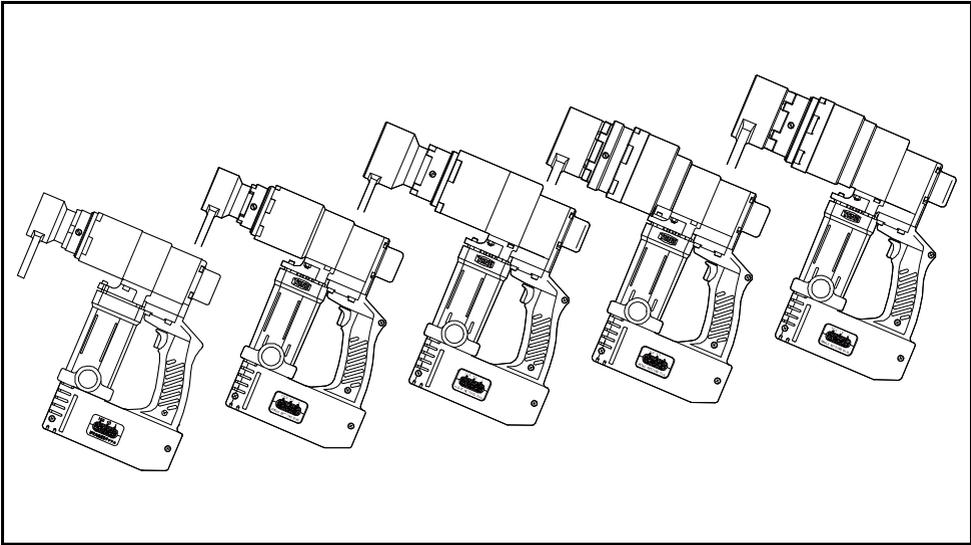


TONE® **TURN OF THE NUT TIGHTENING WRENCH**



INSTRUCTION MANUAL **No.1407**

MODEL	TN-20EZ-1 TN-22EZ-1 TN-24EZA-1 TN-30EZ-1 TN-33EZ-1 TN-39EZ-1
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 **CAUTION**

Read and fully understand all the instructions before use.
Keep this manual in designated place for easy and quick reference.
The models mentioned on this manual are designed for use outside Japan.
Warranty shall be void if above mentioned models are use in Japan.

TONE CO., LTD.

PREFACE

Thank you for purchasing TURN OF THE NUT TIGHTENING WRENCH.

- Upon receipt, check and confirm the following:
 - Check any transport damages.
 - Check for any loose or lost screws and bolts.
 - Check the model as per order.
 - Check all the accessories are contained.

If any problems are found, contact your distributor.

- Read this instruction manual carefully before use.
Full understanding of manual is essential to prevent personal injury or malfunction.
- Keep this manual in a bag attached to the back of metal case lid for easy and quick reference.
- If manual or warning label is lost or becomes illegible, or if additional manual is required, contact your distributor.

If you have any questions about the products or the contents of this instruction manual, contact your distributor.

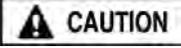
- This manual is only applicable to outside Japan.

SAFETY INSTRUCTIONS

This manual specifies three (3) basic safety instructions:



- Instructions are classified by degree of risk and described as follows:

	Danger is used to indicate threatening dangerous or unsafe practices which could immediately result in severe personal injury or death in the worst case.
	Warning is used to indicate hazardous or unsafe practices which could result in severe personal injury or death in the worst occasion.
	Caution is used to indicate hazardous or unsafe practices which could result in personal injury or product or property damage.

Even if the risk is classified as , risk could become more serious result depending on conditions. Make sure to follow all instructions when using.

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1. GENERAL SAFETY INSTRUCTIONS



WARNING

When using electric tools, basic safety precautions, including the following, should always be followed to reduce the risk of fire, electric shock and personal injury. Read all these instructions before operating this product and keep these instructions.

FOR SAFE OPERATION

1) Keep work area clean.

Cluttered areas and benches invite injuries.

2) Consider work area environment.

