TU Series

OPERATION AND MAINTENANCE

MANUAL

TU Series

Square Drive Hydraulic Torque Wrenches

MODELS TU-2, TU-3, TU-5, TU-7, TU-11, TU-20, TU-27 & TU-60

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Operational and Maintenance Manual for TorcUP
TU-2, TU-3, TU-5, TU-11, TU-20 ,TU-27 AND TU-60
Square Drive Hydraulic Torque Wrenches
Version 8: 2025 August

NOTICE

Series TU-2, TU-3,TU-5, TU-7, TU-11, TU-20, TU-27 and TU-60 Square Drive Hydraulic Torque Wrenches are designed for installing and removing threaded fasteners requiring precise high torque during bolt makeup and maximum torque during bolt breakout.

TorcUP Inc. is not responsible for customer modification of tools for applications on which TorcUP Inc. was not consulted.

WARNING

IMPORTANT SAFETY INFORMATION ENCLOSED.
READ THIS MANUAL BEFORE OPERATING TOOL.
IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PLACE THE INFORMATION IN THIS MANUAL INTO THE HANDS OF THE OPERATOR.
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

USING THE TOOL

- Always operate, inspect and maintain this tool in accordance with American National Standards Safety Code for Hydraulic Rams and Jacks (ANSI B30.1).
- This tool will function using an air or electric powered hydraulic pump. Adhere to the pump safety requirements and follow instructions when connecting the pump to the tool.
- Use only equipment rated for the same pressure and torque.
- Use only a hydraulic pump capable of generating 10,000 psi (681 bar) maximum pressure with this tool.
- Use only twin line hydraulic hose rated for 10,000 psi (681 bar) pressure with this tool.
- Do not interchange the male and female swivel inlets on the tool or the connections on one end of the hose. Reversing the inlets will reverse the power stroke cycle and may damage the tool.
- Do not use damaged, frayed or deteriorated hoses and fittings. Make certain there are no cracks, splits or leaks in the hoses.
- Use the quick connect system to attach the hoses to the tool and pump.
- When connecting hoses that have not been preloaded with hydraulic oil, make certain the pump reservoir is not drained of oil during start-up.
- Do not remove any labels. Replace any damaged label.
- Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.
- Never pressurize uncoupled couplers. Only use hydraulic equipment in a coupled system.
- Always wear eye protection when operating or performing maintenance on this tool.
- Always wear head and hand protection and protective clothing when operating this tool.

The use of other than genuine TorcUP replacement parts may result in safety hazards, decreased tool performance, increased maintenance, and may invalidate all warranties. Repairs should be made only by authorized personnel. Consult your nearest TorcUP Authorized Service Center.

Refer All Communications to the Nearest TorcUP Office or Distributor.

For Technical Support & Information Contact:
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WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY

Do NOT Exceed Maximum Pressure. See Torque Chart with Tool. Damage May Occur.

Do not use damaged, frayed or deteriorated hydraulic hoses and fittings.

Always wear eye protection when operating or performing maintenance on this tool.

Always wear ear protection when operating this tool.

Do not carry the tool by the hose.

Keep body stance balanced and firm. Do not overreach when operating this tool.

The Reaction Arm must be positioned against a positive stop. Do not use the arm as a dead handle. Take precautions to make certain the operator's hand cannot be pinched between the arm and a solid object.

USING THE TOOL

- Keep hands, loose clothing and long hair away from the reaction arm and working area during operation.
- This tool will exert a strong reaction force. Use proper mechanical support and correct reaction arm positioning to control these forces. Do not position the reaction arm so that it tilts the tool off the axis of the bolt and never use the swivel inlets as a reaction stop.
- Avoid sharp bends and kinks that will cause severe back-up pressure in hoses and lead to premature hose failure.
- Use accessories recommended by TorcUP.
- Use only impact sockets and accessories. Do not use hand (chrome) sockets or accessories.
- Use only sockets and accessories that correctly fit the bolt or nut and function without tilting the tool off the axis of the bolt.
- This tool is not insulated against electric shock.
- This equipment must not be operated or serviced unless the operator read the operating instructions and fully understands the purpose, consequences and procedure of each step.
- When operating a larger tool (TU-20, TU-27, or TU-60) above waist height, employ a secondary means of support for safety purposes. A tool sling or chains may be used. Consult your safety department for further suggestions.

Depending on the working environment your local health and safety regulations may require you wear protective gear (i.e. safety shoes, hard hat, gloves, coveralls, etc.). In case external forces are exerted on the equipment, non-compliance with these regulations may result in injury. EAR PROTECTION MUST BE WORN WHEN OPERATING THIS TOOL.

PLACING THE TOOL IN SERVICE

CONNECTING THE TOOL

1. Attach the twin line hose to the swivel inlets of the square drive torque wrench using the spring–loaded quick connect ends.
2. Connect the opposite ends of the hose to the pump in the same manner.

ADJUSTMENTS

SETTING THE SQUARE DRIVE FOR ROTATION

The position of the square drive when looking toward the shroud will determine if the tool is set to tighten or loosen the nut. When the square drive extends to the left (when looking at the shroud with the inlets away from you), the tool is set to loosen the nut. When the square drive extends to the right, the tool is set to tighten the nut. To change the direction of rotation for models TU-2 TU-3, TU-7 and TU-11 simply push the square drive into the housing until the drive projects out the opposite side of the tool. For models TU-5, TU-20, TU-27 and TU-60, loosen and remove the square drive retaining knob and pull the square drive out of the housing. Insert the square drive into the opposite side of the housing and secure it by installing the knob in the splined end of the drive.

SETTING THE TORQUE

After determining the desired torque, use the calibration certificate provided with the tool to determine the pressure necessary to achieve that torque. You may also refer to the chart engraved on the shroud of the tool or the charts provided on pages 9-16 of this manual.

1. Connect the tool to the power supply and turn the pump on.

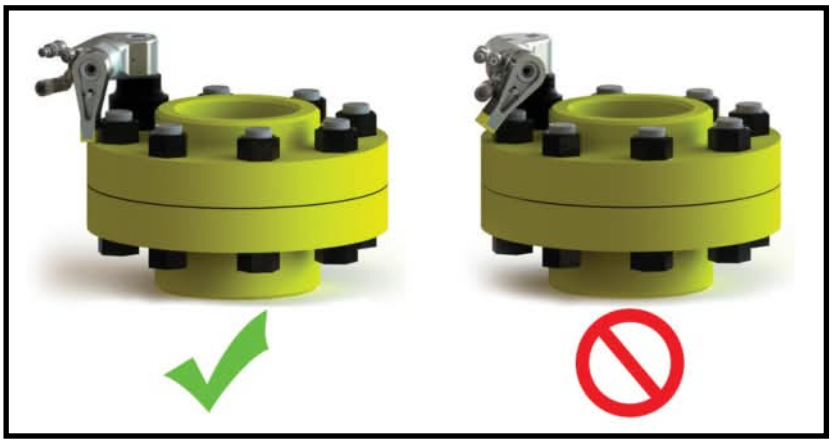
2. Depress the remote control button causing the pressure to be shown on the gauge.

3. Adjust the pressure by loosening the wing nut that locks the pressure adjustment thumb screw. Rotate the thumbscrew clockwise to increase the pressure and counterclockwise to decrease the pressure. When decreasing pressure, always lower the pressure below the desired point and then bring the gauge back up to the desired pressure.

4. When the desired pressure is reached, retighten the wing nut and cycle the tool again to confirm that the desired pressure setting has been obtained.

SETTING THE REACTION ARM

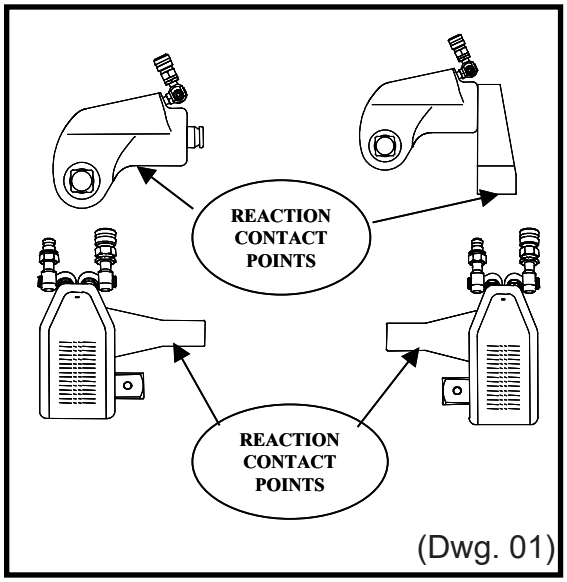
The function of a reaction device is to hold the tool in position against the forces generated to tighten or loosen bolts or nuts. Hydraulic wrenches generate tremendous force.



WARNING

An improperly positioned reaction arm may result in operator injury or damage to tooling.

Square Drive Hydraulic Wrench Reaction Points (Dwg.01)



(Dwg. 01)

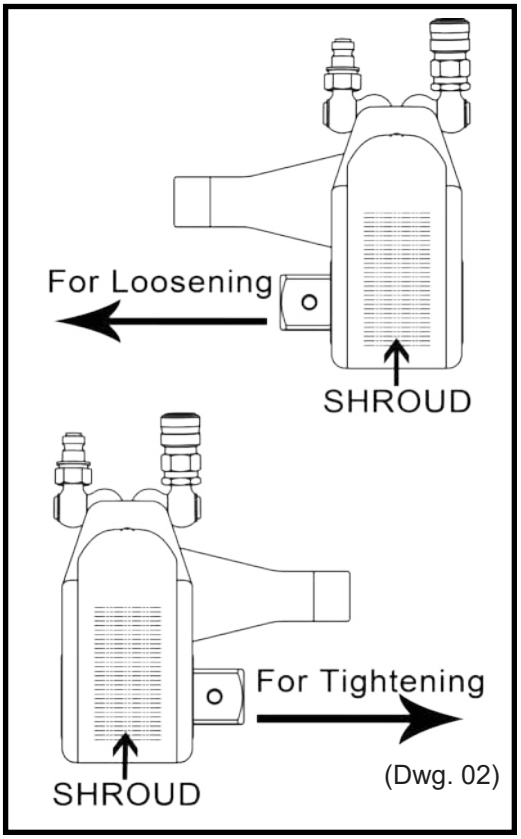
Make sure the reaction arm is positioned correctly. (Refer to Dwg. 01).

The reaction arm can be positioned numerous places within a 360^{O} circle. However, for the arm to be correctly positioned, it must be set within a 90^{O} quadrant of that circle. That quadrant is the area located between the protruding square drive and at the bottom of the housing away from the swivel inlets. It will always be toward the lower half of the housing and on one side of the housing when tightening and on the other side when loosening.

OPERATING THE WRENCH

Square Drive Position for Loosening and Tightening (Dwg.02)

The position of the square drive relative to the shroud determines whether the action will tighten or loosen the nut. (Refer to Dwg. 02 for application examples).
The power stroke of the piston assembly will always turn the square drive toward the shroud.



(Dwg. 02)

1. Insert the square drive into the mating socket. Then, insert the safety pin through the socket and seat the included O-ring into the groove to capture the pin. Place the socket onto the nut making sure the socket is the proper size and that all mating parts are fully seated.

2. Position the reaction arm or surface against an adjacent nut, flange or solid system component. Make certain that there is clearance for the hoses, swivels, inlets and end plug. DO NOT allow the tool to react against the hoses, swivels, inlets or end plug.

3. After turning the pump on and presetting the pressure for the correct torque, depress the remote control button to advance the piston assembly.

4. Once the wrench is started, the reaction surface of the wrench or reaction arm will move against the contact point and the nut will begin to turn.

5. When the nut is no longer turning and the pump gauge reaches the preset pressure, release the remote control button. The piston rod will retract when the button is released. Under normal conditions, an audible “click” will be heard as the tool resets itself.

6. Continue to cycle the tool until it “stalls” and the preset psi/torque has been attained.

7. Cycle the tool one additional time to ensure full torque.

LUBRICATION

MARINE MOLY GREASE

Lubrication frequency is dependent on factors known only to the user. The amount of contaminants in the work area is one factor. Tools used in a clean room environment will obviously require less service than a tool used outdoors and dropped in loose dirt or sand. Marine Moly Grease is formulated not to wash out of the tool in areas where lubrication is critical.

Whenever lubrication is required, lubricate as follows:

1. Remove the drive plate, ratchet, drive segment and sleeves as instructed in the maintenance section and wash the components in a suitable cleaning solution in a well ventilated area.

2. After drying the components, wipe a film of Marine Moly Grease onto the wear surface of both sleeves and the ends of the ratchet.

3. Spread a light film of Marine Moly Grease onto the inner face and both sides of the drive plate. **Do not pack** the teeth of the drive segment or ratchet with lubricant. It can prevent the teeth from engaging properly.

4. Place a daub of Marine Moly Grease in the piston rod recess of the drive plate before linking the piston rod to the drive plate at assembly.

CRITICAL LUBRICATION

It is imperative to lubricate the piston rod recess of the drive plate to piston rod contact area every 80 hours of continuous duty cycling.

