JE-S TYPE ELECTRIC ACTUATOR TROUBLESHOOTING GUIDE

WHAT THIS GUIDE IS, AND HOW TO USE IT

This comprehensive document provides POSSIBLE SOLUTIONS and/or ADVICE for reported 'faulty' actuators, and is intended purely as a guide to identify possible causes and remedies for actuators that are not working as expected.

• Use the index to identify the page in the document most likely to help.

• When a user sends a command signal to an actuated valve and it doesn't respond, it is usually automatically assumed that the actuator is faulty. In most cases, the fault is either with the valve, or with the electrical system controlling the actuator, and not the actuator itself.

• This document is intended to help identify where the problem is. 'POSSIBLE SOLUTIONS/ ADVICE' contained in this document are only suggestions and recommendations based on many years of practical industry experience.

• The warranty on the JE Series Type electric actuator relates to the product itself, and does not extend beyond those parts supplied. All external equipment/ wiring/influences are provided by, and are the sole responsibility of the customer.

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DynaQuip DYNAMIC FLUID CONTROL SYSTEMS

Multi-color LED Status Light - using it as a diagnostic tool:

The LED is provided to give users continuous visual feedback of the functional status of the actuator.

- If the LED is not lit the actuator is not receiving external power at the gray DIN (power) plug.
- If the LED is solidly lit, the actuator has power applied and should be ready to respond to remote commands.
- If a problem exists and the actuator does not respond to remote commands, the sequence and color of the blinking gives an indication of the possible cause.

ON-OFF ACTUATOR	ACTUATOR OPERATIONAL STATUS
Without power supply	
In open position	
In close position	
Opening	
Closing	
Torque limiter function on, moving from close to open	
Torque limiter function on, moving from open to close	
Actuator in MANUAL mode (Exceeded time)	
The actuator has stopped (*)	
In middle position (for a 3 position actuator only)	

(*) Actuator powered on to Open and Close position at the same time.

DynaQuip DYNAMIC FLUID CONTROL SYSTEMS

FAIL SAFE ACTUATOR

ACTUATOR OPERATIONAL STATUS

Without power supply	
In open position	
In close position	
Opening	
Closing	
Torque limiter function on, moving from close to open	
Torque limiter function on, moving from open to close	
Actuator in MANUAL mode (Exceeded time)	
The actuator has stopped (*)	
In middle position (for a 3 position actuator only)	
Actuator without power, working with the BSR NO system. Max.3 min., (led off).	
Actuator without power, working with the BSR NC system. Max.3 min., (led off).	
Battery protection. Danger, the battery needs recharging BSR blocked.	

(*) Actuator powered on to Open and Close position at the same time.

DynaQuip DYNAMIC FLUID CONTROL SYSTEMS

MODULATING ACTUATOR

ACTUATOR OPERATIONAL STATUS

Without power supply	
Motor Stop	
Opening	
Closing	
Self adjusting configuration	
Torque limiter function on, moving from close to open.	
Torque limiter function on, moving from open to close.	
Instrum. Signal overpassed. Blocked. Need a re-set.	
Actuator in MANUAL mode (Exceeded time).	
No Instrum. Signal pick-up. 4-20mA and 1-10V only.	

LED NOT LIT, ACTUATOR DOES NOT WORK

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
LED not lit	No external power arriving at the actuator, or actuator damaged due to wiring error.	• Check wiring AT THE ACTUATOR's GRAY DIN PLUG matches the wiring on the actuator's wiring diagram (affixed to actuator). • Check for loose wires in the DIN plug, or bare wires/ strands shorting across 2 terminals. • Check for damaged cables. .
		• The difference between the wiring connections of the power (gray plug) and end of travel (black plug) wiring has been missed resulting in a short circuit damaging the main PCB. • The plugs have been swapped so the gray power plug was fitted to the black base, creating an internal short circuit resulting in catastrophic voltage to the limit-switch sub-PCB. Thereafter plugging the gray power plug back into its correct base would not show a lit LED.
		• Is the correct voltage being applied? Check voltage being applied AT THE ACTUATOR DIN PLUG* is within the range shown on the actuator ID label; (a) when the DIN plug is not fitted to the actuator and (b) when it is connected to the actuator and driving actuator (checks for undersized power supply) * Checking AT THE ACTUATOR DIN PLUG eliminates any issues in the connection between the power source and the actuator – it is imperative that the voltage the actuator sees is being measured, not the output from a controller/ panel.
		• Insufficient power intensity available, this could be; a) undersized power supply and/ or transformer b) insufficient current allowed for (power supply should be the maximum actuator consumption x 3) c) voltage drop due to length of cable, particularly in DC systems d) control panel issue e) actuators connected in parallel (prohibited) f) damaged cable(s) g) loose connections (may be but not necessarily in the Din plug – could be anywhere in the supply cable route/ system) h) Supply circuit fuse blown/ breaker out . . . or it could be a combination of these
		• Actuator PCB fault. If the customer confirms that all of the above checks have been carried out and that they are sure that the actuator is receiving the correct voltage when power is being applied and that all wiring and signaling is correct, there could be a PCB fault. However, this is very rare, and in most cases the cause is down to a wiring, or power supply issue. See 'PCB' later in this document.