Do not expose power tools to rain. Do not use power tools in damp or wet locations. Keep work area well lit. Do not use power tools where is risk to cause fire or explosion.

3) Guard against electric shock.

Avoid body contact with earthed or grounded surfaces.

4) Keep children away.

Do not let visitors touch the tool or extension cord. All visitors should be kept away from work area.

5) Store idle tools.

When not in use, tools should be stored in a dry, high or locked up place, out of reach of children.

6) Do not force the tool.

It will do the job better and safer at the rate for which it was intended.

7) Use the right tool.

Do not force small tools or attachments to do the job of a heavy duty tool. Do not use tools for purposes not intended.

8) Dress properly.

Do not wear loose clothing or jewelry, they can be caught in moving parts.

Rubber gloves and non-skid footwear are recommended when working outdoors.

Wear protecting head covering to contain long hair.

9) Use safety glasses and ear defenders.

10) Do not abuse the cord.

Never carry the tool by the cord or yank it to disconnect it from the socket.

Keep the cord away from heat, oil and sharp edge.

11) Secure work.

Use clamps or vice to hold the work. It is safer than using your hand and it frees both hands to operate the tools.

12) Do not over reach.

Keep proper footing and balance at all times.

13) Maintain tools with care.

Keep clean for better and safer performance. Follow instructions for lubrication and changing accessories. Inspect tool cord periodically and if damaged have it repaired by an authorized service facility. Inspect extension cords periodically and replace, if damaged. Keep handles dry, clean and free from oil and grease.

14) Disconnect tools.

When not in use, before servicing and when changing accessories.

15) Remove adjusting keys and wrenches.

Form the habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it on.

16) Use outdoor extension leads.

When tool is used outdoors, use only extension cords intended for outdoor use.

17) Stay alert.

Watch what you are doing. Use common sense. Do not operate tool when you are tired.

18) Check damaged parts.

Before further use of tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, free running of moving parts, breakage of parts, mounting and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated in this instruction manual. Have defective switches replaced by an authorized service facility. Do not use the tool if the switch does not turn it on and off.

19) Warning

The use of any accessory or attachment, other than those recommended in this instruction manual, may present a risk of personal injury.

20) Have your tool repaired by a qualified person.

This electronic tool is in accordance with the relevant safety requirements. Repairs should only be carried out by qualified person using genuine spare parts, otherwise this may result in considerable damage to the user.

2. APPLICATION

- **TURN OF THE NUT TIGHTENING WRENCH** is an electric tool for tightening High Strength Hexagonal Bolts/Nuts according to Turn-of-Nut Method.

3. PRECAUTIONS FOR USE

- To prevent accident, personal injury and etc, read and follow all instructions listed below.

DANGER

- **Beware of electric shock when operating at high place.**

- Failure to follow this instruction may result in fall down accidents.
-

- **Do not touch bar socket when operating.**

- Remove the gap between the bar socket and the reaction member in order not to pinch finger, hand or foot.
- Beware that the reaction bar on the bar socket rotates to opposite direction to that of nut rotating direction.

Failure to follow this instruction may result in personal injury such as finger amputation.





WARNING

● **Bar socket must be placed perpendicular to a solid reaction member.**

- Use buffers like steel plate in between the reaction member and the bar socket if reaction members are not solid.

Failure to follow this instruction may result in insufficient tightening result or breakage of the bolt and nut or personal injury.

● **Never use TN wrenches under rainy or snowy condition.**

Failure to follow this instruction may result in electric shock or electric leakage.

● **Hold the wrench and grip of firmly when in operation.**

- TN Wrenches stop automatically with huge reaction force just after tightening bolts completely.

Failure to follow this instruction may result in personal injury.

● **Electric cord must be regularly inspected.**

- Stop using the wrench if there is a problem with the electric cord.
- Contact your distributor for repair.

Failure to follow this instruction may result in electric shock or electric leakage.