Lubricate as follows:

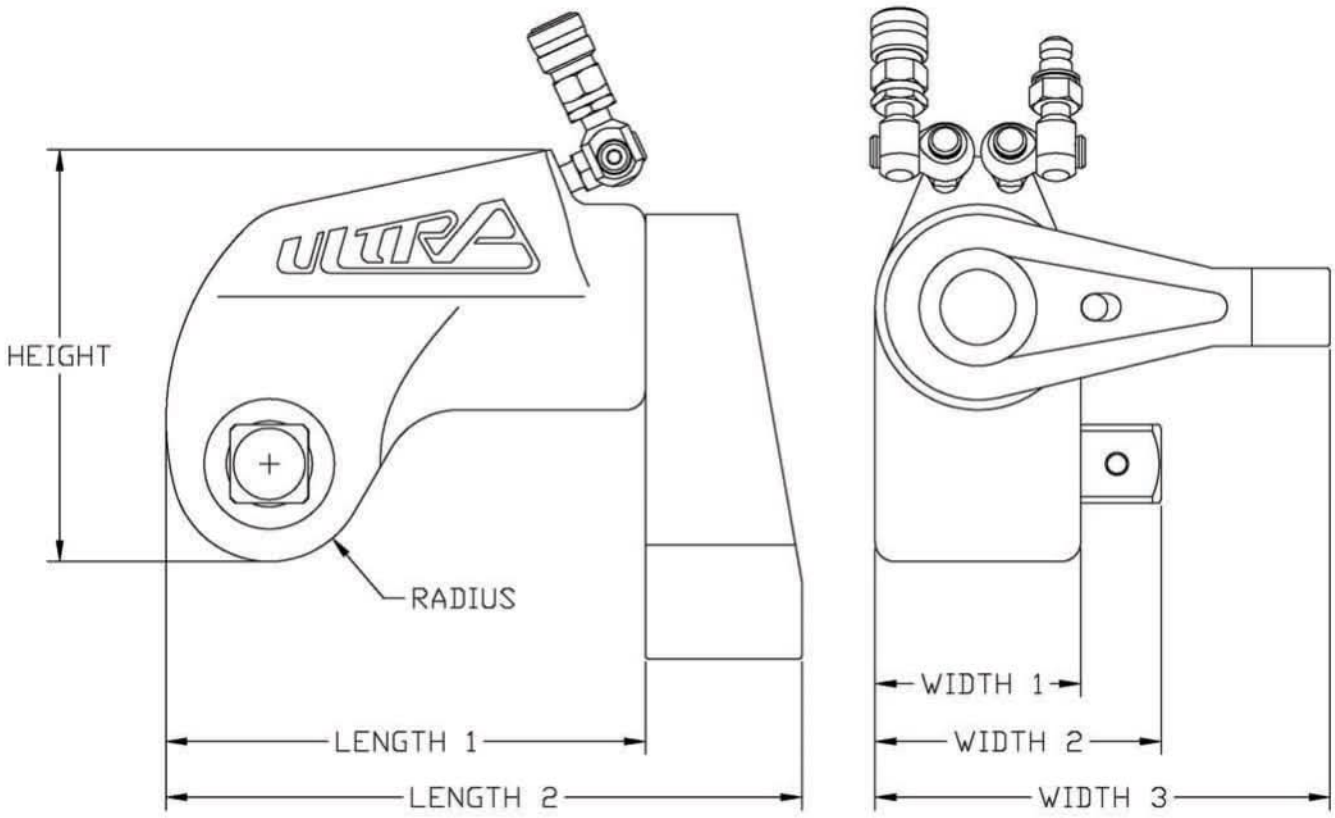
1. Remove shroud screws, shroud, and roll pin.

2. Pry the drive plate assembly forward from the piston rod to expose the recessed contact area in the drive plate.

3. With a rag, wipe clean the area and apply a sizeable amount of Marine Moly Grease.

4. Reassemble as instructed in the maintenance section.

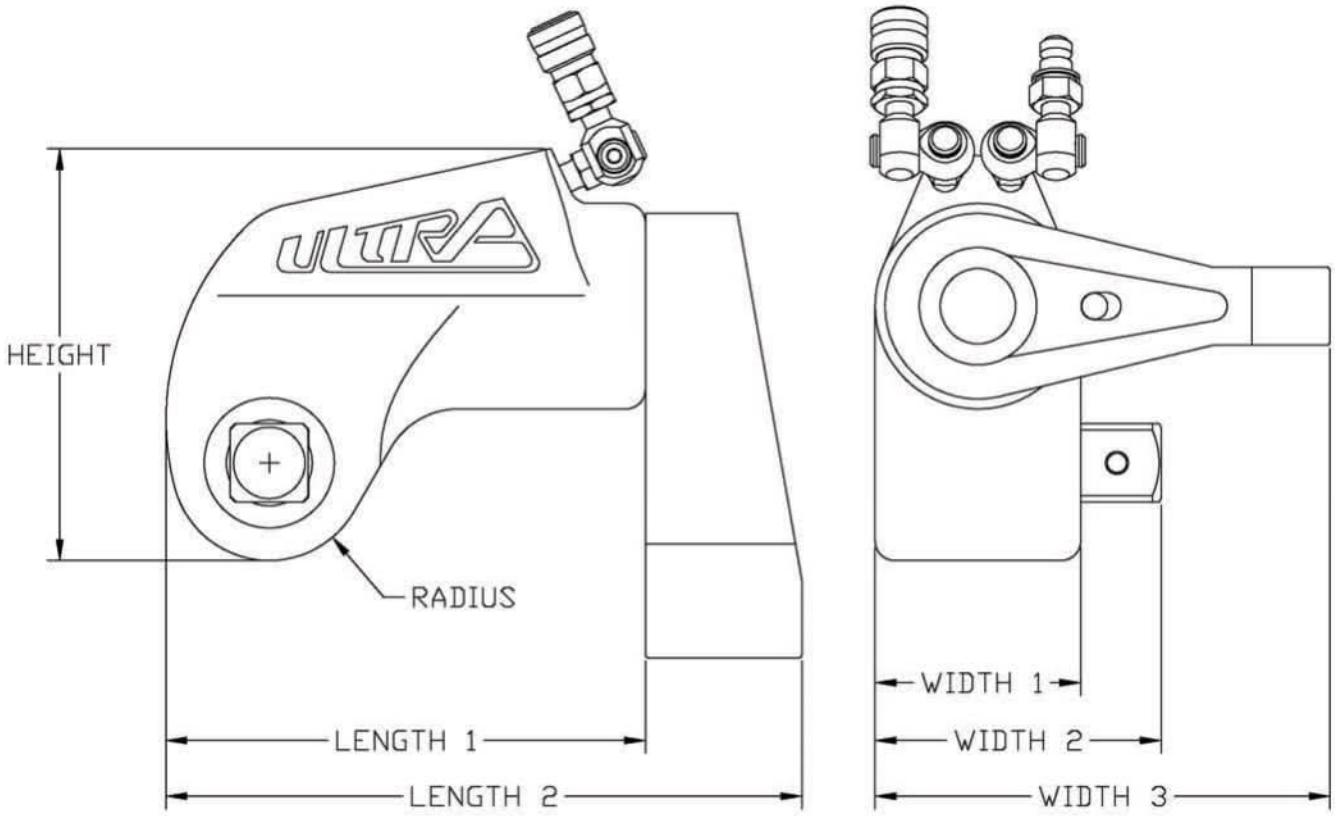
TU Series Wrench Technical & Dimensional Data



Model Number	TU-2	TU-3	TU-5	TU-7
Square drive	3/4”	1”	1 1/2”	1 1/2”
Min. Torque (ft/lbs)	127	330	550	740
Max. Torque (ft/lbs)	1270	3330	5500	7400
Min. Torque (nm)	172	447	745	1003
Max. Torque (nm)	1722	4514	7457	10031
Output Accuracy	+/-3%	+/-3%	+/-3%	+/-3%
Repeatability	100%	100%	100%	100%
Duty Cycle	100%	100%	100%	100%
Tool Weight (lbs/kg)	5.6/2.5	10.9/4.9	18.1/8.2	19.0/8.6
Height (in/mm)	4.20/106.7	5.33/135.3	6.40/162.6	7.17/182.1
Length 1 (in/mm)	4.82/122.4	6.40/162.5	7.91/200.9	8.84/224.5
Length 2 (in/mm)	6.34/161.0	8.43/214.1	10.66/270.7	11.58/294.1
Radius (in/mm)	0.98/24.9	1.31/33.2	1.57/39.8	1.77/44.9
Width 1 (in/mm)	2.00/50.8	2.63/66.8	3.12/79.2	3.61/91.7
Width 2 (in/mm)	2.79/70.9	3.68/93.5	4.64/117.8	5.06/128.5
Width 3 (in/mm)	4.42/112.3	5.81/147.6	7.00/117.8	7.98/202.7

*Reference values only. Consult calibration torque chart provided with tool.

TU Series Wrench Technical & Dimensional Data



Model Number	TU-11	TU-20	TU-27	TU-60
Square drive	1 1/2”	2 1/2”	2 1/2”	2 1/2”
Min. Torque (lbf-ft)	1100	1940	2720	5800
Max. Torque (lbf-ft)	11010	20625	27200	58000
Min. Torque (nm)	1491	2630	3687	7862
Max. Torque (nm)	14925	27964	36872	78625
Output Accuracy	+/-3%	+/-3%	+/-3%	+/-3%
Repeatability	100%	100%	100%	100%
Duty Cycle	100%	100%	100%	100%
Tool Weight (lbs/kg)	29.0/13.1	61.0/27.6	70.0/31.7	130.0/59.8
Height (in/mm)	7.80/198.1	9.22/234.2	10.19/258.8	11.50/292.1
Length 1 (in/mm)	9.23/234.4	9.44/239.7	12.32/312.9	15.38/390.7
Length 2 (in/mm)	12.79/324.8	16.09/408.9	16.33/414.8	20.40/518.2
Radius (in/mm)	2.03/51.5	2.31/58.7	2.46/62.5	3.10/78.7
Width 1 (in/mm)	3.95/100.3	4.87/123.6	5.26/133.6	6.58/167.1
Width 2 (in/mm)	5.43/137.9	7.15/181.7	7.57/192.3	8.89/225.8
Width 3 (in/mm)	8.72/221.5	10.88/276.4	11.63/295.4	14.29/363.0

*Reference values only. Consult calibration torque chart provided with tool.

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TU-2 Torque Conversion Chart

Imperial Conversion	
PSI	**Ft-lbs**
1,000	132
1,200	159
1,400	185
1,600	212
1,800	238
2,000	265
2,200	292
2,400	319
2,600	346
2,800	373
3,000	400
3,200	427
3,400	454
3,600	481
3,800	508
4,000	535
4,200	561
4,400	588
4,600	614
4,800	641
5,000	667
5,200	694
5,400	721
5,600	747
5,800	774
6,000	801
6,200	828
6,400	855
6,600	883
6,800	910
7,000	937
7,200	964
7,400	990
7,600	1017
7,800	1043
8,000	1070
8,200	1098
8,400	1126
8,600	1153
8,800	1181
9,000	1209
9,200	1236
9,400	1263
9,600	1291
9,800	1318
10,000	1345

Metric Conversion	
Bar	**Nm**
69	179
83	216
97	251
110	287
124	323
138	359
152	396
165	433
179	469
193	506
207	542
221	579
234	616
248	652
262	689
276	725
290	761
303	797
317	832
331	869
345	904
359	941
372	978
386	1013
400	1049
414	1086
427	1123
441	1159
455	1197
469	1234
483	1270
496	1307
510	1342
524	1379
538	1414
552	1451
565	1489
579	1527
593	1563
607	1601
621	1639
634	1676
648	1712
662	1750
676	1787
689	1824

*Reference values only. Consult calibration torque chart provided with tool.

TORCUP

TU-3 Torque Conversion Chart

Imperial Conversion	
PSI	**Ft-lbs**
1,000	347
1,200	414
1,400	481
1,600	547
1,800	614
2,000	681
2,200	748
2,400	816
2,600	883
2,800	951
3,000	1018
3,200	1085
3,400	1152
3,600	1220
3,800	1287
4,000	1354
4,200	1421
4,400	1487
4,600	1554
4,800	1620
5,000	1687
5,200	1754
5,400	1822
5,600	1889
5,800	1957
6,000	2024
6,200	2092
6,400	2160
6,600	2229
6,800	2297
7,000	2365
7,200	2432
7,400	2499
7,600	2565
7,800	2632
8,000	2699
8,200	2769
8,400	2838
8,600	2908
8,800	2977
9,000	3047
9,200	3115
9,400	3183
9,600	3251
9,800	3319
10,000	3387

Metric Conversion	
Bar	**Nm**
69	470
83	561
97	652
110	742
124	833
138	923
152	1015
165	1106
179	1197
193	1289
207	1380
221	1471
234	1562
248	1654
262	1745
276	1836
290	1926
303	2016
317	2107
331	2197
345	2287
359	2379
372	2470
386	2561
400	2653
414	2744
427	2837
441	2929
455	3022
469	3114
483	3207
496	3297
510	3388
524	3478
538	3569
552	3659
565	3754
579	3848
593	3942
607	4037
621	4131
634	4223
648	4316
662	4408
676	4500
689	4592

*Reference values only. Consult calibration torque chart provided with tool.

TORCUP

TU-5 Torque Conversion Chart

Imperial Conversion	
PSI	**Ft-lbs**
1,000	587
1,200	705
1,400	823
1,600	940
1,800	1058
2,000	1176
2,200	1294
2,400	1413
2,600	1531
2,800	1650
3,000	1768
3,200	1885
3,400	2002
3,600	2120
3,800	2237
4,000	2354
4,200	2474
4,400	2595
4,600	2715
4,800	2836
5,000	2956
5,200	3076
5,400	3196
5,600	3315
5,800	3435
6,000	3555
6,200	3673
6,400	3791
6,600	3909
6,800	4027
7,000	4145
7,200	4265
7,400	4386
7,600	4506
7,800	4627
8,000	4747
8,200	4864
8,400	4982
8,600	5099
8,800	5217
9,000	5334
9,200	5452
9,400	5569
9,600	5687
9,800	5804
10,000	5922

Metric Conversion	
Bar	**Nm**
69	796
83	956
97	1116
110	1274
124	1434
138	1594
152	1754
165	1916
179	2076
193	2237
207	2397
221	2556
234	2714
248	2874
262	3033
276	3192
290	3354
303	3518
317	3681
331	3845
345	4008
359	4170
372	4333
386	4495
400	4657
414	4820
427	4980
441	5140
455	5300
469	5460
483	5620
496	5783
510	5947
524	6109
538	6273
552	6436
565	6595
579	6755
593	6913
607	7073
621	7232
634	7392
648	7551
662	7711
676	7869
689	8029

*Reference values only. Consult calibration torque chart provided with tool.

