

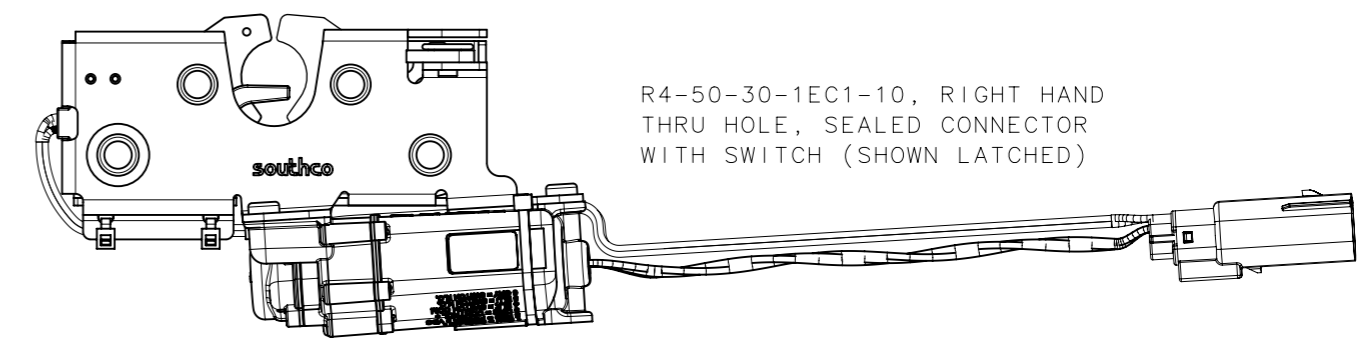
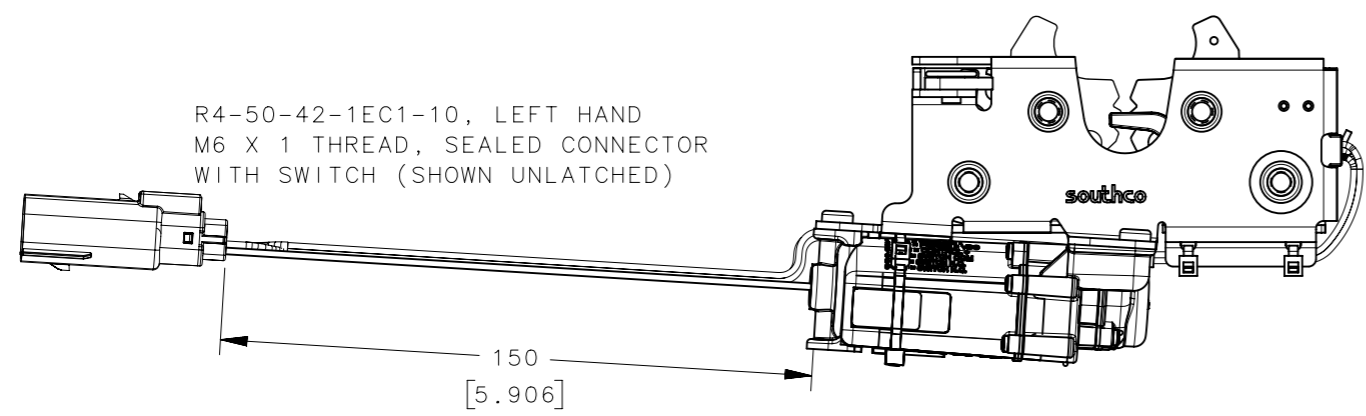
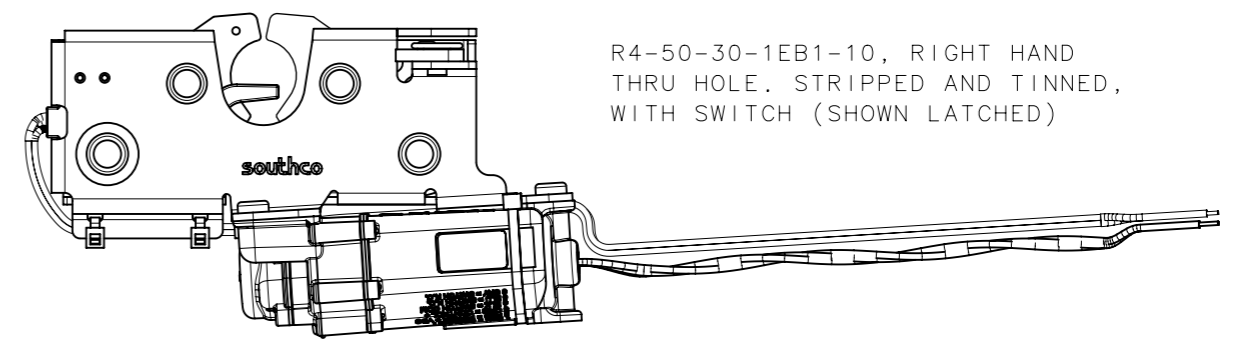
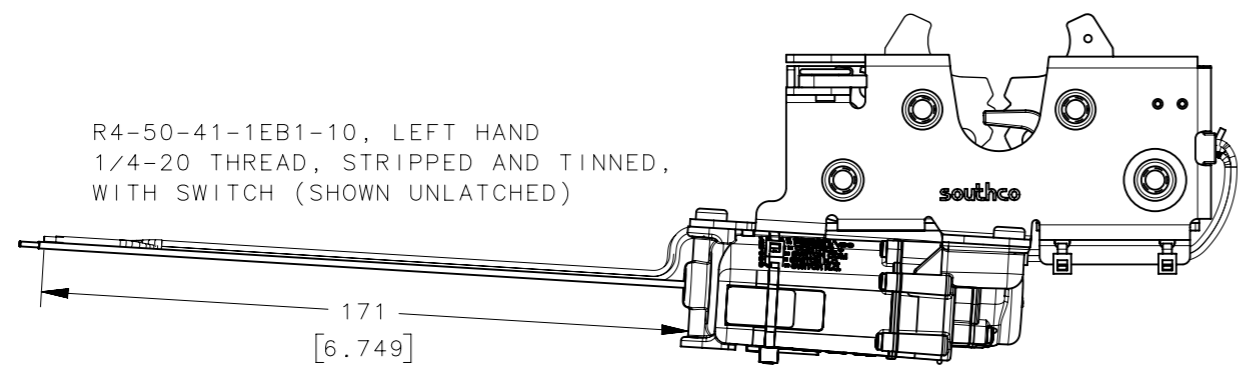
