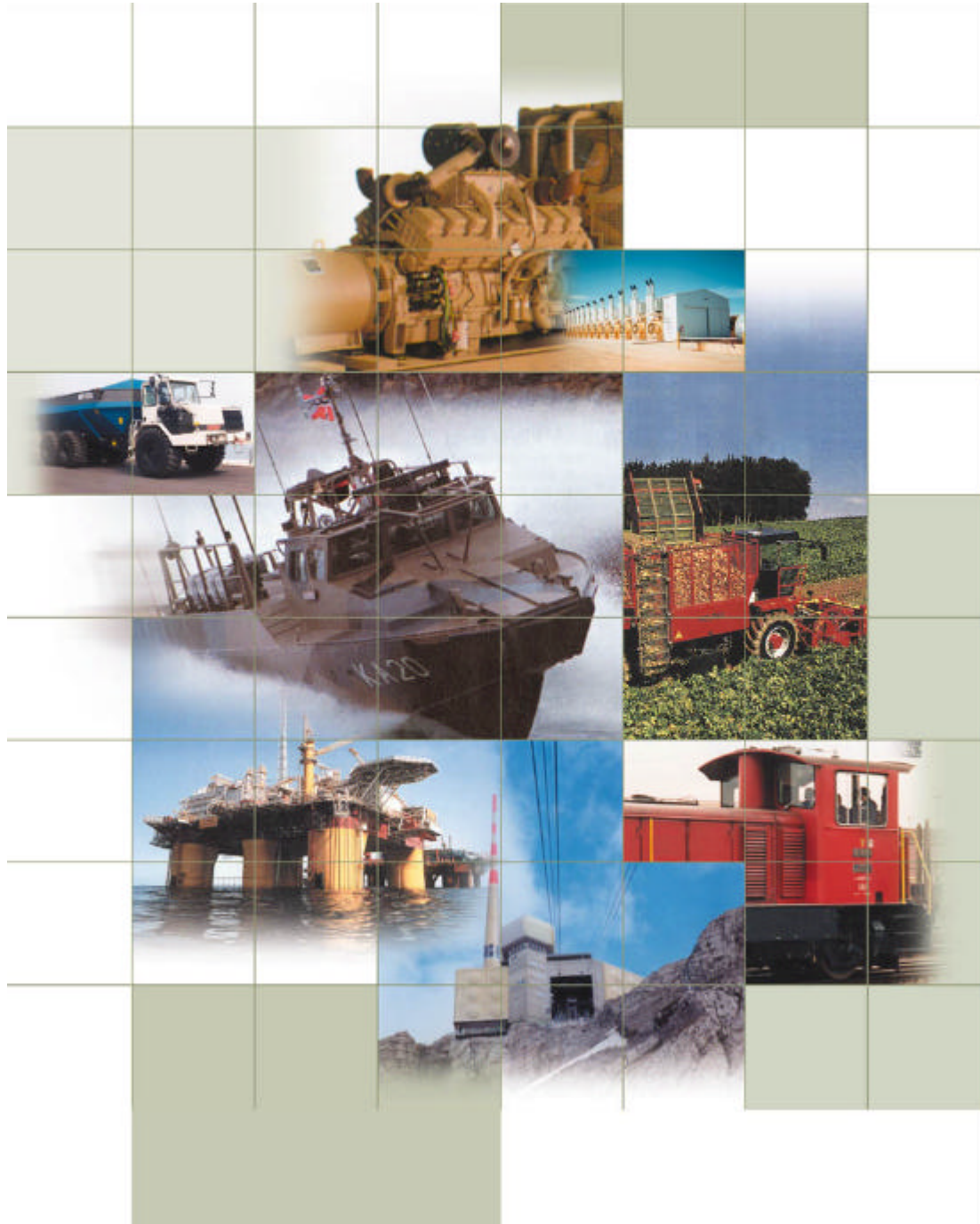




HUEGLI TECH AG (LTD)

