LOBSTER

AIR NUTTER

エアーナッター

AN-200A

INSTRUCTION MANUAL 取扱説明書

FOR PROFESSIONALS

本機はプロ用エビナット専用工具です

日本語版
JAPANESE VERSION

英語版
ENGLISH VERSION

株式会社 ロブテックス
LOBTEX CO.,LTD.

ENGLISH VERSION

IMPORTANT SAFETY INSTRUCTIONS

◆ Be sure to read the following Important Safety Instructions carefully and make sure that you understand them thoroughly before using this tool.

◆ This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

◆ The Important Safety Instructions are divided into ⚠WARNING and ⚠CAUTION. The differences between these two levels are described below.

⚠WARNING : Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator.

⚠CAUTION : Indicates a potentially hazardous situation which, if not avoided, may result in moderate injury to the operator or physical damage.

Moreover, failure to follow the instructions marked with the ⚠CAUTION symbol or cautions without a ⚠CAUTION symbol which appear in the text of this manual may also have serious results in some cases. Always be sure to observe the instructions given in the Important Safety Instructions.

◆ After reading this manual, keep it in a safe place where it is easily accessible to tool users.

⚠WARNING

1. **The air pressure should be kept within the range of 0.59 to 0.69 MPa (6 to 7 kgf/cm², 85 to 100 psi).**
   • If an air pressure which is greater than this is used, the tool may become damaged, and injury or damage to property may result.

2. **When adding hydraulic oil through the air cylinder, be sure to loosen the bleed plug afterwards to allow any excess hydraulic oil to drain away.**
   • If excess oil is allowed to remain inside the tool, damage to the tool or personal injury may result.

3. **Make sure that the tool and the air source are connected securely.**
   • If the threads of the joints do not match or if the screws are not inserted far enough, the air hose may become disconnected during use and injury may result.

4. **Turn off the air supply before disconnecting the tool from the air source.**
   • Compressed air may cause the air hose to whip around, and injury may result.

5. **Check that all screws are securely fastened before using the tool.**
   • If any of the screws are not sufficiently tightened, they may fall out during use and accidents or injury may result.

6. **Check that the tool parts are free from damage before use. Any damaged parts should be repaired before the tool is used.**
   • If the tool is used while any parts are still damaged, injury may result.

⚠CAUTION

1. **Always turn off the air supply before disassembling the tool for cleaning and maintenance purposes.**
   • If the tool is cleaned or disassembled with the air supply connected, injury may result.

2. **Adjust the pulling stroke correctly.**
   • If the stroke is too short, the rivet nut may not be pulled up sufficiently, effecting its clamping ability.
   • If the stroke is too long, the threads of the rivet nut may strip effecting the strength of the fastener. Moreover, the pull-up specification table in this instruction manual is only applicable to "Lobster" brand rivet nuts. Rivet nuts from other manufacturers may not comply with these specifications.

3. **Do not operate the air nutter while the connector is disconnected.**
   • Items such as fingers may become caught in the mechanism.

4. **Avoid direct contact with air coming out of the air outlet holes.**
   • Pressurized air containing fine particles is discharged from the air outlet holes during use. Keep eyes away from this area.
   • Pressurized air containing fine particles is discharged from the air outlet holes during use. This may soil clothing or other items.

5. **If using in elevated locations, use a safety harness, and take care to avoid dropping rivet nuts or the tool itself.**
   • Damage or injury may result if this practice is not followed.

6. **Avoid skin contact with substances such as hydraulic oil, lubricating oil and grease.**
   • Such substances may cause inflammation of the skin. If they come into contact with your skin, wash the affected area thoroughly.

7. **Make sure that the workplace is safe, clean and organized.**
   • Accidents can easily occur in untidy workplaces.

8. **Avoid uncomfortable postures while working.**
   • You may fall down and injury may result.

9. **Keep people who are not involved in work away from the workplace.**
   • Accidents or injury may result.

10. **Maintain the tool with due care.**
    • Refer to the Instruction Manual for details on replacing parts and attachments, otherwise injury may occur.
    • Keep the grip clean and dry at all times, and never let it become greasy, otherwise injury may occur during use.

11. **Use the tool carefully and concentrate on correct operation at all times.**
    • Use the tool with proper care, paying full attention to methods of handling and operation and surrounding conditions. Accidents and injury may result if this practice is not followed.
    • Use common sense at all times, otherwise accidents or injury may result.
    • When you are tired, do not use the tool, otherwise accidents or injury may result.

12. **Ask Lobtex to carry out any repair work required.**
    • Repair work should only be carried out by a qualified technician. Please contact your nearest "Lobster" distributor, representative or direct to Lobtex Co.,Ltd.,Osaka. If the tool is repaired by someone without the necessary qualifications and experience, the tool may not perform to optimum standards, and accidents or injury may result.

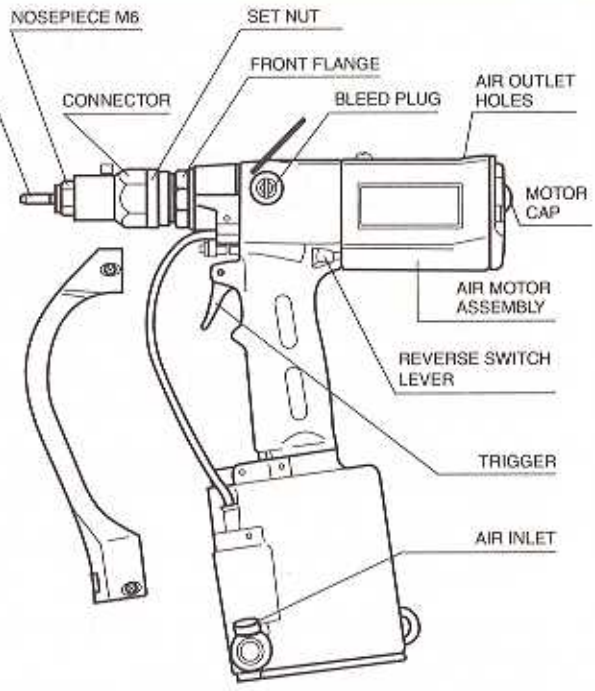
13. **Do not attempt to modify the tool.**
    • Unauthorized modifications may cause malfunctions which can lead to accidents or injury.

