

USER'S MANUAL

Snap-on®

*TQR400A, TQR600C
& TQRM80C Series
Torque Wrenches*

Specifications

Torque Ranges

TQR400A

Maximum Torque Setting	400 lb.ft.
Minimum torque Setting	130 lb.ft.
Torque Setting Increments	10 lb.ft.

TQR600C (shown)

Maximum Torque Setting	600 lb.ft.
Minimum torque Setting	200 lb.ft.
Torque Setting Increments	10 lb.ft.

TQRM80C (metric reading)

Maximum Torque Setting	80 kg•m
Minimum torque Setting	26 kg•m
Torque Setting Increments	2 kg•m

Accuracy* (of setting)

±4%

Ratchet Head

Style	Reversible
Square Drive Size	3/4"
Number of Teeth	32
Ratcheting Reengagement	12° Swing

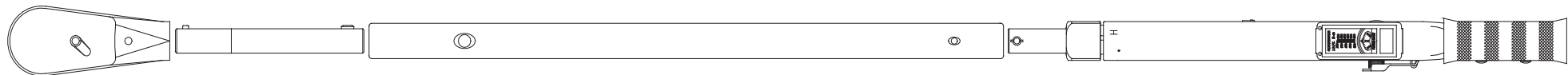
Length

	400	600 & 80
Overall	34"	48.50"
Torque Body	20.50"	20.50"
Torque Body Extension	8.75"	23.25"








Weight (lbs)

	8.85	11.50
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* Orientation of this torque wrench will affect the operation. The torque wrench is calibrated in a "neutral" position (weight of the wrench does not add to or subtract from the torque). In this orientation, the accuracy will be within ±4% of setting. When used in **any** other orientation, the accuracy will be within ±5% of full scale.



Safety Warnings and Cautions

-  The torque wrench must be assembled as illustrated with the ratchet square drive on the opposite side from the calibration dial. Failure to do this will not allow the mechanism to release in the clockwise direction.
-  Caution: Do not use torque wrench to break tight fasteners loose. This can damage the tool and result in inaccurate settings.
-  Overtorquing can cause breakage.
-  Do not exceed the capacity of the Torque Wrench. The sealed ratchet mechanism should be inspected periodically. Do not use a ratchet that has a damaged, worn or dirty ratchet mechanism. When replacing damaged or worn parts, use entire contents of the Service Kit available from Snap-on representative.
-  To protect yourself from injury when applying force with this wrench, always make sure the ratchet reverse lever is fully engaged in the on position and that the socket is properly seated on the nut or bolt. Pull (do not push) on the wrench handle and adjust your stance accordingly.
-  A wrench that is slipping can cause accidents.
-  On detachable wrenches, make sure the spring-loaded locking pins that secure sections of the wrench are fully engaged in their locking pin holes.

Introduction

Snap-on TQ-series torque wrenches are precision measurement tools, designed to torque in the clockwise direction and guaranteed within 4% of the setting from 20% of full scale to full scale.

An innovative "split beam" torque measuring mechanism provides consistent accuracy throughout the torque setting range. Because no coil spring is used, there is no need to "work-in" a TQ-series torque wrench before using it the first time during a work period. Nor is it necessary to adjust to the lowest torque setting after use.

In use, the wrench clicks and provides a few degrees of free movement when the desired torque is reached. When pressure on the wrench is completely released, the wrench automatically resets for the next application.

- Setting torque on adjustable wrenches is fast and easy because there is no spring tension on the set knob.
- Torque setting is lockable for repetitive applications.
- The wrench length is designed to provide the leverage required for maximum torque applications. The length also provides the needed reach for those-hard-to-get-at places.
- The torque wrenches are chrome plated for appearance and easy cleanup, and knurled handles help to provide a slip resistant grip.

Equipment & Testing Tips

This torque wrench will torque in the **clockwise direction only**. Do not use to break fasteners loose without first detaching the wrench's Torque Body. Use of an appropriate wrench or breaker bar and socket is recommended.

Position of force application is critical to torque

measurement. The torque wrench must be pulled at the center of the hand grip to assure accuracy.

There is no need to "work in" the wrench before using it the first time during a work period; *nor* is it necessary to reset it to its lowest setting when it is not being used.

After setting the torque with the set knob, snap the lock lever in place to protect the knob from being accidentally moved. This will also hold the setting for repetitive applications.

To convert Newton•metre (N•m) to lb.ft., refer to the conversion chart located above the scale window.

Periodic re-calibration may be necessary to ensure accurate torque readings.

To protect the wrench when not in use, disassemble and store it in the protective box.

