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Daedal

LINEAR AND ROTARY POSITIONERS

OPERATING MANUAL

Parker Hannifin Corporation
Daedal Division
Irwin, PA. 15642

No. gen-1h

Parker
Automation

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PURPOSE

This manual provides operational information on linear and rotary positioners. Please read the entire manual before operating your new positioner. The positioners performance and service life will be greatly enhanced by proper installation and maintenance. The following procedures will be helpful to you in achieving these objectives.

If at any time you have any questions about your new positioner please contact your authorized dealer or a Sales Applications Engineer (SAE) at the factory at 800-245-6903 or 724-861-8200.

SATISFACTION:

All standard products are covered by a 30-day customer satisfaction guarantee. If for any reason you are not satisfied with your purchased item, it may be returned for full credit, provided it has not been damaged or altered (see "Returns"). All systems are covered by our one-year warranty.

OUT-OF-WARRANTY REPAIR:

Out-of-warranty products are repaired in our service department. You will be notified of the cost, prior to making the repair.

RETURNS:

No product may be returned, in or out of warranty, without a "return authorization number". All returns must reference this number. Daedal assumes no responsibility for products returned without proper authorization. To obtain this return material authorization (RMA), call the Daedal Customer Service Department at 800-245-6903 or 724-861-8200.

UNPACKING:

Carefully remove the positioner from the shipping crate and inspect the unit for any evidence of shipping damage. The removal of shipping restraints may be required. Report any damage *immediately* to your authorized dealer. Please save the shipping crate for damage inspection or future transportation of the components.

Incorrect handling of the positioner may adversely affect the performance of the unit in its application. Please observe the following guidelines for the handling and mounting of your new positioner.

- Do not allow the positioner to drop onto the mounting surface; set it into place gently. Impacts can result in flat spots on bearing surfaces or misalignment of drive components.
- Do not drill holes into the positioner or subject the units to impact loads such as hammering, riveting, etc. Daedal will drill holes if necessary, contact your local distributor or a Daedal SAE.
- Do not lift the positioner by the drive screw, manual adjustment knobs or motor drive assembly. The unit should be lifted by the base structure only.
- Do not submerge the positioner in liquids.
- Do not attempt to adjust factory set screws. Factory set adjustments are covered with sealing tape and *unauthorized adjustments may void the product warranty*.

INSTALLATION:

When purchased, the positioner comes with the carriage, bearing housings, and motor adapter fully assembled. On request, a motor can be mounted and aligned to your positioner. Also upon request, either magnetic or optical limit and home switch assemblies designed to protect against over-travel and provide a fixed reference position for programming purposes can be ordered.
Product specification, dimensions and mounting hole configurations for standard products may be obtained by referring to the catalog, or by contacting your authorized dealer.

INSTALLATION (continued)

Mounting the Positioner to a Mounting Surface

A machined plate such as a laboratory optical table or a granite slab will provide the best mounting surface for your new positioner. We recommend the mounting flatness to be 0.0005 inch/foot or better.
The mounting surface (*not* the positioner base pads) may be scraped or shimmed to achieve the required flatness. With a satisfactory mounting surface, the mounting screws are inserted through the available mounting holes in the base of the positioner and tightened to secure the unit.

Mounting a Motor to the Positioner

Positioners supplied with a motor allow for direct mounting of a NEMA 23, 34 or 42 option motor. A coupling is supplied to make the connection between the motor and screw shaft. For helical couplers, assure that the coupler is tight on the screw shaft. For bellows couplers, assure that the collar is tight on the screw shaft and snug on the motor side but not tight. Make the collar snug enough to keep the collar from turning on the coupler. Insert the motor shaft on to the coupler. Once the shaft is inserted, assure the motor is piloted. Attach four bolts to motor flange and tighten. Begin rotation of the motor,(either rotate by hand, or start the motor at a *very* slow speed) and make sure it rotates freely to assure alignment and that the coupler is not being crushed onto the shaft. If you have a bellows coupler and the screw starts to rotate, you may have to loosen the collar on the motor end. If too much pressure is added to any coupling and the coupling is not aligned, it will crush and /or deform the coupler, causing premature wear. Tighten the coupler onto the shaft.

Mounting a Gearhead to the Positioner

If you have a NEMA 23, 34 or 42 gearhead, then it will attach directly to the face of the motor. If not, you will need an adapter, consult your gearhead manufacturer or a Daedal SAE. Follow the instructions of the gearhead manufacturer for mounting their gearhead to your motor. The gearhead can be mounted to the motor block on the positioner as directed above for mounting a motor. Certain gearhead manufacturers require a spacer, for long shafts, and a different size coupler to accommodate their shaft size. An adapter may be necessary to fit the gearhead to the positioner, consult the gearhead manufacturer or an SAE at Daedal with any questions on this subject.

INSTALLATION (continued)

Mounting the Payload to the Positioner

Before mounting the payload to the positioner, be sure the drive electronics are working and verify that all speeds and positions are attainable. Take notice of the results and record any information that may be helpful to you.

We recommend the mounting flatness to be 0.0005 inch/foot or better. When fixturing the payload to the mechanical positioner, use the mounting screws whose length does not bottom out or hit any components below. Longer screws may project into the interior of the mechanism of the positioner causing damage to the unit.

The positioner carriage has threaded mounting holes for attaching your payload. Some holes have locking threaded inserts. These inserts can be identified by one or more of the coils having a series of straight segments or "chords" (they are also dyed red for identification). When the bolt enters the "grip" coil, these chordal segments flex outward, creating pressure on the bolt. Therefore when tightening the bolt you must overcome the locking element. While doing this it may feel as though you are stripping the bolt. You are not. When tightening the bolt you will have to tighten past the locking element to achieve the tightening torque for your assembly. Consult factory with any questions.

MAINTENANCE

To insure long service and performance to specification, it is essential to keep the positioner bearings and drive elements properly lubricated and free of contamination. The nature of the application in consideration of variables such as environment, duty cycle, speed, etc. will determine the inspection, cleaning, and re-lubrication interval. Lubrication and maintenance information for nonstandard products and vacuum prepared systems may be obtained from your local representative or consult the factory.

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PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

BEARING LUBRICATION SHEET

SECTION I

SUPPLIER'S NAME	TELEPHONE NO.
PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	1-800-245-6903 or (724) 861-8200

ADDRESS *(Number, Street, City, and ZIP Code)*	FAX NO'S
1140 SANDY HILL ROAD, IRWIN, PA 15642	(724)861-3330 or (724)861-3331

BEARING TYPE

SQUARE RAIL BEARINGS

OIL TYPE

DAEDAL GREASE TYPE #1, MODEL NUMBER G1. LITHIUM 12 HYDROXYSTEARATE SOAP BASE CONTAINING ADDITIVES TO ENHANCE OXIDATION RESISTANCE AND RUST PROTECTION (VISCOSITY, 70/80 cSt AT 100 DEGREES C) IS RECOMMENDED FOR GREASE LUBRICATION AND ISO GRADE 32-100 FOR OIL LUBRICATION.

OIL APPEARANCE

BLUE AND VERY TACKY

SECTION II

BEARING MAINTENANCE

SQUARE RAIL BEARING BLOCKS ARE LUBRICATED AT OUR FACILITY PRIOR TO SHIPMENT. FOR LUBRICATION INSPECTION AND SUPPLY INTERVALS FOLLOWING SHIPMENT, APPLY GREASE ONCE A YEAR. THE TIME PERIOD MAY CHANGE DEPENDING ON FREQUENCY OF USE. INSPECT FOR CONTAMINATION, CHIPS, ETC. AND REPLENISH ACCORDING TO INSPECTION RESULTS.

SECTION III

LUBE APPLICATION

APPLY GREASE UTILIZING GREASE FITTINGS LOCATED ON THE EDGE SURFACE OF BEARING BLOCKS.

