Winona Van Norman®

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engine rebuilding equipment

- balancing
- block machining
- boring
- cleaning
- crankshaft
- cylinder head machining
- flywheel grinders
- honing
- motorcycle small engine
- rod reconditioning
- surfacing

Operation & Service Manual

PS2V Power Stroke Cylinder Hone

Model 866837
Serial 1561196

1-800-533-8008

710 E. 17th St. Wichita, Kansas 67214
Phone: 316-219-3500 Fax: 316-219-3510
sales@winonavannorman.com

Part No.

- ☐ 866837 .....230V, 60 Hz, 1 Ph
- ☐ 866829 .....230V, 50 Hz, 1 Ph

Serial Number _____

Purchase Date _____

Purchaser's Name _____

Address _____

_____

Set-Up Date _____

Set-Up By _____

ABOUT THIS MANUAL

Knowledge of and compliance with the operational and service principles outlined in this manual are essential for operation of your machine. Maximum benefit will be gained from the initial set up and training session if all prospective operators have read and are familiar with this manual before the technician arrives. The more you know about your PS2V Power Stroke Cylinder Hone – the more profitable it will be. Please specify the Model and Serial Number of the machine in any correspondence referring to this machine.

If any problems relative to operation or service should arise, contact Winona Van Norman direct , as we maintain personnel whose purpose is to take care of conditions relative to either service or production which might arise.

⚠WARNING

1. All operators should read and understand the complete operation manual before attempting to operate this machine. If any portion of this manual is unclear, contact the manufacturer for additional instructions before operating machine.
2. Never allow unskilled or improperly trained personnel to operate this equipment.
3. DO NOT operate this equipment under the influence of alcohol, drugs or medication which may alter judgement or physical performance.
4. All electrical installation and maintenance should be performed by a licensed electrician only. Use of unqualified personnel to perform electrical maintenance may result in unsafe conditions causing personal injury.
5. Electrical installation must conform to all national electrical codes as well as any state or local codes governing this machine.
6. DO NOT use this machine for honing any items other than internal combustion engine blocks.
7. Honing head must be completely stopped before retracting from engine block.
8. Use only manufacturers recommended hone stone holders and coolants.
9. Honing head must be completely inserted into block before starting.
10. Always securely clamp workpieces with tooling provided.
11. Turn off and lock out electrical power before opening door or removing cover.
12. DO NOT operate this machine with covers removed. Always replace and secure covers after any maintenance work is completed.
13. **All machine operators should wear proper clothing and eye protection.**
    SEE MANUAL.
14. Keep clothing, hair and body parts out of rotating parts, belts and gearing.
15. If skin or eye irritation due to contact with honing coolant occurs, refer to honing coolant manufacturer's recommendations for medical instruction.
16. Dispose of waste honing coolant according to federal, state, and local codes.
17. It is your responsibility to keep this warning label in place and legible. Replacement labels are available from the manufacturer.
18. Failure to heed these warnings may result in damage to the equipment, or failure resulting in property damage, personal or fatal injury.

Part No. 863361

LIMITED WARRANTY

WVN warrants for a period of twelve months from date of shipment by WVN to the original purchaser ("Buyer") that equipment manufactured by WVN will be free from defects in materials and workmanship when installed and operated in accordance with the instructions in the equipment manual. This warranty does not cover any failure due to: accident; modification; tampering; abuse; normal wear and tear; shipping damage; deterioration or wear occasioned by chemicals; abrasion, corrosion, or erosion; improper erection; operation or maintenance; abnormal conditions of temperature or dirt; or operation of the equipment above rated capacities or in an otherwise improper manner.

If within the one-year warranty period WVN receives written notice at 710 E. 17th Street, Wichita, Kansas, 67214, promptly after discovery by Buyer of any defect in material or workmanship in the equipment warranted by WVN herein, WVN shall, at its sole option, either replace (F.O.B. WVN's plant), or repair any defective part(s). If the defective part has a limited useful life, a charge for the replacement part will be prorated according to the amount of wear.

DISCLAIMMER OF IMPLIED WARRANTIES: THE FOREGOING LIMITED WARRANTY IS THE SOLE WARRANTY MADE BY WVN. WVN MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESSED OR IMPLIED, OF MERCHANT-ABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR OTHERWISE, WHICH EXTEND BEYOND THE FACE HEREOF, AND WVN HEREBY DISCLAIMS ALL SUCH WARRANTIES.

UNDER NO CIRCUMSTANCES SHALL WVN BE LIABLE TO BUYER OR ANY OTHER PERSON FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF USE, LOSS OF TIMES, AND LOSS OF GOODWILL, WHETHER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT, OR OTHERWISE.

Any equipment or components thereof that are not manufactured by WVN, carry only the warranties given by the respective manufacturers thereof which warranties, WVN will make available to Buyer to the extent permissible without

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SPECIFICATIONS:

Maximum Block Length: in. (mm)	42 (1066)
Maximum Stroke with powered feed: in. (mm)	14 (356)
(manual feed): in. (mm)	16 (406)
Honing Range with standard equipment: in. (mm)	2.7–5.5 (69–140)
(with optional equipment): in. (mm)	1.5–7.0 (38–177)
Hone Motor: HP	2
Honing Speed (infinitely variable): RPM	120–240
Stroke Motor: HP	0.33
Stroking Speed (infinitely variable): SPM	9–105
Coolant Capacity: gallons (liters)	65 (246)
Coolant Flow: gpm (lpm)	13.5 (51)
Machine Length: in. (mm)	68 (1727)
Machine Width: in. (mm)	60 (1524)
Machine Height: in. (mm)	70 (1778)
Door Opening: in. (mm)	48 (1219)
Machine Weight: lbs. (kg)	1450 (657)
Domestic Shipping Weight: lbs. (kg)	1600 (726)
Export Shipping Weight: lbs. (kg)	1850 (839)

STANDARD EQUIPMENT

Part No.	Item
866899	Friction Feed - Hone Head
866890	Drive Shaft - Hone Head
866891	Hone Head, 2.5" – 5.5" (64–140mm) range
866938	Tall Parallels - 2 Pcs.
804684	Short Parallels - 2 Pcs.
866939	Engine Bar Clamp, Standard
867206	Engine Bar Clamp, Heavy Duty
804831	Coolant, 30 gallons (113 liters)
	Hone Stones, 6 sets
	(see entries marked * below)

OPTIONAL EQUIPMENT

Part No.	Hone Heads
867095	Hone Head, 1.5" –2.2" (38–56mm) range
867096	Hone Head, 2.0" –2.68" (51–69mm) range
Part No.	**Hone Stone Sets**
804770	*70 Grit, $2\frac{3}{4}$" – $4\frac{1}{2}$" (70–114mm) Range
809772	*150 Grit, $2\frac{3}{4}$" – $4\frac{1}{2}$" (70–114mm) Range
863358	220 Grit, $2\frac{3}{4}$" – $4\frac{1}{2}$" (70–114mm) Range
804774	*280 Grit, $2\frac{3}{4}$" – $4\frac{1}{2}$" (70–114mm) Range
863359	400 Grit, $2\frac{3}{4}$" – $4\frac{1}{2}$" (70–114mm) Range
809771	*70 Grit, $3\frac{1}{2}$" – $5\frac{1}{2}$" (89–140mm) Range
804773	*150 Grit, $3\frac{1}{2}$" – $5\frac{1}{2}$" (89–140mm) Range
863356	220 Grit, $3\frac{1}{2}$" – $5\frac{1}{2}$" (89–140mm) Range
804775	*280 Grit, $3\frac{1}{2}$" – $5\frac{1}{2}$" (89–140mm) Range
863357	400 Grit, $3\frac{1}{2}$" – $5\frac{1}{2}$" (89–140mm) Range

Other sizes available to reach size 7.0.

Winona Van Norman is committed to product innovation and improvement and therefore reserves the right to change product specifications without notice.

KEEP THESE LABELS attached to the machine and legible at all times. Replacements are available from the factory.

Part No. 814485

Part No. 862302

Part No. 863261

Part No. 863266

PS2V, 12/06

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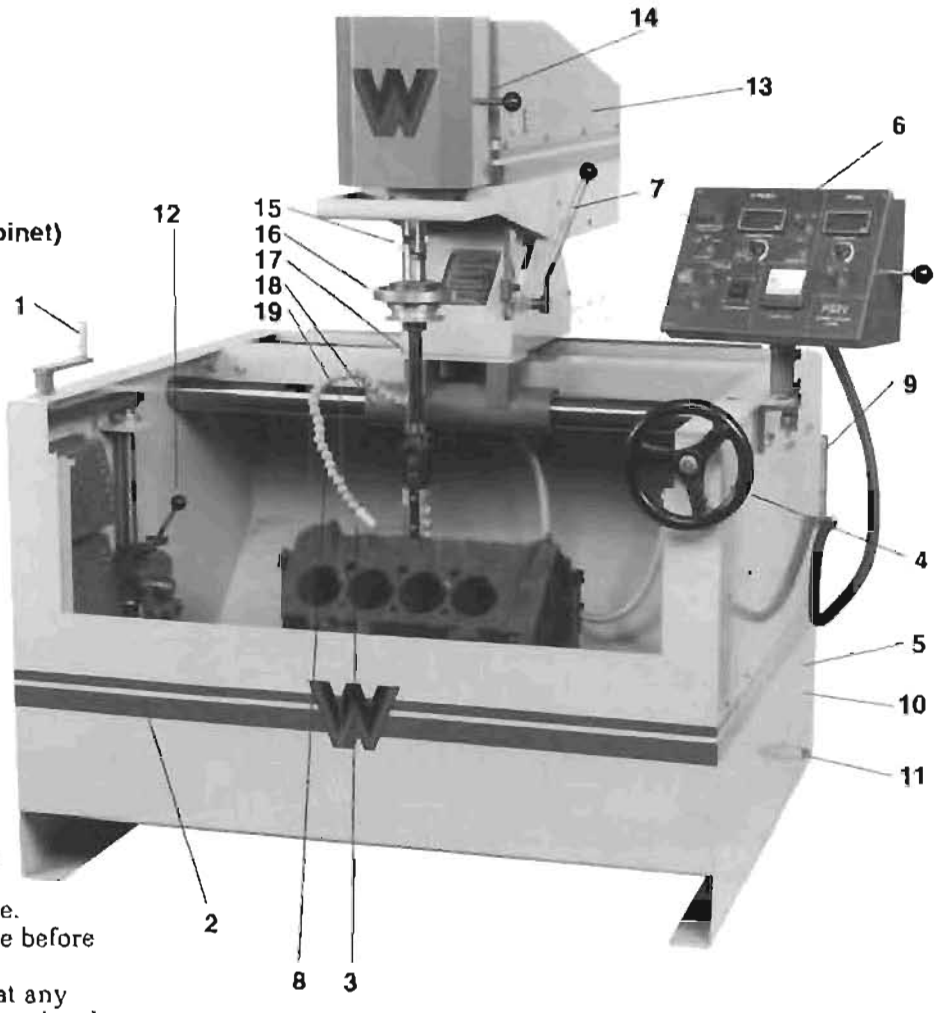
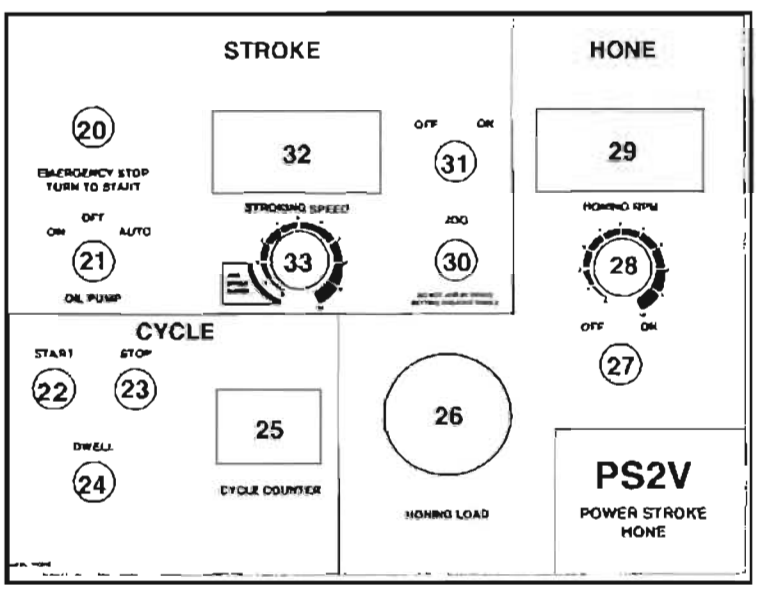
IDENTIFICATION OF CONTROLS AND FUNCTIONS

1. **Cradle Raise & Lower**
2. **Parallels**
3. **Oil Flow Control Valve**
4. **Traverse Handwheel**
5. **Oil Filter (inside cabinet)**
6. **Control Panel**
7. **Head Lock**
8. **Oil Nozzle**
9. **Main Fuse Box (on rear of cabinet)**
10. **Oil Pump (inside cabinet)**
11. **Oil Drain Plug**
12. **Index Release Handle**
13. **Drive Head**
14. **Stroke Adjustment Access Door**
15. **Universal Joint**
16. **Bi-Directional Hone Friction Feed Unit**
17. **Drive Shaft**
18. **Hone Head, Standard**
19. **Stones & Guides**
20. **Emergency Stop:** Turn knob to supply power to machine, push knob to stop all functions of machine.
21. **Oil Pump On/Off Auto:** Select between manual and automatic function of the oil pump. On allows the pump to run continuously. Auto activates the pump only when the machine is cycling.
22. **Cycle Start:** Begins honing cycle.
23. **Cycle Stop:** Stops honing cycle before counter reaches zero.
24. **Cycle Dwell:** Stops the stroke at any point in the cycle while the hone head continues to rotate.
25. **Cycle Counter:** Sets the number of full cycles desired for a honing operation. (one cycle includes both a down and up motion)
26. **Honing Load Meter:** Shows amount of current being drawn by the hone motor. This allows consistent loading of the stones.
27. **Hone ON/OFF:** Turns hone motor on and off.
28. **Honing Speed Adjustment:** Infinitely variable honing RPM.
29. **Honing RPM Digital Display:** Shows actual hone head RPM.
30. **Stroke Jog Button:** Each push of this button cycles the drive head to the next position following a sequence of TOP - MIDDLE - BOTTOM - TOP.
31. **Stroke ON/OFF:** Controls power to stroke controls.
32. **Stroke Speed Digital Display:** Shows actual stroking speed in cycles/min.
33. **Stroke Speed Adjustment:** Infinitely variable stroking speed.





