

Dedicated to People Flow™



ELEVATOR DOOR OPERATION

# Safety and Performance Upgrades



# People judge the performance & safety of an elevator by how well its doors work

Elevator doors can make a lasting impression about your building. Doors that are noisy, unreliable, unattractive or operating uncomfortably could reflect poorly on perceived building safety – and management. Under-performing or unreliable elevators hinder efficient building operation, with probable downtime and expense.

What is the condition of your elevator doors? Ask yourself:

- Are the doors noisy or erratic in operation?
- Do they open or close too slowly or too quickly?
- Do they sometimes fail to open or close at all?
- Do they occasionally strike passengers who are entering or exiting the elevator?

- Do constant shutdowns and malfunctions disrupt building operations?

If you answered “yes” to any of these questions, you may need a KONE elevator door operation upgrade.



*The average elevator door opens and closes more than 200,000 times a year. No wonder over 70% of all elevator trouble calls are related to the door operation.*

# The affordable way to enhance elevator operation

Doors that operate improperly or erratically degrade your entire elevator system. Upgrading their components is a cost-effective way to dramatically improve elevator service and restore passenger confidence.

The immediate benefits you may receive from an upgrade include:

- Substantially reduced noise and vibration.
- Improved elevator efficiency and performance.
- Enhanced passenger satisfaction and comfort.

- Decreased elevator downtime and building disruption.
- Reduced operating expenses.
- Compliance with code and ADA standards regarding door operation.
- Enhanced safety and reduced liability exposure.

KONE offers door operation upgrade packages for every elevator. The installation of an upgrade will be scheduled to best suit your needs.

KONE offers four door operator system upgrades to ensure an efficient and reliable door operation.

The components of each solution are outlined on the following pages. Every component is designed and engineered to stringent KONE standards. Each one is also manufactured from the finest materials using the latest technology. You get the best – without compromise. That's our commitment to you.





## Solution 1: KONE ReNova™

KONE ReNova customized high-performance door modernization solutions deliver precision you can feel. The mechanical coupling is solid, allowing smooth linear action of the car doors and quiet operation. The action is swift and silent, consistent at each stop regardless of differing door weights and air pressure. Break the

curtain of light and the doors will automatically re-open.

It's a function of KONE's closed-loop control and patented AMD door technology. The performance profile is set according to your specific needs. Then, operating conditions are monitored and digitally encoded

feedback allows the system to learn about your building. A Permanent-Magnet Synchronous Motor (PMSM) and the Variable Voltage Variable Frequency (V3F) drive use this information to deliver enhanced performance every time.

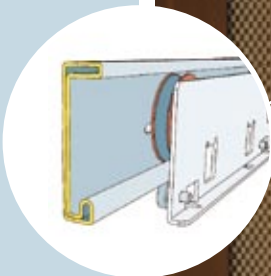
*V3F inverter drive is integrated with door control electronics.*



*The system features a synchronous PMSM motor, excitation by permanent magnets (no brushes).*

