



16609091
Edition 1
September 2008

Multi Spindle Fixtures Assembly Instructions

QMM

Maintenance Information



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 **Ingersoll Rand**

⚠ WARNING

Always wear eye protection when operating or performing maintenance on this tool.
Always turn off the electrical and air supply and disconnect the electrical and air supply hose before installing, removing or adjusting any accessory on this tool or before performing any maintenance on this tool.

Vertical Assembly - 2 Tubes

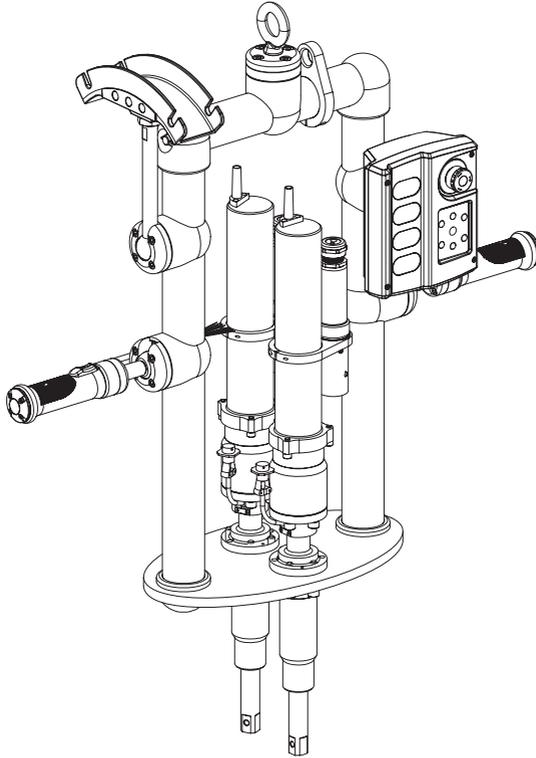


Figure 1

Vertical Assembly - 2 Tubes Exploded View

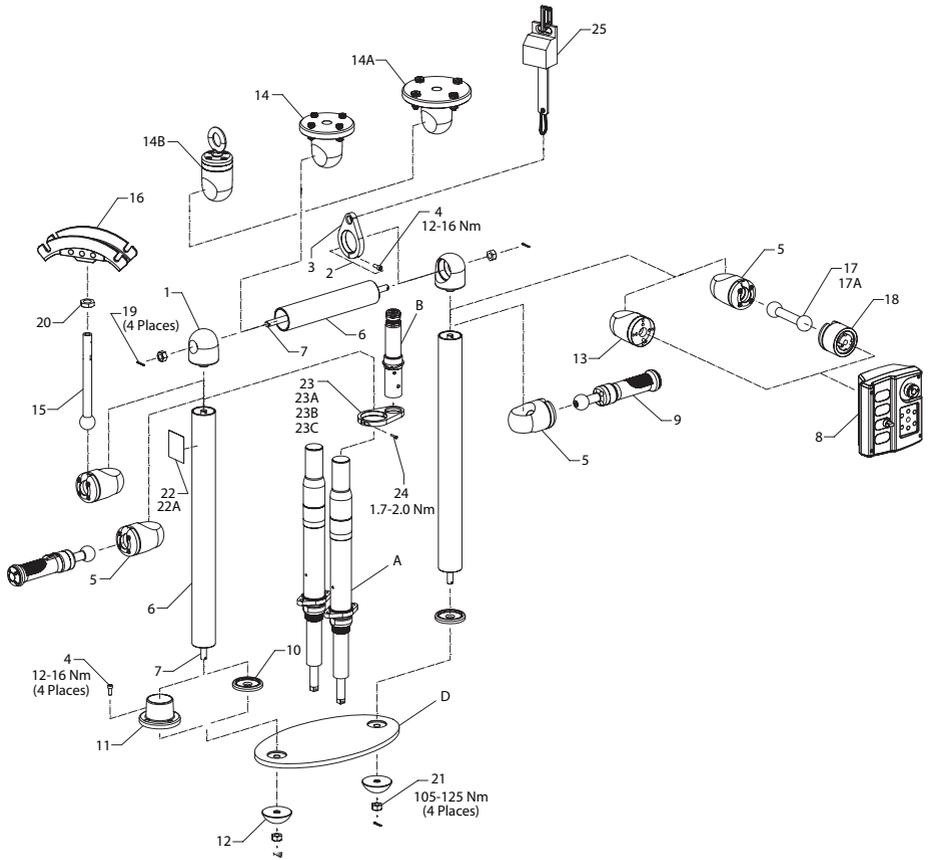


Figure 2

Vertical Assembly - 2 Tubes Parts List

Item	Part Description	Item	Part Description
1	Tube Elbow Joint	17	Ball to Ball Shaft-Short
2	Hanger Assembly	17A	Ball to Ball Shaft-Long
3	Hanger	18	Flat/Tube Holder Assembly
4	Cap Head Screw (M6 x 1 x 16)	19	Cotter Pin
5	Tube Holder Assembly	20	Lock Nut
6	Tube- Standard 1 Meter	21	Hex. Nut - M12 x 1.75
7	Tie Rod-Standard 1 Meter	22	QMM Warning Label
8	Control Panel	22A	QMM Branding Label
9	Handle	23	POD Mounting Bracket for Tube
10	Tube Bracket Vertical	23A	POD Mounting Bracket for QM9 Motor
11	Tube Bracket Horizontal	23B	POD Mounting Bracket for QM7 Motor
12	Spherical Washer	23C	POD Mounting Bracket for QM5 Motor
13	Control Panel Mount Assembly	24	Cap Head Screw (M3 x 0.5 x 16)
14	Suspension Joint - 100 Nm	25	Retractable Safety Strap
14A	Suspension Joint - 500 Nm	A	Tool
14B	Suspension Joint - Eye Bolt	B	Electronics Pod
15	Ball End Shaft	D	Tool Mount Plate
16	Cable Tray		