The Engine & Genset Control Company



1. Speed Governing
2. Genset Automation
3. Hydraulic Cranking
4. Engine Protection

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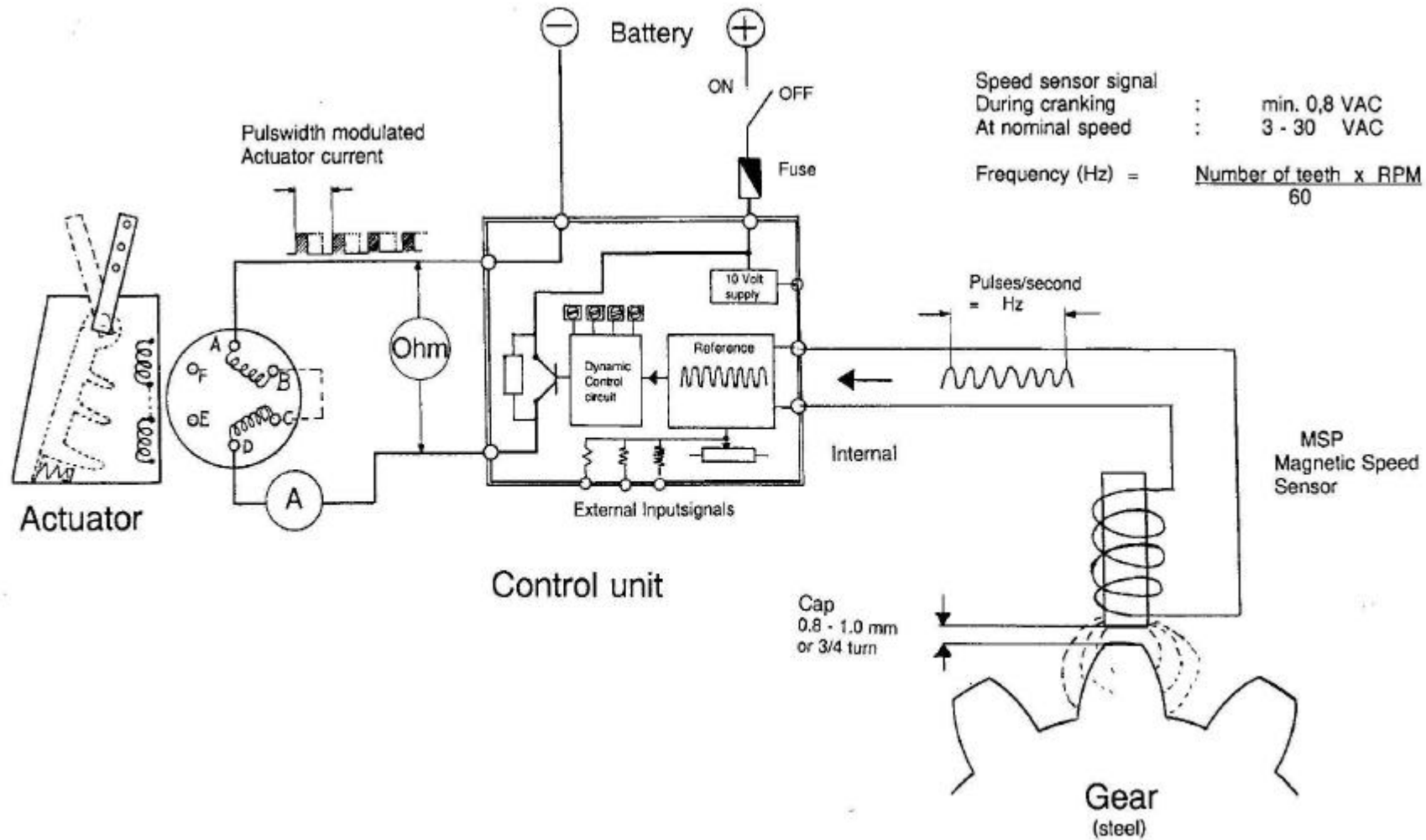
Basic Governing System

