

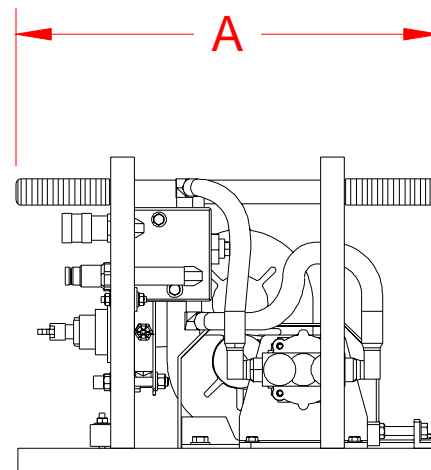
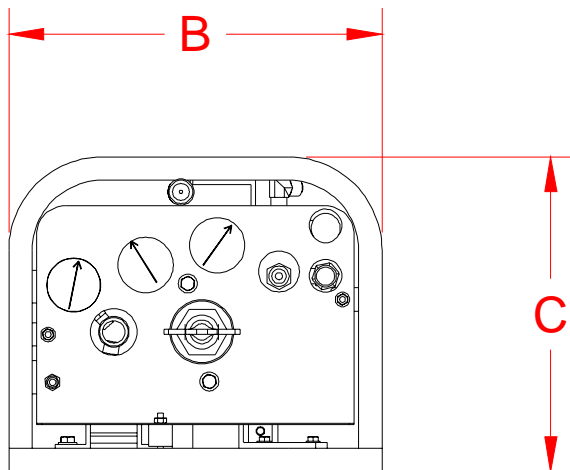
# RAILTECH

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## 03800B RAIL PRE-HEATER

The Rail Pre-heater is a light weight and easy to use tool for heating rail ends before they are welded together. It features a hydraulically driven blower and uses bottled propane gas. It is designed to be safe and economical to use.

This product is proprietary to Railtech Boutet, Inc.  
 US patent no. 6,460,536B2



FLOW	PRESSURE	DIMENSIONS	WEIGHT
10 gpm (38 lpm)	2000 PSI (140 BAR)	A - 18" (457 mm)	83 lbs. (33 kg)
	RPM 3400	B - 16" (406 mm)	
		C - 13-1/2" (343mm)	

**RAILTECH BOUTET, INC.**

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*RAILTECH reserves the right to change parts, features, or specifications without notice.*



## **GENERAL SAFETY PRECAUTIONS:**

TOOL OPERATORS AND MAINTENANCE PERSONNEL MUST ALWAYS COMPLY WITH THE SAFETY PRECAUTIONS GIVEN IN THIS MANUAL, AND WITH ALL STICKERS AND TAGS ATTACHED TO THE TOOL AND HOSE. ALL SAFETY PRECAUTIONS ARE GIVEN FOR YOUR SAFETY. READ TO UNDERSTAND AND FOLLOW ALL SAFETY, MAINTENANCE AND OPERATION INSTRUCTIONS BEFORE YOU USE OR MAINTAIN THE TOOL. REVIEW THE MANUAL DAILY BEFORE USING THE TOOL. IN ADDITION, FOLLOW ALL SAFETY GUIDELINES GIVEN YOU BY YOUR SUPERVISOR. DO NOT USE THE TOOL IF YOU HAVE ANY QUESTIONS ABOUT THE OPERATION, SAFETY OR MAINTENANCE OF THIS TOOL. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PERSONAL INJURY OR EQUIPMENT DAMAGE.

RAILTECH HAS NO CONTROL OVER TOOL USE OR OPERATION ONCE IT LEAVES THE RAILTECH PLANT. RAILTECH HAS NO CONTROL OVER OPERATOR OR MAINTAINER SELECTION. THE CUSTOMER MUST ASSUME RESPONSIBILITY FOR THE TOOL'S SUITABILITY FOR A PARTICULAR FUNCTION, FOR ANYONE USING THE TOOL OR MAINTAINING THE TOOL REGARDING THEIR FITNESS TO USE THE TOOL OR REPAIR THE TOOL, UNDERSTANDING OF THE OPERATION AND SAFETY AND MAINTENANCE MANUAL, INTELLIGENCE TO USE GOOD JUDGMENT NECESSARY TO WORK SAFELY AND EFFICIENTLY WITHOUT ENDANGERING THEMSELVES OR BYSTANDERS IN THE WORK AREA.

