

Quickdraw[®]

SYSTEMS

SHD Conveyor Maintenance Guide

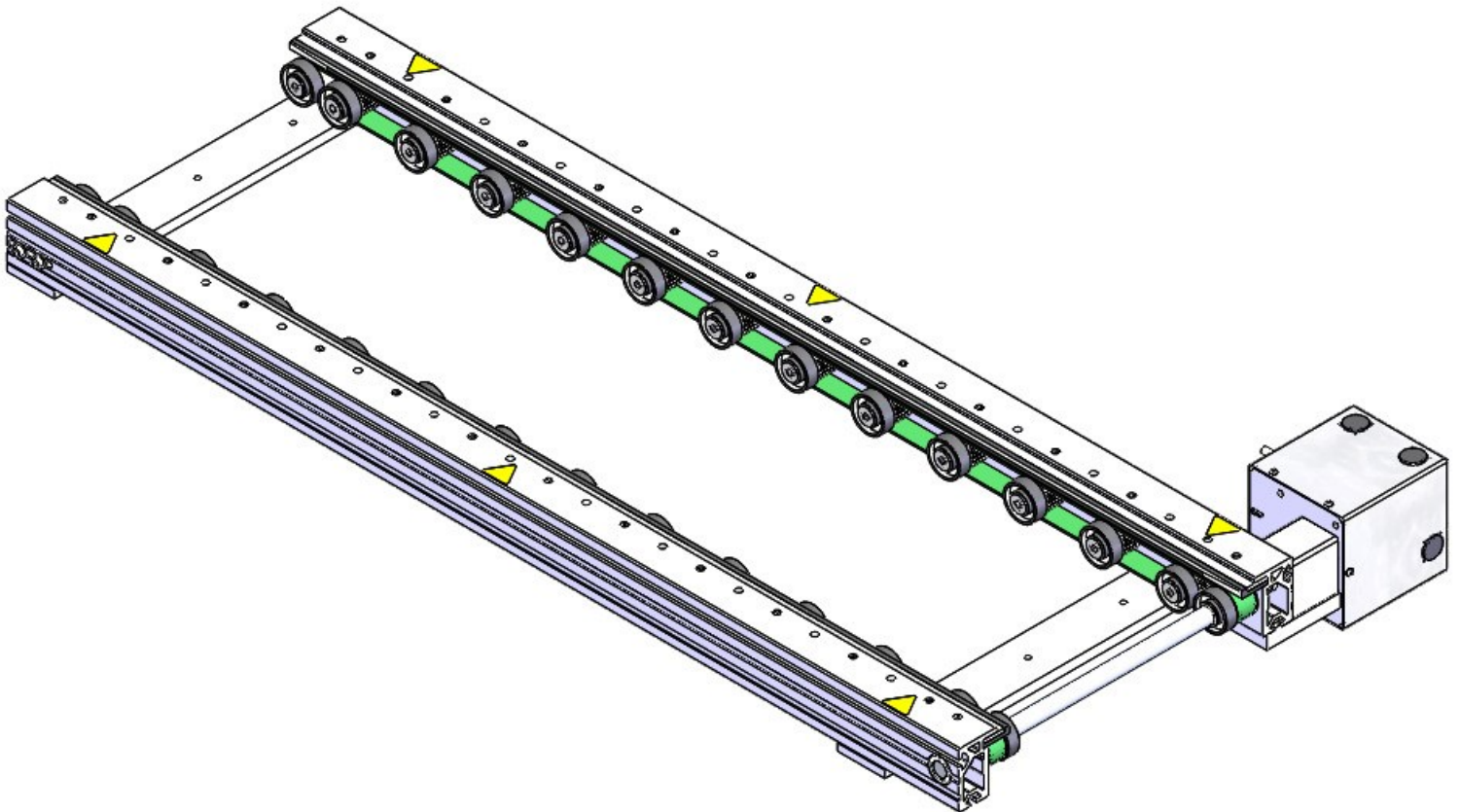


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Overview

Quickdraw Conveyors are designed to be the most reliable and easiest to maintain automated process conveyors available. This Guide consists of easy to understand maintenance procedures for your SHD Series Conveyor. This Guide also contains a Troubleshooting Section to help technicians identify the potential causes of any problems that may occur.

Specifications:

Lengths: 12 in- 120 in (by increments of 2 in)

Loads: 500 lbs static, 800 lbs dynamic

Speeds: Variable up to 30 ft/mn

Power Requirements: 24VDC @ 6 amps

If you require any assistance, technical support or have any questions, please contact Quickdraw's Customer Service Department at:

Quickdraw Systems

***Phone: 1-800-473-8837
(952) 935-6921***

Fax: (952) 933-5803

Internet: www.qdraw.com

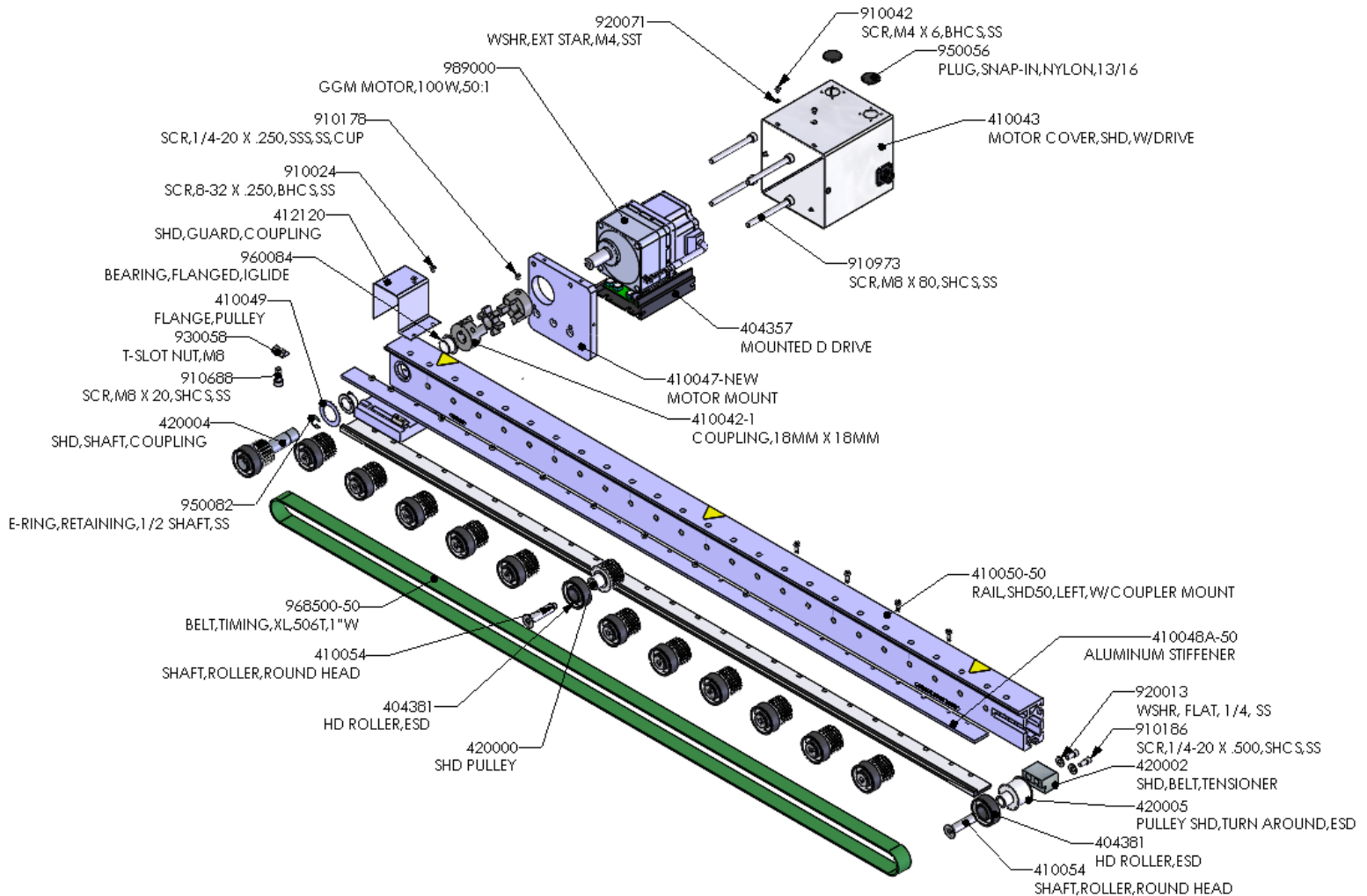
E-mail: info@activartpg.com

**Quickdraw Systems
9650 Newton Ave S.
Bloomington, MN 55431**

Note: Some illustrations in this manual include features that may not match or be included on your conveyor system.

Note: This maintenance manual is offered in the English language. If other languages are required, Quickdraw is not responsible for translation.

SHD Powered Rail (Left) Conveyor Assembly



MOTOR PACKAGE FOR DIRECT DRIVE CONVEYORS:

610002R-50G-NCB—ASM, SHD COUPL'D MTR, DDR, 50:1 GH

- INCLUDES:

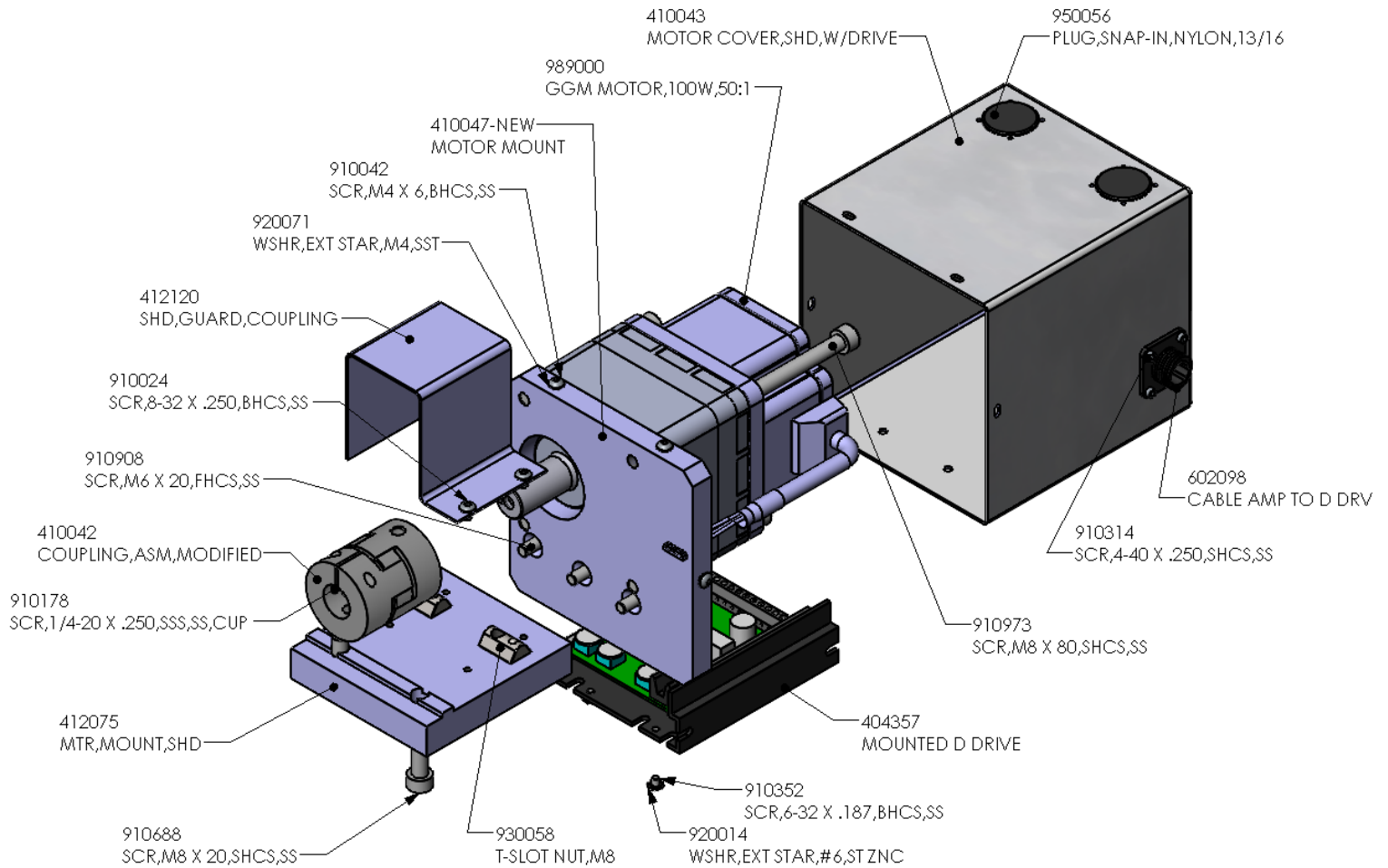
- 989000 MOTOR, 100W, 50:1

610002L-50G-NCB—ASM, SHD COUPL'D MTR, DDL, 50:1 GH

- INCLUDES:

- 989000 MOTOR, 100W, 50:1

SHD Coupled Motor Assembly (Int. Dart Card)



DART CONNECTORIZATION			
Dart 730BDC	GGM Motor	Function	INT AMP 602098
			AMP: 206486-1
1	GRAY	W	
2	PURPLE	V	
3	BLUE	U	
4		+VDC	PIN 1, ORANGE
5		POWER COM	PIN 7, GREEN
6	GREEN	MTR COM	
7	YELLOW	+ 5VDC (MTR)	
8		F/R	*PIN 4,BLACK (If Bi-Directional)
9	ORANGE	HW	
10	WHITE	HV	
11	BROWN	HU	
12		HI	PIN 2, BROWN
13		W	PIN 3, RED
14		LO (COM)	

***USE JUMPER BETWEEN DART PINS 8 AND 5 TO FIX DIRECTION IN PLACE OF REMOTE SIGNAL**

Powering Conveyors By Hand

Powering the Conveyor by hand *MUST BE DONE* during Product Guide replacement and after EVERY maintenance procedure prior to connecting the power source. This is done to ensure that the Timing Belts are **SEATED PROPERLY onto the teeth of the pulleys.**

IMPORTANT: Failure to hand-power a conveyor before turning on its motor may result in the following:

- 1) Blown Fuse**
- 2) Timing Belt Damage**
- 3) Drive Assembly Damage**

Procedure:

- 1) Turn the Drive Pulley with your fingers. Turn in both directions until the Timing Belts are properly seated. **The last direction turned should be the same as the conveyor's direction of flow.*
- 2) To avoid problems, hand-power the conveyor as it is being assembled. *For example:* After assembling the Drive system, hand-power the conveyor. After replacing the Product Guide, hand-power the conveyor.

Preventative Maintenance

The following is a list of procedures that should be followed as a part of a regular maintenance routine.

