



**16574519**  
Edition 2  
May 2008

# Air Screwdrivers

QA1L Series

---

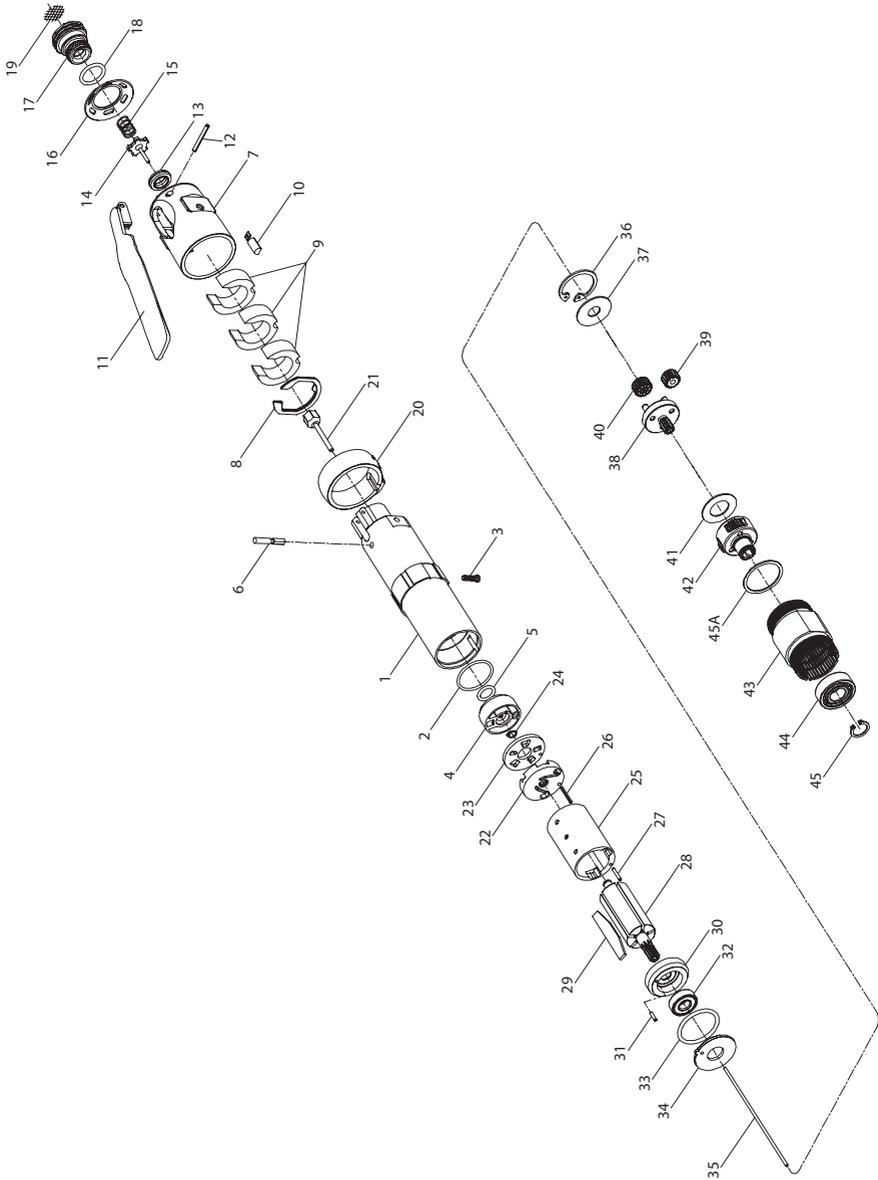
## Parts Information



Save These Instructions

 **Ingersoll Rand**

# QA1L Angle Fastener Motor and Gearing Exploded Diagram



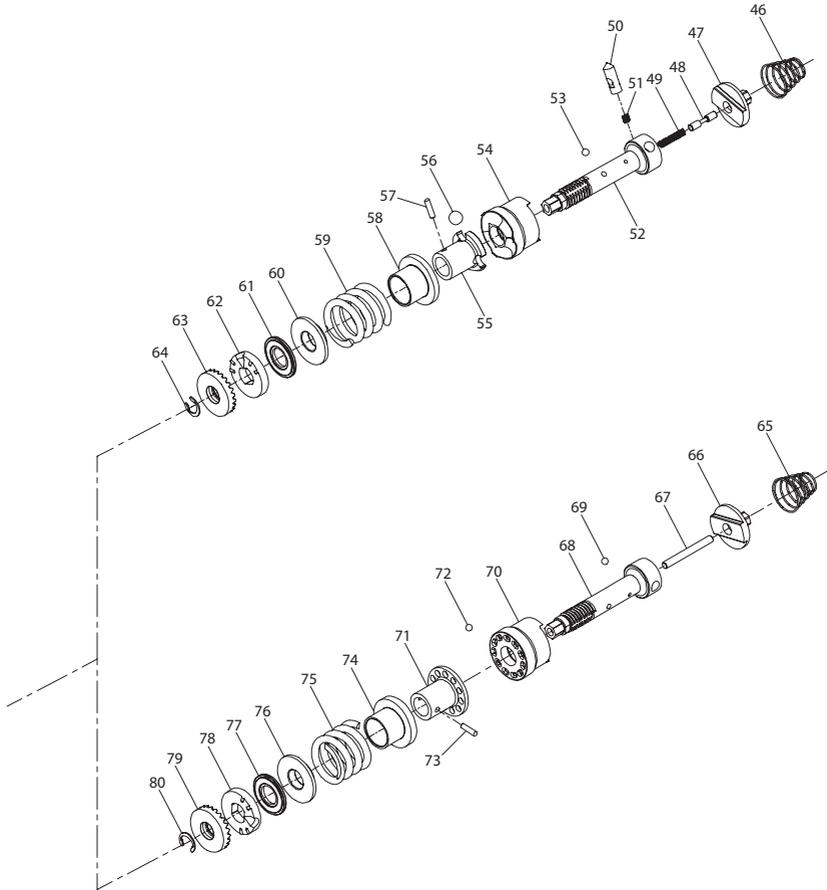
(Dwg. TPA1763-2)

