

Rotary clipper school

14 December, 2006

Raute Controller, 24 GPM Servo Proportional Valves



COURSE CONTENT

Section

Topic

Tags

1

SAFETY

2

DESCRIPTION

3

CLIPPER THEORY

4

OPERATION

5

MAINTENANCE

6

TROUBLESHOOTING

CONTROLLER

O	Durand (old)
N	Raute (New)

AREA

M	Mechanic
E	Electric

LEVEL

1	General
2	Advanced



Section 1

SAFETY***GENERAL***

References:

Plant safety procedures

Clipper Manual - Section 1

SPECIFIC

Critical points:

Hydraulic Power Unit (Knife & Rolls)

Conveyors and hold-downs

Non critical points:

Controller cabinet power



Section 1

SAFETY

IMPORTANT:

The safety procedures described in the following pages are intended only to highlight some specific points regarding the Rotary Clipper and are not meant to replace nor substitute, in any case nor to any extent, any other safety procedures applicable, whether issued by the mill or by any other local, federal or otherwise relevant authority.

In case of conflict or contradiction between the recommendations contained in this document and those emanating from these authorities, the latter will take precedence.



GENERAL PROCEDURES

MAIN POINTS

1. DO NOT OPERATE NOR SERVICE ANY MACHINERY UNTIL YOU GET THE **APROPRIATE TRAINING** TO DO SO.
2. ALWAYS USE SAFETY GEAR: **HIGH VISIBILITY VEST, HARD HAT, SAFETY GLASSES, EAR PLUGS AND STEEL TOE SHOES.**
3. LOCATE AND KNOW HOW TO USE THE **EMERGENCY STOP** BUTTONS.
4. **LOCK-OUT** ALL SYSTEMS AS REQUIRED, BEFORE SERVICING ANY MACHINERY OR ENTERING ANY HAZARDOUS AREAS.
5. REFER AND COMPLY WITH **PLANT SPECIFIC** SAFETY PROCEDURES.



SPECIFIC PROCEDURES

MAIN POINTS

1. SHUT OFF AND LOCK-OUT **HYDRAULIC PUMP**
2. CLOSE **SHUT-OFF VALVE** AT THE HYDRAULIC TANK
3. TURN OFF **CONSOLE** POWER
4. TURN OFF ELECTRONIC **CONTROLLER** POWER
5. LOCK-OUT **INFEEED** CONVEYOR
6. LOCK-OUT **HOLDOWN** BELTS
7. LOCK-OUT **OUTFEED** CONVEYOR
8. **DISCHARGE** ACCUMULATORS

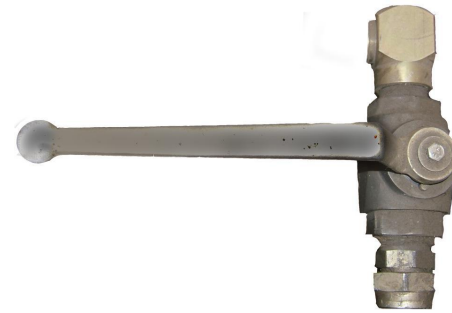
ALL SYSTEMS MUST BE AT ZERO ENERGY STATE



HYDRAULICS LOCK-OUT



**MAIN SWITCH
LOCKED OUT**



**SHUT-OFF VALVE
CLOSED AND
LOCKED OUT**

**ONLY WITH NEW
RAUTE
CONTROLLER**



**DISCHARGE VALVE
CLOSED AND
LOCKED OUT**

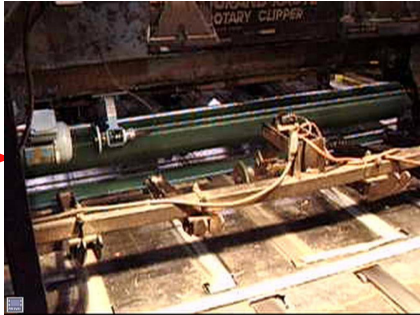


MECHANICAL LOCK-OUT

**MAIN SWITCH
OFF AND
LOCKED OUT**



**IN-FEED
LOCKED-OUT**



**OUT-FEED
LOCKED-OUT**



**HOLD DOWN AIR
VALVE CLOSED**



**HOLD DOWN
LOCKED-OUT**





Section 2

DESCRIPTION

CLIPPER FRAME

Knife Subsystem

Anvil rolls

HYDRAULIC UNIT

General view

Controls

CONTROLLER

General views

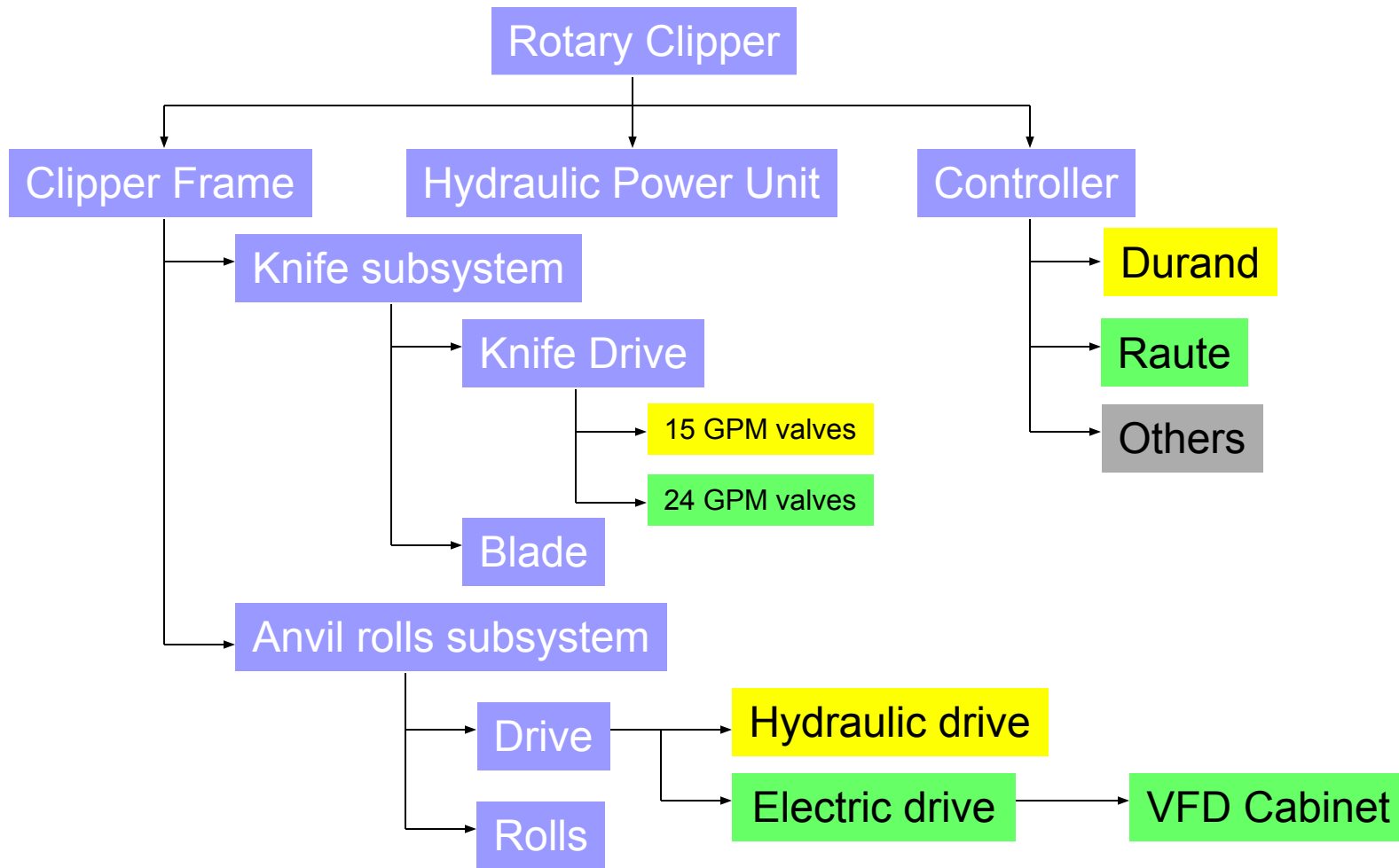
Basic wiring

CONTROL LOGIC

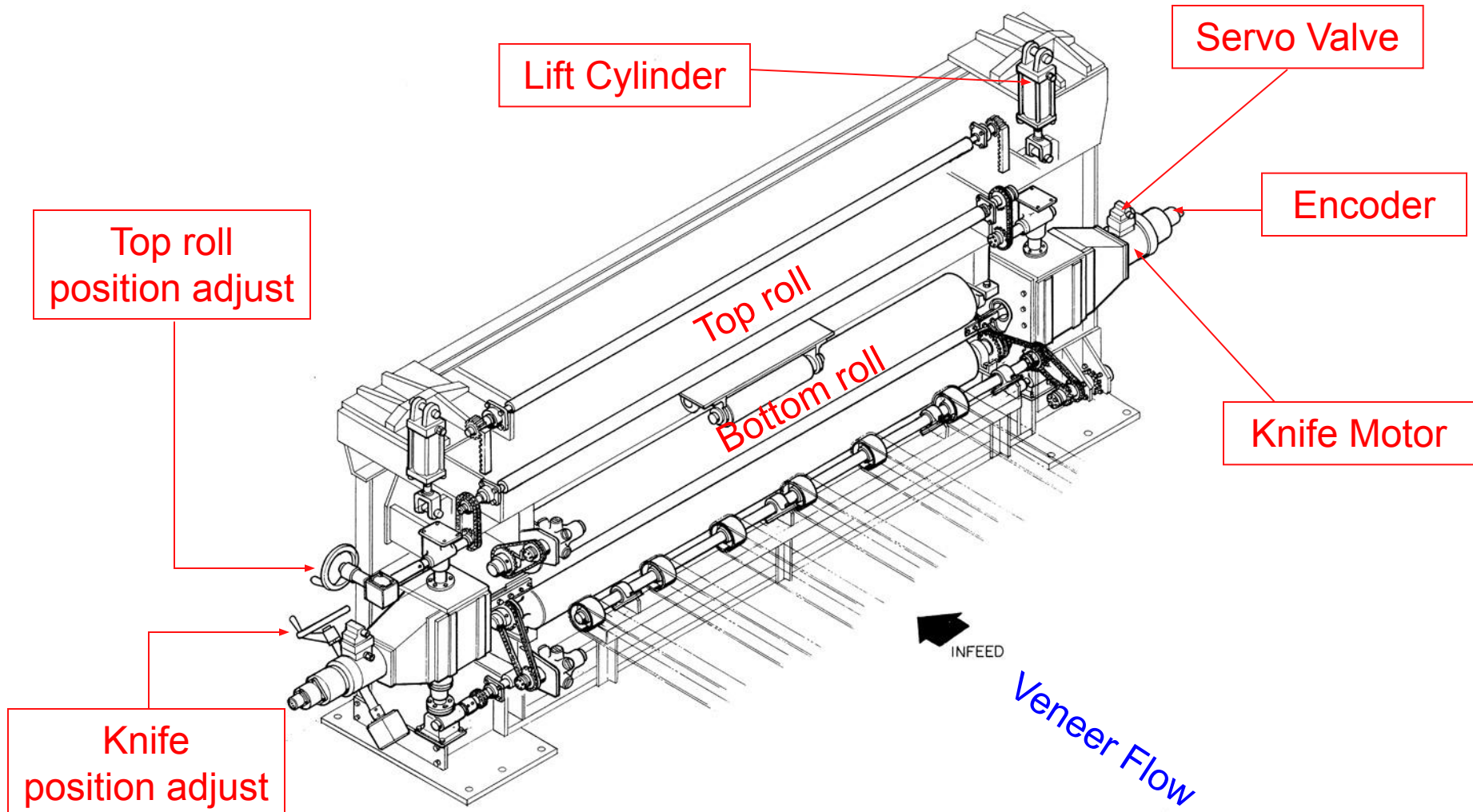
Hardwired logic



CLIPPER VERSIONS

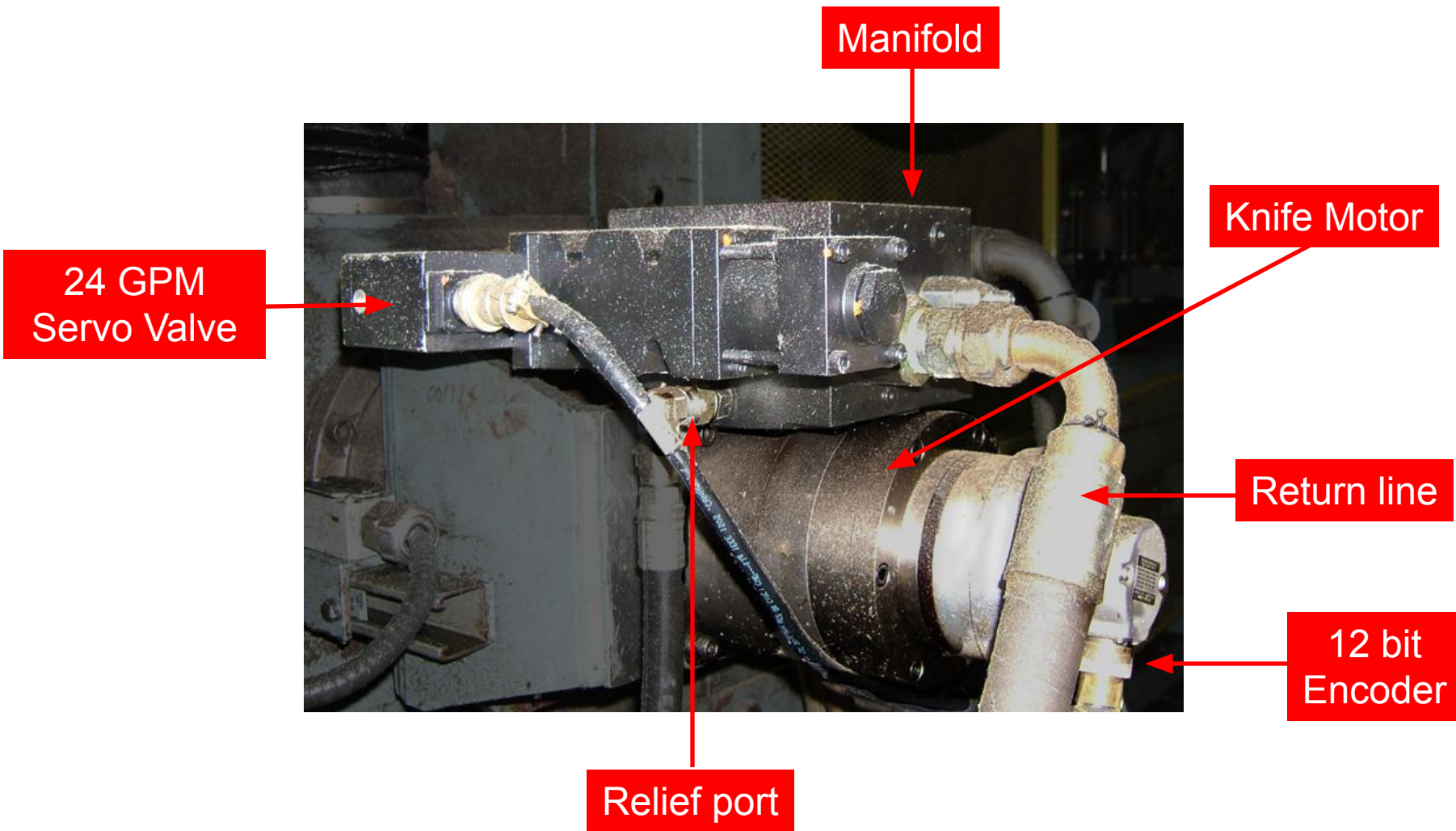


CLIPPER FRAME

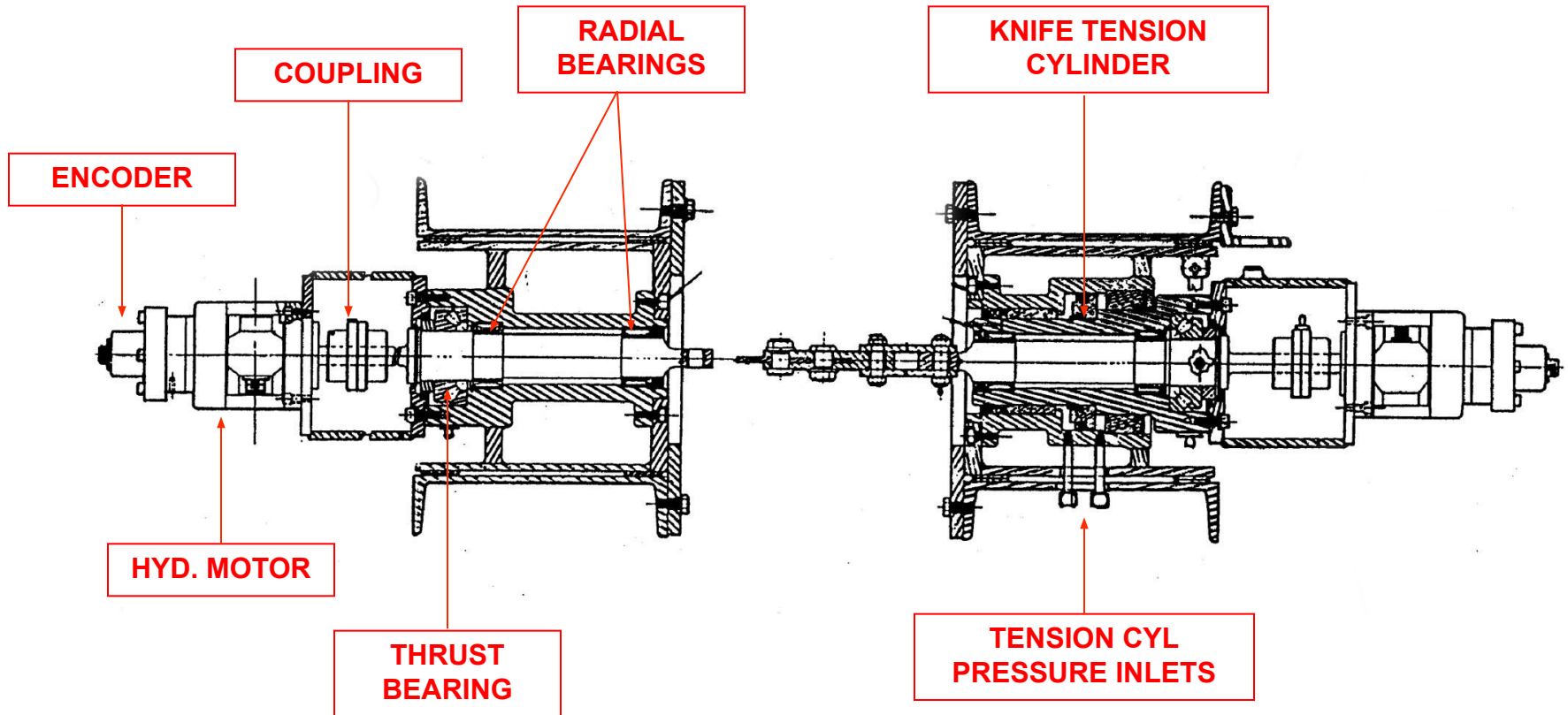




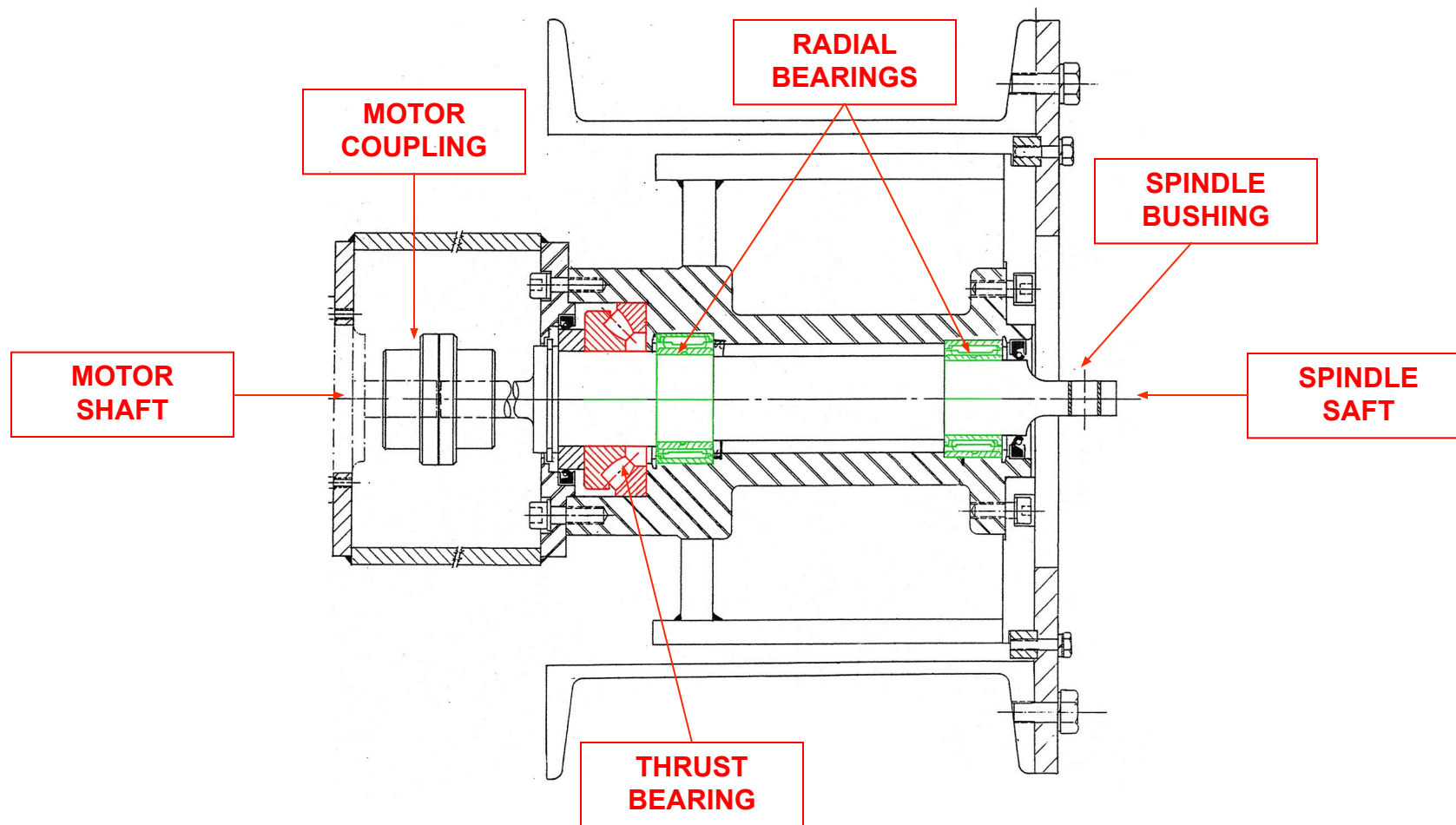
UPGRADED KNIFE DRIVE (24GPM)



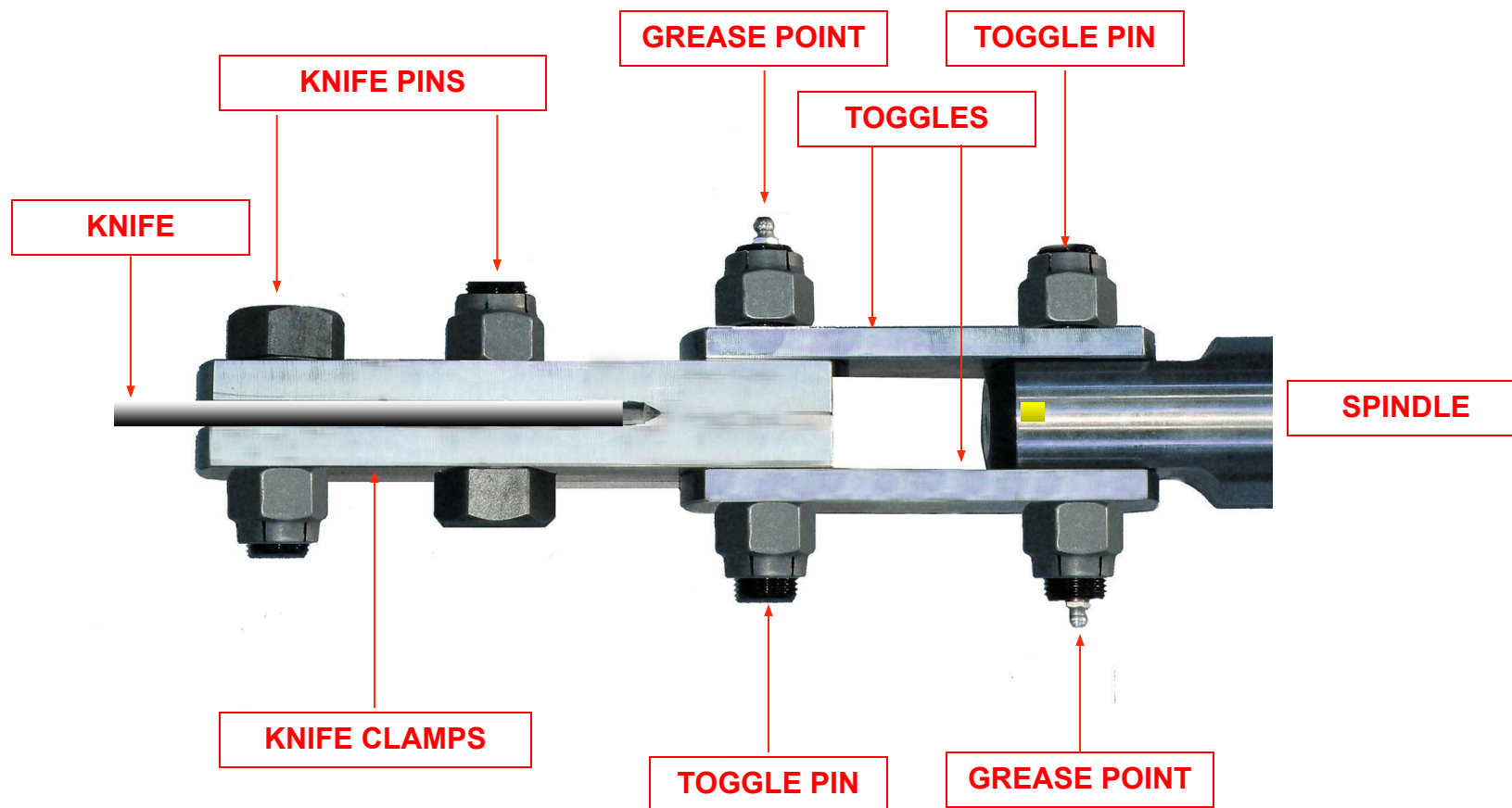
KNIFE LINKAGE



KNIFE DRIVE ASSEMBLY

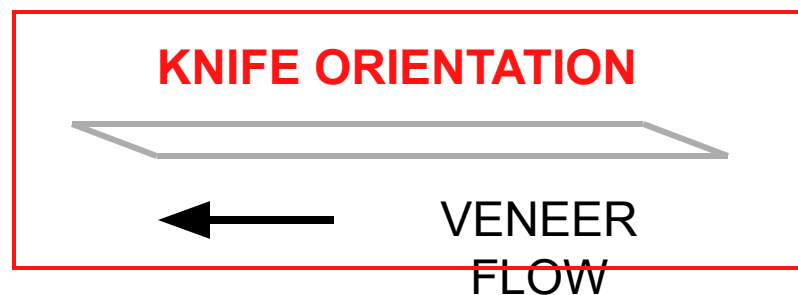
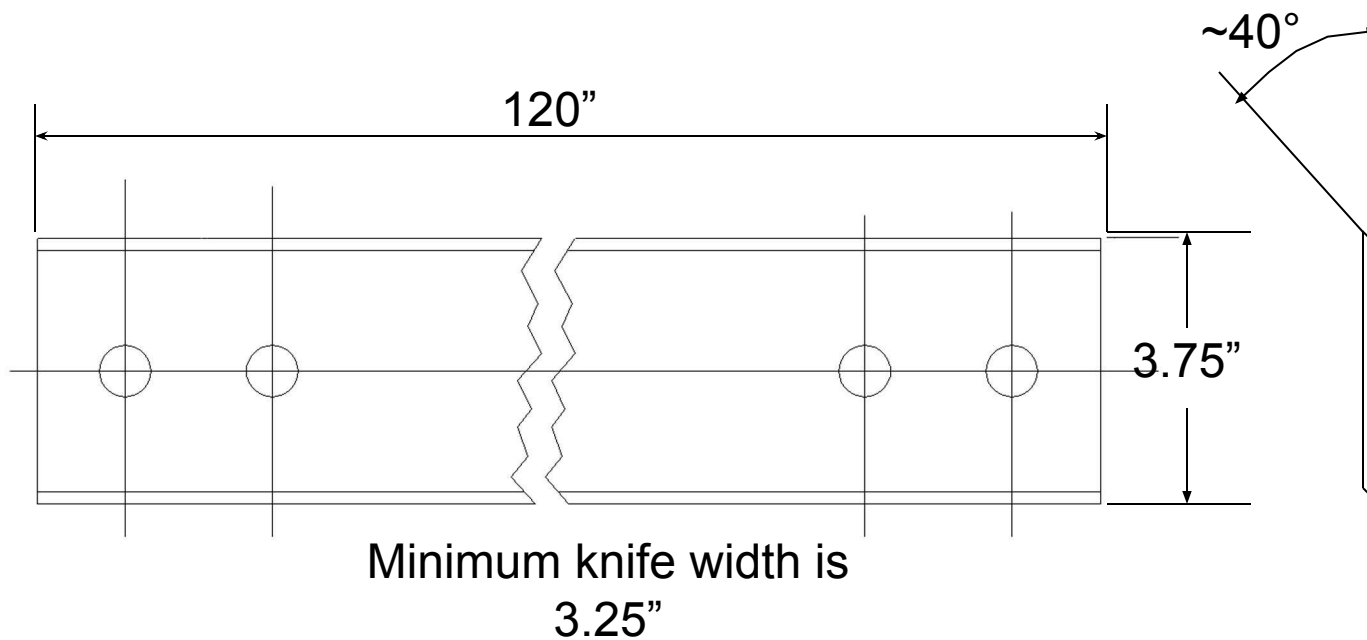