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UNPACKING AND SETUP

1. Unpack oil and packaged tooling inside hone cabinet and on skid. Verify standard equipment against equipment list.

2. Take machine off skid. Place machine so there is adequate clearance in front for loading and unloading of parts. There should also be clearance for access to the back of the machine. The hone should sit flat on the floor. Shim the high corner, if necessary, to achieve a solid footing.

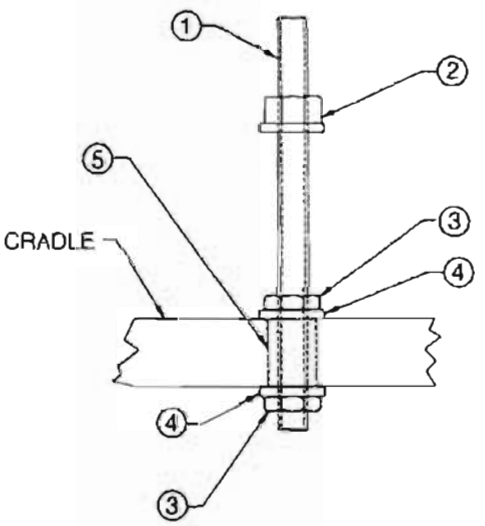
3. Take blocking from head assembly or remove bolt from back rail of hone.

4. Put coolant pump in coolant pan.

5. Add honing oil to machine 860263 - 30 Gallons

6. Assemble hold downs to cradle.

INSTALLING AND



HOLD DOWN ASSEMBLY

Item	Part No.	Description	Qty.
1	810132	Clamp Rod	1
2	141950	Flange Nut .750-10	1
3	808750	Jam Nut .750-10	2
4	808744	Washer	2
5	866954	Clamp Block	1

ASSEMBLING HONE HEAD

1. Mount Friction Feed unit into the U-joint. Tighten the two set screws securely. Check the four set screws that hold the U-joint to the gear motor to be sure they are tight.

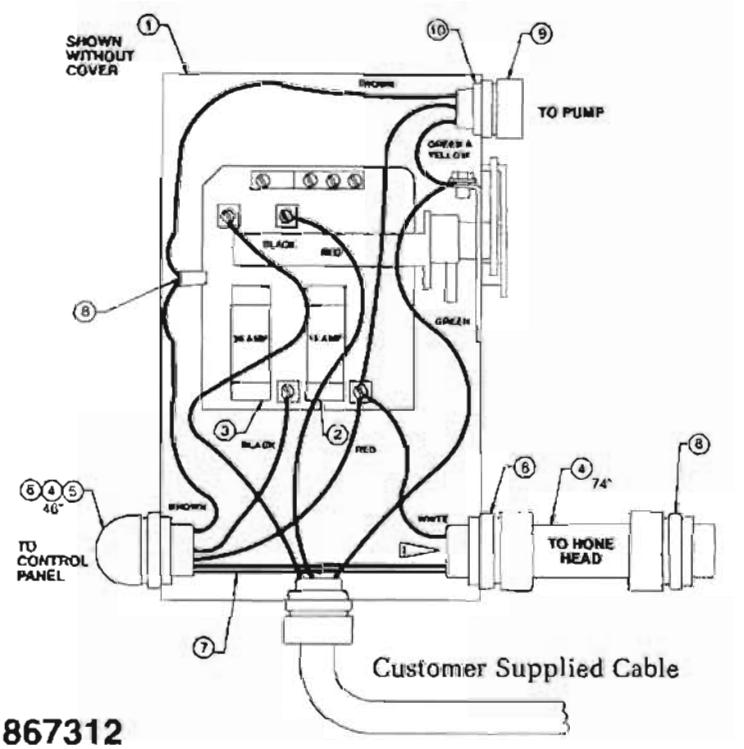
2. Assemble the hone head to the drive shaft ring using the two button head cap screws and spacers attached to the hone head.

3. Mount Drive Shaft/Hone Head assembly to the Friction Feed unit by securing the Drive shaft collar. Be sure the square shaft and drive pin are properly engaged.

4. Install the Stones and guides into the Hone Head. Be sure to install them so the rack teeth are toward the center and inserted from the side with the "X".

ELECTRICAL REQUIREMENTS

Machine requires 220V, 60 Hz. 1 Ph 4 wire electrical supply. Have a qualified electrician wire machine into 20 amp (minimum) supply.



867312
ELECTRICAL SHUT OFF ASSEMBLY

Item	Part No.	Description	Qty.
1	864874	Remote Shutoff Switch	1
2	862306	Fuse 15 Amp	1
3	862881	Fuse 20 Amp	1
4	804881	Flex. Conv. Hose .75	120"
5	809607	Connector 90°	1
6	809606	Connector Str.	3
7	814365	Cable 22 / 4	300"
8	801475	Wire Nut	1
9	801471	Strain Relief	1
10	866793	Lock Nut	1

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LOADING ENGINE BLOCKS INTO MACHINE

Positioning Parallels for Inline and "V" Blocks.

1. If engine blocks main bearing centerline is in line with its pan rails, **(Figure 1)**, position Parallels upward **(Figure 2)**.

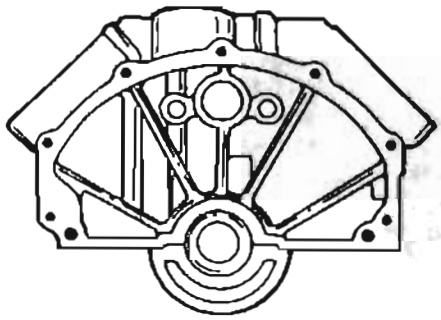


Figure 1

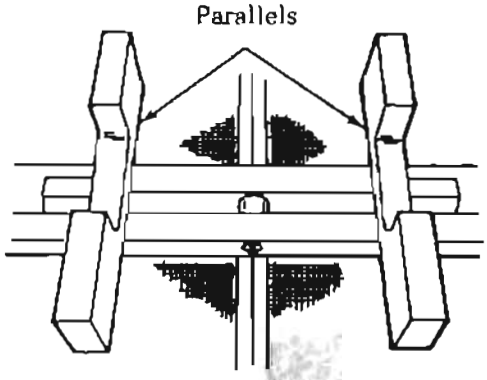


Figure 2

2. If main bearing centerline is above pan rails, **(Figure 3)** turn Parallels to the down position **(Figure 4)**. If the bearing centerline is more than 3 inches above the pan rail then use the short parallel set. When properly positioned the bearing centerline should be approximately in line with the pivot axis of the cradle.

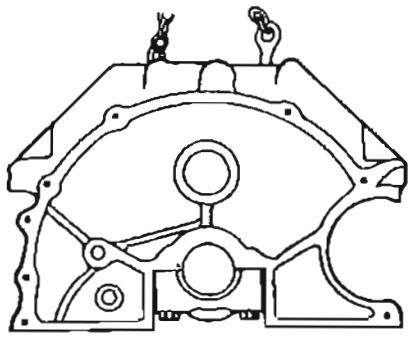


Figure 3

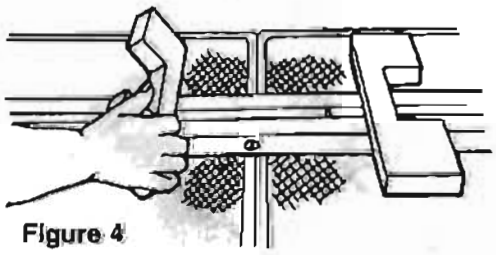


Figure 4

CLAMPING ENGINE BLOCK IN PLACE (INLINE AND "V" BLOCKS).

NOTE: At least the two end bearing caps must be bolted in place. Distortion will be kept to a minimum if all main bearing caps are installed and torqued properly.

1. Place Clamp Bar through main bearing bores **(Figure 5)**.
2. Move carriage to the left and raise the drive head.
3. Make sure that the pan rails do not have any gasket material or dirt on them.
4. Slide Parallels to approximate position near the ends of the engine block.

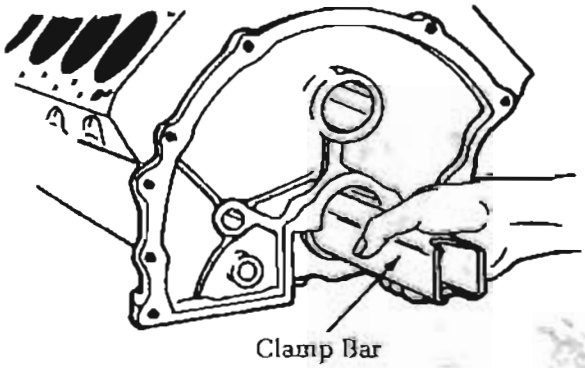


Figure 5

5. Place the engine block on the parallels near the center of the Cradle **(Figure 6)**.

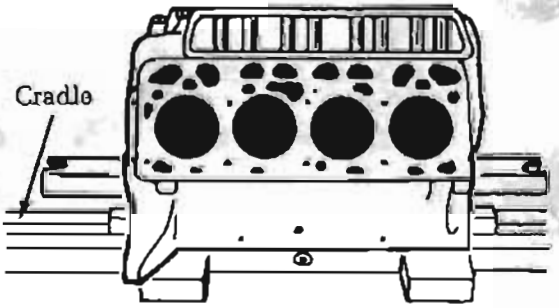


Figure 6

6. Slide the Hold Downs into the Clamp Bar slots. It may be necessary to shift the position of the engine block so that both Hold Downs will slide into the slots of the Clamp Bar.
7. With both Hold Downs in position, tighten clamp nuts evenly, first by hand and then with wrench, so that engine block is held firmly to Cradle. NOTE: **DO NOT overtighten. Inline Engine Blocks are now in a position to be honed.**

POSITIONING "V" TYPE BLOCKS.

1. Release cradle index latch at the left end of the Cradle and rotate the Cradle and engine block to position for honing. The first notch from the center position is for 60° "V" blocks; the second notch is for 90° "V" blocks.
   "V" Engine Blocks are now in a position to be honed.

ADJUSTING HONING STROKE

1. Measure length of cylinder to be honed. Add overtravel to this length. Generally you will only be able to overtravel at the top of the cylinder. If it is possible to overtravel the bottom then additional overtravel distance should be added. For 4" stones approximately .75" of overtravel is required.
2. Release the Drive Head lock and carefully lower the Honing Head into the cylinder bore. Be sure the stones are retracted enough to clear the bore diameter. Clamp the Drive Head securely in the lowered position. Lower the cradle so that only 1-2 inches of the stone are in the bore.
3. Turn main power on, release the Emergency Stop switch and set the Stroking speed to "2". Turn stroke on and momentarily push the JOG button and release. The Drive Head will move down to a horizontal position.
4. Open access door to stroke setting plate. Using the 1/4" hex wrench supplied adjust the stroke.
5. Loosen the stroke lock by turning the top cap screw about 1/2 turn CCW
6. Turn the lower cap screw to adjust the stroke. The front edge of the sliding block indicates the stroke setting on the scales. (This is viewed from the right side of the Drive Head) NOTE: each full turn of the screw changes the stroke 1/4".
7. Tighten the stroke lock by turning the top cap screw until snug. It is not necessary to tighten more than 5 ft-lbs.
8. Remove hex wrench.
9. Momentarily push the JOG button then release. The Drive Head will stop at the bottom position. Raise the cradle until the stones are positioned at the bottom of the cylinder or below the bottom if overtravel is required.
10. Jog Drive Head to the top to verify that the top overtravel is correct. If necessary repeat the stroke setting procedure until proper travel is achieved.

