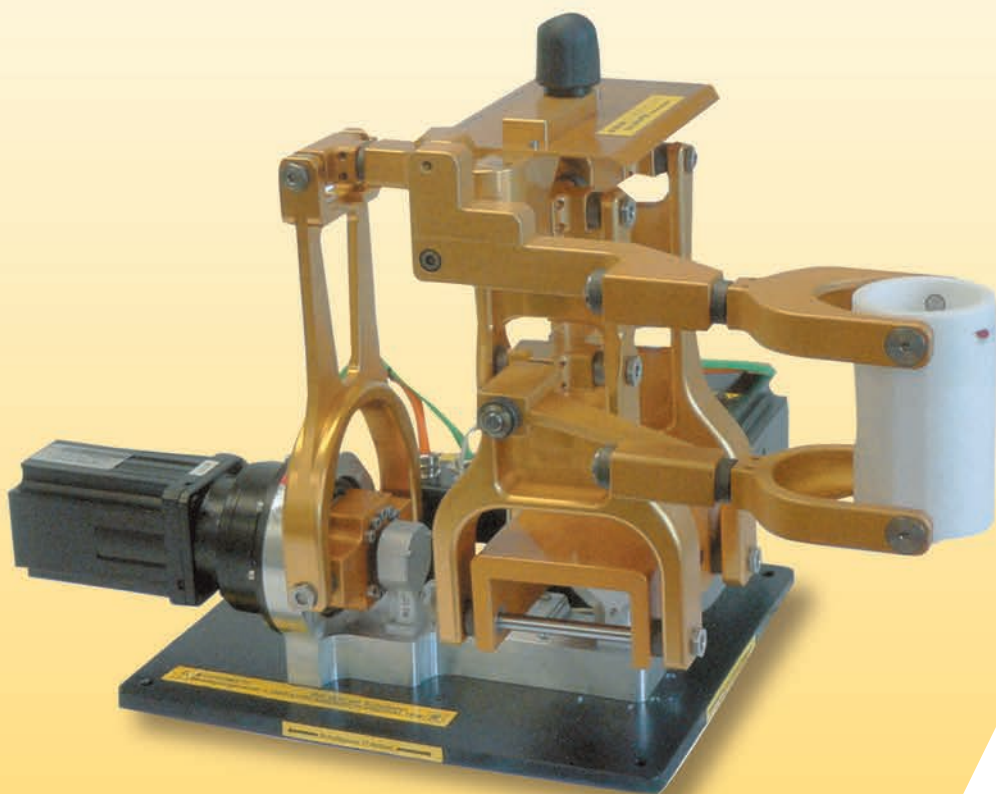


STÄHLE

Robot Shifter

SA-RAPID

for shift operations testing
HIGH DYNAMIC Shifting capability



- For automatic transmission and manual transmission floor shifter
- Gear shift knob force measurement (optional)
- Shift force and shift velocity monitoring and control
- Very high accuracy and repeatability
- Designed for millions of shift operations
- Complete custom software with test cycle editor



STÄHLE
ROBOT SYSTEMS

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Robot Shifter system SA-RAP-B00 (= Shift actuator of SAM-RAPID)

Life time tests for gear boxes | Life time tests for shift lever functions | Life time tests for gear box synchro | Shift force measurement

Descriptions

The robot shifter SA-RAPID consists of two closed loop position and force controlled servo-electric actuators for moving a shift lever through a transmission shift position for both, manual transmission and automatic transmission. While in gear the shift lever also can be “loaded” against its gate stop, simulating a driver pulling or pushing on the lever.

- Complete custom software interface package with WINDOWS User Interface (GUI) to execute user-definable test cycles
- Remote control unit (handy terminal) for single operator teach - in of gear positions
- Teach in procedure to learn the gear positions with the handy terminal
- Limitation of the shift torque by limiting the motor current
- Different parameter sets with definitions of shift arm velocities and forces
- Shift error repetitions with strategies to solve „tooth-on-tooth“ conditions of the transmission
- Synchro force limitation with automatted synch. point detection
- Manual shift operation mode via handy terminal
- Manual transmission: max. 8 gears + neutral + reverse gear
- Automatic transmission: P / R / N / D / 6 / 5 / 4 / 3 / 2 / 1/ M / + / - in any sequence
- Auto-gear detection with manual transmissions (force measurement required)

Specifications

Actuator system	electrically
Motion	spherical
Shift stroke (X-axis lateral)	max. $\pm 30^\circ$ (± 150 mm with gear stick length of 300 mm)
Shift stroke (Y-axis longitudinal)	max. $\pm 50^\circ$ (± 230 mm with gear stick length of 300 mm)
Shift Force	max. 560 N
Nom. Force	280 N @ 3 m/sec
Nom. Velocity	3.0 m/sec
Position measuring	conductive plastic potentiometer
Force Measurement	DMS sensor knob with analog scaling circuitry (option)
Measurement accuracy	0.09mm
Motor voltage	320 VDC
Motor type	Brush-less AC drive with resolverposition loop
Positioning resolution	$360 / (4095 \times 35)^\circ = 0.0025^\circ$
Operating temperature	-40°C ... +80°C

Options

- Other force & speed configurations
- Gear shift release mechanism
- Custom shift unlock devices
- Throttle or clutch actuators
- Host computer interfaces
 - Serial or TCP/IP: Extended AK protocol
 - TCP/IP: OPC Server / Client
 - Hybrid bit - parallel & analog interface
- Shift force measurement knob P-A521.00
- Fieldbus Interfaces

