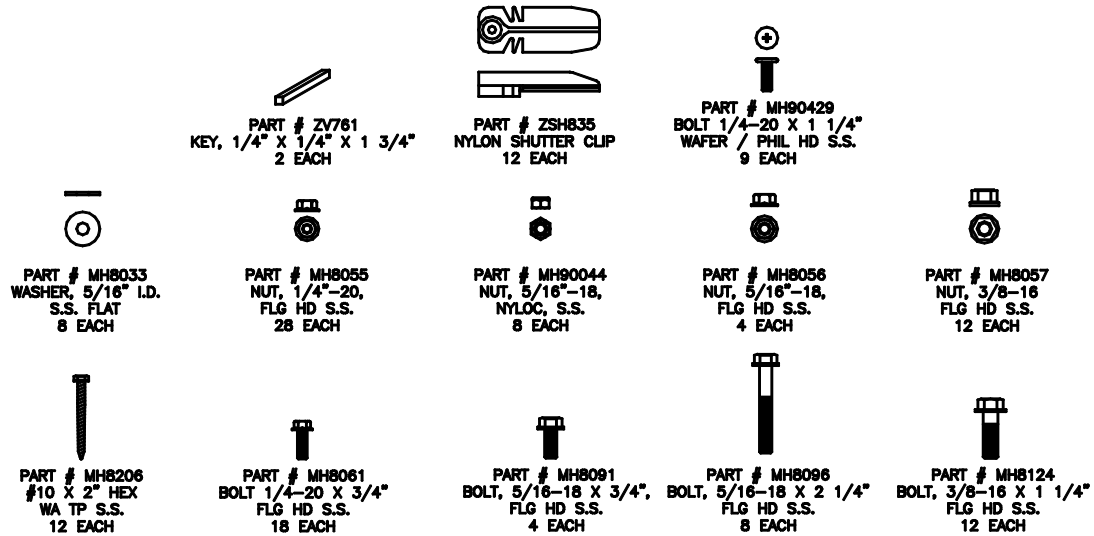


# **PMC-50" & 48" HYPERMAX BELT DRIVE FANS**



Step 1.

Unpackage and become familiar with all of the fan components and hardware. The legend below will help to familiarize you with the hardware required for this assembly. The chart at left below identifies the parts for various possible configurations.



PART NUMBER REFERENCE CHART

PART DESCRIPTION	PMC FAN SIZE		
	50"	48"	36"
HOUSING (WHITE)	FP13210W	FP384W	
HOUSING (BLACK)	FP13210B	FP384	
CONE SECTION FIBERGLASS (WHITE)	FPN13207B	FPN385W	
CONE SECTION FIBERGLASS (BLACK)	FPN13207W	FPN385B	
GUARD SCREEN FOR FIBERGLASS	FP3881CH	FP3881CH	
CONE POLY (WHITE)	FP13235W	FP385S	
CONE POLY (BLACK)	FP13235B	FP385PB	
GUARD SCREEN FOR POLY	FP408CH	FP3881CH	
MOTOR MOUNT TUBE, GALVANIZED	FP428	FP428	
MOTOR/BEARING PLATE, GALVANIZED	FP430	FP430	
MOTOR MOUNT TUBE, S.S.	FP444	FP444	
MOTOR/BEARING PLATE, S.S.	FP449	FP449	

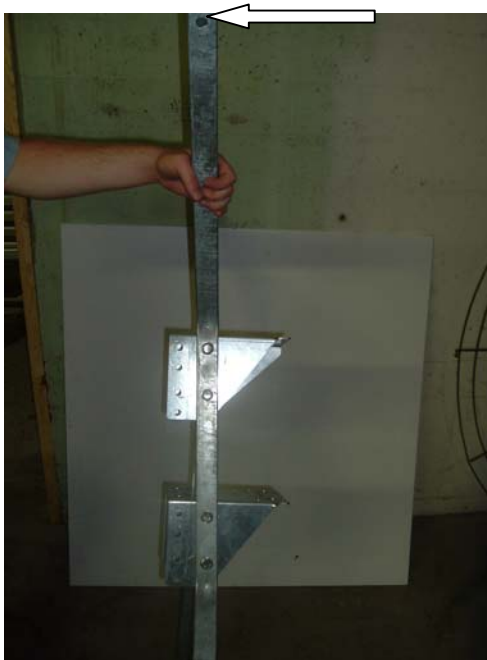
Step 2.