LED LIT SOLIDLY BUT ACTUATOR DOES NOT WORK

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
LED lit solid but actuator not working	Wiring issue	• Check wiring. • Ensure that in on-off versions, a signal is not being sent to both 'live' pins (2 & 3) at the same time
	Signaling issue	• (PURPLE solid LED) Put into 'MANUAL' mode and fully open or close the valve until LED red or green then switch back to 'AUTOMATIC' mode to assume operation. • Ensure the command signal is continuous and not a pulse signal, the actuator will not respond well to any pulsed input command signal. • Relay or switch is not compatible with the actuator. Typically, residual voltage from solid state relays may cause this issue.
	Power supply issue	• Borderline power supply, sufficient to light LED but not to drive actuator

LED FLASHING AND ACTUATOR DOES NOT WORK

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
LED Flashing	Depends on sequence and color of flashes/ blinks	The 2 most common are:
		• Actuator's internal electronic torque limiter has activated (see below for causes) See ①
		• Actuator is in 'MANUAL' mode (see later in document for details) See ②

① TORQUE LIMITER ACTIVATED

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
LED Flashing	Electronic torque limiter (ETL) has activated	• **Electronic Torque Limiter (ETL) activated**. ETL function: An internal micro-processor monitors the current draw and is programmed to cut the motor power if the upper current set point is reached and that the rate of increase exceeds a maximum allowable rate. Once the power to the motor is cut, the LED blinks (see Page 2) and the gearbox is relaxed by a 5-degree movement in the opposite direction to that which activated the ETL. • The ETL activation could be caused by either (or sometimes both) the valve, or the actuator:
		The torque in the valve exceeds the trigger point of the ETL. This could be due to; • Actuator undersized for the torque in the valve, or • Actuator undersized for the application – dry duty, air, steam solids, long periods of no operations etc. • A blockage in the valve • A valve internal issue that has caused the torque to rise (e.g.: seat failure) Although the ETL protects the gearbox from mechanical damage caused by a valve blockage, if the blockage is not investigated and the actuator's ETL is activated excessively (this can be identified from the electronic counters that can be read by DynaQuip, comparing torque limiter activations to number of operations), it is possible that eventually the gearbox will fail mechanically. This is not a warranty issue; it is customer generated by not resolving the excessive torque issue. Quick check 1: • Put the actuator in 'MANUAL' and try to operate the valve using the actuator's hand wheel. DON'T FORCE IT if it is stiff – this is a strong indicator the issue is with the valve. If the gearbox is blocked in mid travel – this is a sure sign the gearbox has failed. Be aware that the gearing system in the manual override system would allow destructive force to be transmitted if there was a blockage and the hand-wheel was forced – this would physically damage either the manual override hand wheel drive shaft (plastic) or gears in the gearbox and the actuator would be irreparable. This damage is not covered under warranty. Quick check 2: • Remove the actuator from the valve, re-apply power, first apply an open signal, then a closed signal. 2a) If the LED lights continuously, *the issue is valve related*, and the valve should be removed from the line, stripped and re-assembled with new seats and seals and/or any other parts required, or replaced.

		If the LED still blinks (see chart on page 2) there is either; • a motor issue that the electronics interpret as a torque issue as it is current related [see 'MOTORS' later in this document for further details], or • a mechanical gear failure in the actuator has occurred. If the actuator has suffered a mechanical failure in the gearbox, the failed gears will cause a blockage and prevent the output shaft rotating (either at all, or partially), and this may trigger the ETL. Normally you can hear a crunching sound if this is the case.