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TU-7 Torque Conversion Chart

Imperial Conversion	
PSI	**Ft-lbs**
1,000	790
1,200	947
1,400	1104
1,600	1262
1,800	1419
2,000	1576
2,200	1734
2,400	1892
2,600	2050
2,800	2208
3,000	2366
3,200	2525
3,400	2683
3,600	2842
3,800	3000
4,000	3159
4,200	3317
4,400	3475
4,600	3632
4,800	3790
5,000	3948
5,200	4106
5,400	4265
5,600	4423
5,800	4582
6,000	4740
6,200	4901
6,400	5063
6,600	5224
6,800	5386
7,000	5547
7,200	5705
7,400	5863
7,600	6021
7,800	6179
8,000	6337
8,200	6505
8,400	6674
8,600	6842
8,800	7011
9,000	7179
9,200	7342
9,400	7505
9,600	7668
9,800	7831
10,000	7994

Metric Conversion	
Bar	**Nm**
69	1071
83	1284
97	1497
110	1710
124	1924
138	2137
152	2351
165	2565
179	2779
193	2994
207	3208
221	3423
234	3638
248	3853
262	4068
276	4283
290	4497
303	4711
317	4925
331	5139
345	5353
359	5568
372	5782
386	5997
400	6212
414	6427
427	6645
441	6864
455	7083
469	7302
483	7521
496	7735
510	7949
524	8163
538	8378
552	8592
565	8820
579	9048
593	9277
607	9505
621	9733
634	9954
648	10175
662	10396
676	10617
689	10838

*Reference values only. Consult calibration torque chart provided with tool.

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TU-11 Torque Conversion Chart

Imperial Conversion	
PSI	**Ft-lbs**
1,000	1198
1,200	1433
1,400	1668
1,600	1904
1,800	2139
2,000	2374
2,200	2612
2,400	2850
2,600	3088
2,800	3326
3,000	3564
3,200	3802
3,400	4041
3,600	4279
3,800	4518
4,000	4756
4,200	4990
4,400	5225
4,600	5459
4,800	5694
5,000	5928
5,200	6164
5,400	6400
5,600	6635
5,800	6871
6,000	7107
6,200	7348
6,400	7589
6,600	7831
6,800	8072
7,000	8313
7,200	8547
7,400	8781
7,600	9015
7,800	9249
8,000	9483
8,200	9727
8,400	9971
8,600	10214
8,800	10458
9,000	10702
9,200	10943
9,400	11184
9,600	11426
9,800	11667
10,000	11908

Metric Conversion	
Bar	**Nm**
69	1624
83	1943
97	2262
110	2581
124	2900
138	3219
152	3541
165	3864
179	4187
193	4509
207	4832
221	5155
234	5479
248	5802
262	6125
276	6448
290	6766
303	7084
317	7402
331	7719
345	8037
359	8357
372	8677
386	8996
400	9316
414	9636
427	9963
441	10290
455	10617
469	10944
483	11271
496	11588
510	11905
524	12223
538	12540
552	12857
565	13188
579	13518
593	13849
607	14179
621	14510
634	14837
648	15164
662	15491
676	15818
689	16145

*Reference values only. Consult calibration torque chart provided with tool.

TORCUP

TU-20 Torque Conversion Chart

Imperial Conversion	
PSI	**Ft-lbs**
1,000	2249
1,200	2683
1,400	3118
1,600	3552
1,800	3987
2,000	4421
2,200	4847
2,400	5273
2,600	5700
2,800	6126
3,000	6552
3,200	6974
3,400	7396
3,600	7818
3,800	8240
4,000	8662
4,200	9077
4,400	9492
4,600	9906
4,800	10321
5,000	10736
5,200	11158
5,400	11580
5,600	12002
5,800	12424
6,000	12846
6,200	13271
6,400	13696
6,600	14120
6,800	14545
7,000	14970
7,200	15388
7,400	15806
7,600	16223
7,800	16641
8,000	17059
8,200	17492
8,400	17925
8,600	18357
8,800	18790
9,000	19223
9,200	19653
9,400	20082
9,600	20512
9,800	20941
10,000	21371

Metric Conversion	
Bar	**Nm**
69	3049
83	3638
97	4227
110	4816
124	5405
138	5994
152	6572
165	7150
179	7728
193	8305
207	8883
221	9455
234	10028
248	10600
262	11172
276	11744
290	12306
303	12869
317	13431
331	13994
345	14556
359	15128
372	15700
386	16273
400	16845
414	17417
427	17993
441	18569
455	19145
469	19721
483	20297
496	20863
510	21430
524	21996
538	22562
552	23129
565	23716
579	24302
593	24889
607	25476
621	26063
634	26645
648	27228
662	27810
676	28393
689	28975

*Reference values only. Consult calibration torque chart provided with tool.

TORCUP

TU-27 Torque Conversion Chart

Imperial Conversion	
PSI	**Ft-lbs**
1,000	3032
1,200	3606
1,400	4180
1,600	4755
1,800	5329
2,000	5903
2,200	6469
2,400	7035
2,600	7600
2,800	8166
3,000	8732
3,200	9302
3,400	9873
3,600	10443
3,800	11014
4,000	11584
4,200	12137
4,400	12690
4,600	13242
4,800	13795
5,000	14348
5,200	14911
5,400	15474
5,600	16037
5,800	16600
6,000	17163
6,200	17720
6,400	18278
6,600	18835
6,800	19393
7,000	19950
7,200	20510
7,400	21069
7,600	21629
7,800	22188
8,000	22748
8,200	23308
8,400	23868
8,600	24427
8,800	24987
9,000	25547
9,200	26106
9,400	26665
9,600	27225
9,800	27784
10,000	28343

Metric Conversion	
Bar	**Nm**
69	4111
83	4889
97	5668
110	6446
124	7225
138	8003
152	8771
165	9538
179	10305
193	11072
207	11839
221	12612
234	13386
248	14159
262	14932
276	15706
290	16455
303	17205
317	17954
331	18704
345	19453
359	20217
372	20980
386	21743
400	22507
414	23270
427	24026
441	24781
455	25537
469	26293
483	27049
496	27807
510	28566
524	29325
538	30083
552	30842
565	31601
579	32360
593	33119
607	33878
621	34637
634	35395
648	36153
662	36912
676	37670
689	38428

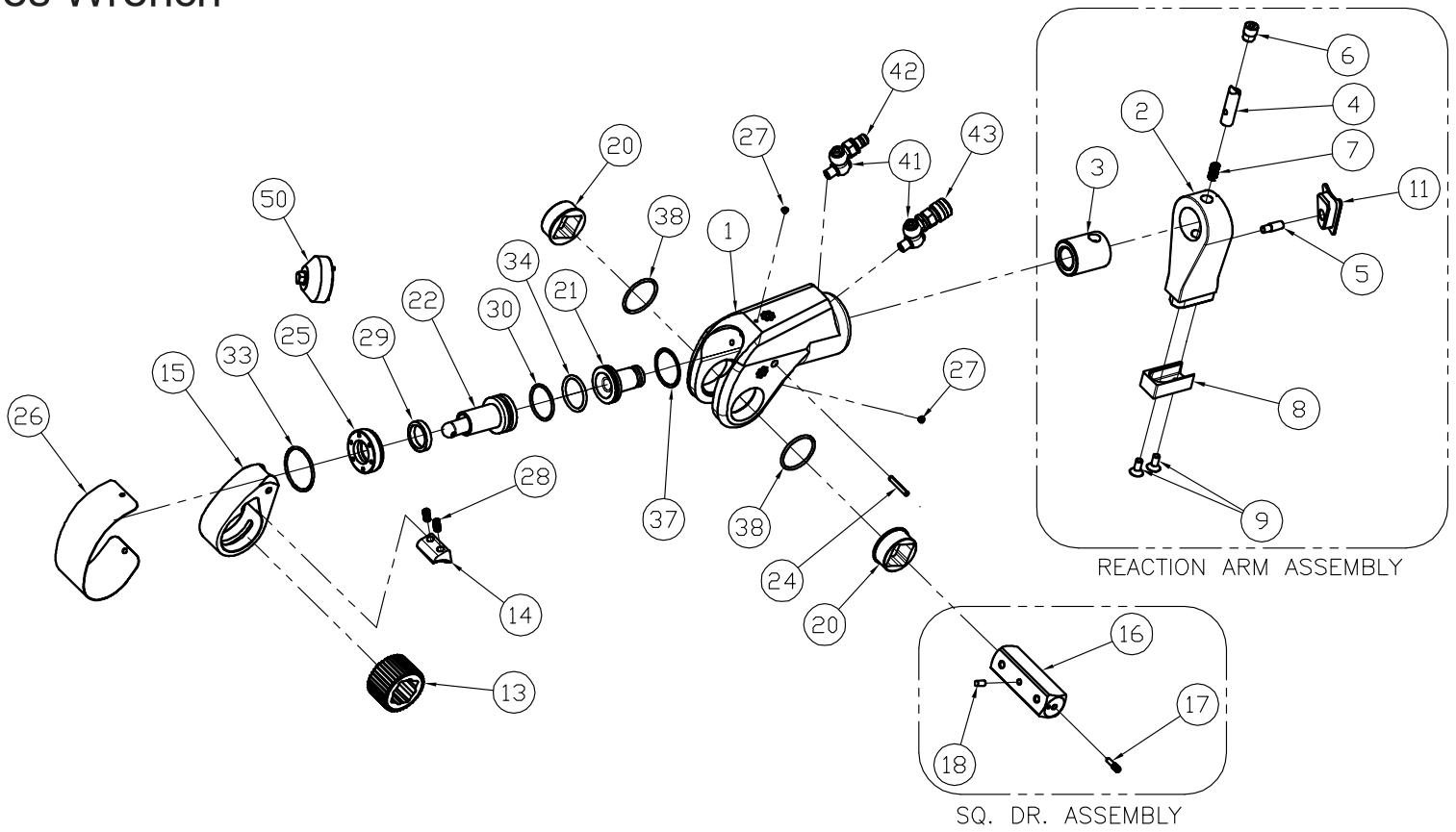
TU-60 Torque Conversion Chart

Imperial Conversion	
PSI	**Ft-lbs**
1,000	6202
1,200	7422
1,400	8641
1,600	9861
1,800	11080
2,000	12300
2,200	13477
2,400	14654
2,600	15831
2,800	17008
3,000	18185
3,200	19378
3,400	20571
3,600	21763
3,800	22956
4,000	24149
4,200	25344
4,400	26538
4,600	27733
4,800	28927
5,000	30122
5,200	31317
5,400	32511
5,600	33706
5,800	34900
6,000	36095
6,200	37293
6,400	38491
6,600	39688
6,800	40886
7,000	42084
7,200	43282
7,400	44480
7,600	45678
7,800	46876
8,000	48074
8,200	49272
8,400	50470
8,600	51667
8,800	52865
9,000	54063
9,200	55260
9,400	56456
9,600	57653
9,800	58849
10,000	60046

Metric Conversion	
Bar	**Nm**
69	8409
83	10062
97	11716
110	13369
124	15023
138	16677
152	18272
165	19868
179	21464
193	23060
207	24656
221	26273
234	27890
248	29507
262	31124
276	32742
290	34361
303	35981
317	37601
331	39220
345	40840
359	42460
372	44079
386	45699
400	47319
414	48938
427	50562
441	52186
455	53810
469	55434
483	57058
496	58683
510	60307
524	61931
538	63555
552	65180
565	66804
579	68428
593	70052
607	71676
621	73300
634	74922
648	76544
662	78167
676	79789
689	81411

*Reference values only. Consult calibration torque chart provided with tool.