TECHNICAL DATA

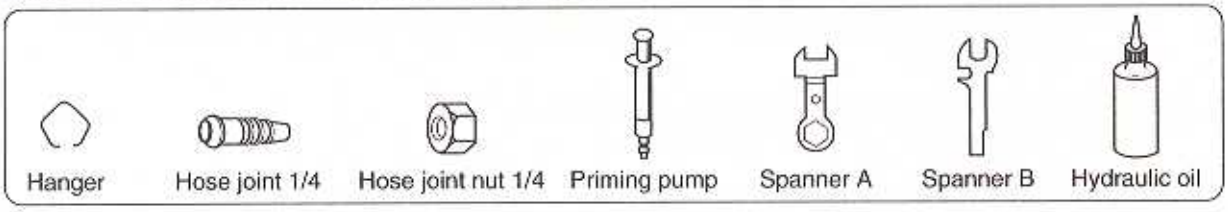
■ SPECIFICATIONS ■

Model No.	AN-200A
Weight	2.6 kg
Height	290 mm
Total length	262 mm
Operating air pressure	0.59 ~ 0.69 MPa (6 ~ 7 kgf/cm², 85 ~ 100 psi)
Work Capacity:	ANY STANDARD THIN WALL RIVET NUT FROM M3 – M10 (#6, #8, #10, 1/4, 5/16, 3/8) IN ALL MATERIALS AND ANY FLANGED HEAD RIVET NUT IN ALL MATERIALS FROM M3 – M8 (#6, #8, #10, 1/4, 5/16) (M10 or 3/8 in aluminum)
Air consumption per rivet nut	5 ℓ /nut

* Product specifications and design are subject to change for improvement without notice.
* Weight and dimensions given are standard values. Actual products may differ slightly from the values given.



■ ACCESSORIES ■ Check at the time of purchase.



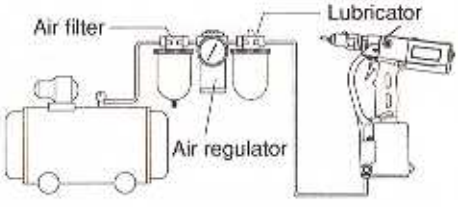
* Accessories differ slightly from those given above between tools delivered in Japan and overseas.

PREPARATION BEFORE USE

1 **Set up the compressor, and be sure to install an air filter, air regulator and lubricator between the compressor and the air nutter.**

ATTENTION!

If these are not installed, water or other particles in the air may prevent the tool from operating smoothly.



2 **Use the air regulator to adjust the operating air pressure to 0.59 ~ 0.69 MPa (6 ~ 7 kgf/cm², 85 ~ 100 psi).**

ATTENTION!

If the air pressure is too high, damage to parts may occur. If the pressure is too low, the rivet nut may not be sufficiently pulled up.

3 **Replace the attachments (screw mandrel and nosepiece) to conform to the size of the rivet nut being used. The tool is fitted with M6 attachments at the time of purchase.**

■ PULLING HEAD COMBINATION ■

It is important to have a correct Screw Mandrel and Nosepiece combination. If incorrect or if you need to change thread size, refer to the listing on the Screw Mandrel and Nosepiece combination, as follows:

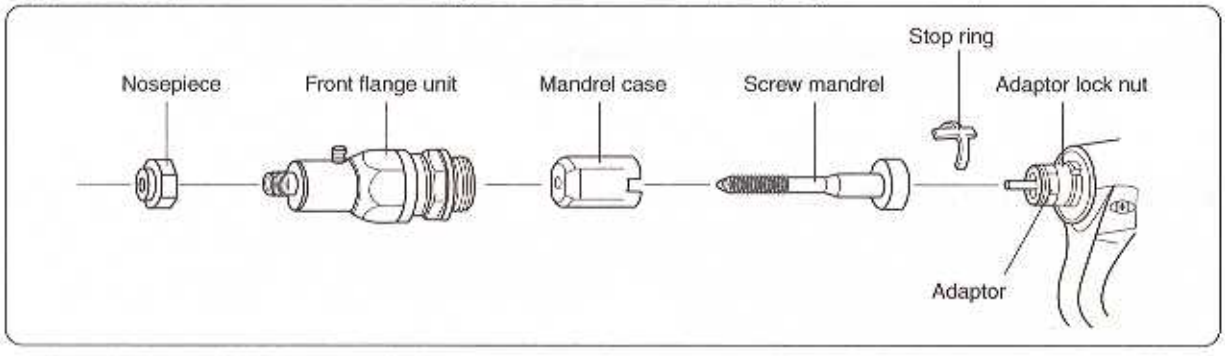
SCREW MANDREL AND NOSEPIECE COMBINATION

Thread Size		(Pull-up Stud) Screw Mandrel		(Anvil) Nosepiece		**Thread Conversion Kit	
		Index	Code	Index	Code	Index	Code
Metric Threads							
M3 × 0.5 – 6H		010A	15460	001A	15445	100A	16830
M4 × 0.7 – 6H		010B	15476	001B	15464	100B	16834
M5 × 0.8 – 6H		010C	15617	001C	15480	100C	14700
*M6 × 1.0 – 6H		010D	15635	001D	15618	100D	16328
M8 × 1.25 – 6H		010E	15656	001E	15640	100E	16537
M10 × 1.5 – 6H		010F	15676	001F	15661	100F	16542
Unified Threads							
#6 – 32	UNC – 2B	010G	16868	001G	16837	100G	16861
#8 – 32	UNC – 2B	010H	16864	001H	16841	100H	14299
#10 – 24	UNC – 2B	010J	16872	001J	16845	100J	14419
#1/4 – 20	UNC – 2B	010K	14327	001K	16849	100K	16152
#5/16 – 18	UNC – 2B	010M	15787	001M	16853	100M	16737
#3/8 – 16	UNC – 2B	010N	16588	001N	16857	100N	16840
#10 – 32	UNF – 2B	010R	14040	001J	16845	100R	15442
#1/4 – 28	UNF – 2B	010S	14600	001K	16849	100S	16329
#5/16 – 24	UNF – 2B	010T	16167	001M	16853	100T	16833
#3/8 – 24	UNF – 2B	010U	16821	001N	16857	100U	16844

* The tool is initially supplied with M6 thread attachment fitted.
** Thread Conversion Kit includes a set of Screw Mandrel & Nosepiece.

■ CHANGING THREAD SIZE ■

⚠CAUTION Make sure that the air supply is disconnected before replacing any of the attached parts.

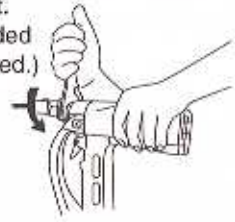


■ DISASSEMBLY ■

❶ Use spanner B to turn the nosepiece clockwise in order to loosen it.
(A left-handed thread is used.)

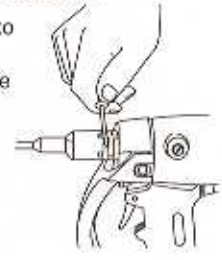
* The nosepiece moves freely back and forth.

❷ Use spanner B to turn the front flange unit clockwise in order to loosen it.
(A left-handed thread is used.)



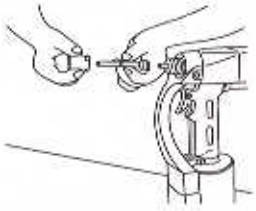
❸ Use a narrow pin or similar device to lift up the stop ring in order to disengage it.

* It will be easier to carry out later reassembly if the stop ring is not fully removed.



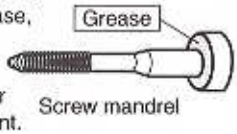
❹ Turn the mandrel case counterclockwise to loosen it.

❺ Remove the screw mandrel.



❻ Prepare the replacement screw mandrel and nosepiece with the correct size.

* When installing the screw mandrel, apply grease to the section which contacts the mandrel case (shaded area). If you do not have any grease, apply the accessory hydraulic oil or similar lubricant.

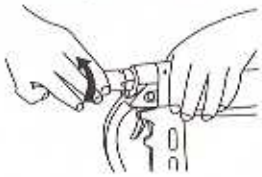


■ REASSEMBLY ■

❼ Insert the screw mandrel into the mandrel case, and then screw it into the tool as far as it will go.

* Working will be easier if the notch in the adaptor lock nut is facing upward before assembly.
* The working life of the screw mandrel will be extended if you apply some "Lobster" brand lubricating oil (sold separately) or available machine oil to the screw mandrel at the time of reassembly.

❽ Turn the mandrel case counterclockwise until the notch in the case is aligned with the notch in the adaptor lock nut.



❾ Align the stop ring with the notches, making sure that it faces in the correct direction.

* The longer end should be at the front, and the shorter end should be at the main unit.

❿ Re-attach the front flange unit counterclockwise using spanner B.
(A left-handed thread is used.)

⓫ Use spanner B to turn the nosepiece counterclockwise until it is securely tightened.
(A left-handed thread is used.)

4 Be sure to adjust the stroke to ensure that the rivet nuts are pulled up correctly.

■ STROKE ADJUSTMENT ■

The AN-200A tool, leaves the factory equipped with M6 (metric) Nose Assembly and is pre-adjusted to provide a stroke of 1.0mm (.040"). To find out the actual tool stroke, proceed as follows:

① Determining tool stroke.

Measure and record overall length of the rivet nut, before upset.

Connect the tool to the air line. Grasp shank end of the rivet nut with fingers tightly to prevent turning. Point the tool mandrel at right angle to the rivet nut head and pull the trigger and hold until the tool completes the cycle i.e., unthreading itself from the upsetted fastener. Release the trigger. (Fig. 1)

Again, measure the overall length of the upsetted fastener. Record the difference between measurement of the fastener before pull-up and after pull-up. This difference "L" is the amount of actual stroke for which the tool is now adjusted. (Fig. 2) This information is essential to the next step of determining the amount of stroke required.

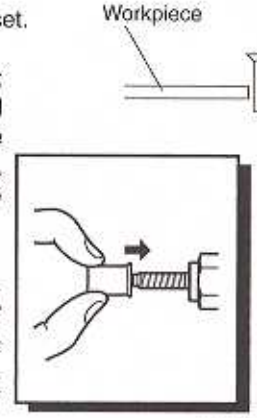


Fig. 1

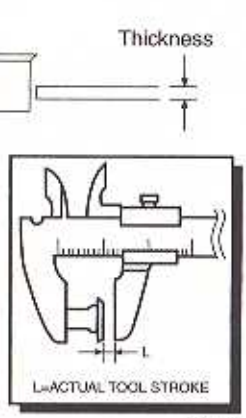


Fig. 2

② Determining stroke required

Each rivet nut will accommodate thickness of material between the minimum and maximum grip limits. Refer to your fastener design guide for details and determine the correct stroke required to install the specific fastener in a given material thickness. Stroke setting requirements from other rivet nut manufactures may vary.

ATTENTION!