SECTION IV

NOTES

CAUTION: DO NOT USE/MIX PETROLEUM BASE GREASE WITH SYNTHETIC BASE GREASE AT ANY TIME. FOR LUBRICATION UNDER SPECIAL OR SEVERE SERVICE CONDITIONS, CONSULT THE FACTORY.

PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

BEARING LUBRICATION SHEET

SECTION I

SUPPLIER'S NAME	TELEPHONE NO.
PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	1-800-245-6903 or (724) 861-8200

ADDRESS *(Number, Street, City, and ZIP Code)*	FAX NO'S
1140 SANDY HILL ROAD, IRWIN, PA. 15642	(724)861-3330 or (724)861-3331

BEARING TYPE

ROUND RAIL BEARINGS

OIL TYPE

DAEDAL OIL TYPE #1, MODEL NUMBER A1. LIGHT MACHINE OIL CONTAINING ADDITIVES TO ENHANCE OXIDATION RESISTANCE WITH A VISCOSITY EQUIVALENT TO SAE 10.

OIL APPEARANCE

LIGHT YELLOW, FLUID.

SECTION II

BEARING MAINTENANCE

LINEAR RAIL BEARING BLOCKS ARE LUBRICATED AT OUR FACILITY PRIOR TO SHIPMENT. TO INSURE LONG SERVICE AND PERFORMANCE TO SPECIFICATIONS, IT IS ESSENTIAL TO KEEP THE POSITIONER BEARINGS AND RAILS ADEQUATELY LUBRICATED AND FREE OF CONTAMINATION.

THE NATURE OF THE APPLICATION IN CONSIDERATION OF VARIABLES SUCH AS ENVIRONMENT, DUTY CYCLES, SPEED, ETC., WILL DETERMINE THE INSPECTION CLEANING AND RE-LUBRICATION INTERVAL. IN GENERAL, IT IS DESIRABLE TO CLEAN AND LUBRICATE THE RAILS APPROXIMATELY EVERY 1000 HOURS OF OPERATION.

SECTION III

LUBE APPLICATION

WIPE THE RAILS DOWN THEIR ENTIRE LENGTH WITH A CLEAN CLOTH. APPLY LUBRICATION ON THE RAILS ALLOWING A FILM OF FRESH OIL TO PASS UNDER THE WIPERS AND INTO THE RECIRCULATING BEARINGS.

SECTION IV

NOTES

PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

BEARING LUBRICATION SHEET

SECTION I

SUPPLIER'S NAME	TELEPHONE NO.
PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	1-800-245-6903 or (724) 861-8200

ADDRESS *(Number, Street, City, and ZIP Code)*	FAX NO'S
1140 SANDY HILL ROAD, IRWIN, PA. 15642	(724)861-3330 or (724)861-3331

BEARING TYPE

CROSS ROLLER BEARINGS

OIL TYPE

DAEDAL OIL TYPE #1, MODEL NUMBER A1. LIGHT MACHINE OIL CONTAINING ADDITIVES TO ENHANCE OXIDATION RESISTANCE WITH A VISCOSITY EQUIVALENT TO SAE 10.

OIL APPEARANCE

LIGHT YELLOW, FLUID.

SECTION II

BEARING MAINTENANCE

CROSS ROLLER WAYS AND BEARING CAGES ARE LUBRICATED AT THE DAEDAL FACILITY PRIOR TO SHIPMENT. TO INSURE LONG SERVICE AND PERFORMANCE TO SPECIFICATION, IT IS ESSENTIAL TO KEEP THE POSITIONER BEARINGS AND WAYS ADEQUATELY LUBRICATED AND FREE OF CONTAMINATION.

THE NATURE OF THE APPLICATION IN CONSIDERATION OF VARIABLES SUCH AS ENVIRONMENT, DUTY CYCLES, SPEED, ETC., WILL DETERMINE THE INSPECTION CLEANING AND RE-LUBRICATION INTERVAL. IN GENERAL, IT IS DESIRABLE TO CLEAN AND LUBRICATE THE WAYS APPROXIMATELY EVERY FIVE HUNDRED (500) HOURS OF OPERATION.

SECTION III

LUBE APPLICATION

COMMAND THE POSITIONER TO TRAVEL TO THE EXTREME ENDS OF TRAVEL TO ACCESS THE WAYS FROM BOTH ENDS. WIPE THE WAYS DOWN THEIR ENTIRE LENGTH WITH A CLEAN CLOTH. APPLY LUBRICATION ON THE WAYS ALLOWING FRESH OIL TO PASS THROUGH THE BEARING RETAINERS AND ONTO THE BEARINGS.

SECTION IV

NOTES

PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

ROTARY TABLE LUBRICATION SHEET

SECTION I

SUPPLIER'S NAME	TELEPHONE NO.
PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	1-800-245-6903 or (724) 861-8200

ADDRESS *(Number, Street, City, and ZIP Code)*	FAX NO'S
1140 SANDY HILL ROAD, IRWIN, PA. 15642	(724)861-3330 or (724)861-3331

GEAR TYPE / BEARING TYPE

WORM GEARS / CROSS ROLLER OR BALL MAIN BEARING

GREASE TYPE

DAEDAL GREASE TYPE #1, MODEL NUMBER G1. LITHIUM 12 HYDROXYSTEARATE SOAP BASE CONTAINING ADDITIVES TO ENHANCE OXIDATION RESISTANCE AND RUST PROTECTION (VISCOSITY, 70/80 cSt AT 100 DEGREES C) IS RECOMMENDED FOR GREASE LUBRICATION.

GREASE APPEARANCE

BLUE AND VERY TACKY

SECTION II

TABLE MAINTENANCE

THE WORM SHAFT BEARINGS AND MAIN BEARING ARE LUBRICATED AT THE FACTORY FOR LIFE OF THE SYSTEM. THE WORM GEAR MESH IS ALSO LUBRICATED AT THE FACTORY PRIOR TO SHIPMENT. TO INSURE LONG SERVICE AND PERFORMANCE TO SPECIFICATIONS, IT IS ESSENTIAL TO KEEP THE POSITIONERS GEAR MESH LUBRICATED. INSPECT FOR NOISE OR VIBRATION AND REPLENISH LUBRICATION ACCORDING TO INSPECTION RESULTS.

THE NATURE OF THE APPLICATION IN CONSIDERATION OF VARIABLES SUCH AS ENVIRONMENT, DUTY CYCLES, SPEED, ETC., WILL DETERMINE THE RE-LUBRICATE INTERVAL. IN GENERAL IT IS DESIRABLE TO LUBRICATE THE SYSTEM APPROXIMATELY EVERY 500 HOURS OF OPERATION.

SECTION III

LUBE APPLICATION

UTILIZING GREASE FITTINGS LOCATED ON THE SIDE OF THE TABLE, APPLY GREASE AND ROTATE THE TABLE TOP COUNTER CLOCKWISE ALLOWING THE GREASE TO FLOW INTO THE MESH. EXCESSIVE LUBRICATION WILL FORCE GREASE OUT UNDER THE TABLE TOP. EXCESSIVE GREASE WILL NOT HARM THE TABLE AND FORCE GREASE INTO THE MESH AREA FOR LIMITED TRAVEL APPLICATIONS.

SECTION IV

NOTES

CAUTION: DO NOT USE / MIX PETROLEUM BASE GREASES WITH SYNTHETIC BASE GREASES AT ANY TIME. FOR LUBRICATION UNDER SPECIAL OR SEVERE CONDITIONS CONSULT THE FACTORY.

PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

BEARING LUBRICATION SHEET

SECTION I	
SUPPLIER'S NAME PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	TELEPHONE NO. 1-800-245-6903 or (724) 861-8200
ADDRESS *(Number, Street, City, and ZIP Code)* 1140 SANDY HILL ROAD, IRWIN, PA. 15642	FAX NO'S (724)861-3330 or (724)861-3331
BEARING TYPE RADIAL BEARING (BALL AND LEAD SCREW END BEARINGS -- DUPLEX BEARINGS)	
OIL TYPE DAEDAL GREASE TYPE #2, MODEL NUMBER G2. MOBILITH AW2, LITHIUM 12 HYDROXY.	
OIL APPEARANCE DARK BROWN AND VERY TACKY	
SECTION II	
BEARING MAINTENANCE ALL RADIAL BEARINGS ARE PACKED AT THE FACTORY FOR THE LIFE OF THE BEARING.	
SECTION III	
LUBE APPLICATION	
SECTION IV	
NOTES	

PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

BALL SCREW LUBRICATION SHEET

SECTION I

SUPPLIER'S NAME	TELEPHONE NO.
PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	1-800-245-6903 or (724) 861-8200

ADDRESS *(Number, Street, City, and ZIP Code)*	FAX NO'S
1140 SANDY HILL ROAD, IRWIN, PA 15642	(724)861-3330 or (724)861-3331

DRIVE SCREW TYPE

ROLLED BALL SCREW

OIL TYPE

DAEDAL GREASE TYPE #1, MODEL NUMBER G1. LITHIUM 12 HYDROXYSTEARATE SOAP BASE CONTAINING ADDITIVES TO ENHANCE OXIDATION RESISTANCE AND RUST PROTECTION (VISCOSITY, 70/80 cSt AT 100 DEGREES C) IS RECOMMENDED FOR GREASE LUBRICATION AND ISO GRADE 32-100 FOR OIL LUBRICATION.

OIL APPEARANCE

BLUE AND VERY TACKY

SECTION II

SCREW MAINTENANCE

NUT PACKAGES ARE LUBRICATED AT OUR FACILITY PRIOR TO SHIPMENT. FOR LUBRICATION INSPECTION AND SUPPLY INTERVALS FOLLOWING SHIPMENT, APPLY GREASE 1000 HOURS AFTER INITIAL START-UP OPERATIONS. INSPECT FOR CONTAMINATION, CHIPS, ETC. AND REPLENISH ACCORDING TO INSPECTION RESULTS.

THE NATURE OF THE APPLICATION IN CONSIDERATION OF VARIABLES SUCH AS ENVIRONMENT, DUTY CYCLES, SPEED, ETC. WILL DETERMINE THE INSPECTION AND RE-LUBRICATION INTERVAL. IN GENERAL, IT IS DESIRABLE TO LUBRICATE THE BALL SCREW APPROXIMATELY EVERY 1000 HOURS OF OPERATION.

SECTION III

LUBE APPLICATION

WIPE THE SCREW DOWN THE ENTIRE LENGTH WITH A CLEAN CLOTH. APPLY LUBRICATION ON THE SCREW ALLOWING A FILM OF FRESH GREASE TO PASS UNDER THE WIPERS AND INTO THE RECIRCULATING BEARINGS.

SECTION IV

NOTES

CAUTION: DO NOT USE/MIX PETROLEUM BASE GREASE WITH SYNTHETIC BASE GREASE AT ANY TIME. FOR LUBRICATION UNDER SPECIAL OR SEVERE CONDITIONS CONSULT THE FACTORY.

PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

BALL SCREW LUBRICATION SHEET

SECTION I

SUPPLIER'S NAME	TELEPHONE NO.
PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	1-800-245-6903 or (724) 861-8200

ADDRESS *(Number, Street, City, and ZIP Code)*	FAX NO'S
1140 SANDY HILL ROAD, IRWIN, PA 15642	(724)861-3330 or (724)861-3331

DRIVE SCREW TYPE

STANDARD OR PRECISION GROUND BALL SCREW

OIL TYPE

DAEDAL GREASE TYPE #1, MODEL NUMBER G1. LITHIUM 12 HYDROXYSTEARATE SOAP BASE CONTAINING ADDITIVES TO ENHANCE OXIDATION RESISTANCE AND RUST PROTECTION (VISCOSITY, 70/80 cSt AT 100 DEGREES C) IS RECOMMENDED FOR GREASE LUBRICATION AND ISO GRADE 32-100 FOR OIL LUBRICATION.

OIL APPEARANCE

BLUE AND VERY TACKY

SECTION II

SCREW MAINTENANCE

NUT PACKAGES ARE LUBRICATED AT OUR FACILITY PRIOR TO SHIPMENT. FOR LUBRICATION INSPECTION AND SUPPLY INTERVALS FOLLOWING SHIPMENT, APPLY GREASE 1000 HOURS AFTER INITIAL START-UP OPERATIONS. INSPECT FOR CONTAMINATION, CHIPS, ETC. AND REPLENISH ACCORDING TO INSPECTION RESULTS.

THE NATURE OF THE APPLICATION IN CONSIDERATION OF VARIABLES SUCH AS ENVIRONMENT, DUTY CYCLES, SPEED, ETC. WILL DETERMINE THE INSPECTION AND RE-LUBRICATION INTERVAL. IN GENERAL, IT IS DESIRABLE TO LUBRICATE THE BALL SCREW APPROXIMATELY EVERY 1000 HOURS OF OPERATION.

SECTION III

LUBE APPLICATION

WIPE THE SCREW DOWN THE ENTIRE LENGTH WITH A CLEAN CLOTH. APPLY LUBRICATION ON THE SCREW ALLOWING A FILM OF FRESH GREASE TO PASS UNDER THE WIPERS AND INTO THE RECIRCULATING BEARINGS. FOR EXTREME WORKING CONDITIONS SPECIAL GREASE LINES CAN BE ADDED TO THE SYSTEM. A LINE CAN TRANSFER GREASE INTO THE SYSTEM VIA THE THREADED HOLE IN THE NUT. IF GREASE LINES WERE NOT ORDERED & THE WIPE ON METHOD PROVES TO BE INSUFFICIENT, REMOVE THE ONE SCREW THAT HOLDS THE CARRIAGE TO THE NUT BRACKET. SLIDE THE CARRIAGE BACK. ON THE SIDE OF THE NUT IS A THREADED HOLE SUITABLE FOR A GREASE FITTING. PUMP THE NUT FULL OF GREASE AND RE-ATTACH THE NUT BRACKET TO THE CARRIAGE.

CAUTION: CONSULT FACTORY FOR SPECIAL GREASE SUPPLY LINES AND NUT REMOVAL.

SECTION IV

NOTES

CAUTION: DO NOT USE/MIX PETROLEUM BASE GREASE WITH SYNTHETIC BASE GREASE AT ANY TIME. FOR LUBRICATION UNDER SPECIAL OR SEVERE CONDITIONS CONSULT THE FACTORY.

PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

LEAD SCREW LUBRICATION SHEET

SECTION I

SUPPLIER'S NAME	TELEPHONE NO.
PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	1-800-245-6903 or (724) 861-8200

ADDRESS *(Number, Street, City, and ZIP Code)*	FAX NO'S
1140 SANDY HILL ROAD, IRWIN, PA 15642	(724)861-3330 or (724)861-3331

DRIVE SCREW TYPE

LEAD SCREW WITH A PLASTIC NUT

OIL TYPE

DAEDAL OIL TYPE #2, MODEL NUMBER A2. LIGHT MACHINE OIL WITH TEFLON.

OIL APPEARANCE

LIGHT YELLOW, FLUID, WITH WHITE RESIDUE AT BOTTOM.

SECTION II

SCREW MAINTENANCE

NUT PACKAGES ARE LUBRICATED AT OUR FACILITY PRIOR TO SHIPMENT. FOR LUBRICATION INSPECTION AND SUPPLY INTERVALS FOLLOWING SHIPMENT, APPLY OIL 1000 HOURS AFTER INITIAL START-UP OPERATIONS. INSPECT FOR CONTAMINATION, CHIPS, ETC. AND REPLENISH ACCORDING TO INSPECTION RESULTS.

THE NATURE OF THE APPLICATION IN CONSIDERATION OF VARIABLES SUCH AS ENVIRONMENT, DUTY CYCLE, SPEED, ETC. WILL DETERMINE THE INSPECTION AND RE-LUBRICATION INTERVAL. IN GENERAL, IT IS DESIRABLE TO LUBRICATE THE LEAD SCREW APPROXIMATELY EVERY 1000 HOURS OF OPERATION.