KNIFE COUPLINGS ASSEMBLY



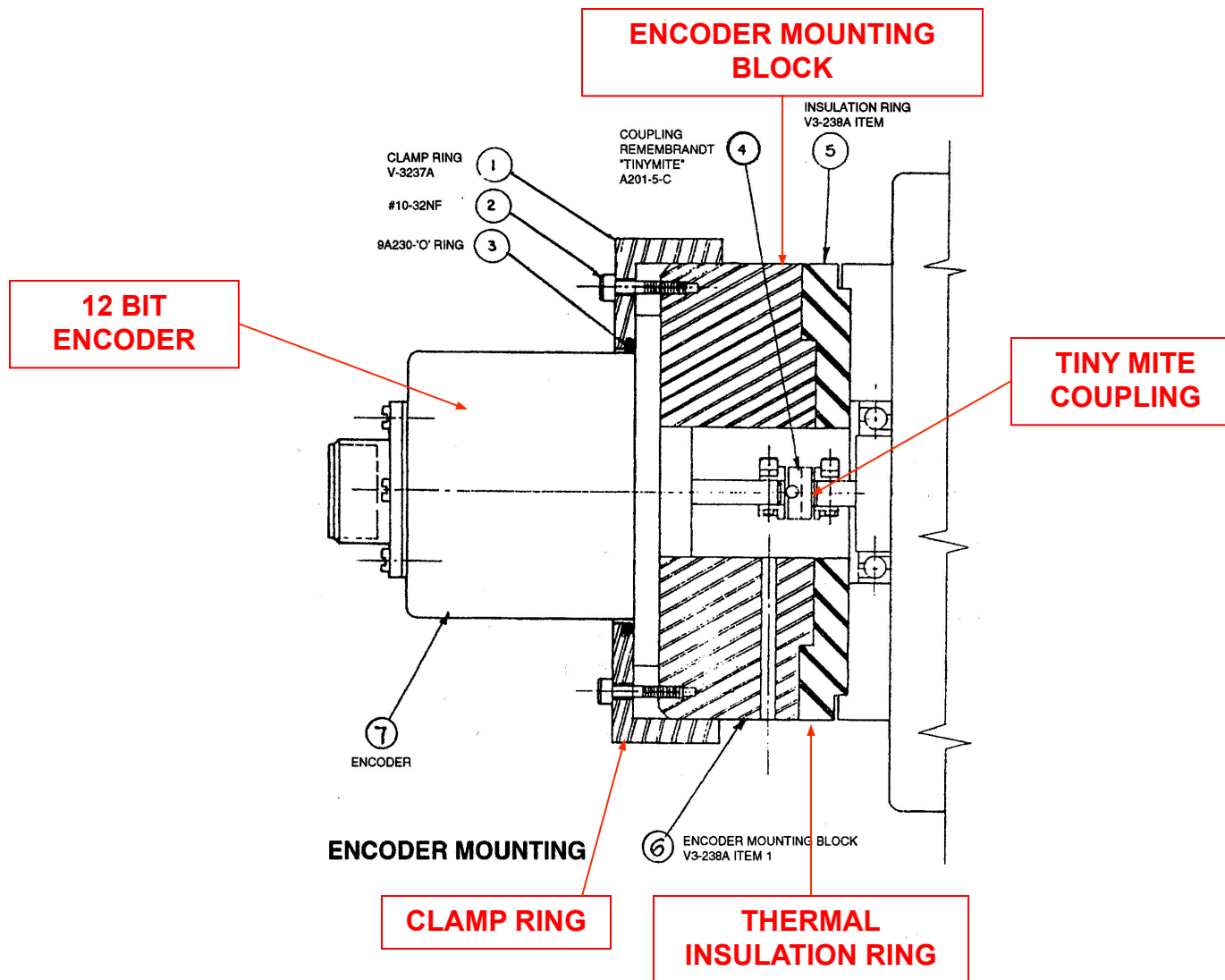


KNIFE BLADE

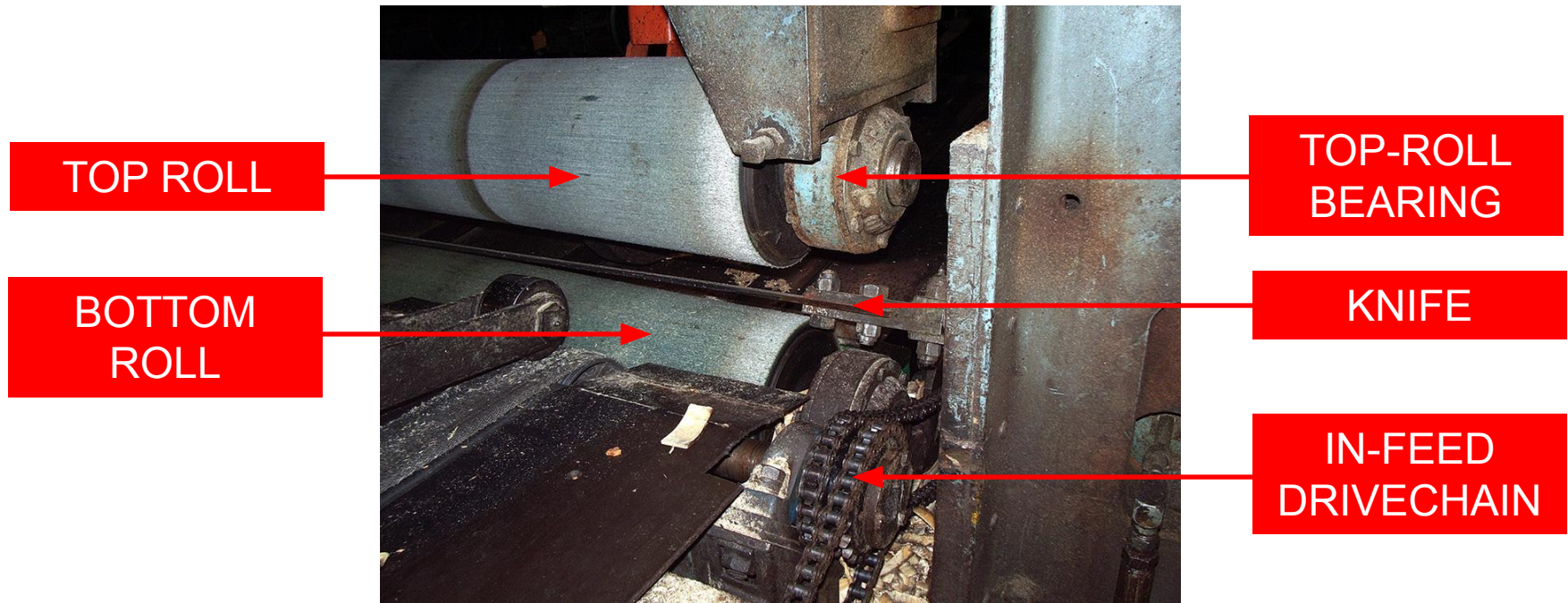




KNIFE ENCODER ASSEMBLY

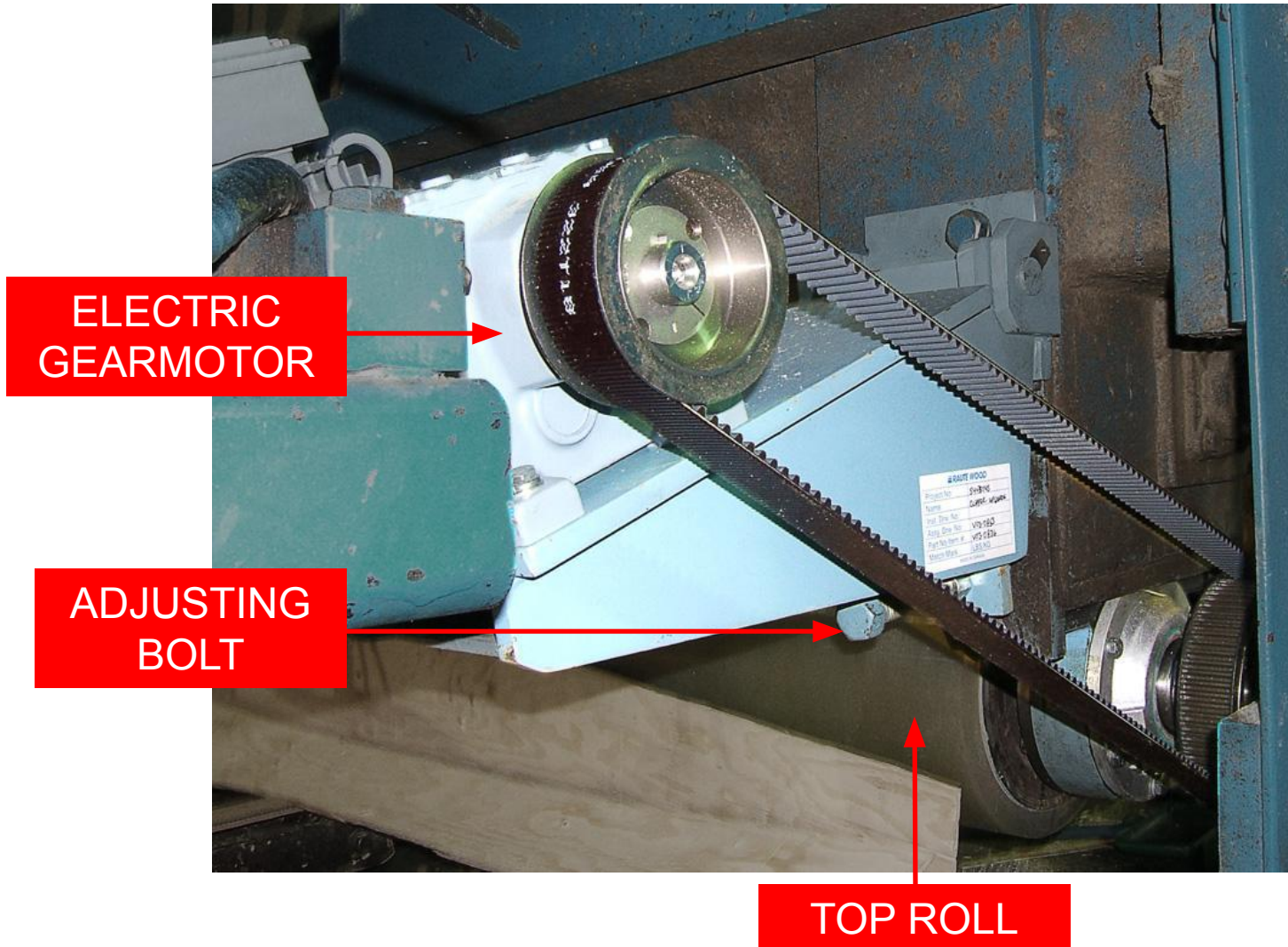


ANVIL ROLLS - IDLE SIDE VIEW



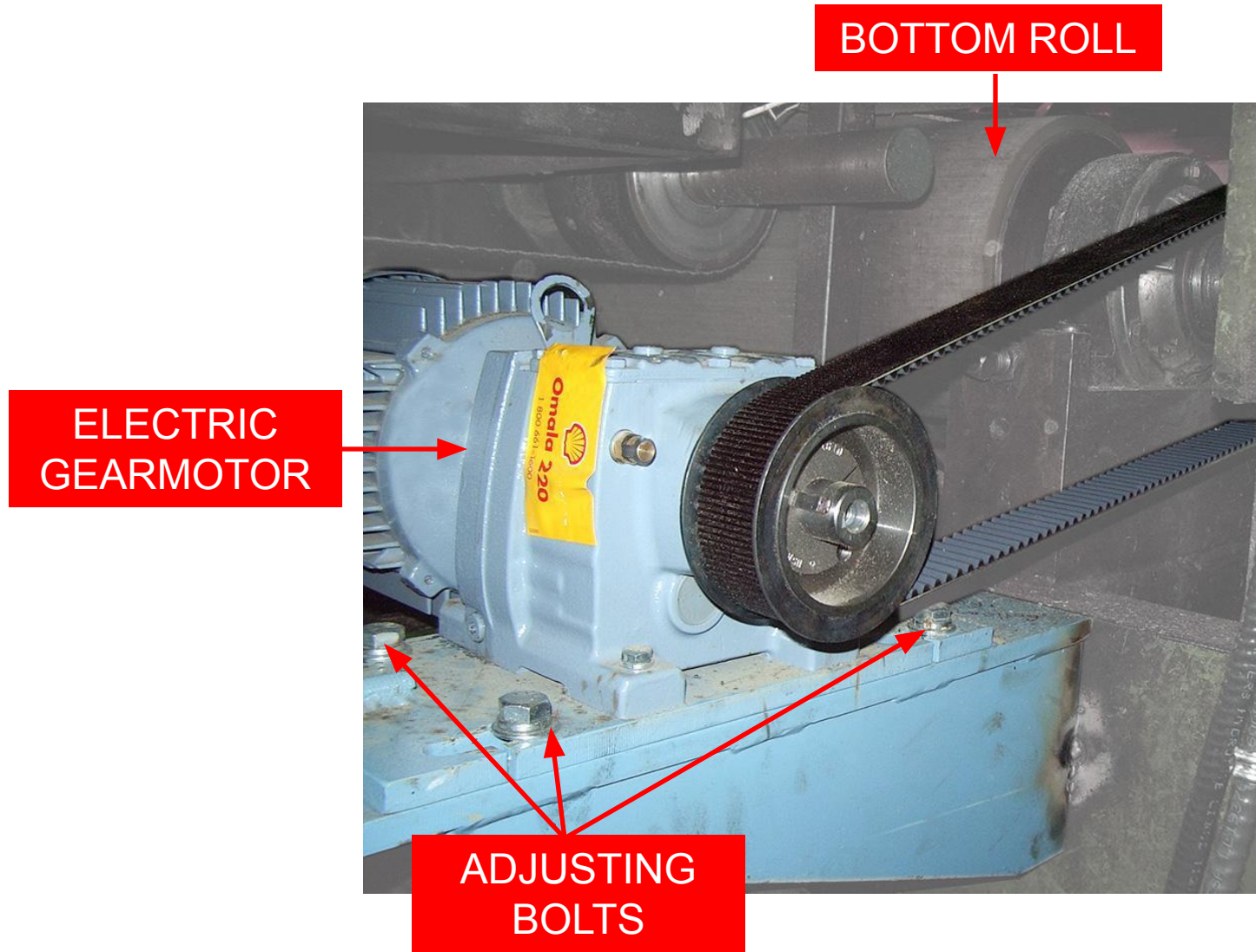


TOP ROLL ELECTRIC DRIVE



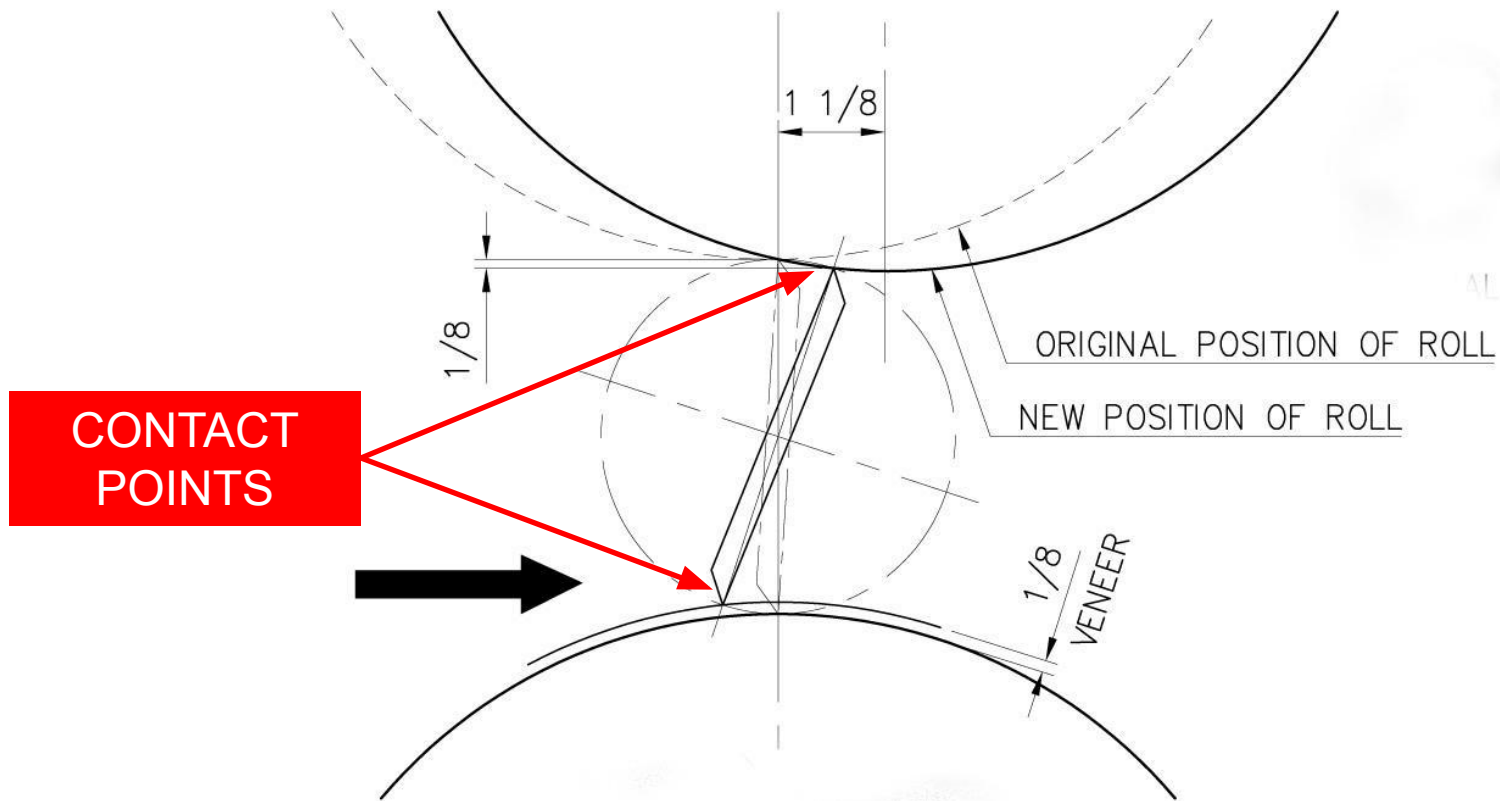


BOTTOM ROLL ELECTRIC DRIVE



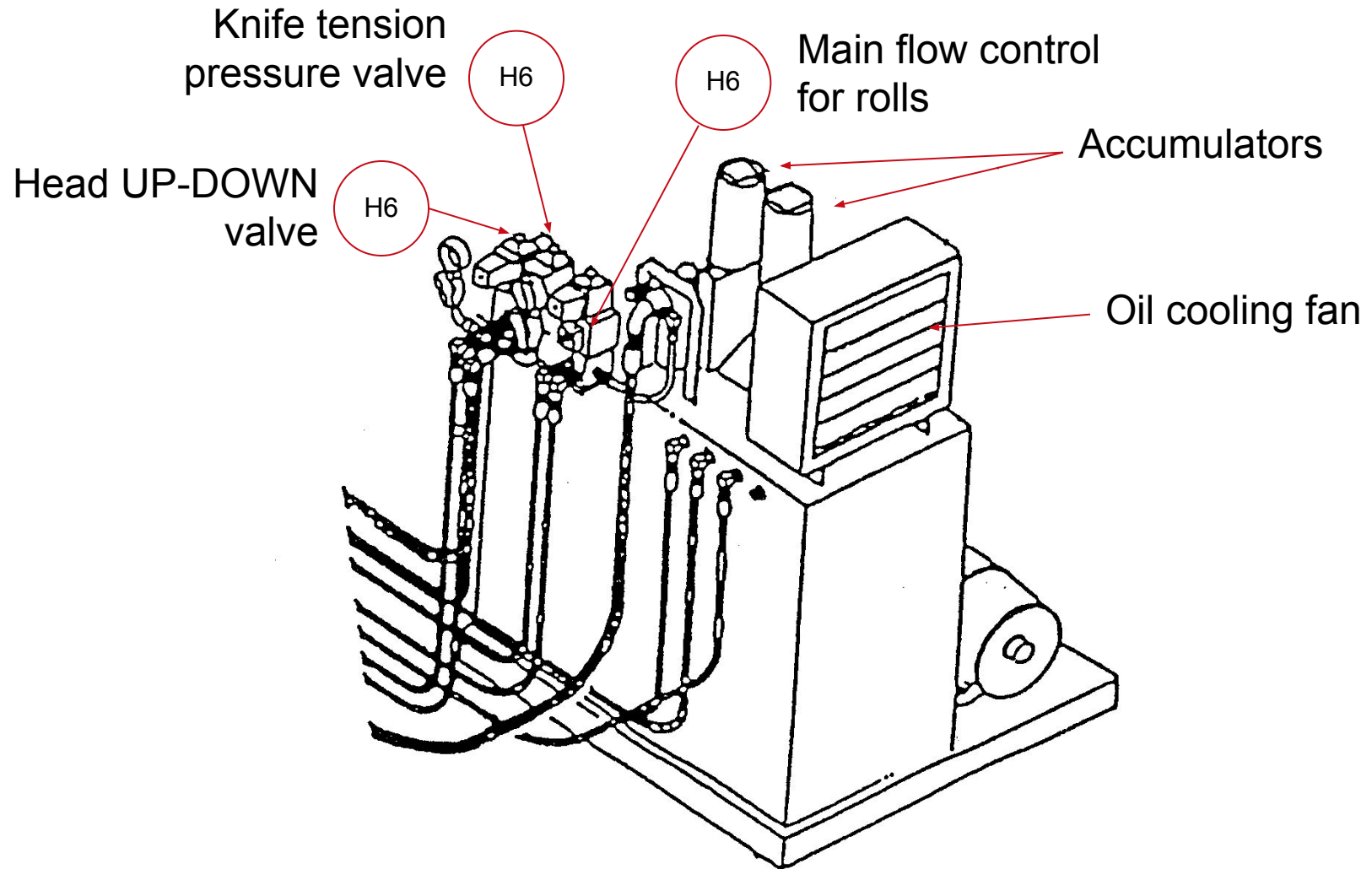


TOP ROLL OFFSET



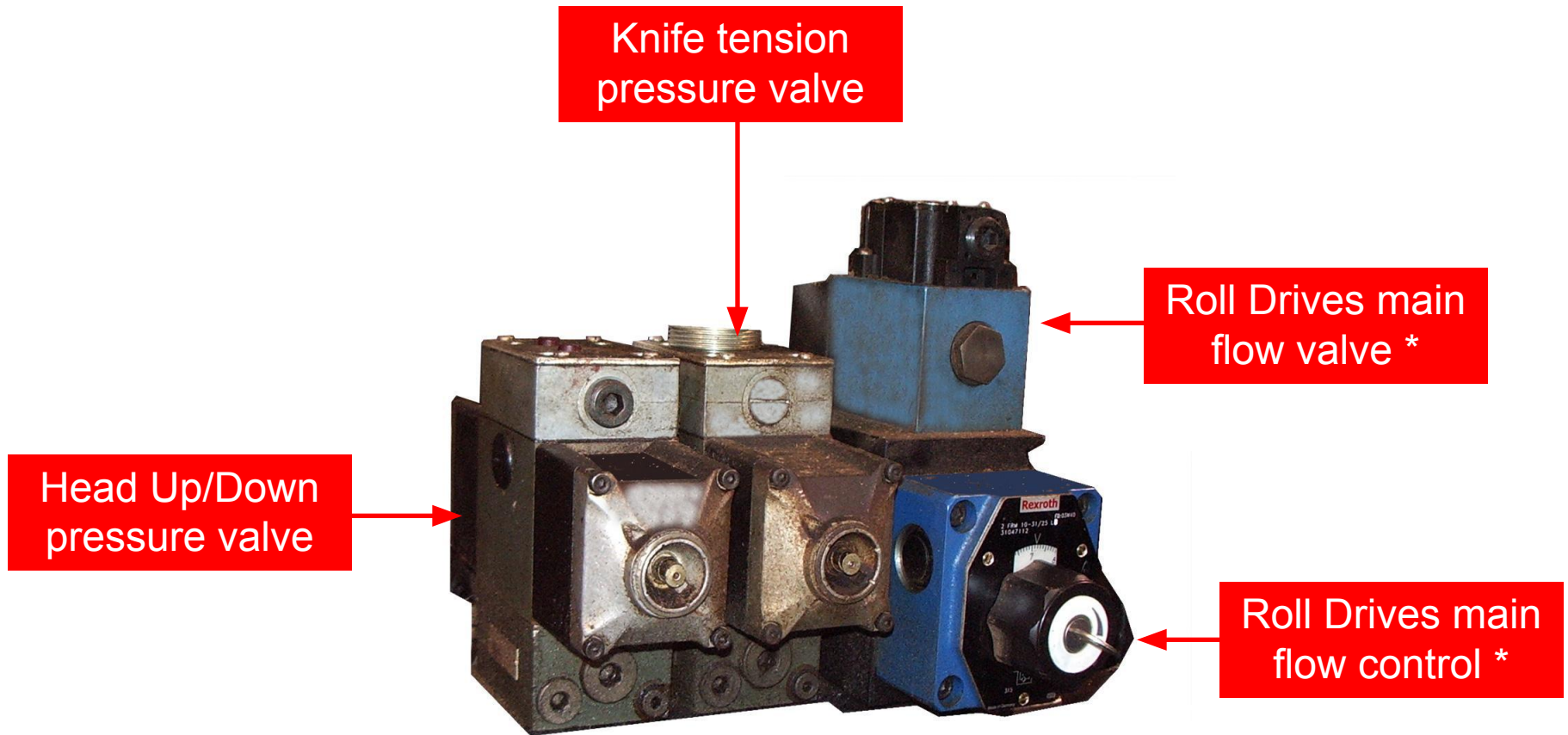
ROLL PRESSURE SETUP MUST BE DONE DIFFERENTLY!

HPU GENERAL VIEW





FLOW CONTROLS DETAIL

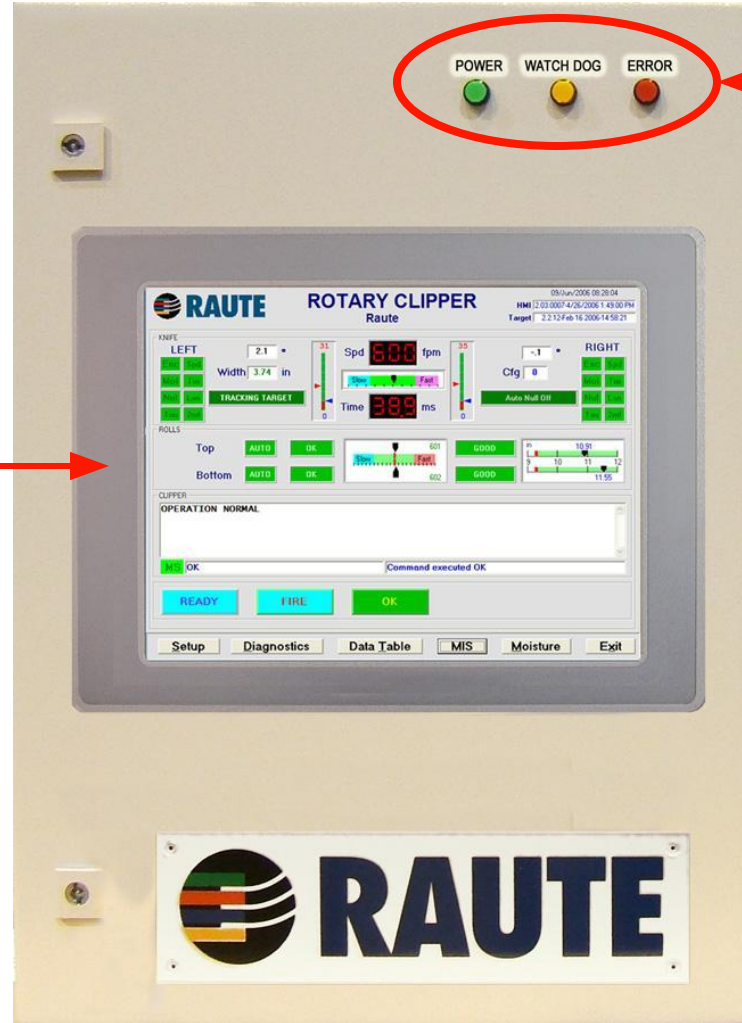


* Not used with electric roll

drives



RAUTE CONTROLLER - 1

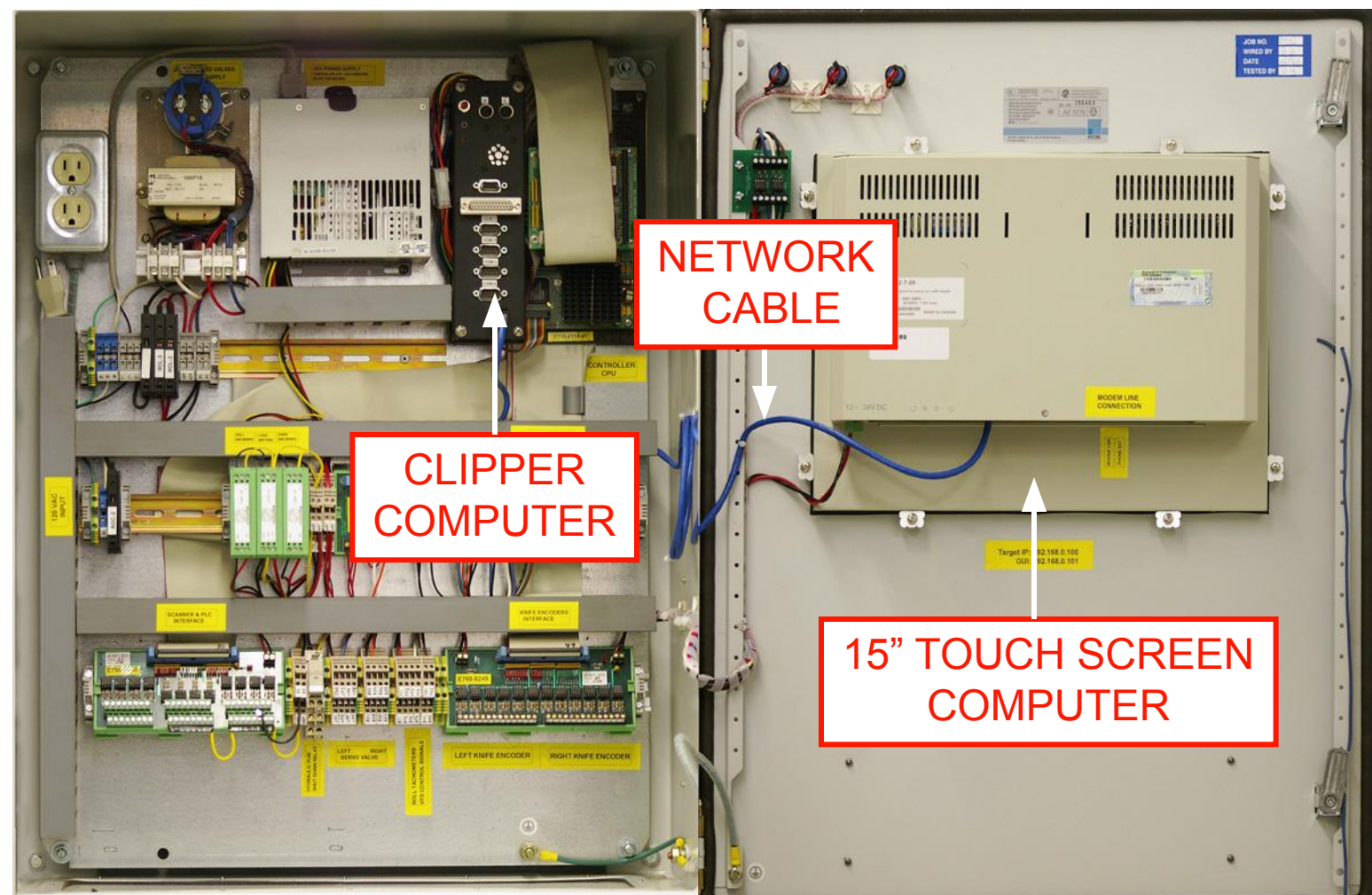


STATUS LAMPS

15" TOUCH SCREEN COMPUTER



RAUTE CONTROLLER - 2



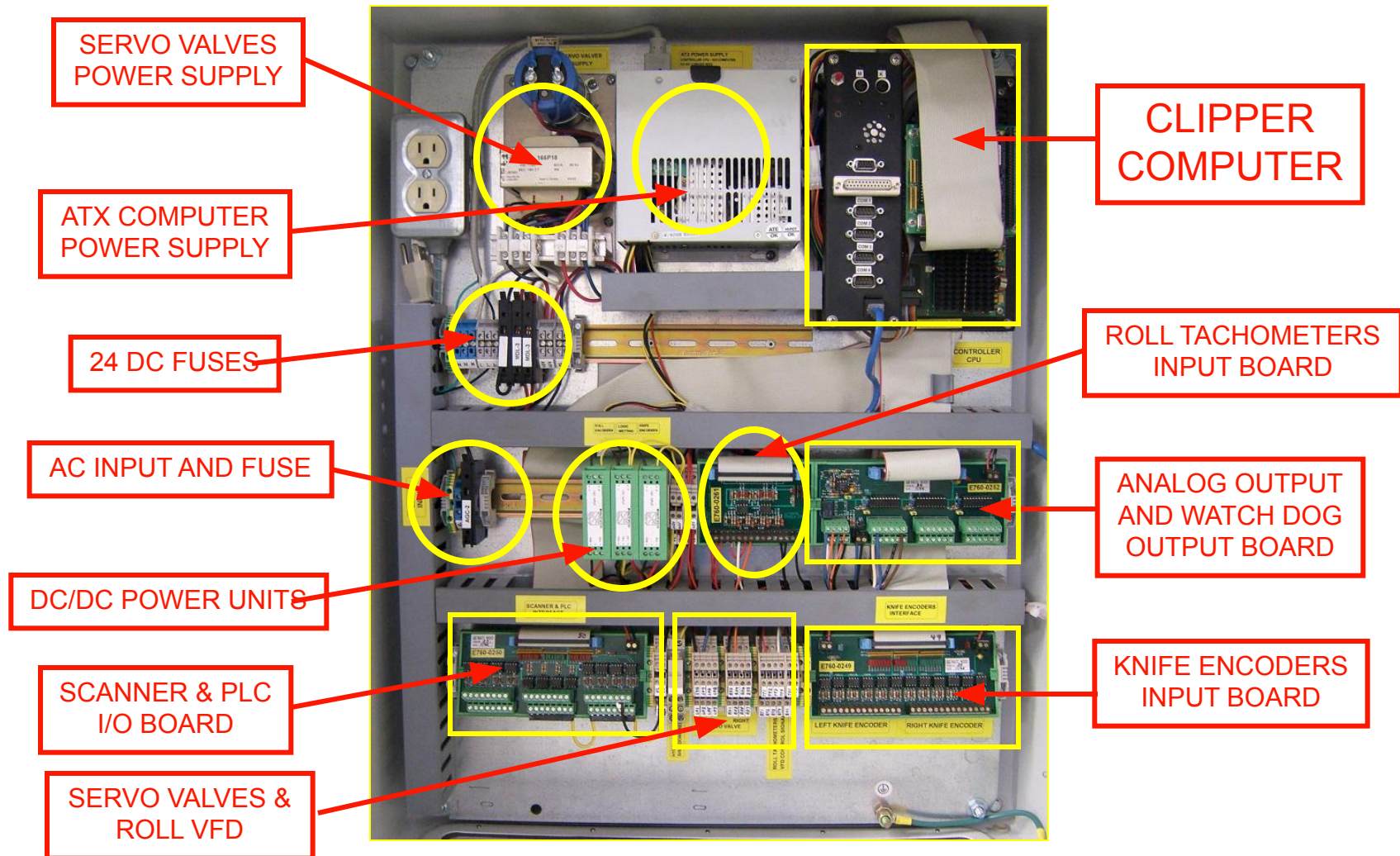
NETWORK CABLE

CLIPPER COMPUTER

15" TOUCH SCREEN COMPUTER

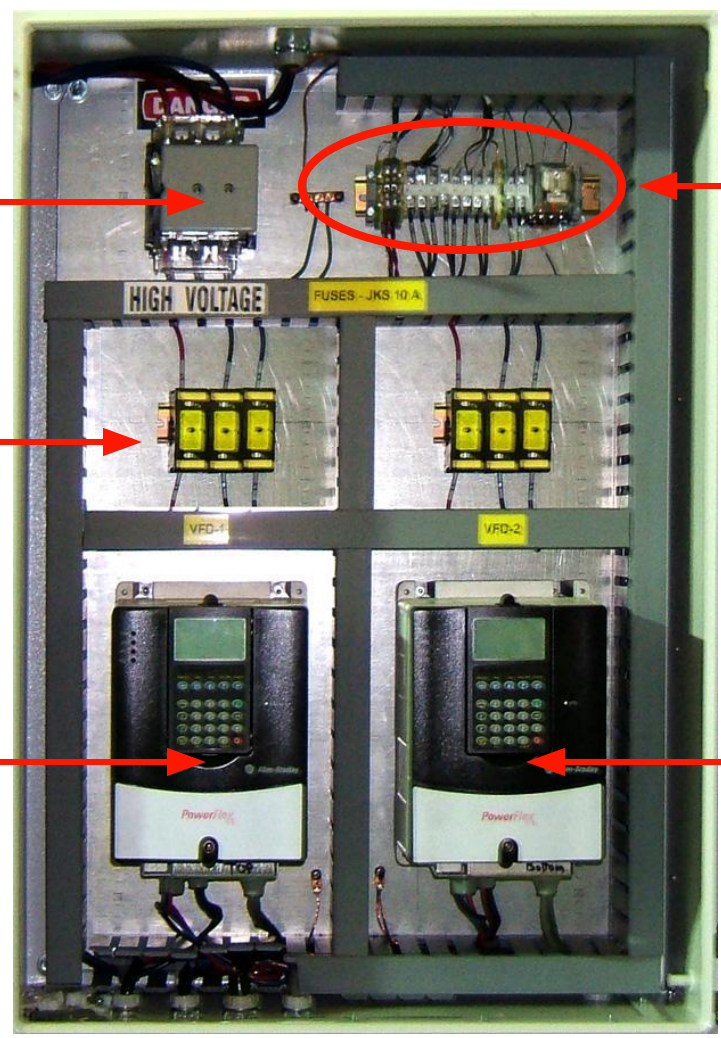


RAUTE CONTROLLER - 3





ROLLS VFD CABINET



MAIN AC SWITCH

Control Signals

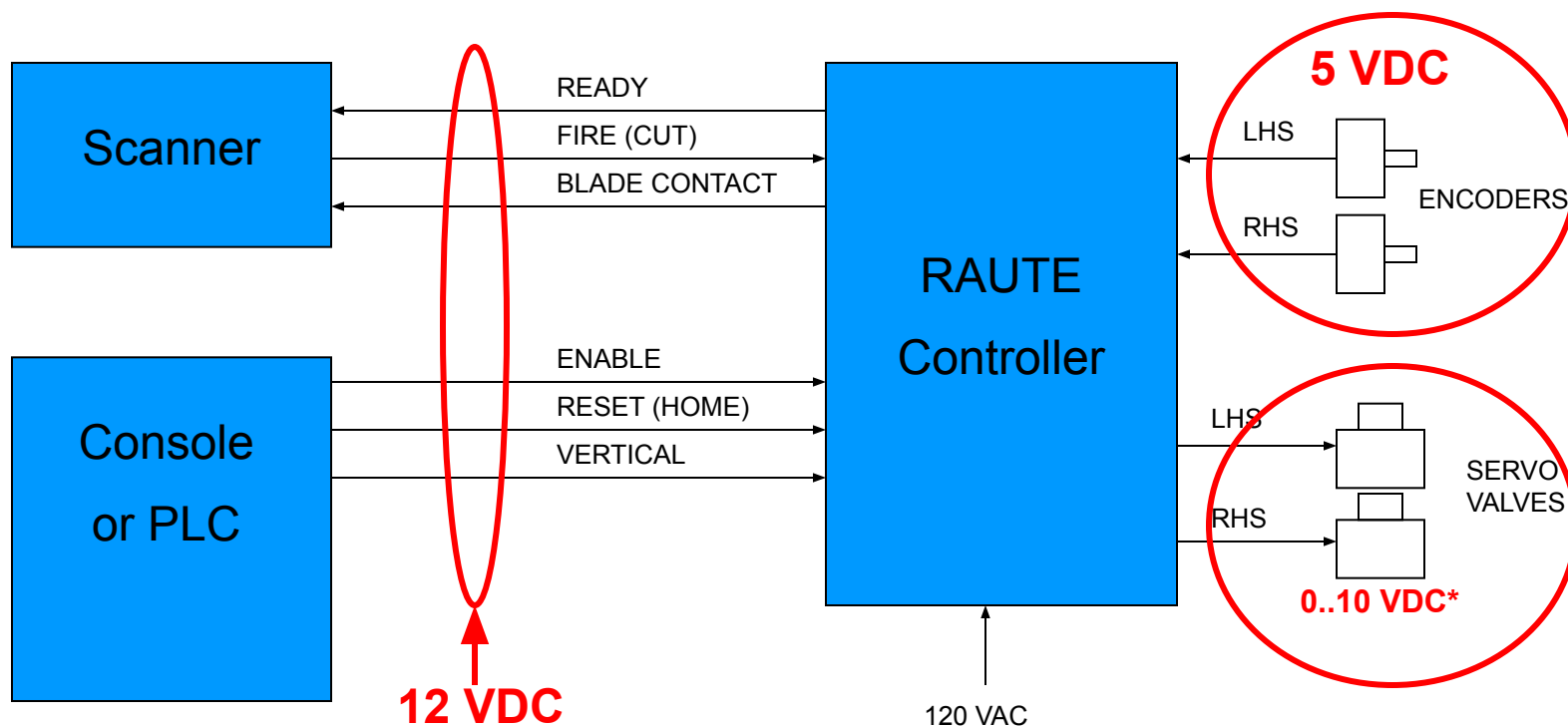
AC FUSES

TOP ROLL VFD

BOTTOM ROLL VFD

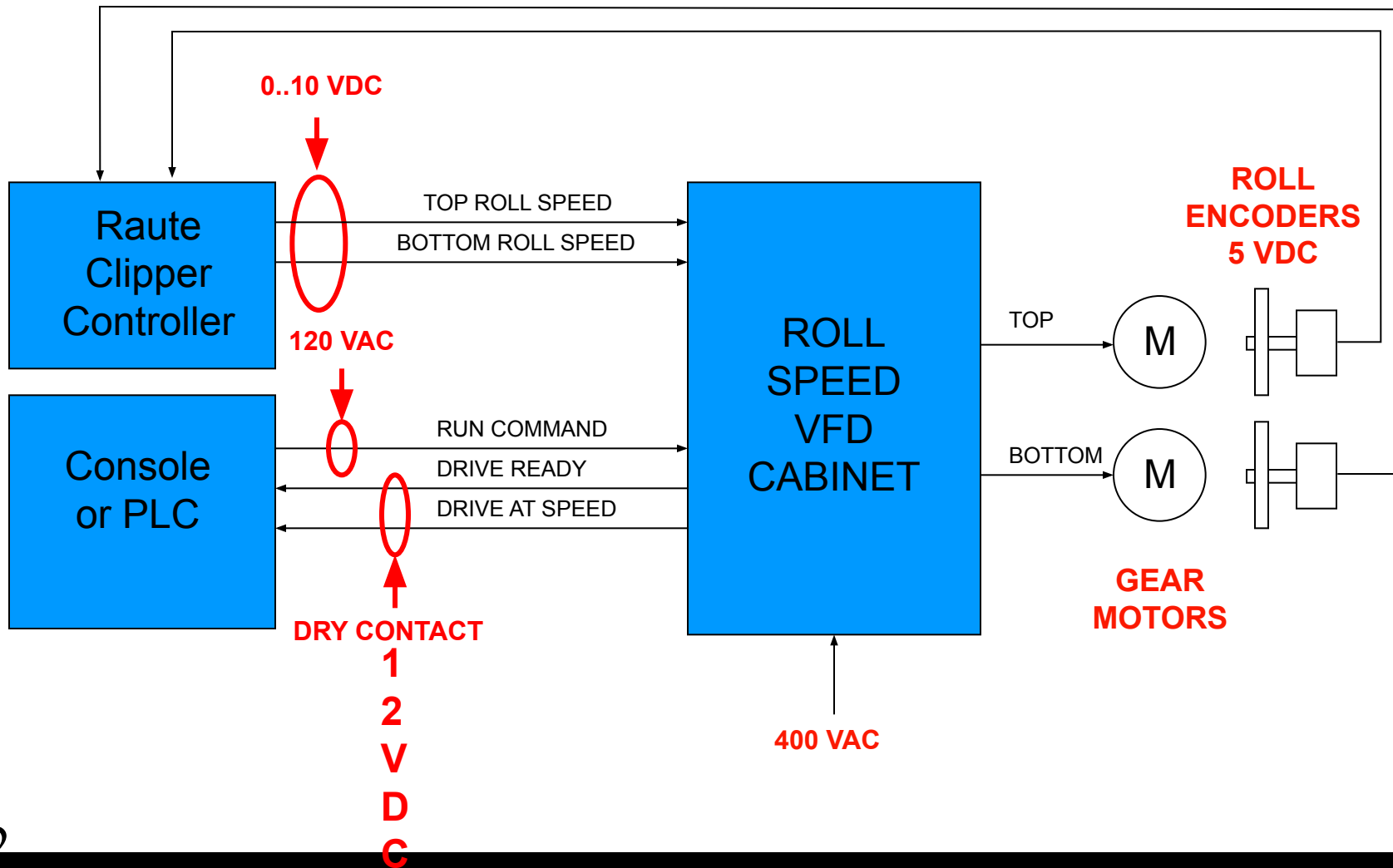


CONTROLLER - I/O WIRING



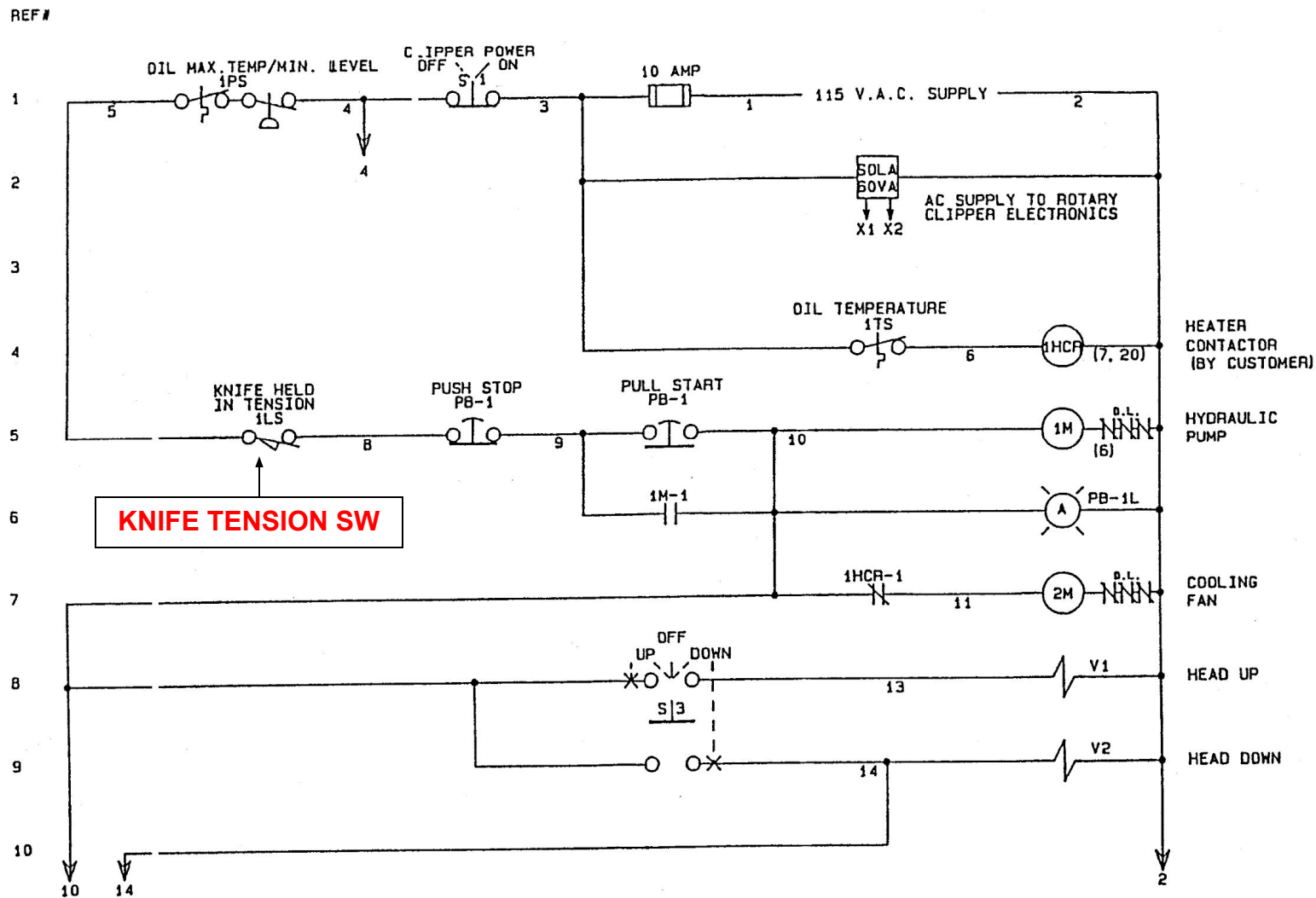


ROLL SPEED CONTROL SIGNALS



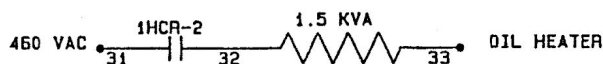
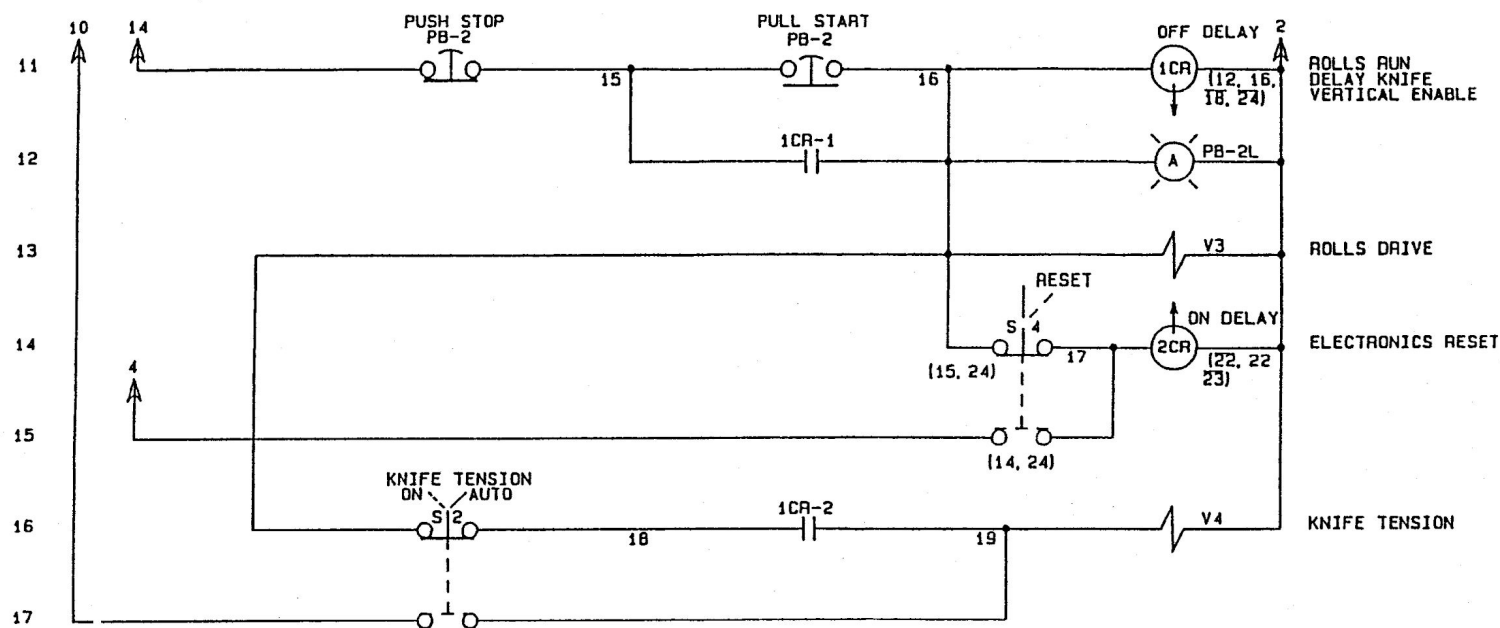