Assembly steps for Vertical Assembly - 2 Tubes

- Assemble Tube Elbow Joint (1) with horizontal Tierod (7) using Nut (21).
- Insert Horizontal Tube (6) into Horizontal Tierod (7) to mate with Tube Elbow Joint (1).
- Insert Suspension Joint-100 Nm/Suspension Joint-500 Nm/Suspension Joint-Eye Bolt (14/14A/14B) and a Hanger (3) over horizontal Tube (6).
- Assemble Suspension Joint-100 Nm/Suspension Joint-500 Nm/Suspension Joint-Eye Bolt (14/14A/14B) slides over horizontal Tube (6). Determine the desired position for this and lock the same as per instructions given under **Suspension Assemblies**.
- Orient Hanger (3) over horizontal Tube (6) and lock position using fastener Cap Head Screw (4).
- Assemble another Tube Elbow Joint (1) at the free end of Horizontal Tierod (7) with Nut (21).
- Secure both ends of horizontal Tierod (7) with Cotter Pins (19).
- Fully engage Tierod (7) in vertical orientation to each Tube Elbow Joint (1) in assembly done upto step 7.
- Insert two Tubes (6) in vertical orientation through each Tierods assembled in step 8.
- Decide on the number of Tube Holder Assembly (5) and Control Panel Mount Assembly (13) (if required) to be used basis the application and insert the same over the Tubes (6).
- Mount the Tool Mount Plate (D) with two Tube Bracket Vertical/Tube Bracket Horizontal (10/11) (as required) on corresponding holes in Tool Mount Plate (D). If Tube Bracket Horizontal (11) is used, fasten using Cap Head Screw (4) to secure it with Tool Mounting Plate (D).
- Mount assembly in step 11 with free ends of Tubes (6) in step 9 by aligning both Tubes (6) with corresponding Tube Bracket Vertical/Tube Bracket Horizontal (10/11).
- Secure the above assembly by fastening two Nuts (21), with Washer (12) to vertical Tierod (7).
- Assemble Control Panel (8) with Control Panel Mount Assembly (13) (as per instructions given under **Control Panel Mount Assembly**) and lock at required orientation over one of the Tubes (6). If Tube Holder Assembly (5), Ball to Ball Shaft-Short/Ball to Ball Shaft-Long (17/17A) and Flat/Tube Holder Assembly (18) are used to mount Control Panel (8) follow steps 15, 16 and 17.
- Assemble Flat/Tube Holder Assembly (18) with Control Panel (8) on one side and Ball to Ball Shaft-Short/Ball to Ball Shaft-Long (17/17A) on another side (as per instructions given under **Flat Holder Assembly**).
- Assemble the free end of Ball to Ball Shaft-Short/Ball to Ball Shaft-Long (17/17A) with Tube Holder Assembly (5) (already assembled with Tube (6) in step 10).
- Orient Control Panel (8) at desired location and in this position, lock both Flat/Tube Holder Assembly (18) and Tube Holder Assembly (5) as per instructions given under **Flat Holder Assembly** and **Tube Holder Assembly** respectively.
- Assemble Cable Tray (16) with Tube Holder Assembly (5) as per instructions given under **Cable Tray Assembly**.
- Mount Handles (9) on Tubes (6) using corresponding Tube Holder Assembly (5) as per instructions given under **Cable Tray Assembly**, lock the Handles (9) at desired orientation.
- Clamp Tools (A) on to Tool Mount Plate (D) as per instructions in tool manual.
- Mount Electronics Pod (B) on Tool (A) as per instructions given under **Pod Holder Assembly**.
- Route the cables from the Tool (A) through Cable Tray (16) and secure them in place using cable ties.
- Fasten all the screws at recommended torque and apply loctite where ever specified.
- Paste Warning Label (22) and Branding Label (22A) at appropriate positions.
- Once the unit is installed at the site, assemble a Safety Strap (25) into Hanger (3).

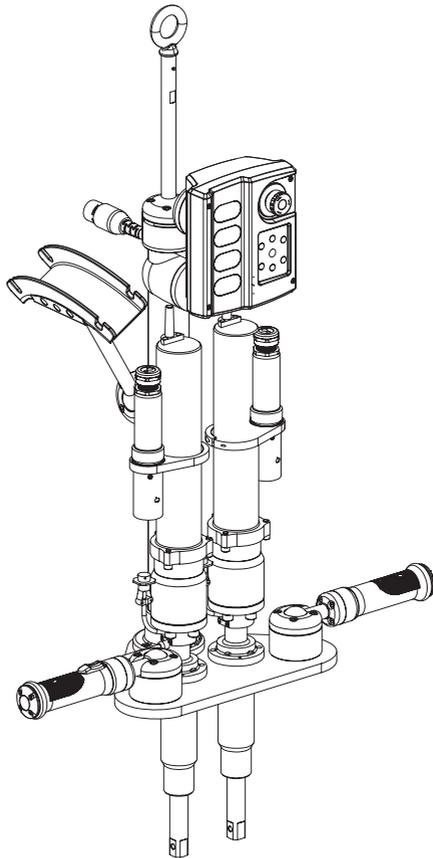


Figure 3

Vertical Assembly - 1 Tube Exploded View

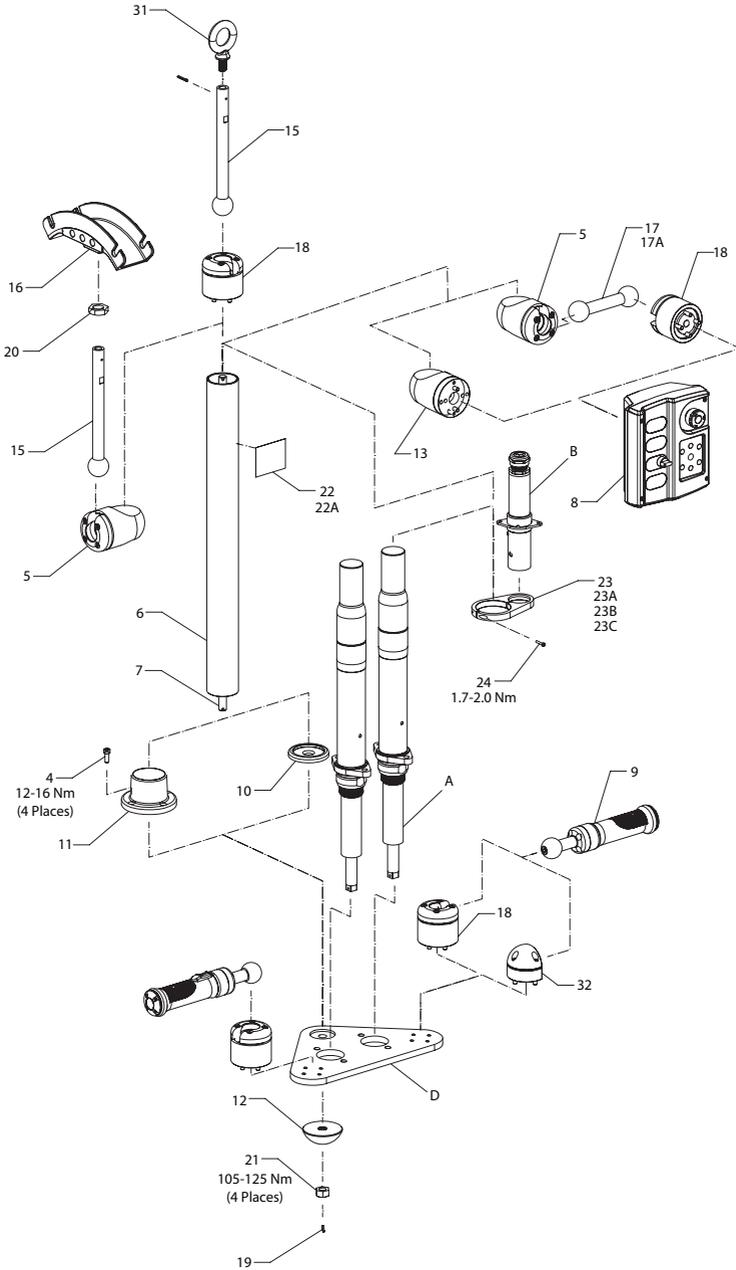


Figure 4

Vertical Assembly - 1 Tube Parts List

Item	Part Description	Item	Part Description
4	Cap Head Screw (M6 x 1 x 16)	19	Cotter Pin
5	Tube Holder Assembly	20	Lock Nut
6	Tube-Standard 1 Meter	21	Hex. Nut-M12 x 1.75
7	Tie Rod-Standard 1 Meter	22	QMM Warning Label
8	Control Panel	22A	QMM Branding Label
9	Handle	23	POD Mounting Bracket for Tube
10	Tube Bracket Vertical	23A	POD Mounting Bracket for QM9 Motor
11	Tube Bracket Horizontal	23B	POD Mounting Bracket for QM7 Motor
12	Spherical Washer	23C	POD Mounting Bracket for QM5 Motor
13	Control Panel Mount Assembly	24	Cap Head Screw (M3 x 0.5 x 16)
15	Ball End Shaft	31	Eye Bolt
16	Cable Tray	32	Plate Holder Assembly
17	Ball to Ball Shaft-Short	A	Tool
17A	Ball to Ball Shaft-Long	B	Electronics Pod
18	Flat/Tube Holder Assembly	D	Tool Mount Plate

