

Possible Causes:	Solutions:
Wrong size Nosepiece (1)	Change a correct size 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 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 (18 & 19)	Replace new Return Springs (18 & 19)
Insufficient Jaw Case Assembly Distance	Adjust to normal Distance 65±0.5 mm
Air Piston Assembly (50AY) stuck in Air Cylinder (25)	See below 12.6 Solutions
Spent Mandrels jammed in the Tool	Clean to eject Spent Mandrels
Spent Mandrel Container (24) is full	Empty Spent Mandrel Container (24)

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

Possible Causes:	Solutions:
Wrong size Nosepiece (1)	Change a correct size Nosepiece (1)
Dust accumulated in Jaws (4)	Clean 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 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 Air Cylinder (25) leak and replace it if necessary, clean Air Cylinder (25) inside, clean or replace O-Rings (48, 52, 54)
Hydraulic Oil Pressure lost	Insufficient Oil and refill Oil, check Oil Cylinder (12) leak and replace it if necessary, replace all O-rings (10, 16, 20) and Back-Up Rings (11, 17)
Exceed Tool's Capacity	Use more powerful Tool

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

Possible Causes:	Solutions:
Wrong size Working Nosepiece (1)	Change a correct size Working Nosepiece (1)
Dust accumulated in Jaw Case Assembly (3AY)	Clean Jaw Case Assembly (3AY) Parts
Spent Mandrels jammed in Tool	Clean to eject Spent Mandrels
Spent Mandrel Container (24) is full	Empty Spent Mandrel Container (24)
Air Piston Assembly (50AY) stuck in Air Cylinder (25) 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 Air Cylinder (25) leak and replace it if necessary, clean Air Cylinder (25) inside, clean or replace O-Rings (48, 52, 54)
Dust accumulated in Jaw Case Assembly (3AY)	Clean 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 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

Low Air Pressure	Check Compressed Air Supply System, adjust Air Pressure to in specification, check Air Cylinder (25) leak and replace it if necessary, clean Air Cylinder (25) inside, clean or replace O-Rings (48, 52, 54)
Improper assembly of Jaw Case Assembly (3AY)	Reassemble Jaw Case Assembly (3AY)
Dust accumulated in Jaw Case Assembly (3AY)	Clean Jaw Case Assembly (3AY) Parts
Dust accumulated in Jaws (4)	Clean 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 65±0.5 mm
Insufficient Hydraulic Oil leads to Stroke decreased	Refill Hydraulic Oil through Oil Refill Hole
Air bubbles in Hydraulic Oil	Suck air bubbles from Oil Refill Hole by Hydraulic Oil Injector (59), or bleed Oil from Air Cylinder (25), and refill New Hydraulic Oil
Oil Cylinder (12) leaks	See 12.7
Improper assembly of Valve Assembly (37AY)	Reassemble Valve Assembly (37AY)
Worn O-Rings in Valve Assembly (37AY)	Replace all O-Rings (36, 38, 40, 42, 45)

12.6 MALFUNCTION: Slow operation or no operation of Air Piston Assembly (50AY) in Air Cylinder (25)

Possible Causes:	Solutions:
Improper assembly of Valve Assembly (37AY)	Reassemble Valve Assembly (37AY)
Worn O-Rings in Valve Assembly (37AY)	Replace all O-Rings (36, 38, 40, 42, 45)
Low Air Pressure	Check Compressed Air Supply System, adjust Air Pressure to in specification, check Air Cylinder (25) leak and replace it if necessary, clean Air Cylinder (25) inside, clean or replace O-Rings (48, 52, 54)
Noise Silencer (27) blocks air exhaust	Clean or replace a new Noise Silencer (27)
Weak or broken Return Springs (18 & 19)	Replace new Return Springs (18 & 19)

12.7 MALFUNCTION: Oil Cylinder (12) leaks Hydraulic Oil

Possible Causes:	Solutions:
Oil Cylinder (12) damaged	Replace a new Oil Cylinder (12)
Improper assembly of O-Rings (10, 16, 20) and Back-Up Rings (11, 17) in front & rear ends of Oil Cylinder (12)	Reassemble O-Rings (10, 16, 20) and Back-Up Rings (11, 17) in front & rear ends of Oil Cylinder (12)
Worn O-Rings (10, 16, 20) and Back-Up Rings (11, 17) in front & rear ends of Oil Cylinder (12)	Replace new O-Rings (10, 16, 20) and Back-Up Rings (11, 17) in front & rear ends of Oil Cylinder (12)

12.8 MALFUNCTION: Air Cylinder (25) and Noise Silencer (27) leak Hydraulic Oil

Possible Causes:	Solutions:
Improper assembly of O-Rings (10) and Back-Up Ring (11) in lower end of Oil Cylinder (12)	Reassemble O-Rings (10) and Back-Up Ring (11) in lower end of Oil Cylinder (12)
Worn O-Rings (10) and Back-Up Ring (11) in lower part of Oil Cylinder (12)	Replace new O-Rings (10) and Back-Up Ring (11) in lower end of Oil Cylinder (12)

12.9 MALFUNCTION: Valve Assembly (37AY) and Noise Silencer (27) leak Air

Possible Causes:	Solutions:
Improper assembly of Valve Assembly (37AY)	Reassemble Valve Assembly (37AY)
Worn O-Rings (36, 38, 40, 42, 45) in Valve Assembly (37AY)	Replace new O-Rings (36, 38, 40, 42, 45) in Valve Assembly (37AY)
Weak Springs (39, 44) in Valve Assembly (37AY)	Replace new Springs (39, 44) In Valve Assembly (37AY)

12.10 MALFUNCTION: Air Inlet and Air Inlet Fitting leak Air

Possible Causes:	Solutions:
Wrong thread size of Air Inlet Fitting	Change correct thread size of Air Inlet Fitting
Air Inlet thread damaged	Tap thread and wrap Tape Seal around Air Inlet Fitting's male thread

13. DISPOSAL

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

14. PATENTS

USA 8,650,731

Germany 202010008658.2

TAIWAN M385417

and Worldwide Patent Pending