Support the fan housing at the four corners as shown below to allow for easier assembly.



Step 3.

Assemble the motor bearing plates to the motor mount tubes using the 3/8"-16 x 1 1/4" flange head bolts (# MH8124) and 3/8"-16 flange nuts (# MH8057). Make sure the tops of both plates are toward the tube top with the holes (as indicated by arrow) in the side of the tubes and that the bolt placement pattern follows that in the picture below. **Do not tighten the fasteners at this time** (below right).



**Step 4.**

Mount the loosely assembled motor mount subassembly to the housing using the 5/16"-18 x 2 1/4" hex head bolts (# MH8097) with 5/16" flat washers (# MH8033) and 5/16"-18 Nyloc nuts (# MH90044). Insert the bolts with washers from the outside of the housing inward and through the motor mount tubes (below left). Take care to install the motor mount subassembly into the housing as shown below right. Once all eight 5/16"-18 x 2 1/4" bolts are installed and the 5/16"-18 nuts are started, tighten all fasteners securely (to approximately 140 – 150 in. lbs.).



**Step 5.**

Using a combination square, square up and tighten (approximately 15 – 20 ft. lbs.) the two motor / bearing plates to the motor mount tubes.



**Step 5A.**

Fill out with the proper fan catalog number and date of assembly, and apply the VALCO serial tag to the inside of the motor plate. It may be applied using either the pop rivets provided or the adhesive backing on the tag. If the sticker is to be applied with the adhesive make certain that the motor plate is thoroughly cleaned with alcohol and allowed to dry before applying the sticker tag.

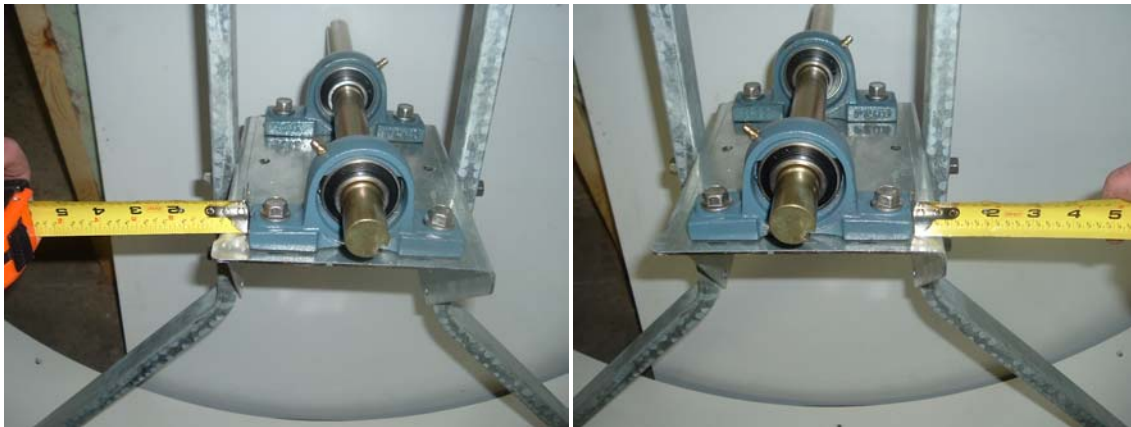
Step 6.

Insert the shaft (# FP441) into one of the pillow block bearings (# ZV7651), making sure that the bearing set screws are toward the middle of the shaft. Keep 2" of the short key way end of the shaft end extended from the inner race of the bearing (refer to picture below left). Turn in one of the setscrews until it makes contact with the shaft and tighten the other setscrew to hold this bearing in position. Then tighten the first setscrew secure. Slide the other bearing onto the end of the shaft with the long key way, making sure the setscrews are toward the middle of the shaft. There should be 5 1/2" between the pillow block mounting feet (refer to picture below right). Using the method stated above, tighten the second bearing in place. All setscrews shall be tightened to 80 – 85 in. lbs. of torque.



Step 7.

Assemble the bearing / shaft subassembly onto the lower motor/bearing plate using four 3/8"-16 x 1 1/4" bolts (# MH8124) and 3/8"-16 nuts (# MH8057). Make sure that the bearings are centered on the motor bearing plate and the shaft is centered in the orifice (refer to pictures below) and snug bolts.