WARNING

- **Never use the wrench around the place where gasoline, gas, thinner, benzine, etc., are stored.**

- Do not use TN wrenches around flammable substances to avoid the accidental fire caused by the spark out of the electric motor.
-

- **Beware of fall down accident when working at a high place.**

- Wear safety belt
- Provide safety net or canvas as safe guarding against falling items.
- Confirm that no one is underneath the working site before operation.
- Stop operation when physically or mentally tired.

Failure to follow these instructions may result in fall down accidents.

- **Avoid overloading.**

- Use TN wrenches and their accessories within the rated specifications. Overloaded TN wrenches and their accessories may result in malfunction of the TN wrenches or accidents or personal injury.
-

- **Properly install bar sockets as described in this manual.**

- Incomplete installation may result in accidents and personal injury.

See “CHANGING SOCKETS” on page 21



WARNING

● **Avoid accidental Starting.**

- Ensure that the switch is in the off-position before plugging into power source.
 - Never carrying TN wrenches with your fingers on the switch when the plug is connected to power source.
-

● **Disconnect the plug from the power source when:**

- Not in use.
- Changing accessories.
- Inspection and maintenance.
- Or other danger is foreseen.

Failure to follow these instructions may result in accidental starting and personal injury.

● **Do not disassemble or modify TN wrenches.**

- Disassembly or modification made by unauthorized personnel may result in malfunction or personal injury.
- Disassembly & Re-assembly work is permitted for the following expendables: Bar Sockets, Set-Screws, Carbon Brushes.



WARNING

● **Store TN wrench in the metal case and keep it at the designated place when not in use.**

- Store TN wrench in lockable dry location to keep any unauthorized personnel away.

Failure to follow this instruction may result in malfunction or accidents.

● **Immediately stop using and then unplug TN wrenches when unusual sound, vibration or smell is detected.**

- Contact your distributor immediately.

Failure to follow this instruction may result in serious injury.

● **Contact your distributor for repair service.**

- Repair work should only be done by a qualified serviceman.
 - Repair work done by an inexperienced person may cause accidents, injury or malfunction.
-

● **Use appropriate power source as indicated on the rating plate.**

- Failure to follow this instruction may result in fire or burn accidents.



WARNING

● Check the following items before operation.

- Check for any deformation, crack or damage on the wrench body, sockets, electric cord, plug, earth cable and etc.
 - Do not use the wrench if any problem are found on items listed above.
 - Make sure that socket assembly is correctly installed on the wrench.
 - Make sure that set screws are securely fastened. Loose installation may result in accidents and personal injury.
-

● Immediately check the wrench when it is dropped down or banged.

- Check for deformation, crack, damage and other abnormality. Stop using the wrench if any abnormality is found.

Continued use of fault wrenches may result in accident and personal injury.

● Check if leakage breaker is available together with earth connection.

- Recommended leakage breaker: Rating capacity at 15mA and acting time below 0.1sec.

 **WARNING**

● **Electric cord must be regularly inspected.**

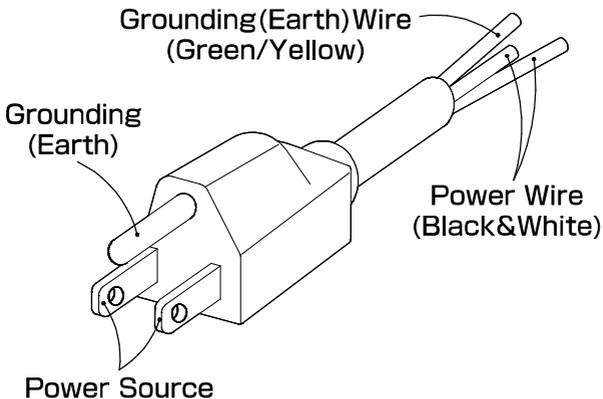
Failure to follow this instruction may result in electric shock or electric leakage.

● **Never connect grounding clip to gas pipe.**

Failure to follow this instruction may result in fire or burn accidents.

● **If extension cable is used, apply those with earth and 3-P cable.**

- Use one of leads for earth and connect to earth on TN wrench side.





