

Elite Powered Mirror



FEATURES AND BENEFITS

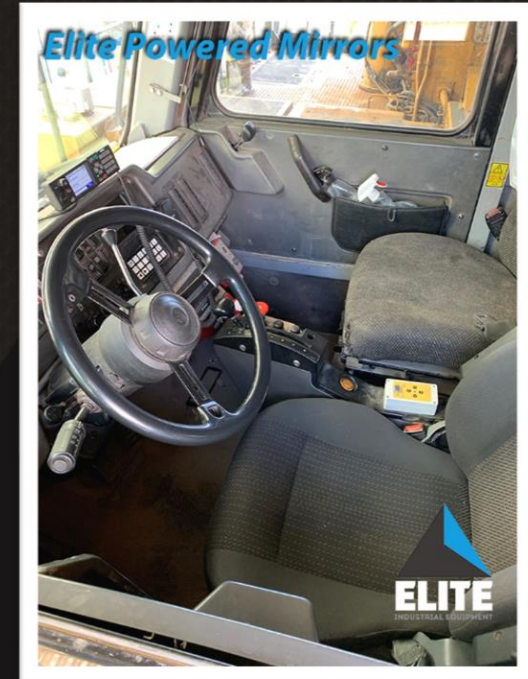
- ✔ Increased productivity
- ✔ Pan and Tilt adjustment
- ✔ 65% DECREASE in driver blind spot (fitting both sides)
- ✔ 12 Month replacement warranty
- ✔ Utilises OEM mirror assembly
- ✔ 24v DC In-Cab push button controller
- ✔ IP66 dust, weather and temp certified
- ✔ Integrated heated mirror control
- ✔ Quick, easy plug & play installation
- ✔ WHS benefits for operators & fitters.
- ✔ Australian & international patents.



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Direct Costs Currently Experienced by Minesites

- ▶ Mirror Breakage (Renewal costs and Downtime for repairs)
- ▶ Workers Compensation for injuries caused by collisions and poor driver position
- ▶ Insurance Premium cost levels
- ▶ Sick Leave
- ▶ Medical and Remedial therapy costs



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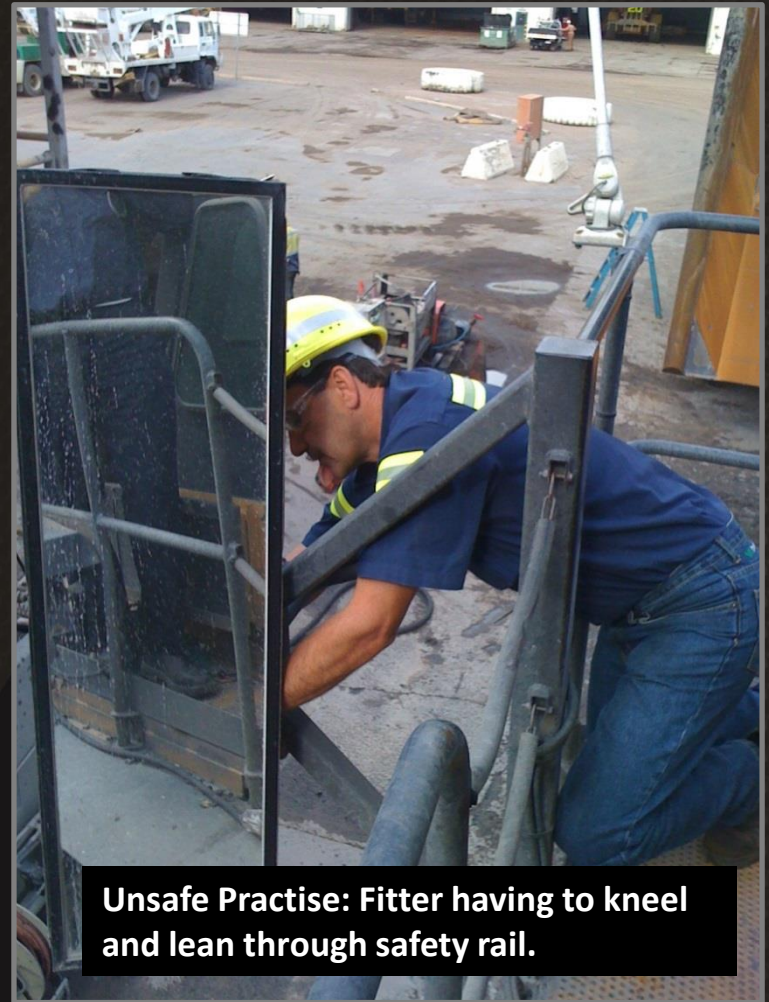
SAFETY