## QA1L Angle Fastener Motor and Gearing Parts List

| Item | Part Description                                               | Part Number | Item                           | Part Description                                                                                      | Part Number  |
|------|----------------------------------------------------------------|-------------|--------------------------------|-------------------------------------------------------------------------------------------------------|--------------|
| 1    | Motor Housing                                                  | TRL-40      | 29                             | Vane Packet (set of 5 Vanes)                                                                          | TRH-42-5     |
| 2    | Housing O-Ring                                                 | TRH-104     | 30                             | Front End Plate Assembly                                                                              | TRH-A11      |
| 3    | Housing Screw                                                  | TRH-330     | 31                             | End Plate Alignment Pin                                                                               | TRH-98-2     |
| 4    | Reverse Valve Assembly                                         |             | 32                             | Front Rotor Bearing                                                                                   | TRH-24       |
|      | for Models with an Automatic Shutoff Valve                     | TRH-A329    | 33                             | Motor Seal                                                                                            | TRH-211      |
|      | for Models without an Automatic Shutoff Valve                  | TRH-A3291   | 34                             | Motor Clamp Washer                                                                                    | TRH-207      |
| 5    | Reverse Valve Seal                                             | R1A-159     | 35                             | Push Rod (for Models with an Automatic Shutoff Valve)                                                 | TRH-425      |
| 6    | Throttle Plunger                                               | TRL-302     | 36                             | Gear Retainer                                                                                         | TRH-28       |
| 7    | Back Cap                                                       | TRL-231     | 37                             | Gear Head Spacer                                                                                      | TRH-81       |
| 8    | Back Cap Gasket                                                | TRL-A283    | 38                             | Planet Gear Head Assembly (includes gear shafts)                                                      |              |
| 9    | Muffler Element (3)                                            | TRL-311     |                                | for Series QA1L02 and QA1L08                                                                          | TRH-A2169-16 |
| 10   | Memory Chip (for models with memory chip only)                 | TRH-800     |                                | for Series QA1L05                                                                                     | TRH-A216-12  |
|      |                                                                |             |                                | for Series QA1L12 and QA1L18C                                                                         | TRH-A2169-12 |
| 11   | Throttle Lever                                                 | TRL-273     | for Series QA1L185 and QA1L18D | TRH-A2169-10                                                                                          |              |
| 12   | Throttle Lever Pin                                             | TRL-98      | 39                             | Planet Gear (3 for each Gear Head)                                                                    |              |
| 13   | Throttle Valve Seat                                            | TRH-303     |                                | for Series QA1L02, QA1L05 and QA1L08                                                                  | TRH-10-16    |
| 14   | Throttle Valve                                                 | TRD-A302    |                                | for Series QA1L12 and QA1L18C                                                                         | TRH-10-12    |
