BOSCH/SIEMENS/GAGGENAU/Thermador®

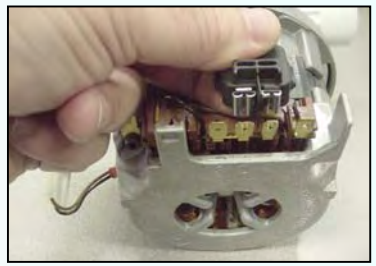
Service Tips -- Checking (PTC) Pump Motor Starter (1)

The (PTC) circulation pump motor starter (# **182318**) is used on **SHX99A-B / SHV99A / SHY99A / DWHD94** *("Apexx"),* **SL95A** & **SHX56B / SHV66A / SHY56A-66C** *("ExactWash")* models with water switches. The matching circulation pump (# **437345**) has three slightly smaller & more efficient windings compared to the traditional pump with two larger windings (# **266511** motor / # **239144** pump). The 3rd (start) winding is cut out when the motor gets running. This stronger pump is needed due to the increased water flow resistance from the water switch.

NOTE: Install starter with terminal pointing inward.

HINT: (PTC) motor starter is located on top of the pump motor and faces inward over the motor.

NOTE: Pump # **437345** includes starter # **182318**.

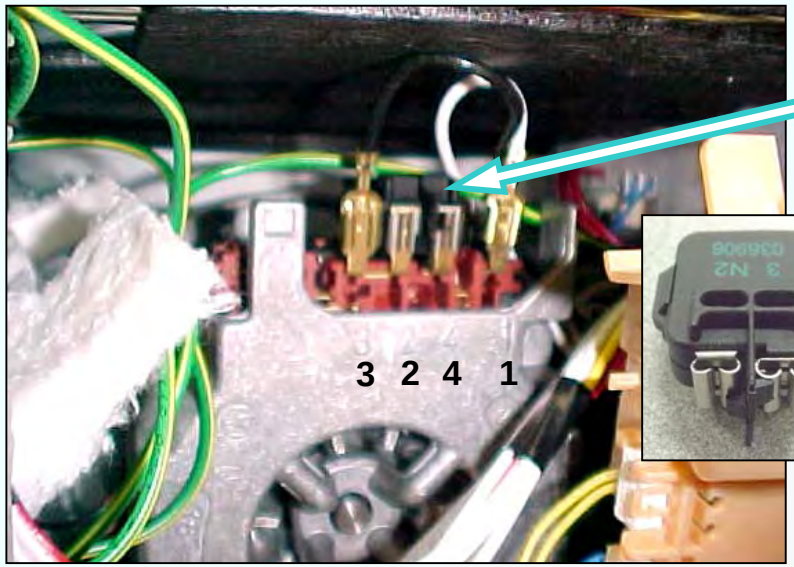


To install (PTC) motor starters, push female terminals over pump motor terminals 2 & 4. The terminals are different sizes to match the smaller motor terminal 4.

The (PTC) motor starter helps start the circulation pump. It's a ceramic thermal switch which conducts current & heats up, cutting out the 3rd (start) winding at a preset temperature. The two main windings (with the start/run capacitor) have power whenever the pump is running.

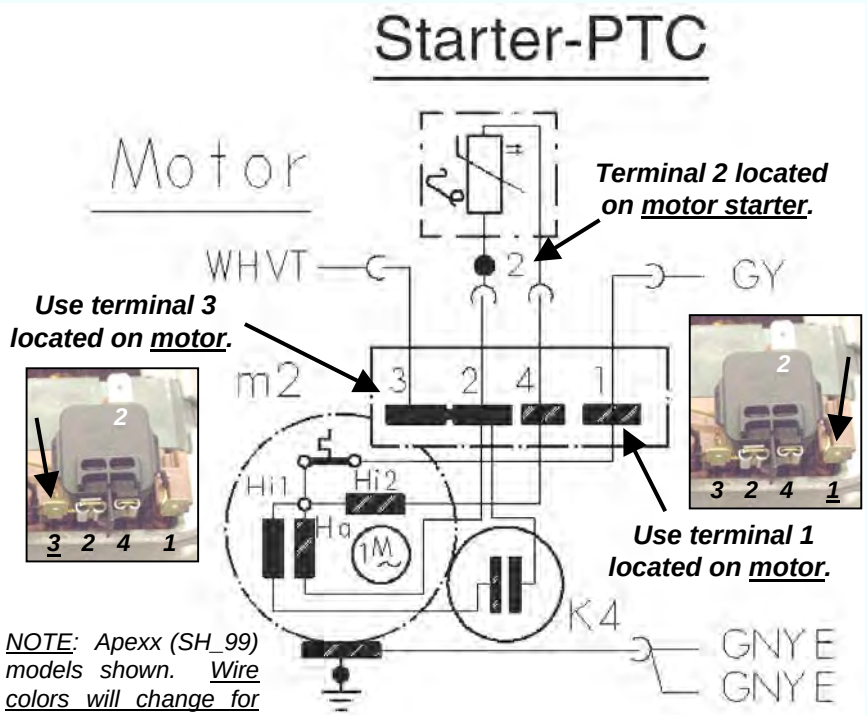
- Check the motor starter if the pump motor won't start (starter stuck open) or runs hot (starter stuck closed).