Assembly steps for Vertical Assembly - 1 Tube

- Fasten Tierod (7) with Flat/Tube Holder Assembly (18), as per instructions given under **Tube End Suspension Assembly**.
- Insert Tube (6) from free end of Tierod to mate with Flat/Tube Holder Assembly (18).
- Insert a Tube Holder Assembly (5) and a Control Panel Mount Assembly/Tube Holder Assembly (13/5), (as per requirement to mount control panel) from the free end of Tube (6).
- Refer **Control Panel Mount Assembly** for assembly instructions of Control Panel Mount Assembly (13) with Tube (6) and **Tube Holder Assembly** for assembly instructions of Tube Holder Assembly (5) with Tube (6).
- If Tube Bracket Horizontal (11) is used with Tool Mount Plate (D), align Tube Bracket Horizontal (11) with mating hole in Tool Mount Plate (D) and secure with fastener Cap Head Screw (4) or if Tube Bracket Vertical (10) is used, align Tube Bracket Vertical (10) with mating hole in Tool Mount Plate (D).
- Assemble sub assembly in step 2 with sub assembly in step 5, by inserting the Tube (6) into Tube Bracket Vertical/Tube Bracket Horizontal (10/11).
- Secure the above assembly by fastening Nut (21), with Washer (12) to Tierod (7).
- Insert a Cotter Pin (19) through hole provided in Tierod (7).
- Assemble Flat/Tube Holder Assembly (18) with Ball End Shaft (15) and Eye Bolt (31) as per instructions given under **Tube End Suspension Assembly** for suspension.
- Assemble Control Panel (8) with Control Panel Mount Assembly (13), (as per instructions given under **Control Panel Mount Assembly**) and lock at required orientation over Tube (6) or if Tube Holder Assembly (5), Ball to Ball Shaft-Short/Ball to Ball Shaft-Long (17/17A) and Flat/Tube Holder Assembly (18) are used to mount Control Panel (8) follow steps 11, 12 and 13.
- Assemble Flat/Tube Holder Assembly (18) with Control Panel (8) on one side and Ball to Ball Shaft-Short/Ball to Ball Shaft-Long (17/17A) on another side (as per instructions given under **Flat Holder Assembly**).
- Assemble the free end of Ball to Ball Shaft-Short/Ball to Ball Shaft-Long (17/17A) with Tube Holder Assembly (5), (already assembled with Tube (6) in step 3).
- Orient control panel at desired location and in this position, lock both Flat/Tube Holder Assembly (18) and Tube Holder Assembly (5) as per instructions given under **Flat Holder Assembly** and **Tube Holder Assembly** respectively.
- Assemble Cable Tray (16) with Tube Holder Assembly (5) as per instructions given under **Cable Tray Assembly**.
- Mount Handles (9) with Flat/Tube Holder Assembly (18), (as per instructions given under **Flat Holder Assembly**) or Plate Holder Assembly (32) as required.
- Clamp Tools (A) on to Tool Mount Plate (D) as per instructions in tool manual.
- Mount Electronics Pod (B) on Tool (A) as per instructions given under **Pod Holder Assembly**.
- Route the cables from Tool (A) through Cable Tray (16) and secure them in place using cable ties.
- Fasten all the screws at recommended torque and apply loctite where ever specified.
- Paste Warning Label (22) and Branding Label (22A) at appropriate positions.