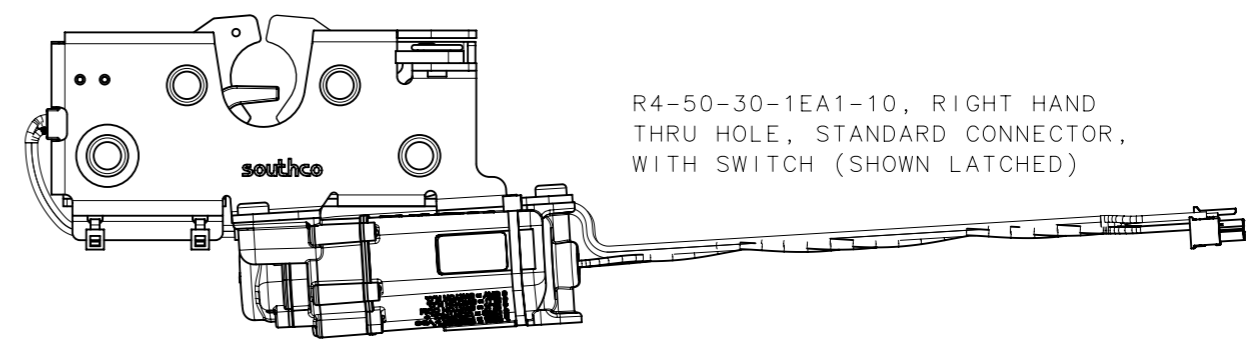
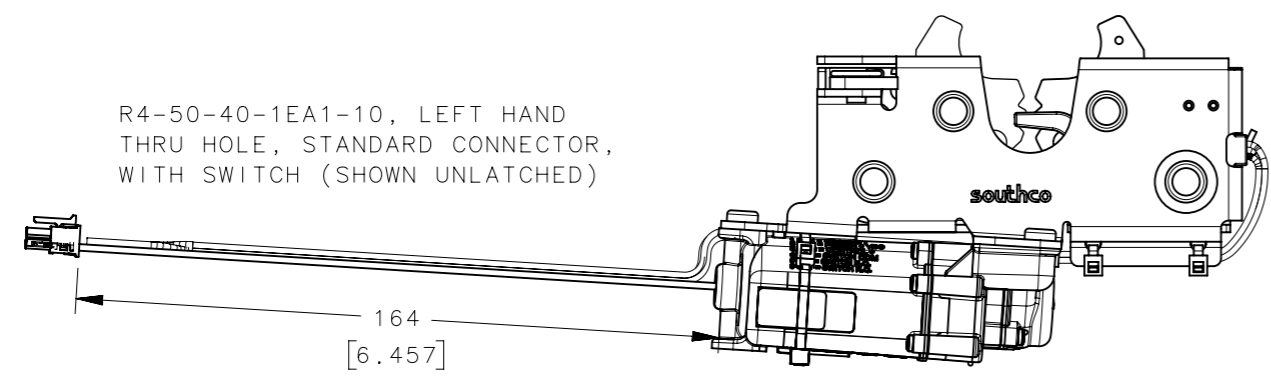
REVISION HISTORY			
REV	DATE	BY	DESCRIPTION
F	15JUL2024	PSP/SAK	PRN: P2024-1142