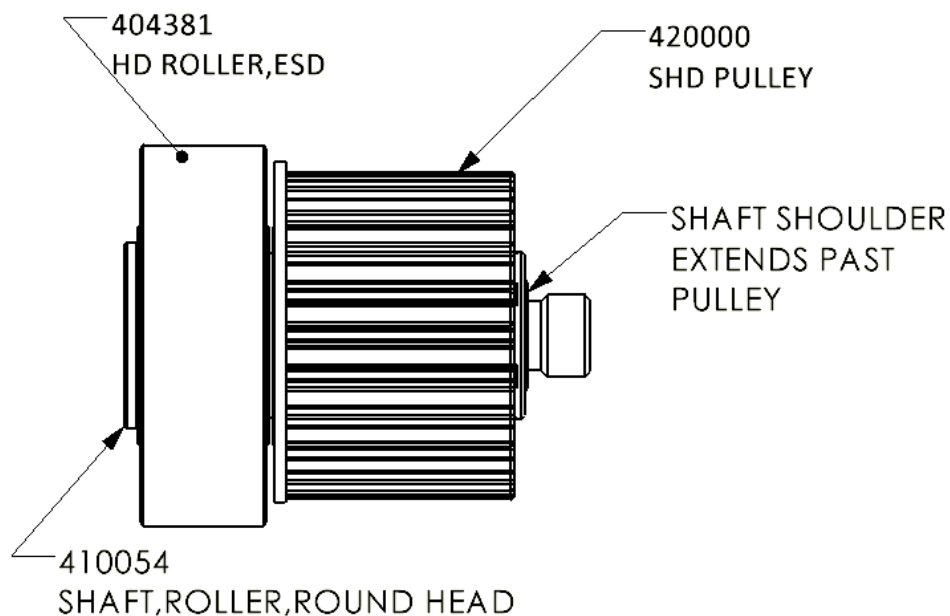
Procedure For SHD Conveyors:

- 1) Check the Conveyor to make sure that all rollers are turning freely.
- 2) Check for wear on the Timing Belts.
- 3) Check to make sure that the Conveyor is securely fastened to its frame.
- 4) Always hand-power the Conveyors after maintenance and before start-up.

Pulley / Roller Replacement

Procedure:

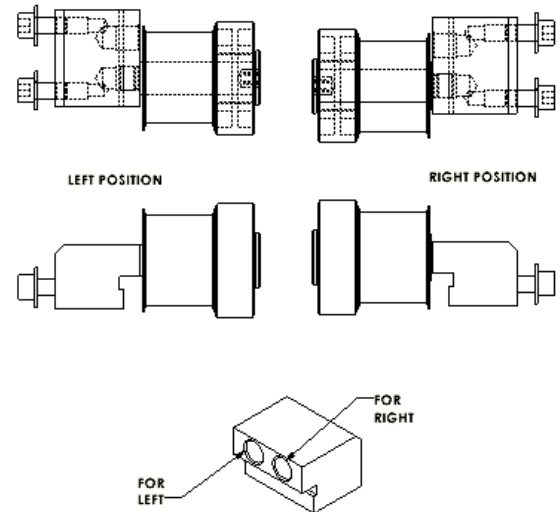
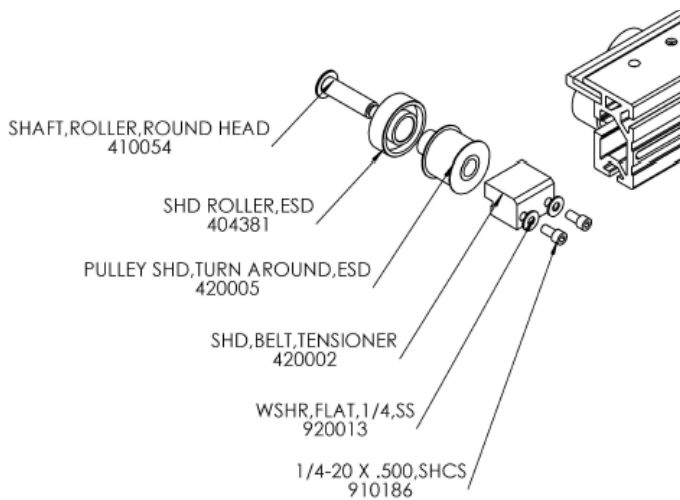
- 1) Loosen the Shaft (PN 410054) from the Rail with a 1/4 " internal hex wrench.
- 2) Turn the Shaft out with your fingers.
- 3) Place a new Roller (PN 404381) and/or Pulley (PN 420000) on the Shaft.
- 4) Make sure that the shoulder of the Shaft extends past the Pulley to prevent the Roller from being pinched against the Rail (See below).
- 5) Turn the Roller Assembly into the rail with your fingers until snug.
- 6) Use a Torque Wrench set to 100 inch/pounds to tighten the Roller Assembly.



Belt Tension

11/14/2024

Important: *OVER-TENSION* of the belts on the SHD system may cause increased wear on the drive components of the system. The tensioners on this conveyor are only supplied to take up slack and are not intended to increase belt pulley engagement.