| 15   | Throttle Valve Spring                                          | TRL-51      |                                | for Series QA1L185 and QA1L18D                                                                        | TRH-10-10    |
| 17   | Inlet Bushing Assembly                                         |             | 40                             | Gear Head Pinion                                                                                      |              |
|      | for 1/4-18 NPT Thread                                          | TRH-A465    |                                | for Series QA1L12 and QA1L18C                                                                         | TRH-17-18    |
|      | for 1/4-19 BSPT Thread                                         | TRH-A465-B  |                                | for Series QA1L185 and QA1L18D                                                                        | TRH-17-21    |
| 18   | Inlet Bushing Seal                                             | AF120-290   | 41                             | Planet Gear Head Spacer                                                                               | TRH-82       |
| 19   | Inlet Screen                                                   | TRH-61      | 42                             | Spindle Assembly (includes all spindle gearing)                                                       |              |
| 20   | Reverse Lever                                                  | TRH-273     |                                | for Series QA1L02                                                                                     | TRH-A8-16    |
| 21   | Automatic Shutoff Valve (for all Models with a Shutoff Clutch) | TRH-A435    |                                | for Series QA1L05                                                                                     | TRH-A8-15    |
| 22   | Rear End Plate Assembly (includes rear rotor bearing)          | TRH-A12-1   |                                | for Series QA1L08 and QA1L18                                                                          | TRH-A8-10    |
|      |                                                                |             |                                | for Series QA1L12                                                                                     | TRH-A8-12    |
| 23   | Rear End Plate Face Plate                                      | TRH-12-2    | 43                             | Gear Case                                                                                             |              |
| 24   | Rear End Plate Assembly Retainer                               | 85L-305     |                                | for direct drive models                                                                               | TAL-37       |
| 25   | Cylinder Assembly                                              | TRH-A3      |                                | for all other models                                                                                  | TAH-37       |
| 26   | Cylinder Rear Alignment Pin                                    | TRH-98      | 44                             | Spindle Bearing                                                                                       | TRH-510      |
| 27   | Cylinder Front Alignment Pin                                   | TRH-98-1    | 45                             | Spindle Bearing Retaining Ring                                                                        | 4E-6         |
| 28   | Rotor                                                          |             | 45A                            | Spindle Bearing Seat                                                                                  | TRH-208      |
|      | for Models with an Automatic Shutoff Valve                     | TRH-53      | *                              | Suspension Bail                                                                                       | 7L-365       |
|      | for Models without an Automatic Shutoff Valve                  | TRD-53      | *                              | Piped-Away Exhaust Kit (optional)                                                                     | LG1-K284     |
|      |                                                                |             | *                              | Tune-Up Kit (Includes the following items: 2, 5, 8, 9, 13, 14, 15, 18, 19, 21, 24, 29, 31, 32 and 33) | Q2-TK1       |

\* Not Illustrated.

# QA1L Angle Fastener Clutches Exploded Diagram



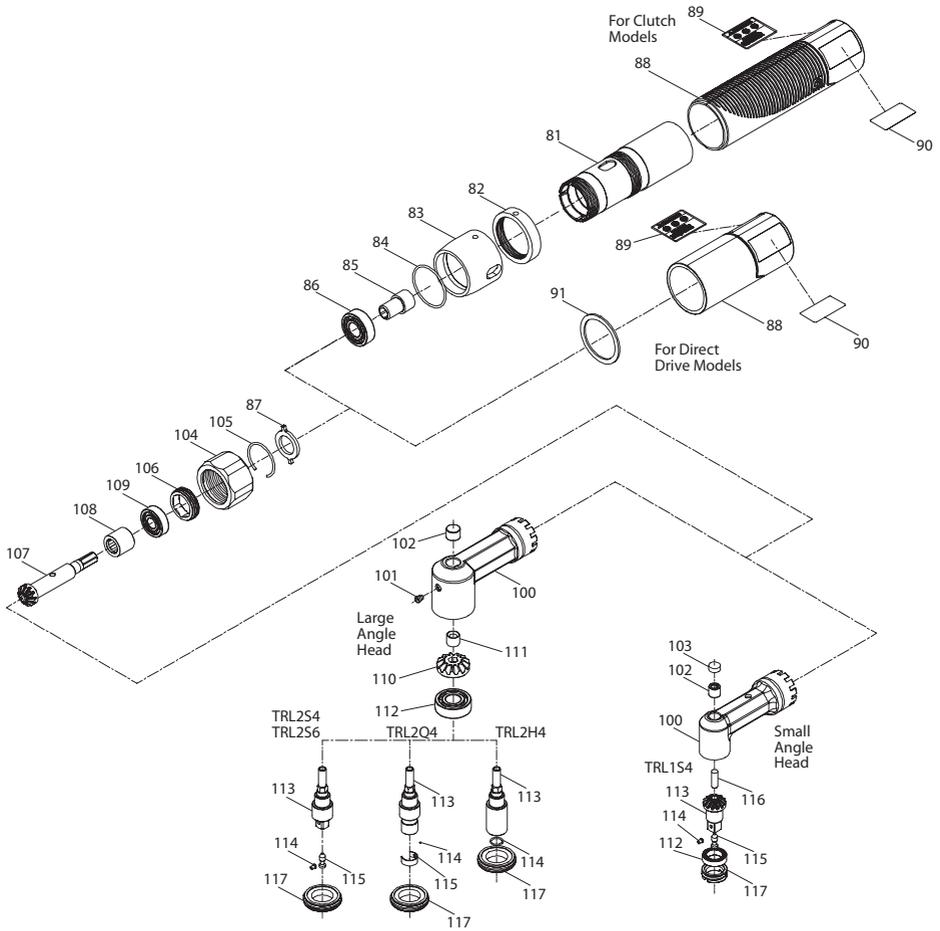
(Dwg. TPA1764)