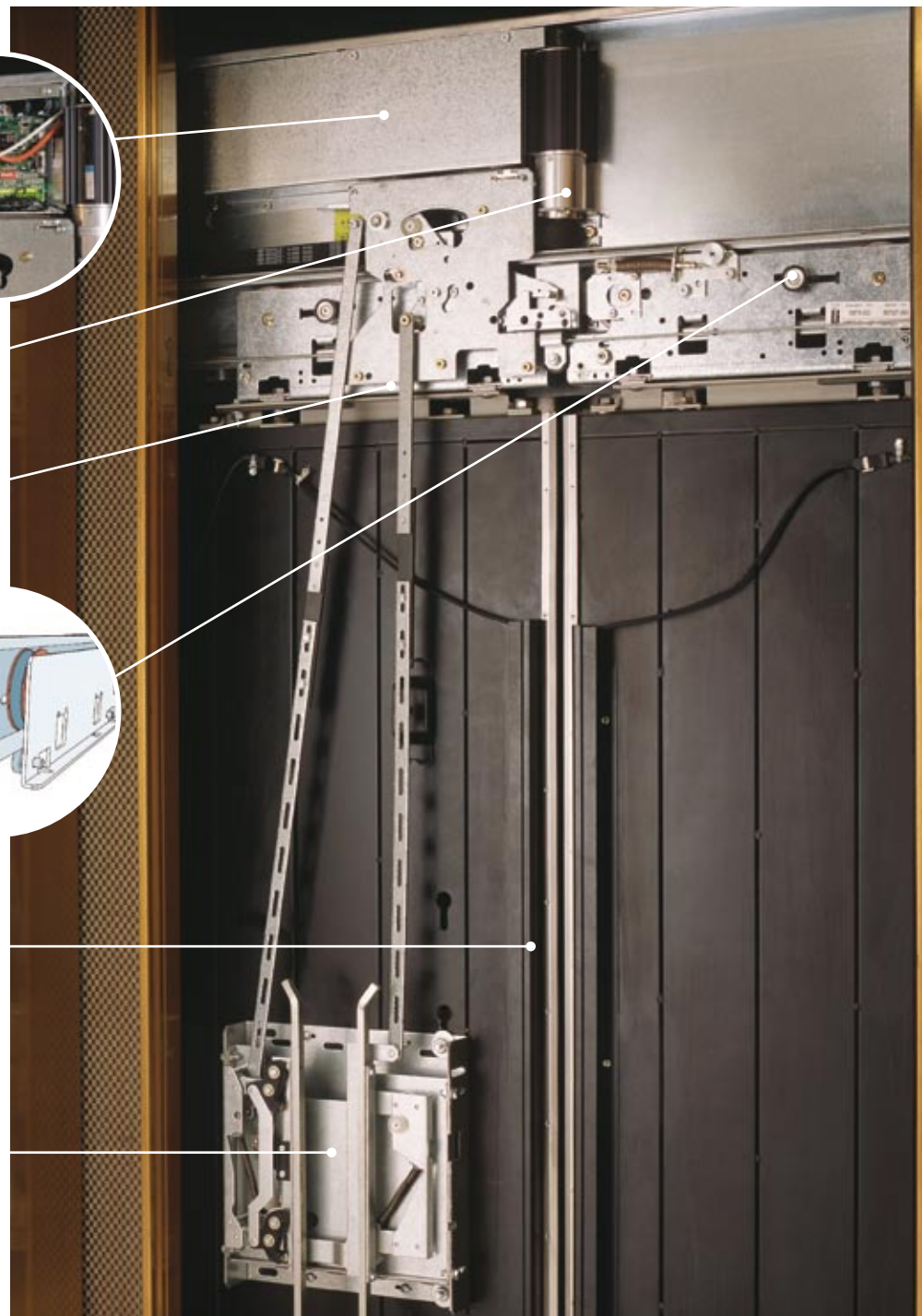
*The drive system and track allow for true "linear" motion.*

*Elevator doors retract the instant the infrared beam light curtain is broken, dramatically reducing the chance of door contact with passengers.*



*KONE ReNova solutions feature patented KONE AMD technology. The substantial track design and resilient rollers are designed for long life.*