Note: This assembly uses the **same parts** on LEFT AND RIGHT side. Assemble the pulley/roller in the other hole.

Procedure:

- 1) Loosen the two fasteners (910186) securing the belt tensioner at the end of the rail opposite the drive side.
- 2) Pull the Tensioner by hand to take the slack out of the belt. **Do not use anything to pry the tensioner, it should be only hand tight.**
- 3) Tighten the two fasteners to lock the tensioning block into place.

Timing Belt Replacement

Frequency: Belt = Yearly
Product Guide = 2 year Interval

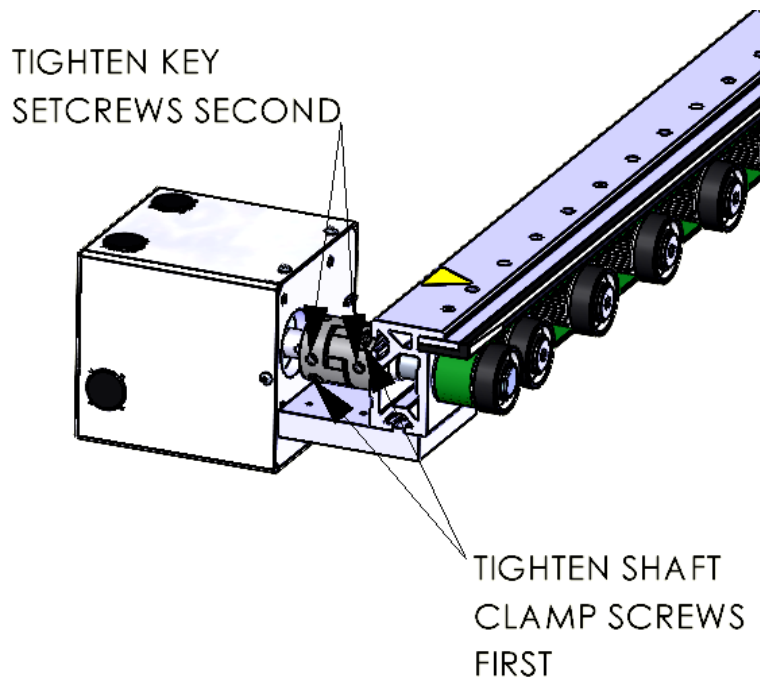
Procedure:

- 1) Remove Product Guide by removing the shoulder screws located along the top of the conveyor and sliding the product guide from the rail.
- 2) Loosen the Belt Tensioner at the end of the Rail opposite the Motor.
- 3) Remove the old Timing Belt.
- 4) Place the new Timing Belt over the far end pulley. ** Make sure that the Belt is engaged on the teeth of the Pulley.*
- 5) Pull the Belt toward the Motor end until it is around all of the pulleys on the conveyor.
- 6) Check the Timing Belt to ensure that it is not twisted or caught on the Rail.
- 7) Place the Belt around Drive Pulley.
- 8) Re-tension the Belt using the Tensioner opposite the Motor
- 9) Replace the Product Guide.
- 10) Hand-Power the Conveyor (See Page 7).
- 11) Turn on the Conveyor.