CAUTION

- **Use commercial power supply.**

- **When using an extension cord, make sure that voltage remains within +/-10% of the rated voltage at all times.**

- **Follow the instructions below when using generators.**
 - Use 50–60Hz sinusoidal power supply without high harmonic wave. Power supply including high harmonic wave may cause malfunction or breakage of the wrench.
 - Use high capacity generators.
Almost 2kW (2kVA) is required per one wrench.
 - The operating voltage must remain within +/-10% of the rated voltage at all times.
 - Do not use inverter generators.
Inverter generators may cause malfunction or breakage of the wrench.
(Inverter Generator: The engine rpm will speed up and slow down automatically due to the wattage being pulled from the generator.)
 - Do not use welder generators.
 - Welder generators may cause malfunction or breakage of the control base installed in TN wrenches. Some welder generators produce electrical noise which may make TN wrenches out of control.
 - Do not use welders along with TN wrenches.
TN wrenches may be out of control due to extraordinary electrical noise even if welders are connected to other generators that TN wrenches are not connected to.



CAUTION

● **Keep work area clean.**

- Cluttered areas and benches invite accidents.

● **Keep children away.**

- Do not let children touch TN wrenches and electric cord.
- All visitors should be kept away from work area.

● **Secure work area.**

- Keep body stance balanced and firmed.
- Never wrap the electric cord around something.
- Keep work area well lit.

● **Use suitable model for each application.**

- Do not use TN wrenches beyond their rated specifications.
- Do not use TN wrenches for purpose not intended.

● **Dress properly.**

- Always wear gloves and non-skid footwear when operating outdoor.
- Always wear safety helmet.

● **Use genuine accessories or attachments manufactured by Maeda Metal Industries, Ltd.**



CAUTION

● **Maintain TN wrenches.**

- Keep TN wrenches handle clean, dry and free of oil or grease.

● **Keep electric motor well ventilated.**

- Do not put any foreign materials in the vent.
- Do not block exhaust vent.

● **Do not abuse the electric cord.**

- Never use the electric cord for carrying, pulling, or unplugging the power.
- Keep the electric cord away from heat, oil, sharp edges or moving parts.

● **Do not connect multiple plugs to a single outlet by using multiple outlet adaptors.**

- Over current may cause fire, accidents or malfunction.

● **Provide leakage breaker as a shock guard for each wrench.**

 **CAUTION**

- **When applying extension cord, select shorter extension units than specified below depending on the cross section.**

Nominal conducting cable cross section		Max. Length
		115V
H07RN-F	1.5mm ²	10m
	2.5mm ²	20m
	4.0mm ²	30m
AWG 14		50ft
AWG 12		80ft
AWG 10		130ft

- Using extension cord more than Maximum Length may result in malfunction or breakdown.

- **Recommended connector when using extension cord.**

For 115V	15A, 125V
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- **Observe local laws and rules concerning noise level.**

4. BEFORE USE

WARNING

● **Disconnect plug from power source before inspection.**

- Accidental starting invites personal injury.

1. Check for any deformation, crack or damage on wrench body, bar socket, electric cable, etc.

Do not use wrench if any problem is found on items listed above.

2. Make sure to use commercial power supply.

Use appropriate power source as indicated on the rating plate.

3. Make sure that socket assembly is correctly installed on the wrench.

4. Make sure that set screws are securely fastened.

Loose installation may result in accident and personal injury.

See “CHANGING SOCKETS” on page 21

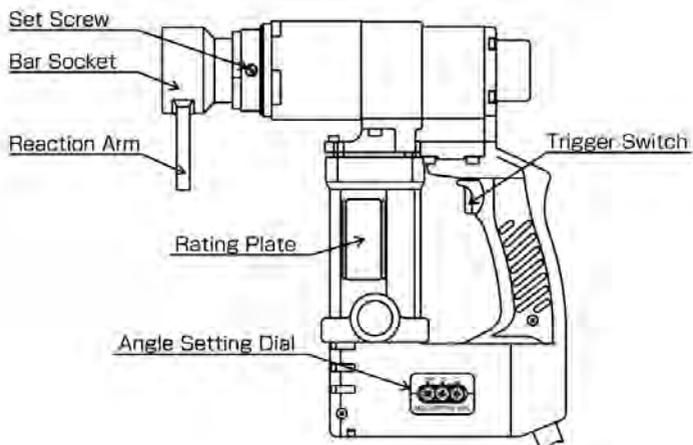
CAUTION

● **Implement exercise procedure before operation.**

- Exercise procedure with no-load should be carried out at least 5 minutes before operation.