*Clutch offers a solid coupling and quiet operation.*



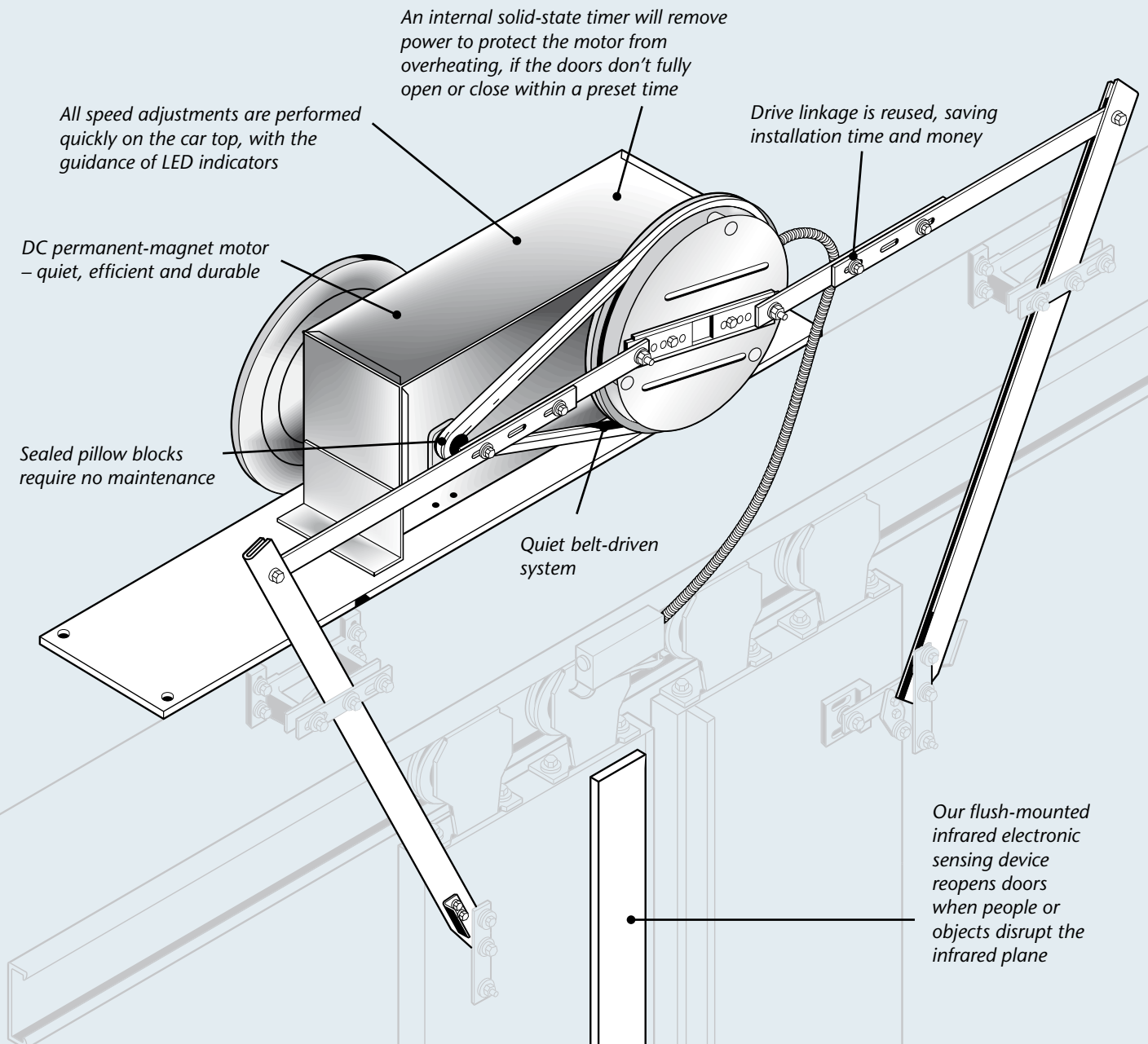
## Solution 2: G2M™ Door Operator

The G2M Door Operator Upgrade easily adapts to existing GAL door operator systems. The G2M door operator was designed to solve the problems of outdated GAL door systems by reducing maintenance/operating costs and providing superior door operation without complete replacement. KONE's G2M Door Operator Upgrade features

exceptionally smooth acceleration/ deceleration soft-start circuitry. This solid-state control provides uniform door speed transitions.

Another speed-regulation feature automatically compensates for differences in door weights, producing consistent operation from floor to floor. Any speed adjustments required