SECTION III

LUBE APPLICATION

DRIVE THE CARRIAGE TOP AWAY FROM THE MOTOR END TO GET A FULL VIEW OF THE SCREW. WIPE THE SCREW DOWN THE ENTIRE LENGTH WITH A CLEAN CLOTH. APPLY LUBRICATION ON THE SCREW ALLOWING A FILM OF FRESH OIL TO PASS OVER THE ENTIRE LENGTH OF THE LEAD SCREW.

SECTION IV

NOTES

TUBE MUST BE SHAKEN BEFORE APPLICATION.

PARKER HANNIFIN CORPORATION

DAEDAL DIVISION

LEAD SCREW LUBRICATION SHEET

SECTION I

SUPPLIER'S NAME	TELEPHONE NO.
PARKER HANNIFIN CORPORATION, DAEDAL DIVISION	1-800-245-6903 or (724)861-8200

ADDRESS *(Number, Street, City, and ZIP Code)*	FAX NO.
1140 SANDY HILL ROAD, IRWIN, PA. 15642	(724)861-3330 or (724)861-3331

DRIVE SCREW TYPE

LEAD SCREW WITH A PHOSPHORUS BRONZE NUT

OIL TYPE

DAEDAL OIL TYPE #3, MODEL NUMBER A3. LIGHT MACHINE OIL.

OIL APPEARANCE

CLEAR FLUID

SECTION II

SCREW MAINTENANCE

NUT PACKAGES ARE LUBRICATED AT OUR FACILITY PRIOR TO SHIPMENT. FOR LUBRICATION INSPECTION AND SUPPLY INTERVALS FOLLOWING SHIPMENT, APPLY OIL 1000 HOURS AFTER INITIAL START-UP OPERATIONS. INSPECT FOR CONTAMINATION, CHIPS, ETC. AND REPLENISH ACCORDING TO INSPECTION RESULTS.

THE NATURE OF THE APPLICATION IN CONSIDERATION OF VARIABLES SUCH AS ENVIRONMENT, DUTY CYCLE, SPEED, ETC. WILL DETERMINE THE INSPECTION AND RE-LUBRICATION INTERVAL. IN GENERAL, IT IS DESIRABLE TO LUBRICATE THE LEAD SCREW APPROXIMATELY EVERY 1000 HOURS OF OPERATION.

SECTION III

LUBE APPLICATION

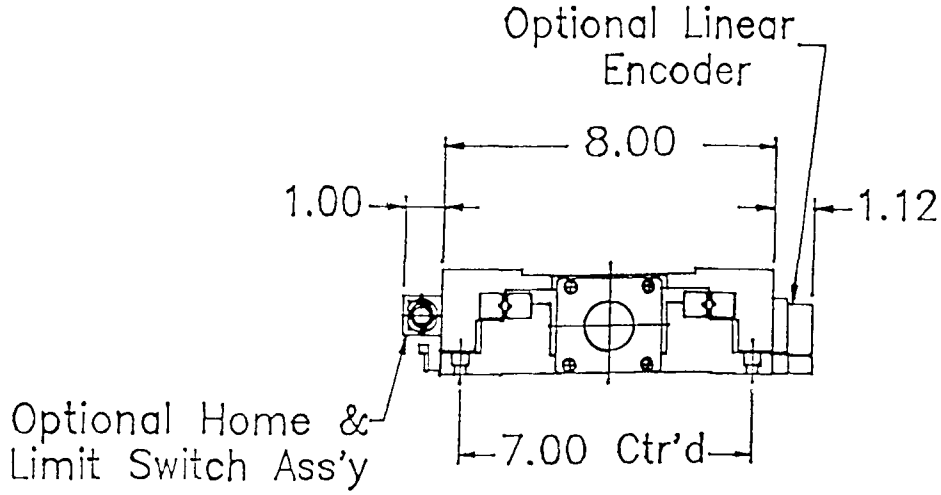
DRIVE THE CARRIAGE TOP AWAY FROM THE MOTOR END TO GET A FULL VIEW OF THE SCREW. WIPE THE SCREW DOWN THE ENTIRE LENGTH WITH A CLEAN CLOTH. APPLY LUBRICATION ON THE SCREW ALLOWING A FILM OF FRESH OIL TO PASS OVER THE ENTIRE LENGTH OF THE LEAD SCREW.

SECTION IV

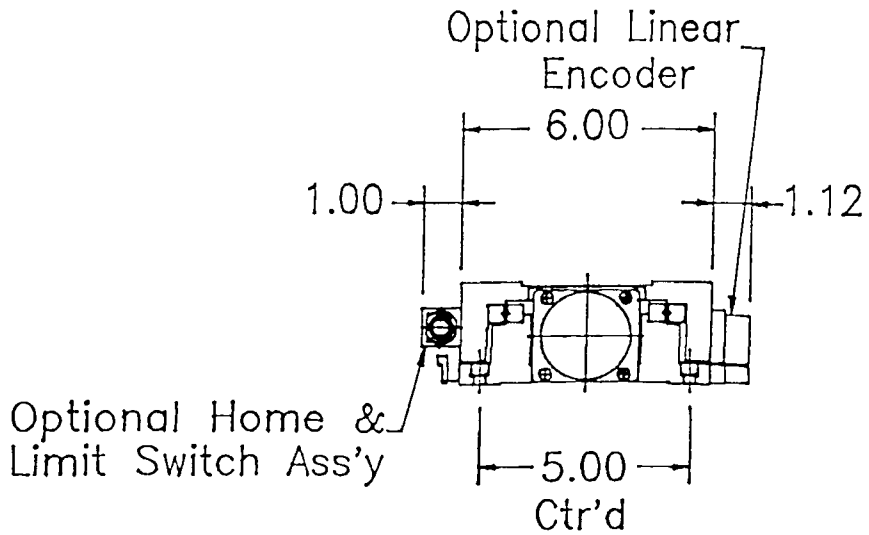
NOTES

EXAMPLE OF ENCODERS AND LIMIT/HOME SWITCH ASSEMBLY

806000 SERIES



808000 SERIES



STANDARD OPTIONS -- LH (Magnetic Limit and Home Switches)

- *Mounting and Adjustment:*

  * Remove three (3) each flat head screws, one (1) on top, two (2) on opposite side cover. Then the cover will slide off of the bracket. (NOTE: slide away from connector).

  * Counter bored holes in bracket. These holes are to be used to mount to pre-drilled and tapped holes in slide top. (NOTE: Hole may be covered by switch).

  * Each switch has two (2) 4-40 button head screws. Loosen both. *Do not remove.* Slide switch into position. Tighten screws.