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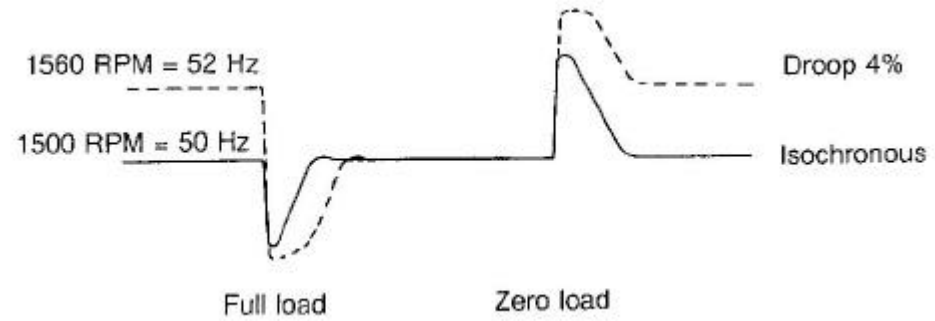


Governing Principle

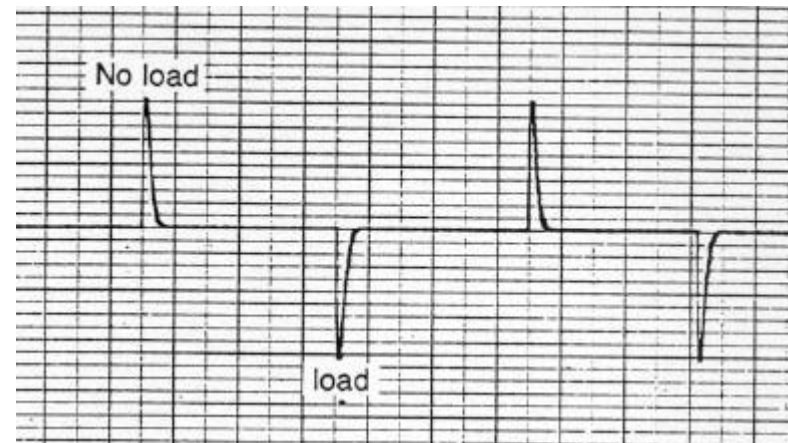


Isochronous Speed

- Mechanical Governor



- Electronic Governor



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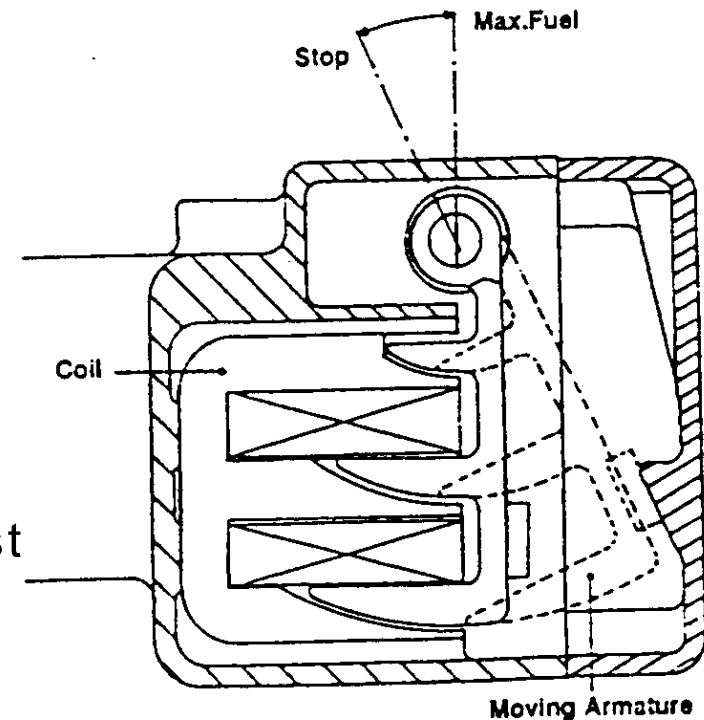
Actuators

