



DENGENSHA EUROPE

RESISTANCE WELDING • AUTOMATIC NUT & BOLT FEEDERS

FAILURE MODE ANALYSIS (FMEA)

COMPONENT		DENGENSHA STANDARD NUT FEEDER (PLC type)			Date: May 2005	
ITEM / FUNCTION	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	SEVERITY	POTENTIAL CAUSES OF FAILURE	ROOT CAUSE	ACTION
Standard nut feeder	Upside down nut	Weld fail / rejected part - nut missing	7	Tube retaining bolt missing	Lack of visual check / maintenance	Implement Planned maintenance
				Worn bush in feed unit	air pressure too high accelerates wear via nut bouncing.	Weekly check
				Air pressure too high (nut bounces & turnover)	unauthorised adjustment from base setting	Weekly check
				Blow time too long (nut bounces & turnover)	unauthorised adjustment from base setting	Weekly check via manual feed observation
				Feed tube inverted	Incorrect re-assembly	Weekly check mark/ identify
	Miss feeding - nut not delivered to chute track B	Weld fail / rejected part - nut missing	7	Poor tube run	bend radius less than 500mm, over 8m long, exit 2m higher than separator, tie clips on tube	Weekly check
				Separator Fault	Broken cylinder rod connector due to air pressure too high, stress etc.	Annual check, replace or Repair
					Debris or wear to separator block	Six monthly inspection
				Jammed nut in chute track A	Debris, grease / oil, wrong nut	Clean & inspect six monthly
					upside down nut in track retained by failsafe stop	Rremove
				Jammed nut in separator	Debris, grease/oil, out of tolerance nut, sticking cylinder, Separator delay	Clean & inspect six monthly
				Jammed nut in chute track B	Feed tube not attached correctly - missing retaining bolt.	Weekly check



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	Miss feeding - nut not delivered to chute track B	Weld fail / rejected part - nut missing	7	Poor tube run	bend radius less than 500mm, over 8m long, exit 2m higher than separator, tie clips on tube	Weekly check
					Nut stock in track too high.	Weekly check mark/ identify
				Empty chute track A	Vibration control setting too high/low	Weekly check mark/ identify
					Bowl / chute track gap not set correctly.	Six monthly inspection
					Poor vibration characteristics due to incorrect floor mounting	Refer to installation manual
					Incorrect setting of selection device in bowl.	Factory set
					Incorrect setting of Proximity switch delay time	Six monthly inspection
					Incorrect setting of bowl level switch	Weekly check, mark/ identify
					Lack of grip in bowl due to oil	Inspect weekly, clean six monthly
					Timeout error - 15 mins after bowl is empty.	Shift start check Refill & restart
					Bowl too full, too empty	Weekly check 25% of bowl bottom visible
				Air blow fails	Time too short, insufficient pressure, debris in venturai, tube rure(see above), air exhaust holes blocked in chute track B .	Inspect weekly, clean six monthly



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	Dropped nut (not delivered to guide pin)	Weld fail / rejected part - nut missing	7	Worn or broken nose pin	Contact with guide pine, wear	Inspect weekly, replace six monthly
				Worn hinge plates	Wear	Inspect weekly, clean six monthly
				Magnet gap setting	Incorrect Assembly	Inspect weekly, clean six monthly
				Magnet weak	Wear / damage	Inspect weekly, clean six monthly
				Incorrect adjustment of feed unit		Six monthly inspection
				Worn nut stopper	Air pressure too high, blow time too long	Inspect weekly, replace six monthly
				Spindle damaged / bent	Contact with guide pin or out of sequence weld head	Replace - Inspect weekly, clean six monthly
				Feed angle too high / low	Incorrect set up	Inspect weekly, clean six monthly
				Damaged side wall to feed cylinder	Physical damage	Inspect weekly, clean six monthly
				Excessive vibration to mounting arm assy	External operations	Inspect weekly
				Incorrect feed cylinder type	Incorrect part used ie cushion should be rubber type.	Inspect weekly, clean six monthly
	Process stop Electrical)	Line stop	7	I/O fault		Repair
				Blown fuse		Repair
				Power fail or low voltage		Repair
				Interupted air supply		Repair



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	Process stop (Electrical)	Line stop	7	I/O fault		Repair
				Blown fuse		Repair
				Power fail or low voltage		Repair
				Interrupted air supply		Repair
				Component failure		Repair
				Proximity switch damaged or loose		TPM