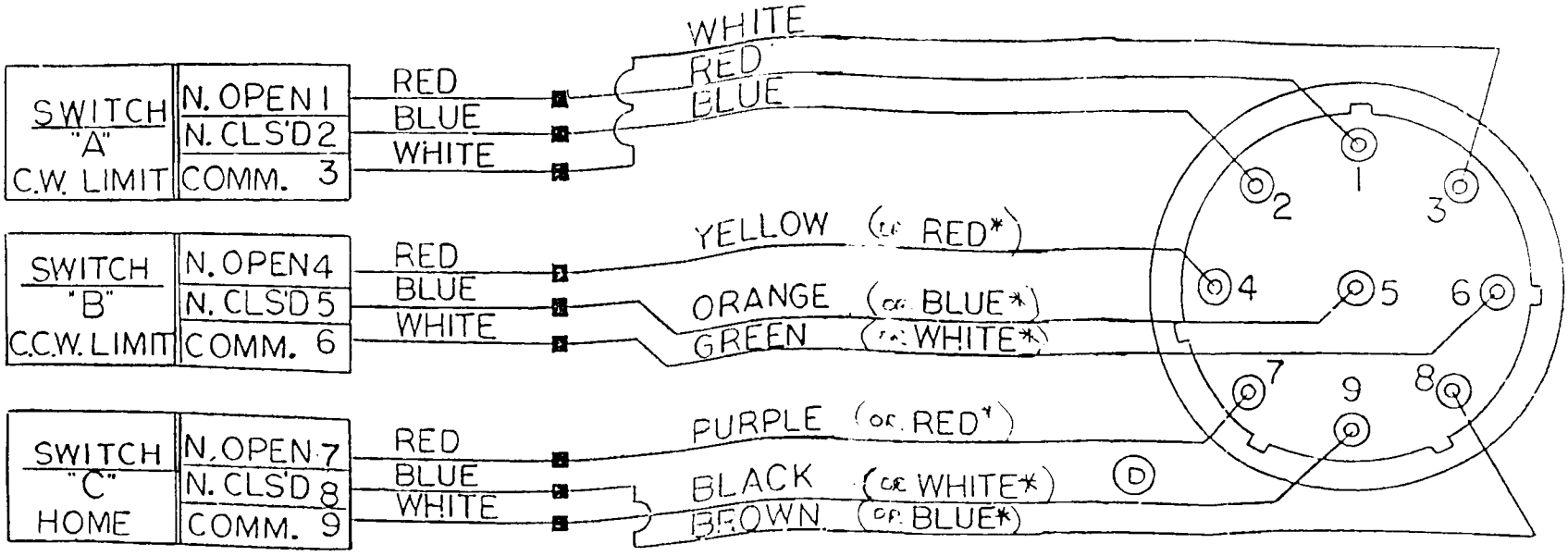
  * The magnet height may require adjustment for the proper switch operation. This can be accomplished by the adjusting slots located on the magnet.

- *Switch Specifications:*

  * Electrical: Form C, 0.25 A @ 120 VAC; 0.25 A @ 28 VDC
  * Repeatability: 0.002 in
  * Connector: 9 pin, AMP circular plastic; Mating connector AMP #206485-1; Contact sockets AMP #66504-8; Strain Relief AMP #206062-1
  * Mating cable: with pigtailed end (one per LH assembly), PN 006-1102-10

Pin Number	Function	Typical Wire Color
1	CW Limit, normally open	Red
2	CW Limit, normally closed	Blue
3	CW Limit, common	White
4	CCW Limit, normally open	Yellow
5	CCW Limit, normally closed	Orange
6	CCW Limit, common	Green
7	Home, normally open	Purple
8	Home, normally closed	Brown
9	Home, common	Black

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



WIRING DIAGRAM

* ON SHORT TRAVEL TABLES WIRES ARE NOT SPLICED.

GR-4	GR-3	GR-2	GR-1	PART OR IDENTIFYING NO.	DESCRIPTION	SPEC.	MATERIAL OR NOTE	ITEM NO.
QUANTITY				LIST OF MATERIAL				

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
0 TO 4 ±1/32	XX ±.01	±0°30'
4 TO 8 ±1/16	XXX ±.005	63
8 AND UP ±1/8	RMS FINISH	

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DRAWN	[illegible]	1-23-97
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APPD		
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REMOVE BURRS, BREAK SHARP EDGES

MATERIAL

FINISH

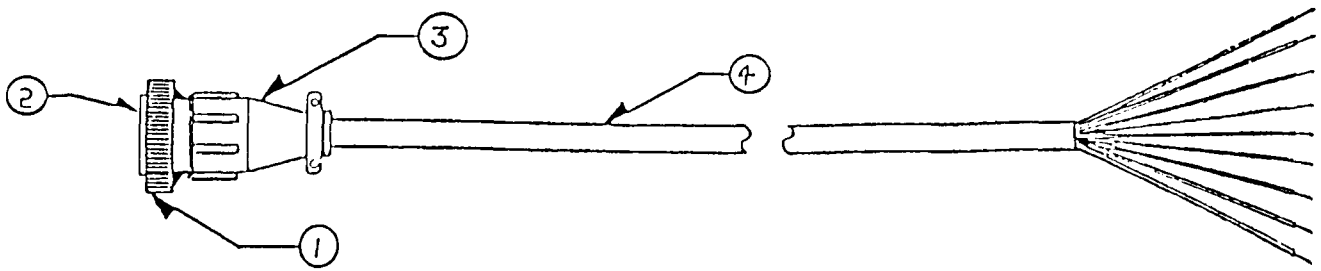
DAEDAL Parker

INNERCONNECTION DIAGRAM
MAGNETIC LIMIT & HOME SWITCHES

	A	003-1018

SCALE FULL | REPRO ~ | SHT 1 OF 1 | REV ~

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



NOTE:

1). NUMBER THAT FOLLOWS THE PART NUMBER INDICATES CABLE LENGTH IN FEET. EX: 006-1102-15 IS A 15 FT. CABLE.

2). MAXIMUM CABLE LENGTH IS 50 FT.

3). SHIELD WIRE IS TO BE CONNECTED TO CHASSIS GROUND.

WARNING: DO NOT CONNECT SHIELD WIRE TO LOGIC GROUND.

COLOR CODE FOR ITEM #1		
PIN #	DESCRIPTION	WIRE COLOR
1	LIMIT + (N.O.)	RED
2	LIMIT + (N.C.)	BLUE
3	LIMIT + (COM.)	WHITE
4	LIMIT - (N.O.)	YELLOW
5	LIMIT - (N.C.)	ORANGE
6	LIMIT - (COM.)	GREEN
7	HOME (N.O.)	PURPLE
8	HOME (N.C.)	BROWN
9	HOME (COM.)	BLACK

COLOR CODE FOR PIGTAIL		
PIN #	DESCRIPTION	WIRE COLOR
---	LIMIT + (N.O.)	RED
---	LIMIT + (N.C.)	BLUE
---	LIMIT + (COM.)	WHITE
---	LIMIT - (N.O.)	YELLOW
---	LIMIT - (N.C.)	ORANGE
---	LIMIT - (COM.)	GREEN
---	HOME (N.O.)	PURPLE
---	HOME (N.C.)	BROWN
---	HOME (COM.)	BLACK
---	SHIELD	BARE

GR-4	GR-3	GR-2	GR-1	PART OR IDENTIFYING NO.	DESCRIPTION	SPEC.	MATERIAL OR NOTE	ITEM NO.
QUANTITY				LIST OF MATERIAL				

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
0 TO 4 ±1/32	.XX ±.01	±0°30'
4 TO 8 ±1/16	.XXX ±.005	
8 AND UP +1/8	RMS FINISH	63

REMOVE BURRS, BREAK SHARP EDGES

MATERIAL

FINISH

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DESIGN		
ENGRG		
APPD		
APPD		

DAEDAL Parker

MAGNETIC LIMIT/HOME SWITCH
CABLE PIGTAIL ENDED

	A	006-1102-XX		
SCALE FULL	REPRO ~	SHT 1 OF 1	REV ~	

STANDARD OPTIONS -- LHO (Optical Limit and Home Switches)