- DO NOT OPERATE THE TOOL UNTIL YOU HAVE BEEN THOROUGHLY AND PROPERLY TRAINED OR UNDER THE SUPERVISION OF AN INSTRUCTOR.
- CHECK POWER SOURCE DAILY TO DETERMINE IF CORRECT FLOW AND PRESSURE ARE AVAILABLE. NEVER EXCEED FLOWS OR PRESSURES FOR THE TOOL BEING USED. PERSONAL INJURY OR DAMAGE TO THE TOOL CAN RESULT.
- OPERATORS MUST CLEAR THE WORK AREA OF NON-ESSENTIAL PERSONNEL. FLYING DEBRIS CAN CAUSE SERIOUS INJURY.
- THE OPERATOR MUST BE FAMILIAR WITH ALL PROHIBITED WORK AREAS SUCH AS UNSAFE GRADES, POOR FOOTING AREAS AND OVERHEAD HAZARDS.
- MAINTAIN BALANCE AND PROPER FOOTING AT ALL TIMES. NEVER OVERREACH TO THE EXTENT THAT A BROKEN PART OR SUDDEN MOVEMENT OF THE TOOL CAN CAUSE YOU TO LOSE YOUR BALANCE AND FALL, OR CAUSE INJURY TO YOUR SELF OR SOMEONE ELSE.

- WHEN WORKING NEAR ELECTRICAL CONDUCTORS, ALWAYS ASSUME THAT THE CONDUCTORS ARE ENERGIZED AND THAT HOSES AND CLOTHING CAN CONDUCT HARMFUL ELECTRICITY. USE HOSES LABELED AND CERTIFIED AS NON-CONDUCTIVE.
- DO NOT OPERATE THE TOOL AT EXCESSIVE FLUID TEMPERATURES OPERATOR DISCOMFORT AND POTENTIAL BURNS CAN RESULT AT HIGH OIL TEMPERATURES.
- NEVER WEAR LOOSE CLOTHING THAT CAN GET ENTANGLED IN THE WORKING PARTS OF THE TOOLS OR BE CARELESS WITH HANDS, FEET OR OTHER BODY PARTS AROUND THE WORKING PARTS OF THE TOOLS. HYDRAULIC TOOLS EXERT HIGH TORQUE AND FORCE AND CAN CAUSE SERIOUS INJURY OR DEATH IF IMPROPERLY USED.
- TO AVOID PERSONAL INJURY OR EQUIPMENT DAMAGE, ALL TOOL REPAIR, MAINTENANCE OR SERVICE MUST ONLY BE PERFORMED BY AUTHORIZED AND PROPERLY TRAINED PERSONNEL.
- ALWAYS WEAR SAFETY EQUIPMENT SUCH AS OIL INJECTION RESISTANT WORK GLOVES, SAFETY GLASSES, SAFETY BOOTS, EAR PROTECTION AND OTHER SAFETY APPAREL DICTATED BY YOUR SUPERVISOR APPLICABLE FOR THE JOB YOU ARE DOING AND THE TOOL YOU ARE USING.
- DO NOT CLEAN INSPECT OR REPAIR THE TOOL WHILE CONNECTED TO THE POWER SOURCE. ACCIDENTAL ENGAGEMENT OF THE TOOL CAN CAUSE SERIOUS PERSONAL INJURY.
- OIL INJECTION HAZARD EXISTS WITH THIS TOOL. OIL INJECTION IS A CONDITION WHERE HYDRAULIC OIL IS INJECTED UNDER THE SKIN FROM PRESSURE IN THE LINE. ALWAYS WEAR GLOVES AND REPAIR ANY LEAKS IMMEDIATELY. NEVER CARRY A TOOL BY THE HOSES.
- DO NOT USE DAMAGED EQUIPMENT. IMMEDIATELY REPLACE ANY DAMAGED HOSES, FITTINGS, OR OTHER COMPONENTS SHOWING WIRE BRAID, NICKS, CUTS, DAMAGE OR ABRASIONS. FAILURE TO DO SO MAY RESULT IN EQUIPMENT DAMAGE AND / OR PERSONAL INJURY OR DEATH.
- CLEAN UP ANY OIL OR FLUID SPILLS IMMEDIATELY.