BASIC OPERATION

Power Stroke Honing

1. Lower Hone head into cylinder and expand stones to within a few thousandths of the cylinder diameter. Clamp Drive Head in lowest position.
2. Release emergency stop switch, select "AUTO" oil pump and turn stroke "OFF".
3. Set cycle counter to desired number of cycles, turn Hone "ON", and select Honing RPM. (Honing motor does not need to be running)
4. Set stroking speed at 3-4 on the potentiometer scale, turn stroke "ON", push cycle "START". The Hone will start full operation at this point. Readjust stroke speed to desired setting.

Manual Honing

1. With Stroke "ON" and Hone "OFF" jog head to lowest position.
2. Turn Stroke "OFF", set Cycle Counter to 1.
3. Release Drive Head Clamp.
4. Press Cycle Start. Raise and lower Drive Head manually.

USING THE FRICTION FEED HONE HEAD

1. Holding the upper friction feed ring will expand the stones, holding the lower ring will retract the stones.
2. The Honing Load meter will show how hard the stones are working. It will also indicate how straight the bore. Reading within one amp on the meter indicates a straight bore.
3. If the load reading fluctuates more than one division, take note at what point in the cycle the readings are highest. A high reading indicates a tight spot in the bore. By using the "DWELL" button, it is possible to run the stones in one place to selectively remove additional stock

DETERMINING CYCLE RATE BASED ON CROSS HEAD ANGLE AND RPM

$$\text{Cycles/Min.} = \frac{K \times D \times R}{L}$$

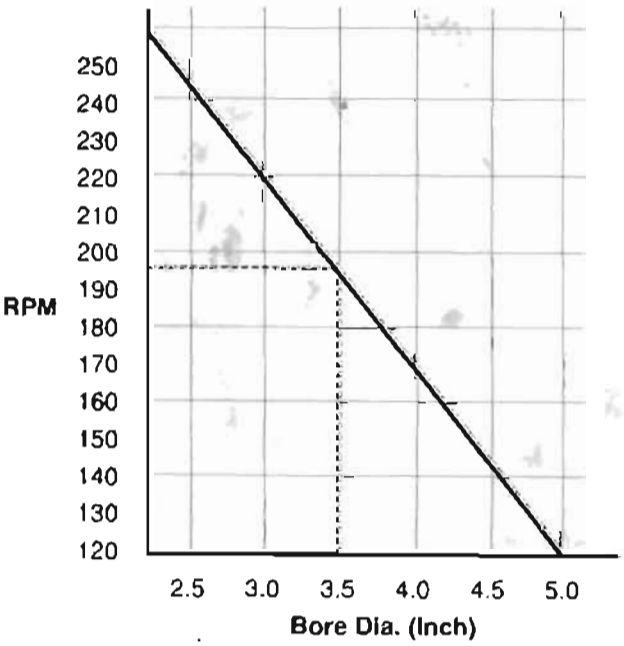
K = Cross Hatch Angle Constant (See Chart)
D = Diameter of Bore
R = RPM of Hone (Based on Bore Dia.) (See below)
L = Length of Stroke of Stones

CROSS HATCH ANGLE	K
10°	.137
15°	.207
20°	.277
25°	.348
30°	.421
35°	.495
40°	.572
45°	.651

Example:
Required cross hatch angle = 20°
Bore diameter = 3.5"
Length of bore = 6.0"
Length of stones = 4.0"
Overtravel = .75"

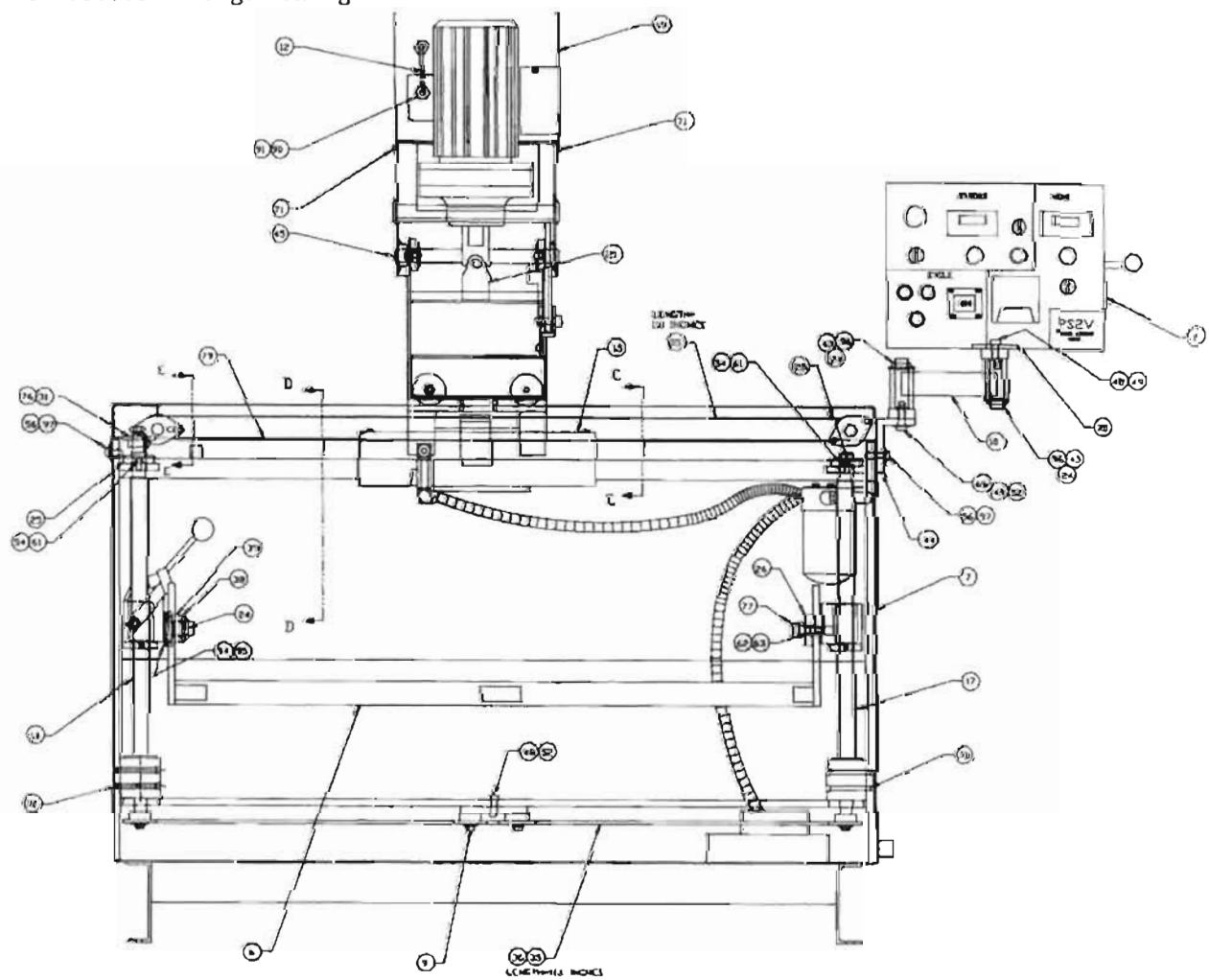
K = .277 for 20° CHA
RPM = 197 for 3.5" Bore
L = 6.0 - 4.0 + .75 = 2.75

$$\text{Cycles/Minute} = \frac{.277 \times 3.5 \times 197}{2.75} = 69 \text{ Cycles/Min.}$$



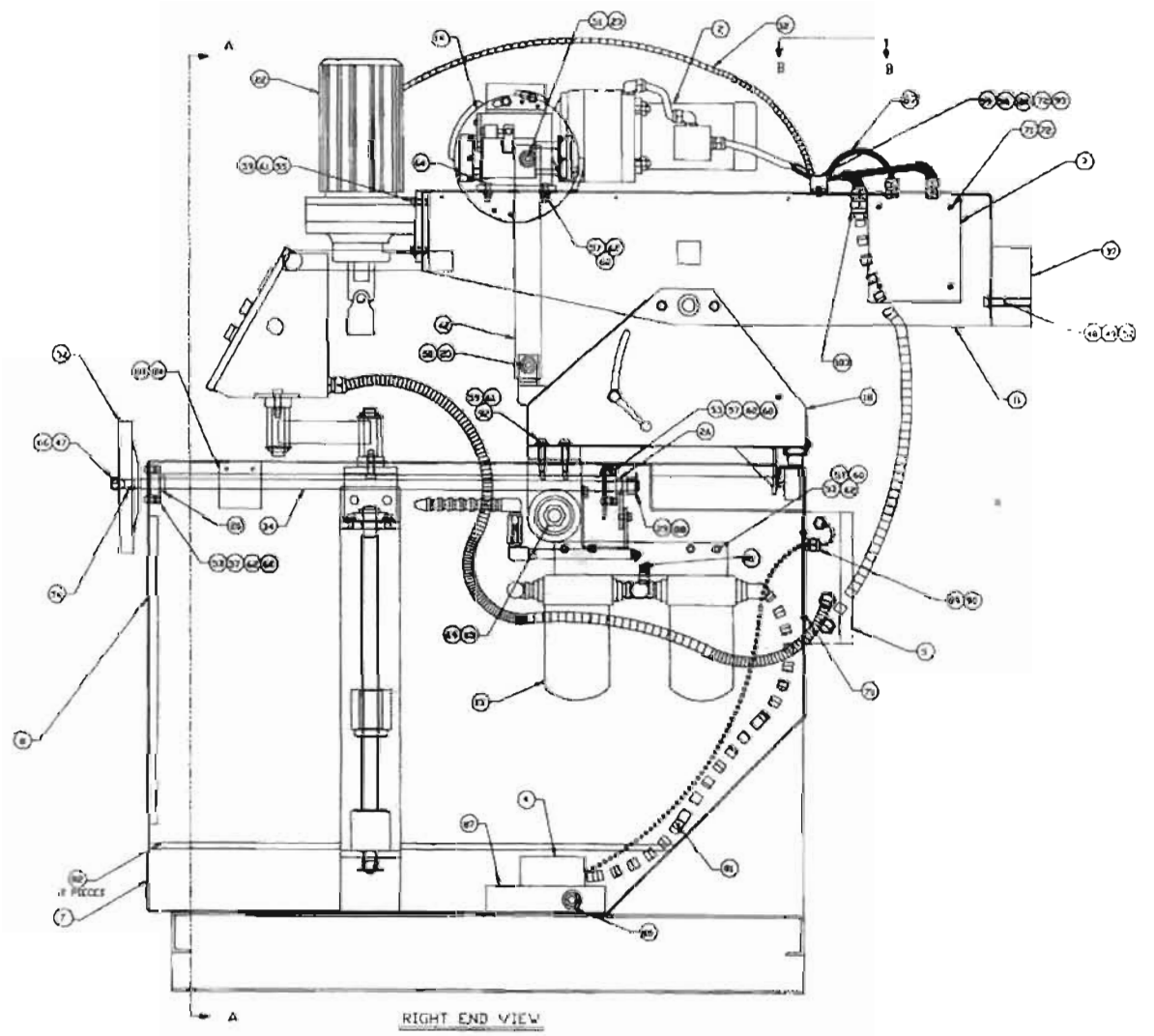
866838
POWER STROKE HONE ASSEMBLY

Item	Part No.	Description	Qty.
1	867000	**Control Box Assembly** (P. 17,18)	1
2	867277	**DC Gearmotor Assembly** (P. 14)	1
3	867280	AC Controller Assembly	1
4	867162	Coolant Pump Assembly	1
5	867275	**Electrical Shut-Off Assembly** (P. 3)	1
6	866926	Cradle Assembly Weldment	1
7	866040	Hone Tank Weldment	1
8	867040	Tank Weldment Door	1
9	866933	Idler Plate Assembly	1
10	867086	Pivot Arm Assembly	1
11	867010	Power Head Assembly	1
12	867268	Motor Cable Assembly	1
13	867271	**Oil Filter Assembly** (Page 9)	1
14	867276	**Str. Cam Assembly** (Page 13)	1
15	867281	**Supp. Slide Assembly** (Page 16)	1
16	867273	**LH Leadscrew Assembly** (P. 11)	1
17	867274	**RH Leadscrew Assembly** (P. 12)	1
18	867272	**PH Base Assembly** (Page 10)	1
19	867279	**PH Cover Assembly** (Page 15)	1
20	860749	Flange Hub	1
21	866884	Universal Joint	1
22	867212	Gearmotor	1
23	866874	Ball Bearing	1
24	866872	BH Locknut	3
25	866869	Flange Bearing 1"	2
26	866868	Flange Bearing 3/4"	3
27	866867	Flange Bearing 3/4"	1
28	866866	Pillow Bl. Bearing	1
29	866865	Sprocket 11 T	1
30	866864	Sprocket 14 T	3
31	866863	Sprocket 16 T	1
32	801240	Lead. Handwheel	1
33	866941	Cradle Handwheel Shaft	1
34	866942	Handwheel Shaft	1
35	806022	#40 Roller Chain	
36	806023	#40 Master Link	4
37	867022	PH Counterweight	1
38	866956	Cradle Pivot Spacer	1
39	866946	Thrust Bearing	1
40	866949	Cradle Handle Assembly	1
41	866974	Chain Hookup Assembly	1
42	866993	Str. Operat. Rod	1
43	867085	Pivot Shaft	2
44	867097	Pivot Arm Base	1
45	867013	Pivot Pin	1
46	801591	Hex Nut .625-11 Jam	1
47	801562	Washer Sr. .625	1
48	801613	HHCS .500-13 x 1.25	5
49	801604	LC Washer .50	3
50	817949	SHCS M12 x 35mm	1
51	866995	BHCS M12 x 30mm	1