- *Mounting and Adjustment:*

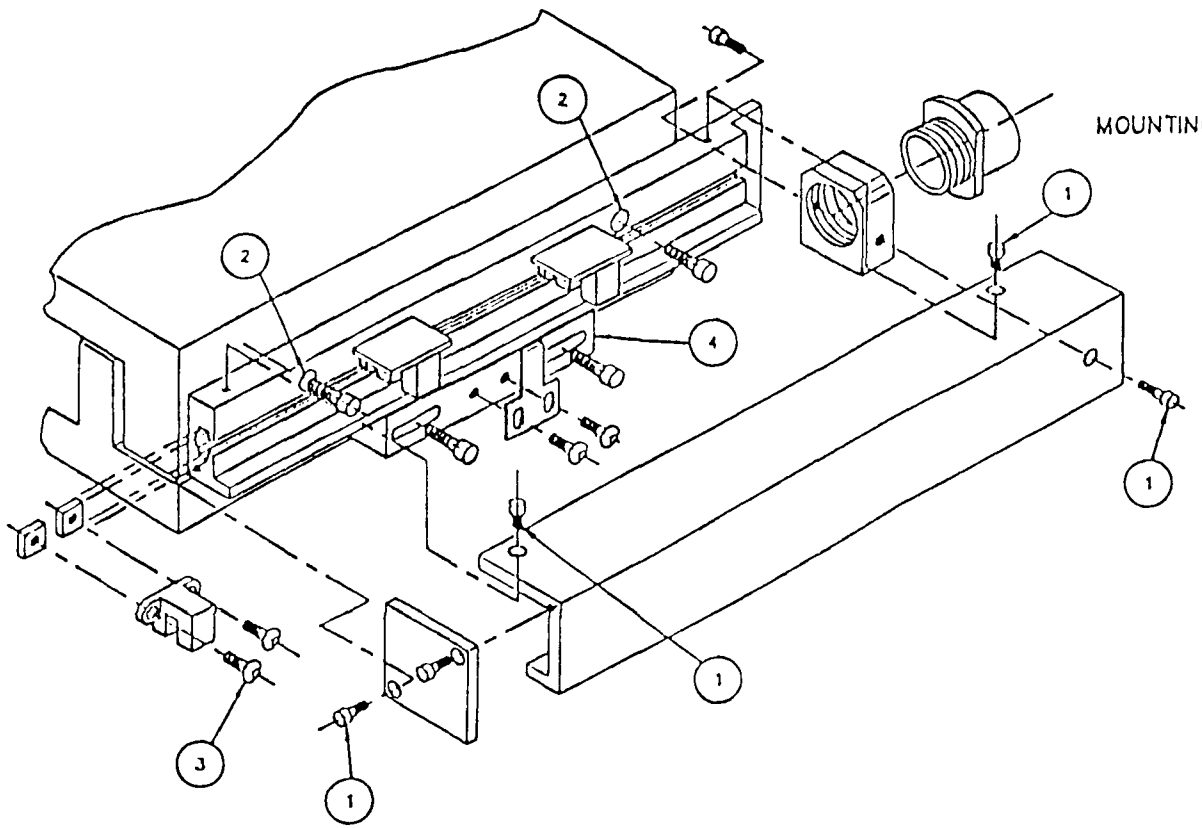
  * See the following page for a diagram of the assembly.

- *Switch Specifications:*

  * Input: 5 VDC, 120 mA
  * Output: 5 V, 20 mA (each), TTL outputs
  * Repeatability: 0.0002 in
  * Connector: 9 pin, AMP circular plastic; Mating connector AMP #206485-1; Contact sockets AMP #66504-8; Strain Relief AMP #206062-1
  * Mating Cable: with pigtailed end (one per LHO assembly), P/N006-1288-10

Pin Number	Function	Typical Wire Color
1	5 VDC, 0.120 amp input	Red
2	Ground	Black
3	Home, normally high	Green
4	Home, normally low	Brown
5	Keying Plug	N/A
6	CW Limit, normally high	White
7	CW Limit, normally low	Blue
8	CCW Limit, normally high	Yellow
9	CCW Limit, normally low	Orange

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



MOUNTING & ADJUSTING OPTICAL LIMIT & HOME SWITCHES

1. REMOVE 4 SOCKET HEAD SCREWS: 2 ON TOP, 1 ON END, 1 ON SIDE
2. C'BORED HOLES IN BRACKET, THESE HOLES TO BE USED TO MOUNT TO PRE-DRILLED & TAPPED HOLES IN SLIDE TOP. (HOLES MAY BE COVERED BY SWITCHES)
3. EACH SWITCH HAS (2) #4-40 BUTTON HEAD SCREWS. LOOSEN BOTH; DO NOT REMOVE. SLIDE SWITCH INTO POSITION. TIGHTEN SCREWS.
4. VANE BRACKET MOUNTS TO PRE-DRILLED & TAPPED HOLES IN BASE OF SLIDE. THIS BRACKET MAY HAVE TO BE ADJUSTED TO GET LIMIT SWITCHES TO ACTIVATE AT EXTREME ENDS OF TRAVEL.

GR-4	GR-3	GR-2	GR-1	PART OR IDENTIFYING NO.	DESCRIPTION	SPEC.	MATERIAL OR NOTE	ITEM NO.
QUANTITY				LIST OF MATERIAL				

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
0 TO 4 ±1/32	XX ±.01	±0°30'
4 TO 8 ±1/16	XXX ±.005	63
8 AND UP ±1/8	RMS FINISH	

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DESIGN		
ENGRG		
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REMOVE BURRS, BREAK SHARP EDGES

MATERIAL

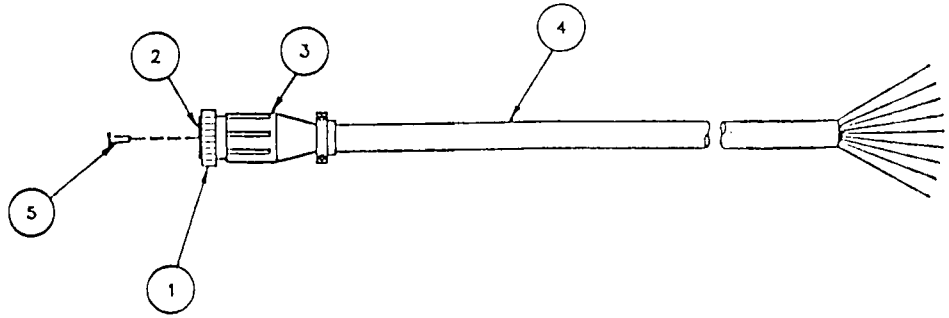
FINISH

DAEDAL Parker

OPTICAL LIMIT/HOME SWITCH ADJUSTMENT ASSEMBLY

	A	006-1356	
SCALE	REPRO ~	SHT 1 OF 1	REV ~

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



NOTE:

1). NUMBER THAT FOLLOWS THE PART NUMBER INDICATES CABLE LENGTH IN FEET. EX: 006-1288-15 IS A 15 FT. CABLE.

2). MAXIMUM CABLE LENGTH IS 50 FT.

3). SHIELD WIRE IS TO BE CONNECTED TO CHASSIS GROUND.

WARNING: DO NOT CONNECT SHIELD WIRE TO LOGIC GROUND.

COLOR CODE FOR ITEM #1		
PIN #		WIRE COLOR
1	+5 VDC	RED
2	GROUND	BLACK
3	HOME (N.O.)	GREEN
4	HOME (N.C.)	BROWN
5	KEYING PLUG	
6	CW LIMIT (N.O.)	WHITE
7	CW LIMIT (N.C.)	BLUE
8	CCW LIMIT (N.O.)	YELLOW
9	CCW LIMIT (N.C.)	ORANGE

COLOR CODE FOR PIGTAIL		
PIN #		WIRE COLOR
---	+5 VDC *	RED
---	DC GROUND	BLACK
---	HOME (N.O.)	GREEN
---	HOME (N.C.)	BROWN
---	CW LIMIT (N.O.)	WHITE
---	CW LIMIT (N.C.)	BLUE
---	CCW LIMIT (N.O.)	YELLOW
---	CCW LIMIT (N.C.)	ORANGE
---	SHIELD	BARE

* +5 VDC POWER SUPPLY
200mA MINIMUM

GR-4	GR-3	GR-2	GR-1	PART OR IDENTIFYING NO.	DESCRIPTION	SPEC.	MATERIAL OR NOTE	ITEM NO.
QUANTITY				LIST OF MATERIAL				

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
0 TO 4 ±1/32	XX ±.01	±0°30'
4 TO 8 ±1/16	XXX ±.005	
8 AND UP ±1/8	RMS FINISH	63

REMOVE BURRS, BREAK SHARP EDGES

MATERIAL

FINISH

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DESIGN		
ENGRG		
APPD		
APPD		