65% of operators state that very often they have to put up with the mirror being out of position due to the availability of the Maintenance Field Crew .

“WHS best practices require drivers to operate the truck with optimal vision and minimal discomfort.”

WHS benefits for fitters as they no longer have to lean through safety rails or kneel on grates to manually adjust the mirror. Operators no longer have to move awkwardly in their seats, causing possible aches and strains, just to get proper vision.

100% of operators using the Elite Powered Mirror said they repositioned it at the start of every shift.



Unsafe Practise: Fitter having to kneel and lean through safety rail.

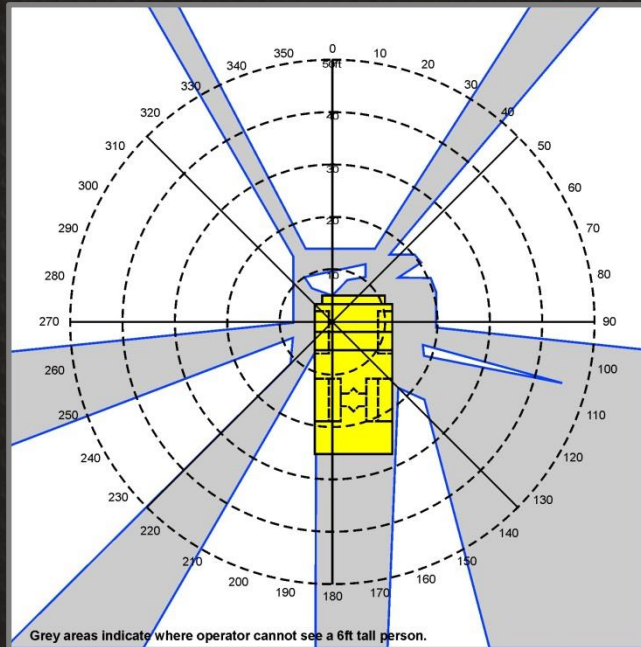


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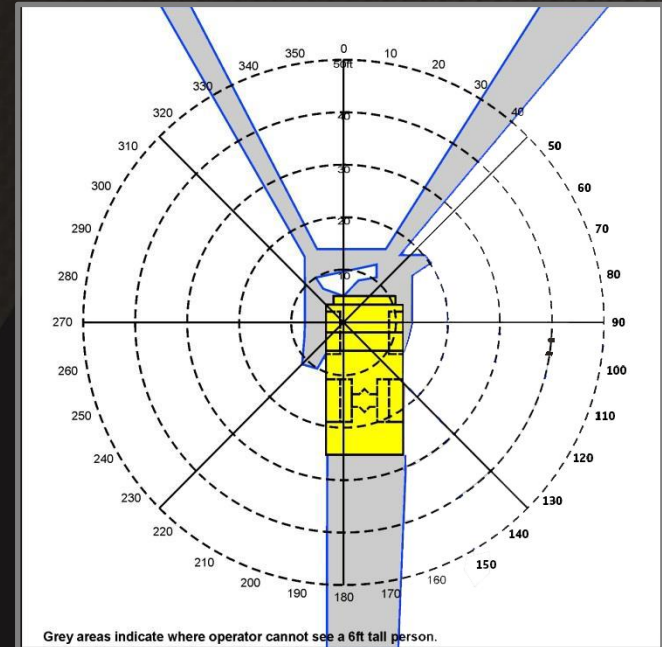
BLIND SPOT REDUCTION

Massive 65% reduction in blindspot area when Elite Powered Mirrors are fitted to both sides

Standard Truck blind spots.