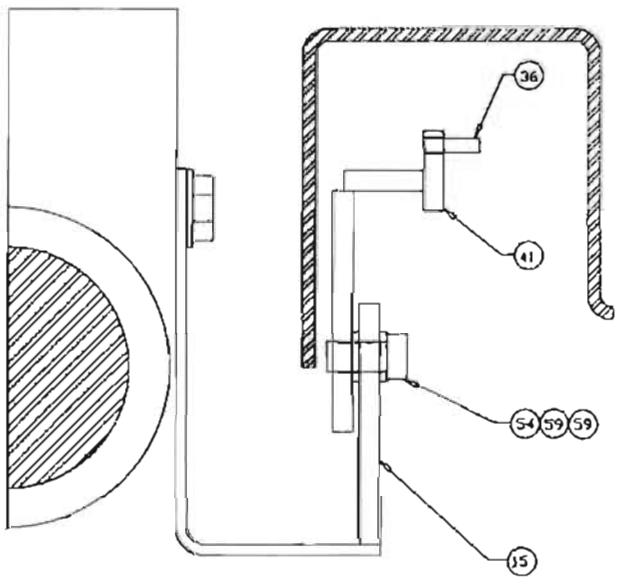
866838
POWER STROKE HONE ASSEMBLY

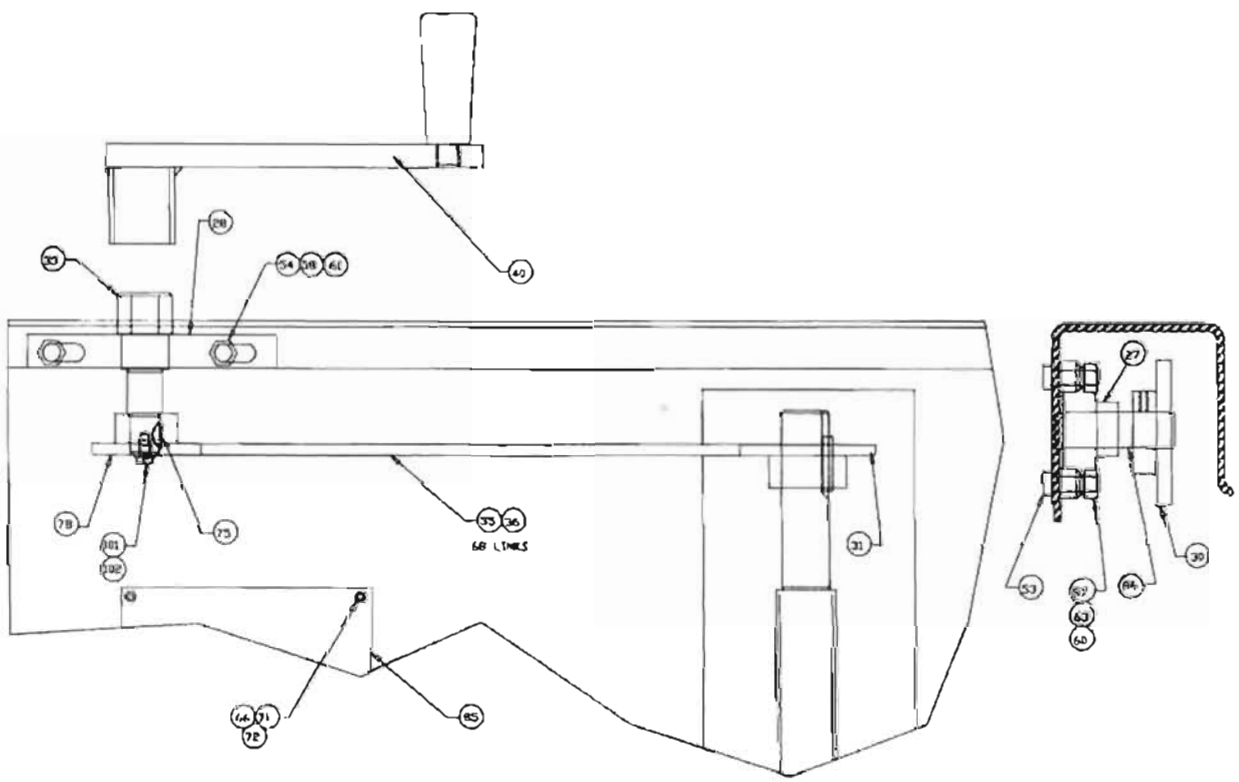
Item	Part No.	Description	Qty.
52	803024	Washer Flat .50	5
53	804735	HHCS .312-18x 1.00	10
54	811237	HHCS .375-16 x .75	6
55	801625	HHCS .375-16 x 1.00	4
56	805324	HHCS .437-14 x 1.0	4
57	803082	Hex Nut .312-18	1
58	801637	Hex Nut .375-16	2
59	801023	Washer Flat .375	12
60	801661	Washer Lock .312	1
61	803061	Washer Lock .375	10
62	801601	Washer Flat .314	1
63	109391	SHCS .312-18 x .875	2
64	804747	HHCS .312-18 x .875	2
65	866904	HHCS 1.00-14 x 2.00	2
66	114160	Washer #10	8
67	801478	Cable 16/4 Std.	8"
68	866805	Self-Tap Screw #10-32	2
69	866888	Washer Flat 1.00 I.D.	2
70	866992	SHCS .312-18 x 3.00	8
71	804764	BHCS #10-32 x .375	2
72	808374	Hex Nut #10-32	1
73			
74	802422	Woodruff Key #304	1
75	809018	Woodruff Key #605	1
76	814566	Key .187 x .187 x .875	2
77	867023	Stripper Bolt .750	1
78	867041	Sprocket 9 T	1
79	866945	Traverse HD Shaft	1
80	867987	Hex Plug 3/4 NPT	1
81	814700	Urethane Tube .625	5
82	867207	Tank Screen (Set)	1
83			
84	867253	Gauge Holder	1
85	804716	Tool Holder Rack	2
86	867217	Sprocket Shaft	1
87	867256	Coolant Pump Pan	1
88	861846	Shaft Key	1
89	801471	Stain Relief 1/2 NPT	1
90	866793	Lock Nut 1/2 NPT	2
91	801469	Strain Relief 1/2 NPT	1
92	801622	HHCS .375-16 x 1.75	4
93	804765	BHCS #10-32 x .62	2
94	866860	Timken Cup Bearing	1
95	866859	Timken Cone Bearing	1
96	813927	Washer 1.00 x 2.00	2
97	105288	Washer .437	4
98	867230	Mounting Rail	1
99	813398	Terminal Block	18
100	867218	Din Rail Clip	6
101	802413	Washer .25	1
102	813498	HHCS .250-20 x .375	1
103	809606	Strain Relief 3/4 NPT	1



866838
POWER STROKE HONE ASSEMBLY

Item	Part No.	Description	Qty.
15	867281	Supp. Slide Assembly	1
27	866867	Flange Bearing 3/4"	1
28	866866	Pillow Bl. Bearing	1
30	866864	Sprocket 14 T	3
31	866863	Sprocket 16 T	1
33	866941	Cradle Handwheel Shaft	1
35	806022	#40 Roller Chain	
36	806023	#40 Master Link	4
40	866949	Cradle Handle Assembly	1
41	866974	Chain Hookup Assembly	1
53	804735	HHCS .312-18x 1.00	10
54	811237	HHCS .375-16 x .75	6
57	803082	Hex Nut .312-18	1
58	801637	Hex Nut .375-16	2
59	801023	Washer Flat .375	12
60	801661	Washer Lock .312	1
61	803061	Washer Lock .375	10
63	109391	SHCS .312-18 x .875	2
66	114160	Washer #10	8
71	804764	BHCS #10-32 x .375	2
72	808374	Hex Nut #10-32	1
75	809018	Woodruff Key #605	1
78	867041	Sprocket 9 T	1
85	804716	Tool Holder Rack	2
86	867217	Sprocket Shaft	1
101	802413	Washer .25	1
102	813498	HHCS .250-20 x .375	1





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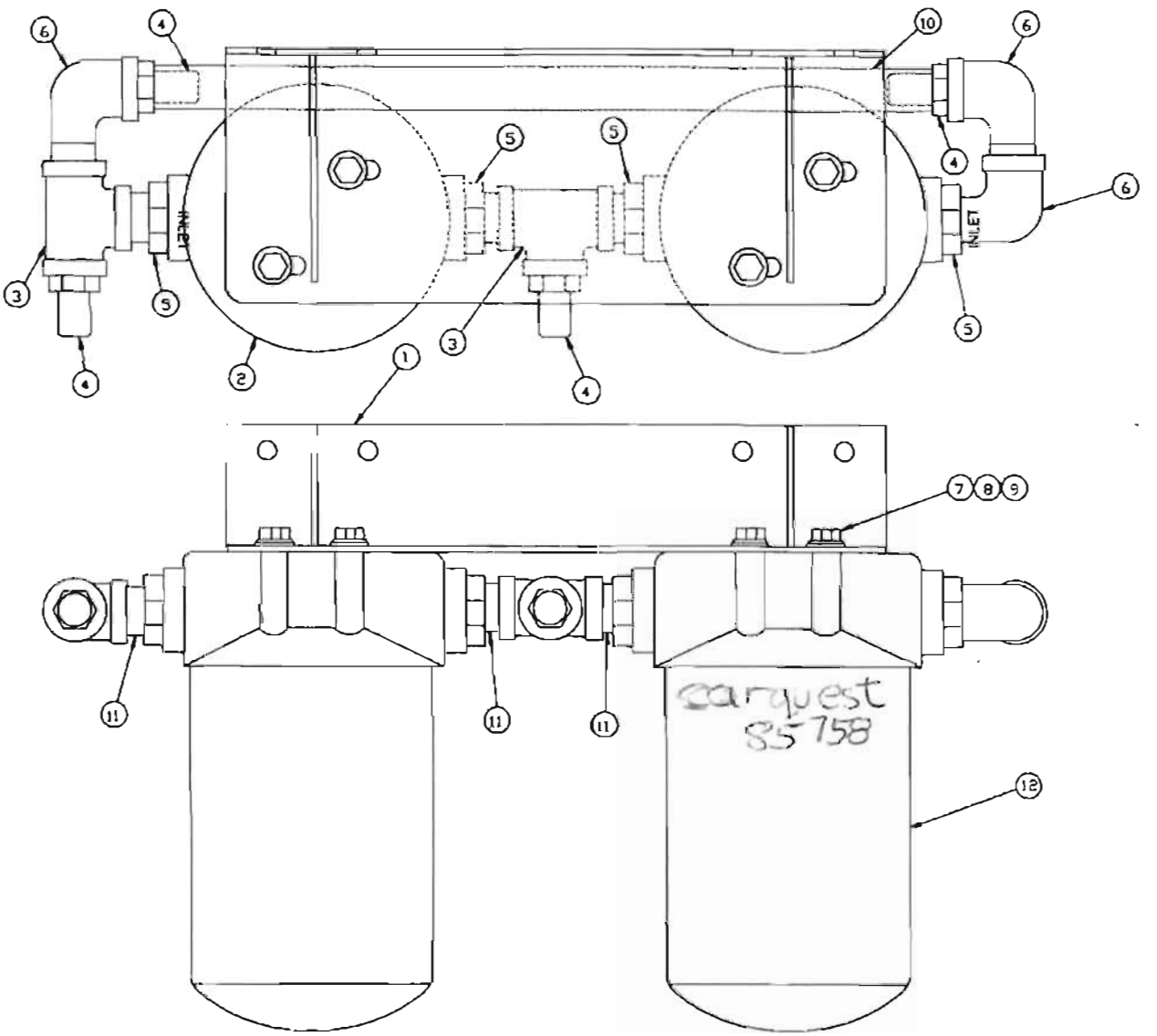
867271
OIL FILTER ASSEMBLY