## 03800B RAIL PRE-HEATER

### **SAFETY PRECAUTIONS:**

1. **ALWAYS** WEAR SAFETY EQUIPMENT SUCH AS SAFETY GLASSES, EAR PROTECTION, AND SAFETY SHOES, AND OTHER REQUIRED SAFETY EQUIPMENT.
2. DO NOT WEAR CLOTHING WHICH MAY BECOME ENTANGLED IN TOOL.
3. **NEVER** TRANSPORT OR CARRY PRE-HEATER WITH THE POWER SOURCE ENERGIZED.
4. **ALWAYS** KEEP WORK AREA FREE OF TOOLS OR ANY OTHER OBJECTS WHICH MAY IMPAIR SOUND FOOTING.
5. **CAUTION** OIL INJECTION HAZARD EXISTS WITH THIS TOOL. OIL INJECTION IS A CONDITION WHERE THE HYDRAULIC OIL IS FORCED UNDER THE SKIN THROUGH PRESSURE IN THE LINE. ALWAYS WEAR GLOVES AND REPAIR LEAKS IMMEDIATELY.
6. **DO NOT** CLEAN OR INSPECT THE RAIL PRE-HEATER WHILE IT IS CONNECTED TO THE POWER SOURCE. ACCIDENTAL ENGAGEMENT OF THE TOOL CAN CAUSE SERIOUS INJURY.
7. **ALWAYS** CHECK WORK AREA FOR ANY TRASH WHICH MAY IGNITE.
8. **ALWAYS** CHECK THE WORK AREA FOR SMOLDERING TIES OR TRASH BEFORE LEAVING THE SITE.
9. MOST HYDRAULIC OILS HAVE A FLASH POINT OF APPROXIMATELY 450 DEGREE (F). MAKE SURE HOSES ARE COMPLETELY CLEAR OF HOT WELD. HAVE SOMEONE STAND CLOSE TO THE HYDRAULIC POWER SOURCE CONTROLS TO OBSERVE OPERATION AND FOR EMERGENCY SHUT DOWN IF NECESSARY.
10. **DO NOT** OPERATE THE PREHEATER UNTIL YOU HAVE BEEN PROPERLY TRAINED OR UNDER THE SUPERVISION OF A QUALIFIED INSTRUCTOR.
11. **NEVER** STORE GEARCASE AND/OR HYDRAULIC OIL NEAR OXYGEN TANKS AND LINES.
12. **NEVER** ADD GEARCASE AND/OR HYDRAULIC OIL WHEN A SPILL MIGHT COME IN CONTACT WITH YOUR OXYGEN LINES, TORCH, FITTINGS HOT WELDS AND/OR OPEN FLAMES.
13. CLEAN UP ANY SPILLS **IMMEDIATELY**.
14. **DAILY**, INSPECT THE PROPANE FUEL TANK, FUEL LINE AND FITTINGS FOR CRACKS OR LEAKS AND REPAIR OR REPLACE ACCORDINGLY.
15. **CAUTION** BLOWER CASING AND ASSOCIATED PIPING OR ACCESSORIES MAY BECOME HOT ENOUGH TO CAUSE MAJOR SKIN BURNS ON CONTACT.
16. STAY CLEAR OF INLET FILTER (SUCTION AREA) OF BLOWER.

## 03800B RAIL PRE-HEATER

### **SAFETY PRECAUTIONS:** (CONT.)

17. **ALWAYS** AVOID EXTENDED EXPOSURE IN CLOSE PROXIMITY TO MACHINERY WHICH EXCEEDS SAFE NOISE LEVELS.
18. **ALWAYS** USE PROPER CARE AND GOOD PROCEDURES IN HANDLING, LIFTING, INSTALLING, OPERATING AND MAINTAINING THE EQUIPMENT.
19. **DO NOT** OPERATE A DAMAGED, IMPROPERLY ADJUSTED, OR IMPROPERLY ASSEMBLED PRE-HEATER.
20. **DO NOT** EXCEED THE RATED LIMITS OR USE THE RAIL PRE-HEATER FOR APPLICATIONS BEYOND ITS DESIGN CAPACITY.
21. OTHER POTENTIAL HAZARDS TO SAFETY MAY ALSO BE ASSOCIATED WITH OPERATION OF THIS EQUIPMENT. **ALL PERSONS** WORKING IN OR PASSING THROUGH THE AREA SHOULD BE WARNED AND TRAINED TO EXERCISE ADEQUATE GENERAL SAFETY PRECAUTIONS AND COMMON SENSE.