65% Reduction Powered Mirrors fitted both sides



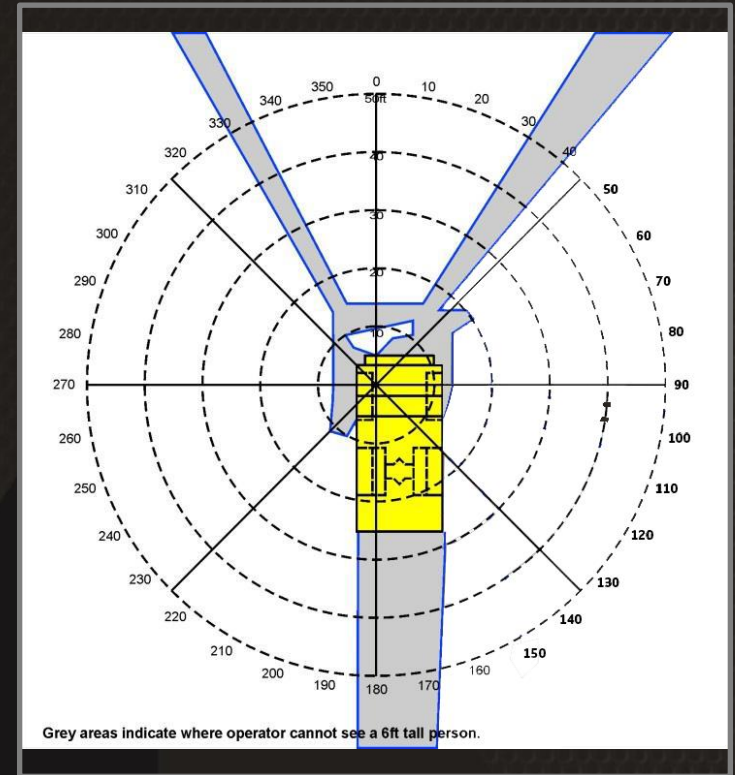
BLIND SPOT REDUCTION - CAMERAS

Cameras are a possible short term solution to the problem of Cab Surround Vision, However:

- They are higher maintenance
- The lens gets scratched and eventually clouds over when cleaned. Dust and mud create grit that cause this issue.
- The lack of room in the Cab for more screens
- They do not give proper distance perception.

What does this mean?

- A slight movement of the eye and the operator can judge the distance of an object in a rearview mirror as the observation angle changes. A camera only gives the same projected view.
- We asked a Formula One team in the UK why they don't use cameras. They responded with the above comment concerning distance judgment.



CASE STUDY RESULTS : Spot Time Savings

The Measurement Acumen used below to calculate the savings obtained and the cost of improving spot times.

Savings obtained across a 12 month period

- A. 3.5 (seconds reduced per spot time) \times 675 (loads) = $2,362$ seconds saved per shift Indicative of Cat 797 & 830
- B. $2,363/38,880$ (seconds worked) = 6.1%
- C. 4100 P&H shovel moves 29 million tons per year
- D. $29,000,000 \times \$0.40$ (cost per ton) = $\$11,600,000$
- E. $\$11,600,000 \times .061 = \$707,600$ per year fleet savings

Spot Time SAVINGS to Business		
Consideration	Value	Comments
Seconds reduced per spot time	3.5	
Average loads per shift (12 hour shift)	675	Indicative of CAT 797 & 830
Seconds saved per shift	2363	
Percentage of seconds worked per shift	6.10%	10.6 hrs - takes into account pre start/breaks
P&H Shovel moves approximately	29000000.00	Material Tonnes
Coal cost (per Tonne)	\$ 0.40	\$40 per Tonne (worldwide average)
Total price of material moved by shovel	\$ 11,600,000.00	
Sum of material moved multiplied by seconds saved	\$ 707,600.00	Per Year fleet saving (Fleet of 10 Trucks)
Cost to Business Per Truck Per Year	\$70,760	
Combined Spot Time and mirror adjustments calculations	\$96,032	
Combined Payback period	57	Payback period (days)