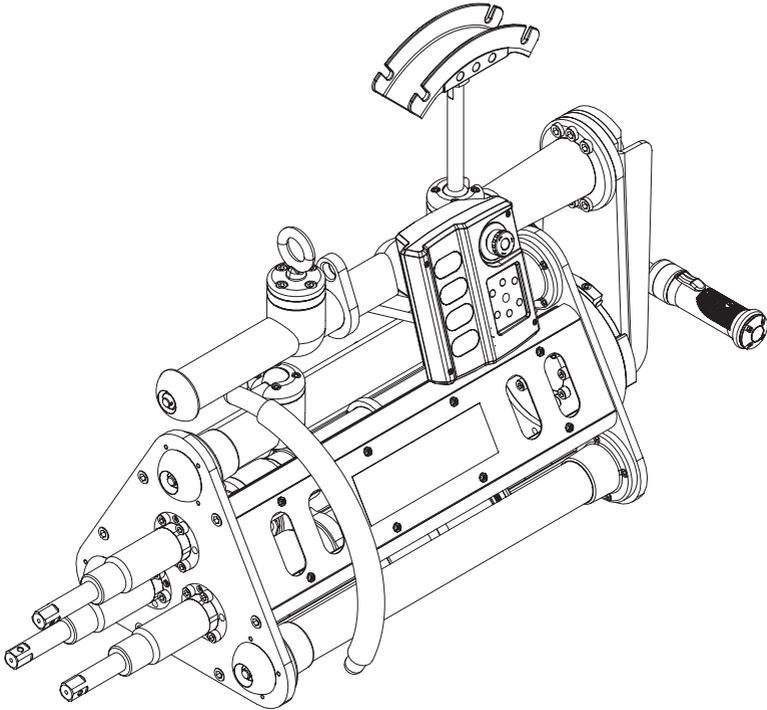


Figure 5

Horizontal Assembly - 3 Tubes Closed Exploded Views

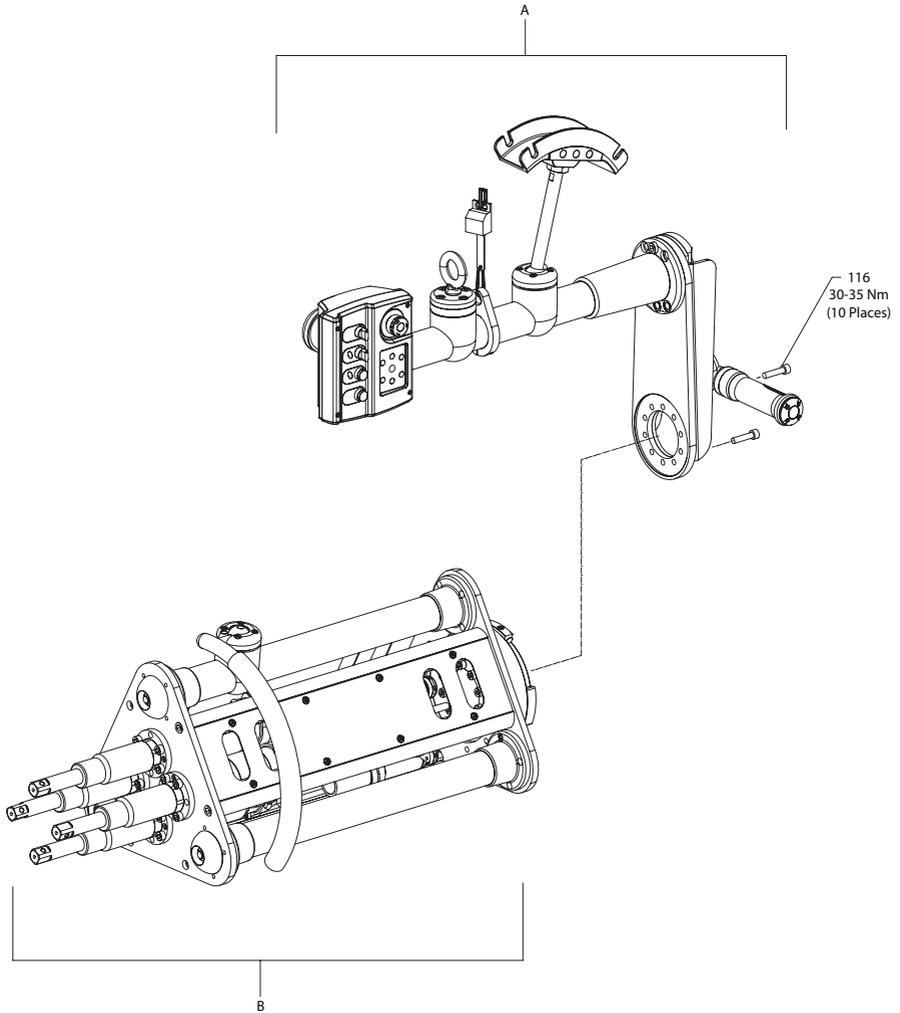


Figure 6

Assembly steps for Figure 6, 7 & 8

1. Align assembly in A with B as shown in Fig 6.
2. Secure assembly in step 1 with fastener Cap Head Screw (116), apply serviceable loctite to fasteners Cap Head Screw (116).
3. Refer following steps to assemble view A and view B.

Horizontal Assembly - 3 Tubes Closed Parts List

Item	Part Description	Item	Part Description
2	Hanger Assembly	32	Plate Holder Assembly
3	Hanger	101	Corner Spacer-1 Meter
4	Cap Head Screw (M6 x 1 x 16)	103	Back Plate for Small Bearing Assembly
5	Tube Holder Assembly	103A	Back Plate for Large Bearing Assembly
6	Tube- Standard 1 Meter	104	Back Plate Rib for Small Bearing Assembly
7	Tie Rod-Standard 1 Meter	104A	Back Plate Rib for Large Bearing Assembly
8	Control Panel	105	Redundant Back Plate for Small Bearing Assembly
9	Handle	105A	Redundant Back Plate for Large Bearing Assembly
10	Tube Bracket Vertical	106	Suspension Tube Bracket
11	Tube Bracket Horizontal	107	Circular Handle for Small Bearing Assembly
12	Spherical Washer	107A	Circular Handle for Large Bearing Assembly
13	Control Panel Mount Assembly	108	Suspension Tube-Standard 1 Meter
14	Suspension Joint-100 Nm	109	Small Bearing Assembly
14A	Suspension Joint-500 Nm	109A	Large Bearing Assembly
14B	Suspension Joint-Eye Bolt	110	Channel Nut-M6
15	Ball End Shaft	111	Button Head Screw-M6
16	Cable Tray	112	Grip-Circular Handle for Small Bearing Assembly
17	Ball to Ball Shaft-Short	112A	Grip-Circular Handle for Large Bearing Assembly
17A	Ball to Ball Shaft-Long	113	Tube End Cap
18	Flat/Tube Holder Assembly	114	Suspension Support
20	Lock Nut	116	Cap Head Screw (M8 x 1.25 x 25)
21	Hex. Nut-M12 x 1.75	117	Cap Head Screw (M10 x 1.5 x 25)
22	QMM Warning Label	119	Cap Head Screw (M10 x 1.5 x 35)
22A	QMM Branding Label	231	Cap Head Screw (M8 x 1.25 x 20)
23	POD Mounting Bracket for Tube	A	Tool
23A	POD Mounting Bracket for QM9 Motor	B	Electronics Pod
23B	POD Mounting Bracket for QM7 Motor	C	Back Plate
23C	POD Mounting Bracket for QM5 Motor	D	Tool Mount Plate
24	Cap Head Screw (M3 x 0.5 x 16)	E	Sheet Metal Cover
25	Retractable Safety Strap		

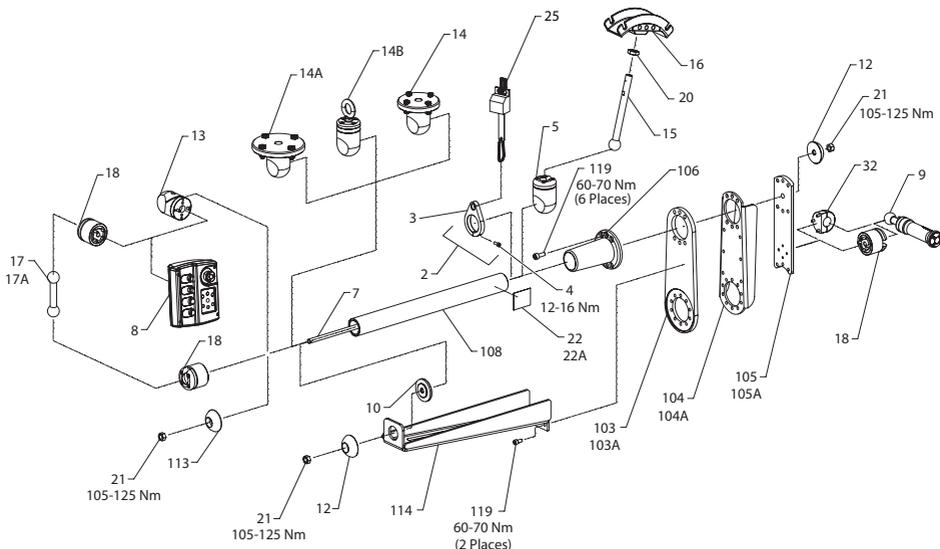


Figure 7

Assembly steps for Fig 6, 7 & 8 (Continued...)