### **IMPORTANT NOTES:**

***TORCH HOSE (RAILTECH PART # HPAP50) IS TO BE 3/4" I.D. AIR  
AND 3/8" I.D. PROPANE  
NEVER USE HOSE LENGTHS LONGER THAN 50 FT.  
NEVER SPLICE HOSE LENGTHS TOGETHER.  
FOLLOW ALL INSTRUCTIONS CONTAINED IN THIS MANUAL***

## **03800B RAIL PRE-HEATER OPERATION**

1. WITH THE POWER SOURCE IN THE “**OFF**” POSITION, CONNECT THE HOSES.  
DO NOT DRAG THE SERVICE HOSES BY PULLING WITH THE TOOL. LOOP THE SERVICE HOSE IN THE WORK AREA IN SUCH A WAY TO RELIEVE STRESS ON THE HOSE AND QUICK DISCONNECT FITTINGS WHILE WORKING. BE AWARE OF HOSE LOCATION AT ALL TIMES.
2. TURN THE HYDRAULIC POWER SOURCE TO THE “**ON**” POSITION TO SUPPLY 10 GPM.
3. START THE PRE-HEATER UNIT BY TURNING HYDRAULIC CONTROL VALVE KNOB **CLOCKWISE**, LET IT ACCELERATE TO FULL SPEED, THEN SHUT OFF BY TURNING HYDRAULIC CONTROL VALVE KNOB **COUNTERCLOCKWISE**. LISTEN FOR ABNORMAL SOUNDS, BOTH WITH POWER ON AND AS SPEED SLOWS DOWN. LET THE BLOWER RUN 2 OR 3 MINUTES TO ALLOW UNIT TO WARM UP. READINGS FROM THE DISCHARGE GAUGE WILL SHOW WHETHER PRESSURE RATINGS OF THE BLOWER ARE BEING EXCEEDED. **TURN UNIT OFF AT THIS TIME (HYDRAULIC POWER SOURCE)**.
4. CONNECT CUSTOMER SUPPLIED PROPANE TANK TO REGULATOR ON PRE-HEATER.
5. THE INOX HEATING NOZZLE MUST BE ALIGNED IN THE MOLDS SO THAT THE FLAT PIECE JUST ABOVE THE NOZZLE IS NO HIGHER THAN THE TOP OF THE INSIDE OF THE MOLD ( WHERE THE DIVERTER PLUG FITS IN). THE NOZZLE MUST BE ALIGNED IN SUCH A WAY THAT THE TIP OF THE NOZZLE IS STRAIGHT UP AND DOWN PERPENDICULAR TO THE RAIL.
6. PRIOR TO STARTING THE RAIL PRE-HEATER, THE NOZZLE NEEDS TO BE TILTED ALL THE WAY BACK SO THE NOZZLE IS POINTING TO THE SIDE OF THE MOLD. THIS IS NECESSARY TO HELP START THE FLAME.
7. MAKE SURE THE PROPANE REGULATOR ADJUSTMENT KNOB (LOCATED ON THE RAIL PREHEATER) IS TURNED ALL THE WAY OUT (**COUNTERCLOCKWISE**).
8. TURN THE HYDRAULIC POWER SOURCE TO THE “**ON**” POSITION TO SUPPLY 10 GPM.
9. TURN HYDRAULIC CONTROL VALVE KNOB **CLOCKWISE**, ON THE RAIL PRE-HEATER, TO ACTIVATE THE BLOWER.
10. WITH THE RAIL PRE-HEATER UNIT OPERATING, OPEN THE SHUT OFF VALVE ON THE PROPANE TANK ALL THE WAY.



## 03800B RAIL-PREHEATER

### OPERATION (CONT.)

11. WITH THE PROPANE SHUT-OFF VALVE LOCATED ON THE INOX BURNER COMPLETELY OPEN, ADJUST THE PROPANE REGULATOR TO 11-12 PSI.
12. WITH THE RAIL PRE-HEATER UNIT OPERATING, USE THE AIR BYPASS VALVE LOCATED AT THE INOX BURNER TO ADJUST AIR PRESSURE FOR EASE OF LIGHTING THE BURNER. THE BURNER CAN BE LIT WITH A TORCH OR A PISTOL TYPE STRIKER.  
**CAUTION: NEVER STAND DIRECTLY OVER MOLDS WHEN LIGHTING, PERSONAL INJURY AND/OR DEATH MAY RESULT.**
13. LET THE FLAMES WARM THE MOLDS FOR 30-45 SECONDS, SLOWLY STRAIGHTEN THE NOZZLE IN THE MOLD SO IT IS STRAIGHT UP AND DOWN, PERPENDICULAR TO THE RAIL. LOOK AT THE FLAMES IN THE MOLD, THE FLAMES SHOULD BE DOWN IN THE RAIL AREA NOT JUST IN THE RISERS. FLAMES SHOULD BE 6 TO 8 INCHES COMING OUT OF THE RISERS. IF THE FLAMES ARE ONLY IN THE RISERS AND NOT IN THE RAIL AREA, TURN THE NOZZLE TO THE SIDE AND SLOWLY STRAIGHTEN AGAIN. IT WILL BE NECESSARY TO ADJUST THE FLAME AT THE PROPANE ON-OFF VALVE TO FINE-TUNE THE FLAME. YOU SHOULD NOT HEAR A LOT OF POPPING OR SPITTING, RATHER YOU SHOULD HEAR A SOUND SIMILAR TO THAT OF A TURBINE OR JET ENGINE.
14. ONCE THE FLAME IS FINE TUNED, START THE PREHEAT TIME.
  - A.) **PREHEAT ALL 5-1/2" BASE RAIL FOR 5-6 MINUTES.**
  - B.) **PREHEAT ALL 6" BASE RAIL FOR 6-7 MINUTES.**
  - C.) **PREHEAT ALL W.G.W. WELDS FOR 6-1/2 MINUTES.**