② MANUAL OVERRIDE ENGAGED

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
LED Flashing	Manual override is selected	**Manual Override (MO) activated**
		Description of MO function: When 'MAN' is selected, the motor continues to run and starts a timer in the processor but the actuator's output drive is disconnected from the drive train. Because the output shaft to which the motor and end of travel cams are fitted is stationary, the electronics time out after a minute and when the end switch has not made to confirm the actuator has reached it's open (or closed) position that reaching the end of travel switch would normally confirm, the actuator knows that the motor is working normally (as it is not drawing high current that a blocked valve would cause, for example) but because the output shaft isn't moving, the actuator must be in 'MANUAL'. Note: The hand-wheel in models 2-5 rotate in the direction of rotation, so clockwise to close. In Model 7, the hand-wheel rotates in the opposite direction to the direction of rotation (counter-clockwise). There is direction of rotation markers in the hand-wheel caps.
		Known issues with MO/ Gearbox: **Selector lever damaged through excessive force** • When the Man/ Auto selector lever is moved to make an alternate selection, excessive force can bend an internal plastic arm which is attached to the selector lever by the external screw, which if damaged prevents the arm from lifting a spring-loaded gear out of the live gearbox gear train, which engages the MO gear drive train. To repair this requires a total actuator strip down, replacement of parts and rebuild, and in our view is not economically viable because of the time it takes. This damage is not covered by the warranty as it is user abuse of the product. **Auto does not engage when selected** • The manual override selector lever lifts a spring-loaded gear out of the gear train to disconnect the final drive (output shaft drive) when 'MAN' is selected. Occasionally when the selector lever is returned to 'AUTO' the gear teeth sit on top of the gear it should slide down next to, and 'AUTO' does not engage. This is corrected by either (a) manually operating the override lever or hand-wheel backwards and forwards (wiggling it!) until the spring

		pushes the gear back down – you can generally hear a click when this happens, or (b) by applying a reversing signal to the actuator which will cause the gear to automatically drop back into place. **Misuse of the hand wheel** • Do not turn the hand wheel without first selecting 'MAN' as the plastic drive shaft will shear. This is not a warranty issue as it is user abuse of the product. • Do not grab the manual override lever/ hand-wheel to try and stop it rotating when the motor is running as it can cause the gear fitted to the gearbox end of the manual override shaft to fail. The ETL may engage before this happens, but there is a greater likelihood that the gear will fail. This is not a warranty issue as it is user abuse of the product. • **Do not carry a built valve and assembly by the MO hand-wheel** because the weight of the valve can cause the heavy assembly to turn which can cause the same gear as described above to fail. This is not a warranty issue as it is incorrect use of the product.

LED FLASHING WHEN ACTUATOR NOT FITTED TO VALVE

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
LED Flashing when the actuator is not fitted to the valve	**Motor issue**	This generally indicates a motor issue. • Motor issues generally cause increased or erratic current draw which can activate the ETL as it mimics the effect of a jammed valve – the actuator can therefore activate the ETL (and causing the LED to flash) even if it is not fitted to a valve. POSSIBLE SOLUTION/ ADVICE is;
		• Motor has been in service for many years and is simply worn out
		• User has applied 110 or 240VAC across the motor terminals to try to prove the motor function, in an actuator that has stopped working. All the motors are 24VDC, therefore this 'test' will cause irreparable damage to the motor and is not covered by the warranty. • Also, should this 'test' be done while the motor cables are still connected to the actuator's main PCB, the PCB will be irreparably damaged, and not covered under warranty.

PRINTED CIRCUIT BOARD(s) (PCBs)