4. Align Suspension Tube Bracket (106), Back Plate for Small Bearing Assembly/Back Plate for Large Bearing Assembly (103/103A), Back Plate Rib for Small Bearing Assembly/Back Plate Rib for Large Bearing Assembly (104/104A) and Redundant Back Plate for Small Bearing Assembly/Redundant Back Plate for Large Bearing Assembly (105/105A) inline as in Figure 7.
5. Secure assembly in step 4 with fastener Cap Head Screw (119).
6. Insert Suspension Tube (108) from open end of Suspension Tube Bracket (106), to mate it with Redundant Back Plate for Small Bearing Assembly/Redundant Back Plate for Large Bearing Assembly (105/105A).
7. Insert sub assemblies Suspension Joint-100 Nm/Suspension Joint-500 Nm/Suspension Joint-Eye Bolt (14/14A/14B), Control Panel Mount Assembly (13) (if required), Tube Holder Assembly (5) and Hanger (3) over Suspension Tube (108).
8. Align Suspension Support (114) and Tube Bracket Vertical (10) inline with Suspension Tube (108) (only if sub assembly Large Bearing Assembly (109A) is used) as in Figure 7.
9. Assemble a Tierod (7) with fastener Nut (21) through Tube End Cap (113) (or Spherical Washer (12) if Suspension Support (114) is used) or with Flat/Tube Holder Assembly (18) (refer **Tube End Suspension Assembly** for assembly instruction on this) on one end.
10. Enter the free end of Tierod (7) into the open end of Suspension Tube (108) and pass through assembly in step 5 as shown in Figure 7.
11. Secure the above assembly by fastening Nut (21), with Washer (12), to Tierod (7).
12. Fasten other end of Suspension Support (114) to Back Plate for Large Bearing Assembly (103A) using Cap Head Screw (119).
13. Assemble Ball End Shaft (15), Cable Tray (16) and Nut (20) as per instructions given under **Cable Tray Assembly**.
14. Assemble sub assembly in step 13, with ball end of Ball End Shaft (15) into sub assembly Tube Holder Assembly (5) at desired location and orientation. (Refer **Tube Holder Assembly** for detailed instructions).
15. If Control Panel Mount Assembly (13) is used to mount Control Panel (8), assemble Control Panel Mount Assembly (13) and Control Panel (8) as per instructions given under **Control Panel Mount Assembly**.
16. If Ball to Ball Shaft-Short Ball to Ball Shaft-Long (17/17A) and Flat/Tube Holder Assembly (18) are used to mount Control Panel (8), first assemble Ball to Ball Shaft-Short Ball to Ball Shaft-Long (17/17A) with Flat/Tube Holder Assembly (18), assembled with Tierod (7), as per instructions given under **Flat Holder Assembly**.
17. Assemble another Flat/Tube Holder Assembly (18) with Control Panel (8) as per instructions given under **Flat Holder Assembly**.
18. Assemble sub assembly in step 17 with sub assembly in step 16 and secure at required orientation as shown in Figure 7.
19. Lock positions of Suspension Joint-100 Nm/Suspension Joint-500 Nm/Suspension Joint-Eye Bolt (14/14A/14B) as per given under **Suspension Assemblies** and Control Panel Mount Assembly (13) (if used) as per given under **Control Panel Mount Assembly**.
20. Orient the position of Redundant Eye (3) and secure it with fastener Cap Head Screw (4) as shown in Figure 7.
21. Assemble bearing assembly Small Bearing Assembly/Large Bearing Assembly (109/109A) and Back Plate for Small Bearing Assembly/Back Plate for Large Bearing Assembly (103/103A) using fasteners Cap Head Screw (116), (apply serviceable loctite to fasteners) as in Figure 6.
22. Assemble Tube Bracket Horizontal (11) with Back Plate (C) using fasteners Cap Head Screw (4), (apply serviceable loctite to fasteners) as shown in Figure 8.

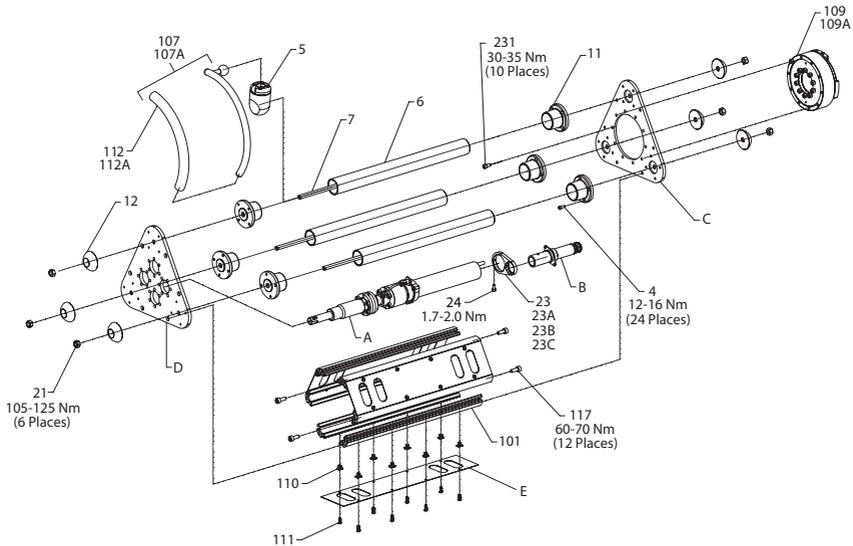


Figure 8

Assembly steps for Fig 6, 7 & 8 (Continued...)

23. Assemble Tube Bracket Horizontal (11) with Tool Mount Plate (D) using fasteners Cap Head Screw (4), (apply serviceable loctite to fasteners) as in Figure 8.
24. Insert Tubes (6) into each Tube Bracket Horizontal (11) of sub assembly in step 22.
25. Assemble Tube Holder Assembly (5) over upper Tube (6) and locate at appropriate position (refer Figure 8).
26. Mount sub assembly in step 23 over free ends of Tubes (6), aligning all Tube Bracket Horizontal (11) with Tube (6).
27. Insert Tierod (7) through each Tube (6) and secure the sub assembly in step 26 with Spherical Washer (12) and Nut (21) on either side.
28. Slide in Grip-Circular Handle for Small Bearing Assembly/Grip-Circular Handle for Large Bearing Assembly (112/112A) into the free end of Circular Handle for Small Bearing Assembly/Circular Handle for Large Bearing Assembly (107/107A).
29. Assemble sub assembly in step 28 with Tube Holder Assembly (5) as per instructions given under **Tube Holder Assembly**. Lock assembly at desired position and orientation.
30. Mount sub assembly created from step 22 to step 29 over sub assembly created from step 4 to step 21 using fasteners Cap Head Screw (231) provided with Small Bearing Assembly/Large Bearing Assembly (109/109A).
31. Fasten the Tool (A) onto Tool Mounting Plate (D), (for tool mounting instructions refer manuals of respective tool).
32. Mount Electronics Pod (B) onto Tool (A) as per instructions given under **Pod Holder Assembly**. Orient the electronics pod in a cyclic fashion, as to occupy minimum space.
33. Ensure the cables from the Tool (A) being routed from the central hole in sub assembly Small Bearing Assembly/Large Bearing Assembly (109/109A).
34. Route the cables from Tool (A) through Cable Tray (16) and secure them in place using cable ties.
35. If cover is used, place the flat face of Corner Spacer (101) on either side of the Sheet Metal Cover (E), (cover can be used only for 3 tube and 4 tube configurations).
36. Secure Sheet Metal Cover (E) to Corner Spacer (101) using screw Button Head Screw (111) and Spring Nut (110).
37. Place one each of sub assemblies in step 36 between a pair of tubes and secure the same with Back Plate (C) and Tool Mounting Plate (D) using fasteners Cap Head Screw (117), (refer Figure 8).
38. Assemble Handle (9) to Redundant Back Plate for Small Bearing Assembly/Redundant Back Plate for Large Bearing Assembly (105/105A) using Flat/Tube Holder Assembly (18), (refer **Flat Holder Assembly** for detailed instructions) or Plate Holder Assembly (32) as per application (refer Figure 7).
39. Suspend the whole assembly using a torque tube (if Suspension Joint-100 Nm (14) or Suspension Joint-500 Nm (14A) is chosen) or spring balancer (if Suspension Joint-Eye Bolt (14B) chosen).
40. Assemble a Safety Strap (25) into sub assembly Hanger Assembly (2).
41. Paste Warning Label (22) and Branding Label (22A) at appropriate positions (refer Figure 7).