Service Tips -- Checking (PTC) Pump Motor Starter (2)



Apexx model shown

NOTE: Unlike standard two-winding pump motors, these three-winding pump motors have four terminals instead of three.



NOTE: Apexx (SH_99) models shown. Wire colors will change for other models.

NOTE: Encountering original equipment pumps & motor starters:

- **11/11/03 & later:** Circulation pump # **437345** (with 135ºC OVLP) with motor starter # **182318** (4.7 – 4.8Ω).
- **9/16/03 – 11/11/03:** Circulation pump # **239129** (with 120ºC OVLP) with motor starter # **423023** (16.8Ω).
- **6/6/02 – 9/16/03:** Circulation pump # **239129** (with 120ºC OVLP) with motor starter # **182318** (4.7 – 4.8Ω).

TECH TIPS: Resistance measurements:

- Between terminals 1 - 2 is **~ 7 Ω** (one of the main run windings).
- Won't help between terminals 2 - 4 (start winding, a run winding & the motor starter). The motor starter can't be measured since the windings are always connected. Must disconnect PTC 1st to measure its continuity.

NOTE: Motor terminals 2 - 3 and both PTC terminals are tied together. Although factory units are connected to motor terminal 3, it doesn't matter if motor terminal 3 or PTC terminal 2 is used (both will work). Use motor terminal 3 to be consistent with factory units.

Service Tips – Water Switch Pump Nuisance Tripping (1)

There was some nuisance tripping & failing of motor thermal protectors on three-winding circulation pumps for water switches (# **239129**) on units built on or before October, 2003 (FD # 8310 or before). To prevent this, motors have been superceded by ones with upgraded thermal protectors (# **437345**).

NOTE: Circulation pump # **437345** includes motor starter # **182318**. When replacing any pump, **always** replace the motor starter as well.

NOTE: Encountering original equipment pumps & motor starters:

- **11/11/03 & later:** Circulation pump # **437345** (with 135ºC OVLP) with motor starter # **182318** (4.7 – 4.8Ω).
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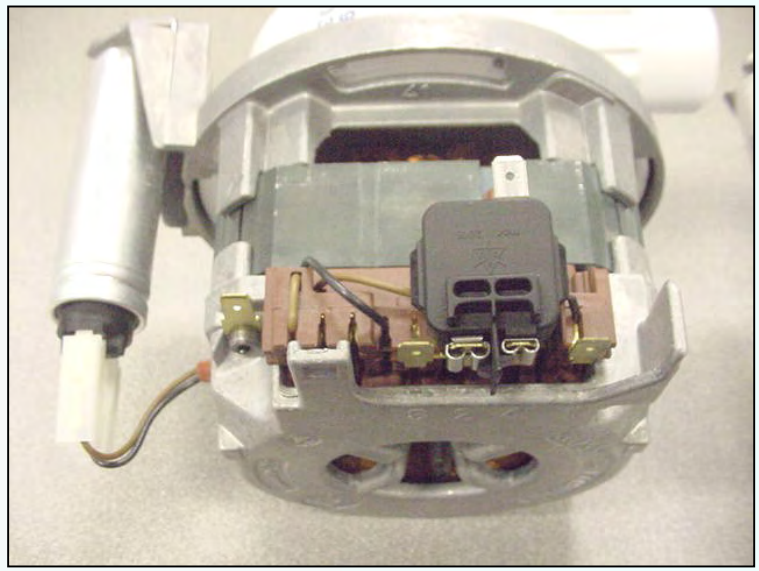


TECH NOTES: Motor starter # **423023** (16.8Ω) has a larger resistance to limit current draw through pump motor start windings. Winding temperatures are reduced, but starting torque is reduced as well (by **10%**). To obtain designed start torque and keep UL certification, do **not** use motor starter # **423023** with circulation pump # **437345**. Use **only** motor starter # **182318** with circulation pump # **437345**.