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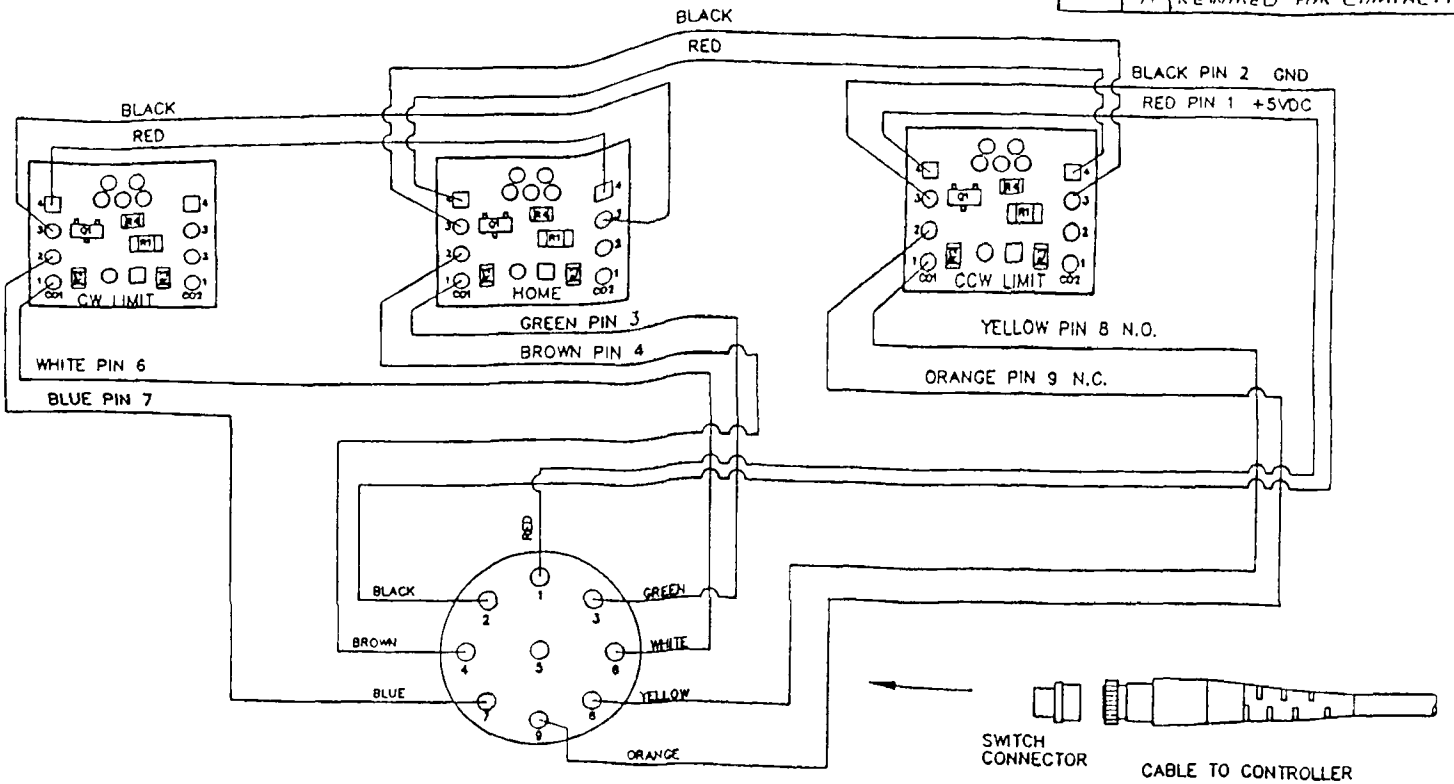
OPTICAL LIMIT/HOME SWITCH
CABLE PIGTAIL ENDED

	A	006-1288-XX

SCALE FULL | REPRO ~ | SHT 1 OF 1 | REV ~

DWG NO.	SH	REV

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	REWIRED FOR COMPACTNESS	10/1/91	MCM



ALL WIRE 28 AWG

GR-4	GR-3	GR-2	GR-1	PART OR IDENTIFYING NO	DESCRIPTION	SPEC.	MATERIAL OR NOTE	ITEM NO
QUANTITY				LIST OF MATERIAL				

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON

FRACTIONS	DECIMALS	ANGLES
0 TO 4 ± 1/32	XX ± .01	± 0° 30'
4 TO 8 ± 1/16	XXX ± .005	
8 AND UP ± 1/8	RMS FINISH	63

CHAMFERS .45° X .02 | RADII .02 "

REMOVE BURRS BREAK SHARP EDGES

MATERIAL

FINISH

THE INFORMATION CONTAINED HEREIN IS BEING MADE AVAILABLE ONLY AS THE PROPERTY OF AND FOR THE PURPOSES OF PARKER HANNIFIN CORP. DAEDAL DIVISION. IT CANNOT BE LAWFULLY REPRODUCED IN ANY FORM NOR DIVULGED TO ANY THIRD PARTY NOR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT HAS BEEN MADE AVAILABLE TO YOU WITHOUT THE EXPRESS WRITTEN CONSENT OF PARKER HANNIFIN CORP. DAEDAL DIVISION

DRAWN	MCM	5/23/91	
CHECKED	MCM	10/16/91	
DESIGN			
ENGRG			
APPD			
APPD			

DAEDAL Parker

INNERCONNECTION DIAGRAM
OPTICAL LIMIT & HOME SWITCHES

CODE IDEN NO	SIZE	DWG NO	REV
	B	006-1357	

SCALE NONE | WEIGHT | SHT 1 OF 1 | REV A

21

STANDARD OPTIONS -- Linear Encoders

- *ELE Specifications:*

  * Max Resolution with quadrature: 0.0001 in
  * Non cumulative Accuracy: 0.0004 in
  * Maximum Speed: 15 in/sec
  * Input: 5 VDC @ 220 mA
  * Output: Differential, TTL compatible, RS422 line drive, 40 mA sink and -40 mA source.

- *ELM Specifications:*

  * Max Resolution with quadrature: 0.001 mm
  * Non cumulative Accuracy: 0.010 mm
  * Maximum Speed: 380 mm/sec
  * Input: 5 VDC @ 220 mA
  * Output: Differential, TTL compatible, RS422 line drive, 40 mA sink and -40 mA source.

- *Encoders:* * Motor mounted rotary encoders are also available.

SPECIFICATION DEFINITIONS

Load Capacity:
The maximum load or weight that a positioning device can support without causing excessive wear or damage to the device. The load capacities stated are based on loads positioned over the bearings, not cantilevered.

Repeatability:
Once a positioning device moves away from a specific point or position, "repeatability" defines how accurately it can repeat, or return to that original position. Repeatability specifications in this manual are for tables only, and exclude motor and encoder effects on repeatability.

Resolution:
The smallest attainable increment of adjustment or positioning. With a manually adjusted positioner, resolution is defined as the smallest movement achievable by controlled rotation of the adjustment screw or micrometer.

Straight Line Accuracy (Straightness and Flatness of Travel):
In theory, a linear slide or stage moves along its axis of travel in a perfectly true straight line. In reality, the actual travel path deviates from the true straight line and flat line in both the horizontal and vertical directions, respectively. Straight and flat line accuracy is defined as the maximum distance that the travel path deviates from the theoretical straight line in either plane, measured from the moving carriage surface center. Specifications for straight line accuracy are for overall travel maximum deviations, and include yaw, pitch, and roll error when measured 2" above the table surface mount.

Concentricity:
In theory, as a table rotates, any point on the surface of the table should travel along a path that forms a perfect circle. In reality, the actual path of travel will deviate from the perfectly true circle. Concentricity defines the maximum difference between a true circle and the actual circular path formed by the rotating point.

Runout (Wobble):
As a rotary table rotates, any point of the surface of the table should remain within a perfectly flat plane that is perpendicular to the axis of rotation. Table runout describes the maximum distance that a point will deviate from that plane.