## QA1L Angle Fastener Clutches Parts List

| Item | Part Description                                                                                          | Part Number | Item | Part Description                                                                                   | Part Number |
|------|-----------------------------------------------------------------------------------------------------------|-------------|------|----------------------------------------------------------------------------------------------------|-------------|
|      | Automatic Shutoff Clutch Assembly                                                                         |             | 67   | Clutch Pushrod                                                                                     | TRH-236-C   |
|      | with heavy clutch spring<br>(standard)                                                                    | TRH-AH579   | 68   | Clutch Shaft                                                                                       | TRH-502     |
|      | with medium clutch spring                                                                                 | TRH-AM579   | 69   | Clutch Ball (1/8" diameter) (12)                                                                   | AVI-255     |
|      | with light clutch spring                                                                                  | TRH-AL579   | 70   | Cam Jaw                                                                                            |             |
| 46   | Clutch Return Spring                                                                                      | TRH-405     |      | for Series QA1L02, QA1L05, QA1L08<br>and QA1L12                                                    | TRH-721-C   |
| 47   | Clutch Input Driver                                                                                       | TRH-103     |      | for Series QA1L18                                                                                  | TRH-722-C   |
| 48   | Automatic Shutoff Plunger                                                                                 | TRH-408     | 71   | Clutch Cam Ball Driver                                                                             | TRH-581-C   |
| 49   | Automatic Shutoff Plunger Return Spring                                                                   | TRH-420     | 72   | Clutch Cam Ball (1/8" diameter) (11)                                                               | AVI-255     |
| 50   | Automatic Shutoff Pin                                                                                     | TRH-704     | 73   | Clutch Cam Ball Driver Retaining Pin                                                               | TRH-188     |
| 51   | Automatic Shutoff Pin Spring                                                                              | TRH-407     | 74   | Cam Ball Seat                                                                                      | TRH-627-C   |
| 52   | Clutch Shaft                                                                                              | TRH-502     | 75   | Clutch Spring                                                                                      |             |
| 53   | Clutch Ball (1/8" diameter) (12)                                                                          | AVI-255     |      | heavy (green)                                                                                      | TRH-H583    |
| 54   | Cam Jaw                                                                                                   | TRH-721     |      | medium (red)                                                                                       | TRH-M583    |
| 55   | Clutch Cam Ball Driver                                                                                    | TRH-581     |      | light (orange)                                                                                     | TRH-XL583   |
| 56   | Clutch Cam Ball (1/4" diameter) (3)                                                                       | 4U-722      | 76   | Spring Seat                                                                                        | TRH-623     |
| 57   | Clutch Driver Retaining Pin                                                                               | TRH-188     | 77   | Thrust Bearing                                                                                     | 161A32-105  |
| 58   | Cam Ball Seat                                                                                             | TRH-627     | 78   | Clutch Adjusting Nut Washer                                                                        | TRH-582     |
| 59   | Clutch Spring                                                                                             |             | 79   | Clutch Adjusting Nut                                                                               | TRH-588     |
|      | heavy (green)                                                                                             | TRH-H583    | 80   | Clutch Adjusting Nut Stop                                                                          | 353-701     |
|      | medium (red)                                                                                              | TRH-M583    | 81   | Clutch Housing                                                                                     | TRL-580     |
|      | light (orange)                                                                                            | TRH-XL583   | 82   | Grip Retaining Nut                                                                                 | TRL-40-305  |
| 60   | Spring Seat                                                                                               | TRH-623     | 83   | Clutch Adjusting Hole Cover                                                                        | TRL-415     |
| 61   | Thrust Bearing                                                                                            | 161A32-105  | 84   | Cover O-Ring                                                                                       | TRL-415-272 |
| 62   | Clutch Adjusting Nut Washer                                                                               | TRH-582     | 85   | Angle Wrench Drive Adapter                                                                         | TRL-586     |
| 63   | Clutch Adjusting Nut                                                                                      | TRH-588     | 86   | Drive Adapter Bearing                                                                              | TRH-510     |
| 64   | Clutch Adjusting Nut Stop                                                                                 | 353-701     | 87   | Housing Lock Spacer                                                                                | TRL-682     |
| *    | Automatic Shutoff Tune-Up Kit (Includes<br>the following items: 35, 46, 49, 51, 53,<br>56, 57, 61 and 64) | Q2-AS0-TK1  | 88   | Grip Assembly                                                                                      |             |
|      |                                                                                                           |             |      | for Clutch Models                                                                                  | TRH-40-A135 |
|      |                                                                                                           |             |      | for Direct Drive Models                                                                            | TRH-40-A136 |
|      | Cushion Clutch Assembly                                                                                   |             | 89   | Nameplate                                                                                          | TRH-301     |
|      | with heavy clutch spring<br>(standard)                                                                    | TRH-AH579-C | 90   | Warning Label                                                                                      | TRH-99      |
|      | with medium clutch spring                                                                                 | TRH-AM579-C | 91   | Grip Spacer                                                                                        | TRL-504     |
|      | with light clutch spring                                                                                  | TRH-AL579-C | *    | Clutch Housing Spanner Wrench                                                                      | TRH-478     |
| 65   | Clutch Return Spring                                                                                      | TRH-405     | *    | Cushion Clutch Tune-Up Kit (Includes the<br>following items: 65, 67, 69, 72, 73, 76, 77<br>and 80) | Q2-CC-TK1   |
| 66   | Clutch Input Driver                                                                                       | TRH-103     |      |                                                                                                    |             |