Tube Holder Assembly Exploded View

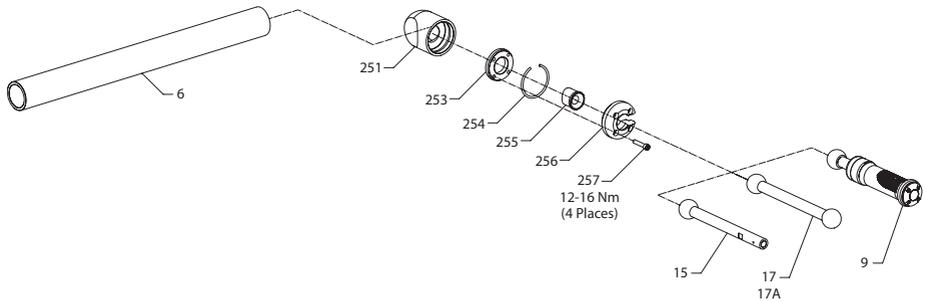


Figure 9

Tube Holder Assembly Parts List

Item	Part Description	Item	Part Description
6	Tube	253	Nut Plate
9	Handle	254	Internal Ring Round Wire
15	Ball End Shaft	255	Ball Shuttle
17	Ball to Ball Shaft-Short	256	Socket Ring
17A	Ball to Ball Shaft-Long	257	Cap Head Screw (M6 x 1 x 30)
251	Holder		

Assembly steps for Tube Holder Assembly

- Slide-in Holder (251) over Tube (6) as in Figure 9.
- Insert Nut Plate (253) into Holder (251) with larger diameter entering first.
- Insert Ball Shuttle (255) inside Holder (251) with curved face entering first.
- Snap fit Internal Ring Round Wire (254) into Holder (251) and ensure its positioning into the groove provided.
- Engage ball end of Handle/Ball End Shaft/Ball to Ball Shaft-Short (9/15/17) via slot of Socket Ring (256) and align the ball to be in-between curved faces of Socket Ring (256) and Ball Shuttle (255).
- Align Socket Ring (256) to Nut Plate (253). Set the orientation of Handle/Ball End Shaft/Ball to Ball Shaft-Short (9/15/17) and then clamp Socket Ring (256) to Nut Plate (253) using fastener Cap Head Screw (257).
- Once Socket Ring (256) is clamped to Nut Plate (253), the position and orientation of Holder (251) is also locked automatically with respect to Tube (6).
- Loosening of fastener Cap Head Screw (257) will allow adjusting the orientation of Handle/Ball End Shaft/Ball to Ball Shaft-Short (9/15/17). Fastening these back, to the recommended torque value, makes the joint rigid.
- All surfaces should be dry and lubricant free.

Flat Holder Assembly Exploded View

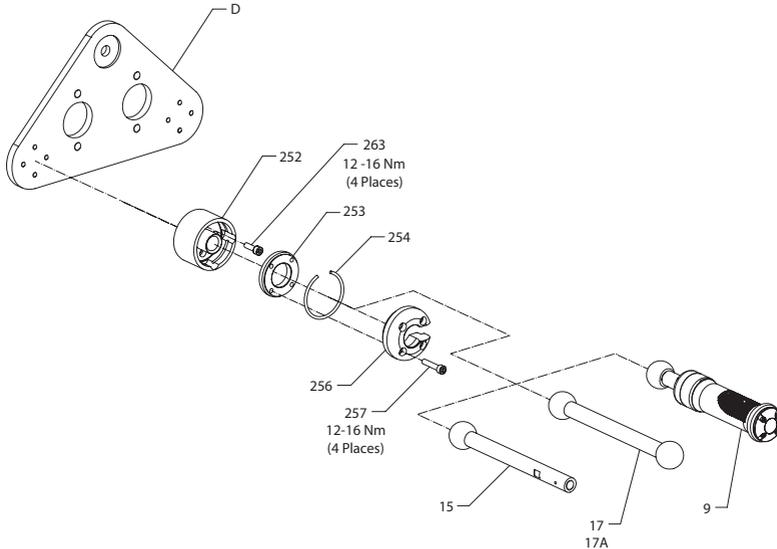


Figure 10

Flat Holder Assembly Parts List

Item	Part Description	Item	Part Description
9	Handle	254	Internal Ring Round Wire
15	Ball End Shaft	256	Socket Ring
17	Ball to Ball Shaft-Short	257	Cap Head Screw (M6 x 1 x 30)
17A	Ball to Ball Shaft-Long	263	Cap Head Screw (M6 x 1 x 20)
252	Tube End Holder	D	Tool Mount Plate
253	Nut Plate		

Assembly steps for Flat Holder Assembly

1. Fasten Tube End Holder (252) to Tool Mounting Plate (D) with fastener Cap Head Screw (263), (apply serviceable loctite to fasteners).
2. Insert Nut Plate (253) into Tube End Holder (252) with larger diameter entering first.
3. Snap fit Internal Ring Round Wire (254) into Tube End Holder (252) and ensure its positioning into the groove provided.
4. Engage ball end of Handle/Ball End Shaft/Ball to Ball Shaft-Short (9/15/17) via slot of Socket Ring (256) and align the ball to be in-between curved faces of Socket Ring (256) and Tube End Holder (252).
5. Align Socket Ring (256) to Nut Plate (253). Set the orientation of Handle/Ball End Shaft/Ball to Ball Shaft-Short (9/15/17) and then clamp Socket Ring (256) to Nut Plate (253) using fastener Cap Head Screw (257).
6. Loosening of fastener Cap Head Screw (257) will allow adjusting the orientation of Handle/Ball End Shaft/Ball to Ball Shaft-Short (9/15/17). Fastening these back, to the recommended torque value makes, the joint rigid.
7. All surfaces should be dry and lubricant free.