TU-2 Series Wrench



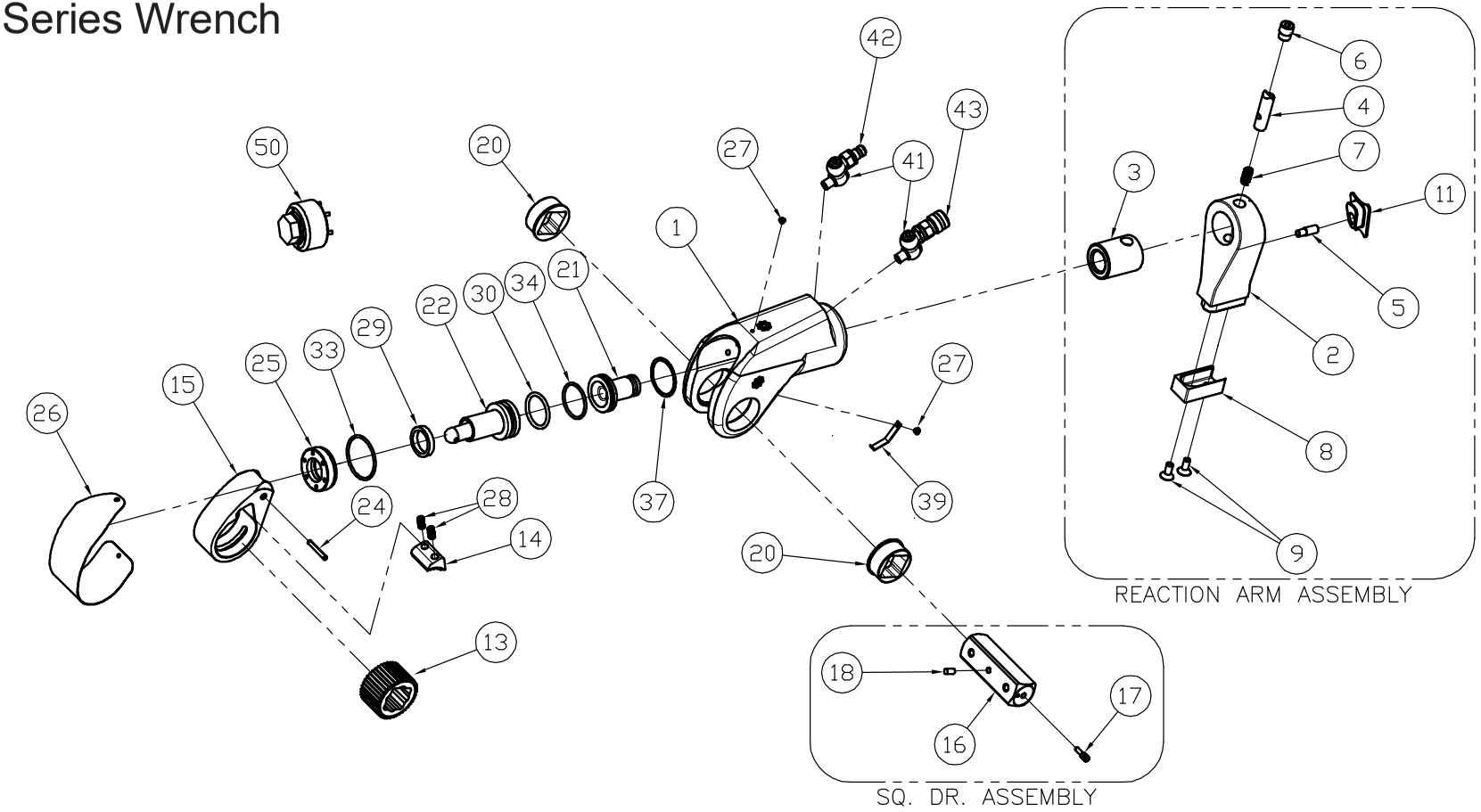
Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Housing	TU-2-01	1
2	Reaction Arm	SQ-1-03-1	1
3	Spline Sleeve	TU-2-03-2	1
4	Locking Pin	TU-2-03-3	1
5	Retract Button	TU-2-03-4	1
6	Reaction Arm Screw	TU-2-03-5	1
7	Reaction Arm Spring	TU-2-03-6	1
8	Reaction Arm Cover	SQ-1-03-7	1
9	Cover Screws	SQ-1-03-8	2
11	Retract Button Cover	SQ-1-03-9	1
13	Ratchet	TU-2-05	1
14	Drive Segment	TU-2-07	1
15	Drive Plate	TU-2-09	1

ITEM	NAME	PART #	QTY.
16	Square Drive	TU-2-11-1	1
17	Sq. Dr. Retaining Screw	TU-2-11-2	1
18	Sq. Dr Pin	TU-2-11-3	1
20	Sq. Drive Sleeve	TU-2-13	2
21	End Plug	TU-2-15	1
22	Piston Rod Assembly	TU-2-17	1
24	Roll Pin	TU-2-19	1
25	Cylinder Gland	TU-2-21	1
26	Shroud	TU-2-23	1
27	Shroud Screws	TU-2-25	2
28	Drive Segment Spring	TU-2-27	2
29	Rod Seal	TU-2-31	1
30	Piston Seal	TU-2-33	1

ITEM	NAME	PART #	QTY.
33	Gland Seal	TU-2-35	1
34	End Plug Seal	TU-2-37	1
37	Cylinder Ring	TU-2-43	1
38	Sleeve O-ring	TU-2-51	2
41	Swivel Assembly	STU-4M-4M	2
42	Male Coupler	HC-M-100	1
43	Female Coupler	HC-F-400	1
50	Gland Wrench	ATU-2-GW	
	Reaction Arm Assembly	SQ-1-03	
	Square Drive Assembly	TU-2-11	
	Coupler Set	HC-S-100	

TU-3 Series Wrench



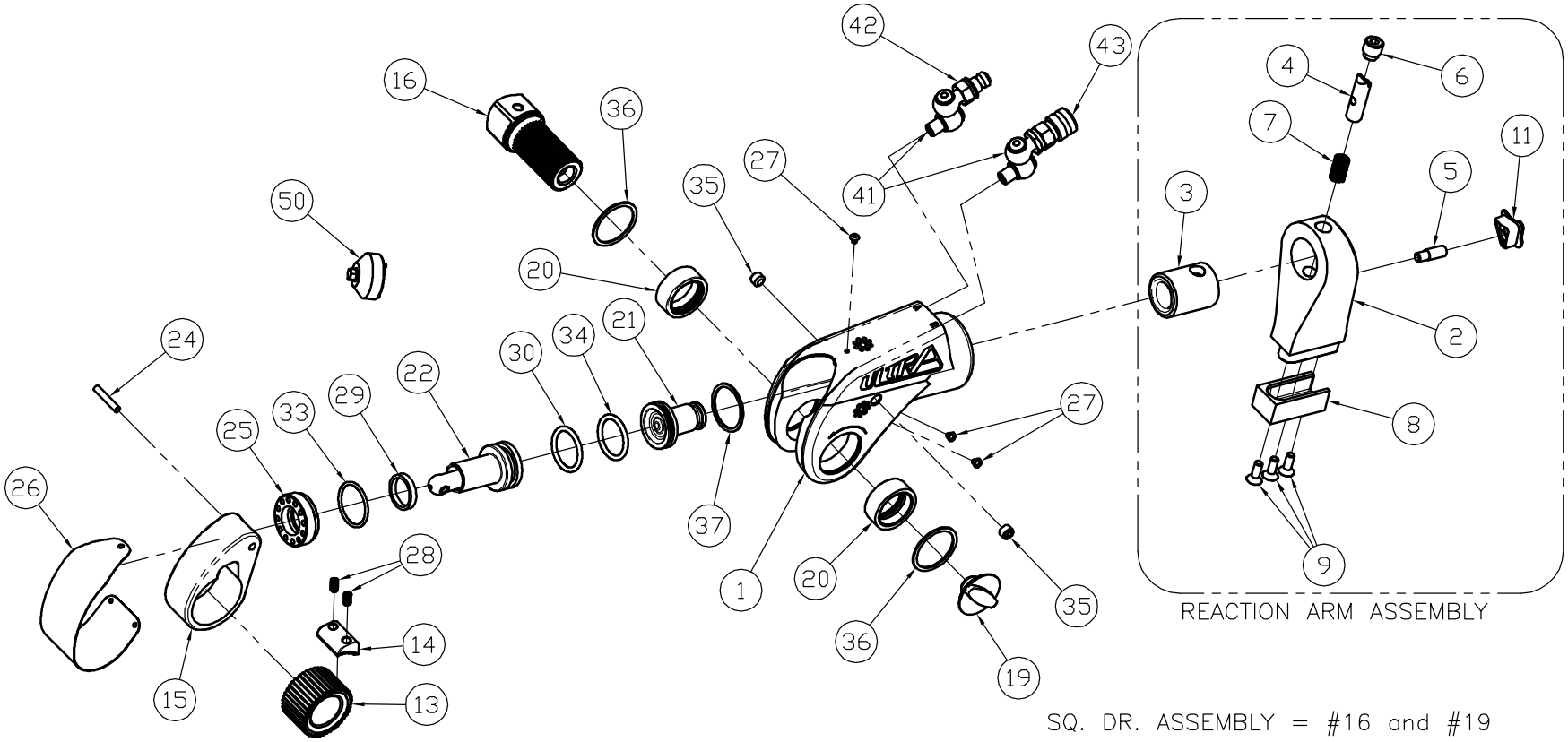
Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Housing	TU-3-01-U	1
2	Reaction Arm	SQ-3-03-1	1
3	Spline Sleeve	TU-3-03-2	1
4	Locking Pin	TU-3-03-3	1
5	Retract Button	TU-3-03-4	1
6	Reaction Arm Screw	TU-3-03-5	1
7	Reaction Arm Spring	TU-3-03-6	1
8	Reaction Arm Cover	SQ-3-03-7	1
9	Cover Screws	TU-3-03-8	2
11	Retract Button Cover	SQ-3-03-9	1
13	Ratchet	TU-3-05	1
14	Drive Segment	TU-3-07	1
15	Drive Plate	TU-3-09-U	1

ITEM	NAME	PART #	QTY.
16	Square Drive	TU-3-11-1	1
17	Sq. Dr. Retaining Screw	TU-3-11-2	1
18	Sq. Dr Pin	TU-3-11-3	1
20	Sq. Drive Sleeve	TU-3-13-U	2
21	End Plug	TU-3-15	1
22	Piston Rod Assembly	TU-3-17-U	1
24	Roll Pin	TU-3-19	1
25	Cylinder Gland	TU-3-21	1
26	Shroud	TU-3-23-U	1
27	Shroud Screws	TU-3-25	2
28	Drive Segment Spring	TU-3-27	2
29	Rod Seal	TU-3-31	1
30	Piston Seal	TU-3-33	1

ITEM	NAME	PART #	QTY.
33	Gland Seal	TU-3-35	1
34	End Plug Seal	TU-3-37	1
37	Cylinder Ring	TU-3-43	1
39	Ratchet Spring	TU-3-53	1
41	Swivel Assembly	STU-4M-4M	2
42	Male Coupler	HC-M-100	1
43	Female Coupler	HC-F-400	1
50	Gland Wrench	ATU-3-GW	
	Reaction Arm Assembly	SQ-3-03	
	Square Drive Assembly	TU-3-11	
	Coupler Set	HC-S-100	

TU-5 Series Wrench



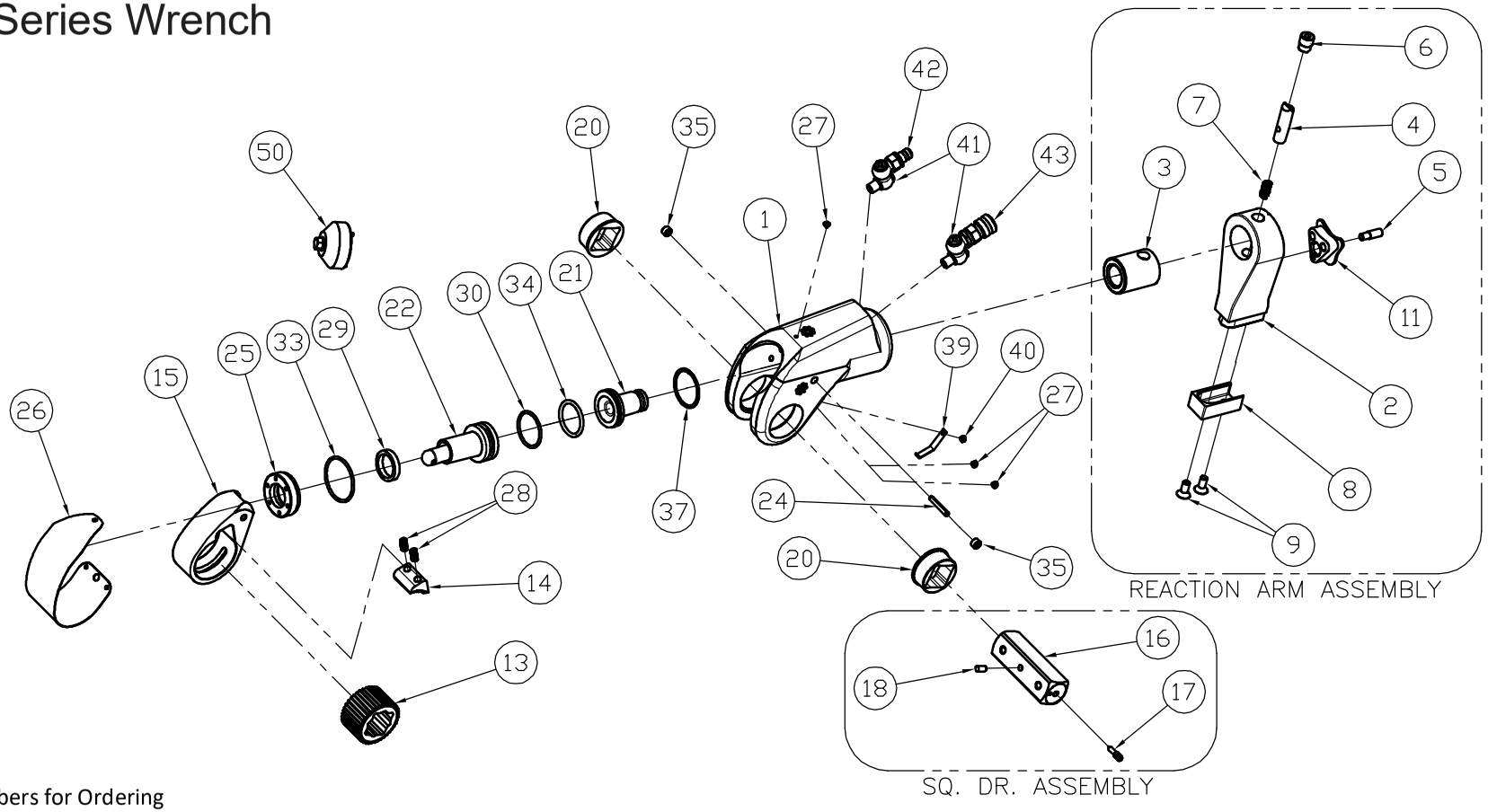
Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Housing	TU-5-01	1
2	Reaction Arm	SQ-5-03-1	1
3	Spline Sleeve	TU-5-03-2	1
4	Locking Pin	TU-5-03-3	1
5	Retract Button	TU-5-03-4	1
6	Reaction Arm Screw	TU-5-03-5	1
7	Reaction Arm Spring	TU-5-03-6	1
8	Reaction Arm Cover	SQ-5-03-7	1
9	Cover Screws	TU-5-03-8	3
11	Retract button Cover	SQ-5-03-9	1
13	Ratchet	TU-5-05	1
14	Drive Segment	TU-5-07	1
15	Drive Plate	TU-5-09	1

