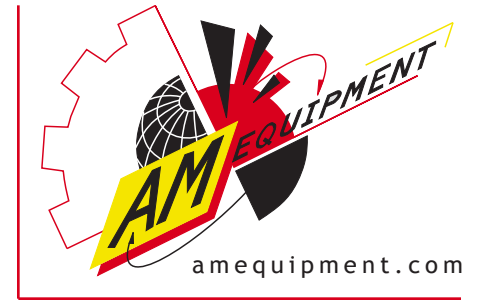


230 Series Unitized Motor Assembly Left Hand and Right Hand



Link and drive arm

Pantograph

| Wipe angle range* | Shaft lever pin position | Connecting link** | Drive arm** |
|-------------------|--------------------------|-------------------|-------------|
| below 60 | B | 307-1005 | 308-1005 |
| 60-62 | A | 307-1072 | 308-1053 |
| 62-65 | A | 307-1022 | 308-1053 |
| 68-72 | A | 307-1022 | 308-1051 |
| 70-74 | B | 307-1037 | 308-1054 |
| 75-79 | B | 307-1072 | 308-1053 |
| 80-85 | A | 307-1022 | 308-1048 |
| 85-91 | B | 307-1022 | 308-1051 |
| 93-99 | A | 307-1022 | 308-1050 |
| 97-103 | A | 307-1022 | 308-1052 |
| 100-105 | A | 307-1072 | 308-1055 |

Radial

| Wipe angle range* | Shaft lever pin position | Connecting link** | Drive arm** |
|-------------------|--------------------------|-------------------|-------------|
| 90-94 | A | 307-1022 | 308-1050 |
| 95-99 | A | 307-1022 | 308-1052 |
| 101-104 | A | 307-1072 | 308-1055 |
| 112-118 | C | 307-1022 | 308-1051 |

* Wipe angle varies with arm and blade combination and low or high speed (pantograph range determined with 22" arm/20" blade, 26" arm/24" blade, and 28" arm/28" blade combinations; radial range determined with 18" arm/18" blade, 22" arm/ 20" blade and 26" arm/ 24" blade combinations).

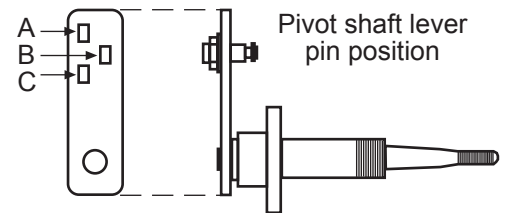
**See 230 drive arms and connecting links pages

230 Series Unitized Motor Assembly Instructions:



Caution: Disconnect power from the motor when assembling.

1. Determine which motor is needed from the 230 motor series page.
2. Determine which drive arm and link is needed for the desired sweep angle (refer to the chart above).
3. Determine which pivot shaft to use from the 230 series pivot shaft page.
4. Mount the pivot shaft to the motor bracket using two 10-32 screws. Torque to 3 foot pounds.
5. Mount the 230 motor with three M6 machine screws. Torque to 80 inch pounds.
6. Energize the "L" (low) speed terminal on the back plate of the motor and allow it to run for several seconds. Remove the power source from "L" (low) and energize the "P" (park) terminal. The motor will continue to run until it reaches its internal park position and stops.
7. Attach the pivot shaft lever pin in its appropriate position (see chart on next page). The pin should face outward, away from the motor. Torque the nut to 5 foot pounds.



Caution: During the next steps, do not rotate the motor output shaft out of the park position until the drive arm is installed as this will cause the motor assembly to park incorrectly. If the output shaft is rotated before the drive arm is installed, energize the park circuit to return the output shaft to the park position before continuing.