5. PART NAME

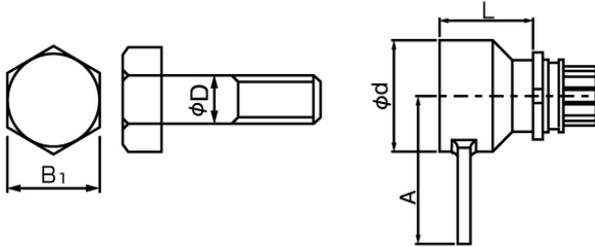
● Part Name



● Accessories

MODEL	ACCESSORIES	
TN-20EZ-1		
TN-22EZ-1		
TN-24EZA-1	1 Size of Bar Socket Screwdriver (-) PSD-M2 (for socket)	BBD-M50 (for control base) Metal Case Instruction Manual
TN-30EZ-1		
TN-33EZ-1		
TN-39EZ-1		

● Bar Socket Line Up



for TN-20EZ-1 & TN-22EZ-1

Bar Socket Code No.	Bolt size ϕ			Bolt(Socket)		ϕd		A		L	
	ϕD			A/F							
	S8T	A490	Conventional HEX	B_1		mm	inch	mm	inch	mm	inch
MRU24T			M16	24		54	2-1/8"	82.5	3-1/4"	41.5	1-5/8"
MRU27T	M16	5/8"	M18	27	1-1/16"	59	2-5/16"	82.5	3-1/4"	48.5	1-29/32"
MRU30T			M20	30		59	2-5/16"	82.5	3-1/4"	48.5	1-29/32"
MRU32T	M20	3/4"	M22	32	1-1/4"	59	2-5/16"	82.5	3-1/4"	48.5	1-29/32"
MRU36T	M22		M24	36		65	2-9/16"	82.5	3-1/4"	51.0	2"
MRUB46Z		7/8"			1-7/16"	65	2-9/16"	82.5	3-1/4"	51.0	2"
MRU41T	M24	1"	M27	41	1-5/8"	70	2-3/4"	90.0	3-1/2"	58.5	2-5/16"

for TN-24EZA-1

HRU32T	M20	3/4"	M22	32	1-1/4"	65	2-9/16"	82.5	3-1/4"	49.0	1-15/16"
HRU36T	M22		M24	36		70	2-3/4"	82.5	3-1/4"	55.5	2-3/16"
HRUB46Z		7/8"			1-7/16"	70	2-3/4"	82.5	3-1/4"	55.5	2-3/16"
HRU41T	M24	1"	M27	41	1-5/8"	75	2-15/16"	90.0	3-1/2"	64.0	2-17/32"
HRU46T	M27	1-1/8"	M30	46	1-13/16"	80	3-5/32"	100.0	3-15/16"	66.5	2-5/8"

for TN-30EZ-1 & TN-33EZ-1

VRU41T	M24	1"	M27	41	1-5/8"	75	2-15/16"	125.0	4-59/64"	49.0	1-15/16"
VRU46T	M27	1-1/8"	M30	46	1-13/16"	80	3-5/32"	125.0	4-59/64"	49.0	1-15/16"
VRU50T	M30		M33	50		85	3-11/32"	125.0	4-59/64"	49.0	1-15/16"
VRUB64Z		1-1/4"			2"	85	3-11/32"	125.0	4-59/64"	49.0	1-15/16"

for TN-39EZ-1

XRU50T	M30	1-1/4"	M33	50	2"	85	3-11/32"	90.0	3-1/2"	54.0	2-1/8"
XRU55T	M33	1-3/8"	M36	55	2-3/16"	90	3-1/2"	90.0	3-1/2"	54.0	2-1/8"
XRU60T	M36	1-1/2"	M39	60	2-3/8"	97	3-13/16"	90.0	3-1/2"	65.0	2-9/16"

● Contact your distributor for other available sockets and accessories.