ITEM	NAME	PART #	QTY.
16	Square Drive	TU-5-11-1	1
19	Sq. Dr Retaining Knob	TU-5-11-6	1
20	Sq. Drive Sleeve	TU-5-13	2
21	End Plug	TU-5-15	1
22	Piston Rod Assembly	TU-5-17	1
24	Roll Pin	TU-5-19	1
25	Cylinder Gland	TU-5-21	1
26	Shroud	TU-5-23	1
27	Shroud Screws	TU-5-25	3
28	Drive Segment Spring	TU-5-27	2
29	Rod Seal	TU-5-31	1
30	Piston Seal	TU-5-33	1
33	Gland Seal	TU-5-35	1

ITEM	NAME	PART #	QTY.
34	End Plug Seal	TU-5-37	1
35	Housing Side Plug	TU-5-39	2
36	Sleeve Retaining Ring	TU-5-41	2
37	Cylinder Ring	TU-5-43	1
41	Swivel Assembly	STU-4M-4M	2
42	Male Coupler	HC-M-100	1
43	Female Coupler	HC-F-400	1
50	Gland Wrench	ATU-5-GW	
	Reaction Arm Assembly	SQ-5-03	
	Square Drive Assembly	TU-5-11	
	Coupler Set	HC-S-100	

TU-7 Series Wrench



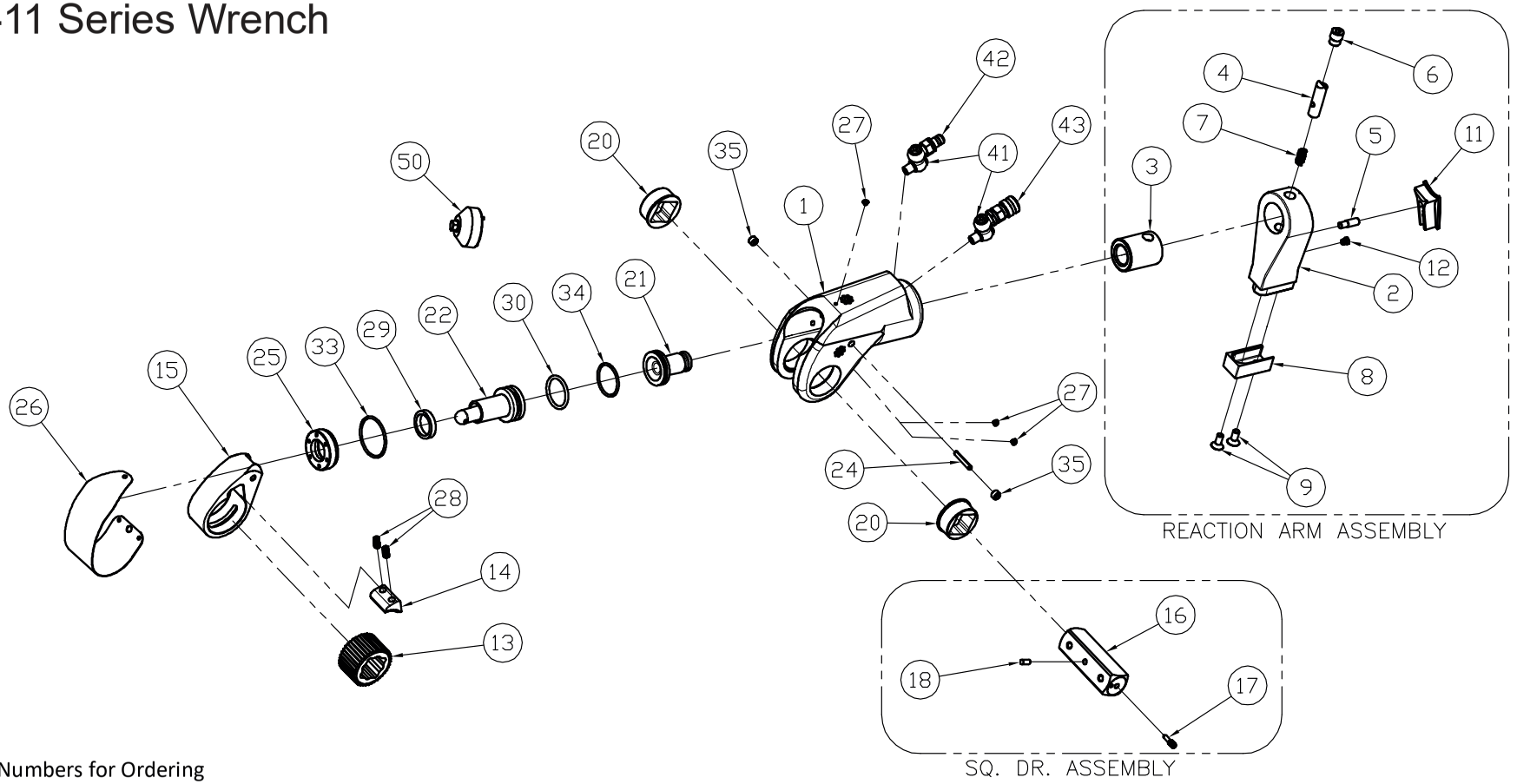
Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Housing	TU-7-01-U	1
2	Reaction Arm	SQ-7-03-1	1
3	Spline Sleeve	TU-7-03-2	1
4	Locking Pin	TU-7-03-3	1
5	Retract Button	TU-7-03-4	1
6	Reaction Arm Screw	TU-7-03-5	1
7	Reaction Arm Spring	TU-7-03-6	1
8	Reaction Arm Cover	TU-7-03-7	1
9	Cover Screws	TU-7-03-8	2
11	Retract Button Cover	TU-7-03-9	1
13	Ratchet	TU-7-05	1
14	Drive Segment	TU-7-07	1
15	Drive Plate	TU-7-09-U	1
16	Square Drive	TU-7-11-1	1

ITEM	NAME	PART #	QTY.
17	Sq. Dr. Retaining Screw	TU-7-11-2	1
18	Sq. Dr Pin	TU-7-11-3	1
20	Sq. Drive Sleeve	TU-7-13	2
21	End Plug	TU-7-15	1
22	Piston Rod Assembly	TU-7-17-U	1
24	Roll Pin	TU-7-19	1
25	Cylinder Gland	TU-7-21	1
26	Shroud	TU-7-23-U	1
27	Shroud Screws	TU-7-25	3
28	Drive Segment Spring	TU-7-27	2
29	Rod Seal	TU-7-31	1
30	Piston Seal	TU-7-33	1
33	Gland Seal	TU-7-35	1
34	End Plug Seal	TU-7-37	1

ITEM	NAME	PART #	QTY.
35	Housing Side Plug	TU-7-39	2
37	Cylinder Ring	TU-7-43	1
39	Ratchet Spring	TU-7-53	1
40	Ratch Spring Screw	TU-7-25	1
41	Swivel Assembly	STU-4M-4M	2
42	Male Coupler	HC-M-100	1
43	Female Coupler	HC-F-400	1
50	Gland Wrench	ATU-7-GW	
	Reaction Arm Assembly	SQ-7-03	
	Square Drive Assembly	TU-7-11	
	Coupler Set	HC-S-100	

TU-11 Series Wrench



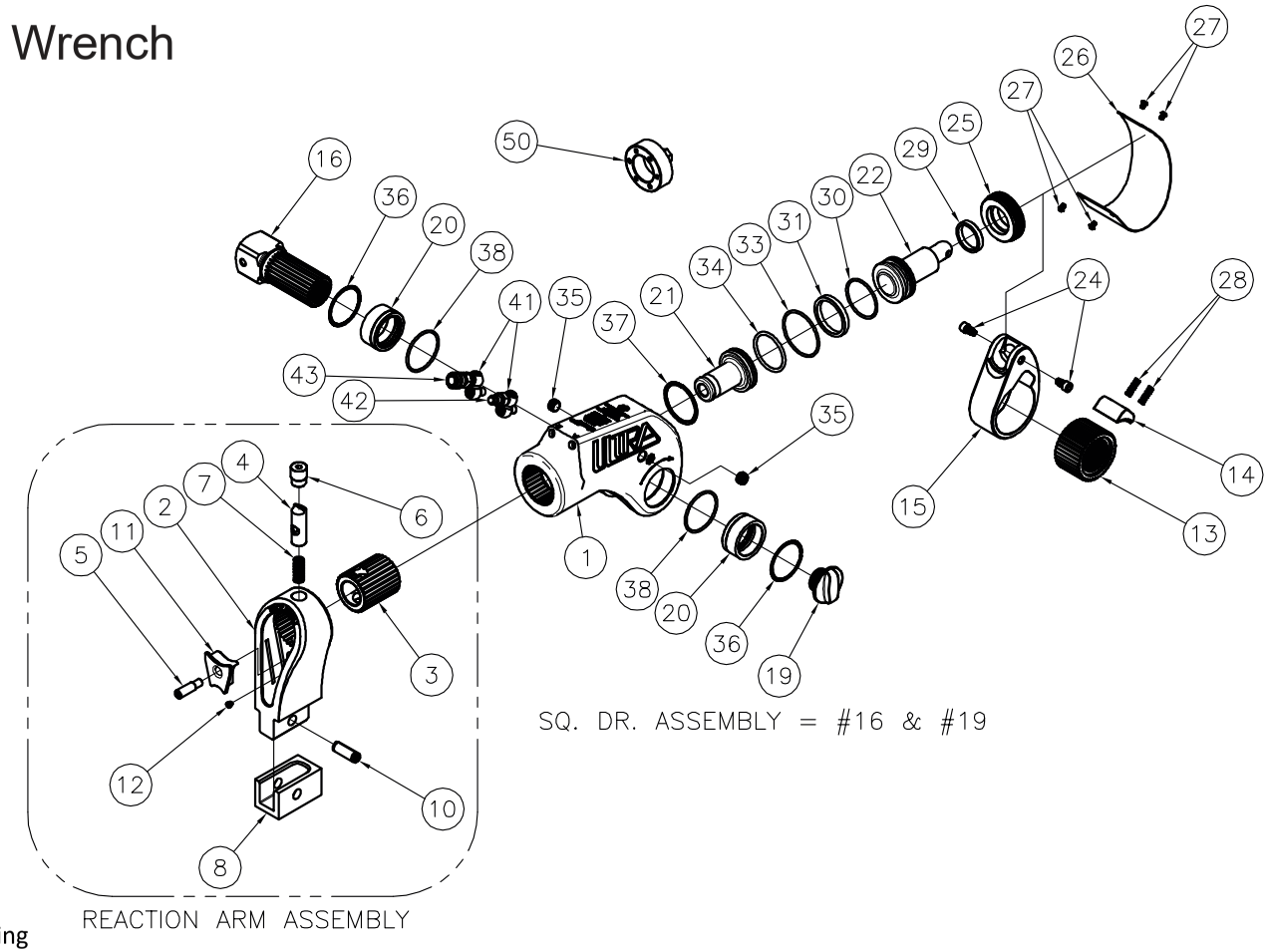
Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Housing	TU-11-01	1
2	Reaction Arm	SQ-10-03-1	1
3	Spline Sleeve	TU-11-03-2	1
4	Locking Pin	TU-11-03-3	1
5	Retract Button	TU-11-03-4	1
6	Reaction Arm Screw	TU-11-03-5	1
7	Reaction Arm Spring	TU-11-03-6	1
8	Reaction Arm Cover	TU-11-03-7	1
9	Cover Screws	TU-11-03-8	2
11	Retract Button Cover	SQ-10-03-9	1
12	Ret. Button Guide Screw	SQ-10-03-10	1
13	Ratchet	TU-11-05	1
14	Drive Segment	TU-11-07	1
15	Drive Plate	TU-11-09	1

ITEM	NAME	PART #	QTY.
16	Square Drive	TU-11-11-1	1
17	Sq. Dr. Retaining Screw	TU-11-11-2	1
18	Sq. Dr Pin	TU-11-11-3	1
20	Sq. Drive Sleeve	TU-11-13	2
21	End Plug	TU-11-15	1
22	Piston Rod Assembly	TU-11-17	1
24	Roll Pin	TU-11-19	1
25	Cylinder Gland	TU-11-21	1
26	Shroud	TU-11-23	1
27	Shroud Screws	TU-11-25	3
28	Drive Segment Spring	TU-11-27	2
29	Rod Seal	TU-11-31	1
30	Piston Seal	TU-11-33	1
33	Gland Seal	TU-11-35	1

ITEM	NAME	PART #	QTY.
34	End Plug Seal	TU-11-37	1
35	Housing Side Plug	TU-11-39	2
41	Swivel Assembly	STU-4M-4M	2
42	Male Coupler	HC-M-100	1
43	Female Coupler	HC-F-400	1
50	Gland Wrench	ATU-11-GW	
	Reaction Arm Assembly	SQ-10-03	
	Square Drive Assembly	TU-11-11	
	Coupler Set	HC-S-100	