Excessive stroke (pull-up) may break screw mandrel (pull-up stud) threads, strip fastener threads or both. Inadequate stroke may result in loose installation.

Suppose the fastener used is "Lobster" NSK-6M, to be installed in 1.0mm material thickness. The stroke (pull-up) needed is 3.5mm, as noted from the fastener data sheet, which is a close approximation of the stroke required to attain a proper bulge. (Fig. 3 & 4)

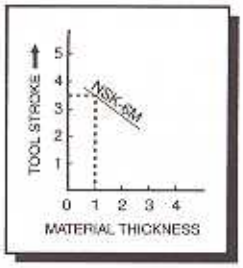


Fig. 3

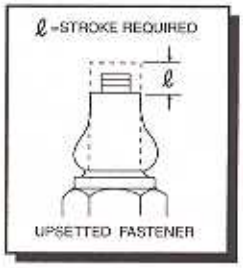
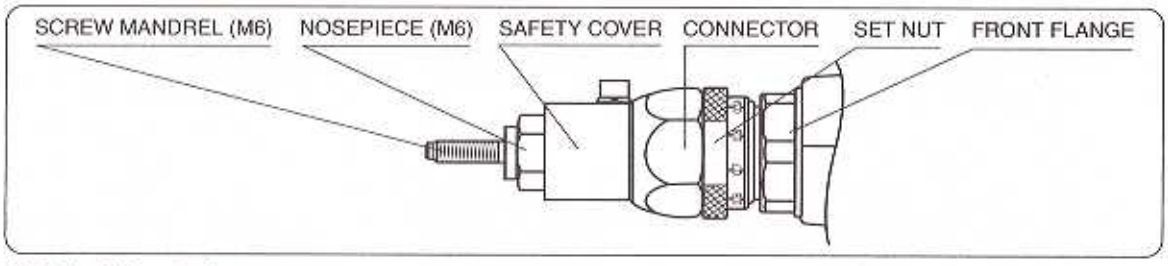


Fig. 4

ATTENTION! **If using fasteners made by other manufacturers, these fasteners may have different pull-up stroke requirements.**

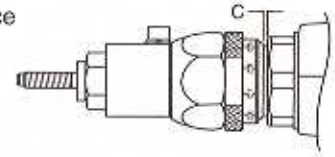
③ Use the actual pull-up length thus obtained to adjust the tool stroke



❶ Adjust the stroke.

Use spanner B to turn the connector clockwise in order to loosen it. (A left-handed thread is used.)

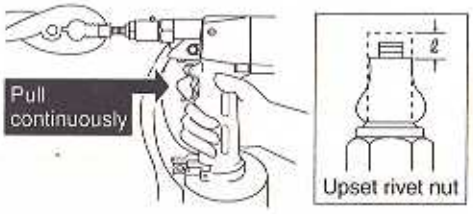
Set the gap C between the front flange and the set nut to the same distance as the actual stroke required.



* At the time of purchase, the clearance C is set to 1 mm. The clearance increases or decreases by 1 mm for each full rotation of the set nut. Use the scale attached to the set nut as a guide for setting.

❷ Set an actual rivet-nut (pull it up without inserting into a workpiece).

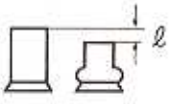
1. Hold the rivet nut securely using pliers.
2. Place the rivet nut gently against the screw mandrel.
3. Pull the trigger on the air nutter.
4. The screw mandrel will thread into the rivet-nut. Once the pull-up is complete, the tool will reverse spin the screw mandrel out of the rivet nut. Do not release the trigger until the screw mandrel comes fully out of the rivet nut.



ATTENTION! If the trigger is released before the cycle is complete, do not attempt to repeat the cycle by pulling the trigger again. Instead, pull the reverse switch lever and hold it in that position while pulling the trigger to remove the screw mandrel. (Refer to page 20.)

❸ Make fine adjustments.

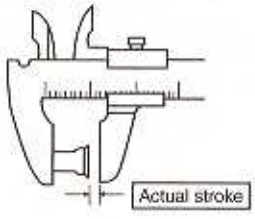
Measure the difference in length (ℓ) between the upset rivet nut and an unused rivet nut. If this difference is more than ±0.3 mm from the actual pull-up length, repeat the stroke adjustment.



* The scale on the set nut is almost equivalent to the actual stroke, but slight differences may occur depending on various conditions. Thus fine adjustments should always be carried out.

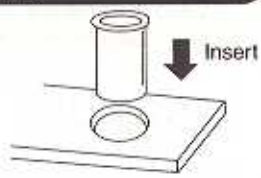
❹ Lock the stroke setting.

Repeat the "upset" procedure once more. If the difference in length (ℓ) is within ±0.3 mm of the required value, adjustment is complete.
Use spanner B to turn the connector counterclockwise to lock it securely.
(A left-handed thread is used.)



OPERATING THE AIR NUTTER

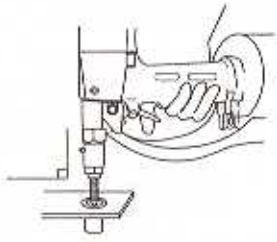
1 **Drill a hole of the appropriate size into the workpiece, and insert the rivet nut into the hole.**



2 **Place the screw mandrel against the rivet nut.**

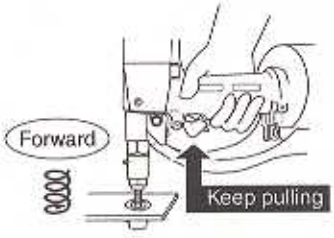
* Place the tool gently against the rivet nut, without pushing too hard.
* Hold the tool so that it is at a right angle to the surface of the workpiece. If it is used at an angle, it may start reversing without pulling up the rivet nut.

"additional information"
or partially thread the rivet nut on to the screw mandrel and insert the screw mandrel and rivet nut into a prepared hole.