CONTROL LOGIC - PAGE 1 - AC





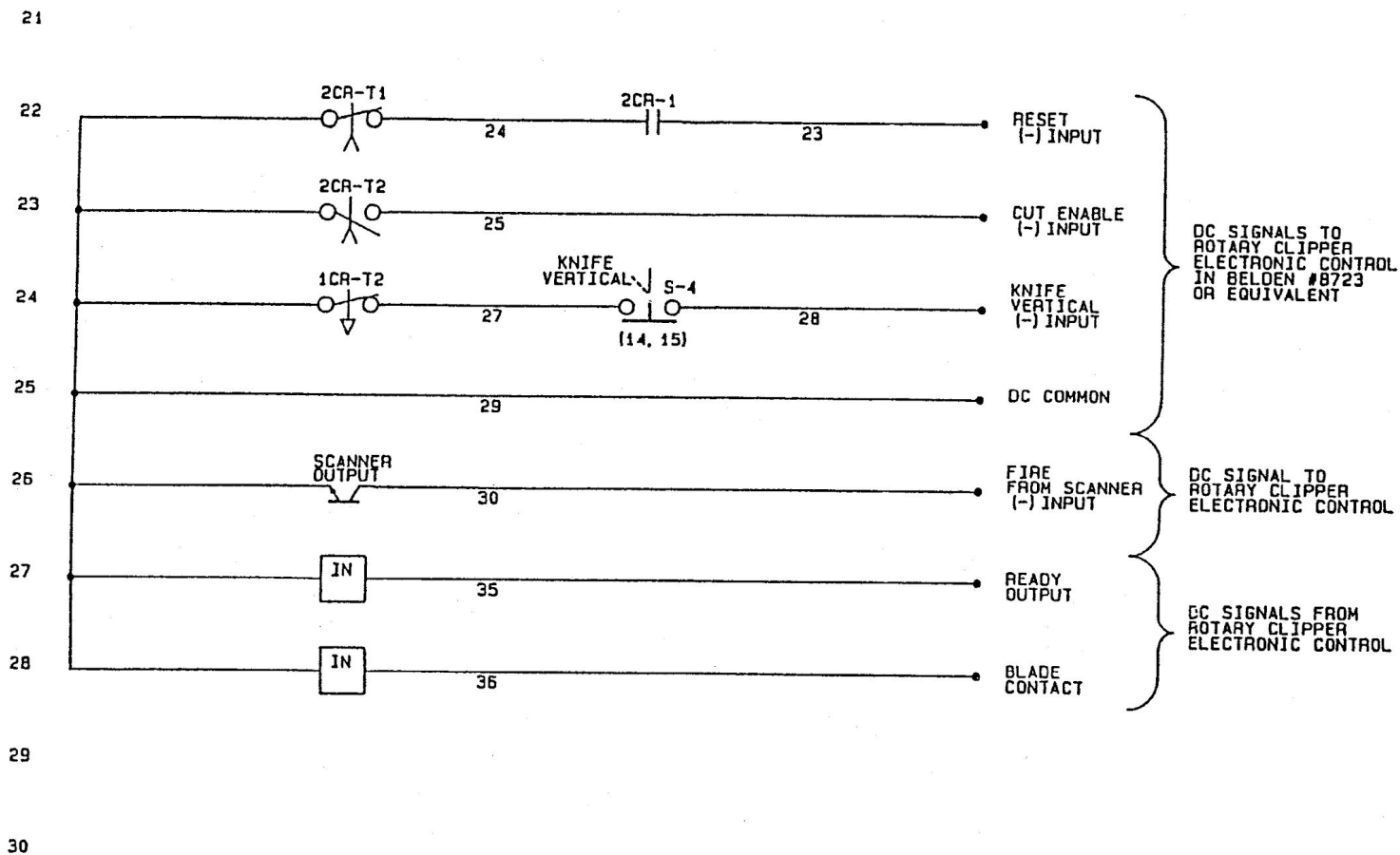
CONTROL LOGIC - PAGE 2 - AC



SPARES
20
21
22



CONTROL LOGIC - PAGE 3 - DC





SECTION 3

CLIPPER THEORY

CLIPPER GOALS

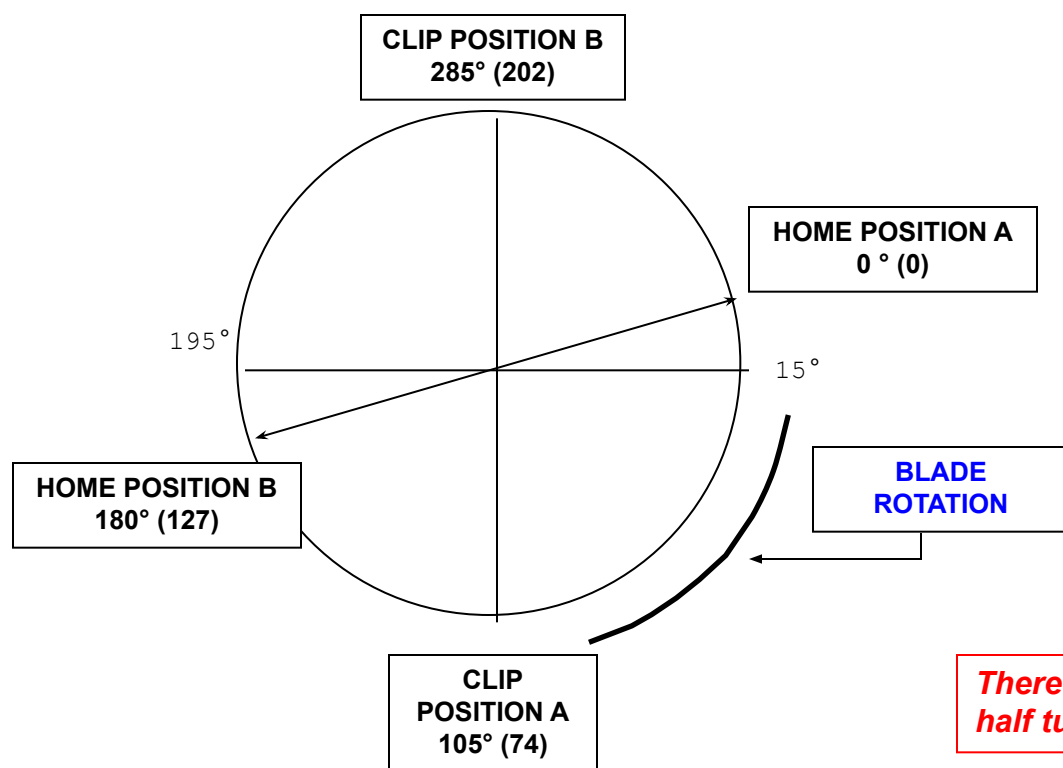
- Exact clip point
- Parallel clips
- Match knife/roll speeds
- Minimize response time
- Straight clips (no bias)

OPERATION

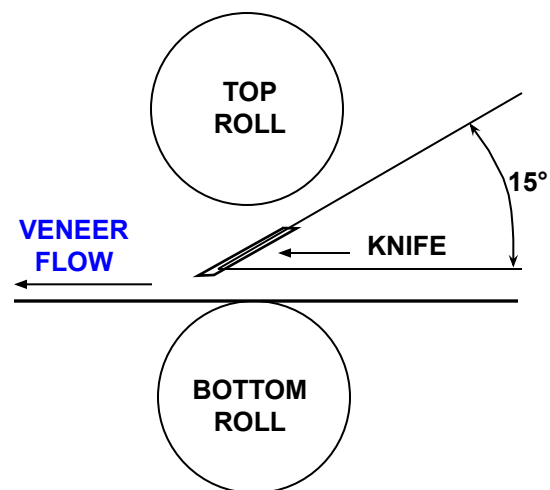
- Knife positions
- Clip steps
- Clip cycle
- Clip zone
- Knife/roll speed mismatch effects

KNIFE POSITIONS

BLADE ANGLE



HOME POSITION



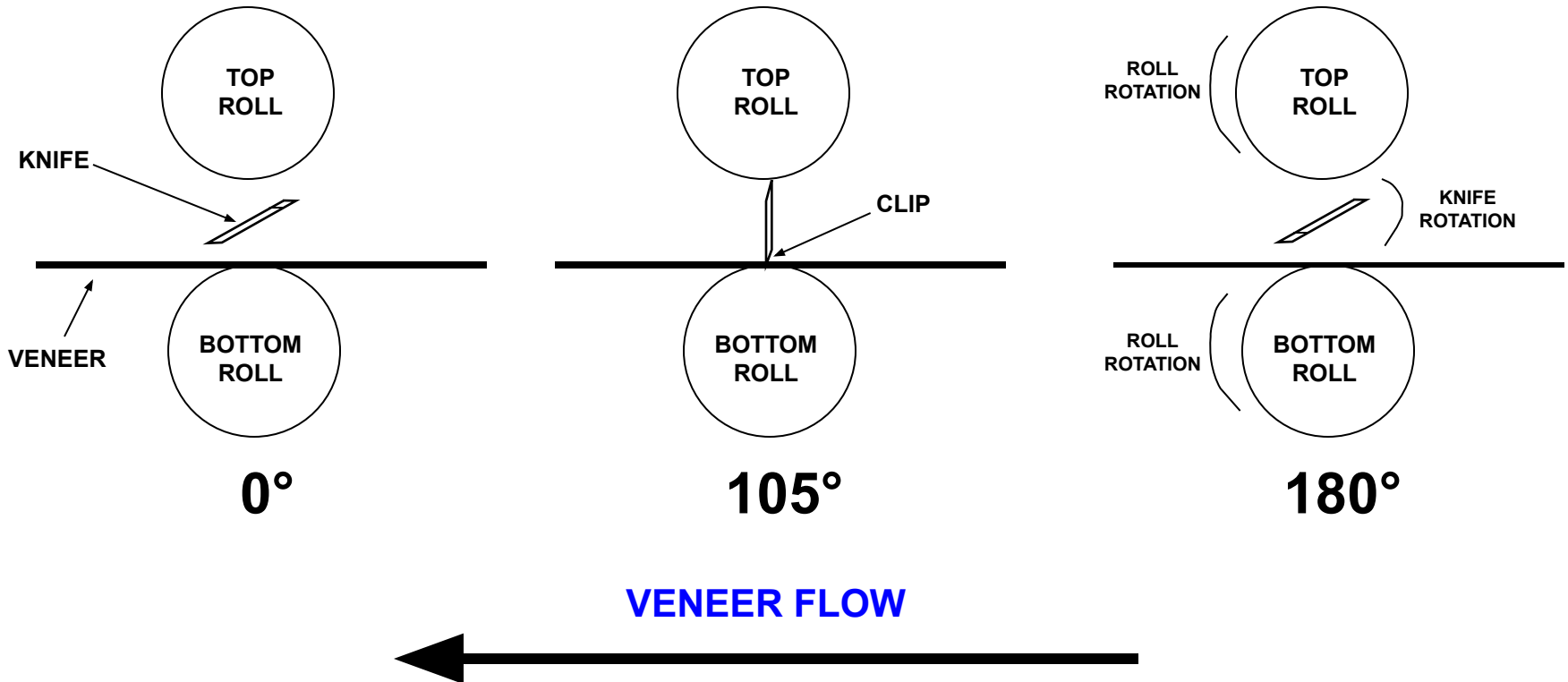
There are two home positions separated by half turn of the blade

CLIP STEPS

1 - HOME POSITION (A)
Knife begins to move upon receiving a FIRE signal from scanner

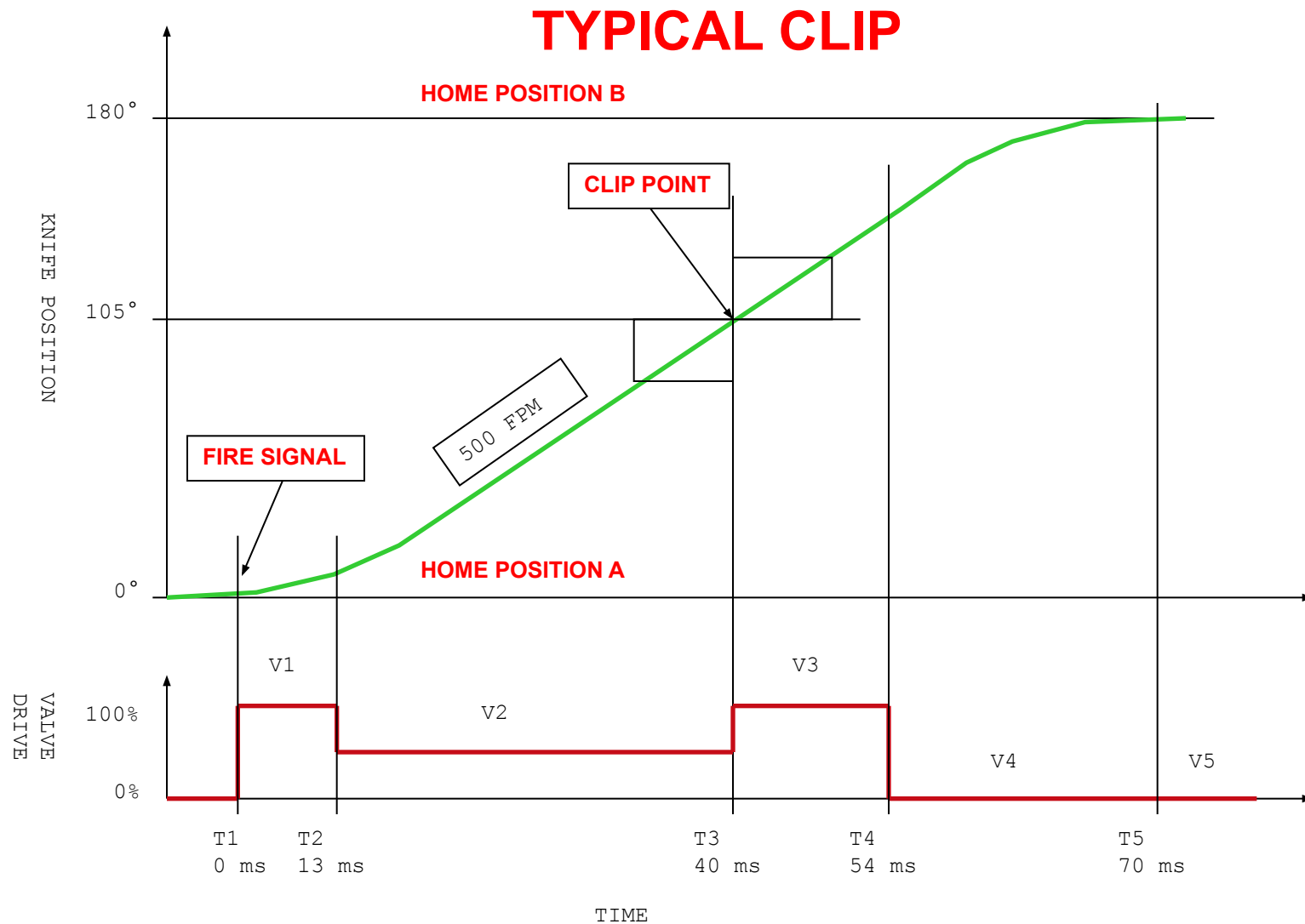
2 - CLIP POSITION
Knife in vertical position. Veneer is clipped between the blade and the bottom roll

3 - HOME POSITION (B)
Knife stops after rotating half turn (180 degrees)