To Assemble

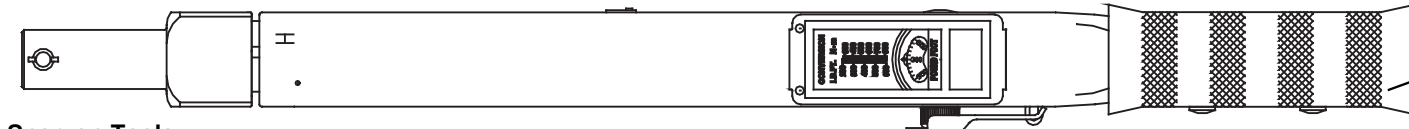
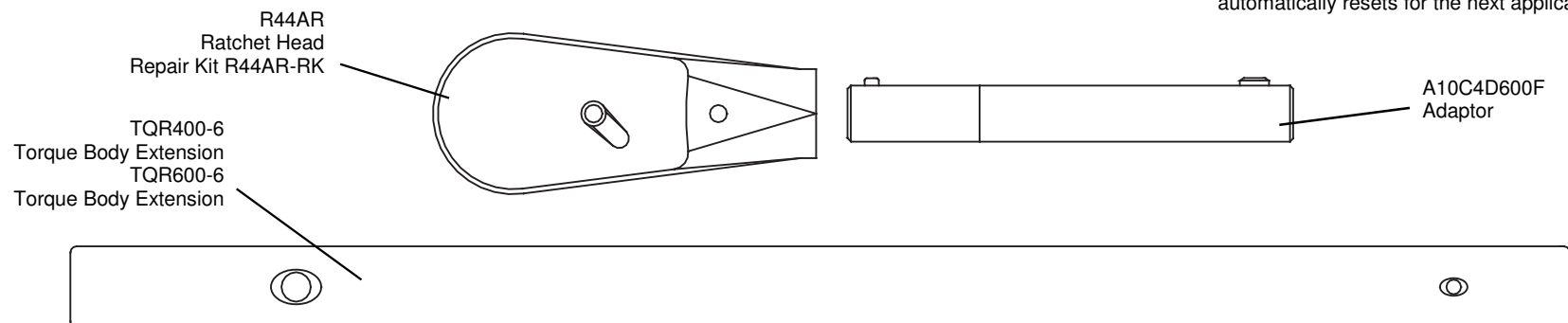
Connect the components together according to the illustration with the ratchet square drive on the opposite side from the calibration dial. Make sure locking pins are fully engaged with mating pin holes.

To Torque Fasteners

Pull back the set knob lock lever to exposed the set knob. Turn the set knob until the desired torque is aligned with the set mark in the scale window. Move the lock lever back over the set knob to lock the torque setting.

Using the proper hand hold position (center of grip), tighten the fastener with a smooth pulling action in the clockwise direction. At the preset torque, a click will be heard as the wrench releases – **stop pulling**.

When you completely release pressure, the wrench automatically resets for the next application.



Snap-on Tools
Kenosha, WI 52140-1410

TQR600C Shown

TQN553 (TQR400) Torque Body
TQN552 (TQR600) Torque Body
TQN554 (TQRM80) Torque Body

If Your Torque Wrench Needs Repair

1. Send it to an authorized Snap-on Service Center, or give it to your Snap-on representative. Do not attempt to repair it yourself.
2. If the warranty is no longer in effect, your Snap-on Customer Service Representative will contact you with repair charges for your approval before being repaired.
3. A series of testers are available from Snap-on for checking the accuracy of your Torque Wrench. See your Snap-on representative for more information.

Visit us at www.torqwrench.com

MECHANICAL AND ELECTRONIC TORQUE PRODUCTS FULL 12-MONTH WARRANTY PROFESSIONAL USE

SNAP-ON TOOLS MANUFACTURING COMPANY WARRANTS TO THE ORIGINAL PURCHASER OF TORQUE PRODUCTS FOR BUSINESS OR PROFESSIONAL USE THAT THE COMPANY'S TORQUE PRODUCTS ARE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS. Snap-on will repair or replace torque products which fail to give satisfactory service due to defective workmanship or materials (excluding calibration) for 12 months from the date of original purchase. Snap-on warrants "initial, out of box calibration" of each new, unused torque product. Repair, replacement or recalibration shall be at the election and expense of Snap-on Tools Manufacturing Company, and is your exclusive remedy in place of all other rights and remedies. Products must be returned with proof of purchase to a Snap-on repair center or an authorized Snap-on representative for warranty service. Consumable products are warranted only against defects in workmanship or materials in a new product that prevents its use. Consumable products are goods reasonably expected to be used up or damaged during use, including but not limited to sensors, internal mechanical torque wrench components and batteries. Snap-on does not provide any warranty for products subjected to abnormal use. Abnormal use includes misuse, accident, modification, unreasonable use, neglect, lack of maintenance, use in production-related service, or use after the tool is significantly worn.