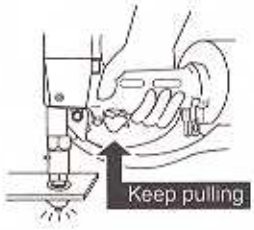


3 **Pull the trigger. (Do not release the trigger until the rivet nut has been pulled up and the screw mandrel has completely reversed out of the fastener.)**

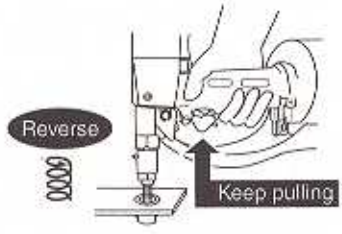
❶ The screw mandrel moves into the rivet nut.



❷ The rivet nut is pulled up in the workpiece.



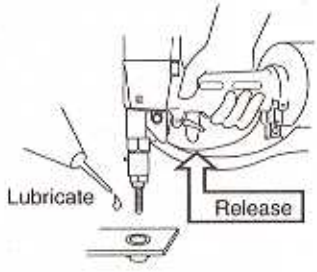
❸ The screw mandrel reverses and comes out of the rivet nut.



4 **Once the screw mandrel has come completely out of the rivet nut, release the trigger.**

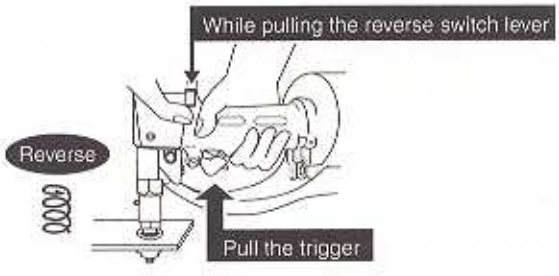
ATTENTION! If you release the trigger before the operation has been completed, do not attempt to press the trigger again.

* Continuous operation by keeping the trigger pressed is not possible. **Release the trigger and then press it again to pull up the next rivet nut.**
* Periodically lubricate the threaded section of the screw mandrel. This will improve workability.



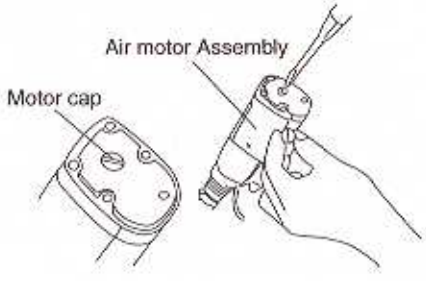
If you release the trigger during pulling-up

While pulling the reverse switch lever, pull the trigger. The air nutter will switch to reverse and the screw mandrel will come out of the rivet nut.



If the screw mandrel sticks inside the rivet nut and will not come out

First turn off the air supply. Then remove the motor cap from the rear of the motor and use a flat-tipped screwdriver to turn the internal conveyor rod counterclockwise until the screw mandrel is free from the rivet nut.



MAINTENANCE

■ ADDING HYDRAULIC OIL ■

When the air nutter is used for a long period of time, the amount of hydraulic oil decreases. This results in the rivet nuts not being pulled up, or rivet nuts that are pulled up but the tool does not reverse and disengage. This happens because of changes in the pull-up stroke resulting from a loss of hydraulic oil.

Add hydraulic oil by following procedure ① at least once a month. If you wish to add oil more frequently than once a month, procedure ② is easier to follow.

① Adding hydraulic oil through the cylinder (includes cylinder greasing procedure)

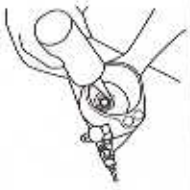
When the tool has been used for a long period of time, dust and shavings will get inside it, reducing smoothness of operation and adversely affecting the durability. Use this procedure when adding oil at a frequency of once a month.

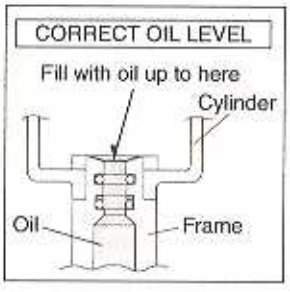
❶ Turn off the air supply. Use spanner A to remove the cylinder cap.

❷ Stand the cylinder up vertically, and then use pliers or a similar tool to pull out the air piston.

❸ Apply grease to the inside of the cylinder.

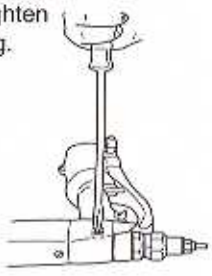
❹ Pour in the hydraulic oil through the oil hole in the frame, and then install the air piston.





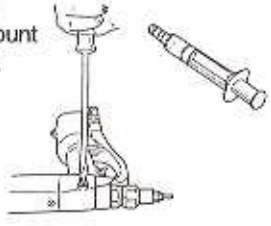
❺ Use spanner A to install the cylinder cap.

❻ After installation, loosen the bleed plug to drain any excess oil.Then re-tighten the bleed plug.

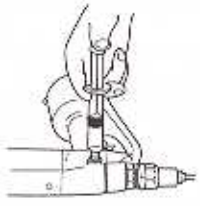


② Adding hydraulic oil through the bleed plug

❶ Turn off the air supply. Then remove the bleed plug and insert the priming pump containing the necessary amount of hydraulic oil.



❷ Gently press the piston of the priming pump until back pressure is felt.



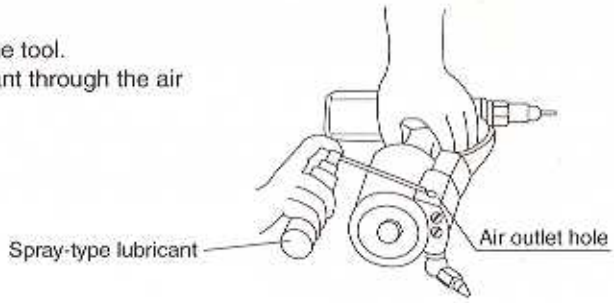
❸ Remove the priming pump, and re-tighten the bleed plug.