PART NUMBER
R4-50-S | -1E1-10

ELECTRONICS:
EA - WITH SWITCH, 9-16V ACTUATOR, MICROFIT 3.0 CONNECTOR.
EB - WITH SWITCH, 9-16V ACTUATOR, STRIPPED & TINNED WIRES.
EC - WITH SWITCH, 9-16V ACTUATOR, MOLEX MX150 SEALED CONNECTOR.

STAGE & ACTUATION:
3 - TWO STAGE RH LATCH
4 - TWO STAGE LH LATCH

MOUNTING STYLE:
0 - 7.2MM THRU HOLE
1 - 1/4-20 THREADED
2 - M6 THREADED



CPB NUMBER 2019-1207	THIRD ANGLE PROJECTION	southco CONNECT · CREATE · INNOVATE
SURFACE AREA	MILLIMETERS [IN]	
VOLUME	TOLERANCES UNLESS OTHERWISE NOTED	DESCRIPTION HEAVY DUTY ROTARY LATCH WITH ELECTRONIC ACTUATOR
PROPRIETARY ITEM <small>EXCEPT FOR USES EXPRESSLY GRANTED IN WRITING, INFORMATION DISCLOSED HEREON IS CONFIDENTIAL AND ALL RIGHTS, PATENT AND OTHERWISE, ARE RESERVED BY SOUTHCO, INC.</small>	ALL DIMENSIONS WITHOUT TOLERANCES ARE FOR REFERENCE ONLY.	SIZE A3
	PER ASME Y14.5M-2009	SYSTEM NX
		DWG NO. J-R4-50-1E1
		DRAWN BY DPZ
		DATE 01SEP2021
		SCALE 1:2
		SHEET 1 OF 5

ELECTRICAL NOTES:

A. ACTUATOR: PLASTIC (PC/ABS AND ACETAL), SILICONE AND BUNA SEALS, AND METAL COMPONENTS.

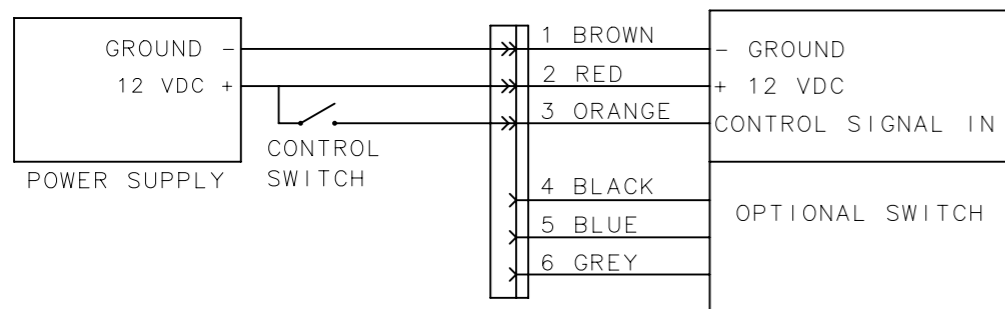
B. ELECTRICAL SPECS:
 ACTUATOR AND SWITCH SEALED TO IP56.
 OPERATING VOLTAGE: 12 VDC (9 VDC MIN, 16 VDC MAX)
 TYPICAL OPERATING CURRENT: LESS THAN 600 MILLIAMPS AT 12 VDC
 PEAK / STALL OPERATING CURRENT: 2A MAX AT 12 VDC
 LOCKED STANDBY CURRENT: LESS THAN 100 MICROAMPS AT 12 VDC
 UNLOCKED STANDBY CURRENT: LESS THAN 10 MILLIAMPS AT 12 VDC
 CONTROL SIGNAL HIGH (UNLATCH COMMAND): 9 VDC TO OPERATING VOLTAGE, 5.5 MILLIAMPS MAX.
 CONTROL SIGNAL LOW (LATCH RESET): 0 TO 1 VDC (OPEN)
 LATCH TRANSIT TIME TO RELEASE: 500 MILLISECONDS NO LOAD, 1.0 SECOND MAX
 OPERATING TEMPERATURE RANGE: -40C TO +80C

C. ELECTRICAL CONNECTIONS AND HOOKUP:
 A BASIC SWITCH CONTROL ELECTRICAL HOOKUP DIAGRAM IS PROVIDED FOR REFERENCE. CONSULT WITH A SOUTHCO REPRESENTATIVE FOR ADDITIONAL ELECTRICAL HOOKUP INFORMATION.
 - CONNECT POWER, GROUND AND CONTROL SIGNAL WIRES TO AN APPROPRIATE DC POWER SUPPLY
 - A DC POWER SUPPLY CAPABLE OF SUPPLYING 9 - 16 VDC AT 2 AMP MINIMUM PER LATCH IS RECOMMENDED
 - POWER MUST BE AVAILABLE TO OPERATE THE LATCH AND MUST REMAIN AVAILABLE DURING THE FULL TRANSIT TIME OF THE LATCH DURING LOCKING OR UNLOCKING
CAUTION! LATCH CAN BE DAMAGED IF WIRED INCORRECTLY, OR IF IMPROPER VOLTAGE IS APPLIED!
WIRE COLOR CODE / CONNECTOR PIN ASSIGNMENT: SEE CONNECTOR PINOUT TABLE AND PIN LOCATION DETAILS.

D. ELECTRICAL OPERATION:
 TO UNLOCK OR RELEASE THE LATCH:
 PROVIDE THE FOLLOWING CONTROL SIGNAL TO THE ORANGE WIRE OR CONNECTOR PIN 3
 - PROVIDE 9 - 16 VDC (CONTROL SIGNAL HIGH) FOR A MINIMUM OF 100 MILLISECONDS
 - THE CONTROL SIGNAL CAN REMAIN HIGH INDEFINITELY
 - THE LATCH WILL REMAIN RELEASED FOR A MINIMUM OF 300 MILLISECONDS OR AS LONG AS THE SIGNAL IS HIGH

E. POSITION FEEDBACK SWITCHES:
 - SWITCH IS LOCATED SUCH THAT ANY STRIKER LOCATION THAT IS NOT IN THE FULL LATCHED POSITION IS CONSIDERED "OPEN", INCLUDING THE SECONDARY STAGE.
 - RELIABLE SWITCH INDICATION REQUIRES A BUMPER/PRE LOAD ON THE DOOR SYSTEM. FAILURE TO PROVIDE A SYSTEM PRELOAD CAN RESULT IN LACK OF DISTINCTION BETWEEN SECONDARY AND PRIMARY LATCH STAGES
 - SWITCH: STRIKER ONLY STATUS INDICATOR CIRCUIT. SEE STRIKER STATUS INDICATOR CIRCUIT TABLE AND SCHEMATIC.
 SWITCH RATINGS: 3 AMP MAX AT 12 VDC, IP67.