SNAP-ON SHALL NOT BE LIABLE FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL COSTS OR DAMAGES INCURRED BY THE PURCHASER OR OTHERS (including without limitation, lost profits, revenues, anticipated sales, business opportunities, goodwill, or interruption of business and any other injury or damage.)

CONSUMER WARRANTY INFORMATION

Consumers buying for personal use can obtain product warranty information by sending a written request, including the catalog number, page number and a description of the products, to:

Snap-on Tools
Consumer Warranty Information Center
2801 - 80th Street
Kenosha, Wisconsin 53143

Rev 10/00

GENERAL TORQUE SPECIFICATION CHART FOR I.F.I.* METRIC FASTENERS** (when SAE10 oil is used as a lubricant)								
Minimum Tensile *** Strength Mpa	400	420	520	830	900	1040	1220	
Proff Load MPa	225	310	380	600	650	830	970	
Property Class	4.6	4.8	5.8	8.8	9.8	10.9	12.9	
Bolt Diameter	Torque: Newton Metre							
metric	inch							
5mm	0.197	2.9	4	5	-	8	11	12
6mm	0.236	5	7	8	-	14	18	21
7mm	0.276	8	11	14	-	24	30	35
8mm	0.315	12	16	20	-	34	44	50
10mm	0.394	23	32	40	-	70	85	100
12mm	0.472	40	56	70	-	120	150	180
14mm	0.551	65	90	110	-	190	240	280
16mm	0.63	100	140	170	270	290	380	440
20mm	0.787	200	-	330	520	-	740	860
24mm	0.945	340	-	580	920	1260	1480	-
30mm	1.181	680	-	-	1820	-	2520	2940

*** Megapascal
** Note: Use only when manufacture's specifications are not available, these values are for stiff metal-to-metal joints and are based on 90% of proof load.
* I.F.I. = Industrial fasteners Institute.

CONVERSION OF VARIOUS UNITS OF TORQUE					
Convert			Convert		
From	To	Multiply	From	To	Multiply
lb.in.	oz.in.	16	oz.in.	lb.in.	.0625
lb.in.	lb.ft.	.08333	lb.ft.	lb.in.	12
lb.in.	kg.cm.	1.1519	kg.cm.	lb.in.	.8681
lb.in.	kg.m.	.011519	kg.m.	lb.in.	86.81
lb.in.	N*m	.133	N*m	lb.in.	8.85
lb.in.	dN*m	1.13	dN*m	lb.in.	.885
lb.ft.	kg.m.	.1382	kg.m.	lb.ft.	7.236
lb.ft.	N*m	1.356	N*m	lb.ft.	.7376
N*m	dN*m	10	dN*m	N*m	.10
N*m	kg.cm.	10.2	kg.cm.	N*m	.09807
N*m	kg.m.	.102	kg.m.	N*m	9.807

GENERAL TORQUE SPECIFICATION CHART FOR I.S.O.** METRIC FASTENERS*** (when SAE 10 oil is used as a lubricant)											
Minimum Tensile Strength	kg/mm2 P.S.I.	40		50		60		80	100	120	
Proof Load	kg/mm2 P.S.I.	56900	29.1	71100	36.4	85340	43.7	113800	58.2	142200	170700
		32150	41390	40110	51770	48220	62160	67560	82780	112650	135130
Property Class		4.6	4.8	5.6	5.8	6.6	6.8	6.9	8.8	10.9	12.9
Bolt Diameter	Figures are KILOGRAM METER except those that are bolded which are KILOGRAM CENTEMETER										
Metric	Inch										
6 mm	0.236	49	63	61	79	74	95	103	126	172	206
8 mm	0.315	119	153	148	191	178	230	250	306	417	500
10 mm	0.394	235	303	294	379	353	455	495	606	8.2	10
12 mm	0.472	411	529	427	662	616	7.9	8.6	10.5	14	17
14 mm	0.551	654	8.4	8.2	10.5	10	12	13	17	23	27
16 mm	0.63	10	13	12	16	15	20	21	26	36	43
18 mm	0.709	14	18	17	23	21	27	30	36	49	59
22 mm	0.866	27	35	34	44	41	52	57	70	95	114

*** NOTE: Use only when manufacture's specifications are not available, these values are for stiff metal-to-metal joints and are based on 90% of proof load.
DO NOT USE for gasket joints or joints of soft materials
** I.S.O.= International Standardization Organization.