Tip

- If the priming pump is not cleaned after use, the rubber at the end of piston will deteriorate and the priming pump will no longer work properly.
- Remove the piston from the priming pump and wipe away any oil adhering to the rubber.
- Store the priming pump with the piston thus removed.

■ LUBRICATING THE SPOOL ■

A dry spool may hinder the air flow operation of the tool.
Periodically apply any available spray-type lubricant through the air outlet hole in the cylinder.



STORAGE

- Store in a place which is well-ventilated and free from excessive dust and humidity, and where there is no danger that the tool will fall.
- If not using the tool for an extended period of time, carry out a maintenance inspection before storing it away.
- To increase the working life of the tool, it is recommended that you give it periodic overhauls. Contact the place of purchase or your nearest "Lobster" dealer for any overhauls and repair work required. (A charge will be made for this service.)

* If making any enquiries about this product or requests for repair work, first check the troubleshooting items below, and make a note of the model number, the usage conditions and the trouble symptoms in as much detail as possible. If you can provide this kind of information, it will contribute to reduce the amount of time required for delivery or repairs to be completed.

TROUBLESHOOTING

If a problem occurs, check the following.
If the problem persists after checking the items in the table below, contact your nearest "Lobster" dealer or direct to us.

Symptom	Cause	Remedy
The screw mandrel does not rotate.	• It may not rotate at times because the air motor is in neutral position.	• While pulling the reverse switch lever, press the trigger, or try turning the screw mandrel clockwise or counterclockwise by hand.
The screw mandrel rotates normally, but it does not thread into the rivet nut.	• The size of the screw mandrel does not match the size of the rivet nut. • The threaded section of the screw mandrel is damaged.	• Replace the screw mandrel with one of the correct size. • Replace the screw mandrel with a new one.
The screw mandrel rotates and moves into the rivet nut, but without pulling up the rivet nut the screw mandrel then switches to reverse.	• The end of the screw mandrel is contacting an obstruction. (If on a pipe, the screw mandrel touches the other side of the pipe. If with a closed end rivet nut, the screw mandrel touches the bottom of the nut.)	• Cut the tip of the screw mandrel until it no longer touches, or attach a nosepiece spacer (sold separately) under the nosepiece. (Refer to page 25.)
The screw mandrel rotates and pulls up the rivet nut, but the screw mandrel does not switch to reverse.	• Hydraulic oil level is low. • Stroke adjustment is incorrect. (Stroke is longer than required pull-up length.)	• Add hydraulic oil. • Re-adjust the stroke.
The screw mandrel draws in but then stays reverse rotating.	• O-ring on the spool inside cylinder has deteriorated.	• Replace the O-ring. • Add lubricant through the air outlet hole in the cylinder.

NOTE : Some fasteners may not be usable with this tool depending on the manufacturer, material or size. If you have problems using any fasteners, contact your nearest "Lobster" dealer or direct to us.

■ HYDRAULIC OIL REQUIREMENTS ■

Use only clean hydraulic oil, as the viscosity of the oil used will affect tool performance.

"Lobster" brand Hydraulic Oil is supplied in a plastic filler bottle with the tool, and can also be obtained from your "Lobster" dealer or agent in your town. If this is not possible, a good quality mineral oil with the following properties should also be used:

Viscosity ISO	: VG46
Viscosity Index	: 113
Viscosity at 40°C	: 46 c.s.t.
Viscosity at 100°C	: 7.06 c.s.t.
Flash Point	: 228

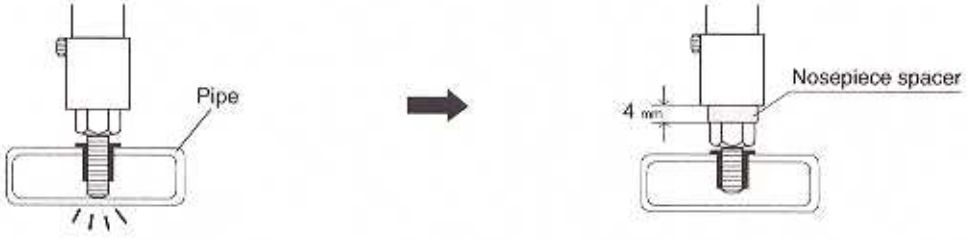
RECOMMENDED OILS are:

Shell Tellus No. 46
Esso Teresso No. 46
Mobil D.T.E. 25 Oil (Medium)

OPTION the nosepiece spacer (sold separately)