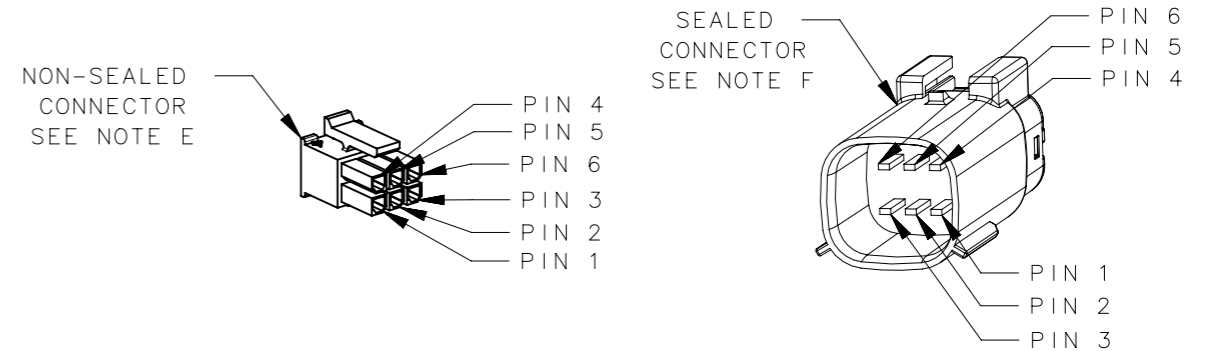
WARNING! SWITCH CIRCUIT IS NOT FUSED OR ELECTRICALLY PROTECTED! USE APPROPRIATE EXTERNAL CIRCUIT PROTECTION.
WIRE SWITCH CORRECTLY PER ELECTRICAL HOOKUP DIAGRAM AND DO NOT SHORT CIRCUIT. A SHORT CIRCUIT CAN DAMAGE LATCH AND MAY POSE AN ELECTRICAL FIRE HAZARD!



ELECTRICAL HOOKUP (SWITCH CONTROL)

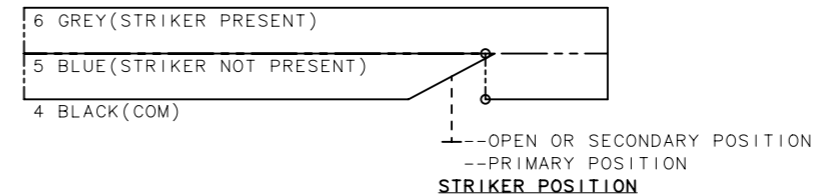
F. OPTIONAL NON-SEALED LATCH CONNECTOR:
 MANUFACTURER: MOLEX, SERIES: MICROFIT 3.0
 - CONNECTOR RECEPTICAL 6 POSITION 3mm VERTICAL DUAL, MOLEX P/N: 43025-0600 OR EQUIVALENT
 - CONTACTS: FEMALE CRIMP TERMINAL (SOCKET) MOLEX P/N: 43030-0007
 WIRE: 20 AWG STYLE UL 3385
 MATE FOR NON-SEALED CONNECTOR (NOT SUPPLIED)
 MANUFACTURER: MOLEX, SERIES: MICROFIT 3.0
 - CONNECTOR PLUG 6 POSITION 3 mm VERTICAL DUAL, MOLEX P/N: 43020-0601
 - RECOMMENDED CONTACTS (6 MAX REQUIRED): MOLEX, MALE CRIMP TERMINAL (PIN), MOLEX P/N: 43031-0007
 - RECOMMENDED WIRE GAGE: 20 AWG
 CONTACT SOUTHCO FOR OPTIONAL EXTENSION HARNESSES

G. OPTIONAL SEALED LATCH CONNECTOR:
 MANUFACTURER: MOLEX, SERIES: MX150
 - CONNECTOR SEALED MALE, 6 POSITION DUAL ROW, 3.50mm PITCH MX150, POLARIZATION A, MOLEX P/N: 33482-3601 OR EQUIVALENT
 - CONTACTS: MOLEX, MALE CRIMP TERMINAL, TIN, MOLEX P/N: 33000-0002
 WIRE: 20 AWG STYLE UL 3385
 MATE FOR SEALED LATCH CONNECTOR (NOT SUPPLIED)
 MANUFACTURER: MOLEX, SERIES: MX150
 - CONNECTOR SEALED FEMALE, 6 POS DUAL ROW, 3.50 mm PITCH MX150, POLARIZATION A, MOLEX P/N: 33472-0601
 - RECOMMENDED CONTACTS (6 MAX REQUIRED): MOLEX, FEMALE CRIMP TERMINAL, TIN 18-22 AWG, MOLEX P/N: 33012-2003
 - RECOMMENDED WIRE GAGE: 20 AWG
 CONTACT SOUTHCO FOR OPTIONAL EXTENSION HARNESSES