\* Not Illustrated.

# QA1L Angle Fastener Grip and Angle Attachments Exploded Diagram



(Dwg. TPA1765-1)

## QA1L Angle Fastener Grip and Angle Attachments Parts List

| Item | Part Description            | Part Number  |              |              |              |              |
|------|-----------------------------|--------------|--------------|--------------|--------------|--------------|
|      |                             | TRL154       | TRL2H4       | TRL254       | TRL256       | TRL2Q4       |
|      | Angle Housing Assembly      | TRL154       | TRL2H4       | TRL254       | TRL256       | TRL2Q4       |
| 100  | Angle Housing               | TRL1-550     | TRL2-A550    | TRL2-A550    | TRL2-A550    | TRL2-A550    |
| 101  | Grease Fitting              | ---          | D0F9-879     | D0F9-879     | D0F9-879     | D0F9-879     |
| 102  | Spindle Upper Bearing       | W22-654      | TRL2-603     | TRL2-603     | TRL2-603     | TRL2-603     |
| 103  | Spindle Upper Bearing Cap   | TRL2-531     | ---          | ---          | ---          | ---          |
| 104  | Coupling Nut                | TRL-27       | TRL-27       | TRL-27       | TRL-27       | TRL-27       |
| 105  | Coupling Nut Retainer       | TRL-29       | TRL-29       | TRL-29       | TRL-29       | TRL-29       |
| 106  | Angle Head Plug             | TRL1-532     | TRL1-532     | TRL1-532     | TRL1-532     | TRL1-532     |
| 107  | Bevel Pinion                | TRL1-552     | TRL2-552     | TRL2-552     | TRL2-552     | TRL2-552     |
| 108  | Pinion Front Bearing        | TRL-654      | H54U-511B    | H54U-511B    | H54U-511B    | H54U-511B    |
| 109  | Pinion Rear Bearing         | TRL-514      | TRL-514      | TRL-514      | TRL-514      | TRL-514      |
| 110  | Bevel Gear                  | ---          | TRL2-551     | TRL2-551     | TRL2-551     | TRL2-551     |
| 111  | Bevel Gear Retainer         | ---          | TRL2-578     | TRL2-578     | TRL2-578     | TRL2-578     |
| 112  | Spindle Lower Bearing       | TRL1-593     | R00B1-510    | R00B1-510    | R00B1-510    | R00B1-510    |
| 113  | Spindle                     | TRL1-A551-S4 | TRL2-A607-H4 | TRL2-A607-S4 | TRL2-A607-S6 | TRL2-A607-Q4 |
| 114  | Spindle Detent              | 47028        | 38790        | 47028        | 30889        | R000B-263    |
| 115  | Detent Retainer             | 46749        | ---          | 46749        | 30890        | TRH-241      |
| 116  | Spindle Upper Bearing Shaft | TRL1-110     | ---          | ---          | ---          | ---          |
| 117  | Lower Spindle Bearing Cap   | TRL1-531     | 120A4-531    | 120A4-531    | 120A4-531    | 120A4-531    |
| *    | Spindle Bearing Cap Wrench  | ---          | 141A12-26    | 141A12-26    | 141A12-26    | 141A12-26    |