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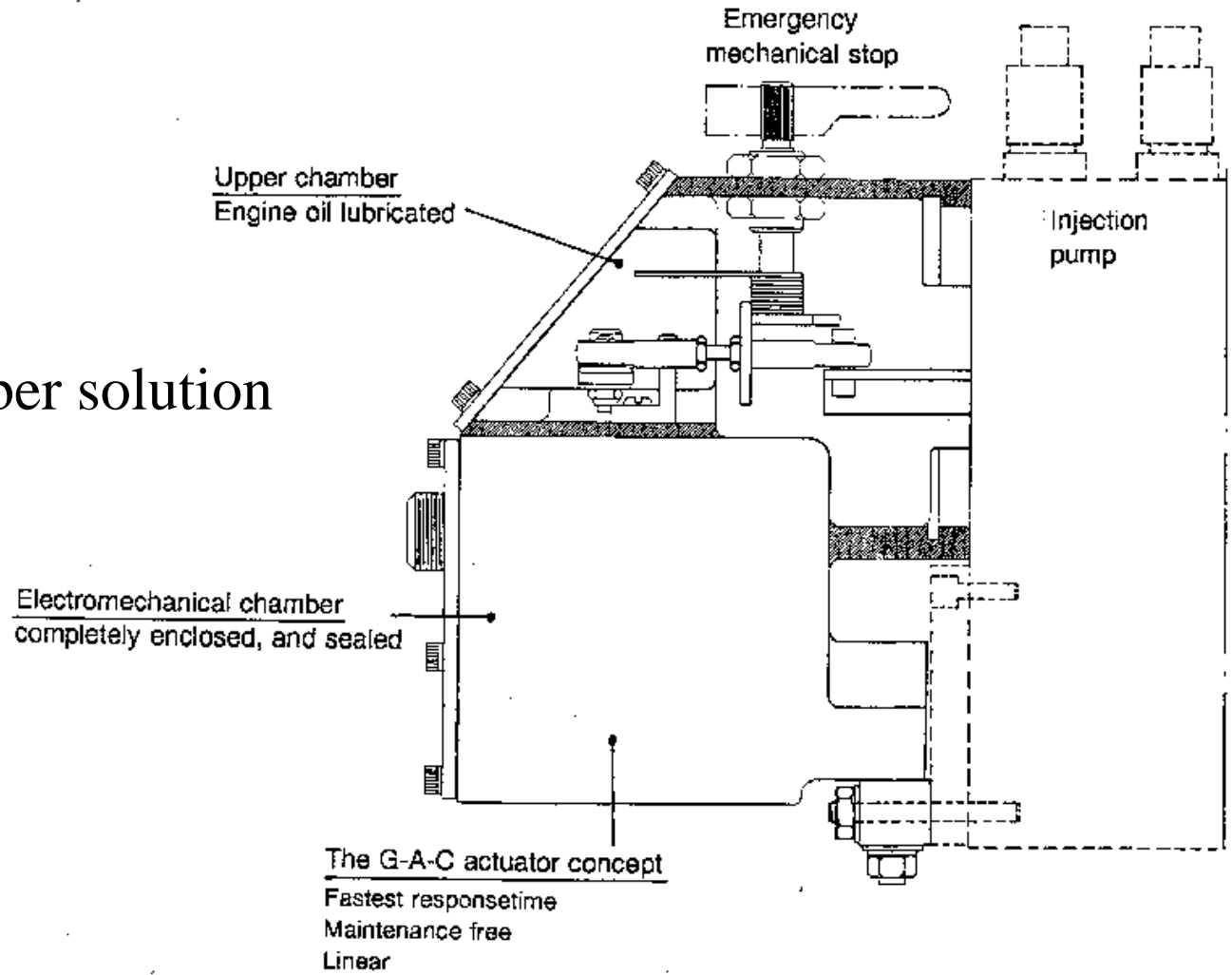
Actuator Design

- Linear motion - requires no position sensor for fuel management applications
- Very fast response time (30-45 ms) results in high performance and lowest possible transients
- Safety shut off feature
- Wear free design for long durability
- Low current consumption
- Integral types are fully protected against external influence