TU-20 Series Wrench



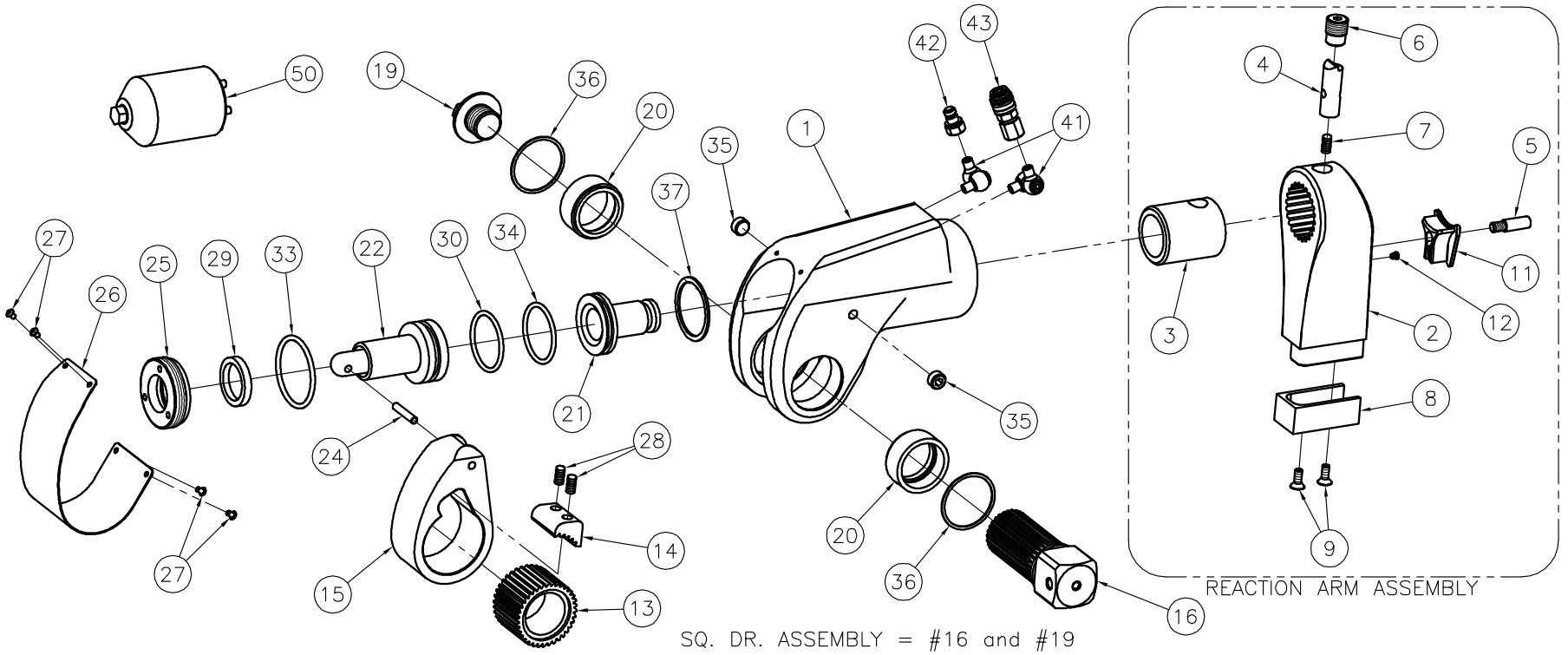
Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Housing	TU-20-01U	1
2	Reaction Arm	TU-20-03-1U	1
3	Spline Sleeve	TU-20-02U	1
4	Locking Pin	TU-27-03-3	1
5	Retract Button	TU-27-03-4	1
6	Reaction Arm Screw	TU-27-03-5	1
7	Reaction Arm Spring	TU-27-03-6	1
8	Reaction Arm Cover	TU-20-03-7	1
10	Cover Roll Pin	TU-20-03-11	1
11	Retract Button Cover	TU-27-03-9	1
12	Retract Button Cover Screw	TU-27-03-10	1
13	Ratchet	TU-20-05	1
14	Drive Segment	TU-20-07	1
15	Drive Plate	TU-20-09	1

ITEM	NAME	PART #	QTY.
16	Square Drive	TU-20-11-1	1
19	Sq Dr Retaining Knob	TU-20-11-8	1
20	Square Drive Sleeve	TU-20-13	2
21	End Plug	TU-20-15	1
22	Piston Rod Assembly	TU-20-17	1
24	Retract Screw	TU-20-19	2
25	Cylinder Gland	TU-20-21	1
26	Shroud	TU-20-23	1
27	Shroud Screw	TU-20-25	4
28	Drive Segment Spring	TU-20-27	2
29	Rod Seal	TU-20-31	1
30	Piston Seal	TU-20-34	1
31	Piston U-Cup Seal	TU-20-33	1
33	Gland Seal	TU-20-35	1

ITEM	NAME	PART #	QTY.
34	End Plug Seal	TU-20-37	1
35	Housing Side Plug	TU-20-39	2
36	Sleeve Retaining Ring	TU-20-41	2
37	Cylinder Ring	TU-20-43	1
38	Sleeve O-Ring	TU-20-51	2
41	Swivel Assembly	STU-4M-4M	2
42	Male Coupler	HC-M-100	1
43	Female Coupler	HC-F-400	1
50	Gland Wrench	ATU-20-GW	
	Reaction Arm Assembly	TU-20-03	
	Square Drive Assembly	TU-20-11	
	Coupler Set	HC-S-100	

TU-27 Series Wrench



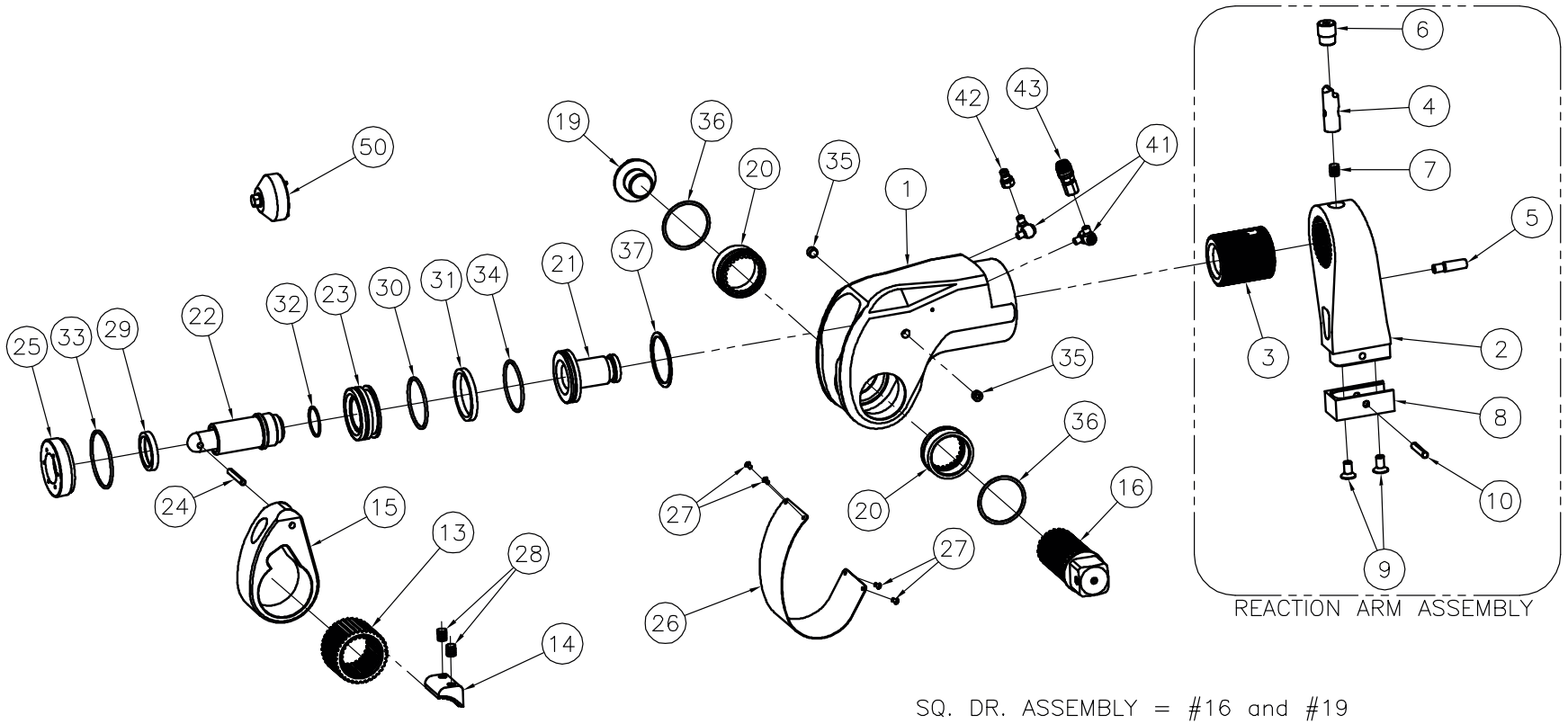
Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Housing	TU-27-01	1
2	Reaction Arm	TU-27-03-1	1
3	Spline Sleeve	TU-27-03-2	1
4	Locking Pin	TU-27-03-3	1
5	Retract Button	TU-27-03-4	1
6	Reaction Arm Screw	TU-27-03-5	1
7	Reaction Arm Spring	TU-27-03-6	1
8	Reaction Arm Cover	TU-27-03-7	1
9	Cover Screws	TU-27-03-8	2
11	Retract Button Cover	TU-27-03-9	1
12	Retract Button Screw	TU-27-03-10	1
13	Ratchet	TU-27-05	1
14	Drive Segment	TU-27-07	1
15	Drive Plate	TU-27-09	1

ITEM	NAME	PART #	QTY.
16	Square Drive	TU-27-11-1	1
19	Sq. Dr Retaining Knob	TU-27-11-6	1
20	Sq. Drive Sleeve	TU-27-13	2
21	End Plug	TU-27-15	1
22	Piston Rod Assembly	TU-27-17	1
24	Roll Pin	TU-27-19	1
25	Cylinder Gland	TU-27-21	1
26	Shroud	TU-27-23	1
27	Shroud Screws	TU-27-25	4
28	Drive Segment Spring	TU-27-27	2
29	Rod Seal	TU-27-31	1
30	Piston Seal	TU-27-33	1
33	Gland Seal	TU-27-35	1
34	End Plug Seal	TU-27-37	1

ITEM	NAME	PART #	QTY.
35	Housing Side Plug	TU-27-39	2
36	Sleeve Retaining Ring	TU-27-41	2
37	Cylinder Ring	TU-27-43	1
41	Swivel Assembly	STU-4M-4M	2
42	Male Coupler	HC-M-100	1
43	Female Coupler	HC-F-400	1
50	Gland Wrench	ATU-27-GW	
	Reaction Arm Assembly	TU-27-03	
	Square Drive Assembly	TU-27-11	
	Coupler Set	HC-S-100	

TU-60 Series Wrench



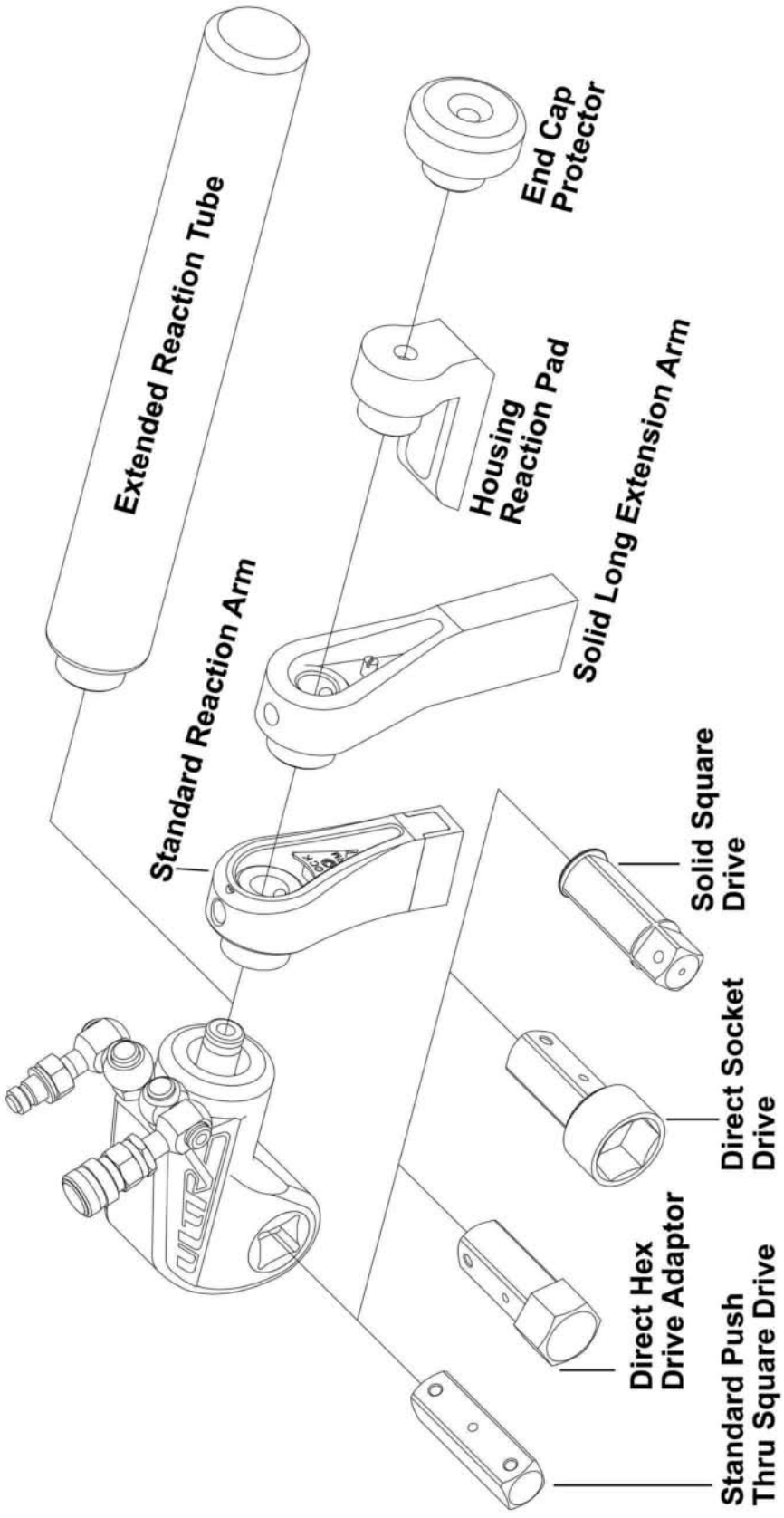
Part Numbers for Ordering

ITEM	NAME	PART #	QTY.
1	Housing	TU-60-01	1
2	Reaction Arm	TU-60-03-1	1
3	Spline Sleeve	TU-60-03-2	1
4	Locking Pin	TU-60-03-3	1
5	Retract Button	TU-60-03-4	1
6	Reaction Arm Screw	TU-60-03-5	1
7	Reaction Arm Spring	TU-60-03-6	1
8	Reaction Arm Cover	TU-60-03-7	1
9	Cover Screws	TU-60-03-8	2
10	Cover Roll Pin	TU-60-03-9	1
13	Ratchet	TU-60-05	1
14	Drive Segment	TU-60-07	1
15	Drive Plate	TU-60-09	1
16	Square Drive	TU-60-11-1	1