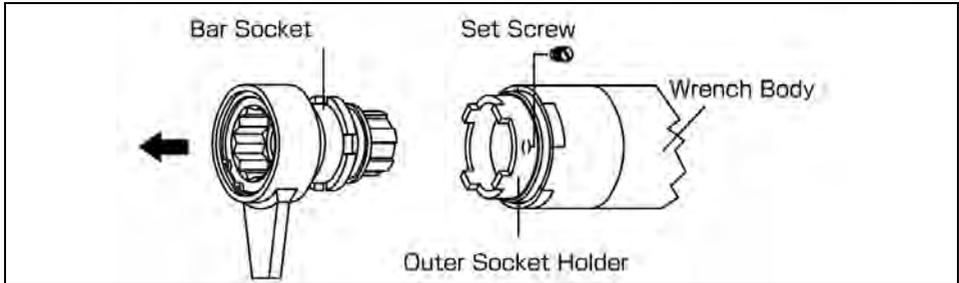
6. CHANGING BAR SOCKET

WARNING

- Do not connect the plug to power source when changing bar sockets.

- ① Remove bar socket from TN wrench by unscrewing set screws (Figure.) Do not remove set screws completely from outer socket holder.

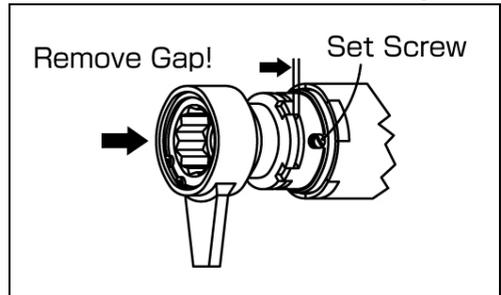
(Figure 1)



- ② Select adequate bar socket for the bolts being tightened.
i.e. Use TONE genuine 5/8" bar socket for tightening 5/8" high strength hexagonal bolts/nuts.

(Figure 2)

- ③ Mount bar socket on the wrench body and remove the gap between the bar socket and the wrench body.



- ④ Fasten the set screws only after gap is completely removed.

WARNING

- There should be no gap between the bar socket and the TN wrench body.

- The gap invites accidents or breakage of the bar socket or the TN wrench.

7. Operating Procedure

■ Pre-Installation Verification

1. Determine the rotation required for the length of bolt being tested. (See fig. 1)
2. Set the tool for the desired angle of rotation. (See fig. 2)
3. Place the bolt assembly in the “Bolt tension Indicator”.
4. Snug tighten the bolt assembly.

Use the “snug tight” condition that is recognized by the American Institute of Steel Construction (A.I.S.C.) and the Research Council for Structural Connections (R.C.S.C) as stated in the publication “Specification for Structural Joints Using ASTM A325 and A490 Bolts”. (Note 1)

5. Match mark the end of the bolt with the face of the nut.
6. Slide the socket assembly over the nut. (See fig. 3)
7. Squeeze the trigger switch to start the tightening process.

The reaction arm will turn counter-clockwise until it comes up against the reaction stud on the face plate of the bolt tension indicator.

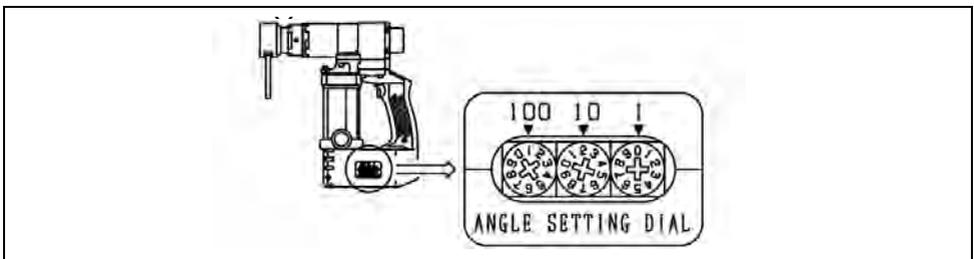
The inner socket will then rotate the nut clockwise.