The Integral Concept

Two chamber solution



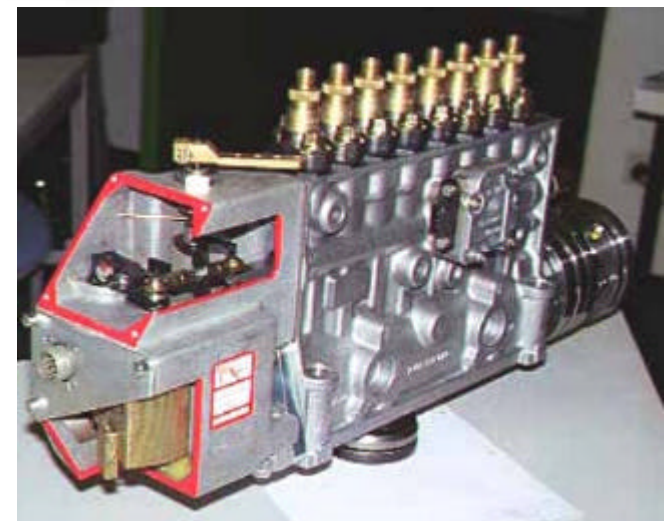
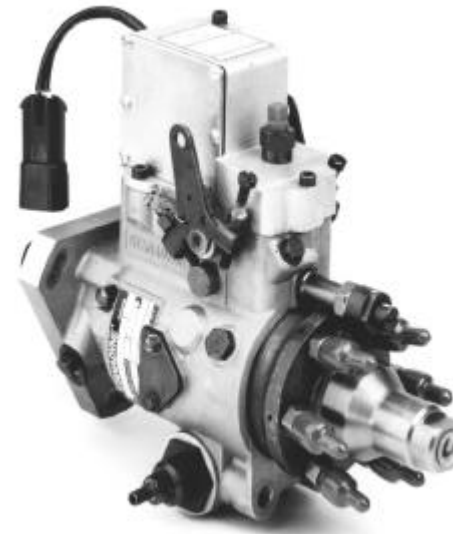


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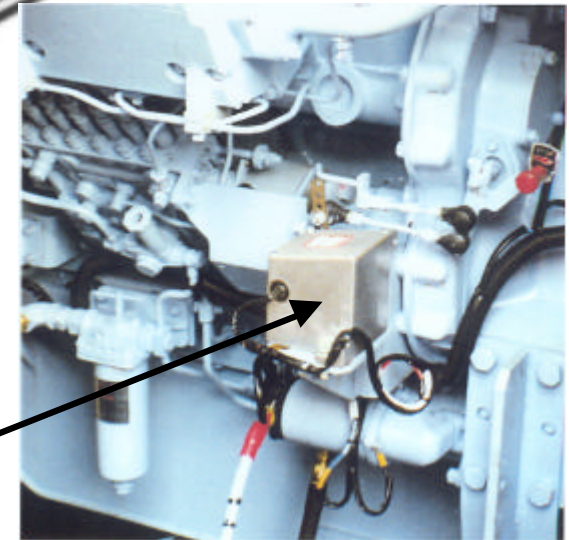
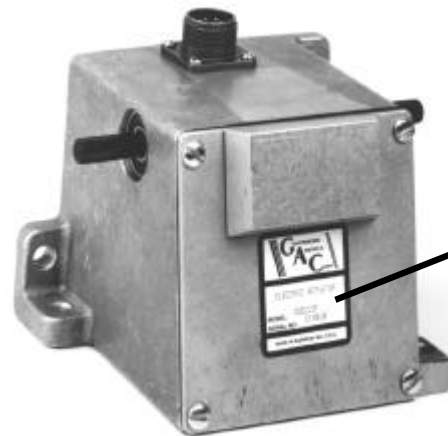
Integral

- Mounts directly on fuel injection pump
- For Bosch A-/P-Series and Stanadyne pumps
- Actuator goes directly on fuel rack
- Various customer makes



External

- For standard and retrofit applications
- Mounts on every engine up to 1.5 MW
- Connection to fuel injection pump with a rod



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Electronic Speed Controls

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The Speed Control Concept

- Fixed and variable speed units for various applications
- Full PID control loop, non interacting, P&I part adjustable
- D Part fixed, limited adjustment possibility for simple set-up
- Speed accuracy 0.25% in full range
- Fast speed anticipation feature reducing transients

- Various features available from low cost standard units to starting smoke limitation, crank termination, dual gain a.s.f.