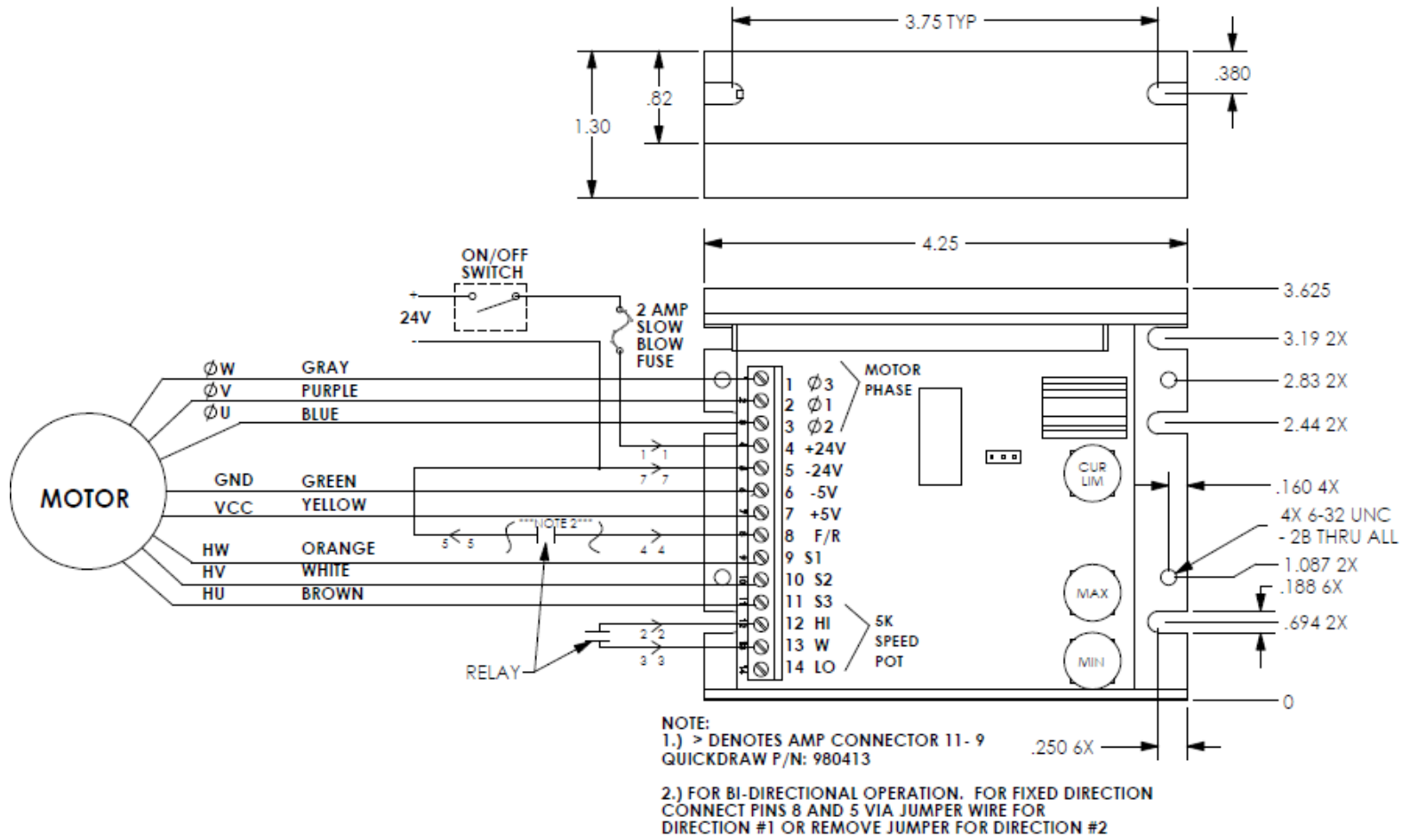
Motor Replacement

Procedure For SHD Models: (See image on Page 6.)

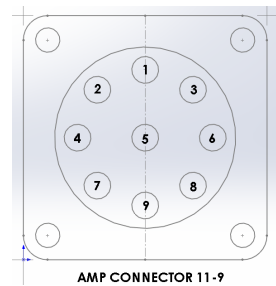
- 1) Unplug the Motor Cable from the Motor.
- 2) Remove the coupling cover. (Cover PN 412120, Screws PN 910024).
- 3) Loosen the coupling set screws (PN 910178) to release the coupling (PN 410042) from the motor shaft.
- 4) Remove motor cover screws (PN 910042) and remove motor cover (PN 410043).
- 5) Remove the four screws (PN 910973) that secure the Motor to the Motor Bracket (PN 410047-NEW) .`
- 6) Remove the Motor (PN 989000).
- 7) Attach the new Motor to the Motor Bracket (PN 410047-NEW) with the four screws (PN 910973) .
- 8) Attach coupling (PN 410042) to motor shaft.
- 9) First, tighten clamping screws of coupling to center the shaft on the coupling, Second, tighten coupling set screws to keys. (See image below).
- 10) Terminate motor cable to control card (see page 6 for proper termination).



GGM Internally Mounted Motor Control Card Wiring Diagram 11/14/2024



Conveyor Interface Connector:



AMP CONNECTOR 11-9
Quickdraw PN-980413

PIN #	DESCRIPTION	STANDARD CABLE COLOR	FLEX CABLE COLOR
1	+24V Source	Orange	Pink
2	Motor ON/OFF	Brown	Brown
3	Motor ON/OFF Common	Red	Red
4	Motor Direction	Black	Gray
5	Motor Direction Common	White	White
6	Speed Reference (0-5VDC)	NA	NA
7	Source Common	Green	Green
8	N/C	X	X
9	N/C	X	X

Setting Conveyor Speeds

Unless otherwise requested, Quickdraw sets all SHD Conveyor Speeds to 15 ft./min. Quickdraw does this to standardize its conveyor performance data. The Motor Cards used on most applications come with Speed Potentiometers (Speed Pots). These potentiometers can be provided upon request. Most customers choose not to use the Speed Potentiometers, but rather set speed with Min/Max Speed Pots directly attached to the board.

How to Determine Conveyor Speed

Procedure:

- 1) Place a small piece of reflective tape onto the roller.
- 2) Turn on the conveyor.
- 3) Measure the rpm with a Handheld Optical Digital Tachometer, such as the "AMETEK Model 1726 Optical Digital Tachometer".

How to Convert Linear Distance/Minute to Target RPM

Procedure:

- 1) Establish the needed conveyor flow rate. * *For example: 30 ft/min.*
- 2) Determine the diameter of a Roller. * *The diameter of a SHD Roller is 1.75".*
- 3) Use the following formula to determine the target rpm:
 - Target RPM = Linear Speed (ft/min) / { π *roller diameter (in feet)}
 - Target RPM = 30 ft/min. / π * (1.75"/12"/ft)
 - Target RPM = 30 ft/min. / π * 0.146 ft.
 - Target RPM = 30 ft/min. / 0.458 ft.
 - Target RPM = 65.5 rpm

Setting Conveyor Speed on Dart 730 BDC Control Cards

Procedure:

With Speed Pot:

- 1) Turn the dial on Speed Pot until the tachometer reads target rpm.
- 2) If unable to achieve target rpm, adjust the white Min and Max dials found on the Motor Control Card until the target rpm can be achieved within the range of the Speed Pot.