#### Step 8A (Galvanized Blade)

Install the blade onto the shaft using a  $\frac{1}{4}$ " x  $\frac{1}{4}$ " x  $1\frac{3}{4}$ " key (# ZV761). Position the blade so the blade tip protrudes from the orifice edge  $\frac{1}{2}$ ". Once the blade has been positioned properly tighten (approximately 80 – 85 in. lbs.) the setscrew (refer to pictures below). Center the blade in the orifice all around. Adjust if necessary.



#### Step 8B (Cast Aluminum Blade)

Install the blade onto the shaft using a 1" I.D. x  $1\frac{1}{2}$ " O.D. Tran Torque (# ZFB302). Position the blade so the blade tip protrudes from the orifice edge  $\frac{1}{2}$ ". Once the blade has been positioned properly tighten the Tran Torque (approximately 150 ft. lbs.) refer to pictures below. Center the blade in the orifice all around. Adjust if necessary.



#### Step 9 (Standard Drive Configuration)

Install the motor onto the upper motor / bearing plate using four  $\frac{5}{16}$ "-18 x  $\frac{3}{4}$ " bolts (# MH8091) and  $\frac{5}{16}$ "-18 nuts (# MH8056). The bolts shall be applied to the two sets of holes in the motor's base plate nearest to the shaft end and thru the motor/bearing plate. Ensure that the motor is centered on the motor/bearing plate and that the edge of the motor's base plate is parallel to the edges of the motor/bearing plate (as indicated by arrow in photo at right below). Tighten all the fasteners securely (approximately 140 – 150 in. lbs.). For Standard Drive Configuration skip to step 10.



#### Step 9A (Forward Drive Configuration)

If the fan is to be set up with a forward drive configuration, install the motor as shown at left below using the same fastening method stated in Step 9 above.



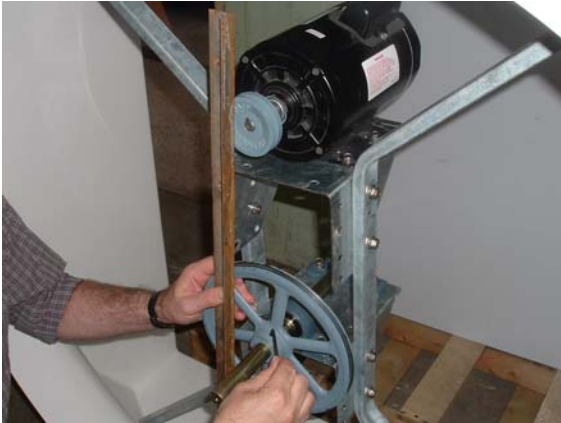
#### Step 10 (Standard Drive Configuration)

Install the drive pulley to the motor shaft using the 3/16" x 3/16" key supplied with the motor making sure the pulley goes onto the shaft with the hub facing outward. Do not tighten the setscrews at this time. Next install the driven pulley onto the fan shaft using a 1/4" x 1/4" x 1 3/4" key (# ZV761) making sure the pulley hub goes toward the pillow block bearings. Once the driven pulley is flush with the end of the fan shaft tighten the driven pulley in place and align the drive pulley using a straight edge along the pulley faces. Tighten all the setscrews securely (approximately 80 – 85 in. lbs.).



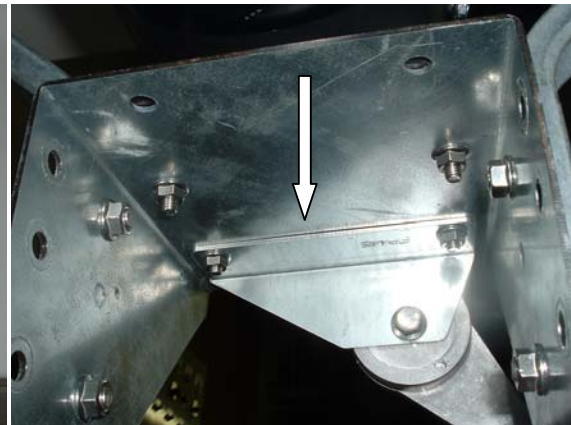
#### Step 10A (Forward Drive Configuration)

If the fan is to be set up with the forward drive configuration, install the drive pulley to the motor shaft using the 3/16" x 3/16" key supplied with the motor making sure the pulley goes onto the shaft hub first. Once the drive pulley is flush with the motor shaft end tighten the setscrews (approximately 80 – 85 in. lbs.). Next install the driven pulley onto the fan shaft using a 1/4" x 1/4" x 1 3/4" key (# ZV761) making sure the pulley hub is facing outward. Align the driven pulley with the drive pulley as shown below and tighten the setscrews (approximately 80 – 85 in. lbs.).