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
Actuator does not work.	PCB damage or failure.	• Incorrect power applied to the actuator. This is easily identified when the cover is removed as the PCB components around the power cable connection on the PCB are burned/ damaged. • In the JE S Type, the main PCB is split into 2 halves, one is the power supply PCB, the other the control PCB. Should the power supply be damaged (e.g.; incorrect voltage, voltage surge/ spike, excessive current drawn due to voltage drop in DC systems), the power PCB can be replaced. However, identify the cause and take corrective action to prevent recurrence.
		• Condensation. This is identified by oxidization of internal aluminum components or dried residue on the PCB. Condensation can only be caused by the external power being removed (check counters) thereby eliminating the internal heater. • Note: Damage caused by condensation is NOT covered by the warranty as a thermostatic anti-condensation heater is provided as standard, activated whenever external power is connected, and the actuator is designed to have external power continuously applied.
		• Water ingress: This is identified by water being visible in the housing, tide marks on the inside of the housing, oxidization of internal aluminum components and by dried residue on the PCB if the water has been drained. Generally, the entry point is clearly visible as an entry 'track' can be seen. • The JE-S is fully weatherproof to IP67 and under normal circumstances does not have any issues with water (or dust) ingress. It cannot however be submerged for long periods, hosed down, deluged in water, or pressure washed.
		Voltage drop: (THIS IS A VERY COMMON CAUSE OF FAILURES) • As the voltage drops the current increases, the excess current causes the damage. Voltage drop can be due to incorrectly sized power supply (undersized), or the effect of the length of cables in DC powered applications has not been considered.
		Voltage spikes/ line faults • If surge protection is not in place, lightning strikes, or simple high voltage spikes, often only seen for a fraction of a second, can blow a variety of PCB components.
		Vibration. JE-S actuators should not be used where vibration is present. • Vibration can move the cams mounted to the output shaft so that they no longer actuate the end of travel micro-switch resulting in the actuator running continuously. • Components can break loose from PCB. Although the 'tall' components are 'glued' to the PCB using silicon, vibration can still cause components to break away from the PCB • Motor housing can break loose from the plastic base • Miscommunication between a plug & play accessory sub-PCB and main PCB where the plug & socket connection is not made/

		maintained.
		Motor failure • When applying high voltage, users may try to apply the supply voltage (110 or 240VAC) directly to the motor in an actuator that isn't working to try to determine if the issue is motor or PCB related. In doing so, the motor is irreparably damaged (and also possibly the main PCB if the motor cable is not removed from the PCB ahead of the 'test') because all JE-S actuators use a 24VDC motor.
		Incorrect wiring • The difference between the power (gray plug) and end of travel (black plug) wiring has not been observed, or the plugs have been swapped so the gray plug was fitted to the black base, creating an internal short circuit resulting in a blow-out on the limit-switch PCB.

ACTUATOR DRIVES CONTINUOUSLY

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
Actuator drives continuously		• Vibration can cause the switch cam to rise up the output shaft so that it misses the switch lever
		• Faulty switch (very rare)
		• Damaged micro-switch PCB creating miscommunication between switch PCB, and main PCB.
		• Wiring completely wrong

FAILSAFE (BSR) ISSUES

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
Actuator doesn't work after installing the BSR	Incorrectly installed	Note: ALWAYS test the actuator into which the BSR is going to be installed as an on-off actuator BEFORE installing the BSR, this confirms that the actuator is working before the function conversion, and that the supply voltage and wiring connections are correct.
		• The correct installation sequence has not been followed. Without external power being applied to the actuator, the BSR sub-PCB must be installed first, THEN connect the battery to the BSR sub-PCB. If the battery is connected to the BSR sub-PCB BEFORE the sub-PCB is connected to the main PCB, the main PCB will be irreparably damaged and such damage is not covered under the warranty.
		• Do not plug the battery into the BSR sub-PCB if external power is being applied to the actuator.
Battery doesn't work when external power is lost	Battery charging issue	• The battery requires a full 29-hour charge after installation and BEFORE being put into service. • When confirming the failsafe function after installing the BSR, operating the actuator under battery power for more than a partial stroke can fully drain the limited charge present when the kit is first supplied. Draining the battery completely at this stage will not only cause long term and permanent damage to the battery, but the BSR will not work when external power Is lost as there is no charge in it. • The LED will indicate when the battery needs recharging.
		• The actuator is designed to have power applied at all times, and while external power is applied, the BSR constantly trickle charges the battery to maintain it at full charge. • Removing the power at any stage prevents the battery from being trickle charged, and also de-energizes the internal heater. Resulting condensation could damage the control circuit(s) such damage is not covered under the warranty. • Note: The internal micro-chip can be read and records how many times power has been turned on.
		• The internal battery connection has vibrated loose, or is unplugged
		• The recharge time between battery powered cycles has not been respected – for example, the failsafe actuator is being used in a similar way to a solenoid, resulting in the battery charge used in each cycle not being replaced before the next demand on the battery. After a while this will fully drain the battery or the battery 'browns out'.
Actuator fails to the wrong position	Incorrectly configured	• An internal jumper that controls this is either missing, or is fitted in the wrong position.