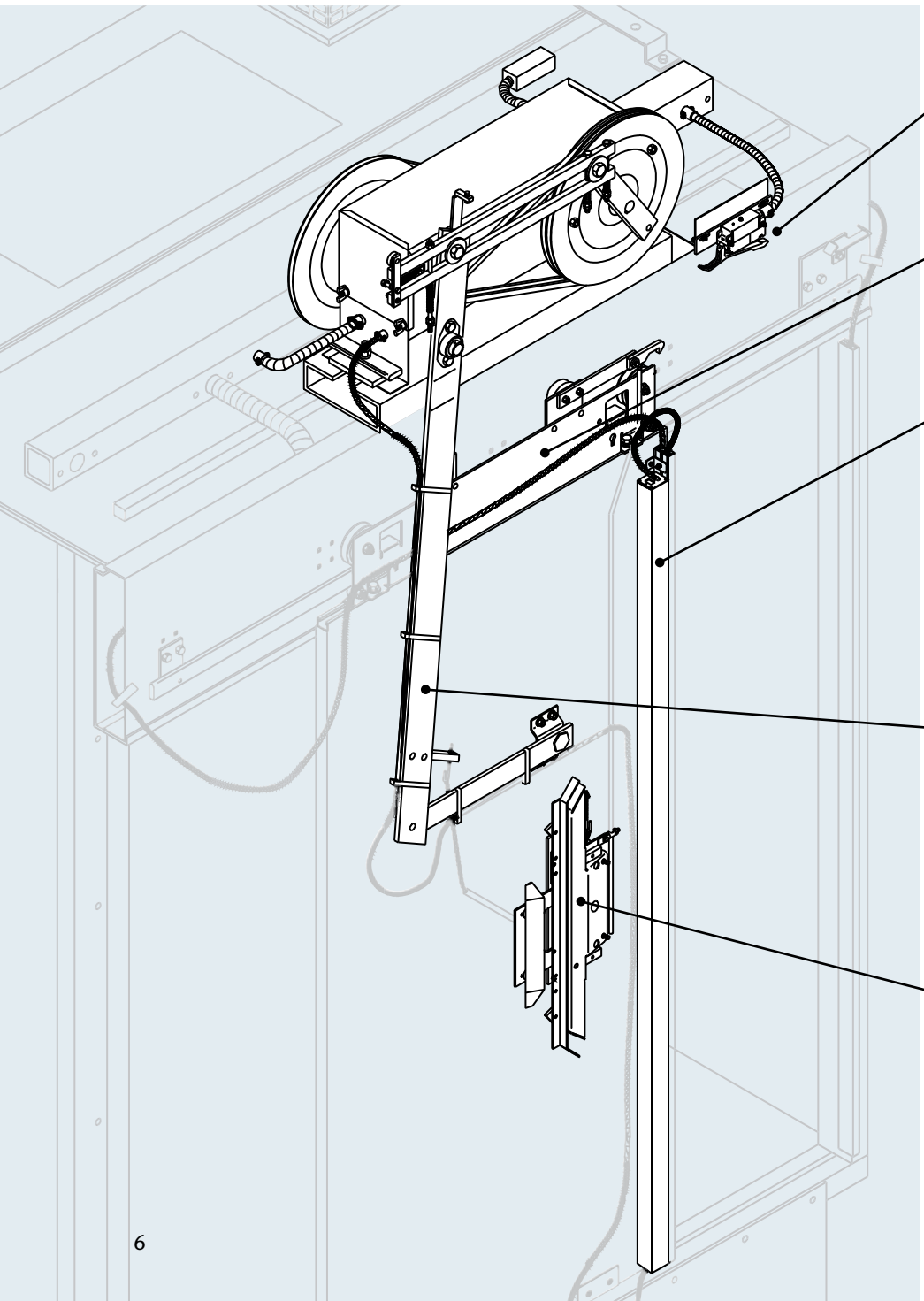
are quickly and easily completed from the car top, with the guidance of LED indicators. Sealed bearings and a cool operating DC permanent magnet motor extend the life of your door operator and reduce maintenance time. These features significantly reduce shutdowns to enhance passenger safety, comfort and convenience.



## Solution 3: MAC<sup>®</sup> Door Operation Upgrades

The MAC door operator is a permanent-magnet solid-state and closed-loop operator which provides high-performance door operation features for all types of applications:

- Measures velocity feedback of the motor
- Measures position feedback of the doors
- Microprocessor control system
- Adjusts to various conditions, including door weights and wind resistance
- Meets consultant closed-loop specification



### Gate Switch

The purpose of the gate switch is to electrically lock the car doors. The elevator will not move until this switch is closed.

### Door Restrictor

The electronic door restrictor is designed to prevent elevator doors from being forced open outside a safe landing zone.

### Door Sensing Device – Infrared Light Curtain

The KONE infrared door detecting device increases passenger satisfaction and comfort while decreasing door-related callbacks and downtime. Forty-seven invisible infrared beams detect virtually any obstruction before the doors touch passengers or their property.

### Door Linkage

Precise control over door movement requires that the linkage between the doors and the door operator transmit movement to the doors efficiently, quietly and reliably. MAC door linkages are heavy-duty use with maintenance-free sealed bearings.

### Door Clutch

The MAC door clutches are designed to provide positive, quiet engagement with the hoistway doors while maintaining close tolerance clearances while the car is in motion.

## Solution 4: Hoistway Door Operation Upgrades

### Fascia

The flat reinforced steel plate is installed vertically inside the hoistway, above the hoistway door hanger header to the sill of the landing above, to prevent pinch points and ledges.

### Hoistway Door Reel Closure

The reel closure ensures that the hoistway doors close tightly. It must have adequate spring tension to pull the hoistway door shut and actuate the door interlock mechanism.

### Hoistway Door Interlock

The hoistway door interlock mechanically locks the door to prevent it from being opened unless the car is present and completes an electrical circuit to allow the elevator to move.

### UL Fire-rated Door Panels

The fire-rated door panels are designed to resist standard fire tests and are labeled for identification.