Without Speed Pot:

- 1) Adjust the white Min and Max dials found on the Motor Control Card until the target rpm can be achieved.

Changing Conveyor Flow Direction

Procedure to Change direction— Dart DC Brushless 730BDC Card:

- 1) Unplug power to Conveyor.
- 2) Locate the Motor Control Card that is operating in the wrong direction.
- 3) Turn off power.
- 4) Unplug the Conveyor Control Box from electrical power.
- 5) Check the Control Card for a wire jumper connecting Terminals #5 and #8.
- 6) If there is a jumper wire, remove the wire to change the direction of flow.
- 7) If there is no jumper, insert a wire jumper to change the direction of flow.
- 8) Plug in the Conveyor Control Box.
- 9) Turn on the power.

Phase Considerations

For most applications, Quickdraw Systems uses low-voltage, Brushless DC, 3-Phase Motors and Control Cards. Occasionally, a faulty phase may be the problem. Signs of a bad phase include but are not limited to:

- a) Intermittent Motor Failure
- b) The ability to start the Motor by turning the Drive Pulley after initial powering up of the Conveyor. After the Motor has been finger started the Motor turns on its own, but again may intermittently have start up problem.

To remedy this situation, follow the Electrical Troubleshooting guide on the following page. Make certain to turn the Conveyor on and off multiple times to make sure that the real cause of the problem is found.

Electrical Troubleshooting

Procedure:

- 1) Check all electrical connections. Make sure that all plugs are connected properly.
- 2) Make sure that it is an electrical problem by eliminating the Conveyor as a possible cause of failure:
 - a) Hand power the Conveyor.
 - b) Attach the Conveyor to a Motor Cable that is connected to a different, functioning Motor Control Card. * **Use a different Conveyor Control Box if possible.**
- 3) If the Conveyor turns by hand, and operates within an acceptably when connected to a different Motor Control Card, the problem lies somewhere in the original electrical system.

Possible causes include:

 - a) Electrical connections
 - b) The Motor
 - c) The Motor Cable
 - d) The Power Supply
 - e) The Motor Drive Card
- 4) To check the Motor, plug the electrical system in question into a different Conveyor. If the new Conveyor operates properly, the Motor on the original Conveyor is probably the cause and should be replaced.
- 5) To check the Motor Cable, switch Cables with a Conveyor that is operating properly. If the problem disappears, check the original Cable for bad electrical connections or cuts. If the original Cable cannot be repaired, then it must be replaced.
- 6) Unplug the Conveyor Control Box and check for loose connections or cut wires within the Control Box. Be careful not to create additional problems by pulling too forcefully on the wires. If you believe that you have found loose wiring and have taken steps to reconnect them properly, plug in the Control Box and re-try. If it works you have fixed the problem. If not, proceed to step #7.
- 7) If you still have not found the problem, replace the Motor Card using the Wiring Diagrams on Pages 6 & 11 as a guide.
- 8) If this does not eliminate the problem, please call a Quickdraw Systems representative for support at 1-800-473-8837 or 952-935-6921.

Problem	Possible Cause(s)	Solution
Conveyor Rollers are not turning.	<ul style="list-style-type: none"> a) Is the Motor turning? b) Is the Drive Shaft Extension turning? c) Is the Belt pinched between the Teeth of the Pulley and the Product Guide? 	<ul style="list-style-type: none"> a) If not, refer to Motor problems. b) Check the Set screw connecting the Motor Shaft to the Extension.. c) Remove the Product Guide and Power by Hand. Replace the Product Guide and Power by Hand.
The Motor is not turning.	<ul style="list-style-type: none"> a) Is a fuse blown? b) Is the speed adjustment turned down? c) Is there a faulty connection? d) Is the Motor Control Card receiving 24VDC? 	<ul style="list-style-type: none"> a) Replace blown fuse. b) Adjust the speed on the Motor Control Card. c) Check to see that the Motor is plugged in and no wires are loose on the Motor Control Card. d) Use a voltmeter and check the potential across terminal numbers 4 and 5 of the Control Card.
The Motor will turn, but only when started by hand.	<ul style="list-style-type: none"> a) If the Motor will not start on its own, but will run if manually started, the Motor Control Card is likely at fault. b) Is it a faulty Motor or Motor Control Card? c) Is it a bad wire connection? 	<ul style="list-style-type: none"> a) Replace the Control Card. b) Try another Motor on this Control Card and/or this Motor on another Control Card. Replace the defective component. c) Check the connections between the Motor Control Card and the Motor. Repair any loose connections.
Motor Fuses continually blow. (High Current)	<ul style="list-style-type: none"> a) Is the Conveyor assembled correctly? b) Is it a bad Motor or Motor Control Card? 	<ul style="list-style-type: none"> a) Check that the Drive Assembly turns easily by hand. b) Try another Motor on this Control Card and/or this Motor on another Control Card. Replace the defective component.
Premature Failure Of timing belts	<ul style="list-style-type: none"> a. Is the belt tension set properly? b. Is the belt seated properly? c. Is the conveyor overloaded? 	<ul style="list-style-type: none"> a) Ensure belt is NOT over-tensioned. b) Powering by hand, Page 7. c) See load/speed specifications, Page 3.