TECH TIPS: All circulation pump motors use auto-reset thermal protectors. Once motor windings cool below a preset temperature, protectors reset and pumps will work again. If thermal protectors fail to reset, replace pumps.

Service Tips – Water Switch Pump Nuisance Tripping (2)

Circulation pumps and motor starters can be readily identified by numbers on their housings.

HINTS: Identifying circulation pumps & motor starters:

- Circulation pump # **437345** – look for # ***"5600 060022"*** stamped on housing.
- Motor starter # **182318** – look for # ***"036906"*** stamped on housing.
- Circulation pump # **239129** – look for # ***"5600 050139"*** stamped on housing.
- Motor starter # **423023** – look for # ***"041692"*** stamped on housing.

NOTE: Replace motor starters when pump motors are replaced.

Pump # 437345

Motor starter 182318

Pump # 239129

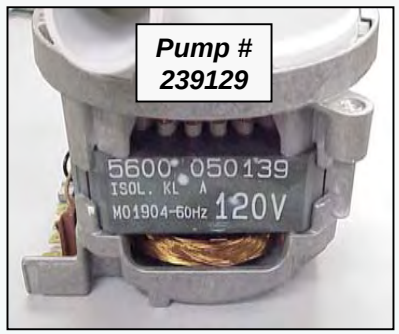
Motor starter 423023

Miscellaneous Service Tips – Repairing SHV66A/99A, SHX56B/99B & SHY56A/66C/99A Dishwashers (FD # 8310 & earlier): (1)

Whenever working on **SHV66A/99A, SHX56B/99B** & **SHY56A/66C/99A** dishwashers built on or before October, 2003 (FD # 8310 and earlier) for any reason, please also perform the following repairs.

1. **If the pump works**, check ratings on rear of pump motor (see photos below & tech hints on page 100). If pump motor shows # **"5600.060022"** (service # **437345**), pump is OK. If pump motor shows # **"5600.050139"** (service # **239129**), verify motor starter shows # **"041692"** (service # **423023**) by removing starter and turning it upside-down (see photos below). If motor starter shows # **"036906**" (service # **182318**), replace it with starter # **423023**. See page 99 for motor starter installation instructions.

   If the pump has failed, replace both pump and pump motor starter with pump # **437345**, which includes motor starter # **182318** packed with it.

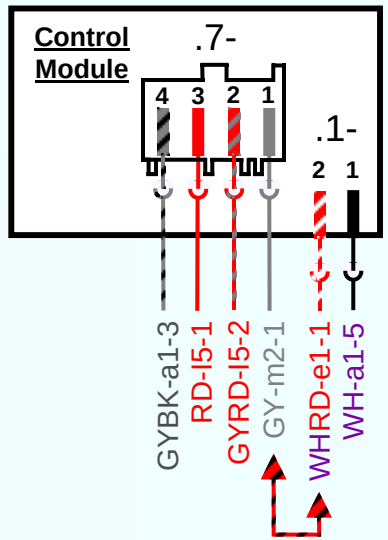


2. **Check door latch and realign if necessary** (see page 100). Access door latch by removing outer door and fascia panel.

Miscellaneous Service Tips – Repairing SHV66A/99A, SHX56B/99B & SHY56A/66C/99A Dishwashers (FD # 8310 & earlier): (2)

TECH HINTS: Checking pump motor & motor starter #'s requires pulling out dishwashers & removing right side panels. To save time working on **SHV66A**, **SHX56B** & **SHY56A/66C** models (since fascia panels must also be removed to check door latch alignment), measure pump resistance at control module – between white/red wire (2nd from right) & gray wire (3rd from right). Close door or trip door latch before measuring resistances.

- If resistance ~ 9.4Ω, motor & starter are OK.
- If resistance ~ 7Ω, pull out dishwasher and check pump motor & motor starter #'s as shown in #1 on previous page.

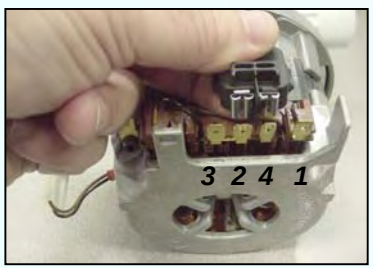


Motor Terminals	Motor Only	With Starter # 182318	With Starter # 423023
1-3	14.3Ω	7Ω	9.4Ω
1-4	8.7Ω	6.2Ω	7Ω
2-4	22.4Ω	3.5Ω	9.9Ω