Suspension Assemblies Exploded View

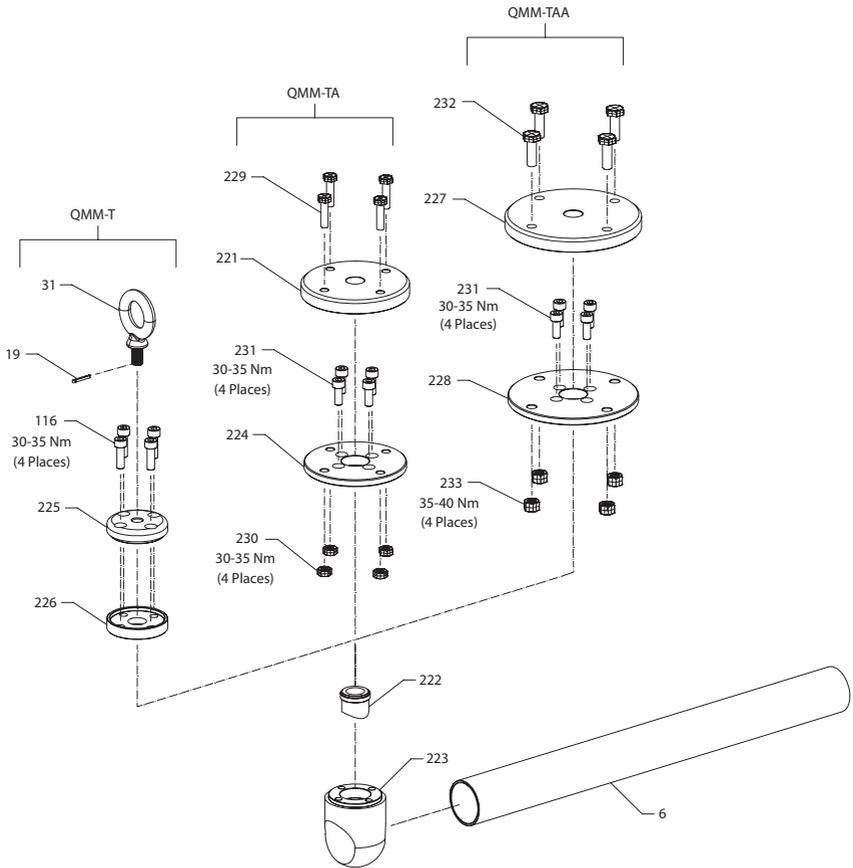


Figure 11

Suspension Assemblies Parts List

Item	Part Description	Item	Part Description
6	Tube	226	Spacer
19	Cotter Pin	227	Adaptor Top Plate-500
31	Eyebolt M12 x 1.75	228	Adaptor Middle Plate-500
116	Cap Head Screw (M8 x 1.25 x 25)	229	Hex. Head Bolt (M8 x 1.25 x 25)
221	Adaptor Top Plate-100	230	Hex. Nut (M8 x 1.25)
222	Tube Shuttle	231	Cap Head Screw (M8 x 1.25 x 20)
223	Suspension Holder	232	Hex Head Bolt (M10 x 1.5 x 20)
224	Adaptor Middle Plate-100	233	Hex. Nut (M10 x 1.5)
225	Adaptor Plate Eye		

Assembly steps for Suspension Assemblies**For QMM-T**

1. Fasten Eye Bolt (31) into Adaptor Plate Eye (225) first then secure with Cotter Pin (19).
2. Insert Tube Shuttle (222) inside Suspension Holder (223) with curved face entering first.
3. Align assembly of step 1 over assembly of step 2 with Adaptor Plate Eye (225) in between.
4. Secure above assembly with fastener Cap Head Screw (116), do not completely tight.
5. Now slide over this assembly on Tube (6) at desired place, tightening fasteners Cap Head Screw (116) will make the assembly rigidly clamped over tube.

For QMM-TA/QMM-TAA

6. Insert Tube Shuttle (222) inside Suspension Holder (223) with curved face entering first.
7. Assemble Adaptor Middle Plate-100/Adaptor Middle Plate-500 (224/228) over assembly of step 6 with fastener Cap Head Screw (231), (apply serviceable loctite).
8. Assemble Tube Shuttle/Adaptor Top Plate-500 (221/227) with assembly of step 7 with Nut (230/233) and Bolt (229/232).
9. For attaching above assembly to Torque tube and fixture tube, remove Nut (230/233) and Bolt (229/232), insert fixture tube inside Suspension Holder (223), place Torque tube bracket over Adaptor Top Plate-100/Adaptor Top Plate-500 (221/227).
10. Slide the assembly over fixture Tube (6) to desired place and fasten back Nut (230/233) and Bolt (229/232).

Tube End Suspension Assembly Exploded View

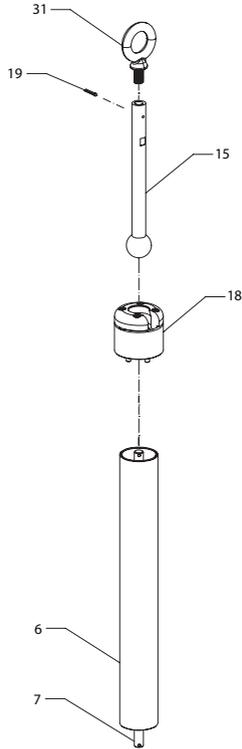


Figure 12

Tube End Suspension Assembly Parts List

Item	Part Description	Item	Part Description
6	Tube	18	Flat/Tube Holder Assembly
7	Tie Rod	19	Cotter Pin
15	Ball End Shaft	31	Eye Bolt

Assembly steps for Tube End Suspension Assembly

1. Place Tube End Holder (252) of sub assembly Flat/Tube Holder Assembly (18), (refer **Flat Holder Assembly**) over Tube (6) as shown in Figure 12 and secure with Tierod (7).
2. To assemble Ball End Shaft (15) with Flat/Tube Holder Assembly (18) refer assembly instructions as given under **Flat Holder Assembly**.
3. Fasten Eye Bolt (31) to the threaded end of Ball End Shaft (15) and secure with Cotter Pin (19).

Cable Tray Assembly Exploded View

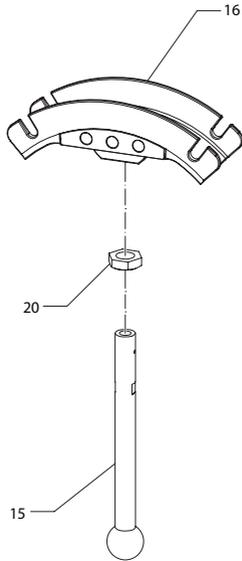


Figure 13

Cable Tray Assembly Parts List

Item	Part Description	Item	Part Description
15	Ball End Shaft	20	Lock Nut
16	Cable Tray		

Assembly steps for Cable Tray Assembly

1. Screw in Lock Nut (20) over threaded end of Ball End Shaft (15) till root end.
2. Screw in the above assembly to Cable Tray (16) with threaded end of Ball End Shaft (15).
3. Tighten Lock Nut (20) till it jams at body Cable Tray (16).

Pod Holder Assembly Exploded View

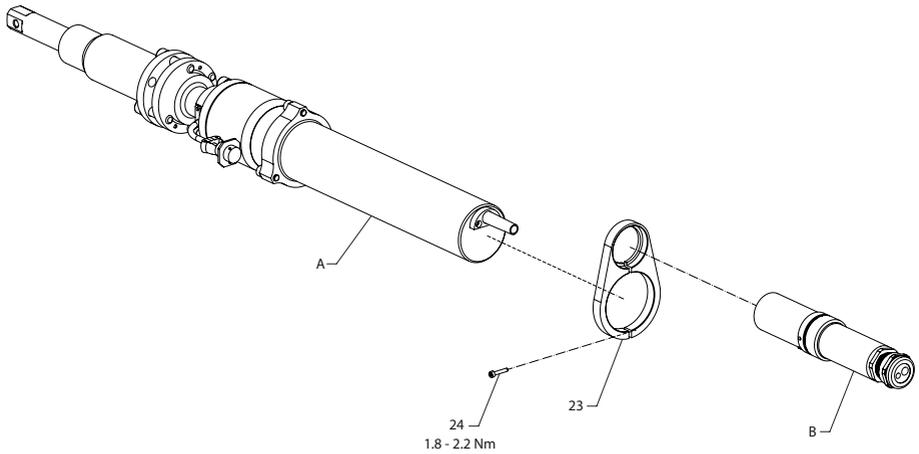


Figure 14

Pod Holder Assembly Parts List

Item	Part Description	Item	Part Description
23	POD Mounting Bracket	A	Tool
24	Cap Head Screw (M3 x 0.5 x 16)	B	Electronics Pod