SHD Conveyor Components Parts List

<u>Part Number</u>	<u>Description</u>
412075	Motor Mount, SHD
410043	MOTOR COVER,SHD,W/DRIVE
410048-XX-WS	PRODUCT GUIDE, UHMW XX"L (Replace every 2 years)
410048A-XX	ALUMINUM STIFFENER XX" L
410054	Shaft,Roller, Round Head
404357	MOUNTED D DRIVE 730 (730BDC)
404381	HD Roller, ESD
410050-XX	RAIL,SHDXX,LEFT,W/COUPLER MOUNT
410051-XX	RAIL,SHDXX,RIGHT,W/COUPLER MOUNT
410045-XX.XXX"	SPCR,PLATE,SHD,XX.XXX"
420000	SHD PULLEY
420002	SHD, Belt Tensioner
420004	SHD,SHAFT,COUPLING
420005	Pulley, SHD, Turn Around, ESD
504009	Cable, 6", Motor to Cover
504010	Cable, 10ft, Connectorized (For External Card)
504010-15	Cable, 15ft, Connectorized (For External Card)
609004	SHD,ROLLER,ASM
609005	SHD,TENSIONER, ASM
603330-15M	ASM,HD MTR CBL,20GA,15 METER
989000	ASM,SHD COUPL'D MTR,DDL,50:1GH, 100W MTR
608299	TURN AROUND PULLEY ASM
609005	SHD, TENSIONER ASM
910688	SCR,M8 X 20,SHCS,SS
910186	1/4-20 x .500, SHCS
911707	SCR,SHLDR,8-32,.1875 X .375,SS
920013	WSHR,FLAT,1/4-20,SS
950082	E-RING,RETAINING, 1/2 SHAFT,SS
968500-XX	BELT,TIMING XL,XXX TEETH, 1"WIDE
960084	BEARING,FLANGED,IGLIDE

NOTE: ITEMS WITH - XX IN PART NUMBER ARE LENGTH-DEPENDENT, CONTACT QUICKDRAW FOR APPLICATION SPECIFIC PART NUMBERS. (SEE PAGE 17)

SHD Conveyor Components Parts List, Cont'd

<u>Part Number</u>	<u>Description</u>
603330-XX	ASM, MTR CBL, 20GA, XX-METER
910056	SCR,M8 X 20,FHCS,SS
910178	SCR, 1/4-20 X .250 SHCS, SSS,SS,CUP
910908	SCR,M6 X 20,FHCS,SS
910024	SCR,8-32 X .250, BHCS SS
920014	WSHR, EXT STAR, #6, ST,ZNC
930058	T-Slot Nut, M8
950083	HAZARD STICKER, ENTANGLEMENT
950284	Label, CE, .375 x .375
950468	Ring, Retaining, E,3/4
968452	50:1 GEARHEAD (GGM)

NOTE: ITEMS WITH - XX IN PART NUMBER ARE LENGTH-DEPENDENT, CONTACT QUICKDRAW FOR APPLICATION SPECIFIC PART NUMBERS.

Disclaimer:

The list above contains parts found on "standard" conveyors. If you have questions about parts that are not listed here you may have a specially configured system. Please contact Quickdraw Systems (include your serial number) with those questions or to order specialized replacement parts.

Additional Support:

Phone: 1-800-473-8837 or (952) 935-6921

Fax: (952) 933-5803

E-mail: Info@qdraw.com

Recommended Spare Parts List

<u>Part Number</u>	<u>Description</u>
420000	SHD PULLEY
410054	Shaft, Roller, Round Head
404381	HD ROLLER, ESD
410048-XX-WS	PRODUCT GUIDE, UHMW XX"L (Replace every 2 years)
404357	MOUNTED D DRIVE 730 (730BDC)
420004	SHD,SHAFT,COUPLING
420005	Pulley, SHD, Turn Around, ESD
609004	SHD,ROLLER,ASM
609005	SHD,TENSIONER, ASM
610002L-50G-NCB	ASM,SHD COUPL'D MTR,LEFT, DDL50:1 GEARHEAD
610002R-50G-NCB	ASM,SHD COUPL'D MTR,RIGHT, DDL50:1 GEARHEAD
608299	TURN AROUND PULLEY ASM
609005	SHD, TENSIONER ASM
968500-XX	BELT,TIMING XL,XXX TEETH, 1"WIDE
960084	BEARING,FLANGED,IGLIDE

NOTE: ITEMS WITH - XX IN PART NUMBER ARE LENGTH-DEPENDENT, CONTACT QUICKDRAW FOR APPLICATION SPECIFIC PART NUMBERS.

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