Item	Part No.	Description	Qty.
1	867138	Filter Support Bracket	1
2	867142	Filter & Adapter	2
3	807167	Tee .50 NPT	2
4	867141	Pusblock Fitting	4
5	867140	Reducing Bushing	4
6	801479	Elbow 90° .50 NPT	3
7	806241	HHCS .312-18 x .750	2
8	801601	Washer Fl. .314 x .75	2
9	801661	Washer LC. .312 x .57	2
10	814700	Urethane Tube .625	18"
11	801386	Nipple P .50 NPT	3
12	867143	Replacement Filter	2



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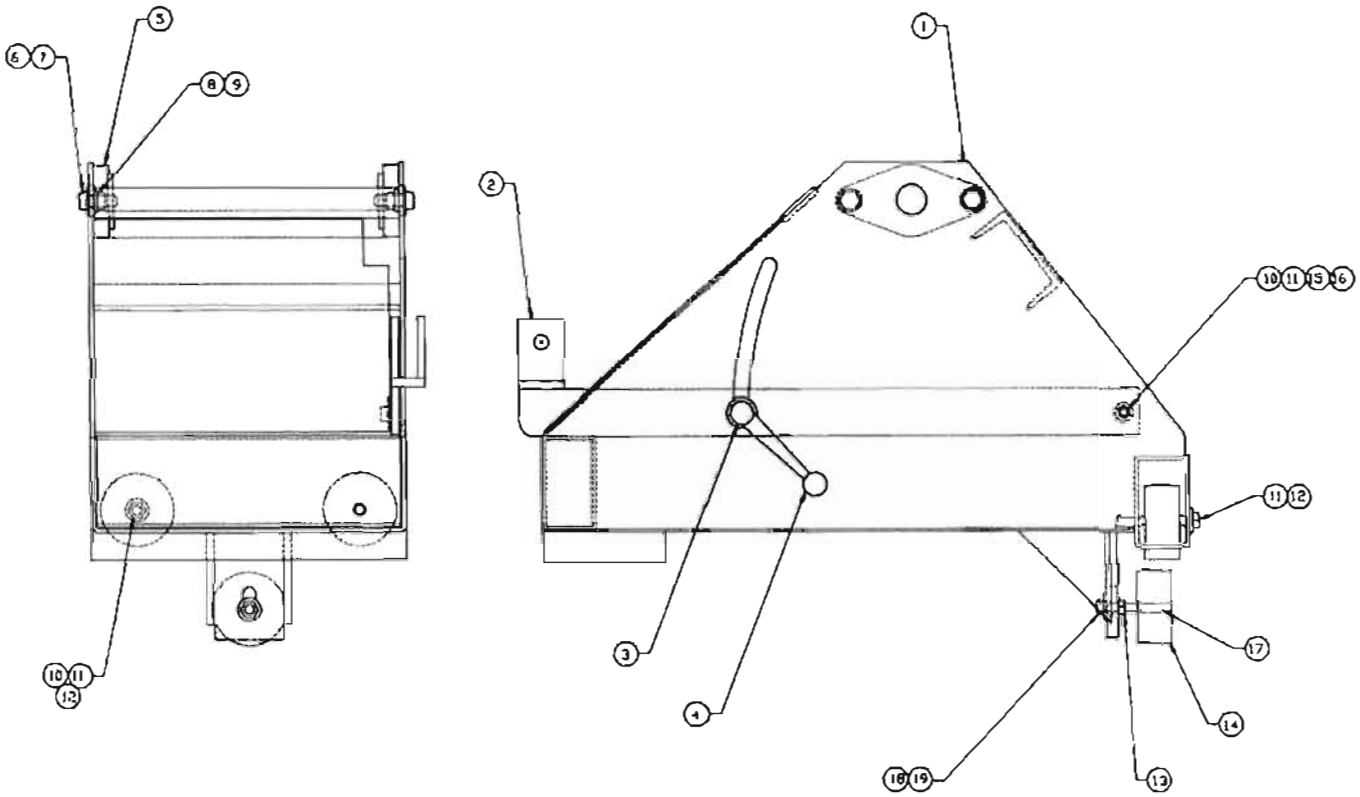
867272
BASE ASSEMBLY, POWER HEAD

Item	Part No.	Description	Qty.
1	867012	Base Weldment	1
2	866985	Bar Weldment	1
3	140695	Washer .50 H.D.	1
4	142174	Handle K/E	1
5	867021	Flange Bearing	2
6	801618	HHCS .375-16 x 1.25	4
7	801023	Washer Flat .375	4
8	803061	Washer LC .375	4
9	801637	Hex Nut .375	4
10	803082	Hex Nut .312	2
11	801601	Washer .314	3
12	804444	HHCS .312-18 x 2.5	3
13	807868	Jam Nut .437-14	1
14	866876	Wheel	3
15	867025	Stripper Bolt	1
16	866870	Needle Bearing	1
17	867216	Axle	1
18	803342	Hex Nut .437-14	1
19	105288	Washer .437	1



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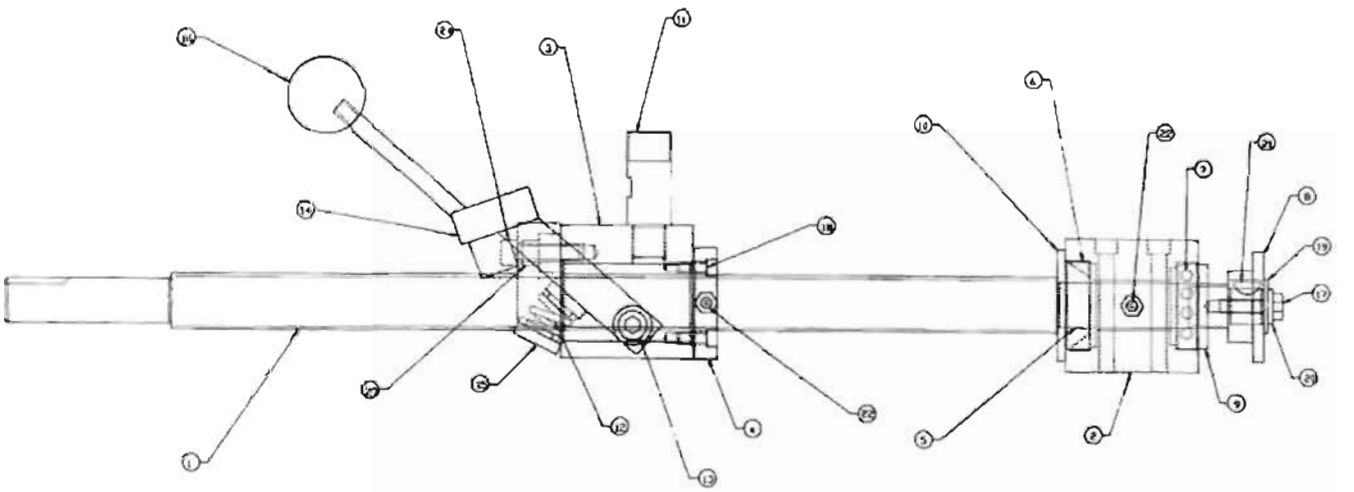
867273
LEADSCREW ASSEMBLY (LEFT)

Item	Part No.	Description	Qty.
1	866853	Leadscrew L.H.	1
2	866855	Bearing Mount Block	1
3	866918	Cradle Mounting Block	1
4	866920	Cradle Block Nut	1
5	866859	Bearing (Cone)	1
6	866860	Bearing (Cup)	1
7	866861	Ball Bearing	1
8	867282	Sprocket	1
9	866872	Locknut	1
10	866888	Washer 2.50	1
11	866955	Pivot Stud	1
12	866957	Comp. Spring	1

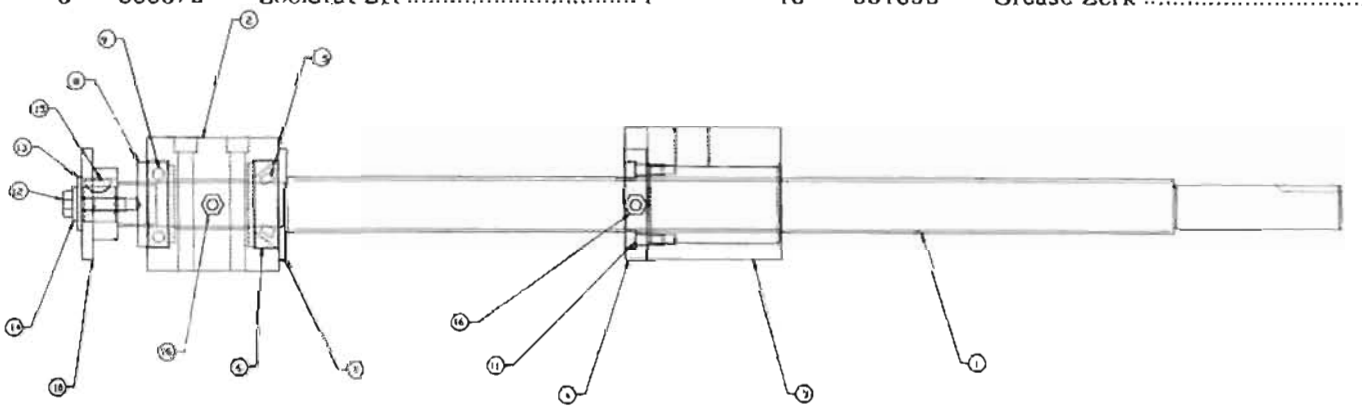
Item	Part No.	Description	Qty.
13	803649	Stripper Bolt .50	2
14	866958	Cradle Lock Assembly	1
15	866959	Cradle Lock Assembly	1
16	866960	Knob	1
17	801568	HHCS .250-20 x .75	1
18	801640	SHCS .250-20 x .75	4
19	804523	Washer .250	1
20	801616	Washer LC .250	1
21	809018	Woodruff Key #605	1
22	801656	Grease Zerk	2
23	801610	SHCS .375-16 x 1	1
24	801599	SHCS .375-16 x 1.25	1



867274
LEADSCREW ASSEMBLY (RIGHT)

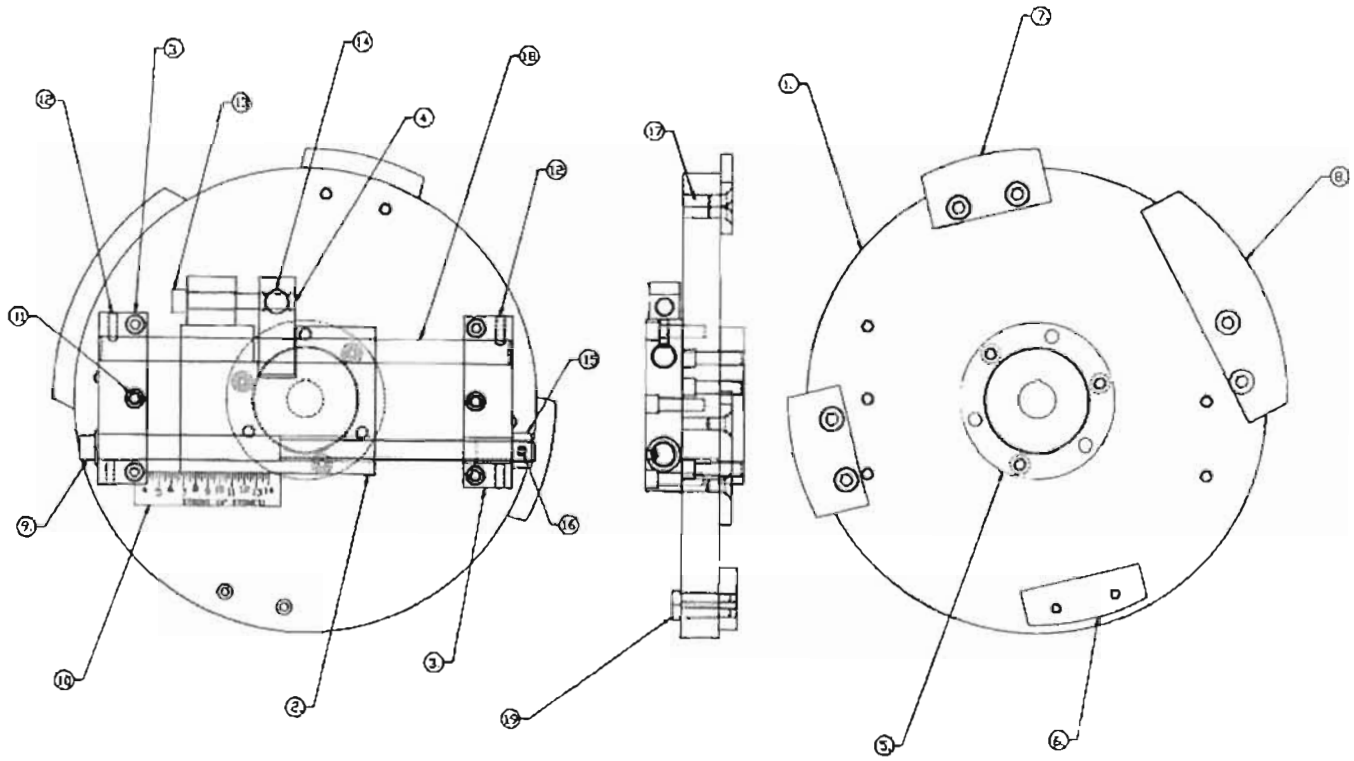
Item	Part No.	Description	Qty.
1	866857	Leadscrew R.H.	1
2	866856	Bearing Block R.H.	1
3	866919	Cradle Block R.H.	1
4	866920	Cradle Block Nut	1
5	866859	Bearing (Cone)	1
6	866860	Bearing (Cup)	1
7	866888	Washer 2.50	1
8	866872	Locknut BH	1