Assembly steps for Pod Holder Assembly

1. Insert POD Mounting Bracket (23) over the motor part of Tool (A) or steel Tube (6/108) of fixture. Ensure wires coming out from rear end of motor passes through bigger diameter of bracket POD Mounting Bracket (23).
2. Slide bracket over the cylindrical body for appropriate orientation and position. Then clamp this bracket with fastener Cap Head Screw (24).
3. Remove the Flange from the Electronics Pod (B) of tool (refer instructions shown in tool manual to remove flange).
4. Assemble electronics pod over POD Mounting Bracket (23) at position of pod flange (refer instructions shown in tool manual to assemble electronics pod).

Control Panel Mount Assembly Exploded View

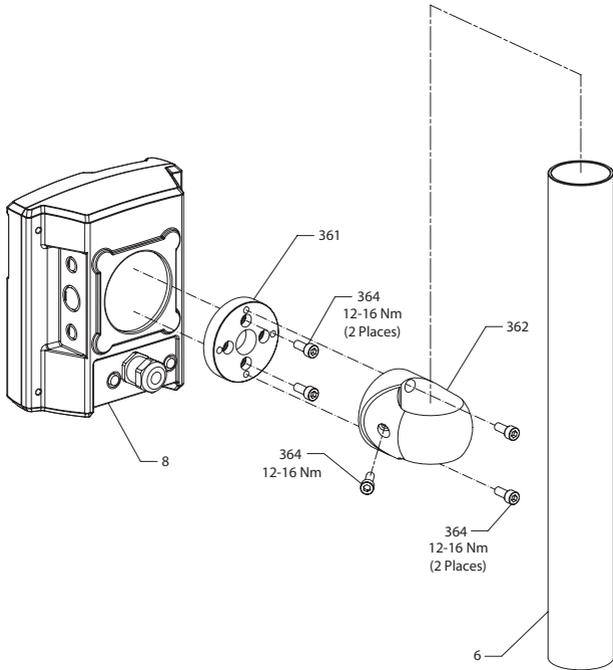


Figure 15

Control Panel Mount Assembly Parts List

Item	Part Description	Item	Part Description
6	Tube	362	Control Panel Mount Tube Holder
8	Control Panel	364	Cap Head Screw (M6 x 1 x 15)
361	Control Panel Mount Plate		

Assembly steps for Control Panel Mount Assembly

1. Mount Control Panel Mount Plate (361) on Control Panel using fastener Cap Head Screw (364).
2. Align Control Panel Mount Tube Holder (362) over Control Panel Mount Plate (361) at desired orientation and secure with fastener Cap Head Screw (364).
3. Insert the above assembly over Tube (6).
4. Orient the assembly at desired location over Tube (6) and clamp it with fastener Cap Head Screw (364).

Bearing Assembly Exploded View

Note: For reference only, this will come as assembled form when supplied to the customer

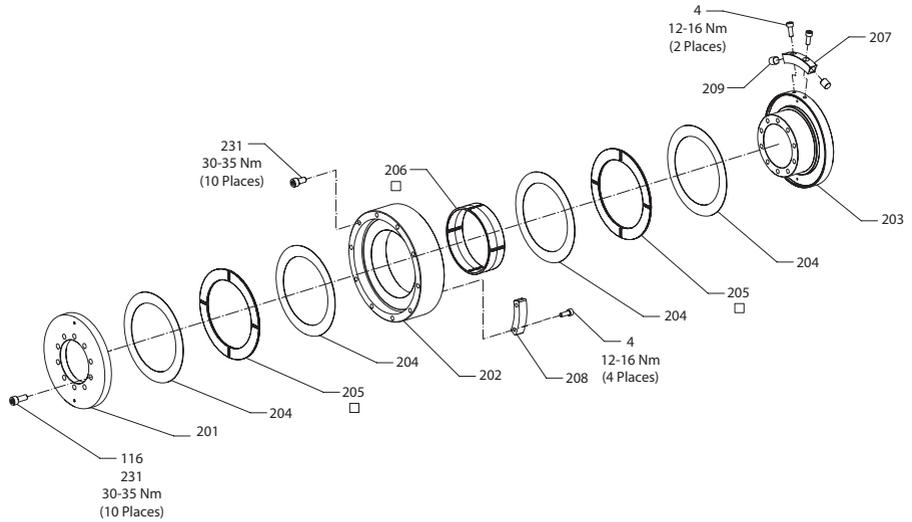


Figure 16

Bearing Assembly Parts List

Item	Part Description	Item	Part Description
4	Cap Head Screw (M6 x 1 x 16)	205	Thrust Bearing
116	Cap Head Screw (M8 x 1.25 x 25)	206	Needle Cage Bearing
201	Side Housing	207	Stationary Stop Part
202	Rotating Part	208	Rotary Stop Part
203	Housing Main	209	Nylon Contact for Stop Mechanism
204	Thin Thrust Washer	231	Cap Head Screw (M8 x 1.25 x 20)

Assembly steps for Bearing Assembly

- Place Housing Main (203) on work table, with larger diameter face touching surface.
- Insert a Thrust Washer (204) into the cavity provided in Housing Main (203).
- Apply IR Grease #222 on both faces of Thrust Bearing (205) and place it over Thrust Washer (204) of assembly explained in step 2.
- Place another Thrust Washer (204) over Thrust Bearing (205).
- Apply IR Grease #222 over Needle Cage Bearing (206) and insert over Housing Main (203).
- Insert Rotating Part (202) over assembly explained up to step 5, guided thru Needle Cage Bearing (206). Follow orientation shown in Figure16.
- Apply grease on both sides of Thrust Bearing (205) and assemble another set of Thrust Washer (204), Thrust Bearing (205) and Thrust Washer (204) over Rotating Part (202) as shown in Figure16.
- Cover the above assembly with Side Housing (201) and secure it with fastener Cap Head Screw (116/231) along with serviceable loctite.
- Ensure free rotation of Rotating Part (202) with respect to Housing Main (203).
- Press fit two Nylon Contact for Stop Mechanism (209), at appropriate holes provided on either side of Stationary Stop Part (207).
- Place assembly of step 10 over main assembly explained upto step 9, secure them using fastener Cap Head Screw (4) with Housing Main (203), apply serviceable loctite to fastener Cap Head Screw (4).
- Then, place a pair of Rotary Stop Part (208) over Rotating Part (202) at appropriate orientation with fastener Cap Head Screw (4). Ensure Rotary Stop Part (208) placed on either side of Stationary Stop Part (207).

Related Documentation

For additional information refer to:

Product Safety Information Manual 16607095.

Product Information Manual 16607228.

Parts Information Manual 16607103.

Manuals can be downloaded from www.irttools.com.

Notes:

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