### Hoistway Door Drive

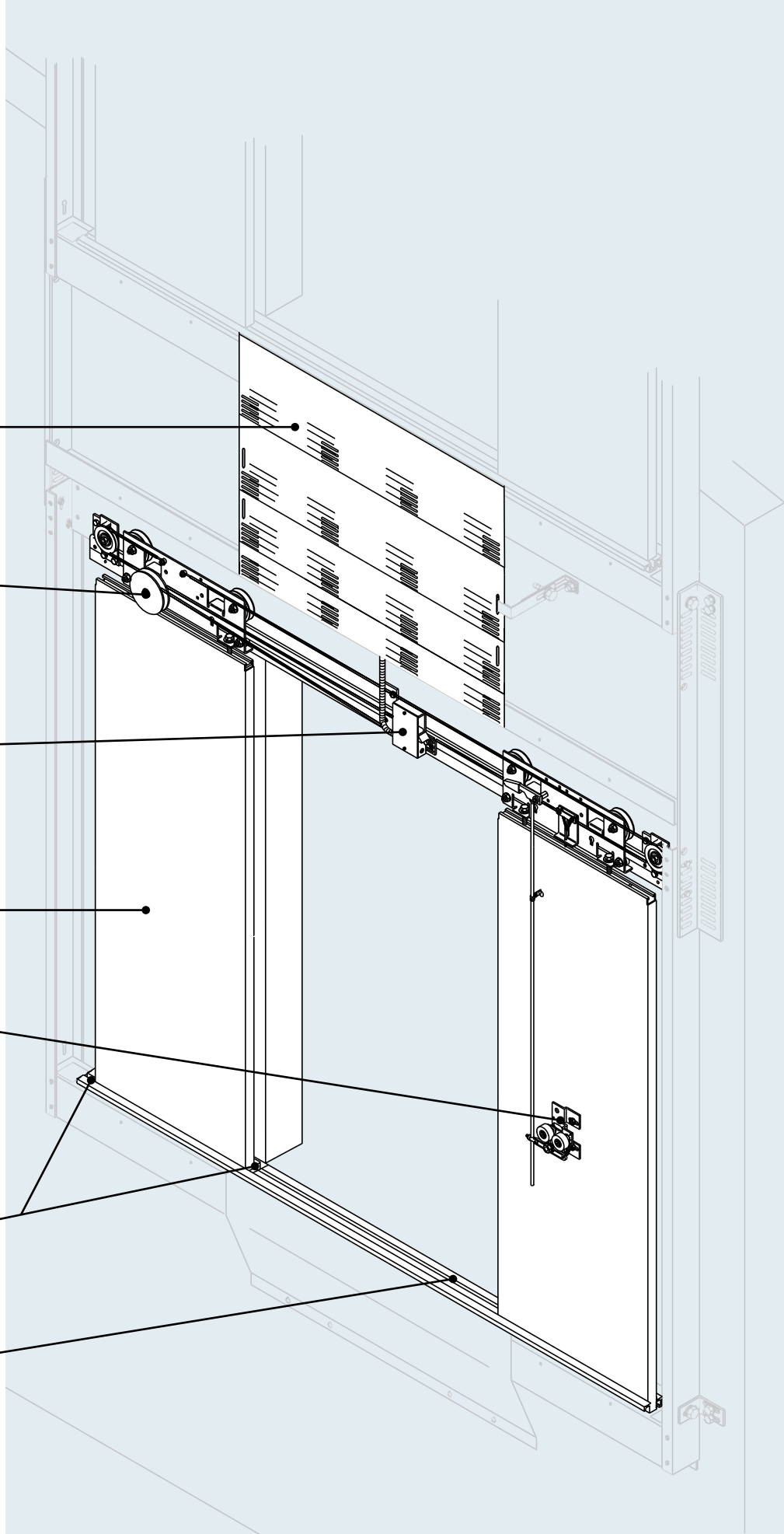
The hoistway door drive works in concert with the car door clutch to transmit the motion of the car doors to the hoistway doors. The door drive system provides precise door control and quiet operation, while maintaining close tolerances with the moving car.

### Hoistway Door Gibs

Both the car and hoistway doors are guided at the sill with a device designed to allow freedom of door movement while providing secure positioning.

### Hoistway Sill

The hoistway sill is the bottom horizontal plate of the landing entrance which provides foundation and footing for the elevator entrance frame.







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