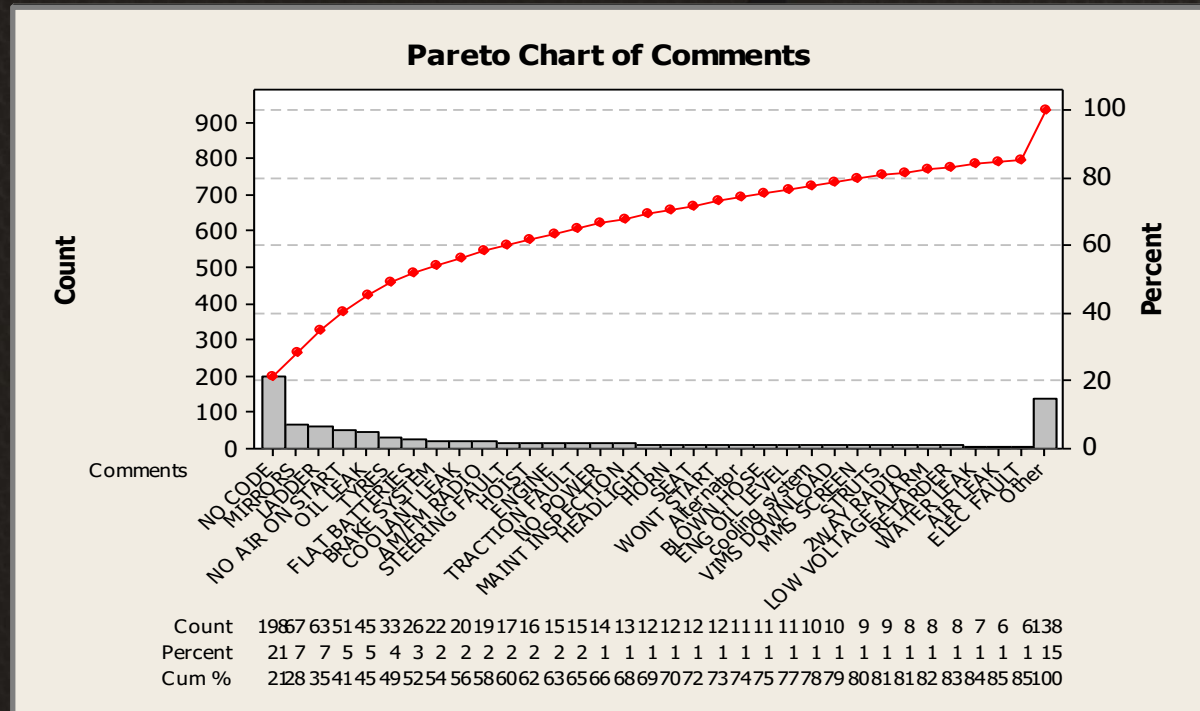


ACTUAL SITE DATA FOR TRUCK DELAYS

The Data below was taken from an actual site running 793C Trucks.