#### Step 11 (Auto Tensioner Option)

If an auto tensioner is to be used, assemble the auto tensioner to the tensioner bracket using the 3/8"-16 x 1 1/4" flange head bolt as shown below left. Leave the bolt finger tight for now. Remove the two nuts from the bolts at the shaft end of the motor and apply the tensioner bracket to the bolts as shown by the arrow at right below and reapply the nuts and tighten (approximately 140 – 150 in. lbs.).





Apply the cog belt to the drive pulley, around the tensioner pulley and onto the driven pulley. With a 15/16" wrench on the large hex head on the front of the tensioner rotate the tensioner clockwise to the belt tension and using a 9/16" wrench tighten the 3/8"-16 x 1 1/4" bolt at the rear of the tensioner bracket (refer to photo below).



#### Step 12 (Standard Drive Configuration)

Make sure that the links are aligned as shown below left, with the link tail ends pointing in the clockwise direction (the arrow on belt indicates drive rotation). Install the power twist link belt onto the small pulley, then hold the belt onto the bottom of the driven pulley and rotate the driven pulley counter clockwise until the belt is completely on the driven pulley (refer to photo below).



**ATTENTION:**  
REFER TO SECTION ON  
**"PROPER TENSIONING"** FOR  
THE PROPER METHOD OF  
DETERMINING THE BELT  
LENGTH.

### Step 13

Once the belt has been installed, rotate the fan blade to check it for centering. The clearance between the blade tips and the edge of the orifice should be equal all the way around the orifice. If some adjustment is needed, slightly loosen the bearing plate and with a block of wood tap the plate in the direction required to better center the blade (refer to left photo below). Retighten (approximately 15 – 20 ft. lbs.) the bolts for the bearing plate and check the fan blade for centering again. If any side-to-side adjustment is required slightly loosen the bolts on the back pillow block bearing and use a block of wood to tap the pillow block bearing in the direction required to center the blade (refer to photo at right below). Retighten (approximately 15 – 20 ft. lbs.) the bolts for the pillow block bearing and check the fan blade for centering again. It may be necessary to shim the pillow block bearings to center the blade vertically. If this is done make certain that both pillow block bearings are shimmed the same amount.



### Step 14

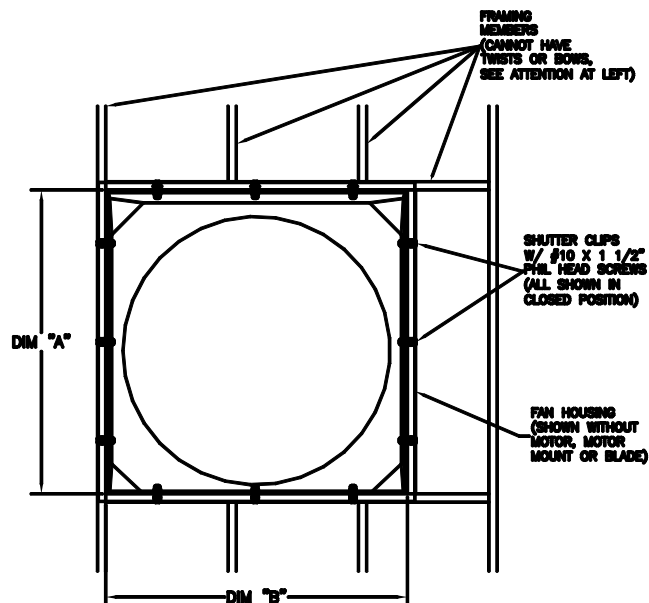
Install the assembled fan into the wall opening (**the wall opening must be square, plumb & flat**), taking care that the housing slopes downward. Use the shutter clips and the self-tapping #10 x 1 1/2" Phillips pan head screws to fasten the fan to the wall (refer to drawing of framing detail below). Take care to screw the shutter clips through the predrilled shutter clip holes in the fan housing. Manually rotate the fan blade to check it for centering, the clearance between the blade tips and the edge of the orifice should be equal all the way around the orifice. If some further adjustment is needed see Step 13.