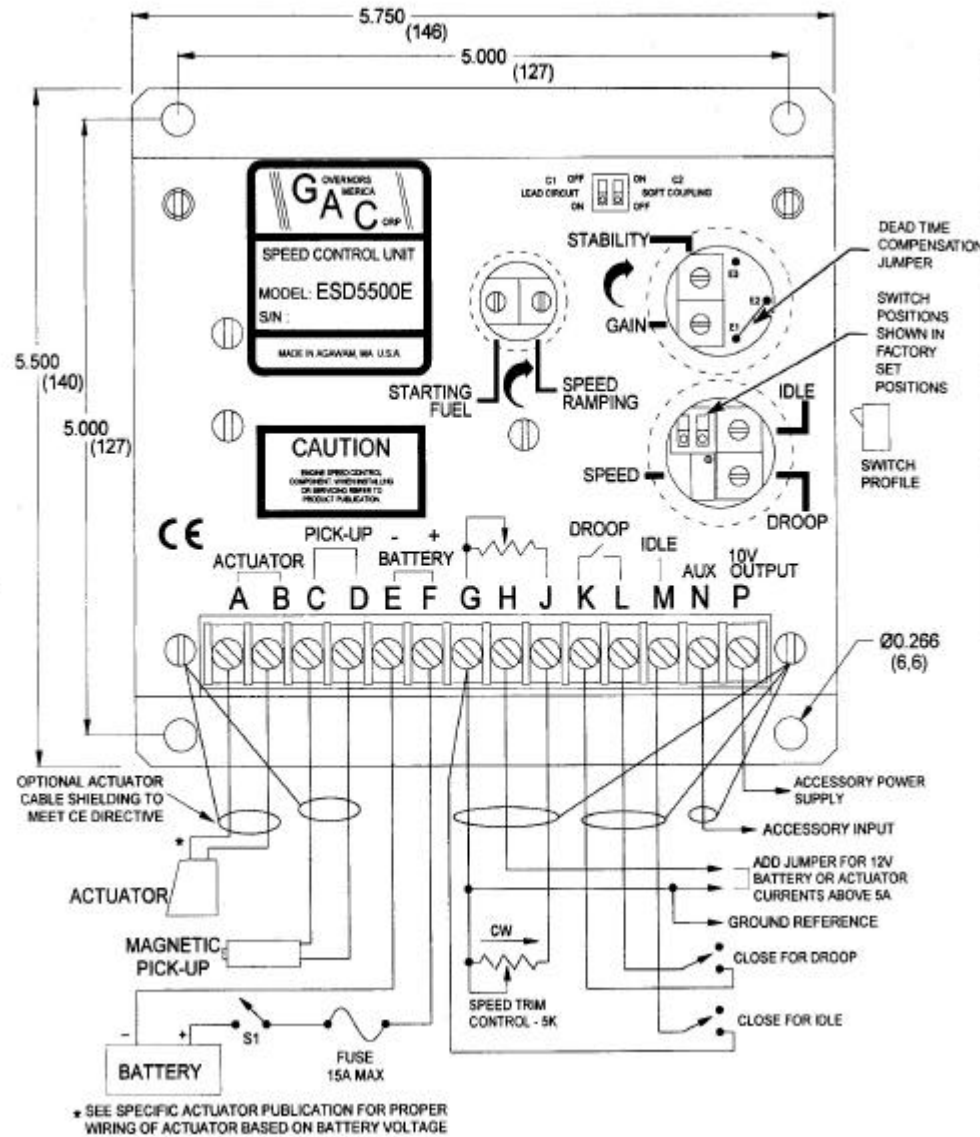
- Humidity and vibration proof design, hard potted versions