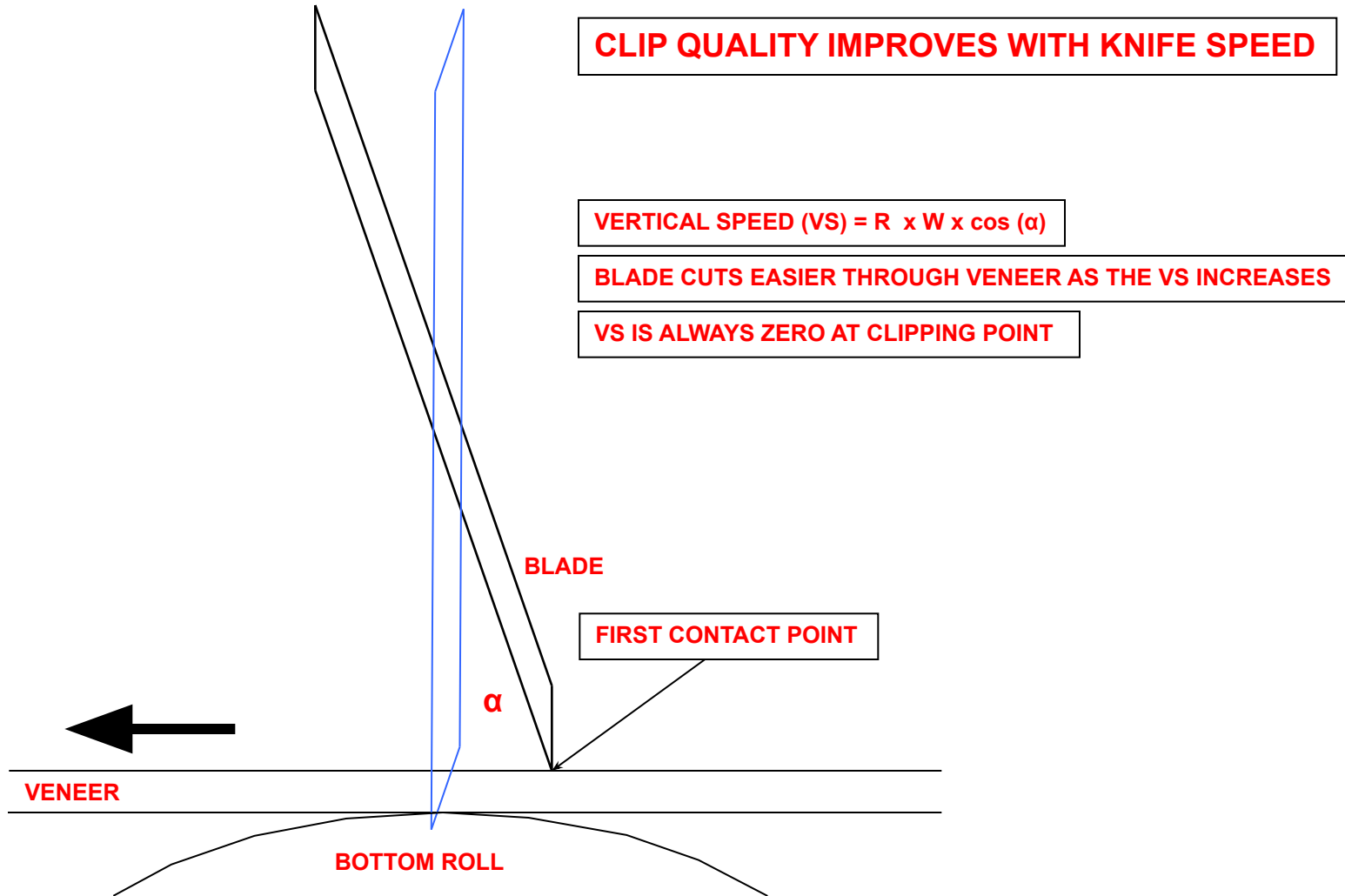




CLIP CYCLE

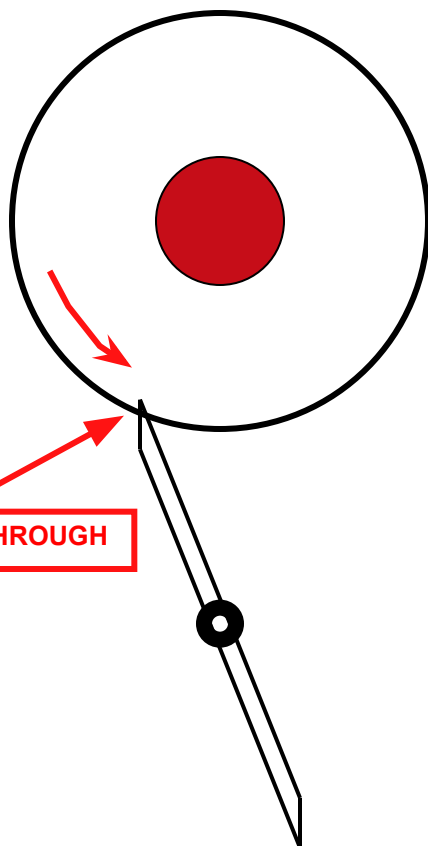


CLIP ZONE

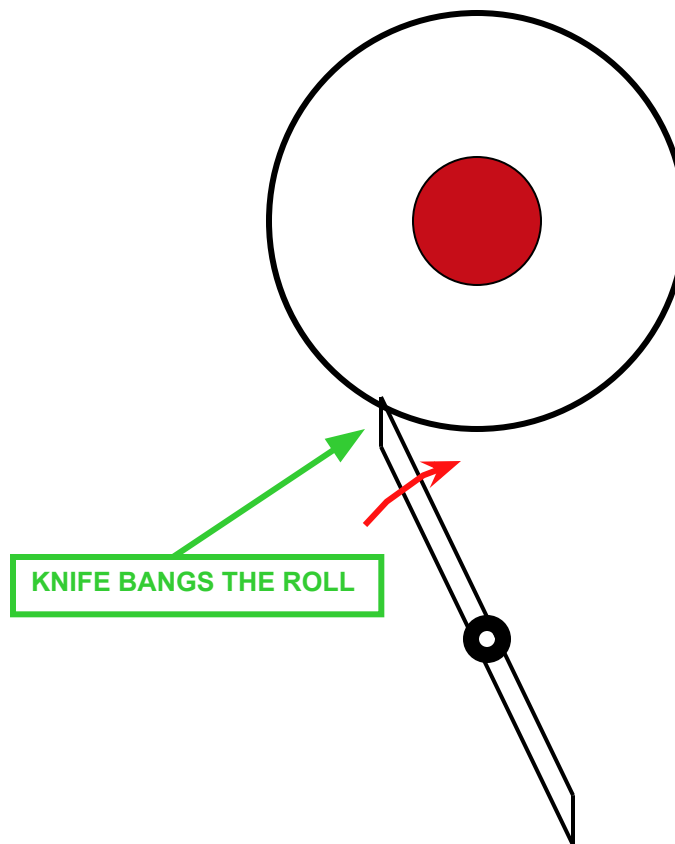


KNIFE/ROLL SPEED MISMATCH

ROLL > KNIFE
MORE WEAR

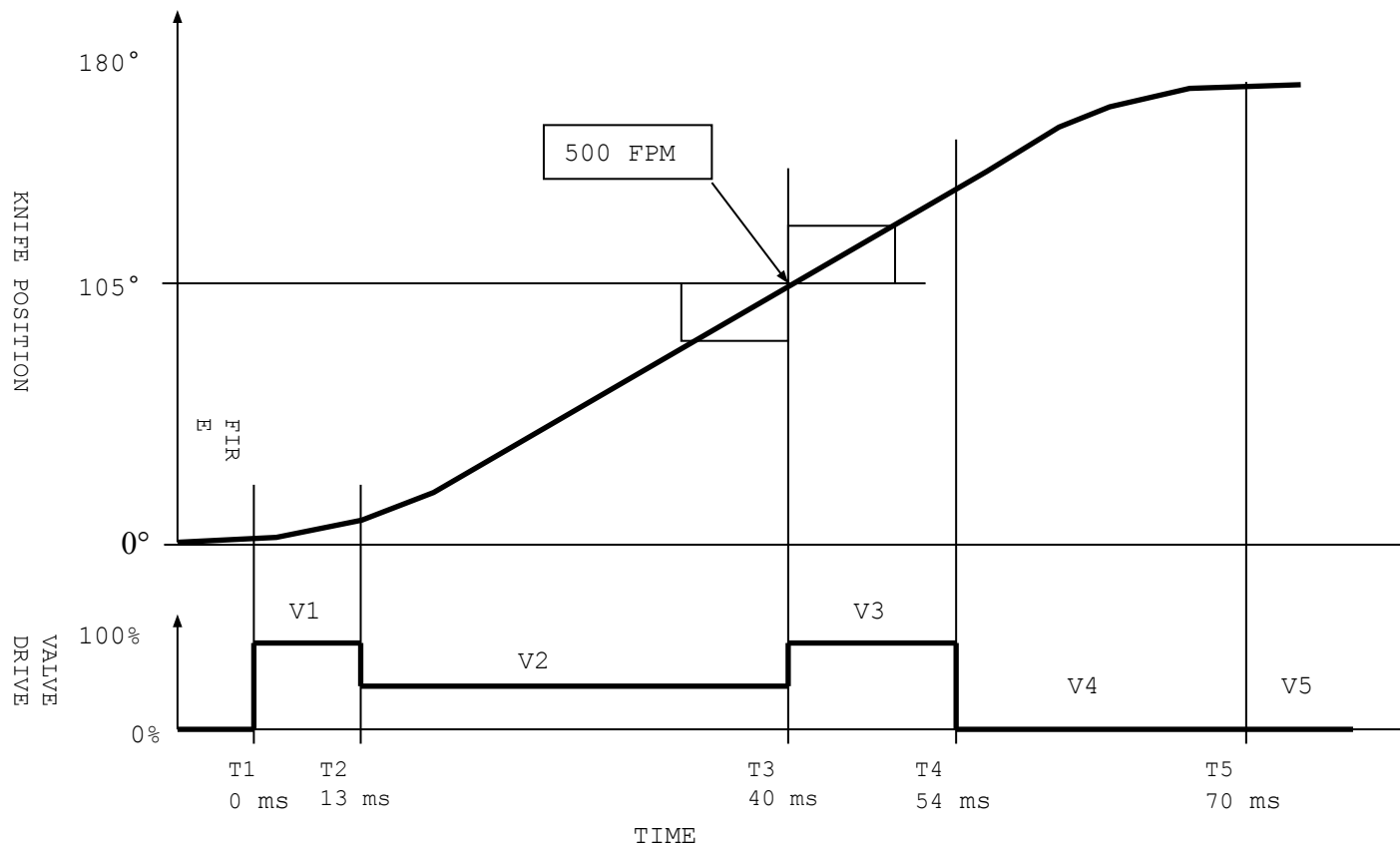


ROLL < KNIFE
LESS WEAR



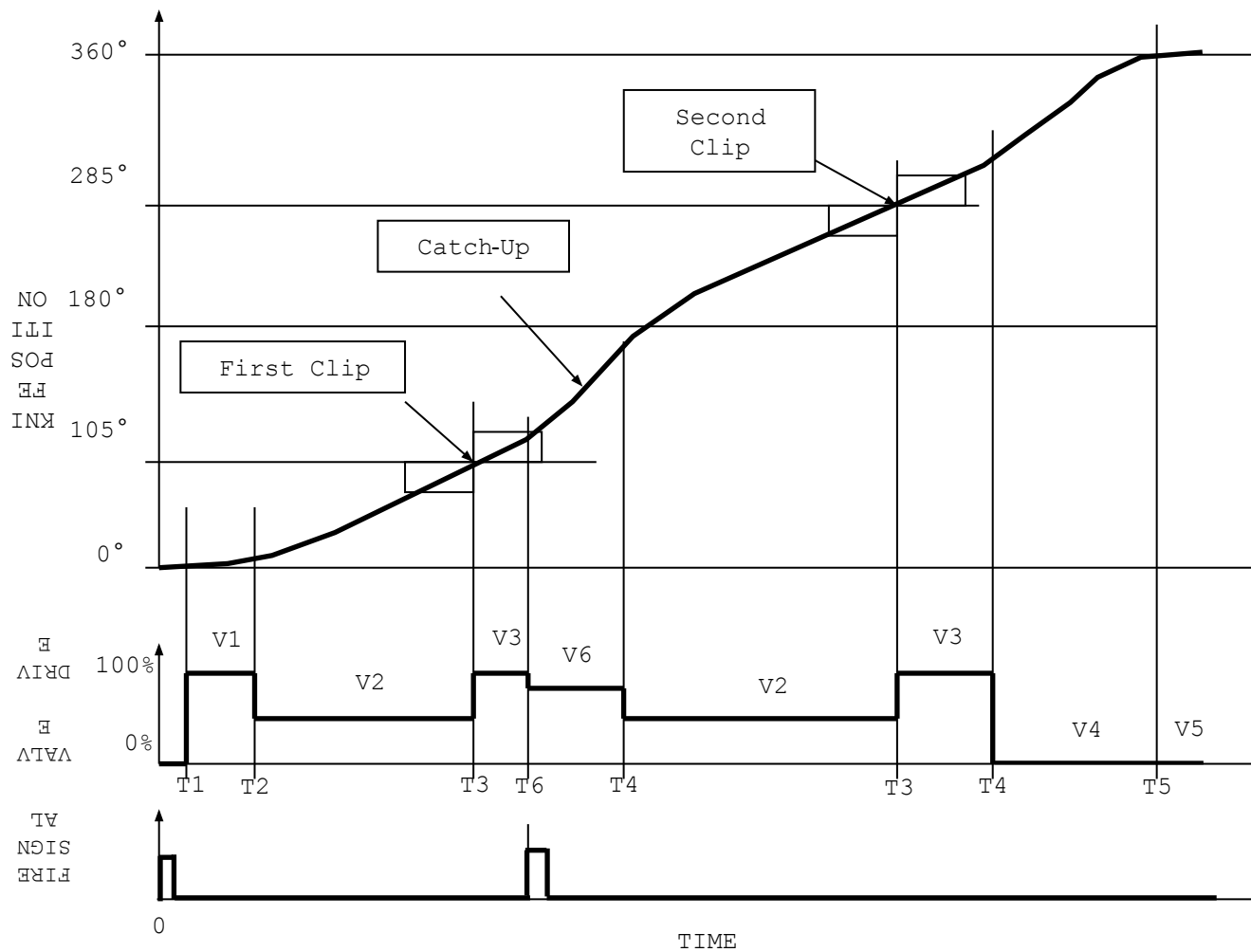


TYPICAL CLIP RESPONSE



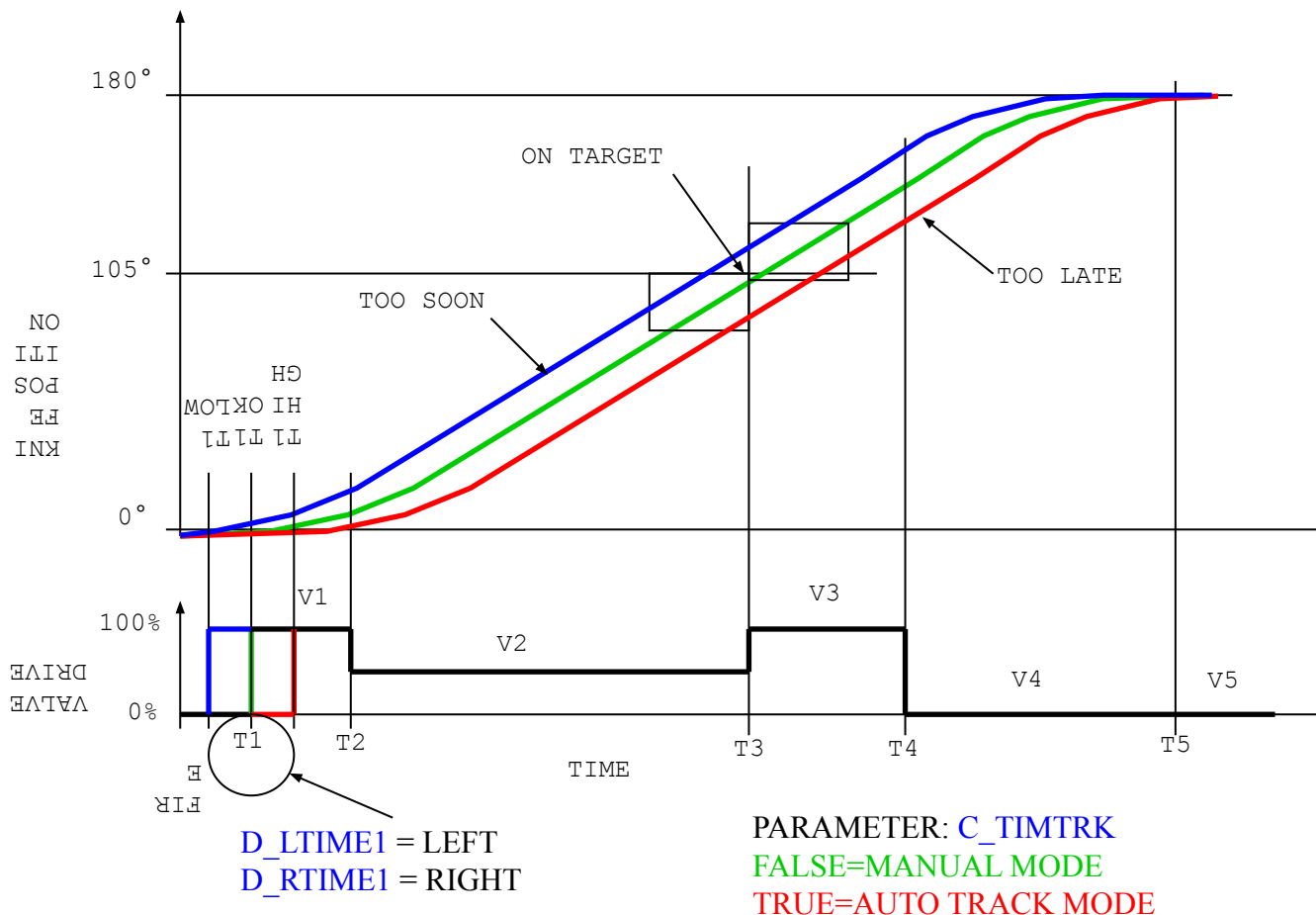


SECOND CLIP CATCH-UP



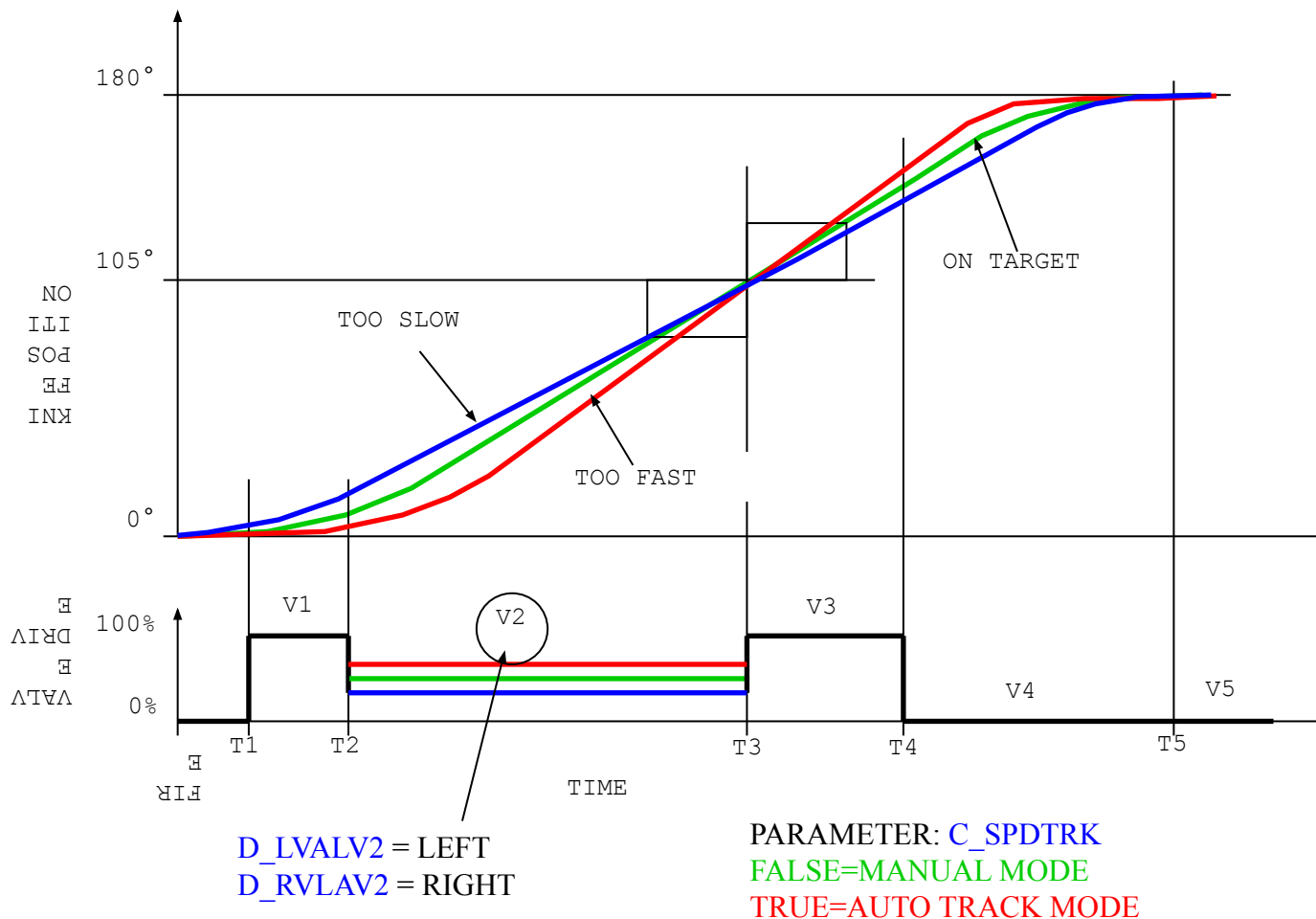


TIME RESPONSE ADJUSTMENT



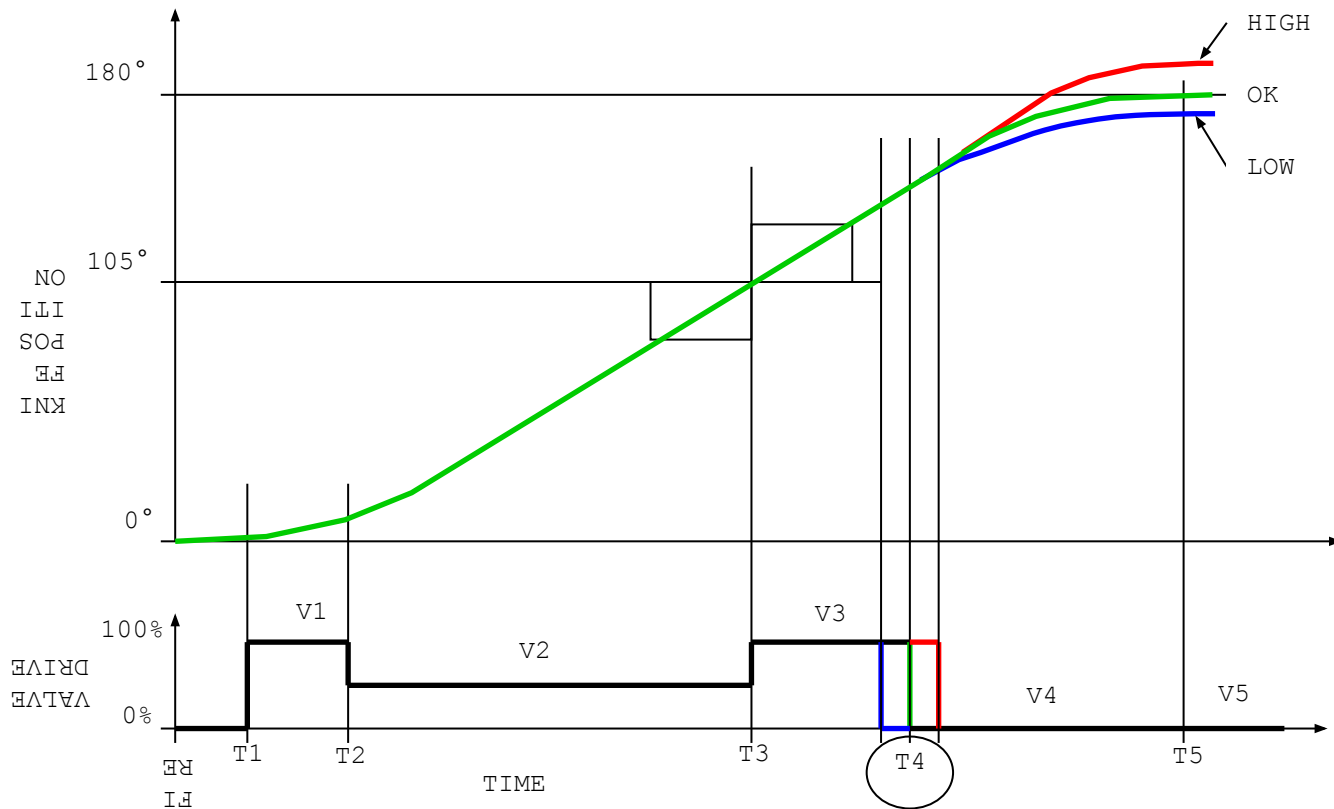


SPEED RESPONSE ADJUSTMENT





LANDING POSITION ADJUSTMENT

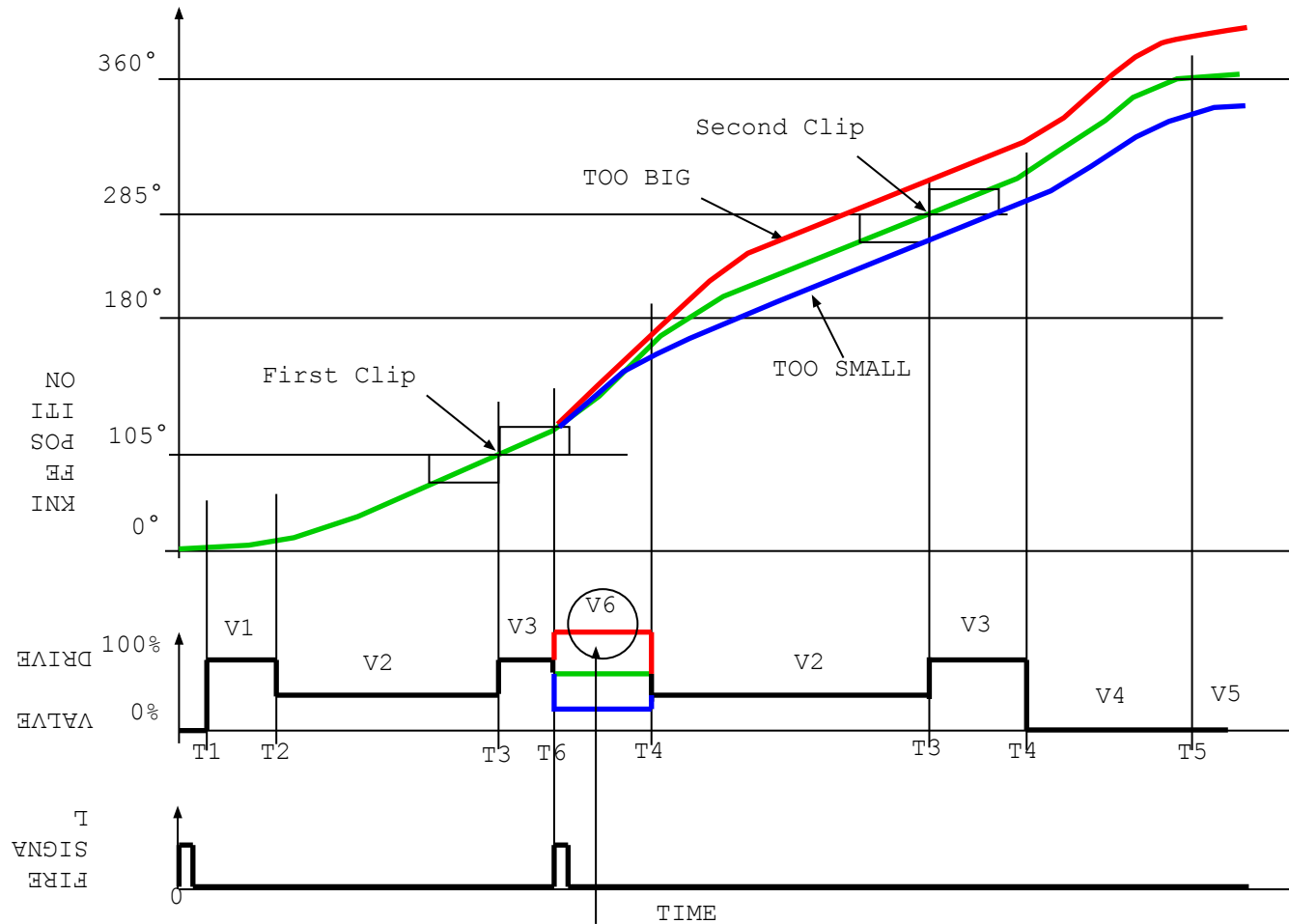


PARAMETER: C_LANTRK
 FALSE=MANUAL MODE
 TRUE=AUTO TRACK MODE

D_LTIME4 = LEFT
 D_RTIME4 = RIGHT



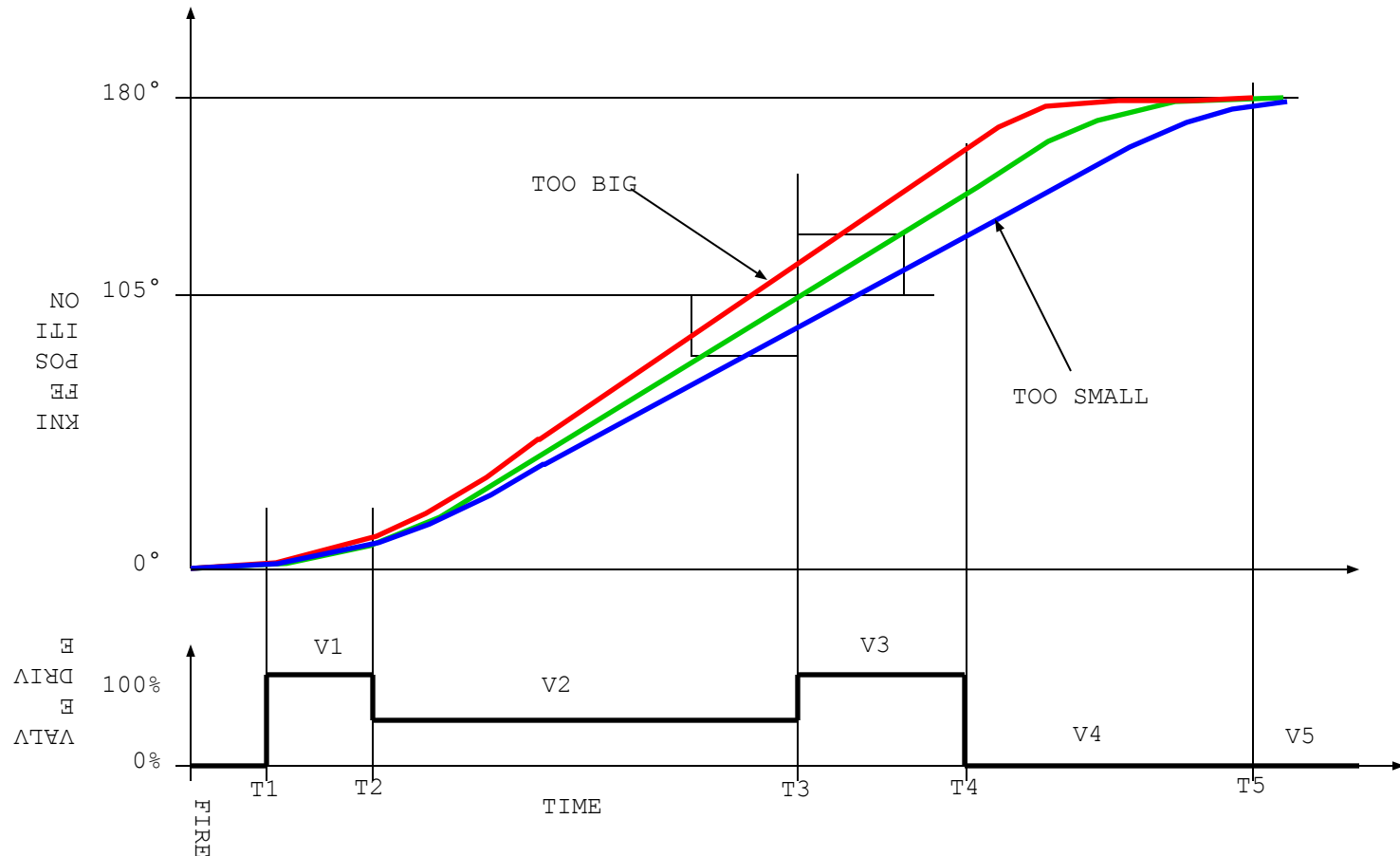
SECOND CLIP ADJUSTMENT



D_LVALV6 = LEFT
D_RVALV6 = RIGHT

PARAMETER: C_2NDTRK
FALSE=MANUAL MODE
TRUE=AUTO TRACK MODE

SPEED FACTOR



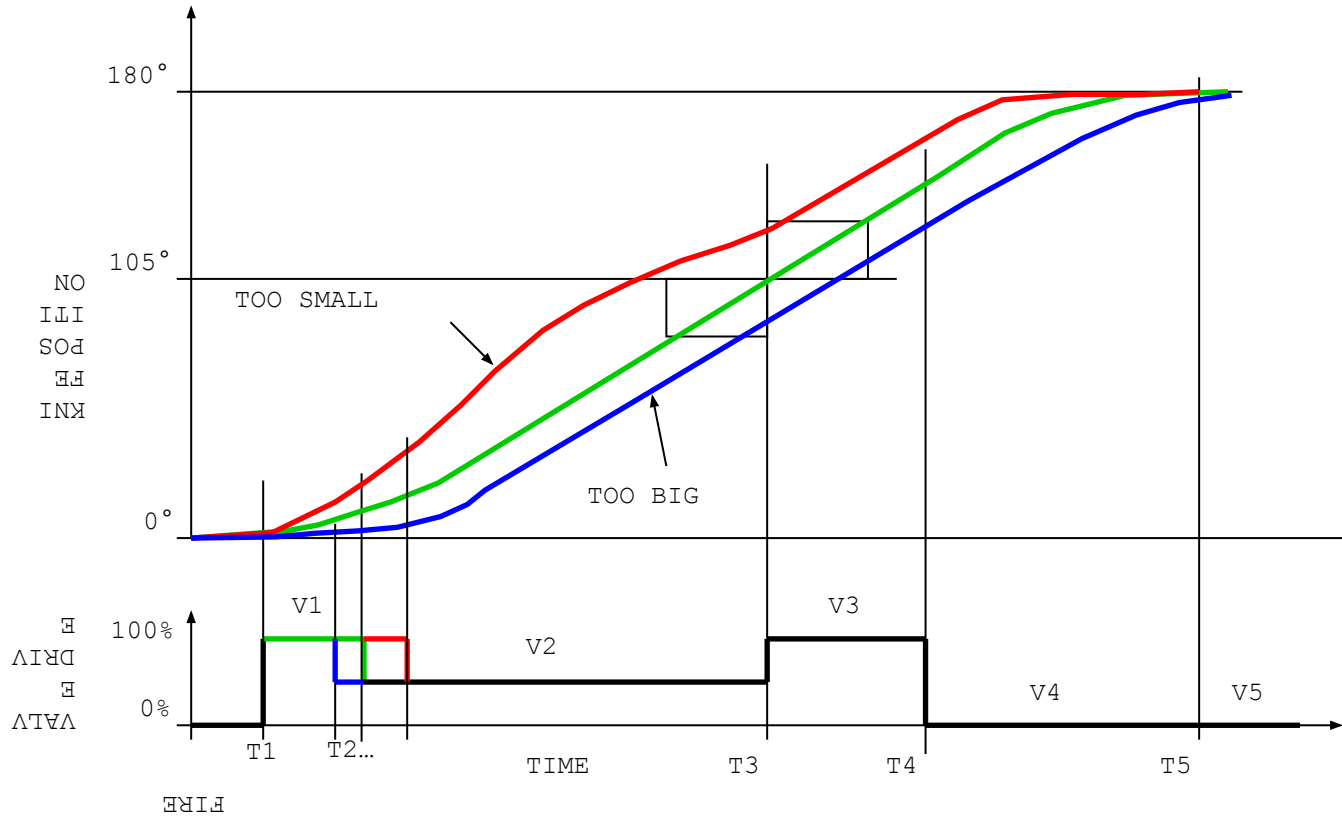
$$V2 = V_{\text{target}} / \text{Speed Factor(DEFAULT)}$$

$$\Delta V2 = \Delta V_{\text{target}} / \text{Speed Factor (AUTO TRACK)}$$

$$D_LSPFAC = \text{LEFT}$$

$$D_RSPFAC = \text{RIGHT}$$

ACCELERATION FACTOR

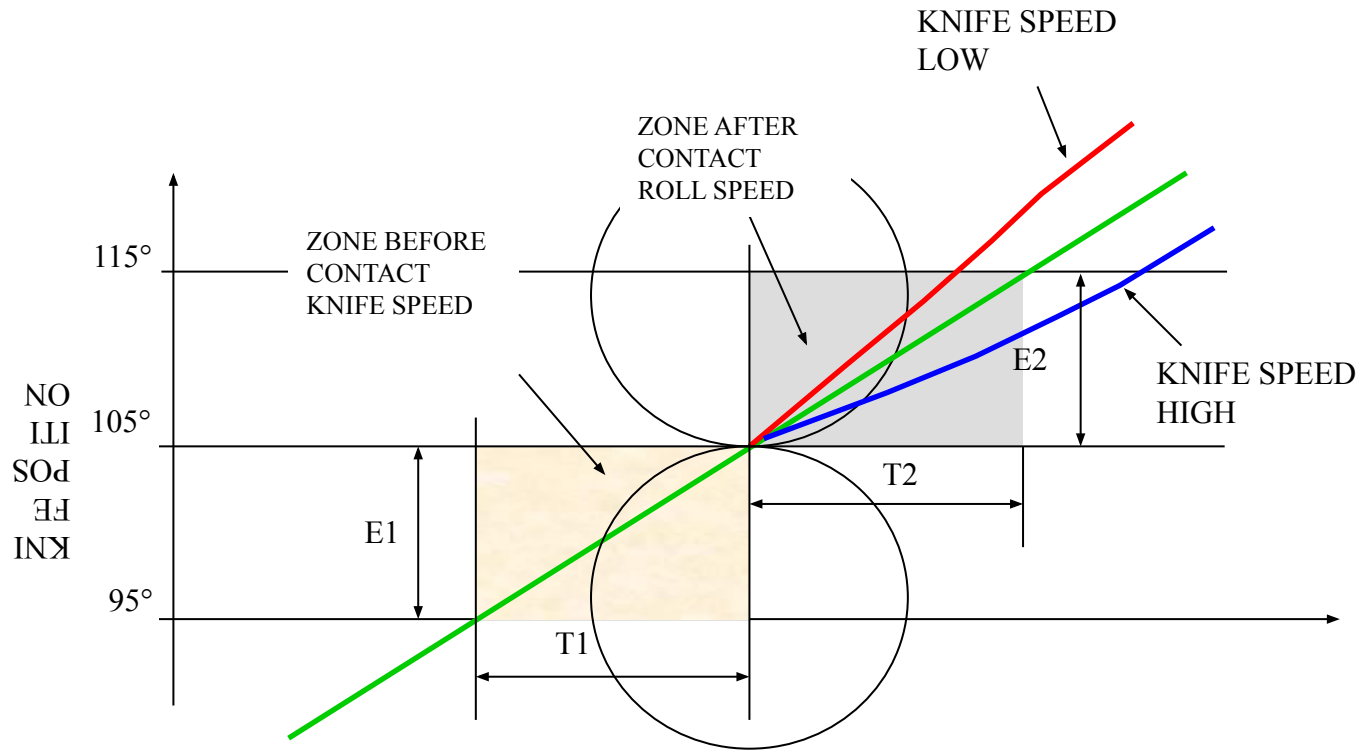


$$T2 - T1 = V_{\text{target}} / \text{Accel Factor(DEFAULT)}$$

$$\Delta(T2 - T1) = \Delta V_{\text{target}} / \text{Accel Factor(AUTO TRACK)}$$

D_LSPFAC = LEFT
D_RSPFAC = RIGHT

KNIFE/ROLL SPEED MEASURE

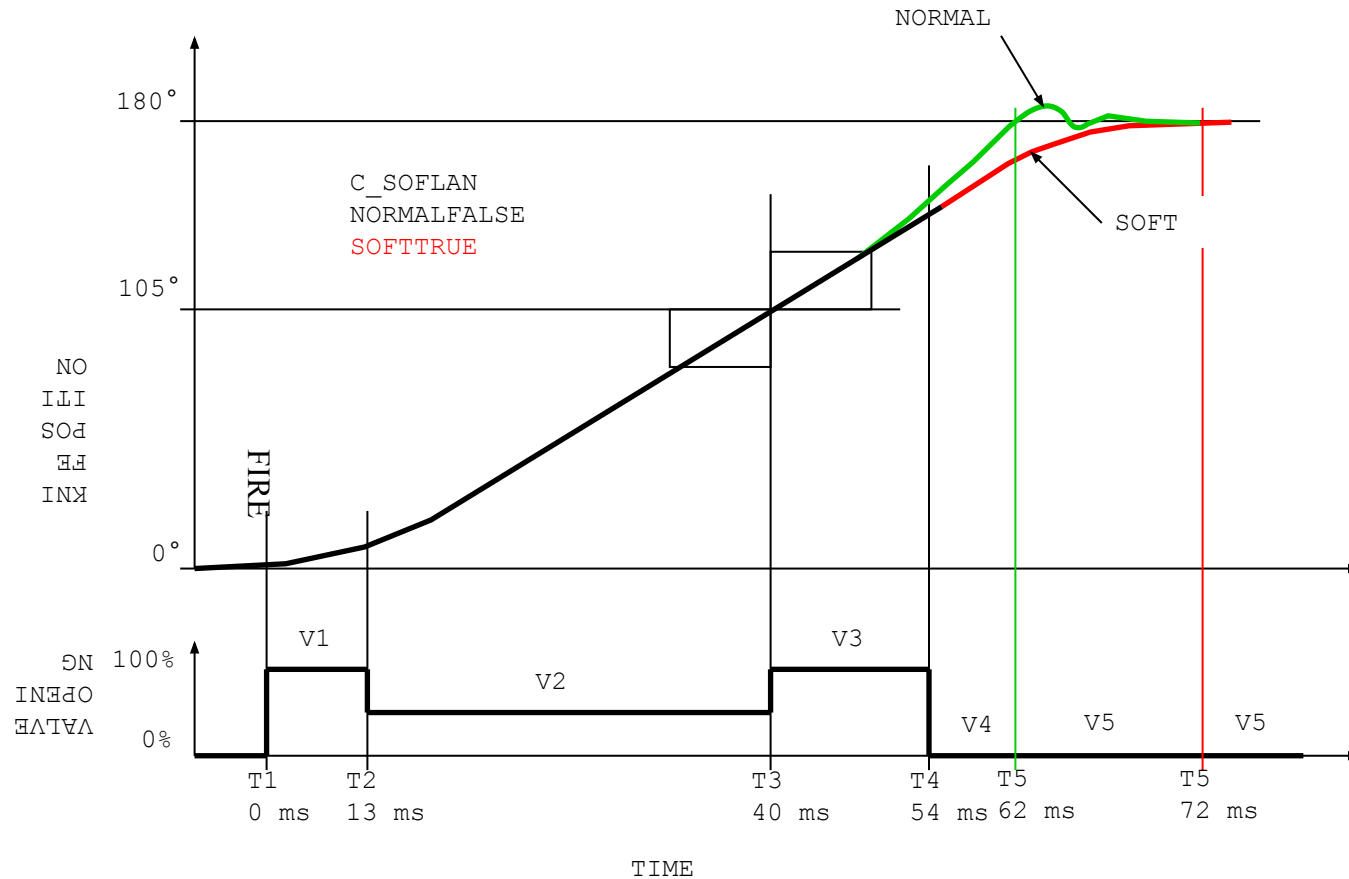


$$\text{Speed Before} = E1/T1 \cdot \text{Knife Diam} \cdot \Pi$$

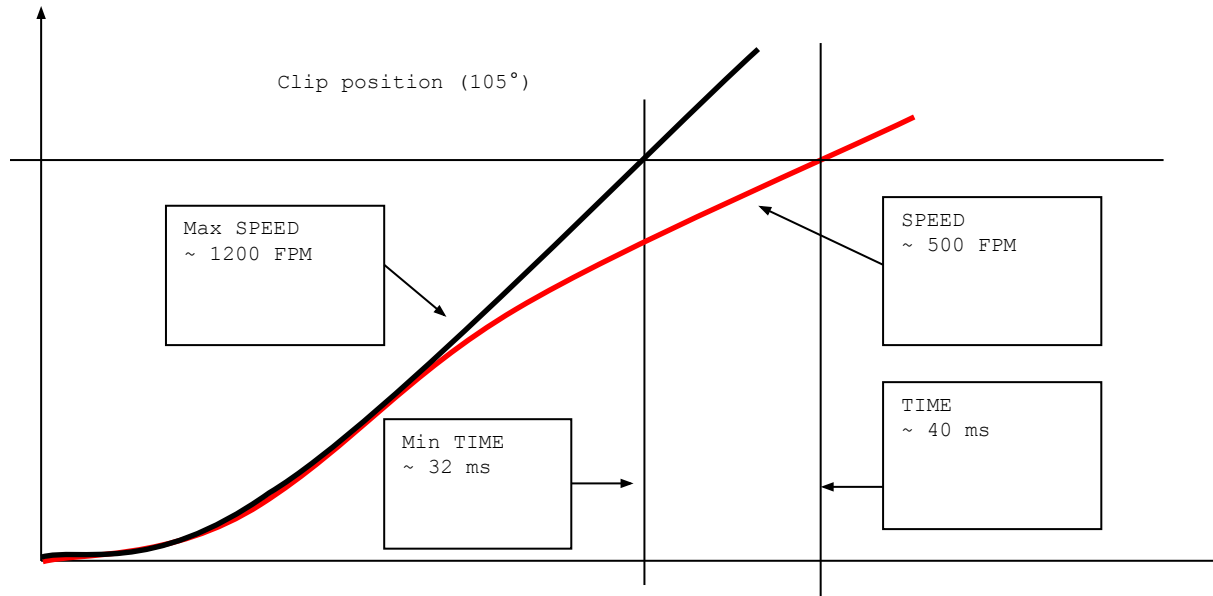
$$\text{Speed After} = E2/T2 \cdot \text{Knife Diam} \cdot \Pi$$



NORMAL/SOFT LANDING



RESPONSE VERSUS KNIFE SPEED





SECTION 4

OPERATION

***CLIPPER
CONSOLE***

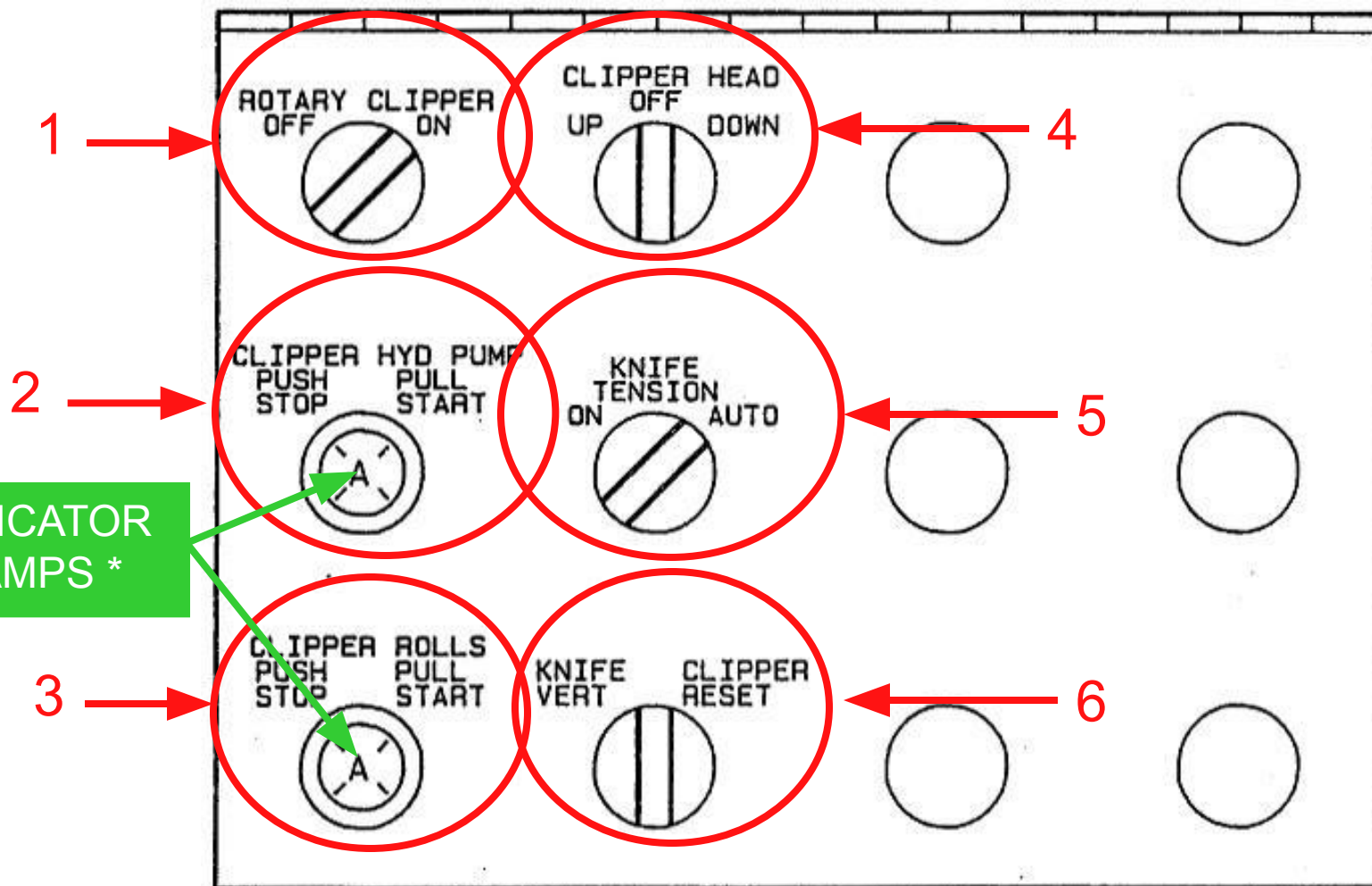
Operator's PB and SW console

CONTROLLER

Raute controller cabinet



CLIPPER CONSOLE LAYOUT

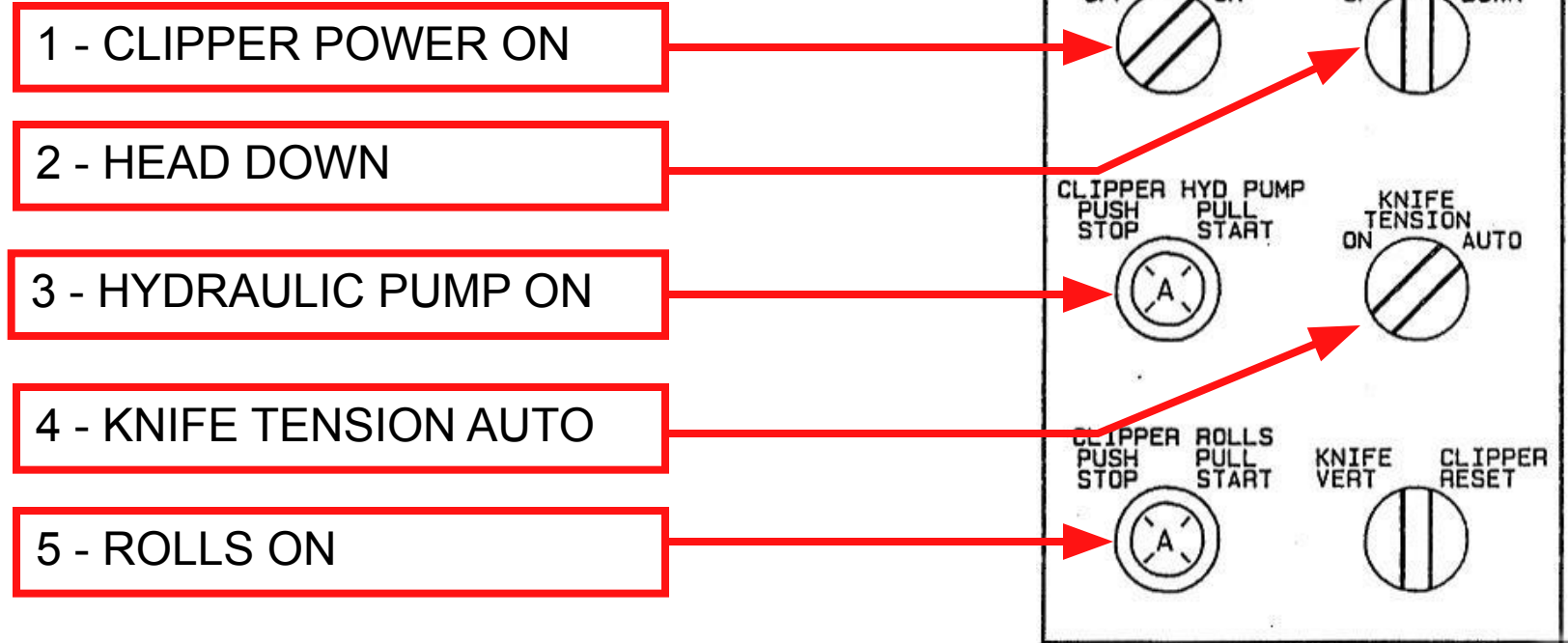


INDICATOR LAMPS *

*LAMPS BLINKING INDICATE FAULT



STARTUP SEQUENCE

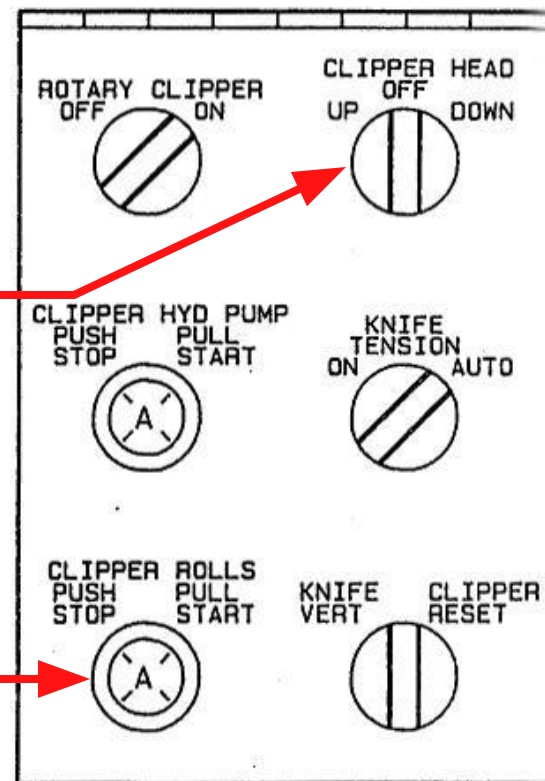




STOP TO CLEAR SEQUENCE

2 - HEAD UP

1 - ROLLS OFF



DO NO ENTER THE CLIPPER AREA!!

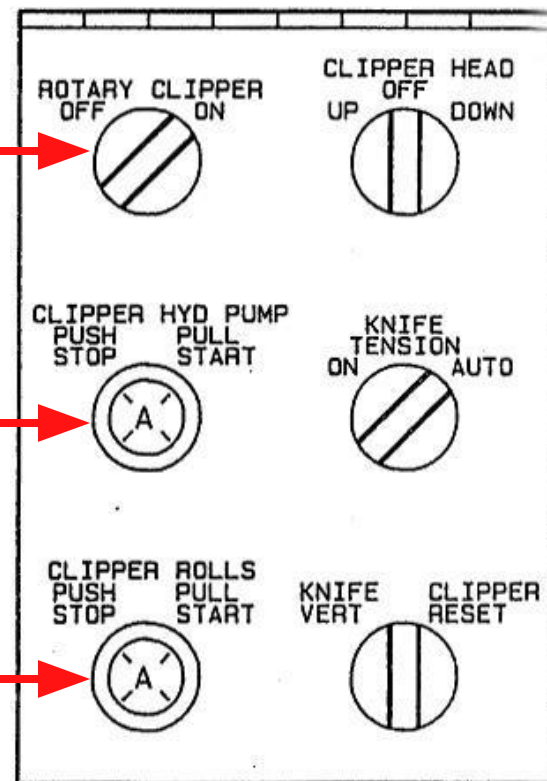


FULL STOP SEQUENCE

3 - CLIPPER POWER OFF

2 - HYDRAULIC PUMP OFF

1 - ROLLS OFF





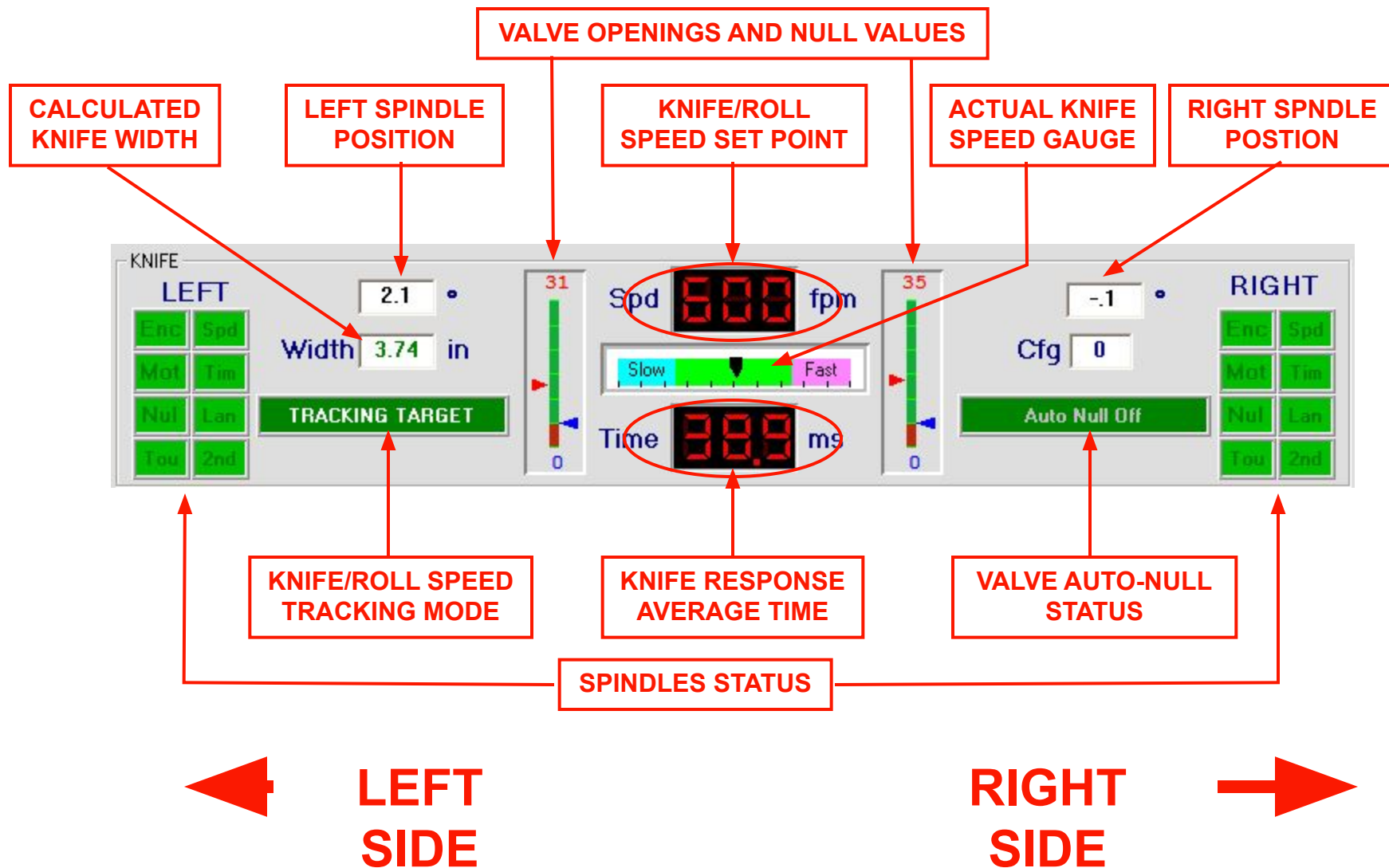
HMI - MAIN SCREEN

The screenshot displays the RAUTE Rotary Clipper HMI Main Screen. The interface is organized into several functional panels, each highlighted with a red box and labeled with an arrow:

- TITLE PANEL:** Located at the top left, it features the RAUTE logo.
- PROGRAM INFO:** Located at the top right, it displays the date and time (07/Nov/2006 10:32:15) and the HMI Target IP address (2.03.0008-10/12/2006 7:17:34).
- KNIFE PANEL:** Located in the upper middle section, it shows settings for the left and right knives, including width (3.7 in), speed (950 fpm), and time (0.00 ms). It also includes a status indicator for 'Auto NULL is OFF during clip cycle or when clipper is not READY'.
- ROLLS PANEL:** Located in the middle section, it displays 'Top' and 'Bottom' roll status, each with 'AUTO' and 'OK' buttons, and a 'GOOD' indicator.
- CLIPPER PANEL:** Located in the lower middle section, it shows 'OPERATION NORMAL' and a 'MS OK' status indicator.
- COMMAND PANEL:** Located at the bottom, it features three large buttons: a blue button, a cyan 'FIRE' button, and a green 'OK' button.
- MENU PANEL:** Located at the very bottom, it contains a row of navigation buttons: 'Setup', 'Diagnostics', 'Data Table', 'MIS', 'Moisture', and 'Exit'.