8. When the socket reaches the preset angle of rotation, the tool will shut down automatically.
9. Record the tension of the installed bolt assembly.
10. Measure and record the installed torque of the assembly.

(Figure 1)

Bolt Length	Required Rotation
1-4 Body Diameters	1/3 Turn - 120 Degrees
4-8 Body Diameters	1/2 Turn - 180 Degrees
8-12 Body Diameters	2/3 Turn - 240 Degrees

(Figure 2)



■ Tightening Procedure

1. Determine the rotation required for the length of bolt being tested. (See fig. 1)
2. Set the tool for the desired angle of rotation. (See fig 2)
3. Snug tighten the bolt assembly.

Use the “snug tight” condition that is recognized by the American Institute of Steel Construction (A.I.S.C.) and the Research Council for Structural Connections (R.C.S.C.) as stated in the publication “Specification for Structural Joints Using ASTM A325 and A490 Bolts”. (Note 1)

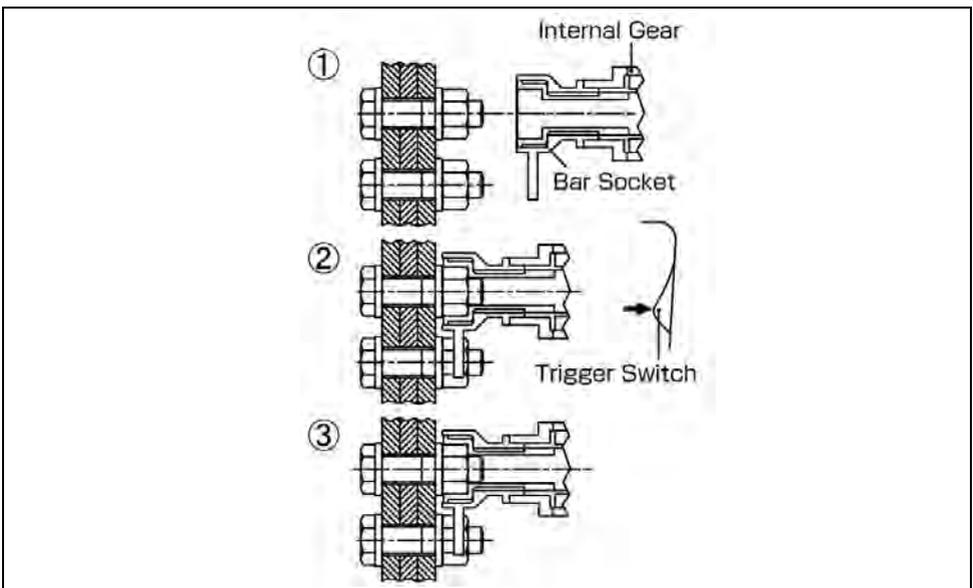
4. Slide the socket assembly over the nut. (See fig. 3)
5. Squeeze the trigger switch to start the tightening process.

The reaction arm will turn counter-clockwise until it comes up against the adjacent nut or other structural material.

The inner socket will then rotate the nut clockwise.

6. When the socket reaches the preset angle of rotation, the tool will shut down automatically.

(Figure 3)



Note 1:

“The snug tightened condition is the tightness attained with a few impacts of an impact wrench for the full effort of an ironworker using an ordinary spud wrench to bring the connected plies into firm contact.”

DANGER

- **Do not touch bar socket when operating.**

Failure to follow this instruction may result in personal injury like finger amputation.



WARNING

- **Bar socket must be placed properly on a solid member.**

Failure to follow this instruction may result in the lack of torque or breakage of bolt and nut or personal injury.