ESD 5500



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Genset Control Company



* SEE SPECIFIC ACTUATOR PUBLICATION FOR PROPER WIRING OF ACTUATOR BASED ON BATTERY VOLTAGE

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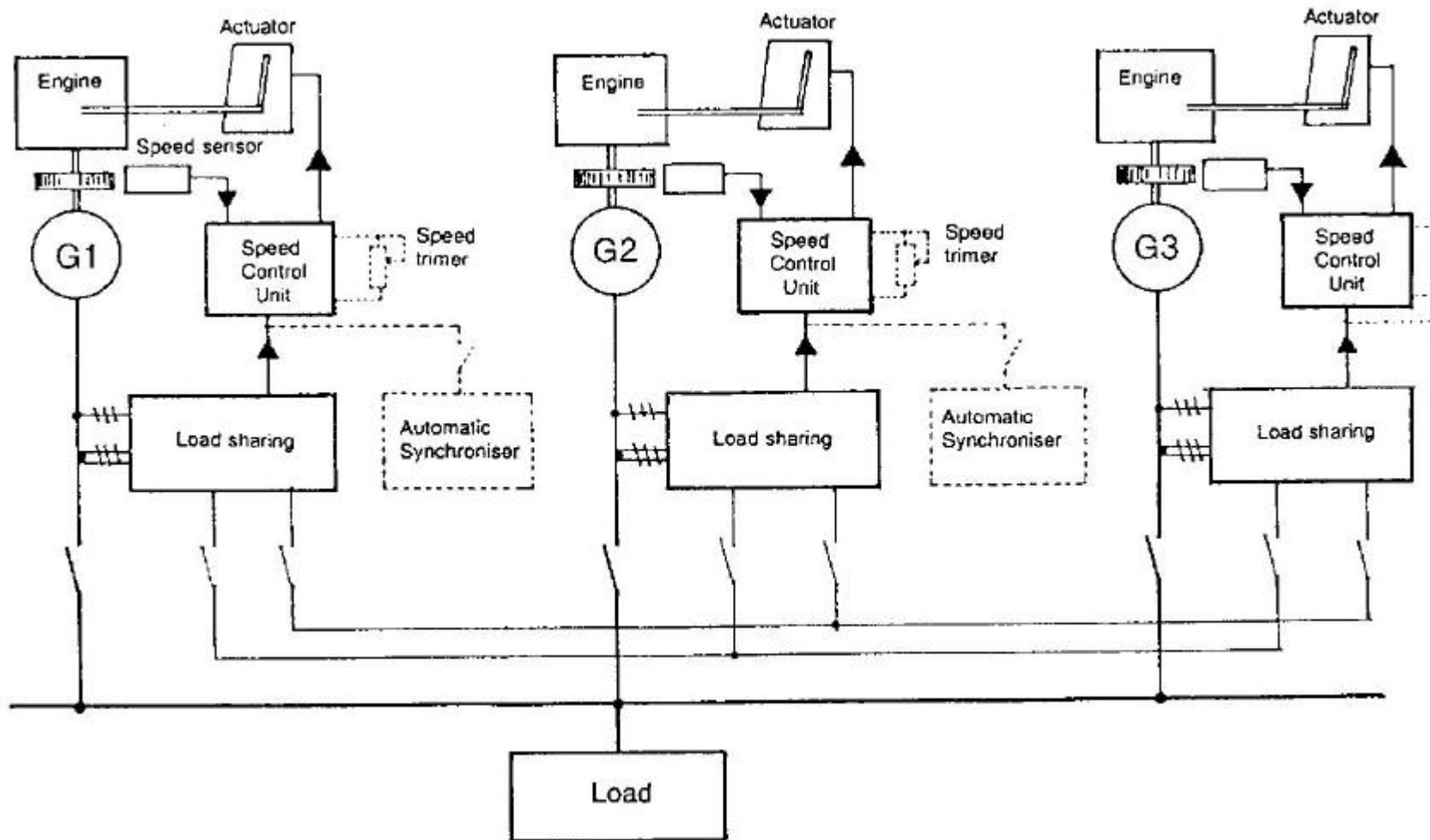
Accessories for Gensets in Parallel

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Functioning Principle





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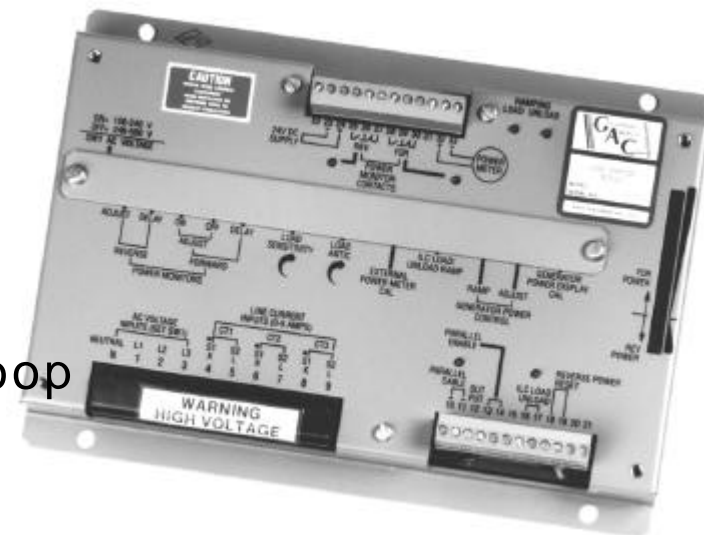
Synchronizer