ROUGH OPENING CHART

	PMC FAN SIZE		
	50"	48"	36"
DIM "A"	58"	55 1/2"	
DIM "B"	56"	55 1/2"	

#### ATTENTION:

It is of the utmost importance to have the opening in the wall square, plumb and flat (to within 1/8"). These conditions must be verified prior to installing the fan into the wall rough opening.



#### Step 15 (Fiberglass Cone)

Assemble the discharge cone using four,  $\frac{1}{4}$ "-20 x  $\frac{3}{4}$ " bolts (# MH8061) and nuts (# MH8055) on each standing seam. Do not tighten the fasteners at this time.



#### Step 15A (Poly Cone)

The poly cone is a one-piece part and requires no assembly.

#### Step 16.

Mount the assembled cone onto the fan housing (this must be done after the fan housing has been installed into the wall). If using a fiberglass cone ensure that one of the standing seams is located top dead center of the fan orifice. Using nine  $\frac{1}{4}$ "-20 x 1  $\frac{1}{4}$ " wafer head bolts (# MH90429) and  $\frac{1}{4}$ "-20 nuts (# MH8055) to fasten the cone to the fan housing. The bolts must be inserted from the inside of the fan orifice through the cone so that the nuts are on the outside. This is very important that the bolt head is the only thing inside of the orifice to reduce the risk of the fan blade hitting anything.



Step 17.

After the cone has been mounted to the fan housing, install the guard screen into the discharge cone using 6  $\frac{1}{4}$ "-20 x  $\frac{3}{4}$ " bolts (# MH8061) and  $\frac{1}{4}$ "-20 nuts (# MH8055). Note that the bolt heads shall be to the inside (refer to photo at left below) against the guard screen loop and the nuts shall be on the outside of the cone.



Step 18.

Install the shutter onto the fan housing on the inside of the building using the shutter clips. When installing the shutter, make sure the shutter vanes open upward (as noted by arrow).





## FAN MAINTENANCE

**CAUTION: Disconnect electrical power before servicing fan.**

**Inspect propeller:** Check to see that the propeller is secure on the shaft and that there are no signs of damage.

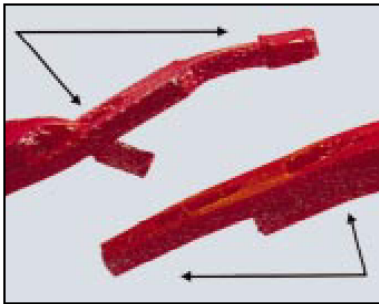
### Drive Belt:

Proper link belt installation and maintenance is very important to achieve maximum performance from your ventilation equipment. The following measures will help achieve that performance.

#### Determining Length

1. Wrap a length of belt around the pulleys.
2. Pull belt hand tight over lapping the last 2 tabs with 2 holes in matching links as shown in Fig. 1.
3. Count the links from your mark to the free end.
4. Remove one link out of every 24 links. This will ensure the optimum belt length and tension.
5. Assemble belt as shown in Figures 2, 3, 4 & 5 below and check tension.

**Fig. 1**



**Fig. 2**



1. Hold belt with tabs pointing outward.

**Fig. 3**



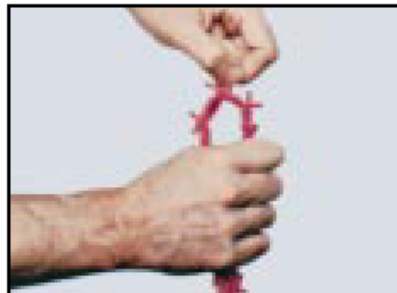
2. Place end tab through two links at once.

**Fig. 4**



3. Flex belt further and insert second tab through end link by twisting tab with thumb.

**Fig. 5**



4. Ensure tab returns to position across belt. Reverse belt so tabs run inside.

#### Proper Tensioning

1. Roll the belt off the pulleys by forcing it side ways off the larger pulley as you turn the drive manually. The arrow on the belt indicates the drive rotation.
2. Reinstall the belt by applying it first to the drive pulley and starting it on the large pulley.
3. As you roll it onto the large pulley, the belt should become tight in the position shown below.
4. If the belt is tight before the position shown below, add one link to the belt and try it again.
5. If the belt is too loose at the position shown below, remove one link and try it again.