MODULATING (DPS) – INSTALLATION ISSUES

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
DPS won't set up	Incorrect installation	Notes: • ALWAYS test the actuator as an on-off actuator into which the DPS is going to be installed BEFORE installing the DPS, this confirms that the actuator is working correctly before the function conversion. • Send the actuator to the CLOSED position before installing the DPS. Installing the DPS when the actuator is in the closed position eliminates most of the issues users have associated with retro- installation.
		• The earth pin on the control Din plug has been connected to ground. This pin is used for an external soft reset procedure and must NOT be connected to ground.
		• 4 core color cable has been used to wire the control Din plug are recommended, it is possible the redundant 4th cable has been cropped but strands of it can touch terminals within the control Din plug causing short-circuit malfunction. • • Each time this cropped cable touches the earth pin, the actuator will perform a soft reset.
		• Whenever external power is lost, on re-start the positioner performs a soft reset to recalibrate, the positioner will not respond to control signal changes during this procedure.
		• The control Din plug wiring is incorrect and/ or • A signal with the wrong polarity is being applied. • Connecting the end of travel Din plug to the control Din plug - doing so would apply excessive voltage to the DPS PCB and cause irreparable damage to the DPS PCB. Such damage is not covered by the warranty. Note: The control signal Din plug base is fitted upside-down compared to the end of travel confirmation Din plug to prevent DIN plug connecting errors.
		• The white DPS PCB plug has not been pushed firmly home into the receiving socket on the main PCB.
		• The power polarity for DC power supplies is incorrect.
		• Cables trapped inside the actuator when the cover was replaced following DPS installation. Ensuring the internal cables (power, control signal, end of travel switches and earth) are not crossed or twisted when the cover is replaced prevents a major cause of malfunctioning DPS's. The control signal push-in plug can be pulled out if the cables are twisted or crossed.

DPS POSITIONER SOFT RESET

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
DPS not responding accurately to input signals	Lost calibration, software locked up/ looping in micro-chip	• Remove power
		• Remove control signal Din plug (center plug)
		• On the control Din plug base, create a short circuit between pin 3 (at 6' clock position) and pin 1 (at 3 o' clock position).
		• Apply power. LED blinks then goes solid. After 5 seconds, remove short
		• Soft reset complete – reconnect all Din plugs and re-test.
		• If not successful, perform hard reset (remove DPS completely, operate actuator as on-off, then re-install DPS)

DPS POSITIONER FAULT FINDING

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
Poor or no performance from positioner	Control signal is most often the main culprit. There are many contributory factors.	*NOTE*: *Most operational issues with modulating actuators relate somehow to signal problems. If a soft reset doesn't correct the issue, start by removing the user's signal (remove the center Din plug) and applying a signal from a hand-held device, totally independent from the customer's system, to see if the issue disappears – often it will, proving that it is a site control signal issue. Alternatively, if this is not possible or practical, if there are other similar actuators on the same system that are working, remove the 'faulty' actuator and connect it to the cables from another actuator that is known to work, to see if the 'fault' disappears, or transfers.*
		In no particular order: • Wrong dip switch setting
		EMI (Electro-magnetic interference) causes interference/ 'noise' in the control signal being received by the DPS, resulting in poor performance. All control devices operate more accurately and reliably with a 'clean' signal.

		Common causes of electrical interference: • Voltage surge, voltage drops, voltage spikes, line faults (damaged cable, bad connections). • Close proximity to electronic equipment, and/or to power source. • Noisy motors, relay 'chatter'. • Poor dead-band control in process controller providing the signal to the DPS Suggested remedies: • Shielding the control cables from the power cables as close proximity of power and control cables is a known cause of signal issues. • Add a voltage stabilizer/ power conditioner • As with most things, the higher the quality the process control equipment, the better
		Signaling devices and/ or controller issues cause problems for the DPS as the DPS receives the signal sent by the controller. If the device isn't correctly configured it can emit rapidly fluctuating signals which causes the controller to constantly adjust its output. The effect of this can be reduced by adjusting the controller's dead-band (sensitivity) and other settings. To identify where the cause of the problem lies: • Check the output from the physical device (temperature sensor, pressure sensor, any type of transducer). • Then check the output from the control panel • Then check the signal at the actuator's Din plug
		0-10V Control Signals: 0-10VDC Control signals are susceptible to issues caused by; • Cabling issues – voltage drop (cable size, length of run, power supply) • Electrical interference from motors, relays etc. • 0V (zero volts) is normally the closed position but could be loss of signal (which is why some prefer 2-10V to differentiate between the two), making diagnosis tricky as it could be a controller fault and it is not sending a signal, or it's OK and sending a correct 0V. • Also, check that the 0V is not linked to the power side of the electrical system, it needs an independent supply. • For unstable signals, a 2200µF capacitor between the +ve and –ve of the 0-10V may help.
		Visual checks: • Often it is not easy to see a fluctuating signal by the naked eye, and the change in control signal can be small – sufficient to cause the motor to constantly change direction but insufficient to physically move the gears. It is more likely that the fluctuations can only be seen by checking the signal with a loop calibrator or similar.