8. Determine your desired park position. Facing the window from the outside, decide if the arm and blade need to travel clockwise or counterclockwise to park.
9. Place the drive arm and M8 shouldered nut over the motor output shaft and barely tighten the nut. For counterclockwise (CCW) applications, the pin on the drive arm should point towards the pivot shaft. For clockwise (CW) applications, the pin on the drive arm should point away from the pivot shaft.
10. Place the connecting link over the pin on the pivot shaft lever and the pin on the drive arm.
11. Align the pivot shaft pin, the motor drive arm pin, and the center of the motor output shaft in the desired park position.
12. Remove the link from the assembly. Support the drive arm with a crescent wrench while torquing the shouldered nut on the motor output shaft to 17 foot pounds.

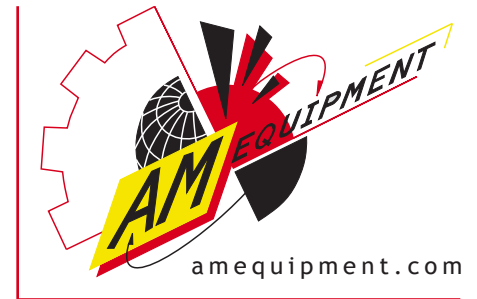


Caution: Do not allow the motor to run backwards, either by energizing the motor with a reversed polarity or by mechanically turning the output shaft of the motor clockwise when tightening the shouldered nut. This will damage the internal park circuit.

13. Apply a drop of light oil on the pivot shaft lever pin and the drive arm pin. Place the connecting link over the pins. When using a link with a cutout in one side, the cutout should face the pivot shaft body.
14. Install a flat thin washer and a retaining spring clip on the pivot shaft pin and drive arm pin to secure the connecting link.



Caution: Take care to keep hands and clothing away from the linkage.



15. Test run the motor. Energize the “L” (low) speed terminal for several seconds. Observe all mechanical functions to confirm proper assembly. Remove the power from “L” (low), then energize the “P” (park) terminal. The motor will run to its park position, then stop. Observe that the drive arm and the connecting link are close to parallel.

****Note:** If you tighten the drive arm in the wrong orientation, you can remove and reset it. After removing the connecting link and drive arm nut, pry the outer end of the drive arm up with a large screwdriver or wrench handle between it and the motor bracket (or motor-mounting tower). This will loosen the drive arm from the motor output shaft. Do not reset the drive arm on the taper more than three times. Each reset enlarges the tapered hole and could cause system failure.

230 Series Unitized Motor Assembly Installation Instructions:

1. Drill a 3/4” (19mm) hole in the cowling or bulkhead at the pivot shaft location.
2. Fit the 230 series unitized motor assembly in the cowling or bulkhead with the pivot shaft protruding through the drilled hole.
3. Connect the vehicle wiring harness to the motor wiring harness.
4. For assemblies with pantograph sweep patterns:
 - a. Fit the pantograph adapter over the pivot shaft, then finger tighten the 11/16”-24 jam nut to hold it in place.
 - b. Use the pantograph adapter as a template to locate the mounting holes (the pantograph adapter should be parallel to the edge of the glass).
 - c. Mark the hole locations with an awl.
 - d. Remove the jam nut and pantograph adapter, then drill two 17/64” (7mm) holes at the marks.
 - e. Use two 1/4”-28 machine screws (not included) that are long enough to engage the threaded holes in the 230 series bracket. If the screws interfere with the operation of the linkage, cut the ends off.
5. Install the rubber or fiber washer on the pivot shaft first, then the steel washer. For assemblies with radial sweep patterns, fasten the 230 series unitized with the 11/16”-24 jam nut. We recommend adding a second point of attachment by using the pre-threaded holes in the motor bracket.



Caution: An improperly anchored system may cause physical injury and/or damage to the vehicle.

6. Attach a negative ground wire to the 230 series motor assembly bracket (or to the gear head of the motor).
7. Cover the jam nut with the rubber boot.
8. Tighten the 1/4”-28 machine screws in the pantograph adapter or bracket brace.
9. Install the blade to the wiper arm and install the wiper arm to the pivot shaft (torque the pivot shaft acorn nut to 10 ft. lbs.).