STRIKER STATUS INDICATOR CIRCUIT

	STRIKER	
	NOT PRESENT	PRESENT
BLACK/GREY WIRES	OPEN CIRCUIT	CLOSED CIRCUIT
BLACK/BLUE WIRES	CLOSED CIRCUIT	OPEN CIRCUIT



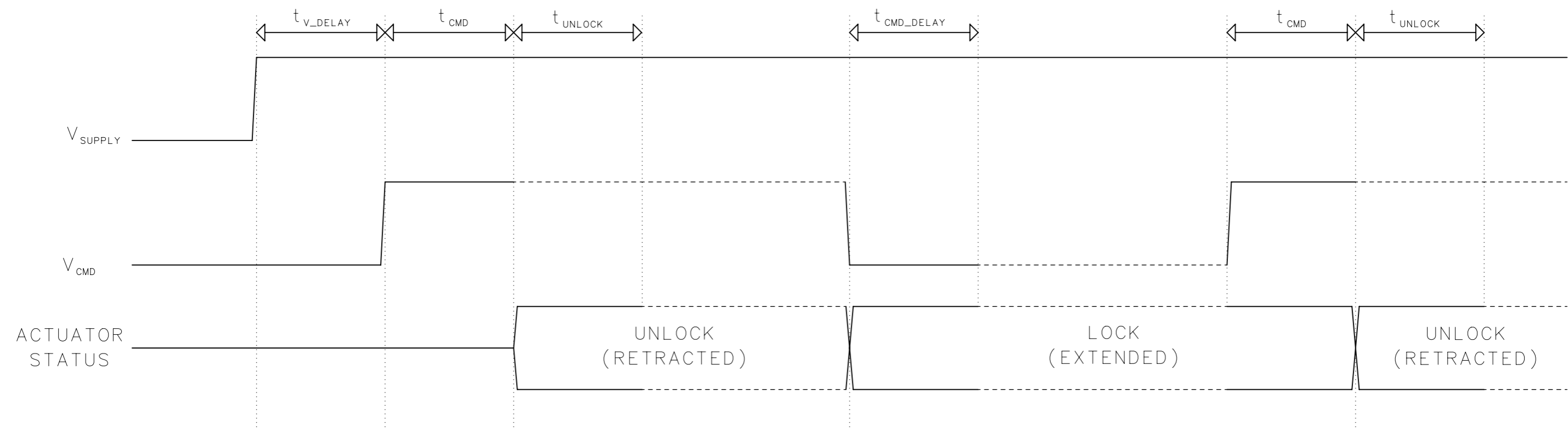
CONNECTOR PINOUT		
PIN	WIRE COLOR	FUNCTION
1	BROWN	ACTUATOR GROUND (-)
2	RED	ACTUATOR POWER (+)
3	ORANGE	CONTROL SIGNAL
4	BLACK	SWITCH COMMON
5	BLUE	SWITCH N.O.
6	GREY	SWITCH N.C.

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		DRAWN BY DPZ	SCALE 1:1
			SHEET 2 OF 5

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SYMBOL	DESCRIPTION	CONDITION	MIN	TYP	MAX	UNITS
V_{SUPPLY}	SUPPLY VOLTAGE	2 AMP MIN	9	12	16	V
V_{CMD}	COMMAND SIGNAL VOLTAGE HIGH (TO UNLOCK / RETRACT ACTUATOR)	$V_{SUPPLY} = 9 - 16VDC$	9		V_{SUPPLY}	V
	COMMAND SIGNAL VOLTAGE LOW (TO LOCK / EXTEND ACTUATOR)	$V_{SUPPLY} = 9 - 16VDC$	OPEN		1	V
I_{CMD}	COMMAND SIGNAL CURRENT	$V_{CMD} = HIGH$			5.5	mA
I_{SUPPLY}	SUPPLY CURRENT - IDLE	LOCKED STATE / ACTUATOR EXTENDED $V_{SUPPLY} = 12VDC$			100	μA
		UNLOCKED STATE / ACTUATOR RETRACTED $V_{SUPPLY} = 12VDC$			10	mA
	SUPPLY CURRENT - OPERATING	$V_{SUPPLY} = 12VDC$			600	mA
	SUPPLY CURRENT - PEAK/STALL	$V_{SUPPLY} = 12VDC$, STALL LIMITED TO 1.4 SECONDS			2	A
I_{SWITCH}	SWITCH CURRENT RATING	SWITCHED VOLTAGE = 12VDC			3	A
t_{V_DELAY}	DELAY BETWEEN VSUPPLY AND FIRST CMD ISSUED	$V_{SUPPLY} = 9 - 16VDC$ $V_{CMD} = 9V - VSUPPLY$	25			ms
t_{CMD}	COMMAND SIGNAL HIGH TIME	$V_{SUPPLY} = 9 - 16VDC$	100			ms
t_{CMD_DELAY}	DELAY BETWEEN CMD LO (TO UNLOCK) AND NEXT HIGH (TO LOCK)	$V_{SUPPLY} = 9 - 16VDC$	-			ms
t_{UNLOCK}	ACTUATOR ELECTRONIC UNLOCK TIME	$V_{SUPPLY} = 9 - 16VDC$	300		T_{CMD}	ms
$t_{RELEASE}$	LATCH TRANSIT TIME TO RELEASE	$V_{SUPPLY} = 9 - 16VDC$ NO LOAD		500	1000	ms
T	OPERATING TEMPERATURE		-40		80	$^{\circ}C$