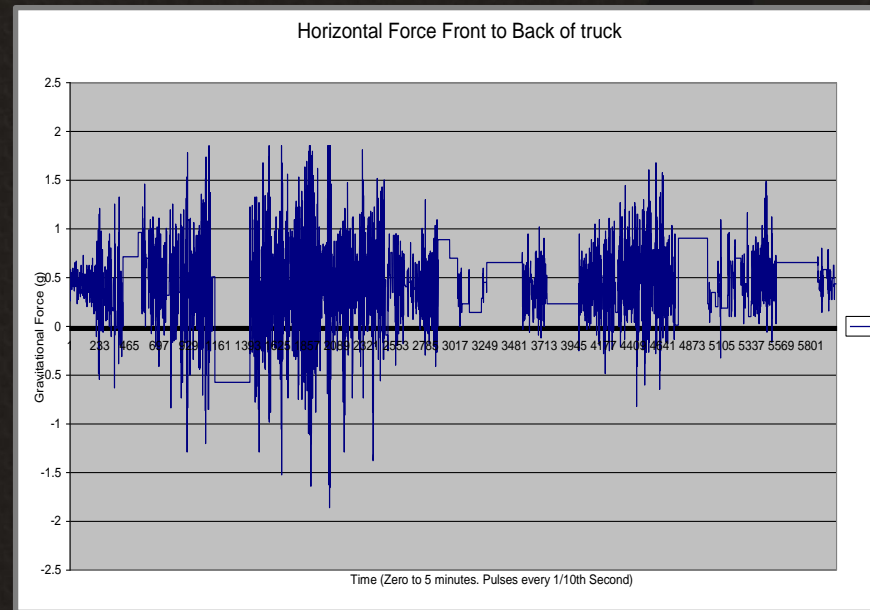
- It Shows a Pareto Chart of actual delays taken over a month period on the Modular System.
- Mirror adjustments are the second highest delay by frequency over this period.
- The highest is 'no code'. This is where the delay has occurred, and the reason code not recorded.

Mechanical Fitters consulted suggested that Mirror adjustments are far more frequent and a large percentage had not been recorded i.e. 'No Code'.



MINING: Site Condition Data

Mining Conditions in Winter have been poor at the test site. Wheel ruts of one metre depth are common. Poor floor conditions result in excessive shock loads up to 2g. The mirror has been tested to withstand up to 2.5g shock loads.



CONTROLLER & SOFTWARE

Control of the unit is equally important. The electronic controller has been designed to be compact but tough. Inside, pulse width modulation circuits determine the level of power required for operations. Embedded software varies the power of the pulses.

The software then adjusts the width and the level of the voltage pulses required to move the motor steadily and smoothly.

The motor, components and all connections are **IP66 dust, weather and temperature certified.**

- Maximising Operator's Vision through finite adjustment.
- No awkward movement in seat required to compensate for misalignment.
- Heating is an optional extra, Ideal for cold climates or fogging issues



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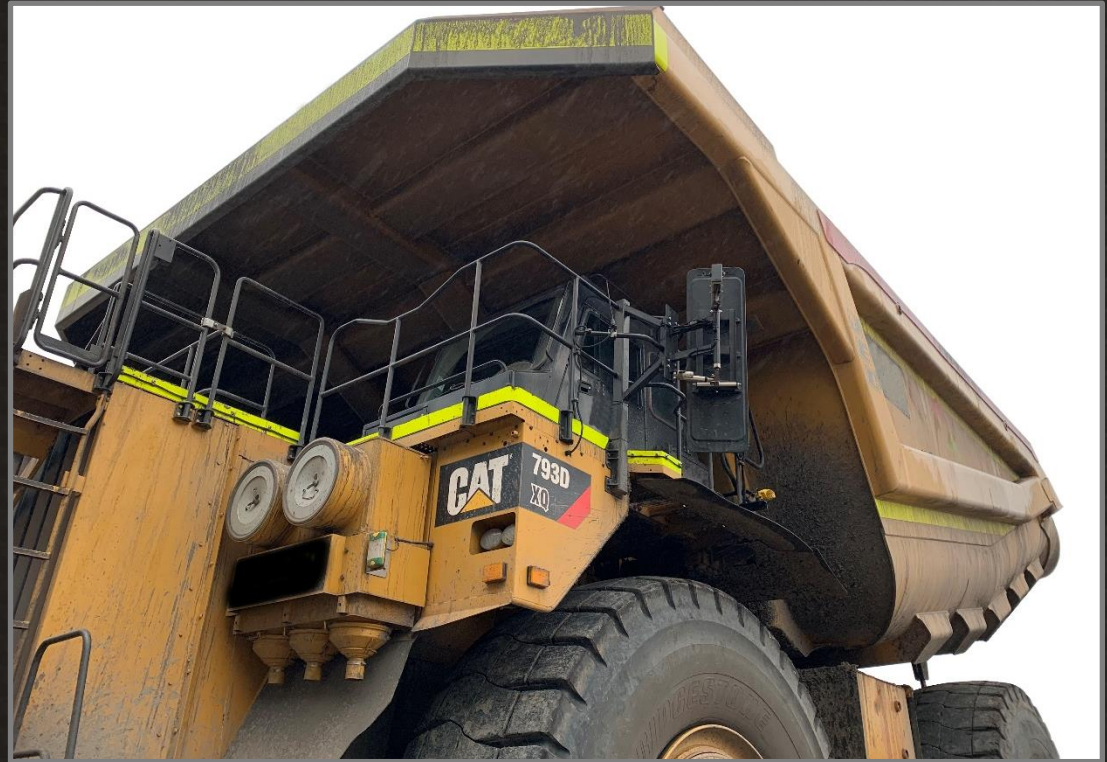
IP66 Push Button
Membrane Controller.