- Stability and gain settings
- Adjustable phase error
- Adjustable breaker closure angle
- Enable and test input
- LED indication for
 - Gen/Mains voltage
 - Breaker relay closed
 - Synchronizer enabled
 - Synchronised
- Fast synchronising, 3-5 sec



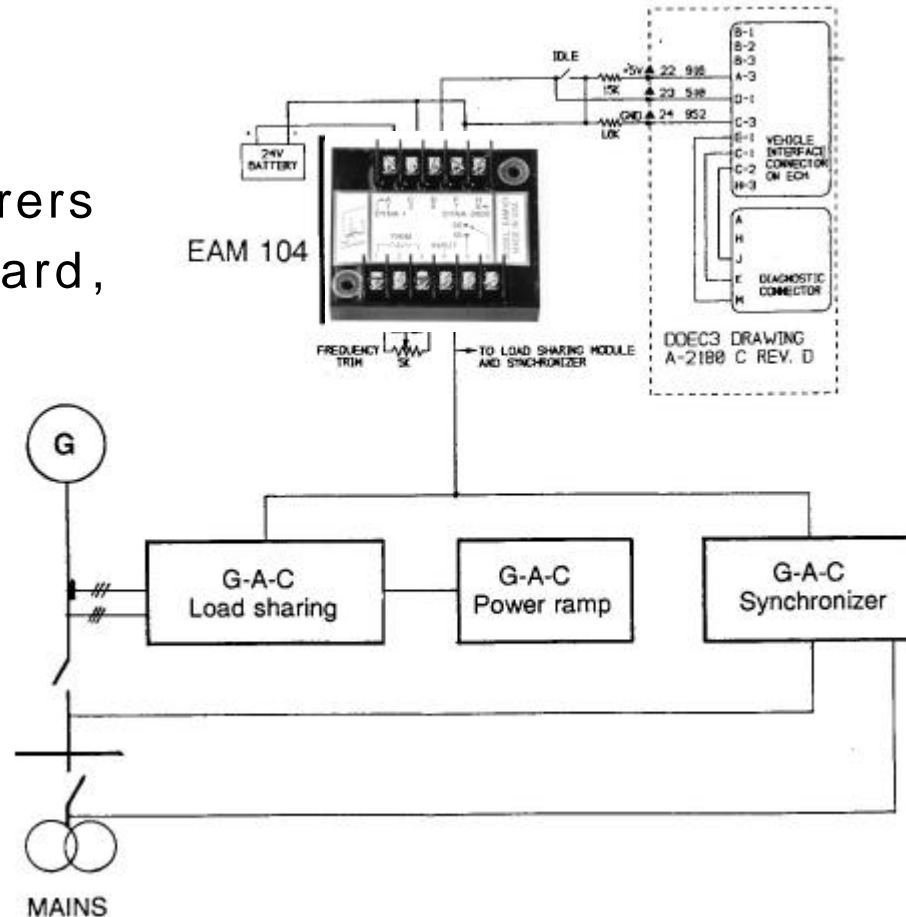
Load Sharing Units

- Very precise load sharing between unlimited sets with equal or different power rating
- Constant, isochronous speed
- True power measurement, load sharing gets independent from eventual actuator losses
- Load sharing over analog parallel cables
- Gain, sensitivity settings for PID loop
- Output directly to speed governor



Interfaces to foreign Governors

- Interfaces to match foreign governors
- For various manufacturers available, B/C, Woodward, Caterpillar, others
- Transforms output to speed governor to requested levels



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Why choose GAC?

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10 Reasons for GAC

Standard or custom designed engine governing with perfect price/performance

- Superior overall engine speed and/or torque control accuracy
- Fully independent PID loop settings for perfect engine control
- Integral or external actuators for inline and rotary type pumps
- Hardware and software engineering for customized solutions
- Tuned equipment for parallel applications of gensets
- Satisfied OEM customers around the world as previously named
- Company with strong sales and support via Huegli Tech
- Various approvals (MIL, Marine such as GL, Rina)
- Long experience in the engine control field worldwide