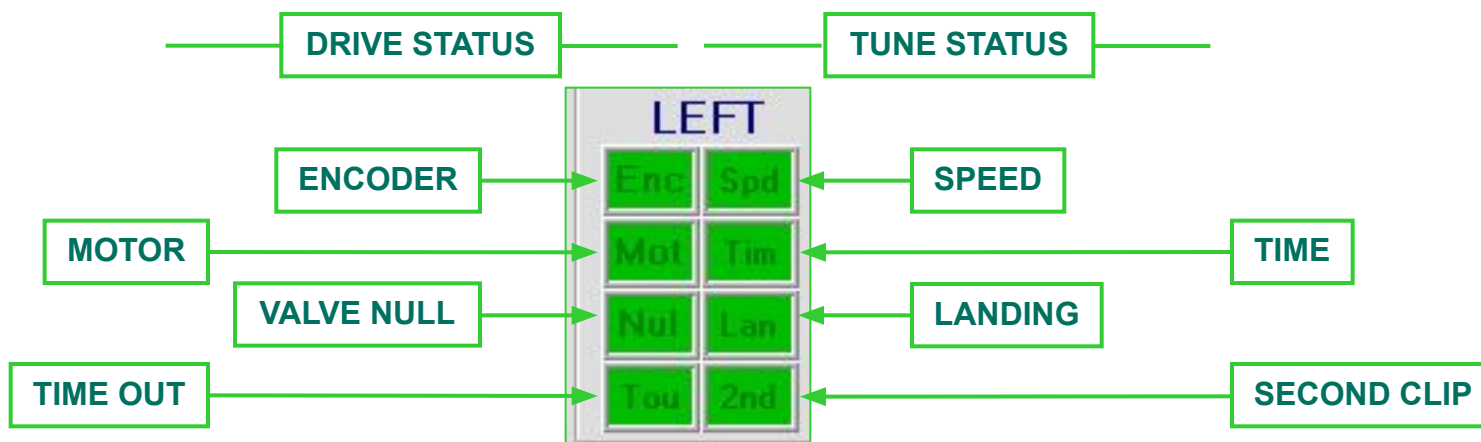


HMI MAIN SCREEN - KNIFE PANEL



MAIN SCREEN - KNIFE STATUS

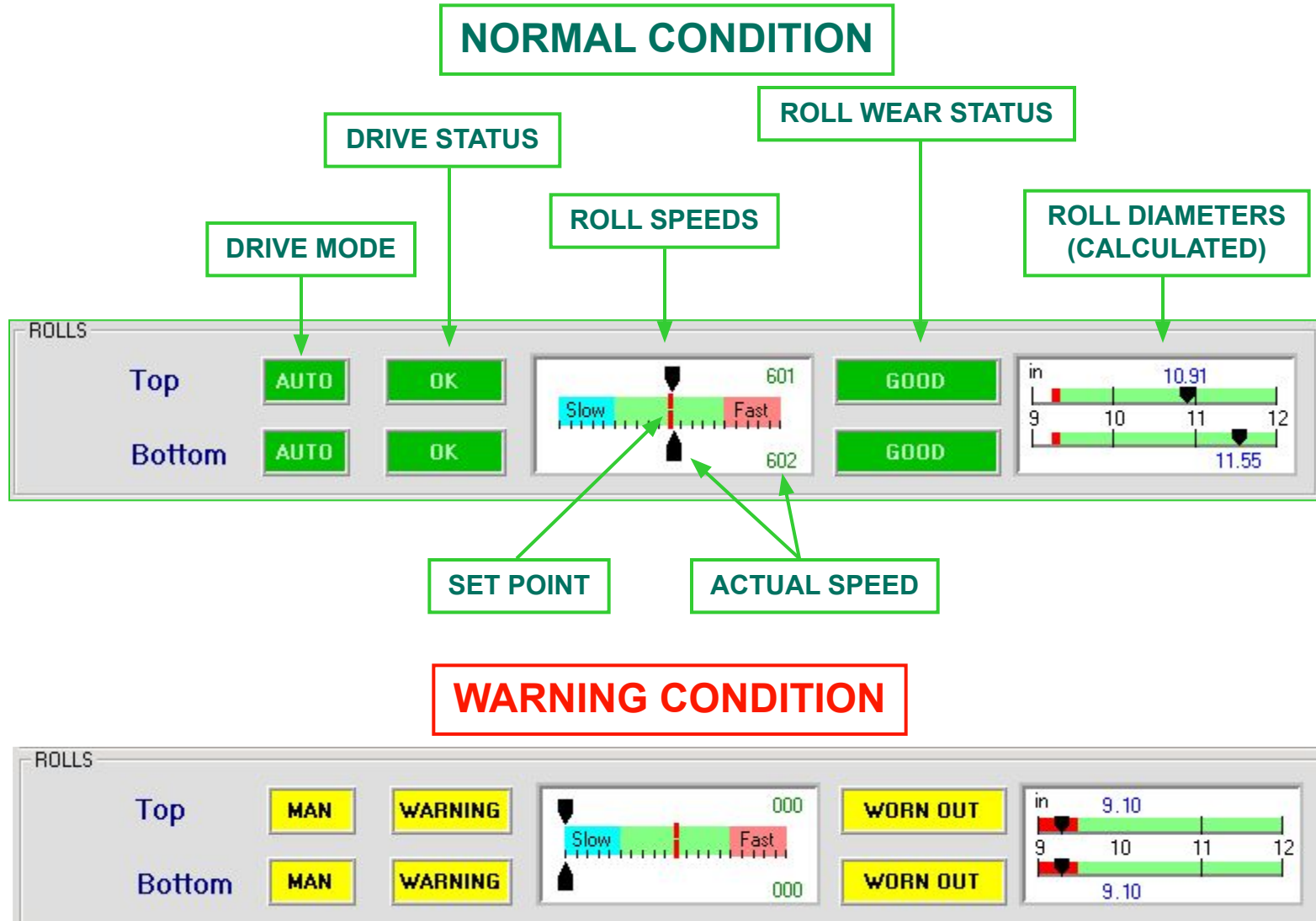
NORMAL CONDITION



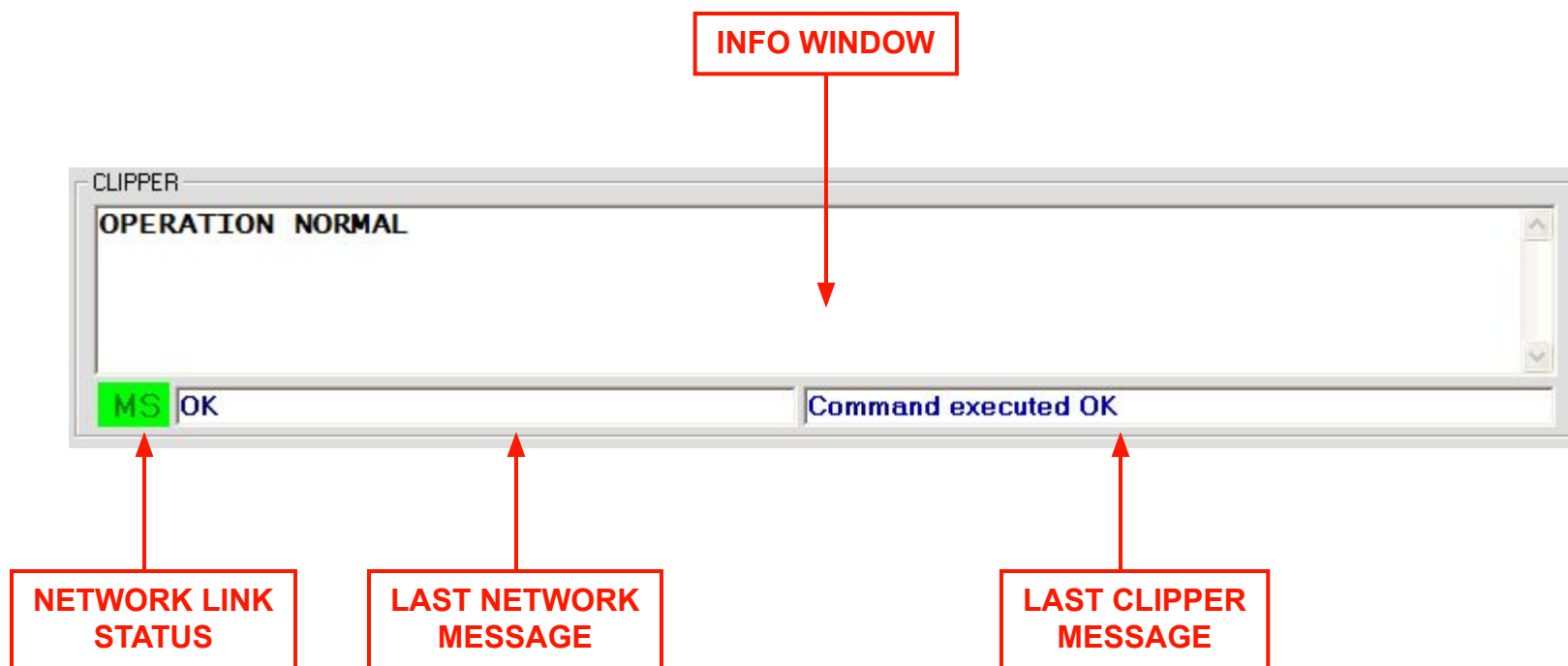
WARNING CONDITION



HMI MAIN SCREEN - ROLLS PANEL

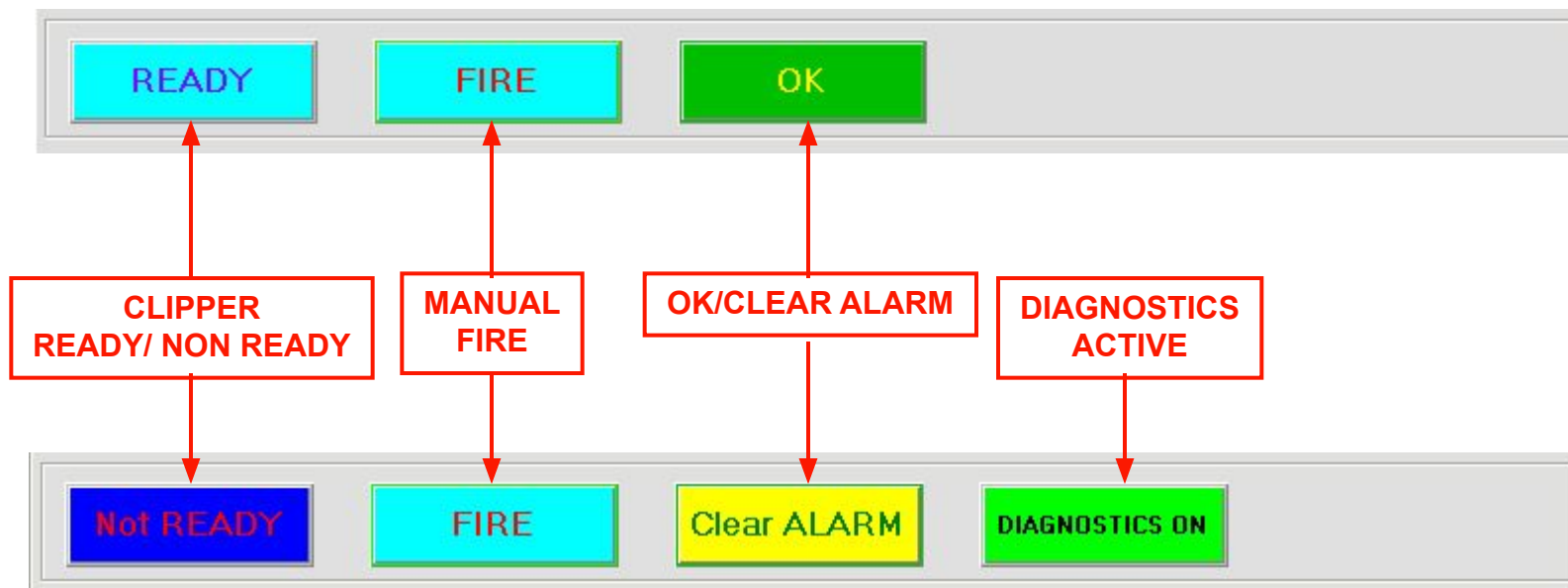


HMI MAIN SCREEN - INFO PANEL



HMI MAIN SCREEN - BUTTONS

COMMAND BUTTONS



MENU BUTTONS





HMI - KNIFE SETUP SCREEN

RAUTE ROTARY CLIPPER SETUP Raute 09/Jun/2006 08:28:44

LEFT	Before CLIP	After CLIP	Targets	After Clip	Before CLIP	RIGHT
Spd	604	594	600	595	603	fpm
Land	0	2			1	AVG
70 ms	3736	Time	390	390	390	ms
						ms

Left				Right			
Spd fac	100	T1 / V1	0 2000	Spd fac	100	T1 / V1	0 2000
Acc fac	350	T2 / V2	171 641	Acc fac	350	T2 / V2	171 715
Dec fac	150	T3 / V3	400 2000	Dec Fac	150	T3 / V3	400 2000
Toff	35	T4 / V4	434 0	Toff	35	T4 / V4	443 0
Max Voff	100	T5 / V5	702 0	Max Voff	100	T5 / V5	702 0
Voff	0	T6 / V6	200 756	Voff	0	T6 / V6	200 1435
Speed OK	Land OK	T7 / V7	682 700	Speed OK	Land OK	T7 / V7	682 700
Time OK	2nd clip	T8 / V8	292 28	Time OK	2nd clip OK	T8 / V8	292 28

Self Tune & Auto Tracking					Auxiliary Commands		
SPEED	TIME	LANDING	2ND CLIP	All	Knife width	Chop delay	2nd clip delay
AUTO	AUTO	AUTO	AUTO		3700	1000	50
Speed	Time	Land	2nd clip	Abort	.001"	CHOP OFF	2nd clip OFF

Link OK		Clipper Command executed OK	
Network	MS	Fire	Rolls
		Graphics	Defaults
		Main	

ACTUAL VALUES

CLIP PARAMETERS

TUNE CONTROLS

AUX. CTRLS.

COMMANDBUTTONS



HMI - ROLLS SETUP SCREEN

09/Jun/2006 08:29:18

RAUTE ROTARY CLIPPER - ROLLS SETUP

Raute

TOP ROLL

D/A 1929

VARIABLE FREQUENCY DRIVE

mVin	rpm
min 0	1650
max 10000	2130

DRIVE OK

ROLL OK

MOTOR

GEAR 0.001

5060

N1 36

N2 71

Dia 0.001"

6000

Enc2 1000

Set Point 600 fpm

Current Values 600 fpm

211 min-1

1089 in

600

AUTO

Loop Closed

BOTTOM ROLL

D/A 1449

VARIABLE FREQUENCY DRIVE

mVin	rpm
min 0	1650
max 10000	2130

DRIVE OK

ROLL OK

MOTOR

GEAR 0.001

5060

N1 36

N2 71

Dia 0.001"

6000

Enc2 1000

Set Point 600 fpm

Current Values 60 fpm

199 min-1

1154 in

601

AUTO

Loop Closed

Link OK

Clipper Command executed OK

Network MS

ENABLED

OK

Setup

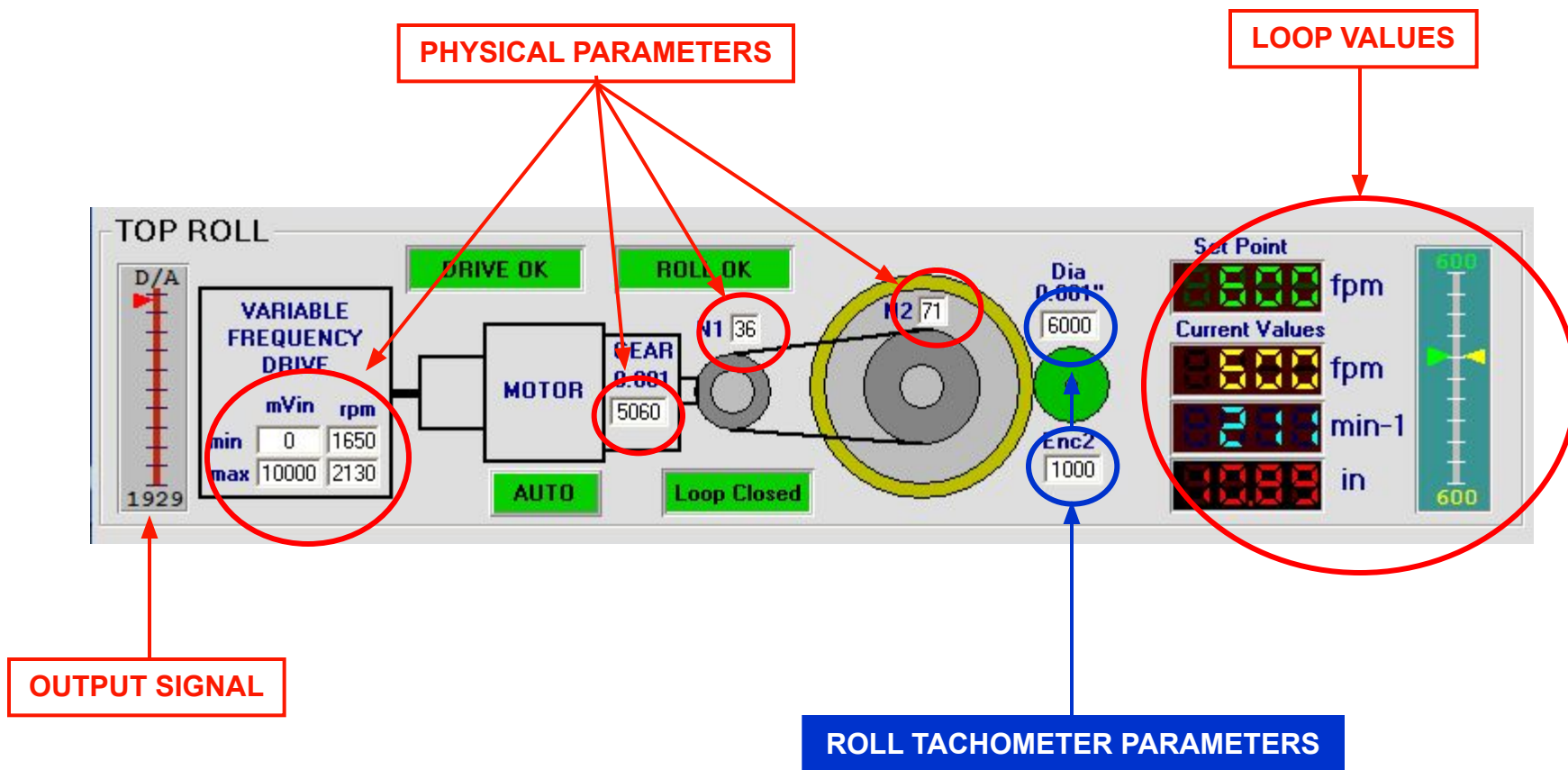
TOP ROLL

BOTTOM ROLL

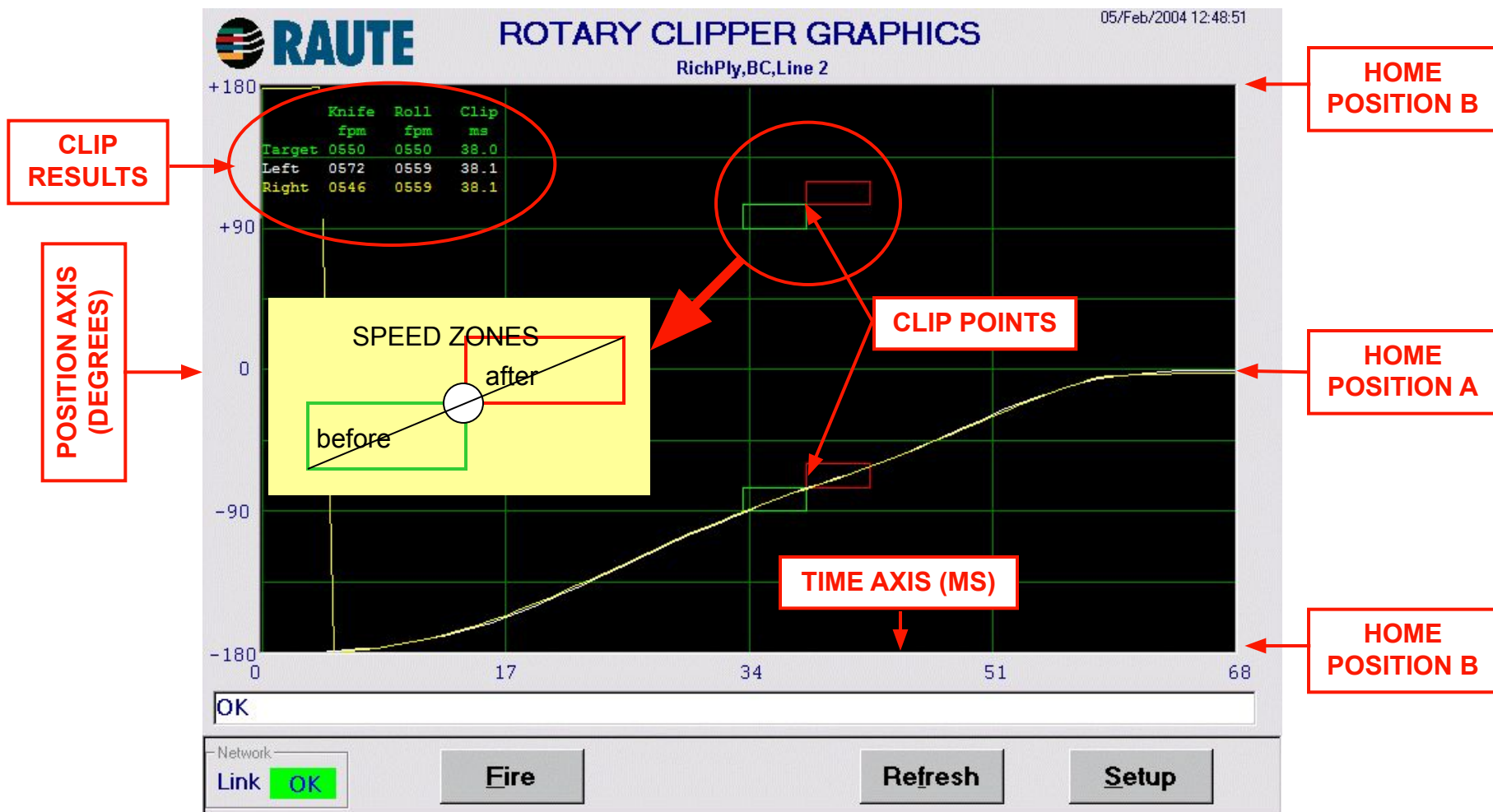
BUTTONS

BACK TO PREVIOUS SCREEN

HMI - TOP ROLL SETUP PANEL



HMI - GRAPHICS SCREEN





HMI - DIAGNOSTICS SCREEN

RAUTE **CLIPPER DIAGNOSTICS** 14/Nov/2002 09:02:01
Coastland Wood Ind, Nanaimo

Select Test

Encoder Test

Motor Test

Vertical

Zero

Move To

TEST SELECTOR

Side **Left ON** **Right ON** Selected when blinking

Encoder + 00 + 00 Degrees

Bits (11..0) [Bar Graphs] Green when OK

Speed + 0000 + 0000 fpm

Valve + 0000 + 0000 %

Auto Null **OFF** **DISABLED** **DIAGNOSTICS OFF**

Maximum Aperture -100 -50 0 50 100 % 20

Ramp time 5 10 15 20 25 30 s 5

None **Execute test** **Reset Test** **Big Numbers**

Clipper Response String-00

Link Message ERR= 1. Tag does not exist

Network Link **OK**

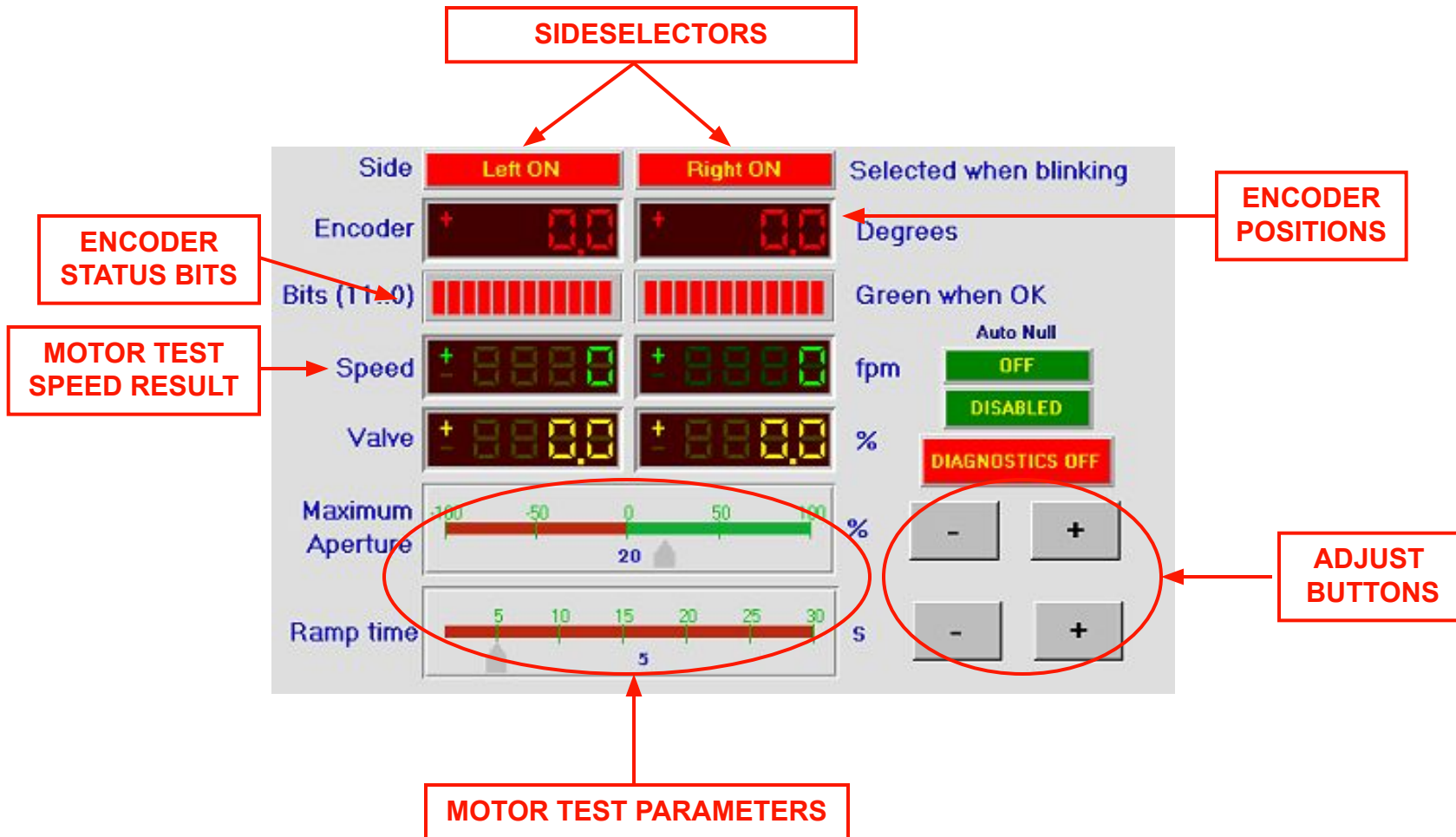
MOVE TO POSITION

VALVE NULL

BUTTONS

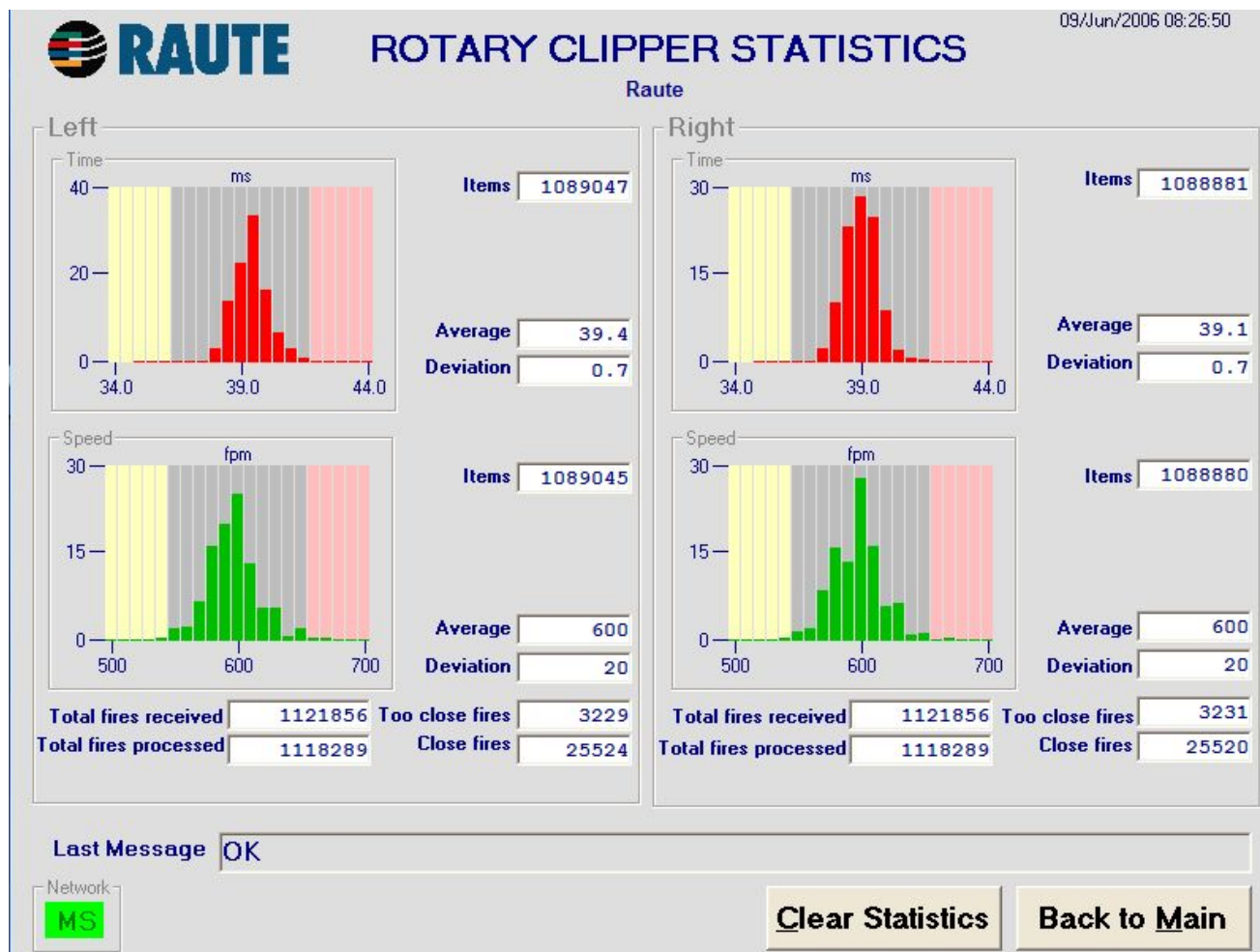
Back to Main

HMI - DIAGNOSTICS SCREEN



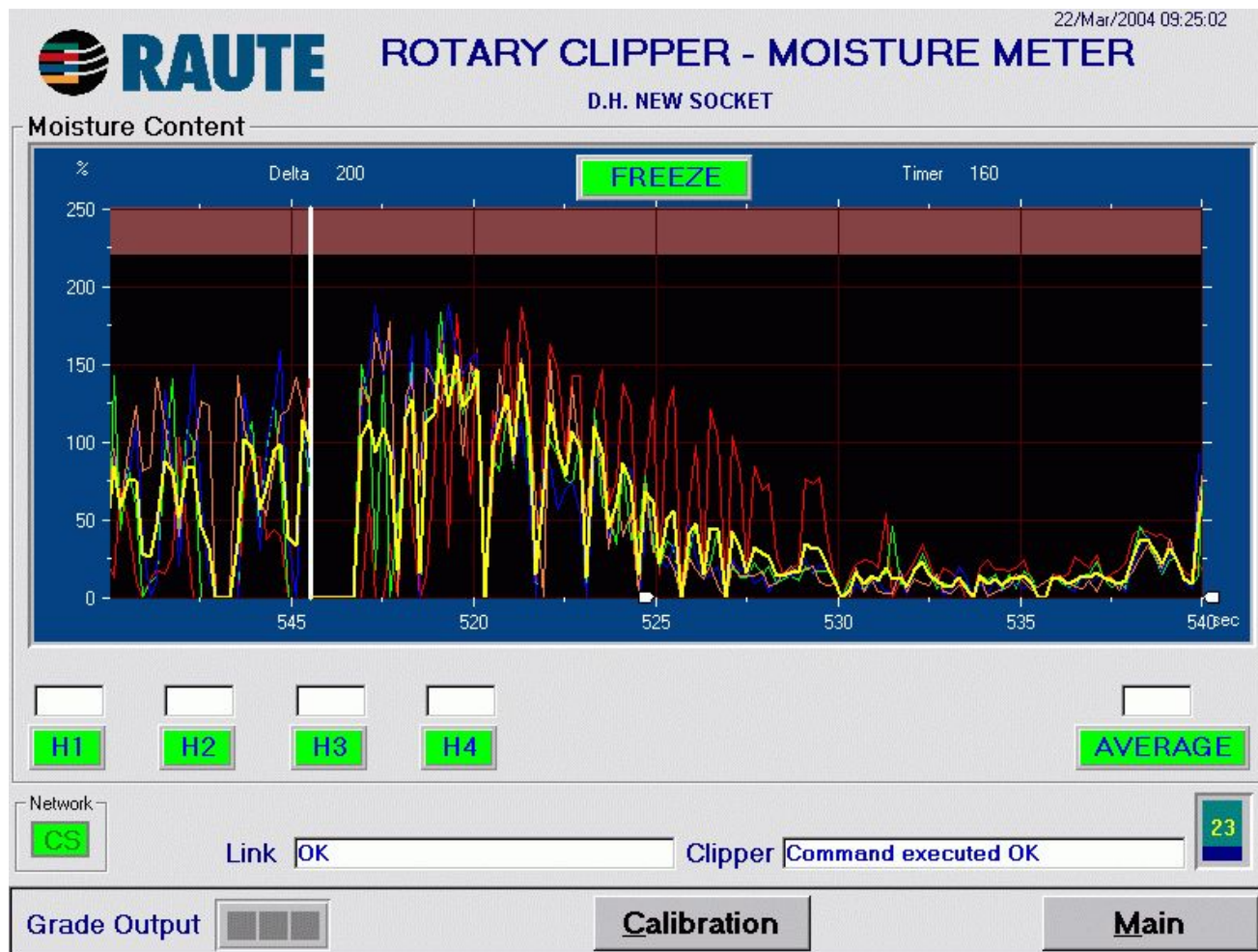


HMI - MIS SCREEN






HMI - MOISTURE SCREEN





HMI - MOISTURE SETUP SCREEN

11/Jun/2003 09:21:57



RC - MOISTURE METER CALIBRATION

RAUTE LTD. R&D

Moisture Heads Calibration

Head	Low	High	Cal. Parameters	Current	A/D	Input
	<input type="text" value="0"/>	<input type="text" value="220"/>	Factor	Reading	Reading	Volts
1	<input type="button" value="READ"/>	<input type="text" value="??"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.000"/>
2	<input type="button" value="READ"/>	<input type="text" value="??"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.000"/>
3	<input type="button" value="READ"/>	<input type="text" value="??"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.000"/>
4	<input type="button" value="READ"/>	<input type="text" value="??"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.000"/>
5	<input type="button" value="READ"/>	<input type="text" value="??"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.000"/>
6	<input type="button" value="READ"/>	<input type="text" value="??"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.000"/>
7	<input type="button" value="READ"/>	<input type="text" value="??"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.000"/>
8	<input type="button" value="READ"/>	<input type="text" value="??"/>	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0.000"/>

Grading

Grading Limits

Min %MC

Max %MC

Avg %MC

Grade

Network

Link Link Clipper



SECTION 5

MAINTENANCE

QUICK CHECKS

Roll wear
Servo, Spindles RPM
Filters
Shafts and bearings

HYDRAULIC SETUP

Adjusting the hydraulic pressures

ROLL ALIGNMENT

Vertical alignment
Horizontal alignment

ROLL SPEED SETUP

Match roll speed to knife speed

KNIFE HANDLING

Removal/Installation
Setup

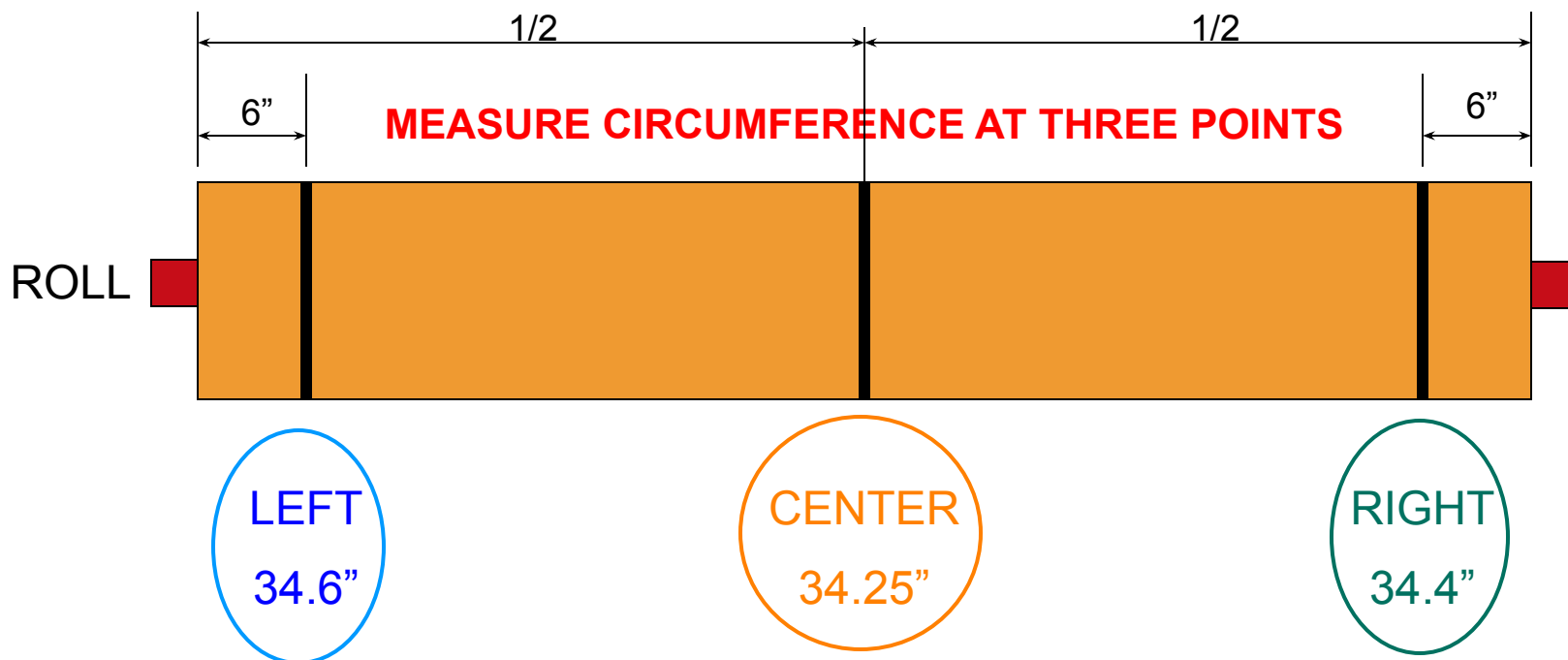
ENCODERS SETUP

General procedure
Only one spindle removed
Encoder replacement



ROLL WEAR & MISALIGNMENT

CLIPPER MUST BE LOCKED OUT FOR THIS PROCEDURE!