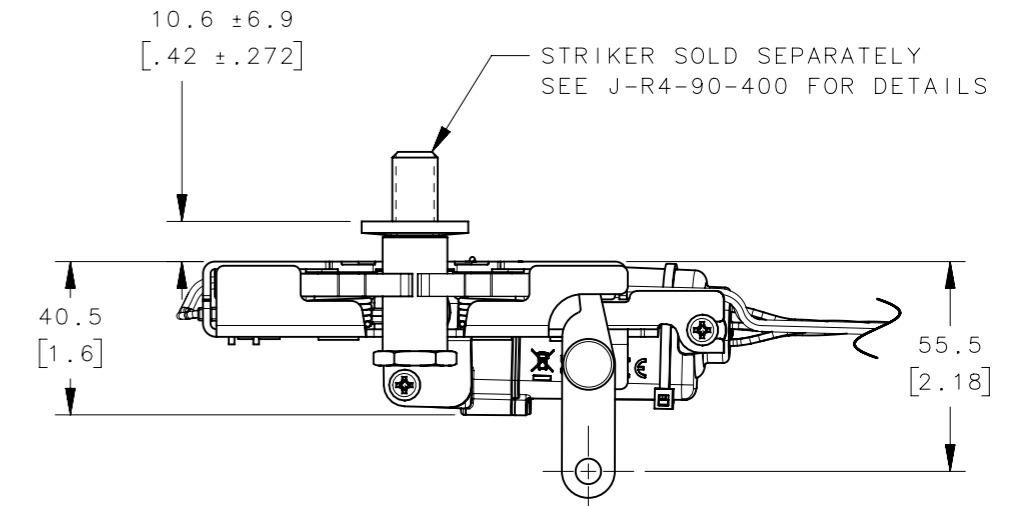


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PER ASME Y14.5M-2009	DRAWN BY DGJ	DATE 12JUL2022 SCALE 1:1 SHEET 3 OF 5

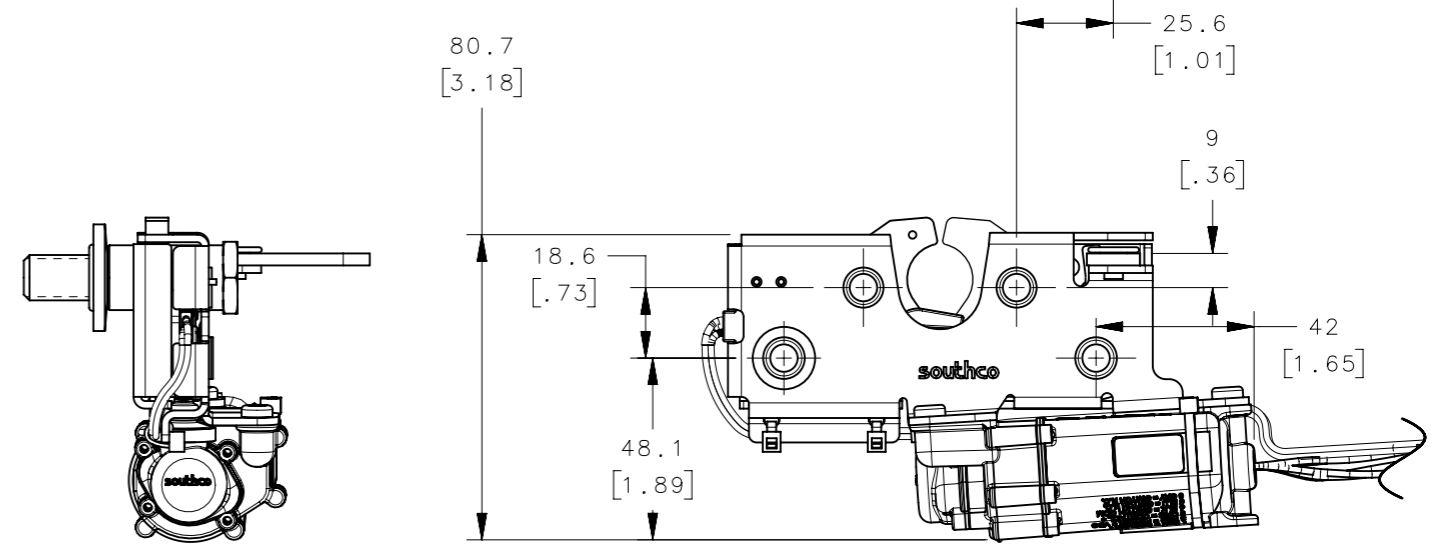
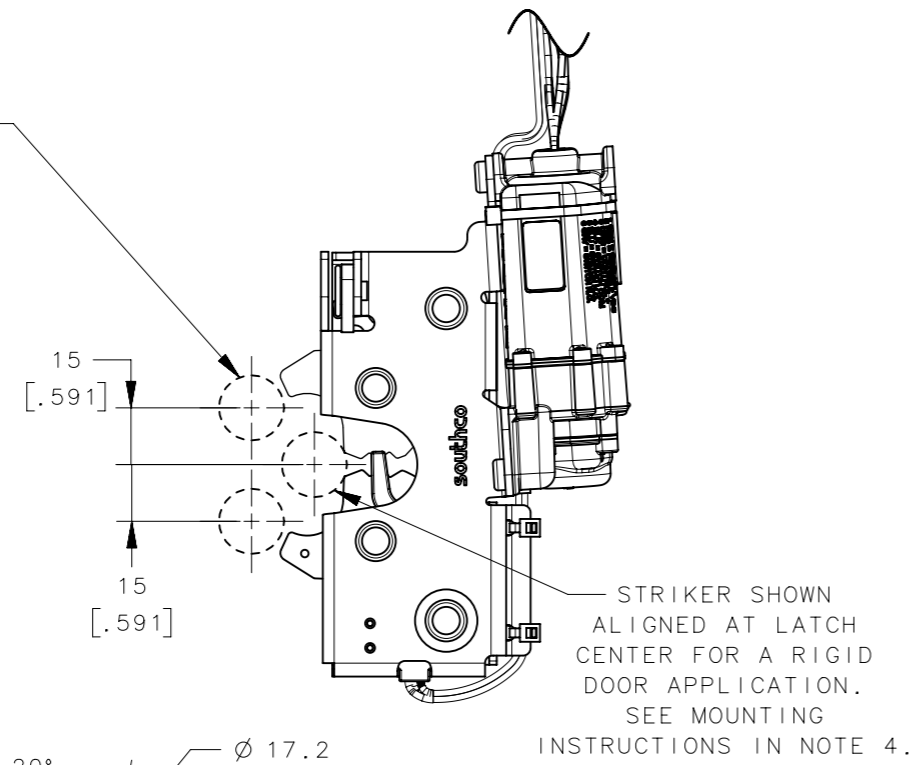
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MECHANICAL NOTES:

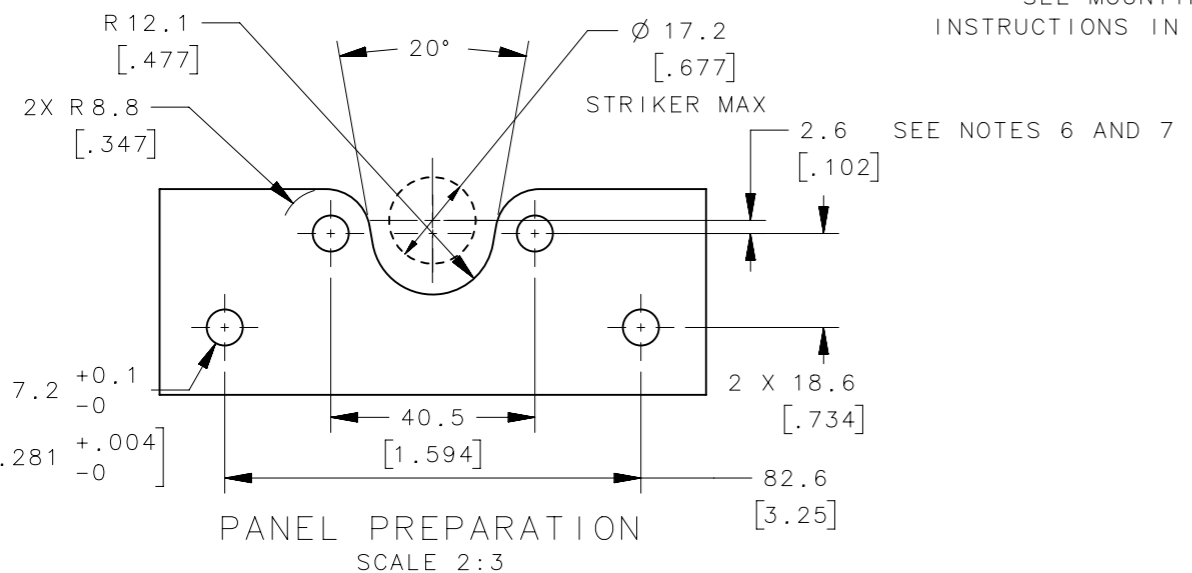
- ASSEMBLY CAPABLE OF MEETING FMVSS 206 LATCH REQUIREMENTS WHEN TESTED WITH A SOUTHCO STRIKER IN ACCORDANCE WITH SAE J839.
- MATERIALS:**
 PINS, LEVER, RIVET: STEEL, ZINC PLATE BRIGHT CHROMATE
 PAWLS & TRIGGER: HEAT TREATED CARBON STEEL, LUBRICATED W/ OVEN CURED DRY LUBRICANT.
 SPRINGS: STAINLESS STEEL, PASSIVATED (BLACK OXIDE)
 FRAME HSG. FRONT AND BACK: HIGH STRENGTH STEEL, ZINC PLATED BRIGHT CHROMATE
- MAXIMUM RECOMMENDED MOUNTING TORQUE NOT TO EXCEED 13.3 N-m (120 in-lbs) INSTALLATION WITH FLANGE HEAD FASTENERS OF SUFFICIENT GRADE AT ALL FOUR (4) MOUNTING HOLE LOCATIONS. FLANGE SHOULD BE $\phi 13\text{mm}$ MIN."
- INSTALLATION INSTRUCTIONS:**
 -INSTALL SOUTHCO STRIKER BOLT ASSEMBLY IN DOOR FRAME
 -CLOSE DOOR CHECKING FOR INTERFERENCE OR MISALIGNMENT
 -ADJUST STRIKER AS NECESSARY, SHIM IF REQUIRED TO ACHIEVE PROPER POSITIONING OF STRIKER HEAD.
 -ADJUST STRIKER SO IT ENGAGES IN THE CENTER OF THE LATCH
 -VERIFY THAT BOTH STAGES OF LATCH ARE FUNCTIONAL
 -CHECK DOOR ALIGNMENT AND SEAL PRESSURES.
- PAWL OPENING ALLOWS FOR SELF-ALIGNMENT OF A NON-RIGID DOOR SYSTEMS ONLY, CONTACT SOUTHCO SALES OR ENGINEERING FOR APPLICATION ASSISTANCE.
- LOCATION OF SOUTHCO STANDARD STRIKER WHEN LATCHED WITH PRELOAD.
- WHEN INSTALLED INTO A RIGID DOOR SYSTEM AND USING A SOUTHCO STANDARD STRIKER, STRIKER HAS A POSITIONAL TOLERANCE OF ± 0.15 FROM THE CENTERLINE OF THE LATCH.