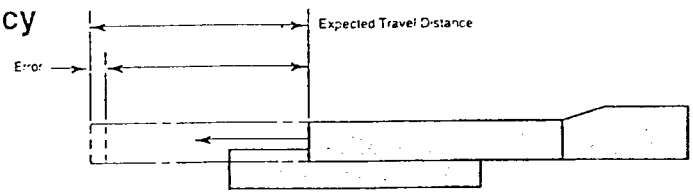
SPECIFICATION DEFINITIONS (continued)

Table Specifications:
Table specifications in this manual apply to single axis tables only. When one or more positioning tables are integrated with motors, drives and controls, any one component can affect the system specifications.

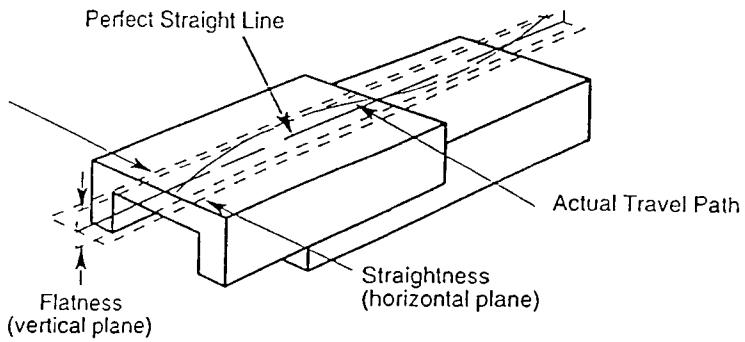
Yaw, Pitch, and Roll:
Yaw, pitch, and roll are terms used to describe angular movement (error) found in all linear table travel. The illustrations on the following page shows how these elements affect straight line and positional accuracy. Flatness of travel is also affected, but is insignificant in most applications.

Positional Accuracy:
When ever a motorized positioning table is commanded to travel a desired distance (from one point to another) it should, theoretically move that exact distance and then stop. Positional accuracy is defined as: the maximum allowable difference (error) between the expected travel distance, and the actual travel distance measured 2" above the moving carriage surface center. Positional accuracy specifications include pitch and yaw error for standard center drive tables. Positional accuracy stated, is for tables only, effects of motors and encoders are not included. Positional accuracy specifications are for overall travel maximum deviation defined by the least squares method described on *page 25.*

Positional Accuracy



Straight Line Accuracy



SPECIFICATION DEFINITIONS (continued)

Inch/inch Specification

The inch/inch specification is used *only* to determine the mean travel deviation **E**, as determined by the least squares method. The inch/inch specification is *not* used to determine a maximum bandwidth deviation.

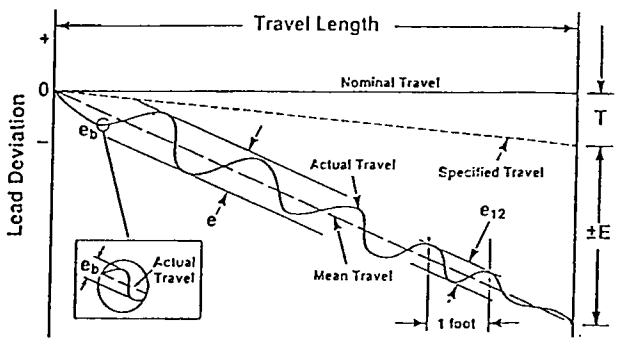
Example: Precision Grade Ball Screw with 4 " of travel
= 80 micro inches/inch
= 600 micro inches/foot
E = 320 micro inches

Inch/foot Specification

The inch/foot specification $\mathbf{e_{12}}$ is used to determine the maximum bandwidth deviation in a given foot from the mean travel deviation **E**. The inch/foot specification is also used to determine **E** when the inch/inch values in a given foot exceeds the inch/foot values.

Example: Precision Grade Ball Screw with 8" of travel
= 80 micro inches/inch
= 600 micro inches/foot
E = 600 micro inches

Example: Precision Grade Ball Screw with 14 " of travel
= 80 micro inches/inch
= 600 micro inches/foot
E = 760 micro inches



e Maximum bandwidth deviation for overall travel from mean travel deviation **E**.

E Mean travel deviation is obtained by the least squares method. See the inch/inch and inch/foot definition to determine **E** values. To determine worse case overall travel deviation from specified travel, use **E** for 800 000 Series catalog table as an example.

$\mathbf{e_b}$ Deviations per revolution normally seen by the screw and bearing combined.

T Values selected by the customer to compensate for elongation caused by temperature changes or external loads. This value is normally set at zero and neglected in most cases.

Notes: Measurements made with screw and assembly at 68°F.

PITCH ERROR
AND ITS EFFECTS ON
LINEAR ACCURACY

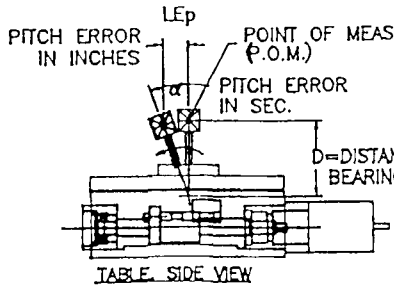


TABLE SIDE VIEW

FORMULA:
[(α ÷ 3600) TAN] X D = LEp

EXAMPLE: D = 2.5" ;PITCH ERROR = 10 SEC.
[(10 ÷ 3600) TAN] X 2.5 = .00012 (3.1μ)

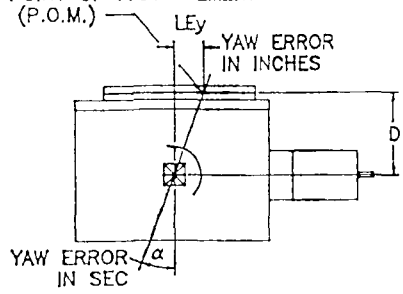


TABLE TOP VIEW

YAW ERROR
AND ITS EFFECTS ON
LINEAR ACCURACY

FORMULA:
[(α ÷ 3600) TAN] X D = LEy

EXAMPLE: D = 3.25" ; YAW ERROR = 10 SEC.
[(10 ÷ 3600) TAN] X 3.25 = .000157 (4.04μ)

ROLL ERROR
AND ITS EFFECTS ON
STRAIGHT LINE ACCURACY

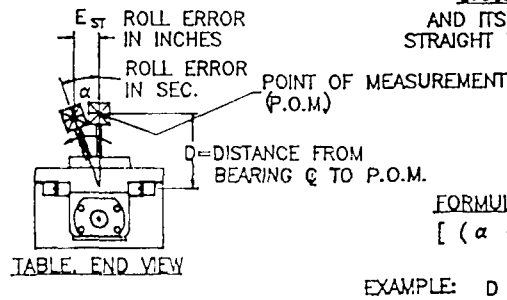


TABLE END VIEW

FORMULA:
[(α ÷ 3600) TAN] X D = E_{ST}

EXAMPLE: D = 2"; ROLL ERROR = 10 SEC.
[(10 ÷ 3600) TAN] X 2 = .000,097 (2.47μ)

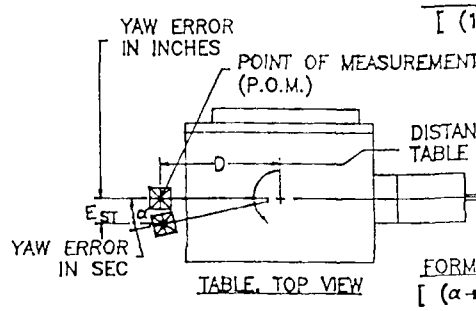


TABLE TOP VIEW

YAW ERROR
AND ITS EFFECTS ON
STRAIGHT LINE ACCURACY

FORMULA:
[(α ÷ 3600) TAN] X D = E_{ST}

EXAMPLE: D = 8.5" ; YAW ERROR = 10 SEC.
[(10 ÷ 3600) TAN] X 8.5 = .0004 (10.6μ)

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