SIMPLE FITTING

Standard adaptor designed to fit any make or size of truck.

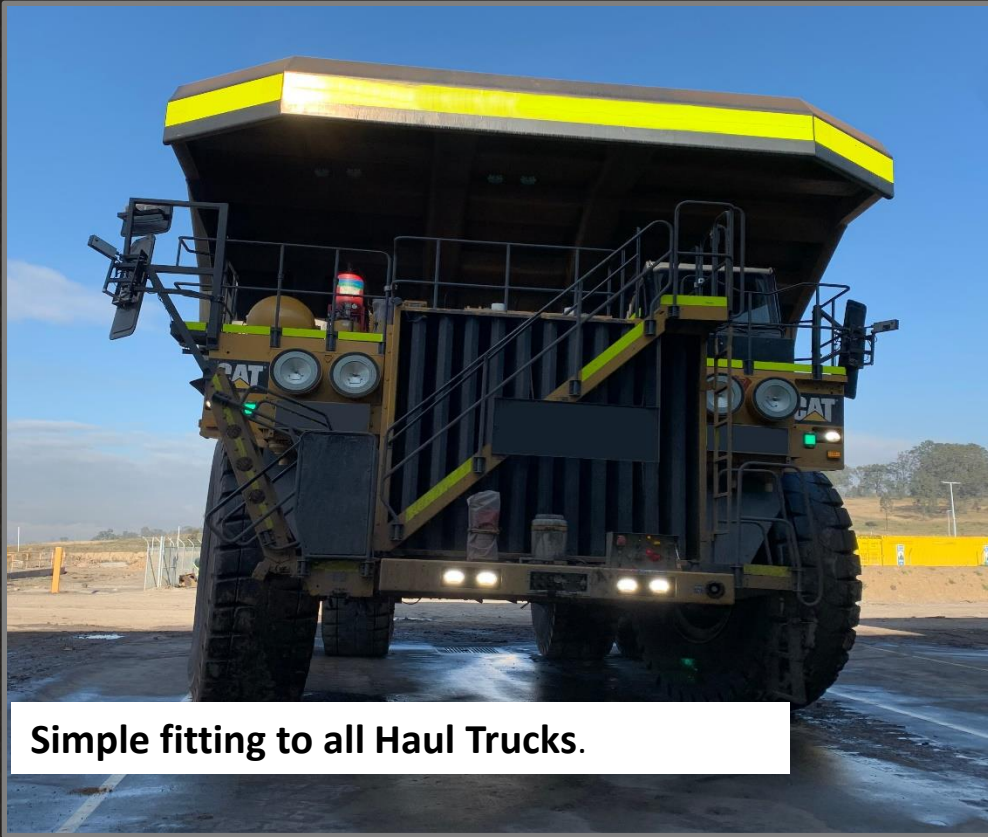
Bolt-on, bolt off in Just minutes. Wiring harness Simple to install using Deutsch plugs and standard 24vDC connection.



Also available for the off side of Haul truck



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Simple fitting to all Haul Trucks.