\* Not Illustrated.

## Clutch Spring Selection Chart

| Tool                                        | Free Speed (rpm) | Torque Range (Soft Draw)                  |                                           |                                            |
|---------------------------------------------|------------------|-------------------------------------------|-------------------------------------------|--------------------------------------------|
|                                             |                  | Light Clutch Spring (Orange)              | Medium Clutch Spring (Red)                | Heavy Clutch Spring (Green)                |
| All Series QA1L18 models                    | 1750             | 2.0 to 11.5 in.-lbs.<br>(0.23 to 1.30 Nm) | 9.3 to 26.1 in.-lbs.<br>(1.05 to 2.95 Nm) | ---                                        |
| All Series QA1L12 models                    | 1270             | 2.0 to 11.5 in.-lbs.<br>(0.23 to 1.30 Nm) | 9.3 to 32.2 in.-lbs.<br>(1.05 to 3.64 Nm) | ---                                        |
| Series QA1L08 models with large Angle Heads | 850              | 2.0 to 11.5 in.-lbs.<br>(0.23 to 1.30 Nm) | 9.3 to 33.4 in.-lbs.<br>(1.05 to 3.77 Nm) | 15.7 to 47.2 in.-lbs.<br>(1.77 to 5.33 Nm) |
| Series QA1L08 models with small Angle Heads |                  | 2.0 to 11.5 in.-lbs.<br>(0.23 to 1.30 Nm) | 9.3 to 36.0 in.-lbs.<br>(1.05 to 4.07 Nm) | ---                                        |
| Series QA1L05 models with large Angle Heads | 500              | 2.0 to 11.5 in.-lbs.<br>(0.23 to 1.30 Nm) | 9.3 to 33.4 in.-lbs.<br>(1.05 to 3.77 Nm) | 15.7 to 56.4 in.-lbs.<br>(1.77 to 6.37 Nm) |
| Series QA1L05 models with small Angle Heads |                  | 2.0 to 11.5 in.-lbs.<br>(0.23 to 1.30 Nm) | 9.3 to 36.0 in.-lbs.<br>(1.05 to 4.07 Nm) | ---                                        |
| Series QA1L02 models with large Angle Heads | 250              | 2.0 to 11.5 in.-lbs.<br>(0.23 to 1.30 Nm) | 9.3 to 33.4 in.-lbs.<br>(1.05 to 3.77 Nm) | 15.7 to 56.4 in.-lbs.<br>(1.77 to 6.37 Nm) |
| Series QA1L02 models with small Angle Heads |                  | 2.0 to 11.5 in.-lbs.<br>(0.23 to 1.30 Nm) | 9.3 to 36.0 in.-lbs.<br>(1.05 to 4.07 Nm) | ---                                        |

## Parts and Maintenance

When the life of the tool has expired, it is recommended that the tool be disassembled, degreased and parts be separated by material so that they can be recycled.

Tool repair and maintenance should only be carried out by an authorized Service Center.

Refer all communications to the nearest **Ingersoll Rand** Office or Distributor.

## Related Documentation

For additional information refer to:

Product Safety Information Manual 04585006.

Product Information Manual 80167406.

Maintenance Information Manual 16575201.

Manuals can be downloaded from [www.irttools.com](http://www.irttools.com).

[www.irttools.com](http://www.irttools.com)

© 2008 **Ingersoll Rand** Company