Item	Part No.	Description	Qty.
9	866861	Ball Bearing	1
10	867282	Sprocket	1
11	801640	SHCS .250-20 x .75	4
12	801568	HHCS .250-20 x .75	1
13	804523	Washer .250	1
14	801616	Washer LC	1
15	809018	Woodruff Key #605	1
16	801656	Grease Zerk	2



867276
STROKE CAM ADJUSTING PLATE ASSEMBLY

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	867035	Wheel (Mach.)	1	11	801609	SHCS .250-20 x 1	6
2	867082	Block Assembly	1	12	803998	SSS #10-32 x .62	2
3	867076	End Block	2	13	864965	SHCS .312-18 x 2.25	1
4	867080	Stroke Adjustment Clamp	1	14	867081	Clamp Pin	1
5	866902	Bushing	1	15	867078	Screw Retainer	1
6	867209	Spacer	1	16	111539	SSS #10-32 x .25	1
7	867036	Cam Plate	2	17	802087	FSHCS .25-20 x .50	6
8	867208	Cam Plate (Large)	1	18	867004	Adjusting Rod	1
9	867099	Shaft Assembly	1	19	867249	SHCS #10-32 x 1	2
10	867137	Scale	1				



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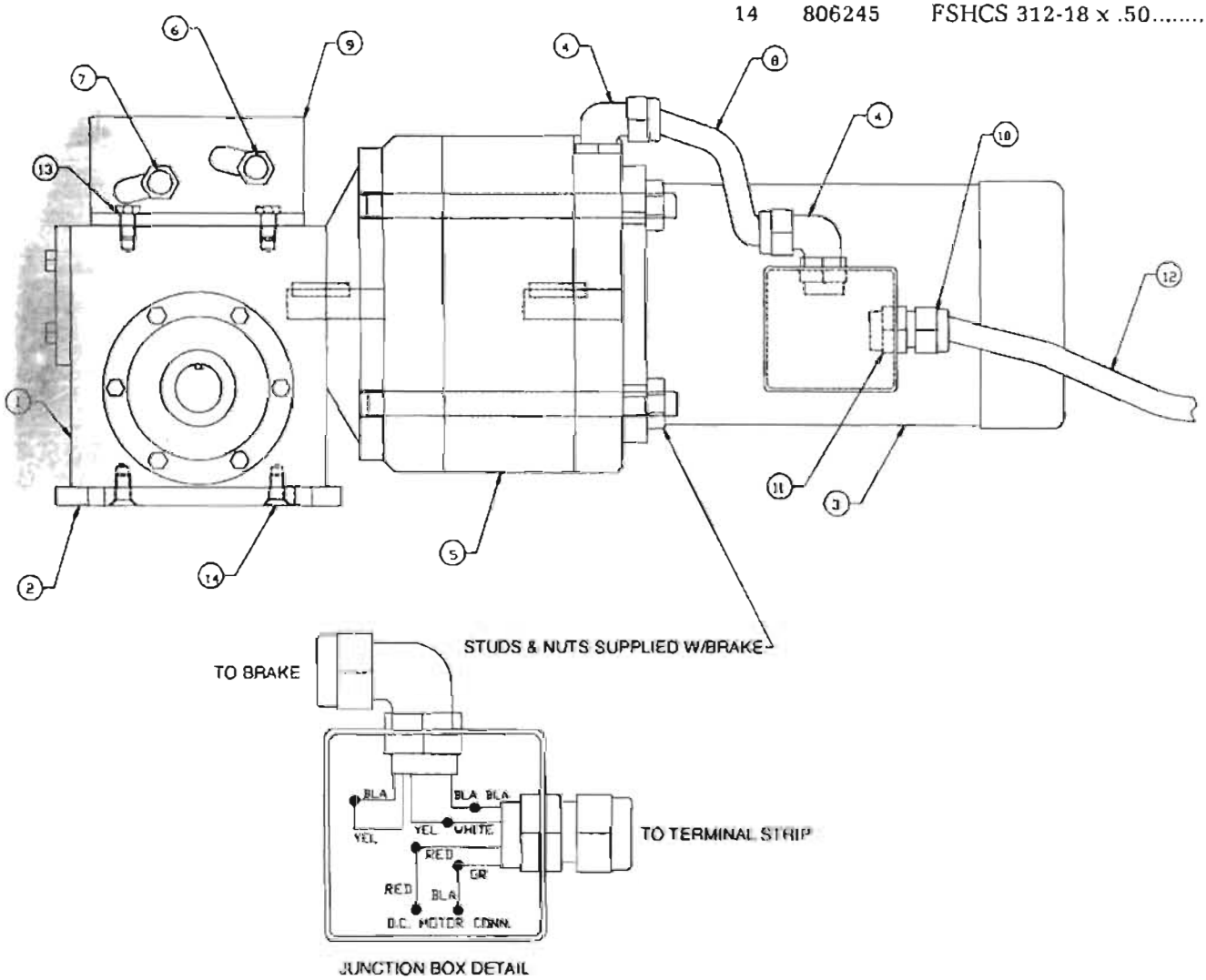
867277
GEARMOTOR ASSEMBLY

Item	Part No.	Description	Qty.
1	866882	Gear Reducer	1
2	867309	Reducer Base	1
3	867676	D.C. Motor	1
4	814403	Connector 90°	2
5	866873	Clutch Brake	1
6	866903	Sensor Switch (NC)	1
7	866862	Sensor Switch (NO)	1
8	804881	Flexable Hose	5"
9	867005	Sensor Pickup Weldment	1
10	801471	Strain Relief	1
11	866793	Lock Nut	3
12	801478	Cable 16/4 STO	12"
13	801860	HHCS .312-18 x .50	2
14	806245	FSHCS 312-18 x .50	4



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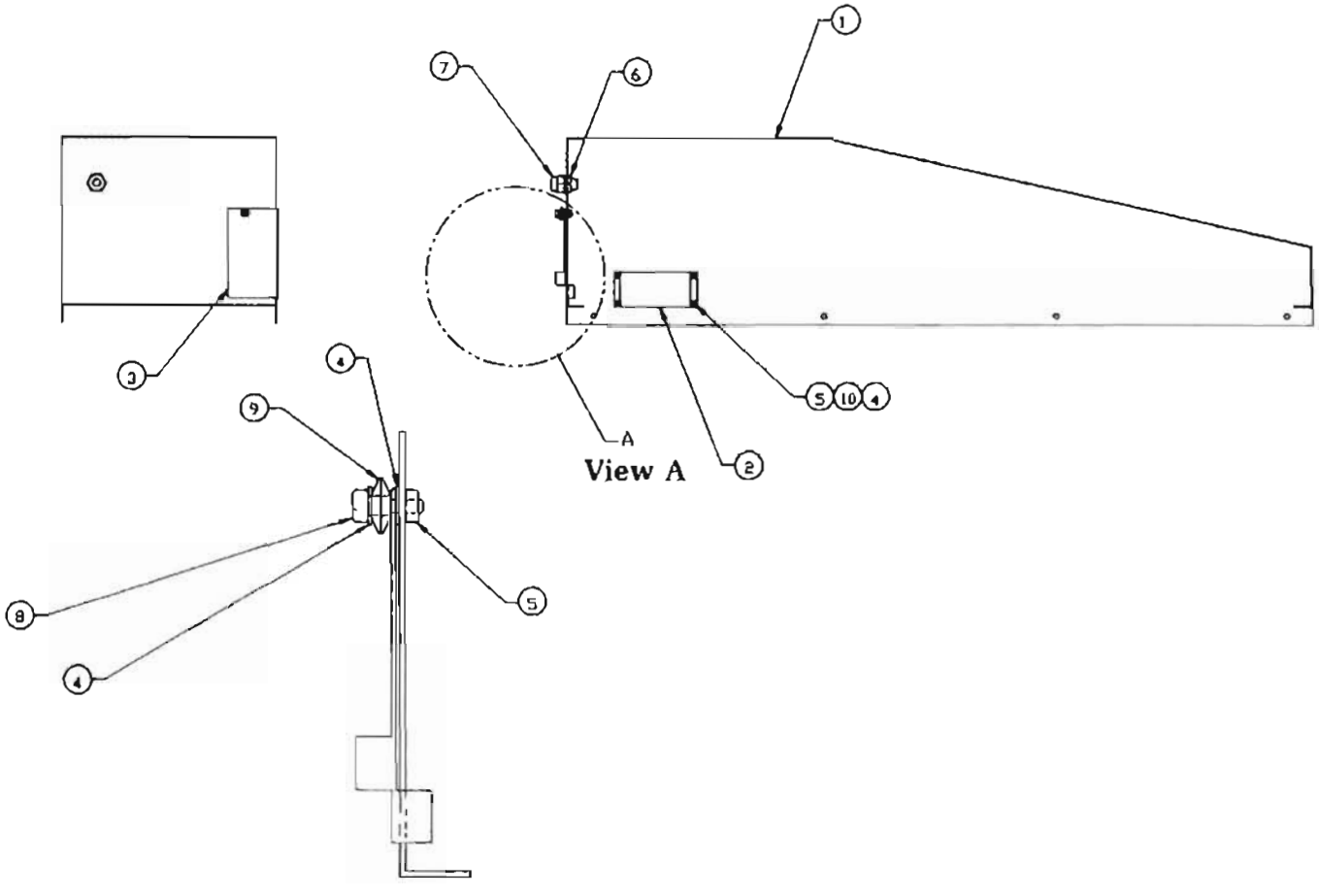
867279
POWER HEAD COVER ASSEMBLY

Item	Part No.	Description	Qty.
1	867011	Cover	1
2	867135	Viewport	1
3	867136	Door	1
4	114160	Washer #10	6
5	807142	Hex Nut #10-24	5
6	801469	Strain Relief	1
7	866793	Lock Nut	1
8	860598	Stripper Bolt	1
9	867267	Bellville Washer	2
10	129340	BHCS #10-24 x .375	4



View A

View A

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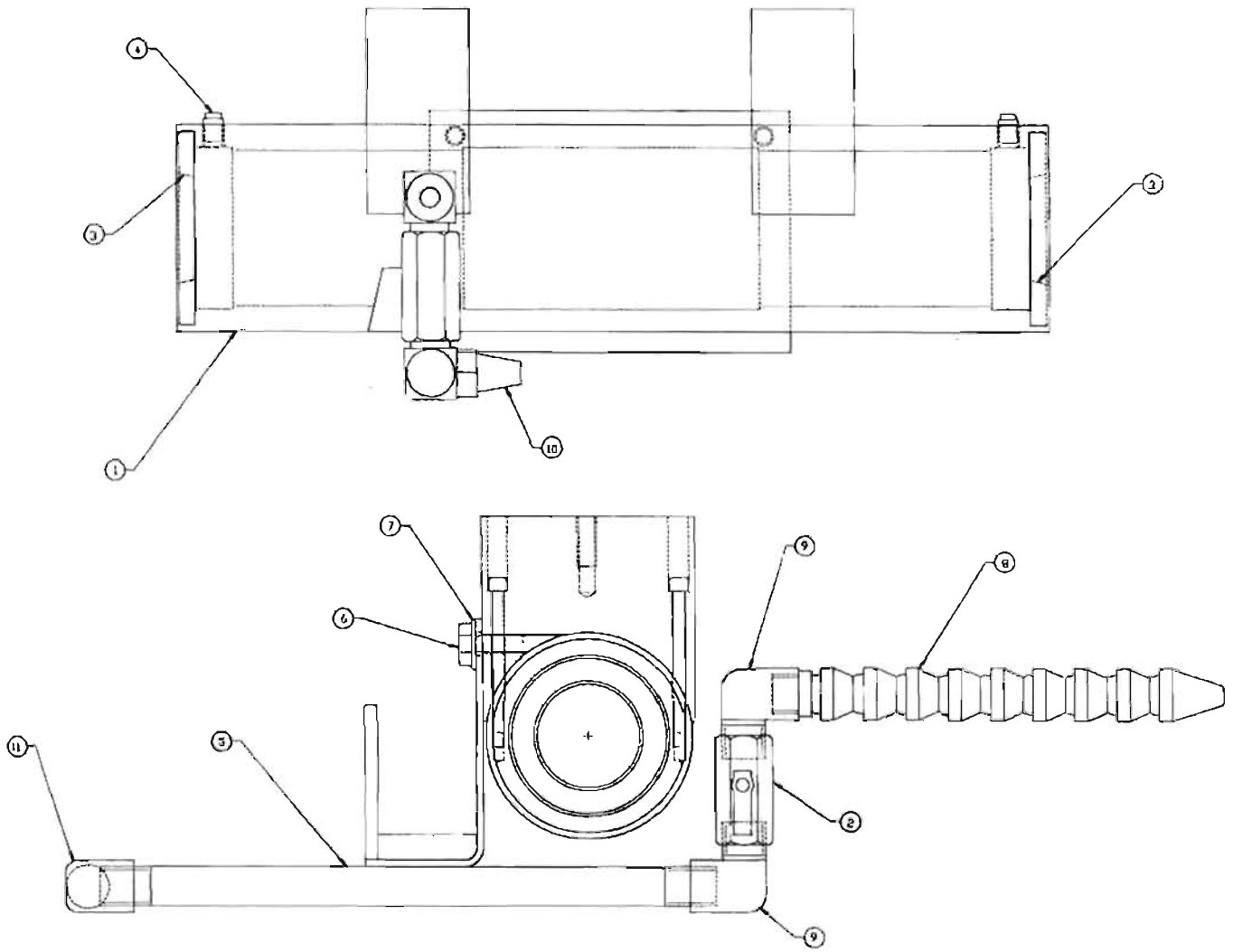
867281
SUPPORT SLIDE ASSEMBLY