**Tested in real life tough conditions.
4000 hours on current trucks in
Australian Coal Mine**



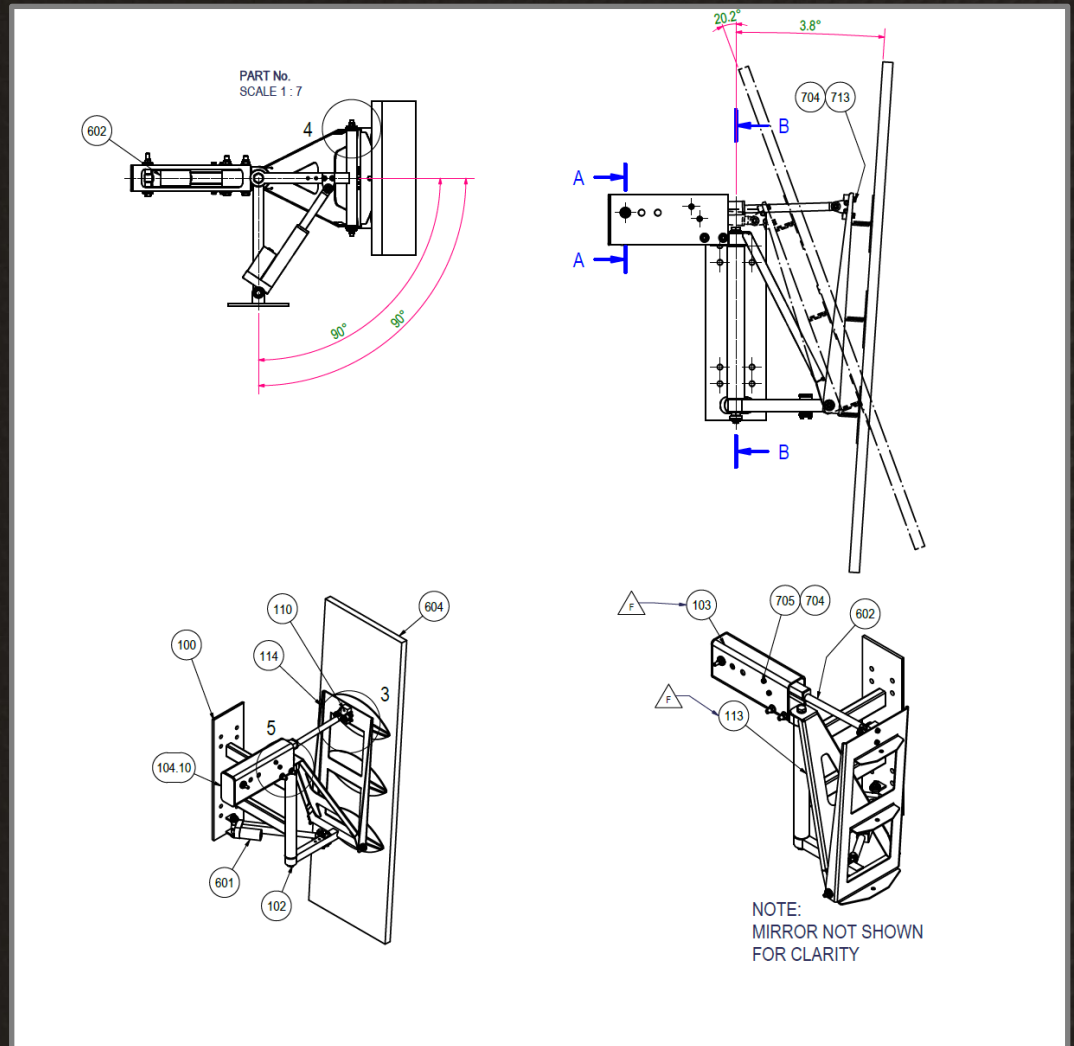
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Robust Design Based on Utilising Actuators

The actuators are not a standard type and are built specifically for rugged/tough conditions.

Benefits:

- Light weight / Strong Design
- Simple installation
- Rugged fit-for-purpose design
- Heated mirror control
- Compact in-cab controller



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