

# MAINTENANCE AND TROUBLESHOOTING

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## CHAPTER 3

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## ROUTINE MAINTENANCE

A routine maintenance schedule should be developed for every IronHorse motor installation based on the individual application. Motors installed in a harsh running environment should be serviced more frequently than those installed in a clean, climate controlled area. The following list should be used as a basis for creating the routine maintenance schedule.

- A) Clean the motor housing using a brush, soft cloth or compressed air. Remove any dirt and dust from the fan and fan cover vents.
- B) Frequently monitor the bearing temperature on the motor. It should not exceed 60°C (140°F).
- C) Have the insulation checked periodically by an authorized motor specialist.
- D) Replace the motor brushes after every 2500 hours of operation.

## BEARING SIZE INFORMATION

Bearing Chart		
Frame Size	Drive End Bearing SKF Type	Opposite Drive End Bearing SKF Type
Small-Frame	not user serviceable	
56C	6203ZZ or equivalent	

*All IronHorse 56C-frame motors use premium sealed SKF brand bearings.*

## REPLACING BRUSHES



**WARNING:** TO PREVENT SERIOUS PERSONAL INJURY AND DAMAGE TO YOUR EQUIPMENT, ALWAYS DISCONNECT INPUT POWER BEFORE REPLACING BRUSHES.

A spare set of brushes ship in each 56C-frame PMDC motor box, and the brushes should be replaced after every 2500 hours of operation. Small-frame PMDC motor brushes should be replaced as needed. If you visually inspect the brushes, the minimum acceptable length is 6mm.

See “Chapter 4: Accessories” for replacement brush ordering information. Make sure you install the correct replacement brushes; check the part numbers carefully. Ensure that the replacement brushes are the same width as the brushes being removed from the motor. DO NOT install smaller brushes in a larger motor. There is no break-in period with new brushes.

*Replacement brush and spring assembly sets:*



**NOTE:** THE BRUSHES ARE SPRING-LOADED. BE CAREFUL WHEN REMOVING THE BRUSH COVER.

Motor has two brushes; one on each side of the motor.

Always replace the brushes in pairs.

- A) Remove the brush cover using a flathead screwdriver as shown. Turn the brush cover counterclockwise to remove.
- B) Carefully remove the old brush and spring assembly and install the replacement.
- C) Reinstall the brush cover, turning clockwise.
- D) Replace the other motor brush and spring following the same steps.



## TROUBLESHOOTING

To prevent serious damage, faults observed when a motor first goes into service or during subsequent operation should be investigated and repaired immediately. These troubleshooting tables cover most common PMDC motor problems.



**WARNING: TO PREVENT SERIOUS PERSONAL INJURY AND DAMAGE TO YOUR EQUIPMENT, ALWAYS DISCONNECT INPUT POWER BEFORE INSPECTING OR REPAIRING YOUR MOTOR.**

Mechanical Problems – Noise While Running		
Problem	Possible Causes	Solutions
Motor vibrates or runs noisily when coupled up, but runs okay when uncoupled.	Defective transmission components, or problem with the machine being driven.	Inspect transmission and drive components. Check alignment.
	Foundation has become unlevel.	Realign machine set. Check and repair foundation level.
	Problem with gear drive.	Align drive, check driving and driven gear pitch circles.
	Incorrectly balanced drive or driven machine components.	Re-balance drive and/or driven components.
Motor runs rough when uncoupled.	Bearing damage.	See Bearing Problems troubleshooting table.
	Mounting bolts are loose.	Re-tighten and lock mounting bolts.
	Fitted drive components (coupling or pulleys) affecting rotor balance.	Balance rotor with coupling or pulley fitted.

Mechanical Problems – Roller Bearing Problems		
Problem	Possible Causes	Solutions
Scratching, rubbing, or rumbling noise from bearing.	Bearing is defective.	Replace bearing. *
Whistling noise from bearing.	Bearing has run dry.	Replace bearing. *
	Faulty cage.	Replace bearing. *
Excessive bearing wear.	Bearing overloaded.	Check alignment, belt tension, gear pressure, coupling thrust. Reduce bearing load. If needed, reduce additional axial load.
Scoring when motor is inoperative.	Bearing is being subjected to vibration from outside source.	Isolate motor from source of vibration or keep motor turning over.
Scoring when motor running.	Current leakage.	Remove motor from service. Repair or replace motor.

\* Bearings in the small-frame PMDC motors are not user replaceable; replace motor instead of bearings.

**TROUBLESHOOTING (CONTINUED)**

<b>Electrical Problems</b>		
<b>Problem</b>	<b>Possible Causes</b>	<b>Solutions</b>
Motor shaft rotates in wrong direction (should rotate clockwise when facing shaft).	Positive (+) and negative (-) input power leads are reversed.	Switch the input power connections.
Motor fails to start off-load.	Break in the armature supply.	Check and repair connection.
	Fuse is blown.	Replace fuse.
	Controller damaged or incorrectly connected.	Check starter for break in circuit and repair break.
	Armature coils burned out or short-circuiting.	Correct short circuit. This may require bringing the motor to a repair shop.
	Brushes not bearing down correctly.	Check brush position and bearing pressure. Replace worn brushes.
Jerky starting.	Break in starter circuit.	Repair break.
	Armature short-circuit.	Correct short circuit. This may require bringing the motor to a repair shop.
	Commutator short-circuit.	Check commutator and repair short-circuit.
Motor will not run under load.	Short circuit in the supply.	Locate short circuit and repair.
	Overloading.	Check current input and remedy overload.
	Voltage drop.	Increase supply line cross section.
Motor overspeeding and hunting while under load.	Controller.	Decrease IR compensation. Check speed potentiometer wiring and signal, and repair if needed.
Motor overheating.	Overloading.	Check voltage and current levels, and correct overload condition.
	Insufficient airflow.	Improve cooling conditions.
	Cooling air temperature too high.	If TEFC model, inspect the fan for damage.
	Armature winding short-circuit.	Check windings and soldered connections. Repair coils or windings.

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