CAUTION

- Do not release trigger switch before the wrench is automatically shut off. The preset angle of rotation can only be obtained when automatic shut off is correctly functioned.
- Over tightening or reuse of bolts previously tensioned are strictly prohibited. Failure to follow this instruction may result in improper tensioning or breakage of the wrench.
- Angle setting can only be done when motor is OFF.
- Use the wrench within its rated maximum torque.

8. INSPECTION & MAINTENANCE

WARNING

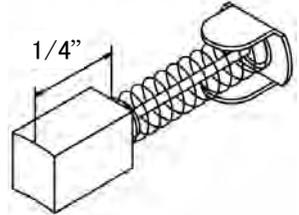
● **Disconnect plug from power source before inspection and maintenance.**

- Accidental starting invites serious injury.

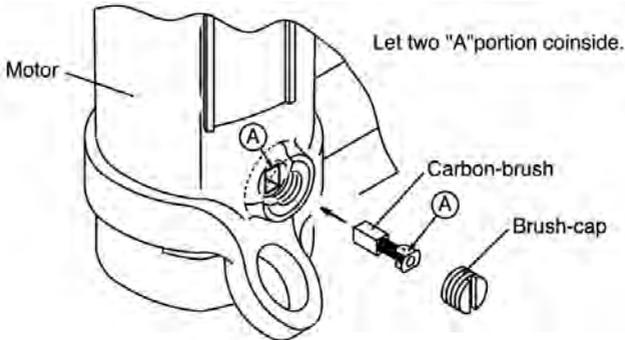
- ① Clean dust and debris from bar socket periodically.
- ② Use only a damp cloth to clean your TN Wrench and sockets since certain cleaning agents and solvents are harmful to those parts. Some of these include: benzene, thinner, gasoline and etc.
- ③ Never put solvents into the exhaust vent.
- ④ Store TN wrench in the metal case after operation and keep it dry.
- ⑤ Carbon-brush must be regularly inspected and replaced with the new genuine carbon brush when brush length become less than 1/4".

*Carbon brushes are placed in two position.

*Indicate the wrench model when carbon-brushes are needed because carbon-brush differs from model to model.



- ⑥ Replace carbon brush as shown in the following figure.



- ⑦ Overhaul must be carried out every 6 months or 30,000 tightening, whichever comes first. Contact your distributor for overhaul.
- In case that TN wrenches become discontinued, replacement parts and sockets are available for purchase for 7 years after discontinuance date.

9. FEATURES

- The wrench stops automatically when the preset angle is reached.

10. SPECIFICATIONS

Model	Voltage (Single Phase)	Max Current (A)	Max Power (W)	Rated Max Torque (lb.ft)	Controllable Angle Range	Repeated Accuracy	No-load Speed (min ⁻¹)	Main Body Weight (kg)	Available Bolt Size
TN-20EZ-1	115V	13.5	1100	398	90 ~ 240	±10 Degrees	22	5.1	5/8"(A325, A490)
TN-22EZ-1	115V	13.5	1100	542			17	5.6	5/8"(A490) 3/4"(A325, A490)
TN-24EZA-1	115V	13.5	1100	921			9	7.0	3/4"(A490) 7/8"(A325, A490)
TN-30EZ-1	115V	15.0	1300	1444			6	8.0	1"(A325, A490)
TN-33EZ-1	115V	13.5	1100	2200			3.5	8.2	1-1/8"(A325, A490)
TN-39EZ-1	115V	12.0	1350	3700			2.0	10.5	1-1/4", 1-3/8"(A325, A490)

- +/- 10% of repeated accuracy is obtained with adequate operating procedure on page 22 & 23 above.
- Never use TN wrenches out of 90 – 240 degrees range.
- Commutator motor is used on the wrench.
- Control base is used on the wrench.
- Weight excludes socket and cord.

11. AFTERSALES SERVICE

- Contact your distributor for available services.
- Provide model, serial number, date of purchase and details of failure when contacting your distributor.

CAUTION

- **Do not use TN wrenches when malfunction, deficiency in wrenches' performance, personal injury or property loss is foreseen.**
If possible, prepare backup wrenches beforehand.

TONE[®] TONE CO., LTD.



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● Specifications and the design are subject to change without notice. ●