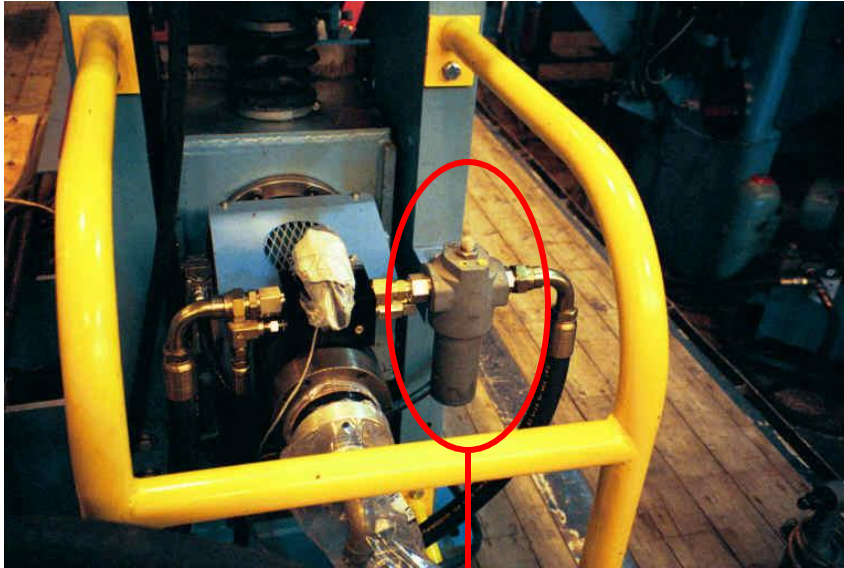
$$\text{AVERAGE OF LEFT/RIGHT} = (34.6" + 34.4)/2 = 34.5"$$

$$\text{ROLL WEAR (L,R - CENTER)} = 34.5" - 34.25 = 0.25"$$

$$\text{ROLL VERT. MISSALIGNMENT (L-R)} = 34.6" - 34.4 = 0.2"$$

EXAMPLE VALUES !

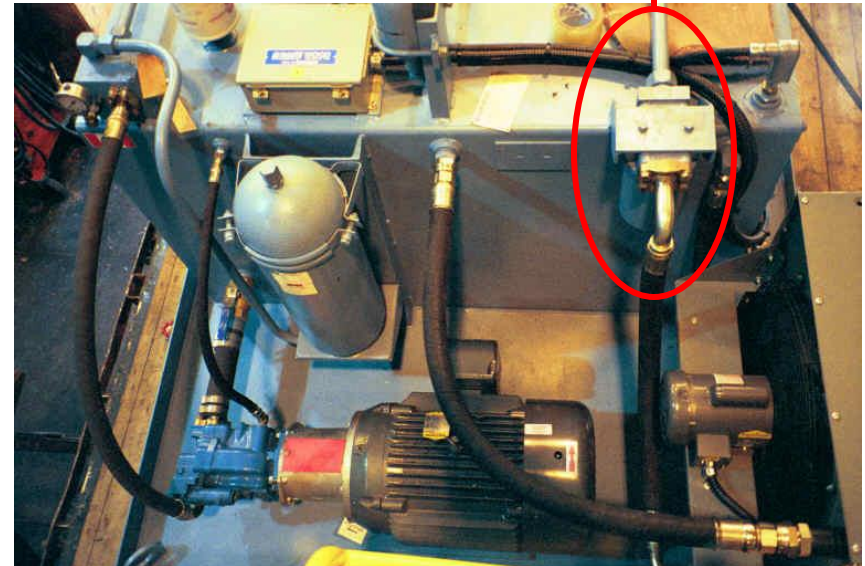
OIL FILTERS, CLASSIC CLIPPER



**REPLACE FILTERS
EVERY 3 MONTHS**

LOW PRESSURE FILTER

**HIGH PRESSURE FILTERS
(ONE PER SPINDLE) ***

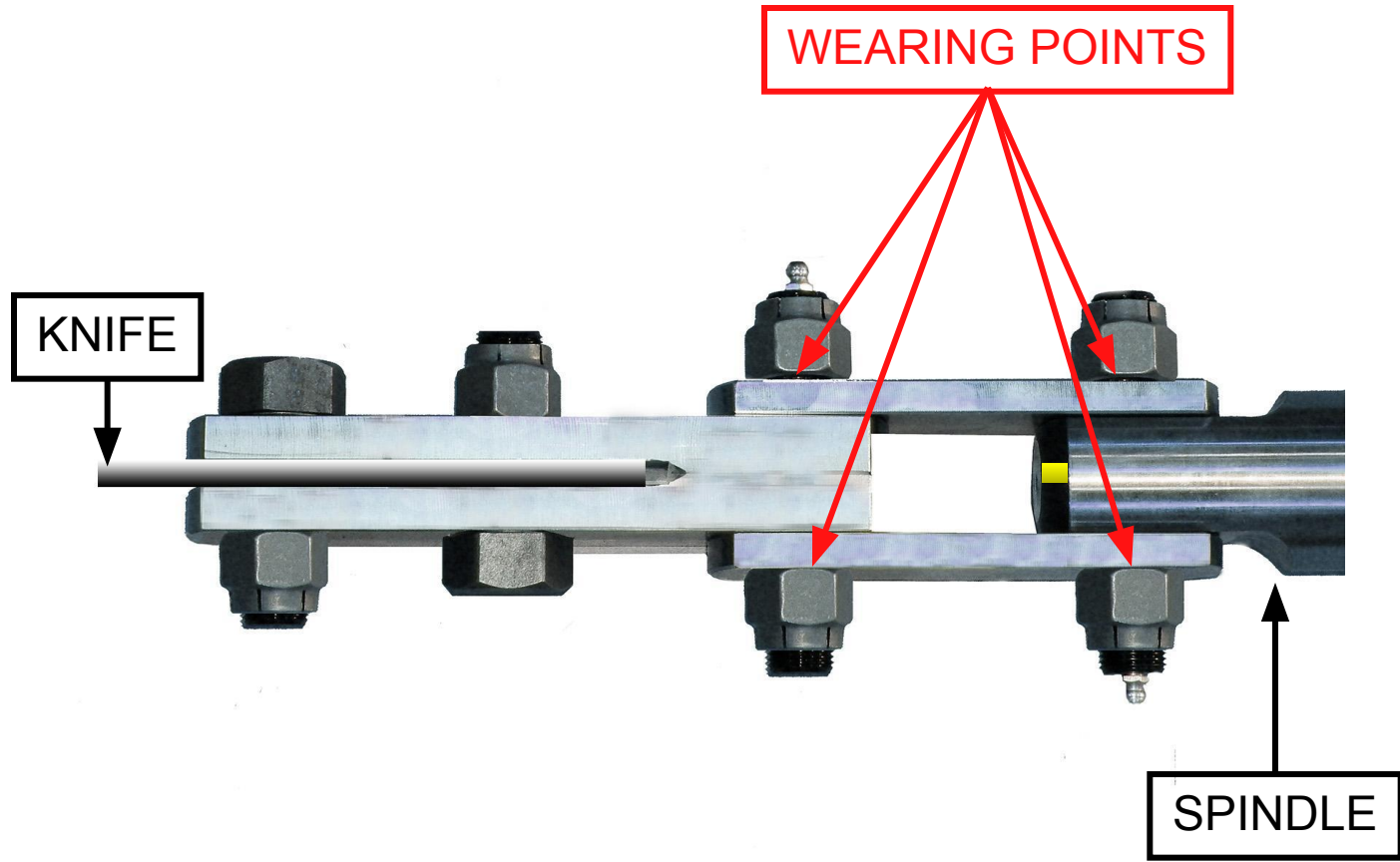


* Not present in upgraded

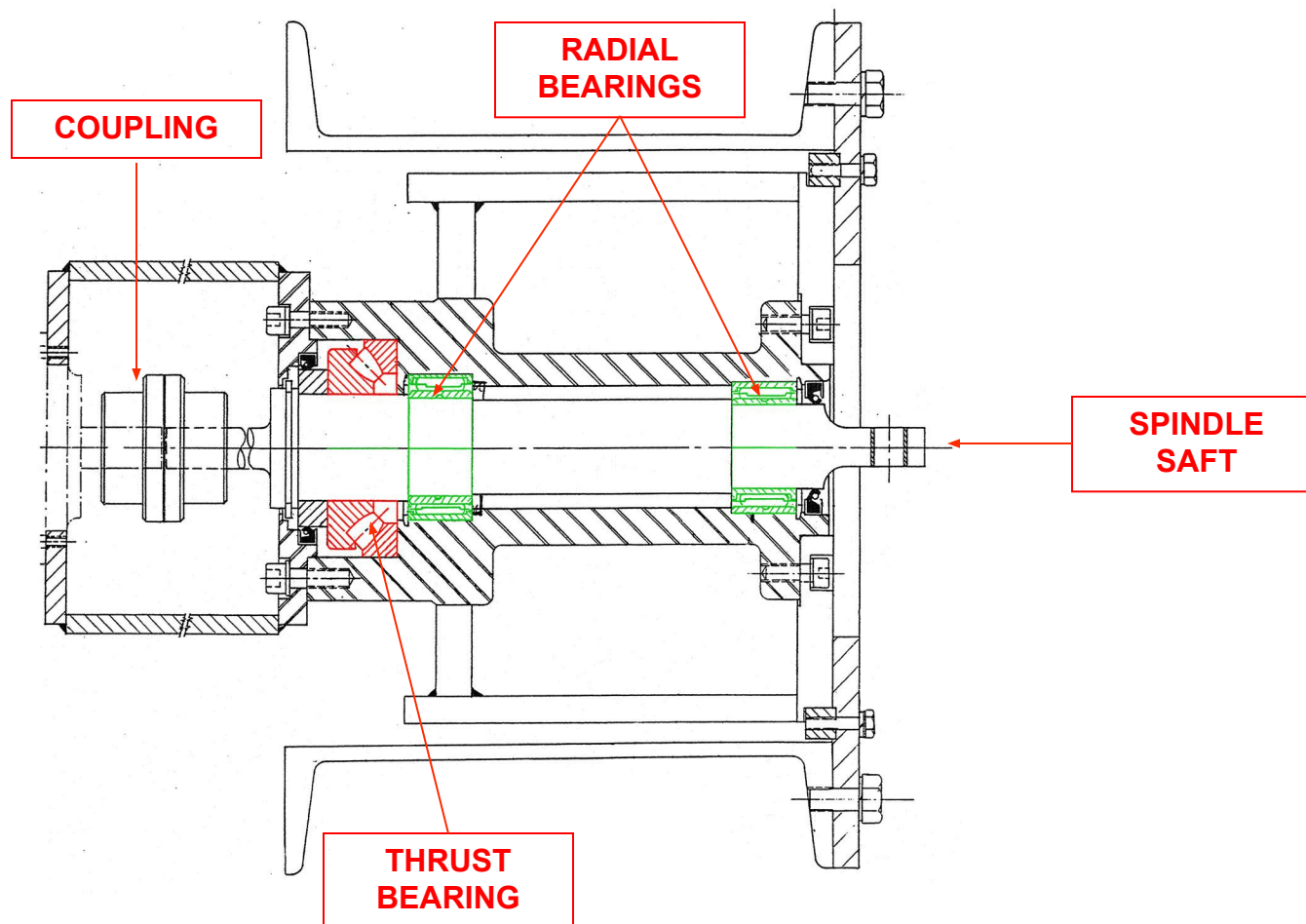
clipper



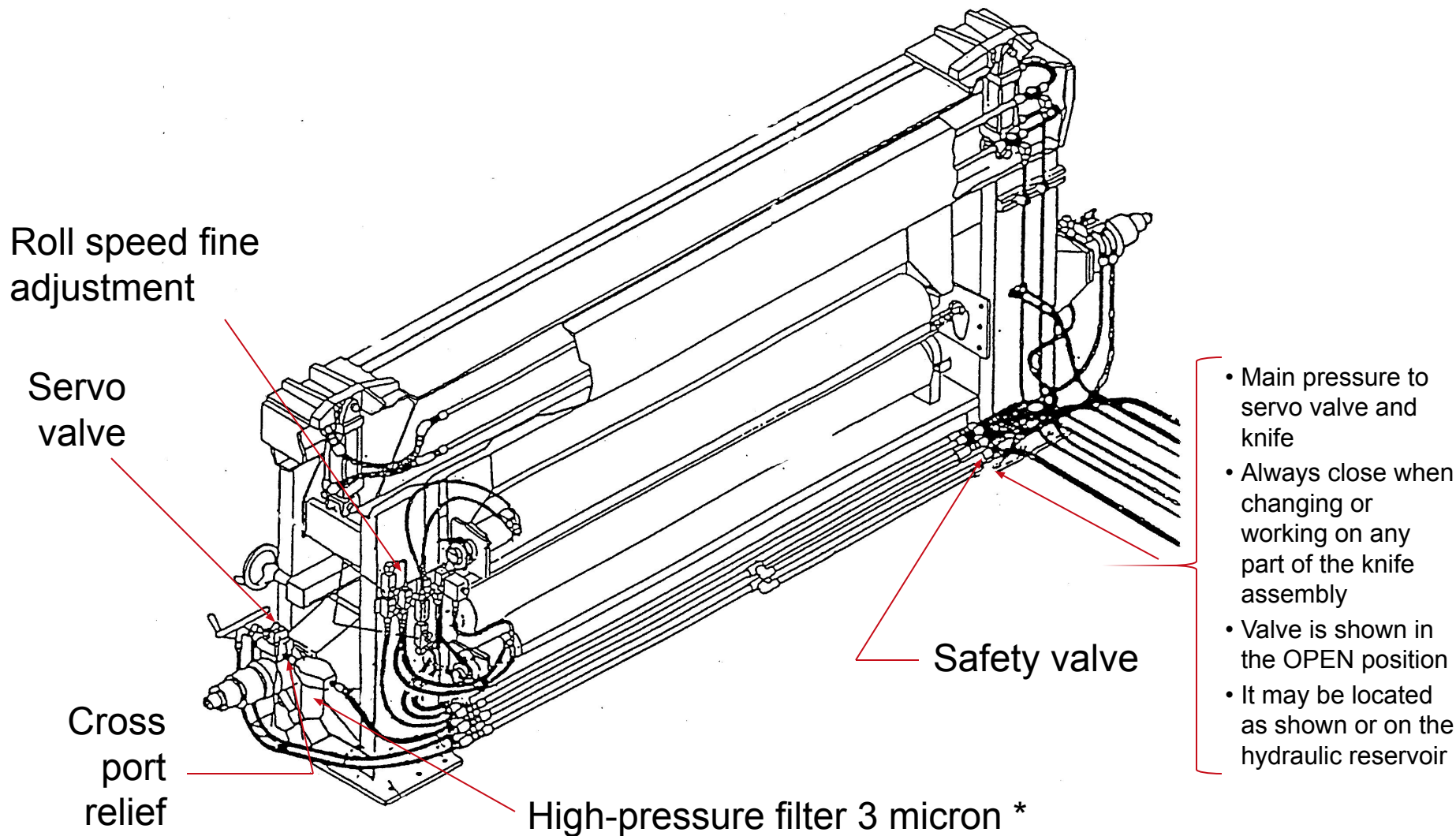
SPINDLES TOGGLES



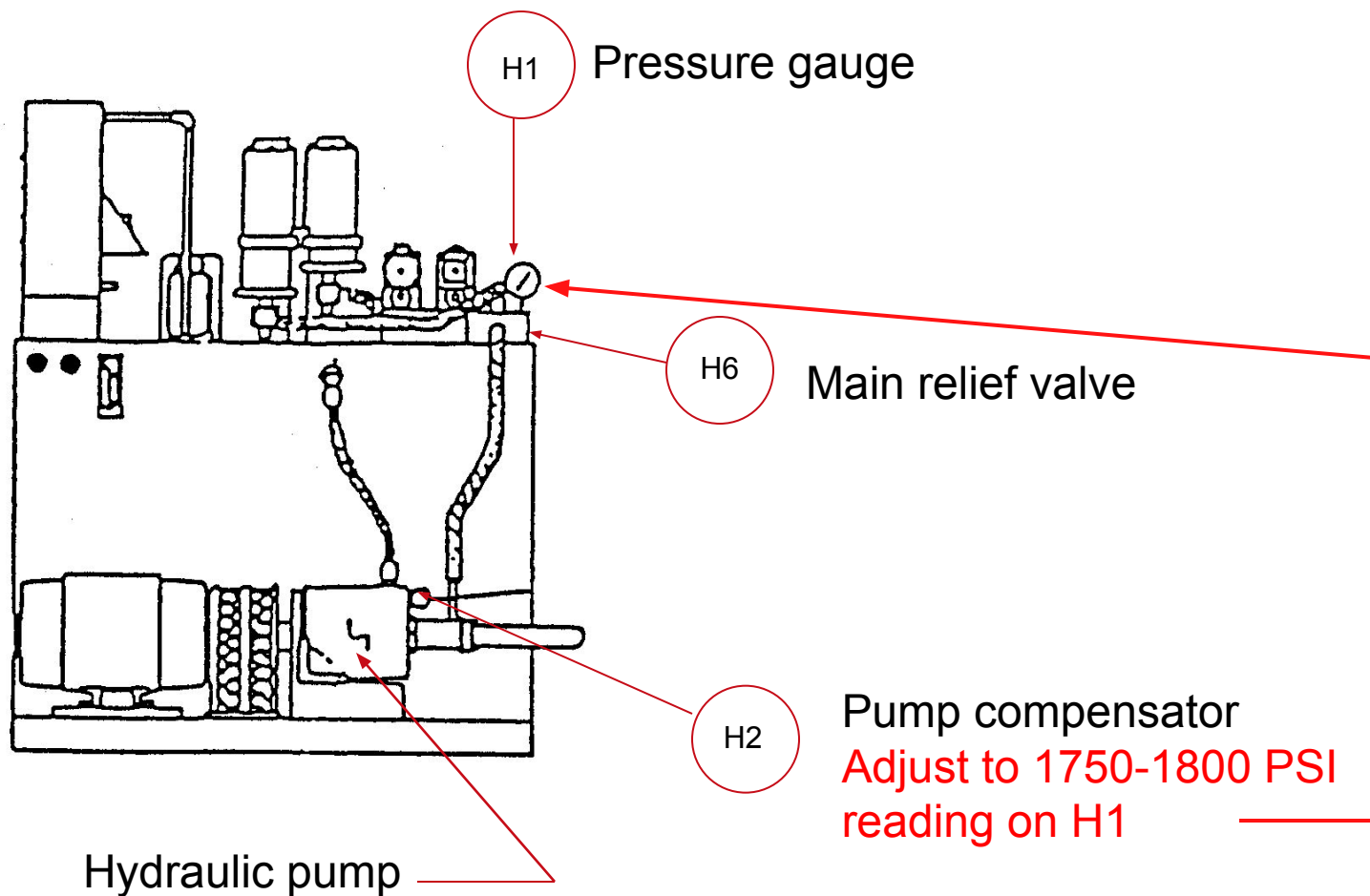
SPINDLES BUSHINGS



HYDRAULICS SETUP - 1



HYDRAULICS SETUP - 2





HYDRAULICS SETUP - 3

Knife tension
pressure valve

Adjust to 550-600 PSI

Head UP/Down
pressure valve

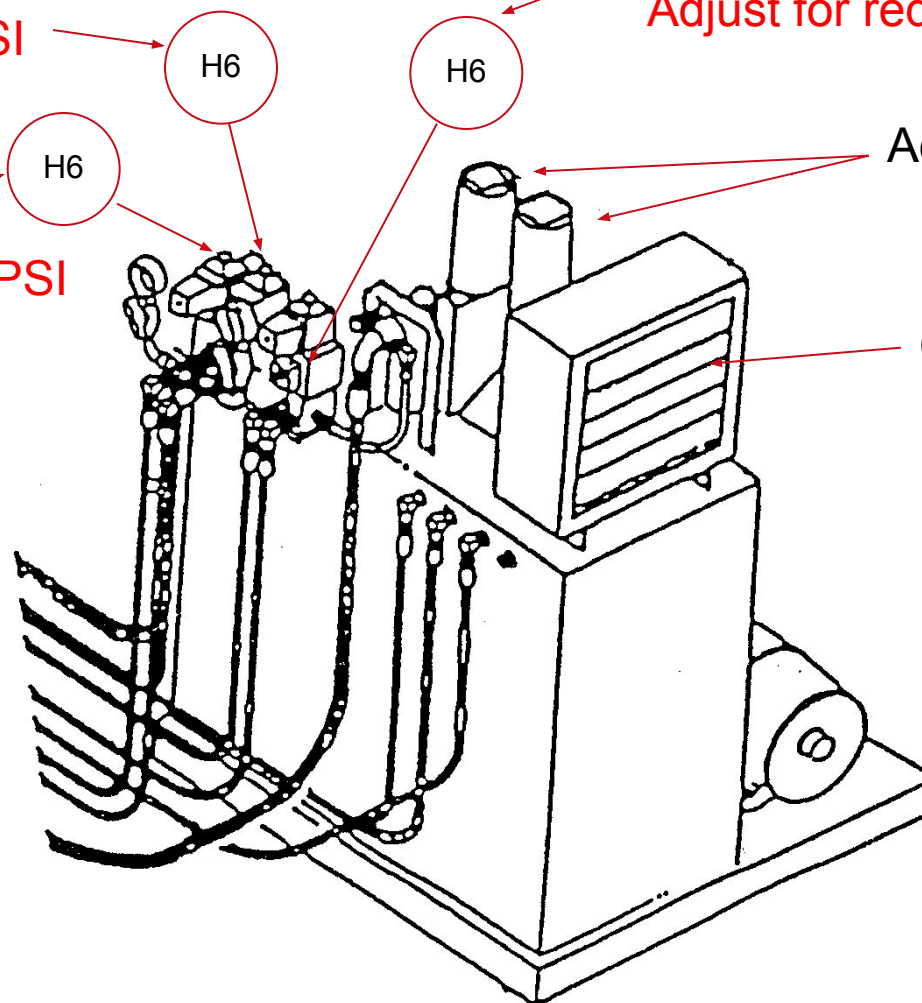
Adjust to 900-1000 PSI

Main flow control for rolls

Adjust for required roll speed

Accumulators

Cooling fan





ROLL ALIGNMENT PROCEDURE

ROLL ALIGNMENT TOOL SET *



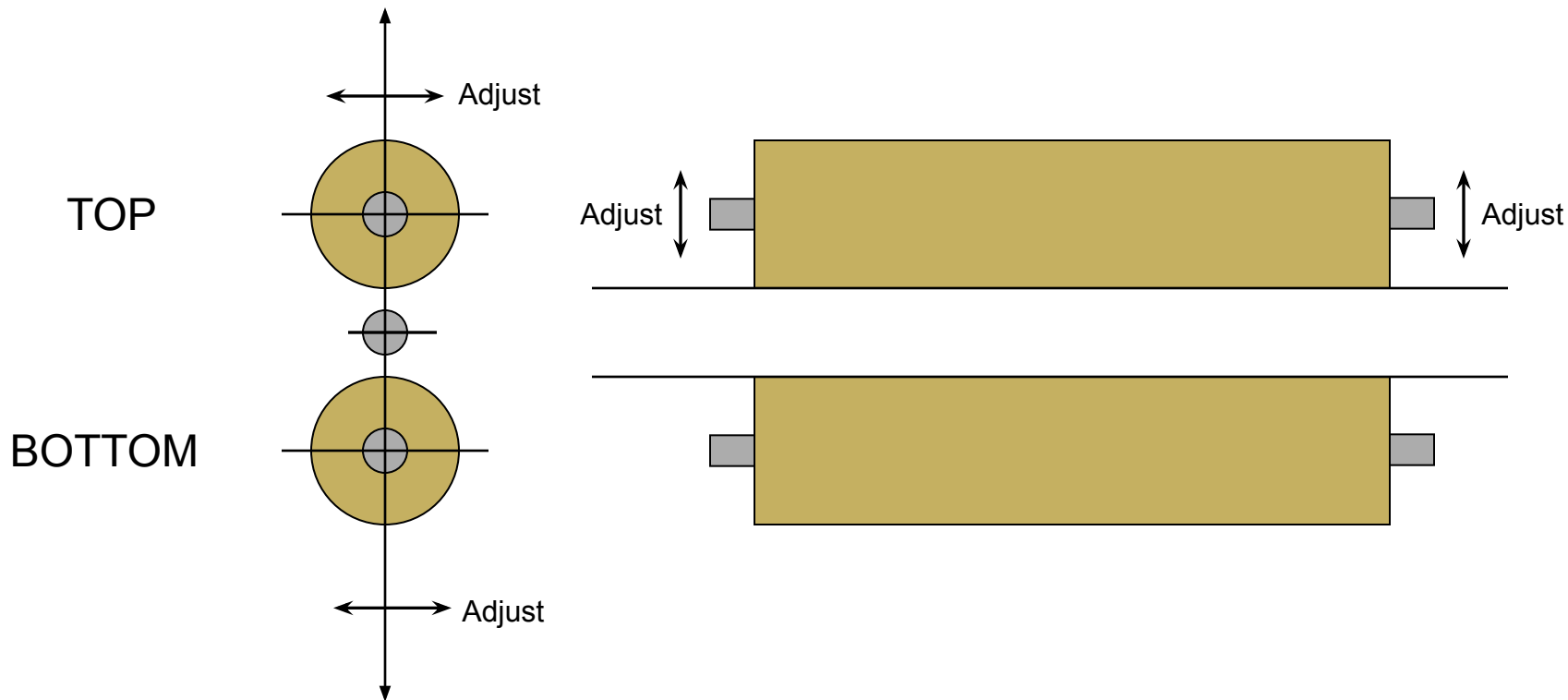
TAIL END T-BAR

SLEEVE

DRIVE END T-BAR

* NOTE: There is a different set of T-bars for the clipper with top offset roll

ROLL ALIGNMENT - GOALS



VERTICAL ALIGNMENT

Rolls and spindle axis must be aligned

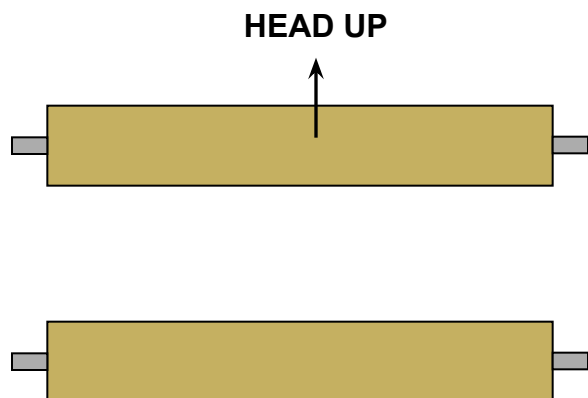
HORIZONTAL ALIGNMENT

Rolls must be parallel



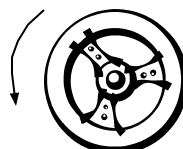
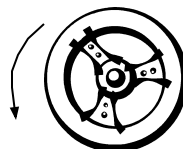
ROLL ALIGNMENT - SETUP

1 - Head UP



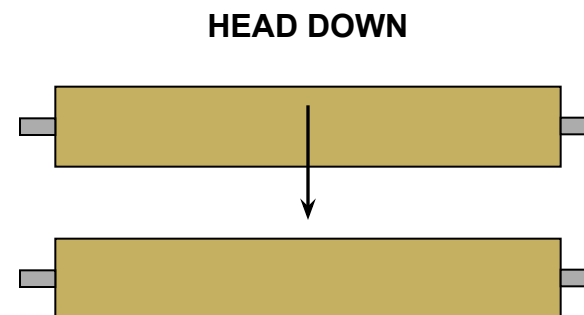
2 - Raise rolls & knife

Roll UP
(10-15 turns)



Knife UP
(10-15 turns)

3 - Head DOWN

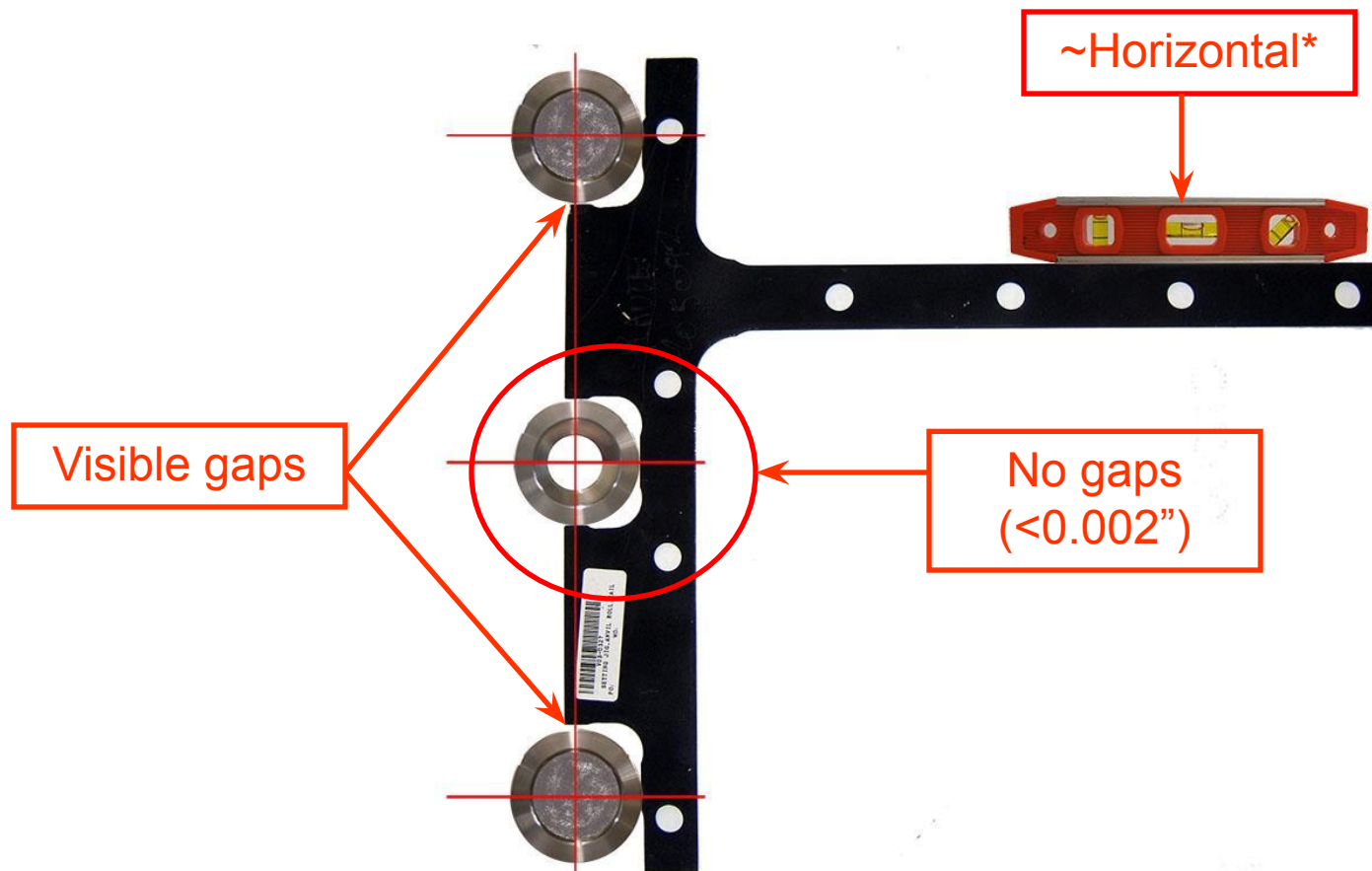


HYDRAULICS ON!



VERTICAL ROLL ALIGNMENT - 1

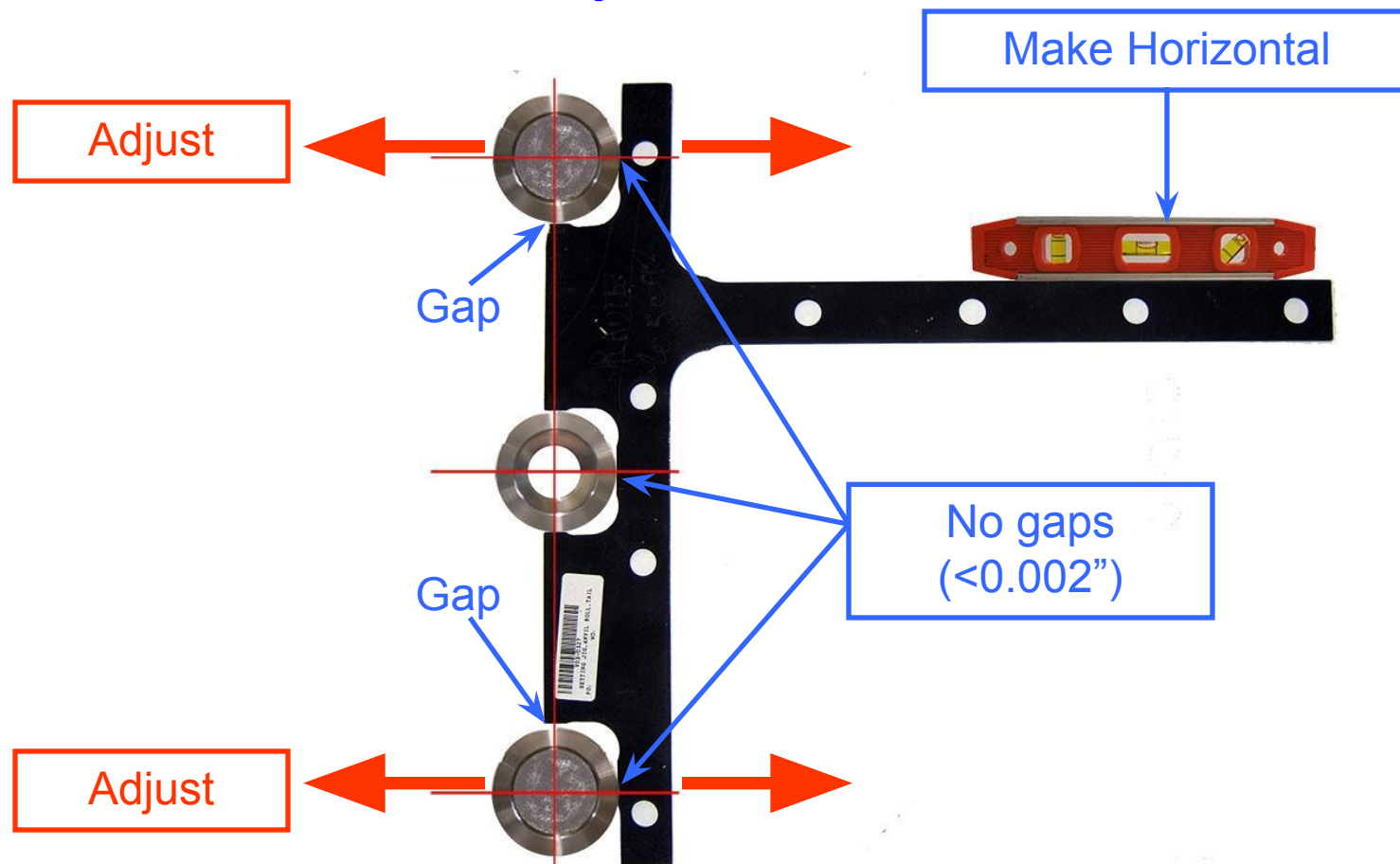
4 - Set T-bar & Level



* USE ONLY MACHINIST GRADE LEVEL

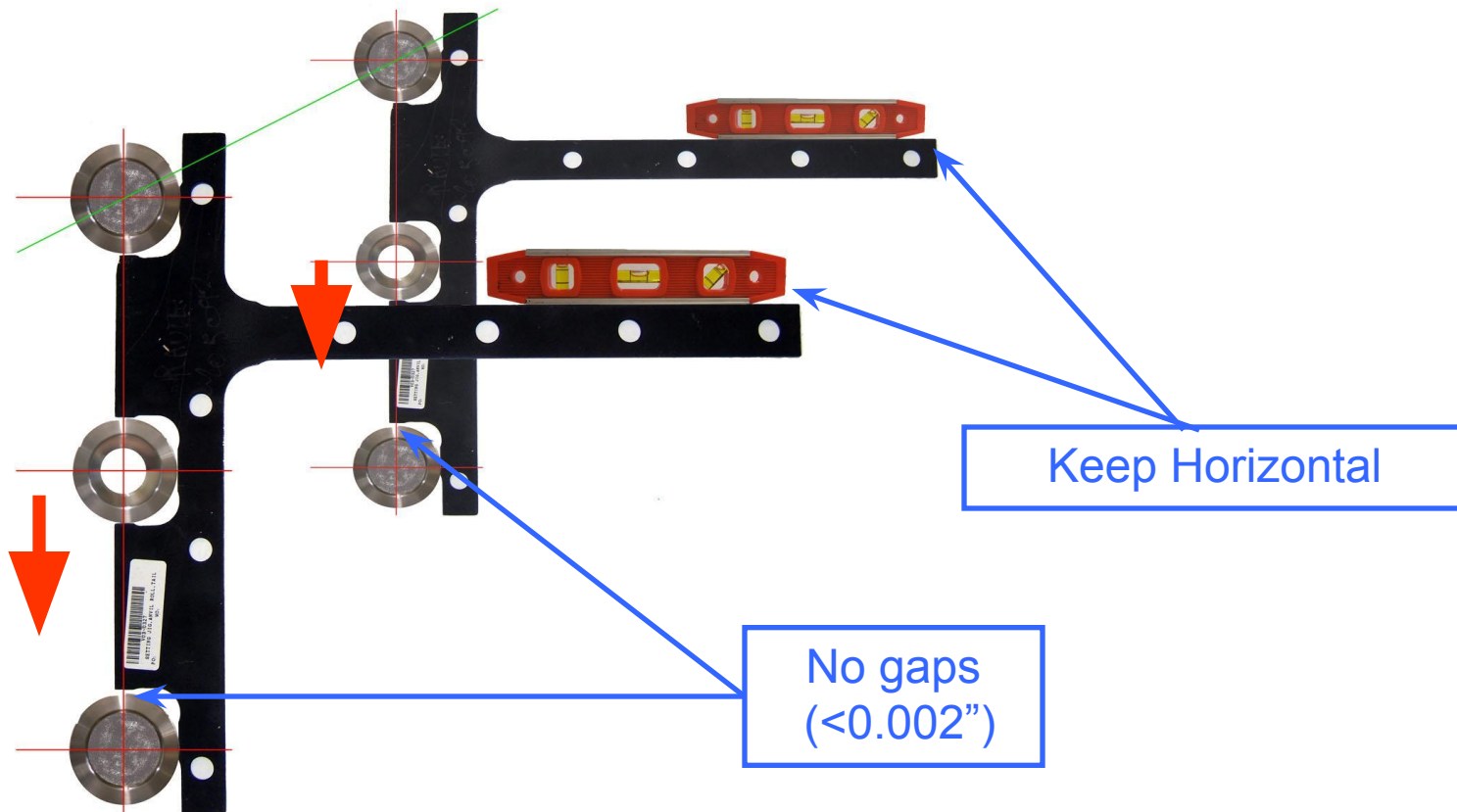
VERTICAL ROLL ALIGNMENT - 2

5 - Adjust rolls



HORIZONTAL ROLL ALIGNMENT - 1

6 - Lower Knife

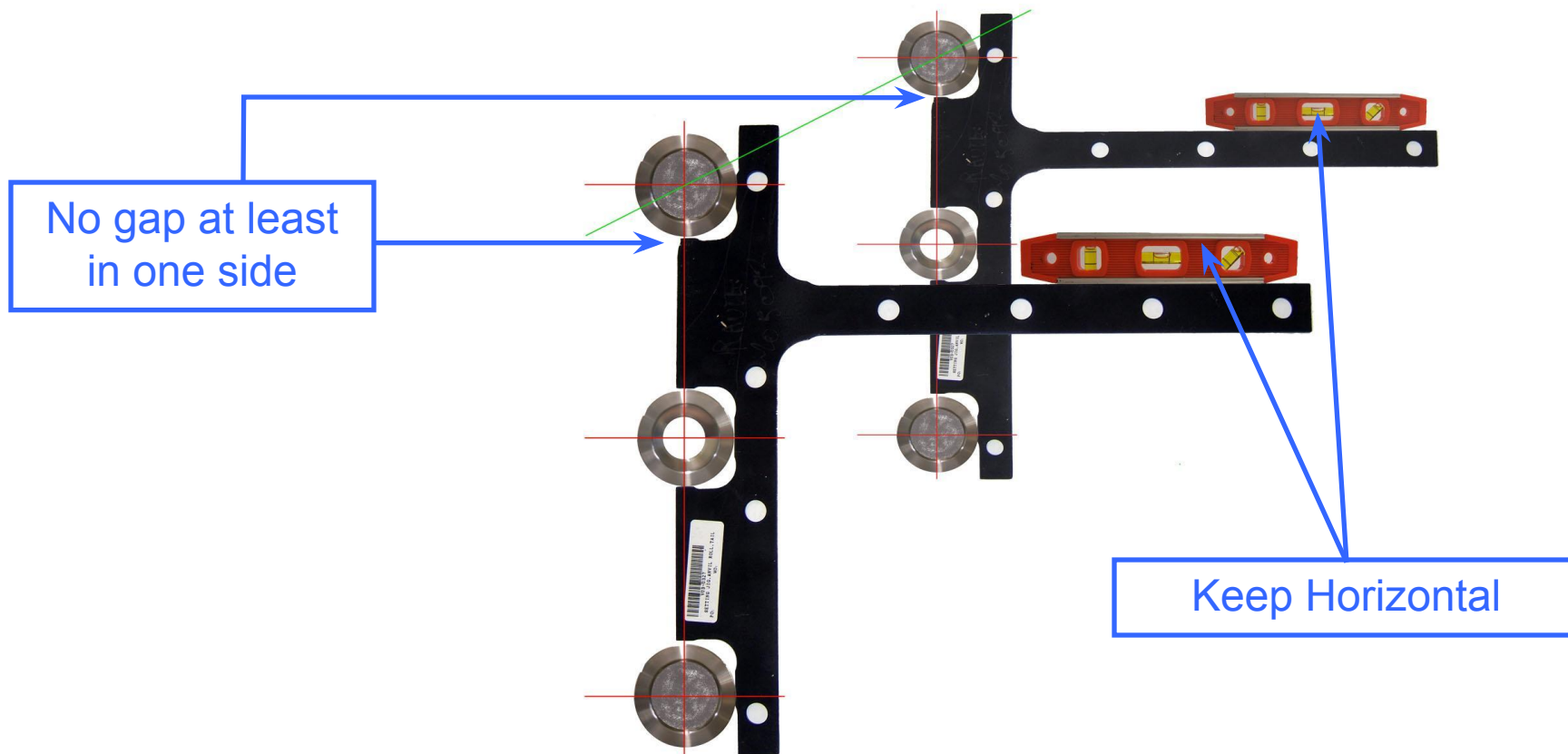


HYDRAULICS ON!