THREADED FASTENER TENSION GUIDE (Figures Represent Pounds of Clamping Force)																				
Stress Area	0.0091	0.0141	0.0175	0.0318	0.0524	0.0775	0.1063	0.1419	0.1819	0.226	0.3344	0.4617	0.6057	0.7632	0.9691	1.4052	1.8993			
Outside Diameter	No.6	No.8	No.10	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1"	1-1/8"	1-1/4"	1-1/2"	1-3/4"			
Threads Per Inch	32	32	24	20	18	16	14	13	12	11	10	9	8	7	7	6	5			
Torque:	5 lb.in.	205	157																	
	10 lb.in.	410	316	315																
	20 lb.in.	820	632	630	337															
	40 lb.in.		1264	1264	674	541														
	80 lb.in.				1348	1082	987													
	10 lb.ft.				2043	1625	1482	1224												
	20 lb.ft.				4092	3250	2964	2448	2143											
	40 lb.ft.					6503	5928	4896	4286	3899										
	80 lb.ft.						11857	9796	8572	7799	7065									
	100 lb.ft.							12245	10716	9749	8832	7915								
	125 lb.ft.								13395	12186	11049	9894								
	150 lb.ft.									16091	14623	13261	11872							
	175 lb.ft.										17061	15462	13851	12117						
	200 lb.ft.										19498	17664	15830	13836	12113					
	250 lb.ft.										24373	22100	19788	17296	15142	11985				
	300 lb.ft.											26523	23745	20776	18170	14382	13247			
	400 lb.ft.												31660	27700	24227	19176	17663			
	500 lb.ft.													39576	34592	30284	23971	22079	19754	
	750 lb.ft.														51941	45426	35956	33118	29631	22678

In some cases it may be desirable to know the total clamping force obtained for a given torque. Values are approximate. SAE 30 engine oil was used as lubricant. Use of high stress lube may increase value 20% or more. Highest values for a given size may only be obtained with heat treated bolts having minimum tensile strengths of 150,000 P.S.I. or more.

* Stress area is calculated as the area of the circle whose diameter is the mean between the root and pitch diameters. This closely approximates the actual stress condition. Maximum theoretical clamping force cannot be obtained from threaded fasteners. Additional stresses to the fastener are caused by the torsional forces of tightening.

Caution

Always use manufacturers specifications when available. These specifications are approximate and may not be appropriate for some applications. No liability is assumed for errors which may result from the use of any of these specifications.

Fastener	Type	Minimum Tensile Strength	Material	PRODUCTION TORQUE GUIDE																							
				Body size of Outside Diameter																							
				2	3	4	5	6	8	10	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2			
	S.A.E 2 Steel	74000 P.S.I.	Low Carbon											6	12	20	32	47	69	96	155	206	310	480	675	900	1100
	S.A.E. 5 Steel	120000 P.S.I.	Medium Carbon Heat Treat											10	19	33	54	78	114	154	257	382	587	794	1105	1500	1775
	S.A.E. 7 Steel	133000 P.S.I.	Medium Carbon Alloy											13	25	44	71	110	154	215	360	570	840	1325	1825	2500	3000
	S.A.E. 8 Steel	150000 P.S.I.	Medium Carbon Alloy											14	29	47	78	119	169	230	380	600	900	1430	1975	2650	3200
	Socket Head Cap Screw	160000 P.S.I.	High Carbon Quenched Tempered											16	33	54	84	125	180	250	400	640	970	1520	2130	2850	3450
	Socket Set Screw	212000 P.S.I.	High Carbon Quenched Tempered																								
	Machine Screw Stainless		18-8	2.6*	4*	5.5*	8*	10*	20*	23*	75*	132*	20	31	43	58	95	130	194	260	400	500					725
	Machine Screw Stainless		316	2.7*	4*	5.7*	8*	10*	22*	25*	80*	140*	22	34	46	60	100	135	210	280	425	515					750
	Machine Screw Yellow Brass	60000 P.S.I.	CU 63 ZN 37	2*	3.3*	4.4*	6.4*	8*	16*	20*	65*	110*	17	27	37	49	78	104	160	215	325	400					595
	Silicone Bronze Type "B"	70000 P.S.I.	CU 96 ZNI-5 Min.	2.3*	3.7*	4.9*	7.2*	10*	19*	22*	70*	125*	20	30	41	53	88	117	180	250	365	450					655
	Machine Screw Aluminum	55000 P.S.I.	CU 3.8-4.9 1.2-1.8 MN 3-9	1.4*	2.1*	2.9*	4.3*	5.4*	12*	15*	46*	82*	13	20	27	36	62	83	128	170	255	315					460
	Machine Screw Monel	82000 P.S.I.	NI 67 CU 30 FE 1.4	2.5*	4*	5.5*	8*	11*	21*	27*	87*	155*	23	36	50	67	115	155	235	315	475	585					850
	Sems Heat Treated Steel	120000 P.S.I.	1018 1022	4*	5*	7*	11*	15*	27*	37*	90*	200*	330*														
	Studs	Use SAE 2.5 and 8 values when grade is known, with nut of sufficient strength.											All figures are POUND FEET except those marked with an ASTERISK (*) WHICH ARE pound inches. These values are for lubricated fasteners.														
	Tapping Screw	Set up joint as it will be in production use 70% of over-torque failure as production specifications.																									