Item	Part No.	Description	Qty.
1	866910	Support Housing A'bly	1
2	804806	Ball Valve	1
3	866871	Oil Seal	1
4	807112	Pipe Plug	2
5	866979	Tube Assembly	1
6	863141	HHCS .375-16 x .62	2
7	801636	Washer .375	2
8	867154	Nozzle Assembly	1
9	802264	Elbow .50 Br.	2
10	867141	Pushlock Fitting	1
11	810038	Elbow .50	1



LEFT END VIEW

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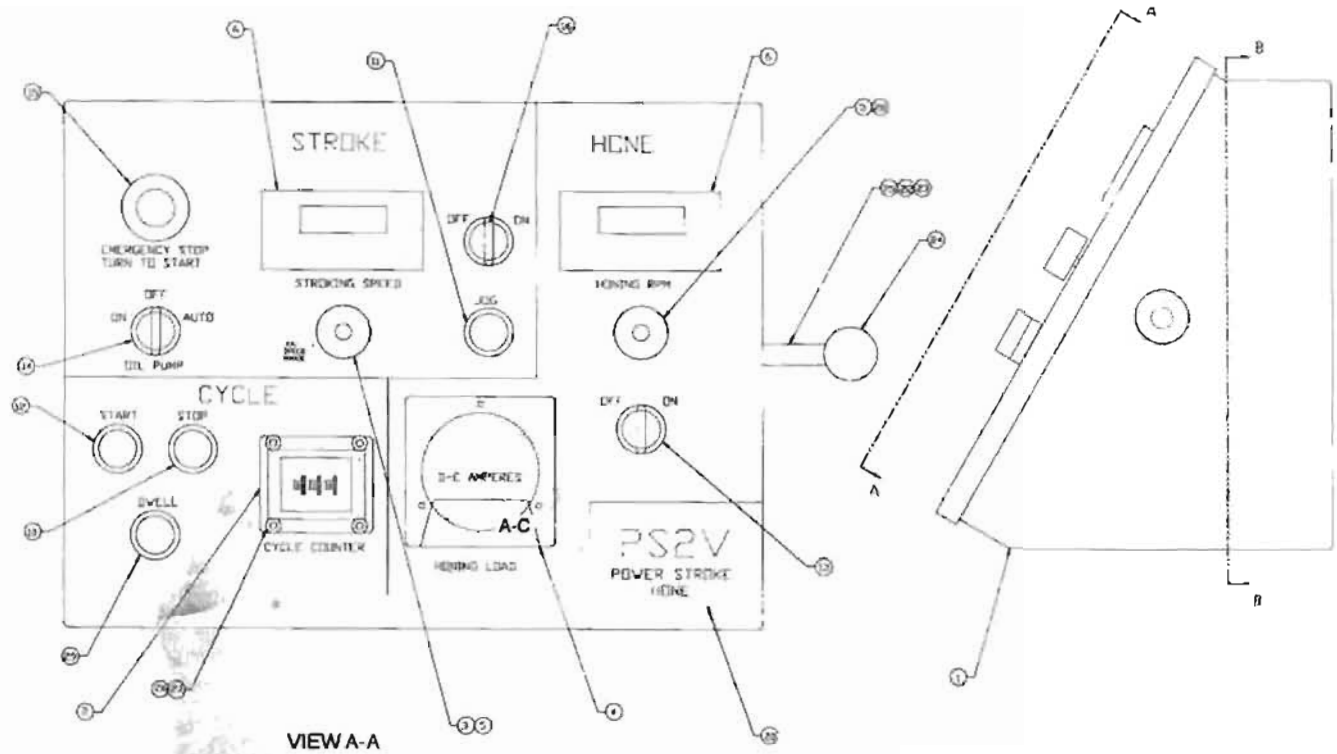
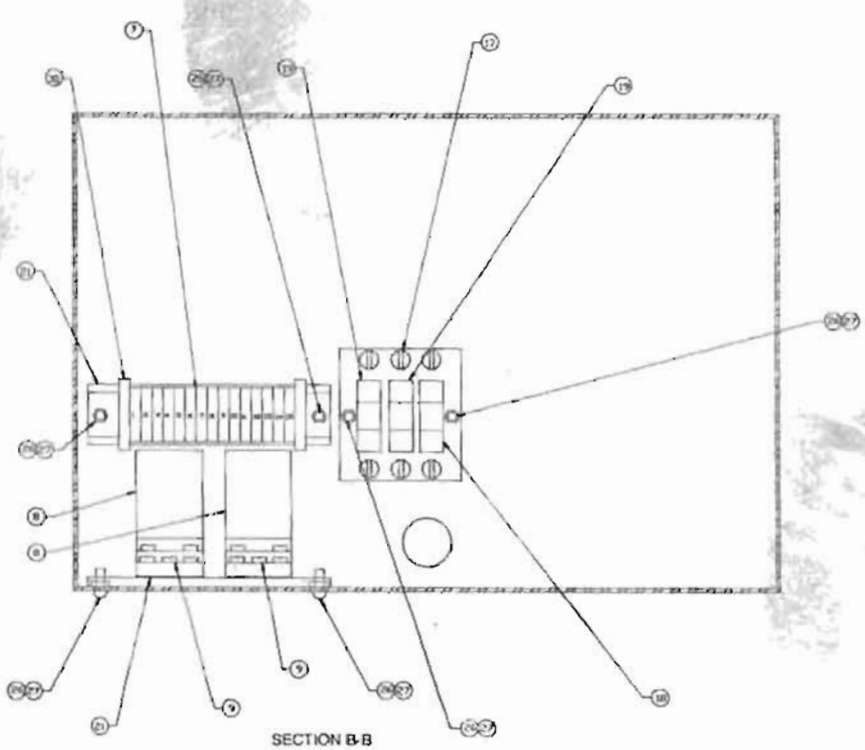


VIEW A-A

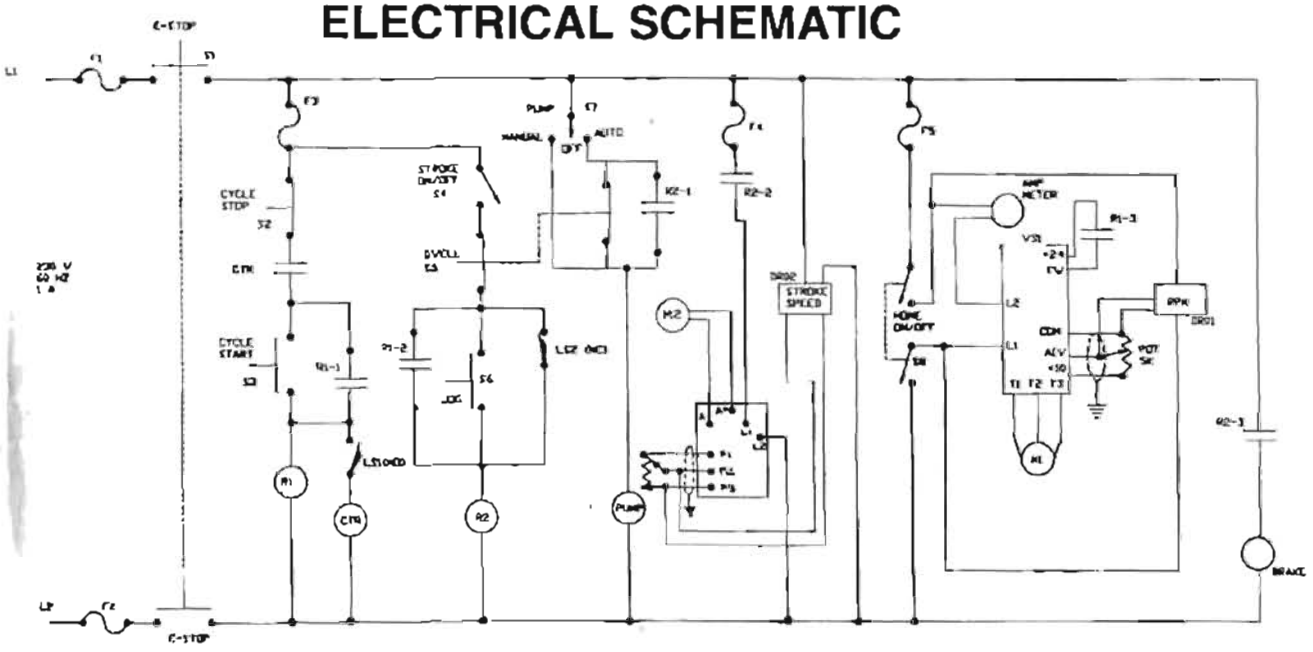


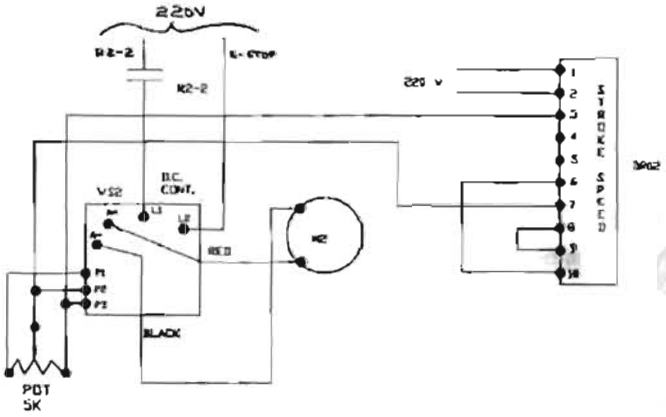
SECTION B-B

867000 CONTROL BOX ASSEMBLY

Item	Part No.	Description	Qty.
1	867001	Control Box	1
2	866880	Counter	1
3	860679	D.C. Controller	1
4	804725	Control Ampmeter	1
5	864382	Knob Kit	1
6	864455	RPM Indicator	2
7	813398	Terminal Block	15
8	862515	Relay 10 Amp 115V	2
9	867066	Relay Socket	2
10	867067	Switch PB (NC)	1
11	867068	Switch PB (NO)	1
12	867069	Switch PB (NO)	1
13	867070	Switch 2-Pos (2NO)	1
14	867071	Switch 3-Pos (2NO)	1
15	867072	Switch E-Stop 2NC	1
16	867073	Switch 2-Pos (1NO)	1
17	813270	Fuse Holder	1
18	862306	Fuse 15A FRN-R-15	1
19	814212	Fuse 6A FRN-R-6	2
20	867144	Control Box Label	1
21	867251	Mounting Rail	2
22	807137	HHCS .250-20X .50	1
23	801616	LC. Washer .25	1
24	803016	Ball Knob	1
25	867260	Handle	1
26	808374	Hex Nut #10-32	10
27	801901	BHCS #10-32X .50	10
28	805850	Potentiometer	1
29	867308	Switch PB (1NC)(1NO)	1
30	865367	Clamp Block	2