HORIZONTAL ROLL ALIGNMENT - 2

7 - Lower Top Roll



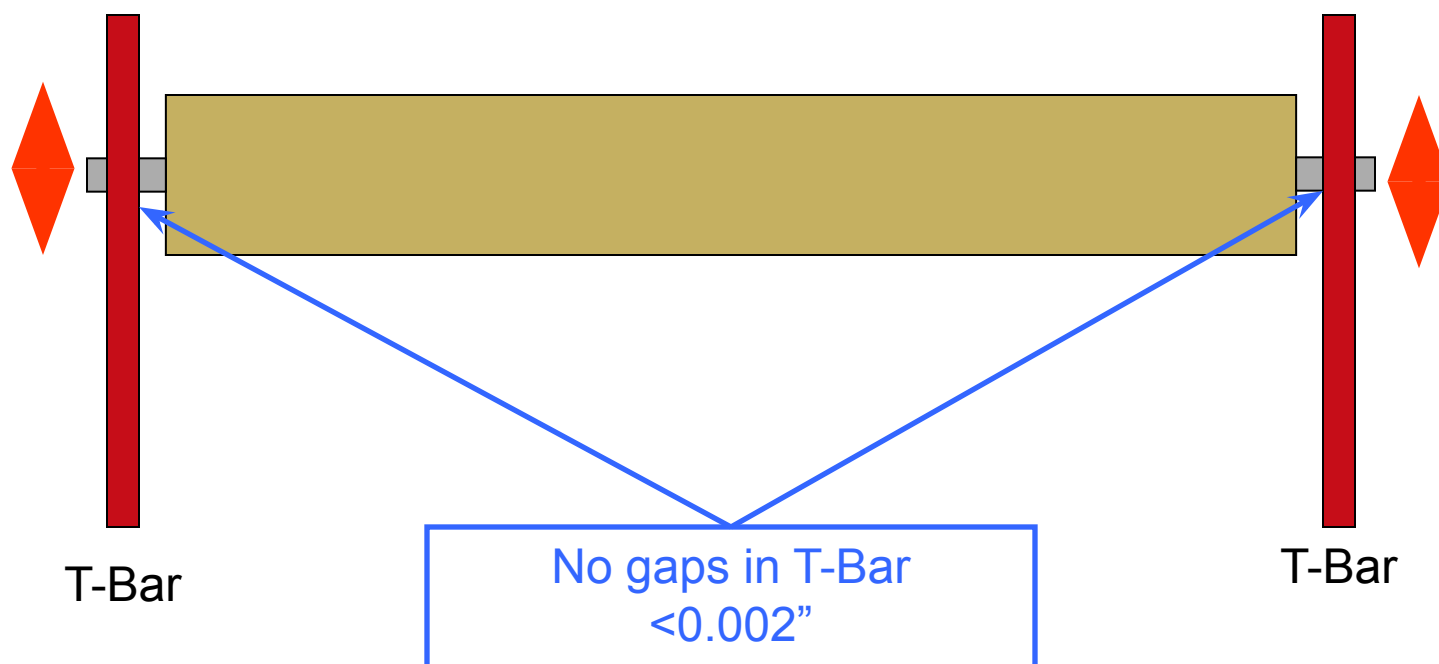
HYDRAULICS ON!





HORIZONTAL ROLL ALIGNMENT - 3

8 - Adjust Top roll

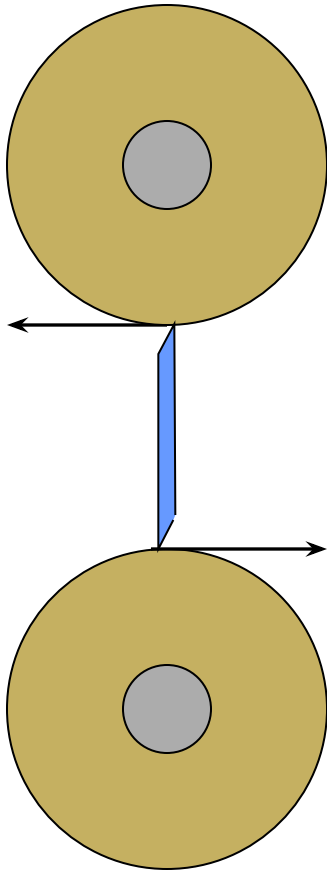


HYDRAULICS ON!





ROLL SPEED SETUP - GOALS

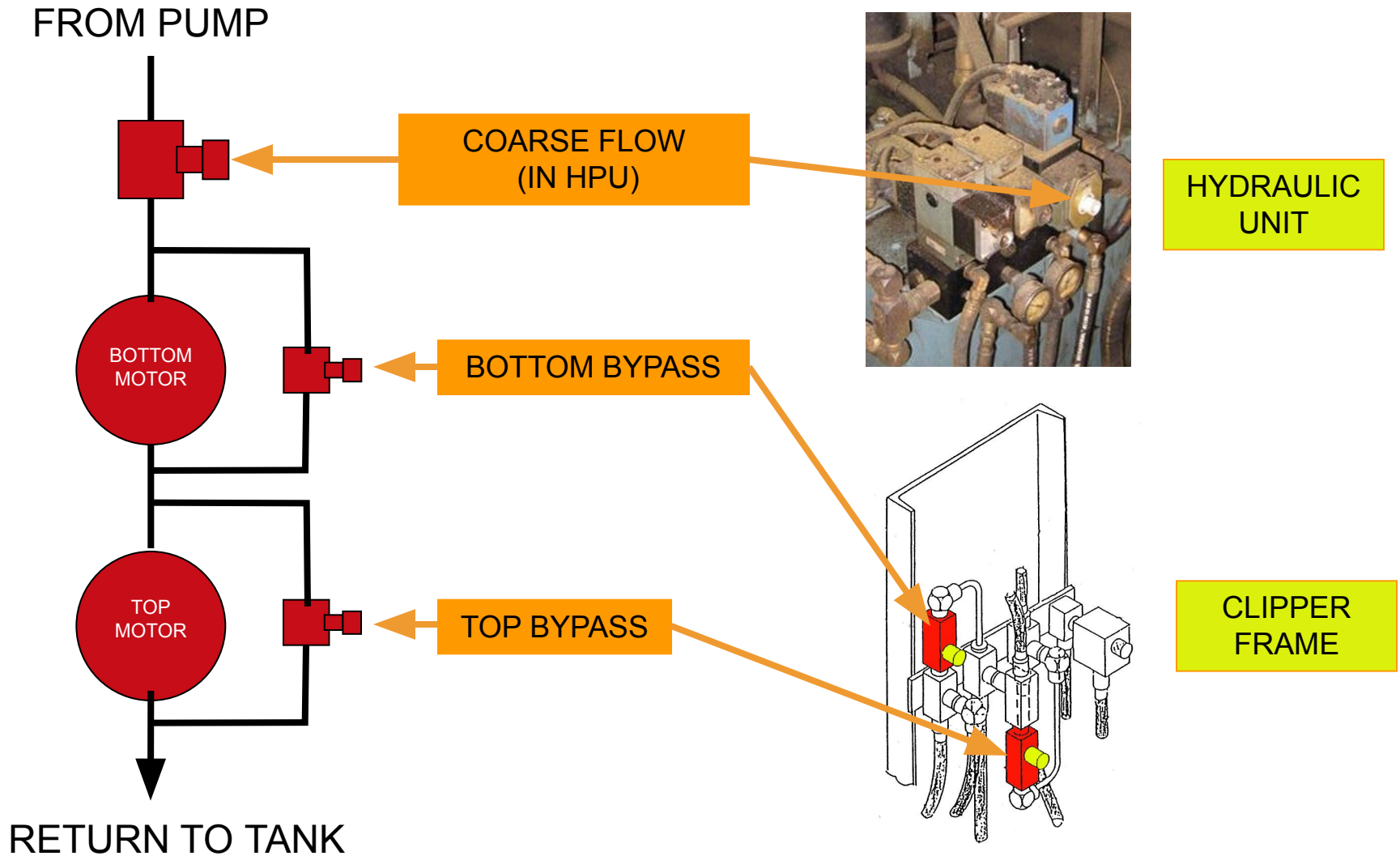


ROLL SPEEDS MUST BE EQUAL
TO KNIFE SPEED

TYPICAL KNIFE SPEED
VALUES
430 TO 480 FPM

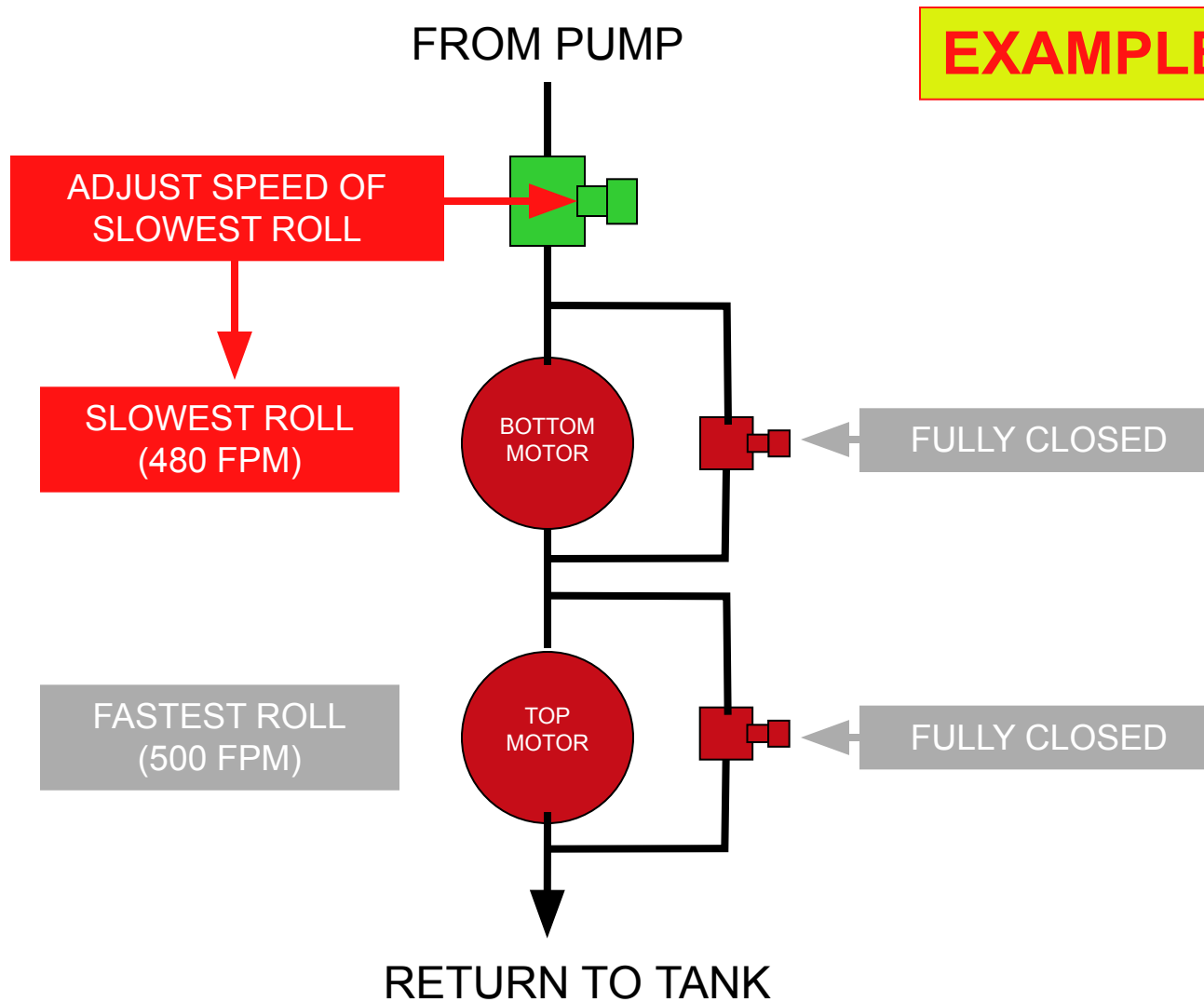


ROLL SPEED SETUP - 1



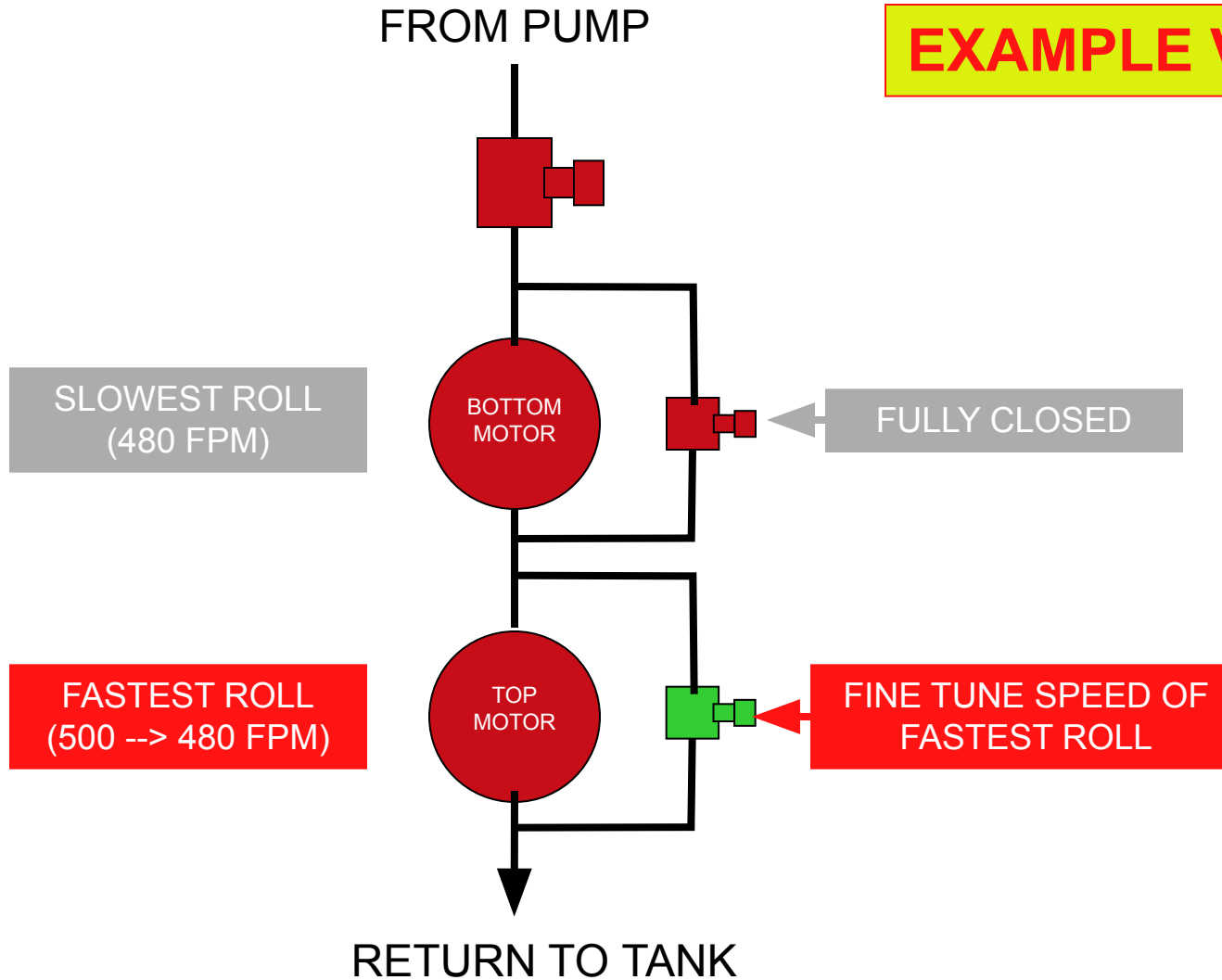


ROLL SPEED SETUP - 2

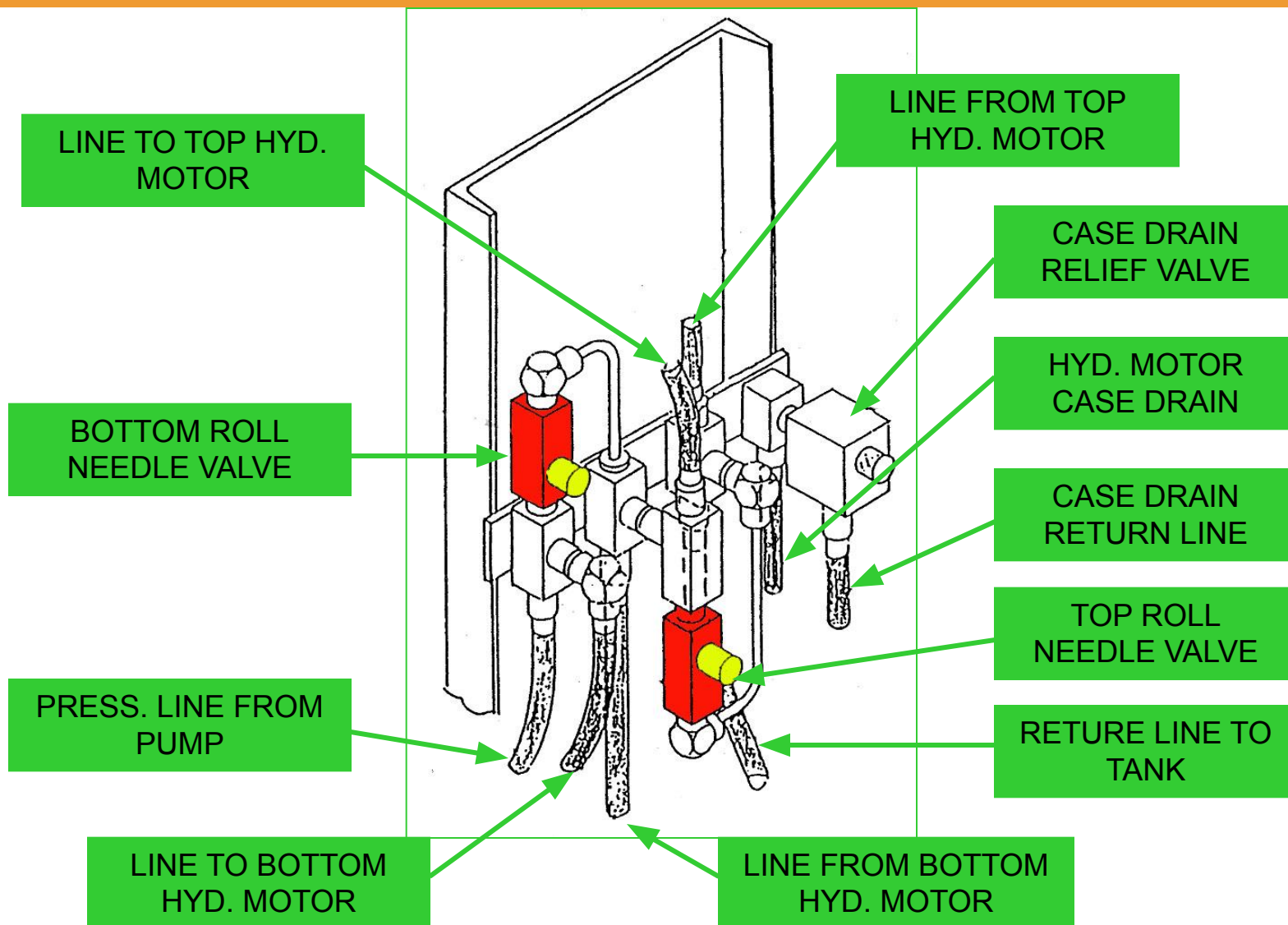




ROLL SPEED SETUP - 3



ROLL SPEED SETUP - 4





ROLL SPEED SETUP - 5

09/Jun/2006 08:29:18

RAUTE ROTARY CLIPPER - ROLLS SETUP

Raute

TOP ROLL

D/A

DRIVE OK **ROLL OK**

VARIABLE FREQUENCY DRIVE

	mVin	rpm
min	0	1650
max	10000	2130

MOTOR

GEAR 0.001

5060

N1 36

N2 71

AUTO **Loop Closed**

Dia 0.001"

6000

Enc2 1000

Set Point

600 fpm

Current Values

600 fpm

21 min-1

10.99 in

BOTTOM ROLL

D/A

DRIVE OK **ROLL OK**

VARIABLE FREQUENCY DRIVE

	mVin	rpm
min	0	1650
max	10000	2130

MOTOR

GEAR 0.001

5060

N1 36

N2 71

AUTO **Loop Closed**

Dia 0.001"

6000

Enc2 1000

Set Point

600 fpm

Current Values

60 fpm

19.9 min-1

11.54 in

Link Clipper

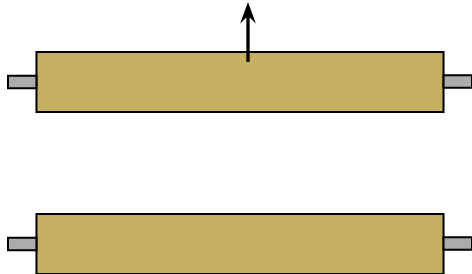
Network **ENABLED** **OK**

Setup



KNIFE HANDLING SETUP

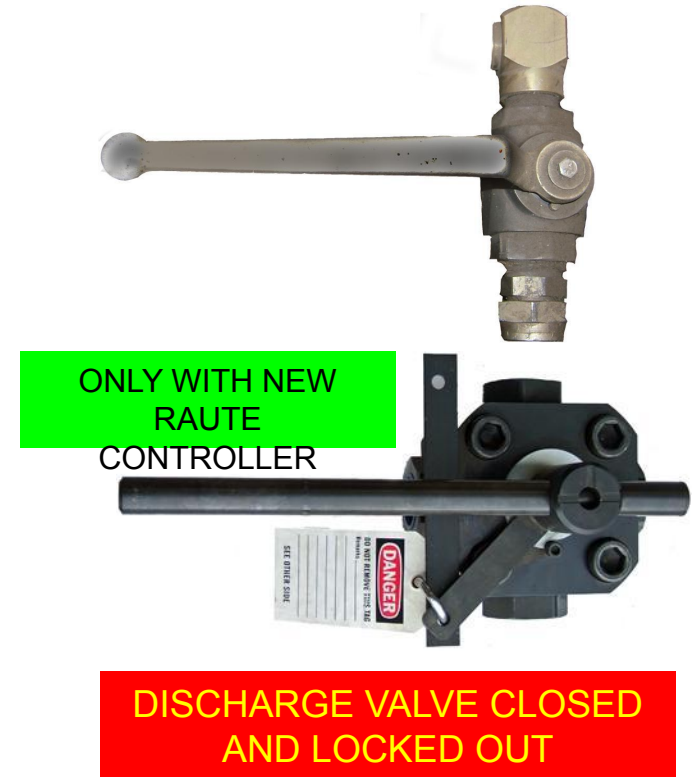
**1 - Head UP
and Secure**



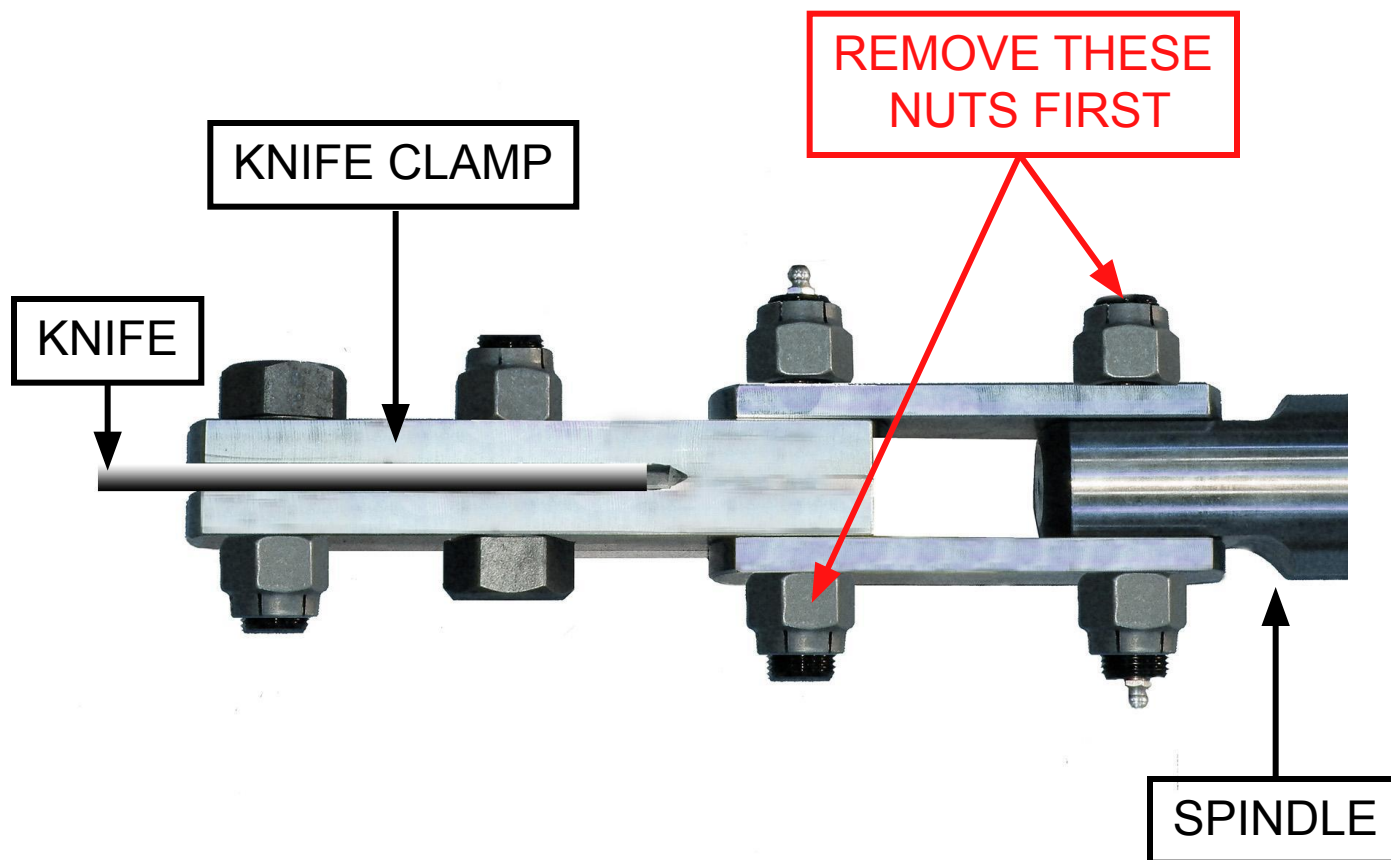
2 - Hydraulics OFF



3 - Shut-off valve OFF

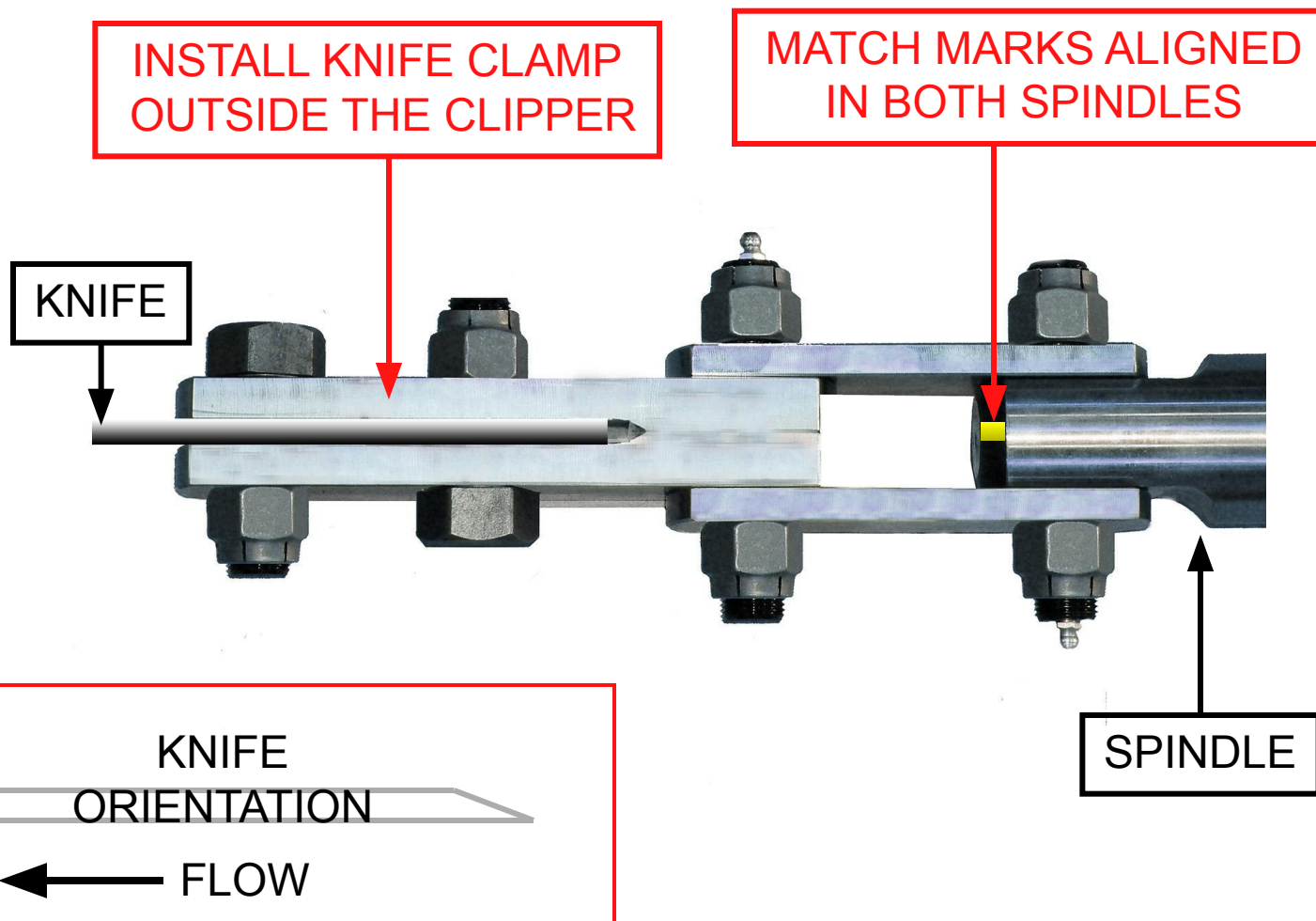


KNIFE REMOVAL





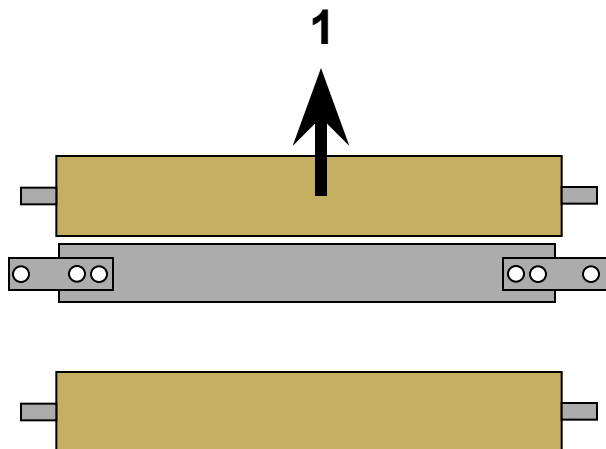
KNIFE INSTALLATION - 1





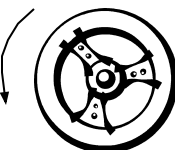
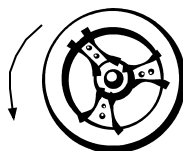
KNIFE INSTALLATION - 2

1 - Head UP



**2 - Raise top roll
and knife**

Roll UP
(10-15 turns)



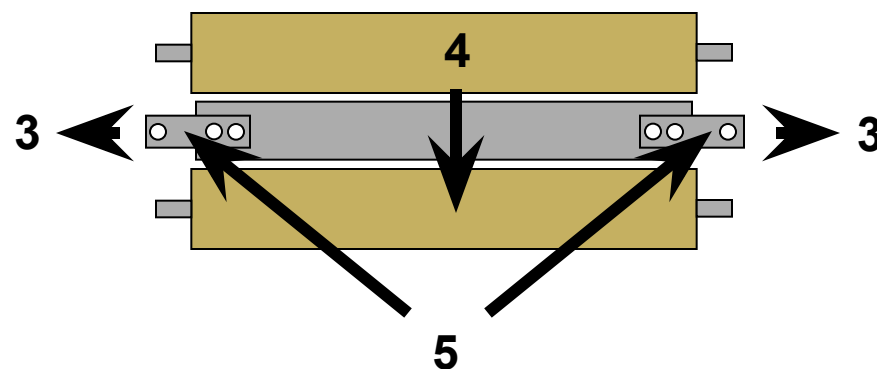
Knife UP
(10-15 turns)

2

3 - Knife Tension ON

4 - Lower Head

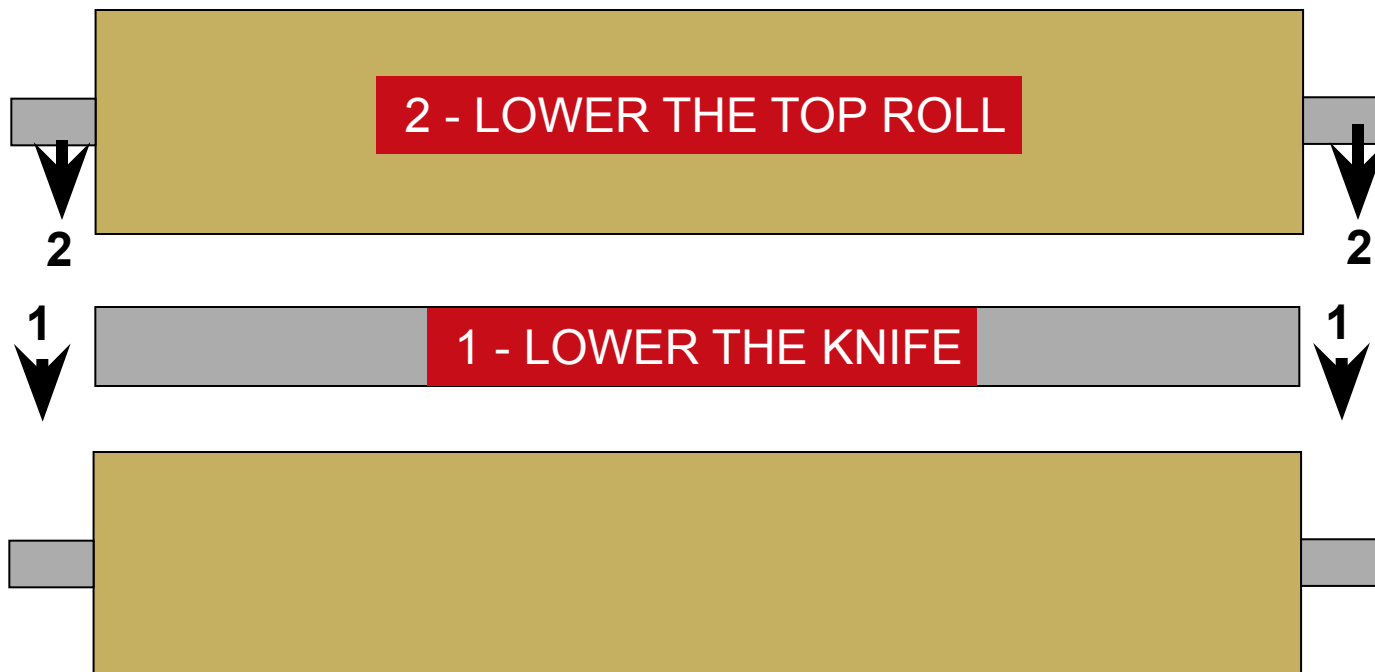
5 - Check toggles



HYDRAULICS ON!