DIN PLUG ISSUES

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
Common Din plug issues	Wiring issues	Incorrect wiring. • Check wiring diagram to confirm that the right cable is connected to the right pin. • The power connection is gray (pug and base) with neutral in pin 1 and a switchable live between pins 2 (to close) and 3 (to open), • The end of travel confirmation (black plug & base) is live on pin 1 and neutral on 2 and 3. • NEVER connect the gray plug to the black base or vice versa, otherwise short circuits will irreparably damage the actuator. Such damage is not covered by the warranty. • The DIN plug base is marked with the pin numbers, and the plugs (and bases) are color coded.
		• The stripped part of the cable is too long and can touch and short with other pins.
		• Cable gauge too big for size of connector
		• Trapped cables when plug cover replaced
		• Cables damaged when securing screw re-inserted when cover replaced (usually occurs when cables are trapped under cover on re-assembly)
		• DIN plug seals not fitted, or if profiled seals, fitted the wrong way round.
		• Securing screws over-tightened, under-tightened, or not fitted at all.
		• Cable gland (strain relief) not fitted, or incorrectly fitted can allow water ingress/ condensation. Also, small gauge (outside diameter) cable can eliminate the effectiveness of the cable gland, again allowing ingress/ condensation.
		• If the DIN plugs are knocked the bases can come away from the housing – ingress protection is lost.

HOUSING ISSUES

REPORTED FAULT	POSSIBLE REASON(S)	POSSIBLE SOLUTIONS/ ADVICE
Common housing issues		Ingress Protection Issues: • The actuator has been hosed down, pressure washed, or located where a tank can overflow and deluge the actuator in water. The actuator has an ingress protection rating of IP67 which allows it to be submerged to a maximum of 1m for 30 minutes, but does not offer protection against any form of pressurized wash down. If the actuator is to be subjected to wash down, it should have a plastic bag covering it for the duration of the wash down. • Cover shaft seals missing or incorrectly fitted. Often the O ring and clip will be left on a shaft when the cover is removed. They must be replaced into their sockets in the housing, correctly, before the cover is refitted, otherwise ingress protection is lost.
		• In an attempt to prevent use of the manual override, the selector lever securing screw, and the selector lever are removed by the user. Removing these parts cause internal components of the selector lever assembly to become loose inside the gearbox compartment and can cause a jam inside the gearbox. It is not economically viable to remove these loose components and this situation is not covered by the warranty.
		• Trapped cables. Care must be taken when refitting the cover to ensure that no cables are trapped.

MOST COMMON CAUSES OF 'MALFUNCTION'

- Actuator is in 'MANUAL' mode
- Valve is jammed and actuator's electronic torque limiter has engaged
- Incorrectly sized actuator for the application
- Incorrect wiring
- Incorrect power supply
- Incorrect command signal/ Poor quality of control signal in modulating applications

INFORMATION NEEDED WHEN REPORTING A 'FAULTY' ACTUATOR

Please provide as much of the information below when reporting a 'faulty' actuator. (* minimum required)

1) *Actuator type and model number from main ID label
2) *Actuator serial number from main ID label - if listed*
3) *Actuator function. Options: on-off, failsafe, 0-10V modulating, 4-20mA modulating, failsafe modulating 0-10V, failsafe modulating 4-20mA
4) * External supply voltage being applied
5) Valve type, material, and size
6) Valve duty – media, pressure, temperature
7) Valve installation location – Inside building, inside cabinet, outside protected from weather, outside exposed to weather, salty atmosphere (coastal/ ship) etc.
8) Frequency of operation
9) * What is the LED light doing?
10) * Symptoms of 'failure' – Provide as much information as possible.
11) How long has it been installed, has it always worked until now, what changed recently, what new equipment was added to the system etc.?