ITEM	NAME	PART #	QTY.
19	Sq. Dr Retaining Knob	TU-60-11-6	1
20	Sq. Drive Sleeve	TU-60-13	2
21	End Plug	TU-60-15	1
22	Piston Rod Assembly	TU-60-17	1
23	Piston	TU-60-17-5	1
24	Roll Pin	TU-60-19	1
25	Cylinder Gland	TU-60-21	1
26	Shroud	TU-60-23	1
27	Shroud Screws	TU-60-25	4
28	Drive Segment Spring	TU-60-27	2
29	Rod Seal	TU-60-31	1
30	Piston Seal	TU-60-32	1
31	Piston U-cup Seal	TU-60-33	1
32	Piston Inner Seal	TU-60-34	1

ITEM	NAME	PART #	QTY.
33	Gland Seal	TU-60-35	1
34	End Plug Seal	TU-60-37	1
35	Housing Side Plug	TU-60-39	2
36	Sleeve Retaining Ring	TU-60-41	2
37	Cylinder Ring	TU-60-43	1
41	Swivel Assembly	STU-4M-4M	2
42	Male Coupler	HC-M-100	1
43	Female Coupler	HC-F-400	1
50	Gland Wrench	ATU-60-GW	
	Reaction Arm Assembly	TU-60-03	
	Square Drive Assembly	TU-60-11	
	Coupler Set	HC-S-100	

TU Series Wrench Available Accessories



MAINTENANCE SECTION

WARNING **Always turn off the power supply. Bleed off hydraulic fluid from the hose connections on the cylinder assembly and disconnect the hoses before attempting to repair or perform maintenance on this tool. Always wear eye protection when operating or performing maintenance on this tool.**

With the release of the SQ, TU wrenches will feature SQ style reaction arms. Below are maintenance instructions for both TU and SQ style reaction arms.

DISASSEMBLY

GENERAL INSTRUCTIONS

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Use extra care not to score, nick or damage surfaces that will contain hydraulic oil under pressure.
3. Whenever grasping a tool in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
4. Do not remove any part that is press fit in or on an assembly unless the removal of that part is necessary for repairs or replacement.
5. Do not disassemble the hydraulic cylinder assembly unless you have a complete set of seals and O–rings for replacement.
6. Use only British Standard fractional size tools when disassembling these tools.

DISASSEMBLY OF THE REACTION ARM ASSEMBLY

1. Push the reaction arm retract button cover (10) toward the reaction arm cover (8) and separate the reaction arm assembly from the housing (1).
2. While holding the button down, unscrew and remove the reaction arm spline screw (6).
3. Apply some downward pressure to the reaction arm locking pin (4) and unscrew the reaction arm retract button (5) from the locking pin (4).
4. Remove the locking pin (4) by sliding it out of the top of the reaction arm (2).
5. Remove retract button cover (11).
6. **For SQ-10 model only:** Remove retract button guide screw (12).
7. Pull the reaction arm splined sleeve (3) out of the reaction arm (2).
8. Use a hooked tool through the reaction arm screw opening, pull the reaction arm spring (7) out of the reaction arm (2).
9. To remove the reaction arm cover (8), use a hex wrench to unscrew the cover screws (9) and pull the cover off the reaction arm. **Note: For TU-20 and TU-60 models**: Remove the cover roll pin (10) prior to removing the reaction arm cover.

CAUTION

In the following step, the shroud will spring to a straightened position when the screws at one end are removed. Hold the shroud in position until the screws are removed and control the flex of the loose end.

DISASSEMBLY OF THE TU-2, TU-3, TU-7, AND TU-11 CYLINDER ASSEMBLIES

1. Clamp the housing (1) in copper–covered or leather–covered vise jaws with the swivel assemblies upward and using a 1/4" hex wrench, unscrew and remove the two swivels (41) with their attached couplers (42&43).
2. Remove the housing assembly from the vise jaws and turn over a container to catch any oil remaining inside the cylinder.
3. Use a hex wrench to unscrew and remove the shroud mounting screws (27). Remove the shroud (26). **Note: For TU-3 models**, the drive side shroud screw holds the ratchet spring (39) in place, which will come out with the removal of the shroud.
4. **For TU-7 and TU-11 models**, use a hex wrench to unscrew and remove the side housing plugs (35) from each side of the housing (1).
5. If the piston assembly (22) is not fully retracted, use a brass drift or brass hammer to tap the assembly inward until the roll pin (24) aligns with the cross holes in the housing. **Note:** Covering the inlets with a cloth will contain any oil that may expel from the housing.
6. Use a small drift to tap the roll pin (24) out of the piston rod assembly (22) and drive plate (15).
7. Insert a hex wrench through the larger opening in the square drive (16) and loosen the square drive locking pin (17) until the square drive slides out of the tool. **Note: Use caution when removing the square drive**. The square drive pin (18) loosely fits in the square drive and can fall out when the drive is removed.
8. Remove the drive plate (15), assembled with the ratchet (13), drive segment (14) and segment springs (28).
9. Using finger pressure, push the sleeves (20) inward to remove them from the housing (1).
10. Being careful not to let the springs (29) eject from the assembly, slide the ratchet (13), drive segment (14) and segment springs (28) out of the drive plate (15).

NOTICE

The cylinder gland is staked into the housing to prevent it from loosening due to vibration or turbulence in the hydraulic oil flow. The stake point must be drilled out before attempting to remove the cylinder gland.

11. Locate the stake point on the threads of the cylinder gland (25) and housing. Using a 1/16" drill bit centered on the stake point, drill approximately 3/32" deep in one continuous motion to remove the thread and interference at that point.
12. Engage the pins of the cylinder gland wrench (50) with the holes in the cylinder gland (25) and using a socket on the hex of the wrench unscrew and remove the cylinder gland. If the gland does not rotate freely after initial breakout, additional drilling, in small increments, may be required to remove the obstruction.
13. Clamp the housing (1) in the vise with the end plug (21) upward and a catch cloth draped between the jaws.
14. Insert a flat face drift into the hole in the center of the end plug (21). Tap the end plug and piston assembly (22) lightly until both the piston assembly and end plug slip through the housing (1) and into the catch cloth.
15. While using caution as to avoid scratching the cylinder, remove the cylinder ring (37) by using a thin blade screwdriver to work it out of the groove within the housing.

CAUTION

In the following step, the shroud will spring to a straightened position when the screws at one end are removed. Hold the shroud in position until the screws are removed and control the flex of the loose end.

DISASSEMBLY OF THE TU-5, TU-20, TU-27, AND TU-60 CYLINDER ASSEMBLIES

1. Clamp the housing (1) in copper–covered or leather–covered vise jaws with the inlet end upward. Use a 1/4" hex wrench to unscrew and remove the two swivels (41) with their attached couplers (42&43).
2. Remove the housing assembly from the vise jaws, and turn over a container to catch any oil remaining inside the cylinder.
3. Use a hex wrench to unscrew and remove the shroud mounting screws (27). Remove the shroud (26).
4. Use a hex wrench to unscrew and remove the side housing plugs (35) from each side of the housing.
5. If the piston assembly (22) is not fully retracted, use a brass drift or brass hammer to tap the assembly inward until the roll pin (24) aligns with the cross holes in the housing (1). **Note:** Covering the inlets with a cloth will contain any oil that may expel from the housing.
6. Use a small drift to tap the roll pin (24) out of the piston rod assembly (22) and drive plate (15). **Note: For TU-20 models,** retract screwsare used in the place of the roll pin. Use a hex wrench to remove the retract screws from the drive plate.
7. Unscrew the square drive retaining knob (19). Pull out the square drive (16).
8. Remove the drive plate (15), assembled with the ratchet (13), drive segment (14) and segment springs (28).
9. Using finger pressure, push the sleeves (20) inward to remove them from the housing (1). Remove the sleeve retainers (36).
10. Being careful not to let the segment springs (28) eject from the assembly, slide the ratchet (13), drive segment (14), and segment springs (28) out of the drive plate (15).
11. Locate the stake point on the threads of the cylinder gland (25) and housing. Using a 1/16" drill bit centered on the stake point, drill approximately 3/32" deep in one continuous motion to remove the thread and interference at that point.
12. Engage the pins of the cylinder gland wrench (50) with the holes in the cylinder gland (25). Use a socket on the hex of the wrench to unscrew and remove the cylinder gland. If the gland does not rotate freely after initial breakout, additional drilling, in small increments, may be required to remove the obstruction.
13. Clamp the housing (1) in the vise with the end plug (21) upward and a catch cloth draped between the jaws.
14. **For TU-20 models**, use a 1" square drive extension and an adjustable wrench to unscrew the end plug (21) from the spline sleeve (3). Pull the spline sleeve from the housing.
15. Insert a flat face drift into the hole in the center of the end plug (21). Tap the end plug and piston assembly (22) lightly until both the piston and end plug slip through the housing (1) and into the catch cloth.
16. While using caution as to avoid scratching the cylinder, remove the cylinder ring (37) using a thin blade screwdriver to work it out of the groove within the housing.

ASSEMBLY

GENERAL INSTRUCTIONS

1. Use extra care not to score, nick, or damage surfaces that will contain hydraulic oil under pressure.
2. Whenever grasping a tool in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
3. Apply O–ring lubricant to all O–rings before final assembly.

NOTICE **Inspect all parts prior to assembly. Replace any worn or damaged parts.**

ASSEMBLY OF THE TU-2, TU-3, TU-7, AND TU-11 CYLINDER ASSEMBLIES

1. Install the cylinder ring (37) into the groove at the inlet end of the housing (1).
2. Clamp the housing (1) in copper–covered or leather–covered vise jaws with the inlet end facing downward.
3. Insert the end plug (21), small end leading, into the bore of the housing. Using a brass drift, tap the end plug into the cylinder approximately 1/2”.
4. Insert the piston rod assembly (22), shaft trailing, into the bore of the housing. Using a brass drift, tap the piston rod assembly into the housing (1) until the end plug bottoms out against the cylinder ring (37).
5. Thread the cylinder gland (25) into the housing (1). Tighten with the gland wrench (50) and a socket until flush with the housing.
6. Reposition the housing in the vice with the inlet end upward.
7. Wrap the swivel (41) threads with Teflon tape. Install the swivel with the male coupler into the port marked ‘A’ (on the right when looking at the inlets) and the swivel with the female coupler into the port marked ‘R’ (on the left when looking at the inlets).
8. Connect the tool to a pump and cycle several times to check for leaks.
9. **If leaks are present**, disconnect the hoses and take the necessary steps to correct the problem. **If no leaks are detected**, disconnect the hoses and re-clamp the tool in the vise with the inlet end downward.
10. Stake the thread of the gland (25) and housing (1). Make certain the stake point deforms both the housing and gland.
11. Wipe a thin film of marine moly grease on the sides of the drive plate (15) as well as the inner race and piston rod recess of the drive plate.
12. Insert the ratchet (13) into the drive plate (15).
13. Position the drive segment (14) at the cavity ensuring the ratchet (13) and drive segment engage properly. If they will not engage properly, reverse the ratchet in the drive plate.
14. Insert the segment springs (28) into the holes of the drive segment (14) and compress the springs while installing the drive segment into the drive plate (15).
15. Wipe a thin film of marine moly grease around the outside of the drive sleeves (20) and install, with the shoulder trailing, into the bores on each side of the housing, from the inside.
16. Insert the drive plate assembly into the housing (1) with the pocket for the piston rod toward the piston, ensuring alignment of the holes in the drive plate and piston.
17. Insert the roll pin (24) into the hole in the drive plate through the hole in the housing (1). Use a drift and hammer to tap the pin into the plate making certain the pin does not protrude beyond either side of the drive plate.