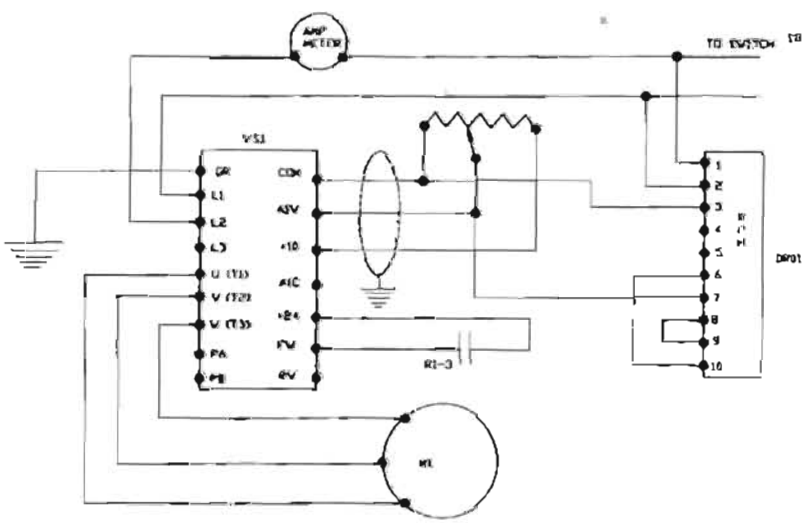
867312
ELECTRICAL SCHEMATIC





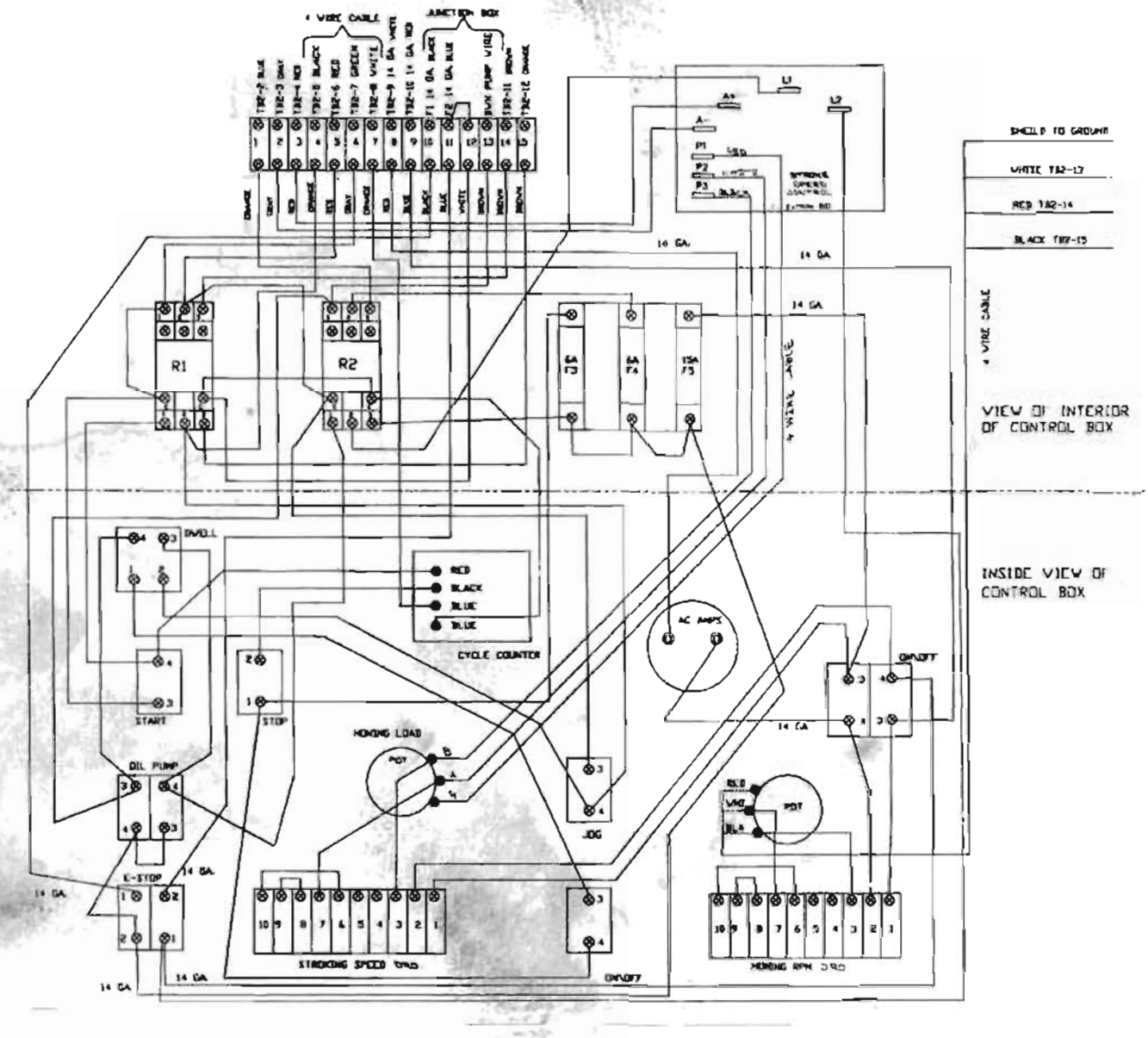
D.C. VARIABLE SPEED DRIVE WIRING

Item	Part No.	Description
S1	867072	E-Stop Switch Contact Block (2NC)
S2	867067	PB Switch Contact Block (1NC)
S3	867069	PB Switch Contact Block (1NO)
S4	867073	2 Pos. Switch Contact Block (1NO)
S5 (1NO)	867308	PB Switch Contact Block (1NC)
S6	867068	PB Switch Contact Block (1NO)
S7	867072	3 Pos. Switch Contact Block (2NO)
S8	867070	2 Pos. Switch Contact Block (2NO)
F1	862881	20 Amp Fuse
F2	862306	15 Amp Fuse
F3	814212	6 Amp Fuse
F4	814212	6 Amp Fuse
F5	862306	15 Amp Fuse
R1	801709	Relay
R2	801709	Relay
CTR	866880	Counter
LS1	866862	Sensor Switch
LS2	866903	Sensor Switch
DR01	864455	RPM Indicator
DR02	864455	RPM Indicator
VS1	866878	AC Controller
VS2	864379	DC Controller
POT	805850	Potentiometer
M1	867212	AC Gearmotor
M2	867676	DC Motor 1/3 HP, 1725 RPM, 180V
PUMP	866887	AC Gearmotor
BRAKE	866873	Electric Clutch Brake



A.C. VARIABLE SPEED DRIVE WIRING

867312
ELECTRICAL SCHEMATIC



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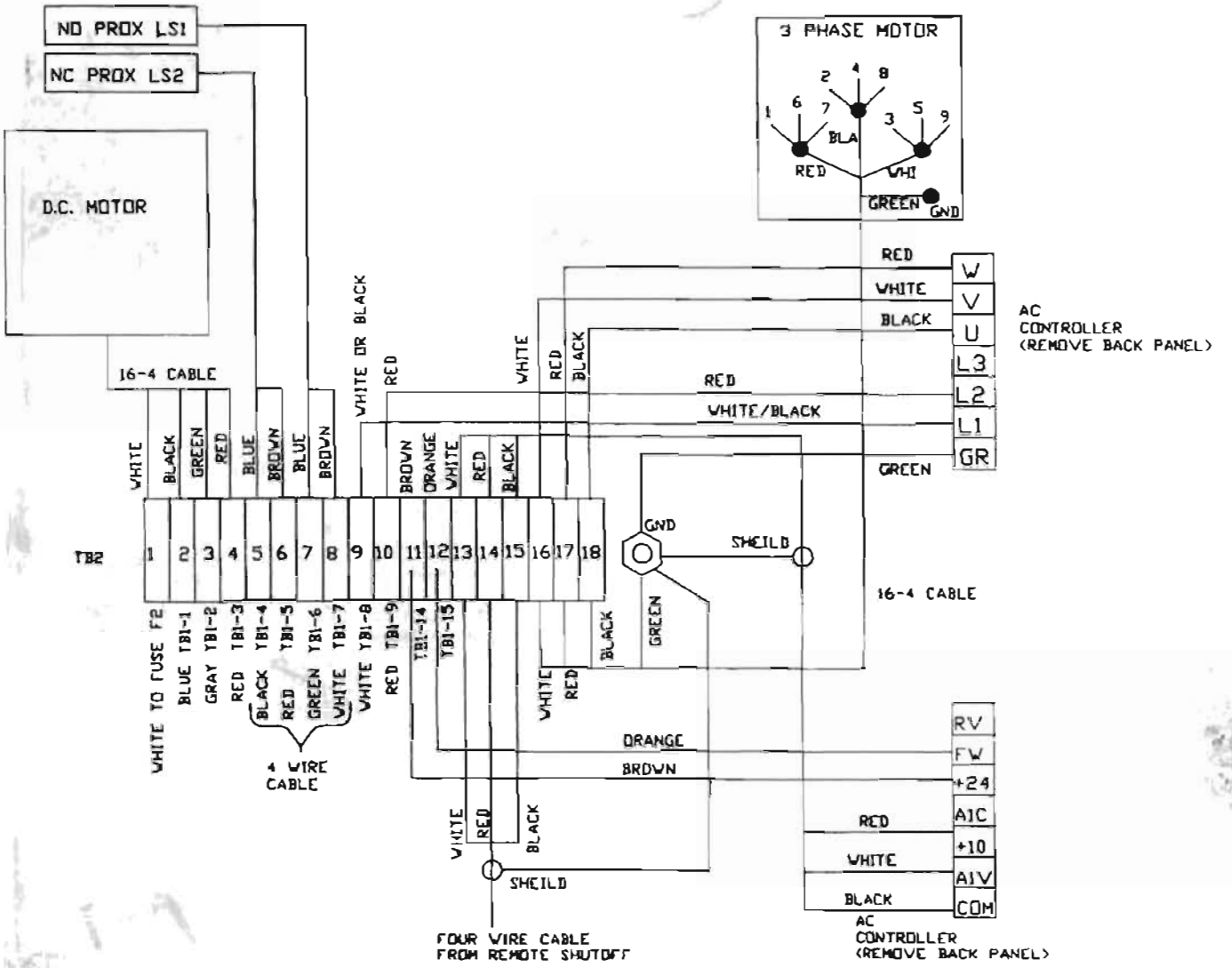

LS1 OMRON E2E2-X2Y1-US

LS2 Telmec anique XS1M12MB230 FRANCE 43235600

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MAINTENANCE AND SERVICE

SCHEDULED MAINTENANCE

1. **Weekly**
   Grease all fittings (Figure 1).
2. **Monthly**
   Check wayoil in traverse Shaft Housing. Fill to top of housing.

GENERAL MAINTENANCE

Oil

1. Change oil filters (2 pcs.) when honing oil flow rate gets low.
2. Before sediment gets 1 1/2" deep in tank, change honing oil. Remove Drain Plug from right side of machine, drain oil, remove sediment, wipe out coolant tank, install drain plug, fill with oil (30-65 gallons).

Gearmotor

1. The Sumitomo SM-Cyclo gearmotor is grease packed and is maintenance free.

Speed Reducer

Dayton Speed Reducer or
Alling-Lander Blue Max Speed Reducer

1. After initial operation of 100 hours, change oil (when oil is warm), then oil should be changed every 2500 hours or 6 months whichever comes first. Refill with AGMA #8 gear oil.

Dayton Magnetic Disc Brake

⚠CAUTION

Load must be removed or blocked.
Brake will be inoperative during this procedure.

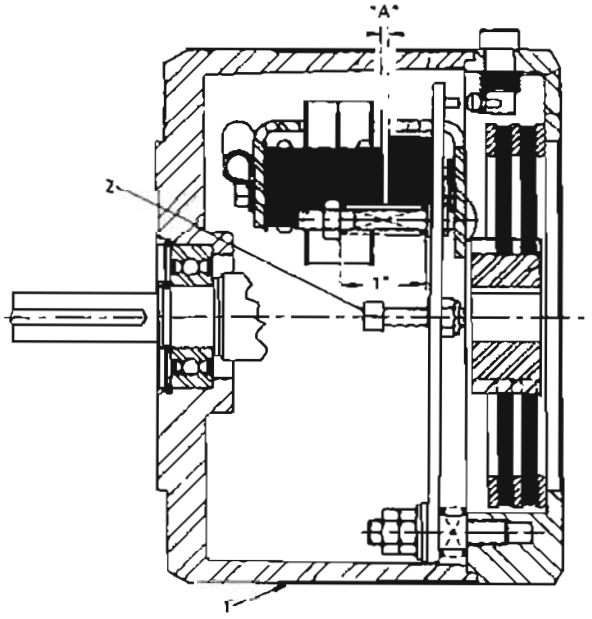
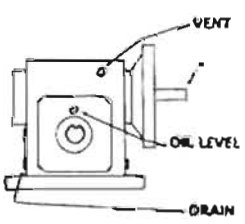
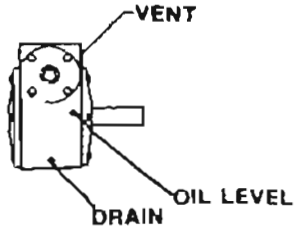


Figure 1



Dayton Speed Reducer



Alling-Lander Blue Max Worm Over

Approximate Oil Capacity 10 ounces, fill to oil level plug.

Before air gap "A" reaches .100", adjustment is required. Any delay in adjusting the magnetic air gap will result in eventual loss of torque.

1. To adjust, remove cover (Ref. 1) to expose adjusting screws (Ref. 2) and magnet air gap "A".
2. Measure air gap "A" using 3/8" to 1/2" wide feeler gauge as shown below.
3. Turn two square head set screws (Ref. 2) until air gap "A" measures:
   .045/.050 for 1 disc models

Air gap should be the same on both sides.