**CAUTION:** Disconnect electrical power before servicing fan.

**Fasteners:** Retighten nuts and bolts on a quarterly basis.

FASTENER / DEVICE	RECOMMENDED TORQUE
1/4"-20 X 3/4" HX HD BOLT	80 – 85 IN. LBS.
5/16"-18 X 3/4" HX HD BOLT	140 – 150 IN. LBS.
5/16"-18 X 2" HX HD BOLT	140 – 150 IN. LBS.
3/8"-16 X 1 1/4" HX HD BOLT	15 – 20 FT. LBS.
1/4" SETSCREWS (BEARINGS)	80 – 85 IN. LBS.
5/16" SETSCREWS (PULLEYS)	80 – 85 IN. LBS.
5/16" SETSCREWS (BLADE)	80 – 85 IN. LBS.
1" I.D. X 1 1/2" O.D. TRAN TORQUE	150 FT. LBS.

**Lubrication:** Lubricate the pillow block bearings on a quarterly basis with a NLG1 type grease.

#### Clean Fan:

**Motor:** Remove any dust accumulation from motor using a brush or cloth. **(DO NOT USE A PRESSURE WASHER ON THE MOTOR)** A clean motor will run cooler and last longer. Check if the motor is secure in its mount.

**Shutter:** Carefully clean dust from shutter vanes and frame so that shutter opens and closes freely. If shutters are extremely dirty you can lose up to 45% of your fan capacity.

**Guard:** Clean any dust or dirt buildup from fan guards using a brush. Dirty guards can also reduce airflow.

**Housing:** Remove dust and dirt accumulations from housing with a pressure washer.

**If any portion of the fan is cleaned with a power washer or any liquid it is highly recommended to run the fan for a minimum of 15 minutes to allow the fan and motor to dry before it is left idle for any length of time.**

**Inspect Fan Controls:** All controls should be inspected every six months to assure optimum protection of your ventilation system.

- Check all covers for a tight fit.
- Wipe enclosures with a damp rag to remove dirt and dust.
- Clean sensors with a damp rag to remove dirt and dust. Be very careful not to damage sensors.
- **NEVER CLEAN ELECTRICAL EQUIPMENT WITH A PRESSURE WASHER!**

**WIRING DIAGRAM:** Be sure power is “OFF” before doing any wiring. All wiring will be installed in accordance with national, state and local electrical codes. Fans used to ventilate livestock buildings or other rooms where continuous air movement is essential should be connected to individual electrical circuits. For electrical connection requirements, refer to diagram on the motor nameplate or the enclosed wiring diagram. Motors are pre-wired for 230 volts. Motor overload protection should be provided for each fan. A circuit breaker switch or slow blow motor type fuse must be used.

Three phase motors do not include overload protection. Specifications subject to change without notice.

**NOTE:** A safety cut-off switch should be located adjacent to the fan.

**PROPER SHUTTER INSTALLATION:** When installing the shutter, make sure the shutter vanes open upward.

**WARNING** If these ventilation products are used to support life in agricultural structures where failure of the system could result in loss or injury, the user must provide an adequate backup and alarm system. The user must accept all risks of such loss or injury due to the possible failure of the ventilation system.

**CAUTION** Do not install fan with moving parts within seven feet of floor or grade level without a guard that complies with OSHA Regulations. Do not use unless electrical wiring complies with all applicable codes. Do not wire without providing for power source disconnect at the fan itself. Do not service except by a qualified maintenance technician and only after disconnecting the power source. Do not install in room where flammable material is stored or flammable vapors might build up. Failure to observe all of these precautions can result in serious injury or death.

## SERVICE AND TECHNICAL ASSISTANCE

Your dealer or the Valco Service Department will be happy to answer all your technical questions which will improve your use of the Hypermax Power Miser series fan. **Be prepared with the model number and necessary information before you place a call to your dealer or Valco.** If your fan requires service when the warranty period has expired, please contact your dealer for assistance or return the unit to Valco for repair.

### Inquiries



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