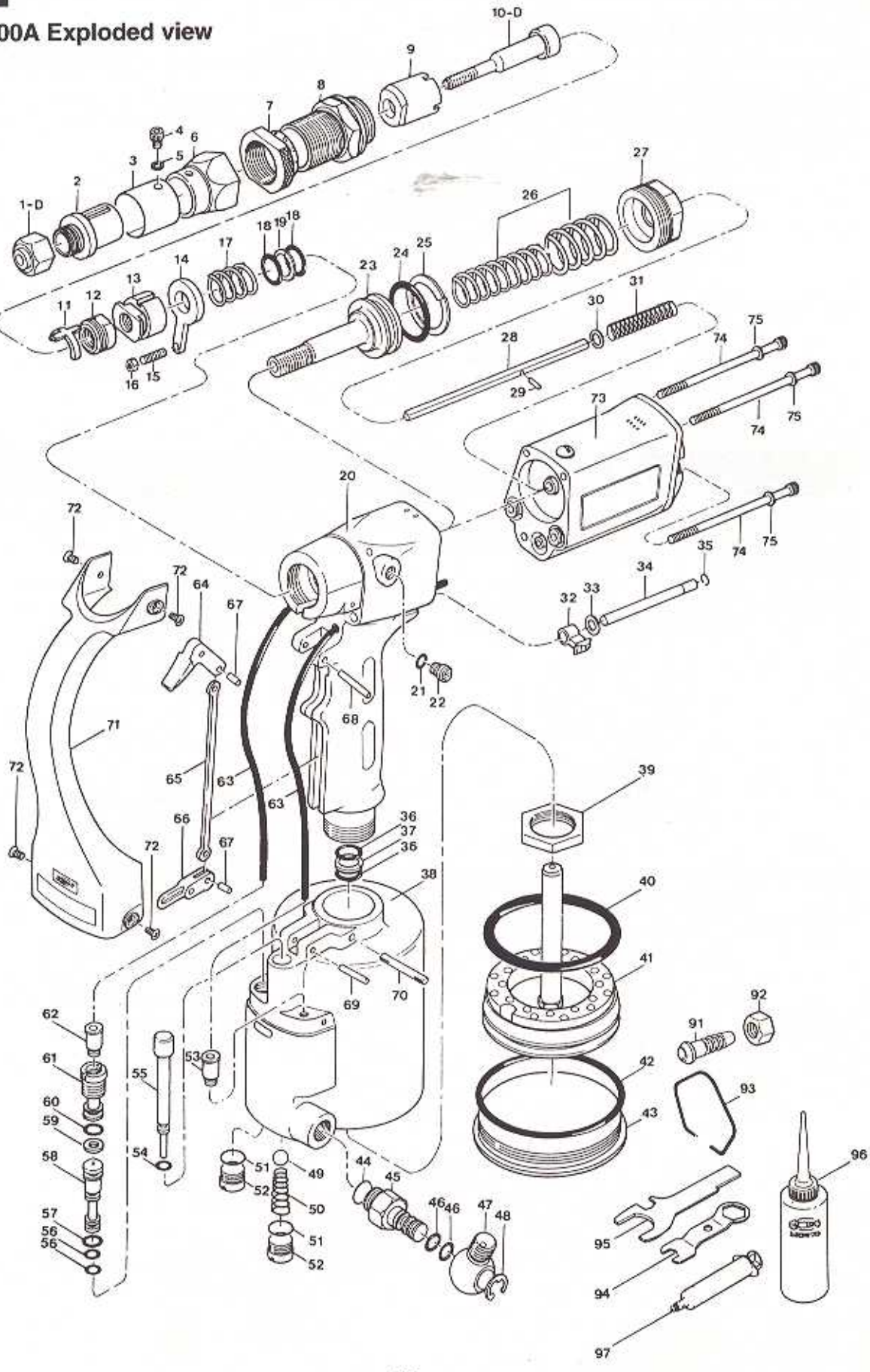
If pulling-up cannot be carried out for the reasons given below, the optional nosepiece spacer may be useful. (The nosepiece spacer should only be inserted between the nose and the nosepiece, and the nosepiece should be securely tightened.)

Example 1 : The screw mandrel touches the base of a pipe and cannot complete the pulling-up operation normally due to back side clearance.



Example 2 : The screw mandrel touches the bottom of a closed end rivet nut and cannot complete the pulling-up operation normally.

AN-200A Exploded view



AN-200A Parts table

Index No.	Code	Parts name	Index No.	Code	Parts name
1-D*	15618	Nosepiece M6	44	10151	O-ring S-10
2	12898	Nose	45	12130	Double male connector
3	12899	Safety cover	46	10149	O-ring P-7
4	12901	Hex indent screw M4	47	10294	Rotary joint
5	15667	Spring washer M4B	48	10285	Retaining ring E-7
6	17112	Connector	49	14239	Urethane ball
7	17108	Stroke set nut	50	14255	Valve spring
8	17104	Front flange	51	14475	O-ring S-8
9	15692	Mandrel case	52	14294	End plug
10-D*	15635	Screw mandrel M6	53	14848	One touch joint
11	17100	Stop ring	54	10454	O-ring P-4
12	17096	Adaptor	55	14172	Valve pusher
13	17092	Adaptor lock nut	56	12120	O-ring P-5
14	15955	Guide	57	10149	O-ring P-7
15	15680	Guide screw	58	14513	Spool
16	15732	Guide screw nut	59	14818	Packing
17	15841	Guide spring	60	10149	O-ring P-7
18	10128	O-ring P-12	61	14767	Pilot holder
19	10129	B-ring P-12	62	14848	One touch joint
20	15837	Frame unit (with 18, 19, 36, 37)	63	15611	Urethane tube
21	12120	O-ring P-5	64	14375	Trigger
22	12135	Bleed plug	65	10202	Trigger connector rod
23	17077	Oil piston	66	10282	Trigger lever
24	12437	O-ring P-26	67	10147	Spring pin 3 × 6
25	12438	B-ring P-26	68	10251	Spring pin 3 × 20
26	16623	Return spring set	69	10145	Spring pin 3 × 18
27	17088	Frame cap	70	14154	Slotted pin 4 × 31
28	15817	Conveyor rod	71	17042	Grip cover
29	16101	Spring pin ø1.2	72	15645	C-screw M3
30	14642	Flat washer M5	73	29150	Air motor assembly
31	10133	Jaw pusher spring	74	15435	Hex indent screw M4 × 90
32	15744	Reverse switch lever	75	15667	Spring washer M4B
33	14642	Flat washer M5	91	10140	Air hose joint 1/4
34	15768	Guide pin	92	10139	Air hose joint nut 1/4
35	15800	Retaining ring E-3.2	93	15468	Hanger
36	10337	O-ring P-10A	94	10141	Spanner A
37	16030	B-ring P-10A	95	14036	Spanner B
38	15869	Air cylinder	96	10012	Hydraulic oil in a bottle
39	10112	Frame lock nut	97	14142	Priming pump
40	10134	O-ring P-60			
41	14798	Air piston unit (U)	OPTION	889	Jaw-Lube in a bottle
42	10080	O-ring G-70	OPTION	28054	Nosepiece spacer 4mm
43	15276	Air cylinder cap			

* For other thread sizes, please refer to the page 19, "Pulling Head Combination".