THE TOLERANCE BETWEEN THE LATCH AND STRIKER BOLT ASSUMES A NON-RIGID DOOR. INSTALLATION THAT WILL ALLOW THE DOOR TO MOVE INTO THE NOMINAL POSITION DURING LATCHING. RIGID DOORS MUST HAVE THE STRIKER INSTALLED PER THE PANEL PREPERATION RECCOMENDATION.



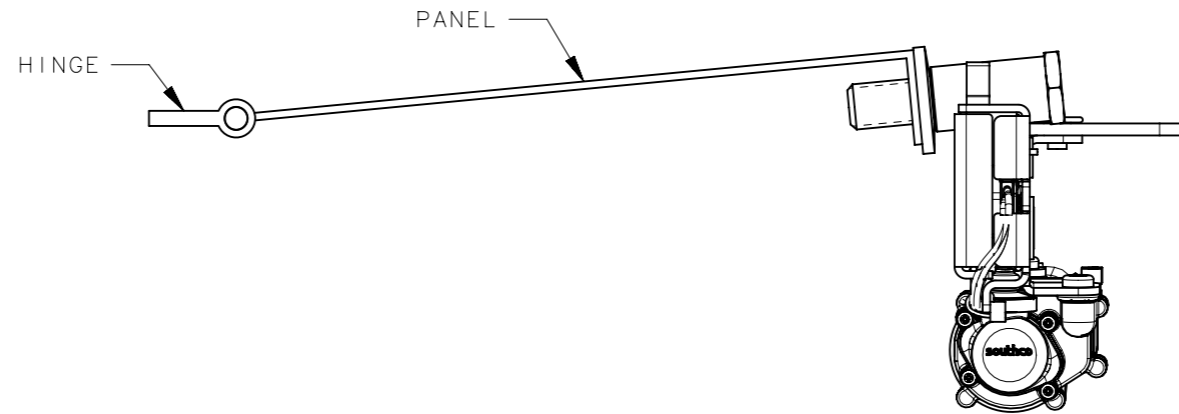
RIGHT HAND LATCH SHOWN. LEFT HAND DIMENSIONS ARE THE SAME, MIRRORED ACROSS LATCH



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		SCALE 1:2	SHEET 4 OF 5

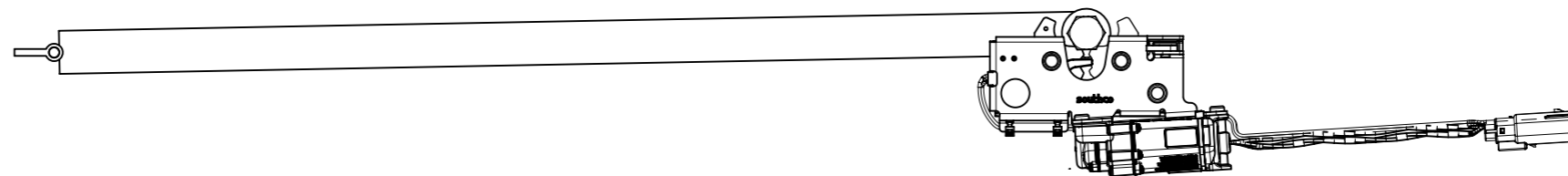
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CASE A: STRIKER AXIS PERPENDICULAR TO PANEL HINGE AXIS



SCALE 1:2

CASE B: STRIKER AXIS PARALLEL TO PANEL HINGE AXIS



MECHANICAL NOTES:

8. R4-50 SERIES ROTARY LATCHES ARE NOT INTENDED TO BE USED AS DOOR/PANEL LOCATING FEATURES.
9. PLEASE CONSULT SOUTHCO TECHNICAL SUPPORT TO DISCUSS DESIGN CONSIDERATIONS FOR INCORPORATION INTO HIGH VIBRATION APPLICATIONS.
10. SYSTEMS THAT ARE REPRESENTED BY CASE "B" BELOW ARE NOT RECOMMENDED FOR PANELS LESS THAN 600mm FROM HINGE AXIS TO STRIKER AXIS. SHORT PANEL LENGTHS OR A LARGE OFFSET BETWEEN THE STRIKER AXIS AND PANEL FACE MAY REQUIRE ADJUSTMENT TO LATCH PANEL PREP FOR PROPER FUNCTION.
11. PAWL SPRING LOADS ARE INTENDED TO ENSURE PAWLS ARE ABLE TO FULLY OPEN ACROSS CYCLE LIFE. PAWL SPRING LOADS ARE NOT INTENDED TO BE USED FOR PANEL KICK OUT.
12. REFERENCE ELECTRICAL NOTE "D" ON SHEET 2 FOR ACTUATOR TIMING. IF STRIKER IS NOT REMOVED SUCH THAT THE LATCH CANNOT REACH ITS FULLY OPEN STATE (PAWLS HARDSTOP AGAINST FRAME) BEFORE ACTUATOR RESET THE STRIKER COULD BE CAPTURED IN EITHER PRIMARY OR SECONDARY STAGES.
13. WHEN LATCHED, ACTUATION LEVER SHOULD HAVE FREEPLAY SUCH THAT IT IS NOT PROVIDING A LOAD ONTO THE TRIGGER. FAILURE TO MAINTAIN LEVER FREEPLAY COULD RESULT IN LOWER ULTIMATE LATCHING LOADS.

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		DRAWN BY DGJ	SCALE SHEET 5 OF 5