18. Use a hex wrench to loosen the square drive locking pin (17) enough so that the square drive pin is flush with the square drive.
19. Insert the square drive into the housing (1) through the drive sleeves (20) and tighten the drive locking pin so that the square drive can slide freely without sliding out.
20. Place one end of the shroud (26) on the housing (1) and, using a hex wrench, thread the shroud screws (27) part way in.
21. Bend the shroud (26) around the housing (1)and install the remaining screws, going back and tightening the screws from the previous step.

NOTICE **Inspect all parts prior to assembly. Replace any worn or damaged parts.**

ASSEMBLY OF THE TU-5, TU-20, TU-27, AND TU-60 CYLINDER ASSEMBLIES

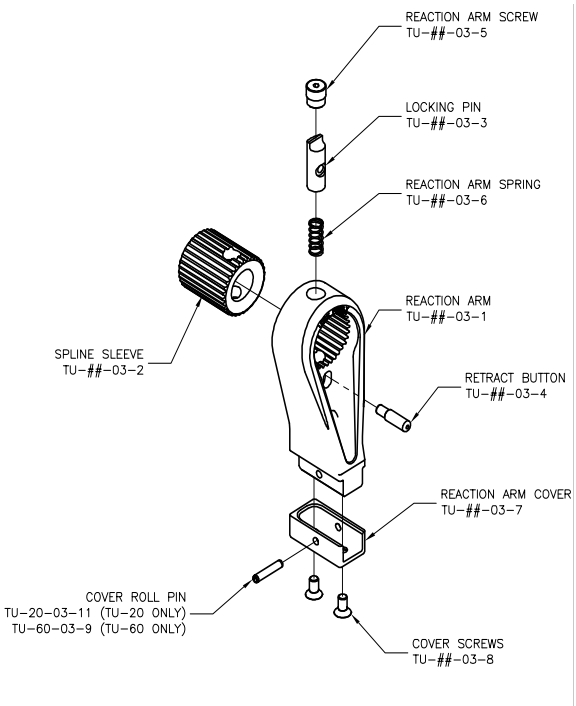
1. Install the cylinder ring (37) into the groove at the inlet end of the housing (1).
2. Clamp the housing (1) in copper–covered or leather–covered vise jaws with the inlet end downward.
3. Insert the end plug (21), small end leading, into the bore of the housing (1). Using a brass drift, tap the end plug into the cylinder approximately 1/2".
4. Insert the piston rod assembly (22)**,** shaft trailing, into the bore of the housing (1). Using a brass drift, tap the piston rod assembly into the housing until the end plug bottoms out against the cylinder ring.
5. Thread the cylinder gland (25) into the housing (1). Tighten with the gland wrench (50) and a socket until flush with the housing.
6. Reposition the housing (1) in the vice with the inlet end upward.
7. Wrap the swivel (41) threads with Teflon tape. Install the swivel with the male coupler into the port marked 'A' (on the right when looking at the inlets) and the swivel with the female coupler into the port marked 'R' (on the left when looking at the inlets).
8. Connect the tool to a pump and cycle several times to check for leaks.
9. **If leaks are present,** disconnect the hoses and take the necessary steps to correct the problem. **If no leaks are detected,** disconnect the hoses and re-clamp the tool in the vise with the inlet end downward.
10. Stake the thread of the gland (25) and housing (1). Make certain the stake point deforms both the housing and gland.
11. Wipe a thin film of marine moly grease on the sides of the drive plate (15) as well as the inner race and piston rod recess of the drive plate.
12. Insert the ratchet (13) into the drive plate (15)**.**
13. Position the drive segment (14) at the cavity, ensuring the ratchet (13) and drive segment engage properly. If they will not engage properly, reverse the ratchet in the drive plate.
14. Insert the segment springs (28) into the holes of the drive segment and compress while installing the drive segment into the drive plate.
15. Insert the drive plate assembly into the housing (1) with the pocket for the piston rod toward the piston, ensuring alignment of the holes in the drive plate and piston.

17. Install the square drive sleeves (20) with the small hub end leading. The small hub must engage the recess in the drive plate assembly. Install the sleeve retaining rings (36).
18. Insert the square drive (16) into the housing through the drive sleeves (20). Install the square drive retaining knob (19) in the end of the square drive and tighten.
19. Insert the roll pin (24) into the hole in the drive plate (15) through the hole in the housing (1). Use a drift and hammer to tap the pin into the plate making certain the pin does not protrude beyond either side of the drive plate. **Note: For TU-20 models,** retract screws (24) are used in the place of the retract pin. Use a hex wrench to install into the drive plate.
20. Place one end of the shroud (26) on the housing (1) and, using a hex wrench, thread the shroud screws (27) part way in.
21. Bend the shroud (26) around the housing (1) and install the remaining screws, going back and tightening the screws from the previous step.

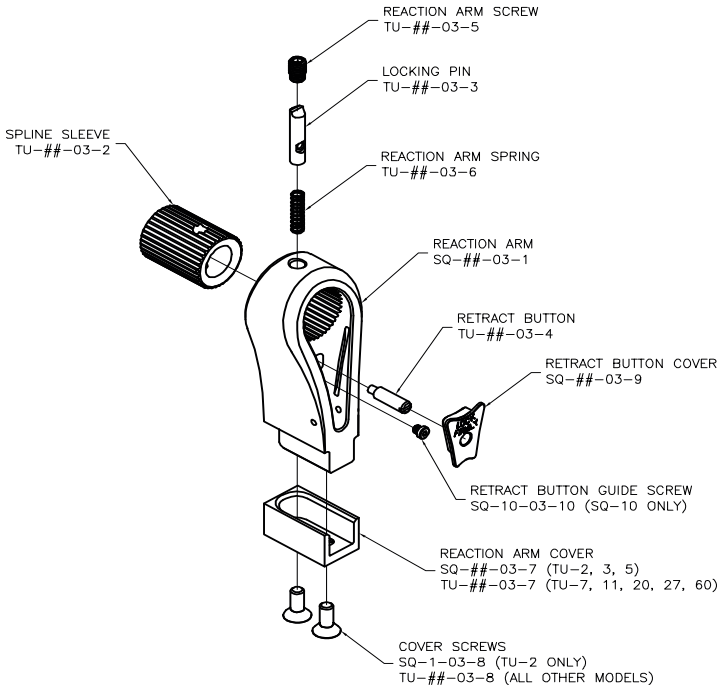
MAINTENANCE SECTION

ASSEMBLY OF THE TU/SQ REACTION ARM

1. If the reaction arm cover was removed, push it onto the end of the reaction arm and secure it with the cover screws.
2. **For TU-60 model only**: Install the cover roll pin into the reaction arm and cover.
3. Insert the reaction arm spring into the blind hole below the bore for the spline sleeve.
4. Push the spline sleeve into the reaction arm so that the holes in the sleeve align with the reaction arm screw hole. The sleeve should protrude from the back of the arm.
5. **For SQ-10 model only:** Install the retract button guide screw, applying a small amount of serviceable thread locking compound to the threads.
6. **For SQ style arms only:** Install the retract button cover in the slots in the inside pocket of the reaction arm.
7. Insert the locking pin into the reaction arm through the reaction arm screw opening, while ensuring the screw hole is accessible through the slot in the reaction arm.
8. Apply some downward pressure to the locking pin and thread the retract button into the locking pin through the slot in the reaction arm. Use a small amount of serviceable thread locking compound on the threads and tighten.
9. Thread the reaction arm screw into the reaction arm and tighten until the unthreaded end enters the hole in the spline sleeve and the threads bottom out.



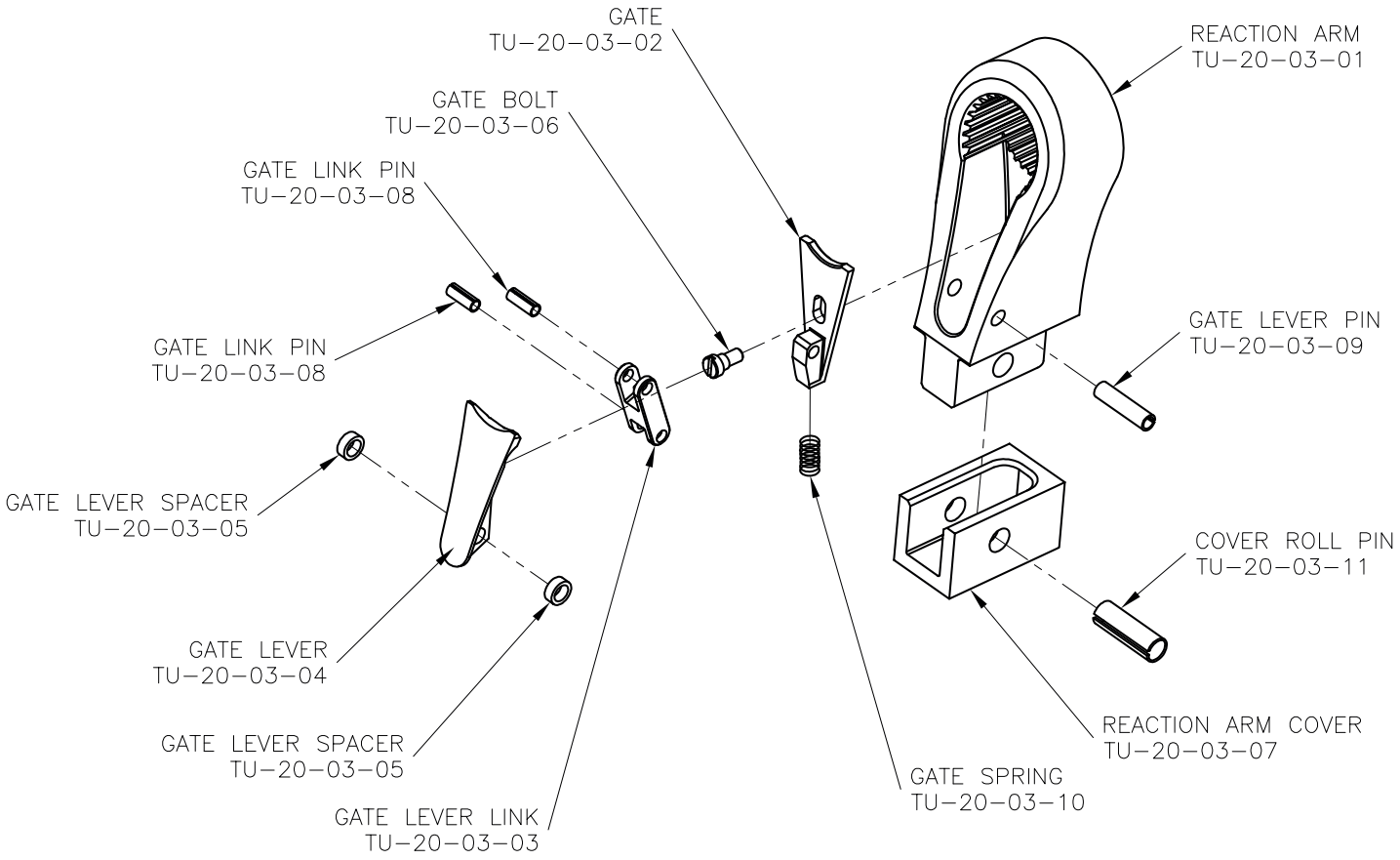
TU Style Reaction Arm



SQ Style Reaction Arm

ASSEMBLY OF THE OLD-STYLE TU-20 REACTION ARM

1. If the reaction arm cover was removed, push it onto the end of the reaction arm and insert the cover roll pin to retain the cover using a hammer.
2. Assemble the gate lever to the gate lever link using the gate link pin.
3. Assemble the gate to the gate lever link using the second gate link pin.
4. Insert the gate spring into the gate.
5. Hold the gate in the reaction arm and thread the gate bolt through the gate into the reaction arm. Use a small amount of serviceable thread locking compound on the threads. Tighten with a screwdriver.
6. Place the gate lever spacers over the gate lever.
7. Swing the gate lever and the link into the reaction arm with the gate lever spacers.
8. Insert the gate lever pin into the reaction arm through the gate lever and the gate lever spacers.



TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Piston will not advance or retract	Couplers are not securely attached to the tool or pump	Check the coupler connections, and make certain that they are connected.
	Coupler is defective	Replace any defective coupler.
	Defective remote control switch	Replace the switch and/or control pendent.
	Dirt in the direction-control valve of the pump unit	Disassemble the pump, and clean the direction-control valve.
Piston will not retract	Hose connections reversed	Make certain the advance on the pump is connected to the advance on the tool, and that the retract on the pump is connected to the retract on the tool.
	Retract hose not connected	Connect the retract hose securely.
	Retract pin broken	Replace the broken pin and/or spring.
Cylinder will not build up pressure	Piston seal and/or end plug Seal leaking	Replace any defective O-rings.
	Coupler is defective	Replace any defective coupler.
Square drive will not turn	Grease or dirt build up in the teeth of the ratchet and drive segment	Disassemble the ratchet and clean the grease or dirt out of the teeth.
	Worn or broken teeth on ratchet an/or drive segment	Replace any worn or damaged parts.
Tool tightens immediately when turned on	Hose connections are reversed	Depress the advance button to release the tool; shut the pump off in the advance position and reverse the hose connection.
Pump will not build up pressure	Defective relief valve	Inspect, adjust or replace the relief valve.
	Clogged Filter	Inspect, clean and/or replace the pump filter.
	Electric power source is too low	Make certain the amperage, voltage and any extension cord size comply with the pump manual requirements.
	Defective gauge	Replace the gauge.
	Low oil level	Check and fill the pump reservoir.
Pressure reading erratic	Defective gauge	Replace the gauge.

SAVE THESE INSTRUCTIONS DO NOT DESTROY

NOTES:

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