■ ORDERING PARTS ■

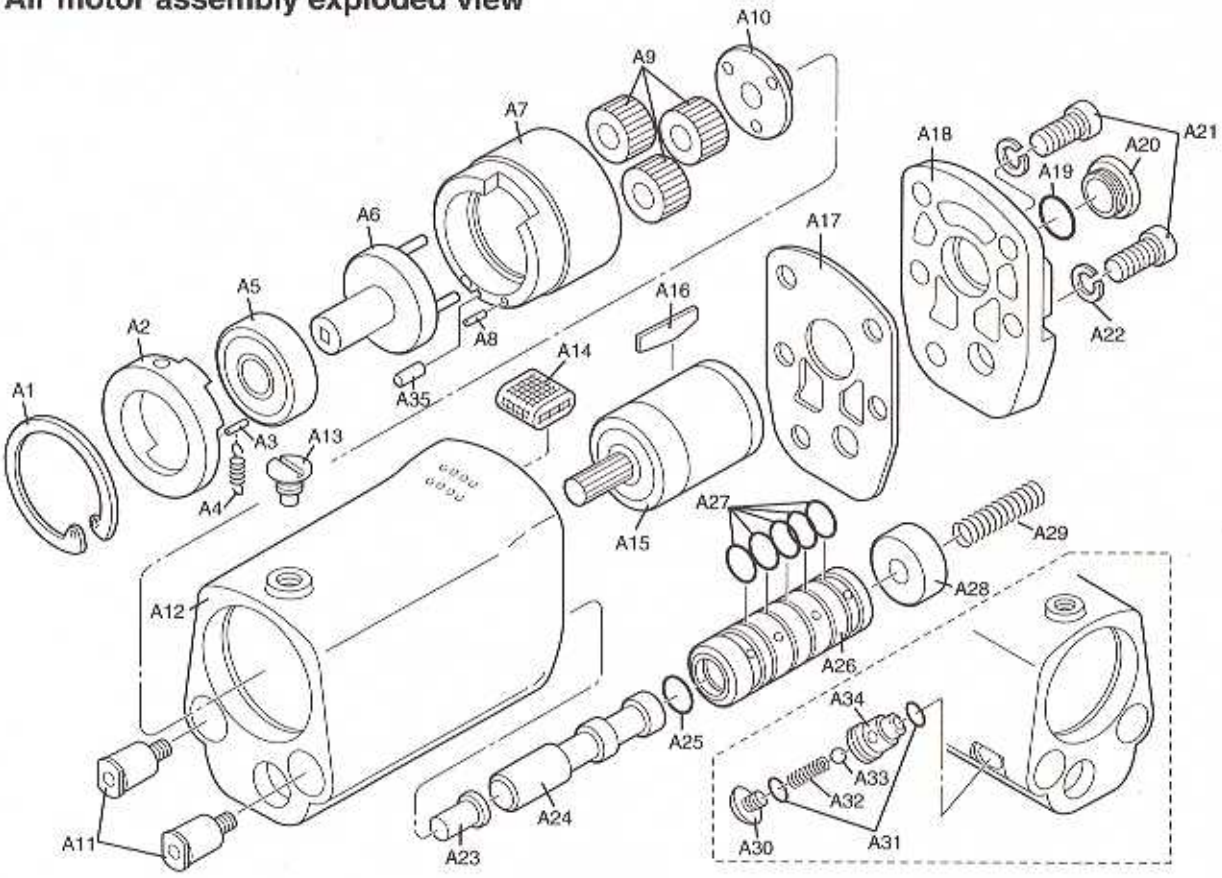
Indicate the tool model, part code number, part name and quantity as shown below when ordering.

(Example)

Model	Part Code No.	Part Name	Qty.
AN-200A	15617	Screw Mandrel M5	2

When parts are modified for improvement, the older parts are kept in stock for a period of five years.

Air motor assembly exploded view



Air motor assembly parts table

Index No.	Code No.	Parts Name	Index No.	Code No.	Parts Name
A 1	17068	Snap Ring ♯34	A19	10219	O-Ring P-9
A 2	28468	Adaptor Cap	A20	16665	Motor Cap
A 3	11932	Spring Pin 2×8	A21	16863	Hex Indent Head Bolt (4×10)
A 4	28483	Clutch Returning Spring	A22	15667	Spring Washer M4 (black)
A 5	16452	Bearing 629ZZ	A23	16867	Changer Pin
A 6	16136	Gear Frame (2)	A24	28472	Spool (2)
A 7	28469	Internal Gear	A25	10274	O-Ring P-10
A 8	14438	Spring Pin φ2×10	A26	28473	Attachment
A 9	16733	Planetary Gear	A27	10219	O-Ring P-9
A10	16829	Gear Frame (1)	A28	28474	Spool Stopper
A11	14848	One Touch Joint	A29	16826	Spool Returning Spring
A12	28471	Motor Casing	A30	28475	Truss Head Screw
A13	29060	Setting Screw	A31	10220	O-Ring S-6
A14	16847	Muffler	A32	28481	Plunger Spring
A15	16851	Motor Set (Including 5 Vanes)	A33	28484	Urethane Ball 5/32
A16	14015	Vane (Inner Parts)	A34	28482	Plunger Case
A17	16855	Seal Packing	A35	28470	Pin 3×8
A18	16859	Cap			