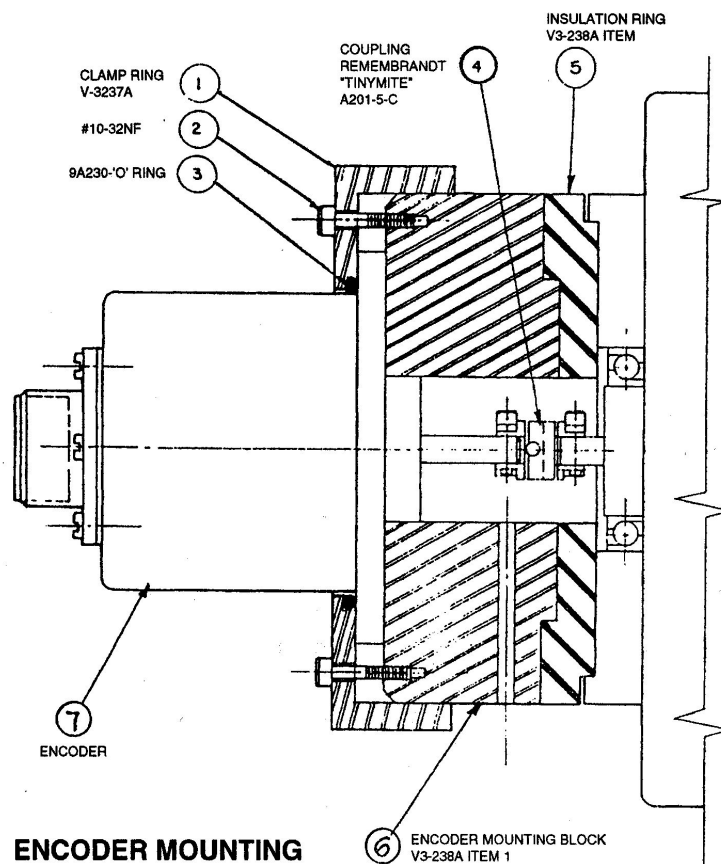
KNIFE SETUP



HYDRAULICS ON!



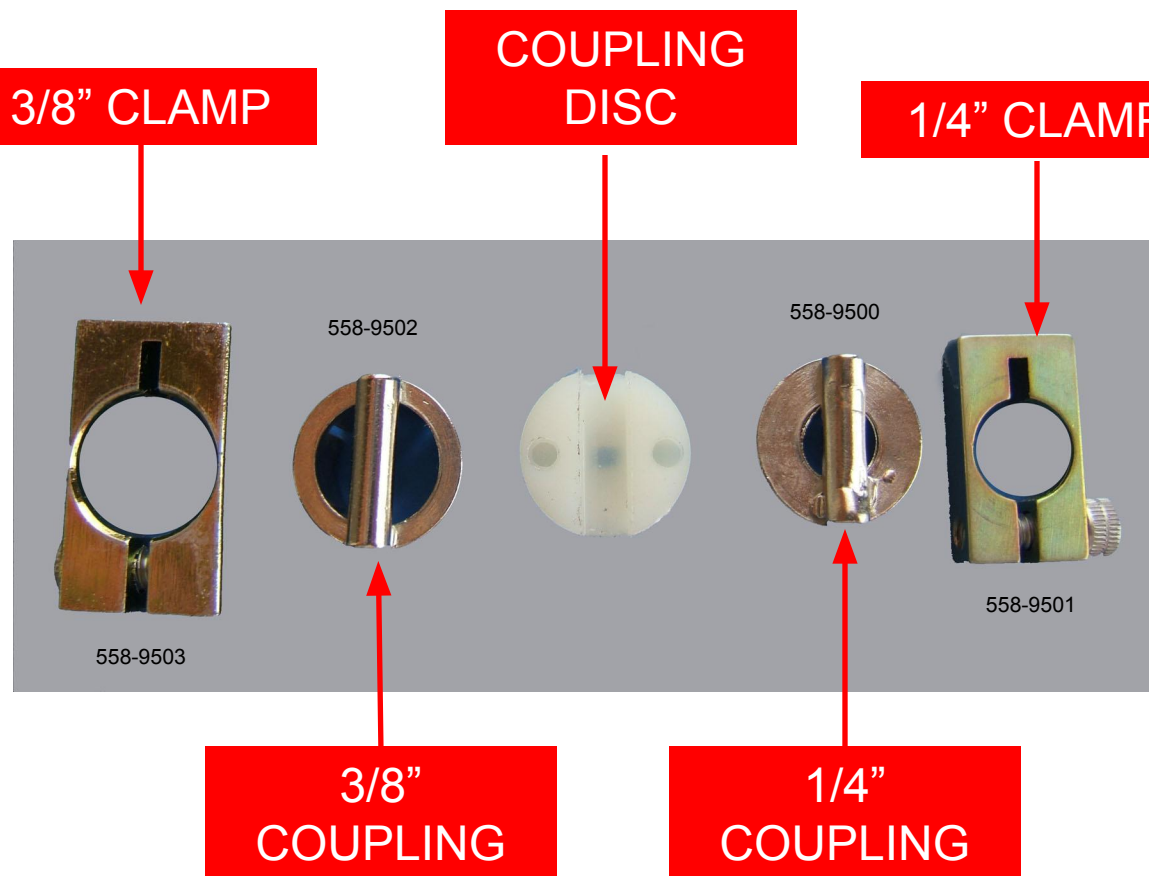
KNIFE ENCODER



MOUNTING DETAIL

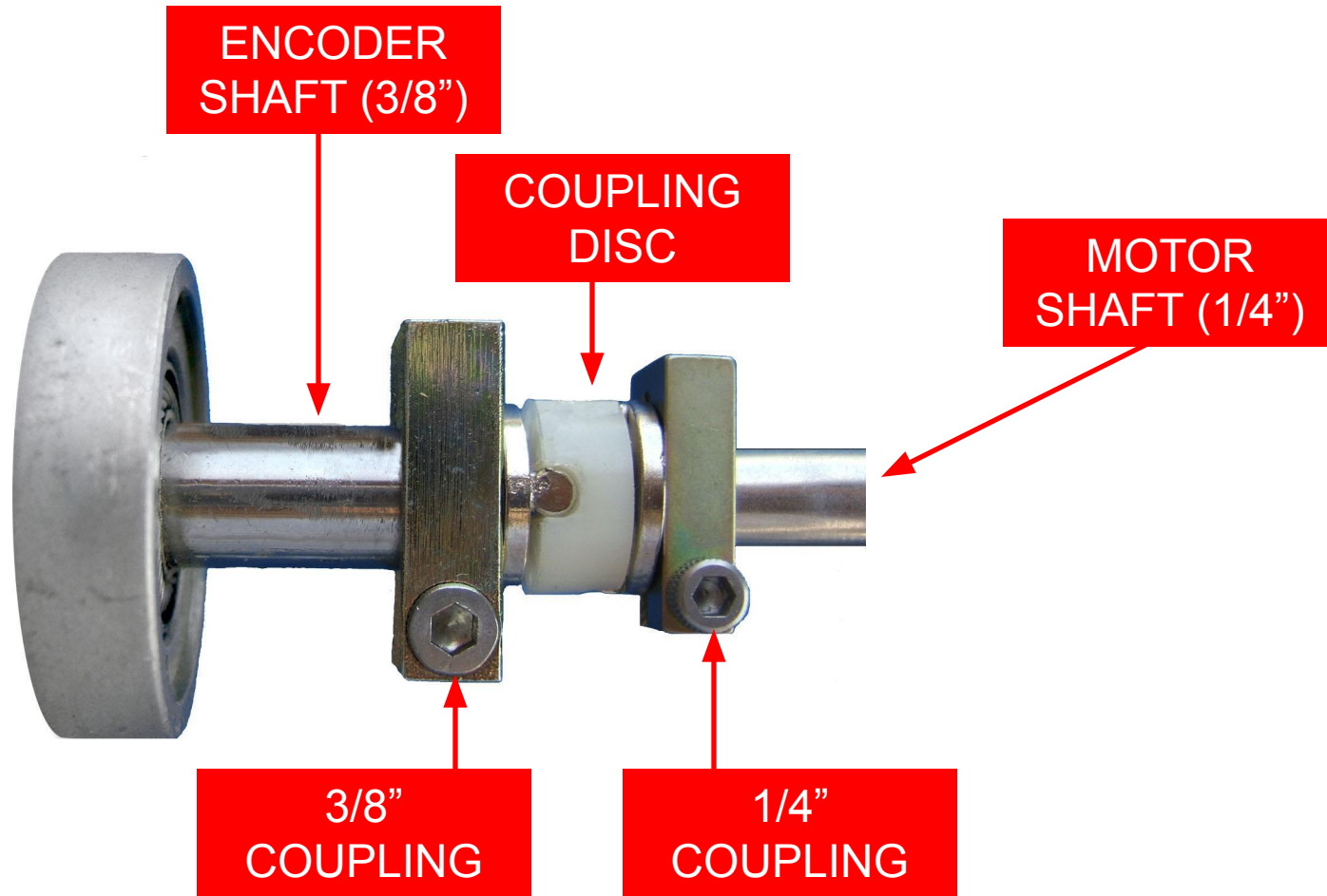


TINY-MITE COUPLING

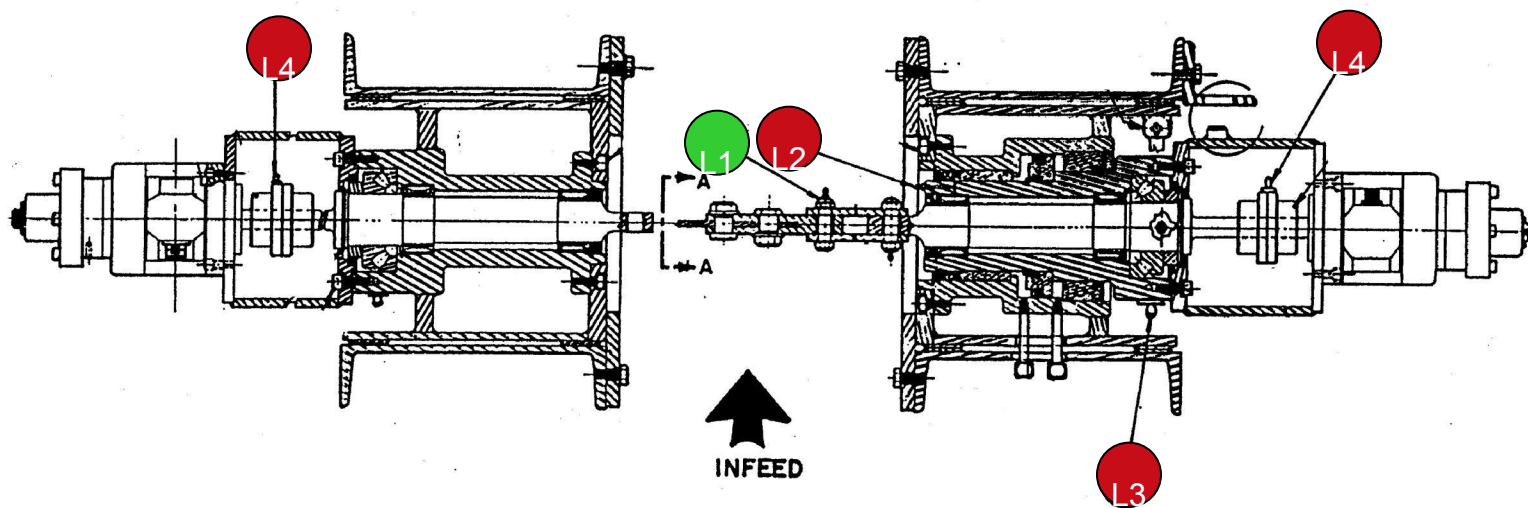




ENCODER COUPLING ASSEMBLY



LUBRICATION



USE ONLY GREASE TELLUS OR EQUIVALENT!



Section 6

TROUBLESHOOTING

GENERAL

Normal failures

Threshold failures

QUICK GUIDE

Symptom

Cause

Solution

CONTROLLER BASED

Diagnostics tests

Graphics



GENERAL

NORMAL FAILURES

- Originated by a single element (e.g.: broken spindle)
- Easy to diagnose
- Direct fixing by repair/substitution of parts

THRESHOLD FAILURES

- Multiple origins (e.g: Bias clip)
- Effects only seen after a certain “threshold” is passed
- Difficult to diagnose
- Multiple actions required to fix the problem



QUICK GUIDE - EXAMPLE

Response time		
SYMPTOM	PROBABLE CAUSE	ACTION
Response time above 42 ms on both sides	Low hydraulic pressure	Adhust pump to 1800 psi of higher
	Low clipping speed	Adjust rolls and knife speed to 450 fpm or higher
Response time above 42 ms only on one side	Local accumulator discharged	Recharge or replace accumulator
	Thrust bearing with excessive drag	replace bearing
	Faulty servo-valve	Replace servo-valve
	Faulty motor	replace motor
Response time difference between sides greater than 2 ms	Mechanical failure in the slowest spindle (motor, bearing, coupling)	repair
	Faulty servo-valve	Replace servo-valve



THRESHOLD ISSUES - EXAMPLE

BIAS CLIP

- **Symptoms:** Veneer sheets are not perfect rectangles but parallelograms.
- Possible causes
 - A. Spindles with different response times (1 ms ~ 0.1 in @ 500 FPM)
 - B. Outer in-feed belts with different speeds in both sides. Worn belt is a typical cause.
 - C. Hold down belts with different gap in each side. Incorrect hold down alignment.
- **Solution:** Multiple actions may be required.



Section 6

DIAGNOSTICS - ENCODER

1 → Select Test
Encoder Test

2 → Side **Left ON** **Right ON** Selected when blinking

Encoder **00** **00** Degrees

4 → Bits (11.0) **Green when OK**

Speed **0000** **0000** fpm

Valve **0000** **0000** %

Maximum Aperture **20** %

Ramp time **5** s

3 → **Execute test**

Auto Null **OFF**
DISABLED
DIAGNOSTICS OFF

Clipper Response String-00

Link Message ERR= 1. Tag does not exist

Network Link **OK**

Back to Main



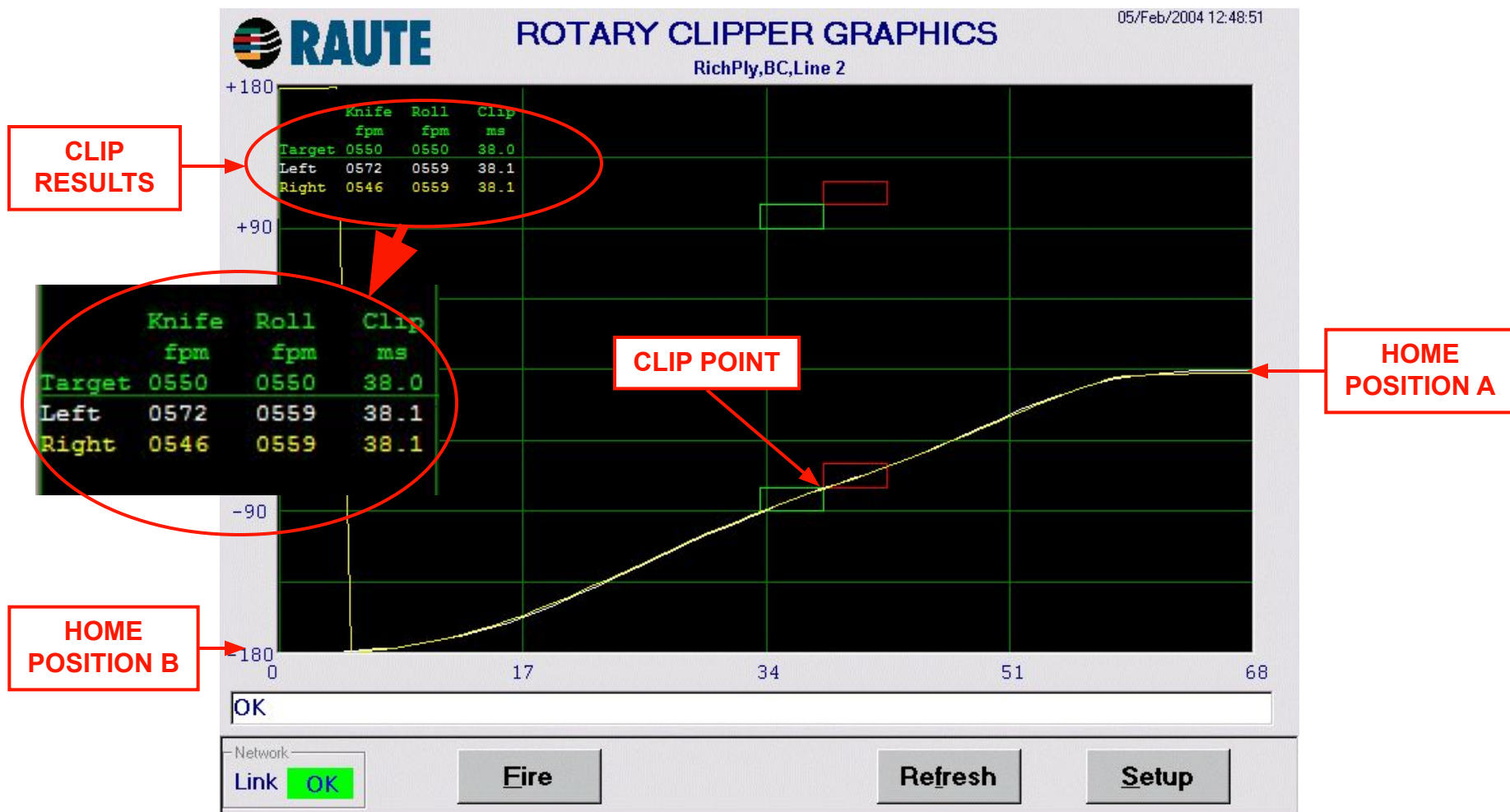
Section 6

DIAGNOSTICS - MOTORS

The screenshot shows the RAUTE CLIPPER DIAGNOSTICS interface for Coastland Wood Ind, Nanaimo, dated 14/Nov/2002 09:02:01. The interface includes a 'Select Test' menu on the left with options: Encoder Test, Motor Test (circled with callout 1), Vertical, Zero, and Move To. The main display area shows two columns of data for 'Left ON' and 'Right ON' sides, with a note 'Selected when blinking' (callout 2). The data includes Encoder (00 Degrees), Bits (11..0) (Green when OK), Speed (8880 fpm), and Valve (8800 %). A 'Maximum Aperture' slider is set to 20% (callout 3), and a 'Ramp time' slider is set to 5s (callout 4). The 'Auto Null' control is set to OFF (callout 6), with a 'DIAGNOSTICS OFF' indicator. At the bottom, there are buttons for 'None', 'Execute test' (circled with callout 5), 'Reset Test', and 'Big Numbers'. The 'Clipper Response' field shows 'String-00' and the 'Link Message' field shows 'ERR= 1. Tag does not exist'. A 'Network Link' indicator shows 'OK' and a 'Back to Main' button is at the bottom right.

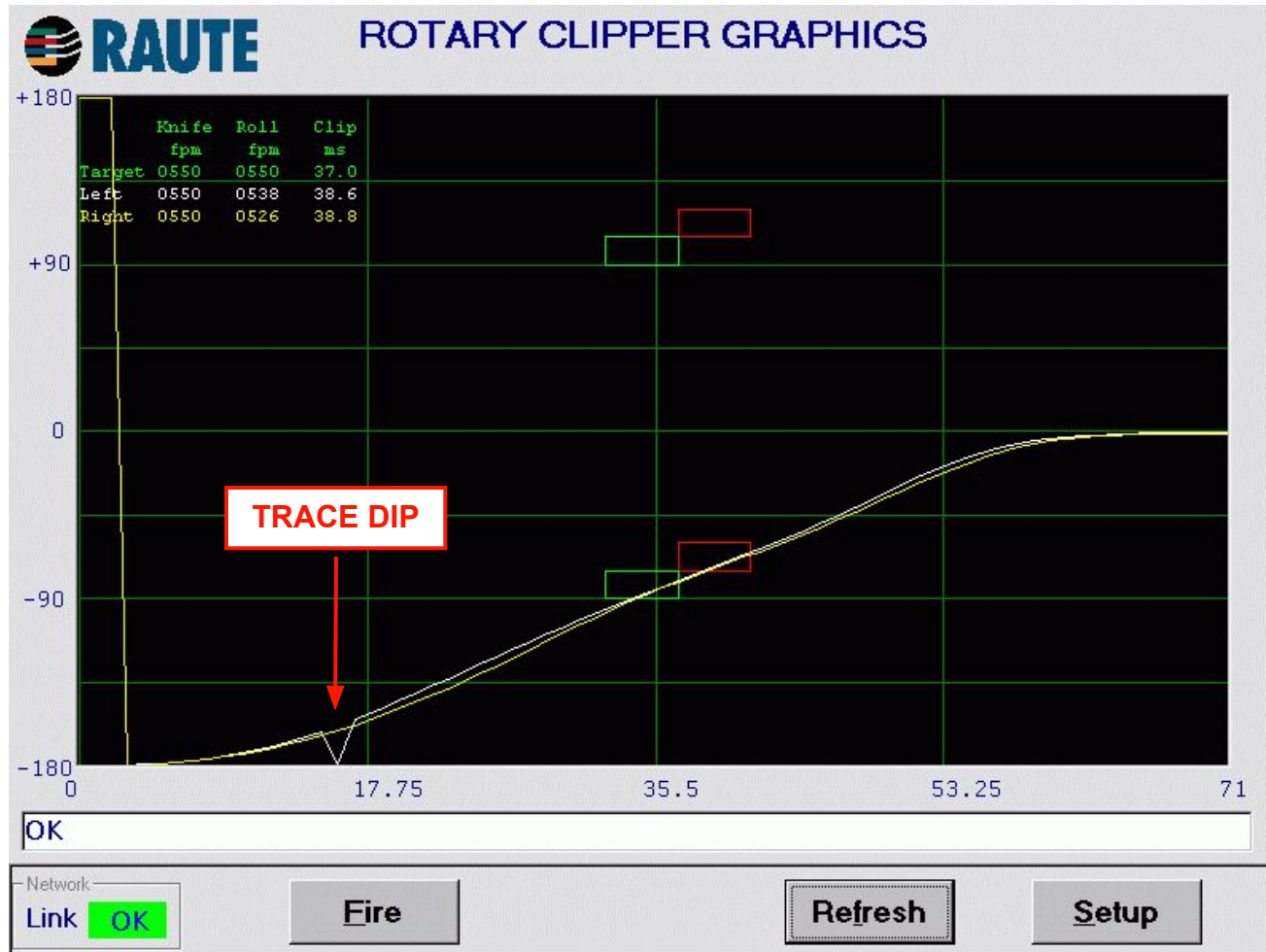


GRAPHIC OF A NORMAL CLIP



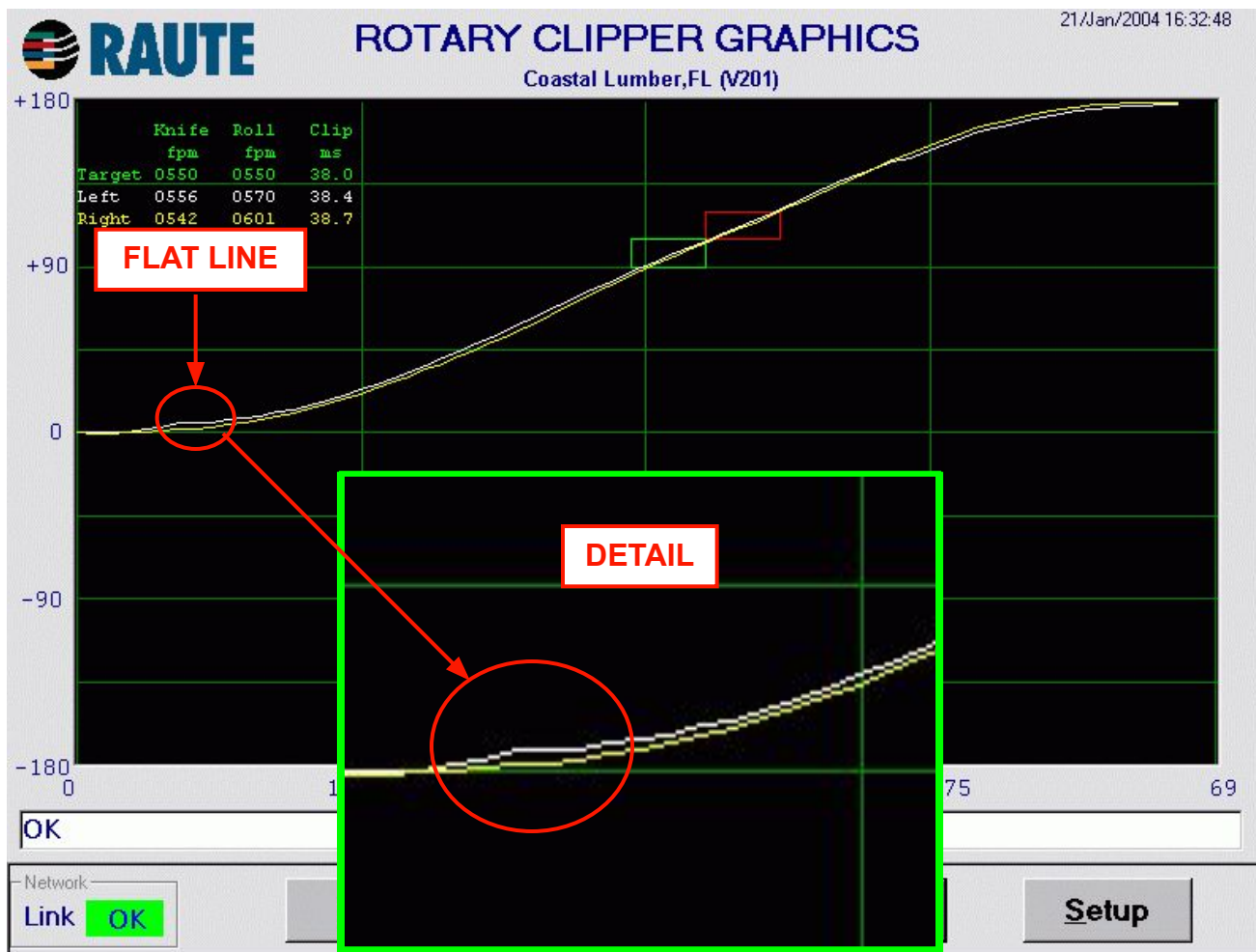


LEFT ENCODER FAILURE



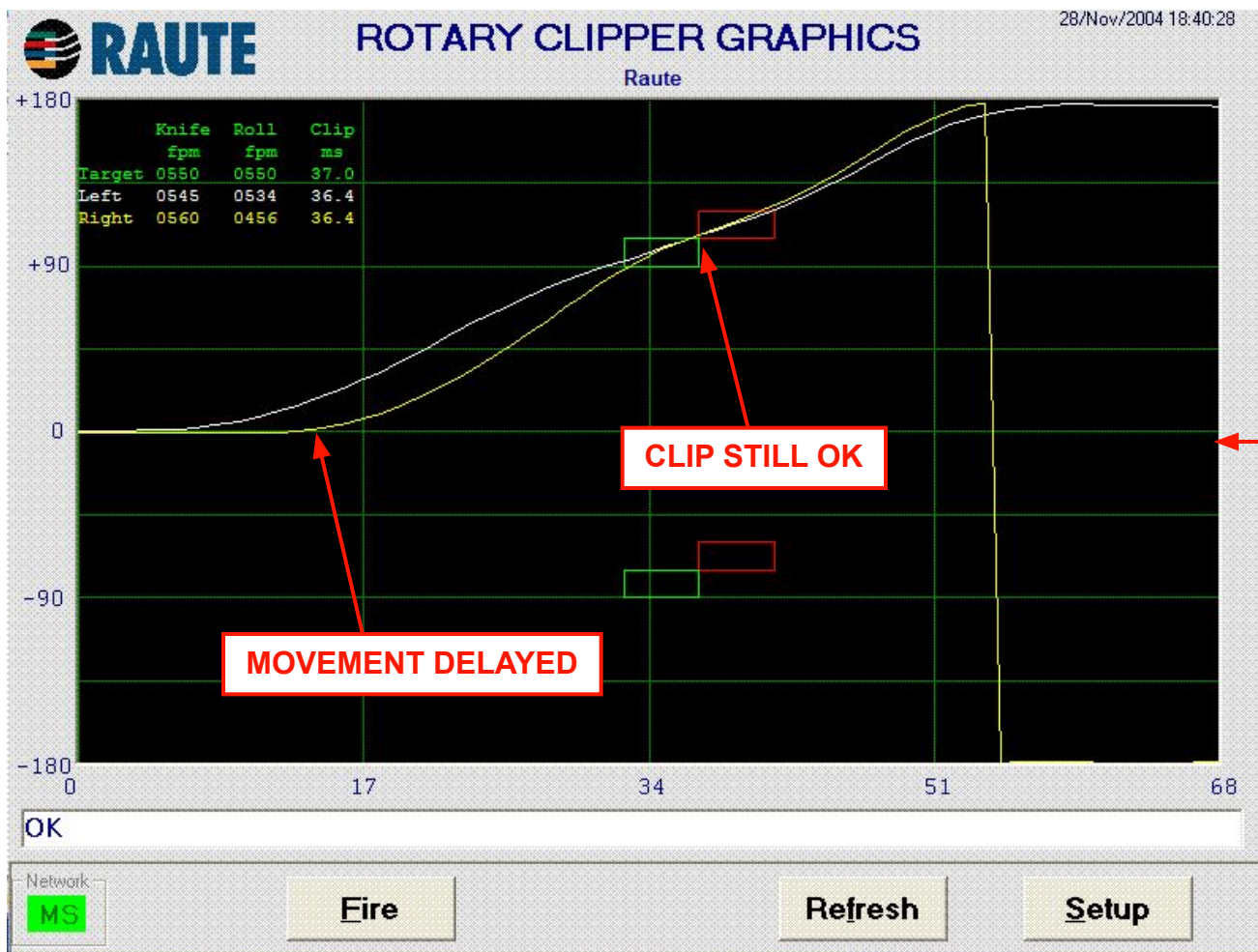


LEFT ENCODER BACKLASH



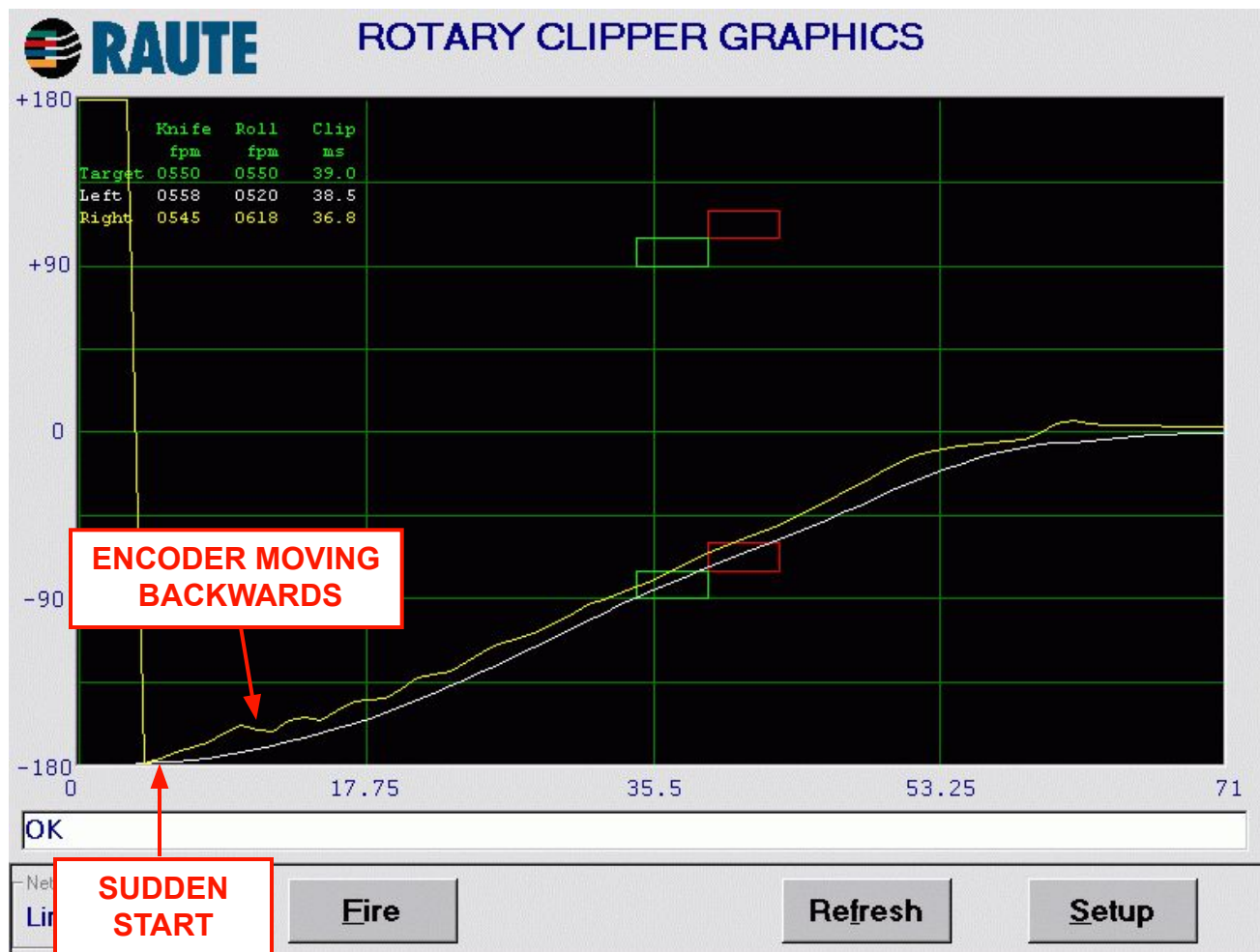


RIGHT MOTOR LAGGING





RIGHT COUPLING PROBLEM



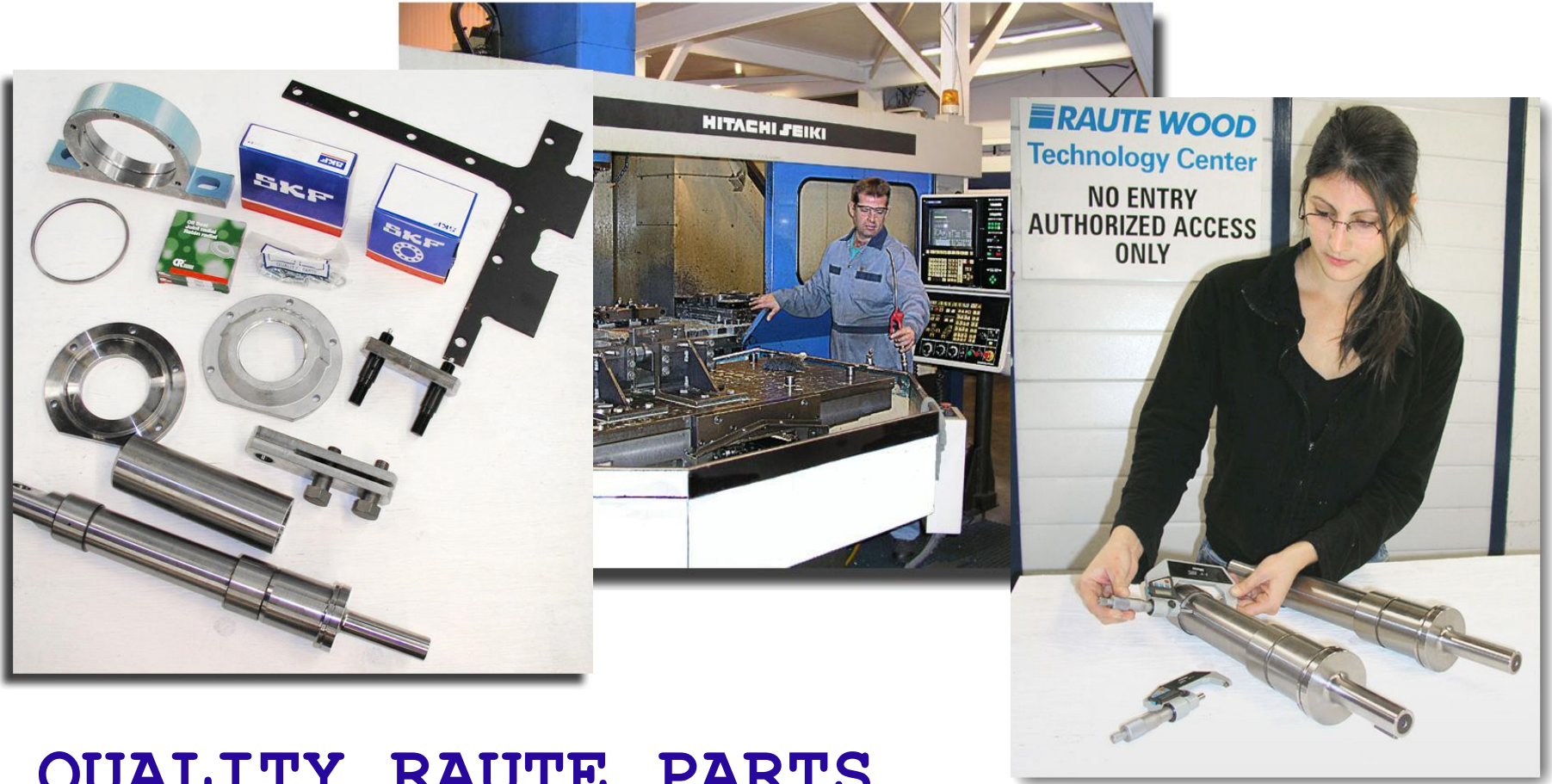


Section 7

APPENDIX



PARTS



QUALITY RAUTE PARTS



PARTS & SERVICE

A white business card with rounded corners. At the top left is the RAUTE logo. To its right, the word "RAUTE" is printed in a large, bold, dark blue font. Below this, the tagline "Your Partner in Performance" is written in a smaller, grey font. The card is divided into two sections: "Parts" and "Service". Each section lists contact information for New Westminster and Rossville, TN, including toll-free numbers, fax numbers, and email addresses. The "Parts" section also includes a 24-hour emergency number.

RAUTE
Your Partner in Performance

Parts
New Westminster Toll Free: 1-877-297-2787
New Westminster Fax: 1-866-615-1379
E-Mail: parts@rautewood.ca
24 Hour Emergency Parts: 1-604-603-9400
Rossville, TN. Toll Free: 1-800-448-8592
Rossville, TN. Fax: 1-901-853-4765

Service
New Westminster Toll Free: 1-877-728-8373
New Westminster Fax: 1-604-517-6811
Email: service@rautewood.ca
24 Hour Emergency Service: 1-604-667-0482

PARTS & SERVICE PHONE NUMBERS