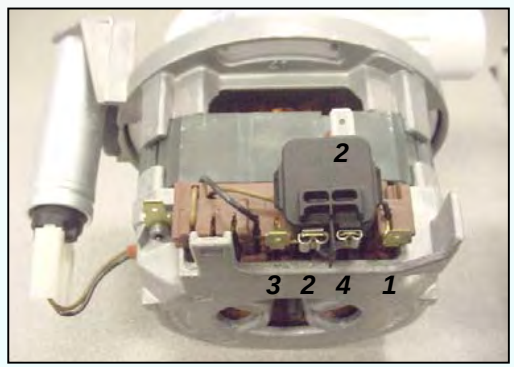
Starter # 182318	4.7-4.8Ω
Starter # 423023	16.8Ω

Resistance Readings at Motor Terminals:

Installing circulation pump motor starters:

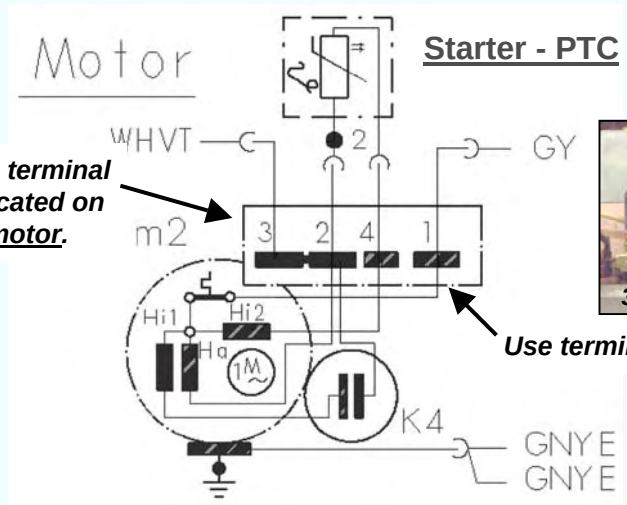


To install (PTC) motor starters, push female terminals over pump motor terminals 2 & 4. The terminals are different sizes to match the smaller motor terminal 4.



HINT: (PTC) motor starter is located on top of the pump motor – install it with terminal 2 facing inward (as shown above).

Miscellaneous Service Tips – Repairing SHV66A/99A, SHX56B/99B & SHY56A/66C/99A Dishwashers (FD # 8310 & earlier): (3)



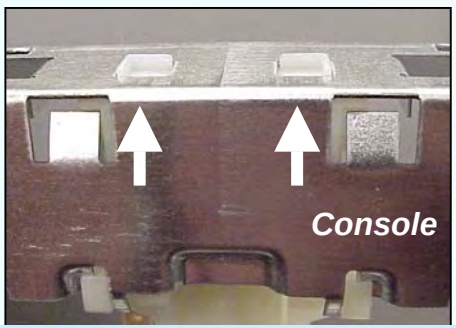
HINTS: Identifying circulation pumps & motor starters:

- Circulation pump # **437345** – # ***"5600 060022"*** on housing (on rear of motor).
- Motor starter # **182318** – # ***"036906"*** on housing.
- Circulation pump # **239129** – # ***"5600 050139"*** on housing (on rear of motor).
- Motor starter # **423023** – # ***"041692"*** on housing.

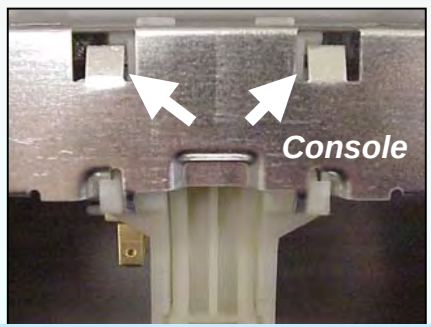
NOTE: Circulation pump # **437345** includes motor starter # **182318**. When replacing any pump, **always** replace the motor starter as well.

Realigning door latches:

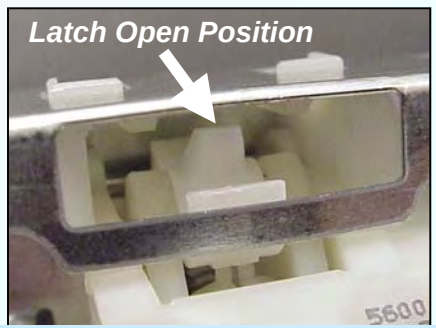
Occasionally dishwasher door latches can be misaligned, causing doors to not close properly or dishwashers to run with doors open (when latches don't reset). Please follow these steps to realign door latches.



First: ***Insert latch tabs into frame, insuring they're even on each side.***



Second: ***Bend console tabs into door latch until they're fully engaging it.***



Third: ***Reset latch to the open position and check for proper operation.***