***DO NOT HEAT RAIL ENDS MORE THAN 8 MINUTES.***

***AT THE END OF PREHEAT THE TOP OF THE BASE OF THE RAIL SHOULD BE 450 DEGREES MINIMUM AT 2-1/2 INCHES FROM THE RAIL ENDS, TESTED WITH A TEMPSTICK (RAILTECH PART # TS450).***

15. AFTER PREHEATING THE RAIL REMOVE THE INOX NOZZLE FROM THE MOLD. NEXT, COMPLETELY CLOSE PROPANE ON-OFF VALVE. BEFORE SHUTTING RAIL PRE-HEATER UNIT DOWN.

**NOTE:** *SHOULD OPERATING EXPERIENCE PROVE THAT BLOWER CAPACITY IS TOO HIGH FOR THE ACTUAL AIR REQUIREMENTS, ANY EXCESS MAY BE BLOWN OFF CONTINUOUSLY THROUGH THE MANUAL UNLOADING VALVE LOCATED ON THE INOX BURNER.*

## 03800B RAIL PRE-HEATER

### MAINTENANCE:

1. CHECK TOOL FOR OVERALL WORKING CONDITION **DAILY**.
2. INSPECT HOSES **DAILY**. AT THE FIRST SIGN OF ANY ABRASION OR CUT TO THE COVER, THE HOSES **MUST** BE CHANGED.
3. KEEP QUICK DISCONNECT COUPLERS **CLEAN & LUBRICATED**.
4. USE ONLY RECOMMENDED HYDRAULIC OILS. NEVER USE ATF OR MOTOR OIL.

**SUGGESTED HYDRAULIC OILS:**

AMOCO RYKON MV	CITGO A/W ALL TEMP
SUN 2105	MOBIL D.T.E. 15
CHEVRON EP-MV	TEXACO "RANDO" HD-AZ

IF YOUR LOCAL DISTRIBUTOR DOES NOT CARRY ANY OF THE ABOVE SUGGESTED HYDRAULIC OILS USE THE FOLLOWING GUIDELINES:

VISCOSITY @ 100° F.....100-190SUS  
 VISCOSITY INDEX.....MIN.150

EACH APPLICATION IS DIFFERENT, IF THERE ARE ANY QUESTIONS CONCERNING THE RIGHT CHOICE FOR YOUR PARTICULAR APPLICATION CALL RAILTECH BOUTET FOR ASSISTANCE.

5. HAVE TOOL INSPECTED, AT LEAST ANNUALLY, BY A RAILTECH OR RAILTECH QUALIFIED SERVICE REPRESENTATIVE TO DETERMINE IF TOOL IS IN NEED OF SAFETY CHANGES

### **RECOMMENDED GEARBOX OIL GRADES:**

AMBIENT TEMP F	VISCOSITY RANGE SSU @ 100 DEGREE F	ISO NO.
32-90 DEGREE F (0-32 C)	(38 C) 7000-1000	220
<b>OIL SUMP CAPACITY 3.4 FL. OZ. (.1 LITER)</b>		

**TO FILL THE GEAR BOX**, REMOVE THE BREATHER PLUG AND THE OIL OVERFLOW PLUG. FILL THE RESERVOIR UP TO THE OVERFLOW HOLE. PLACE THE BREATHER AND THE OVERFLOW PLUG BACK INTO THEIR RESPECTIVE HOLES.

**A WEEKLY CHECK OF GEARBOX OIL LEVEL** AND NECESSARY ADDITION OF LUBRICANT SHOULD BE SUFFICIENT. HOWEVER, OIL SHOULD BE CHANGED AFTER INITIAL 100 HOURS OF OPERATION. THERAFTER, A COMPLETE OIL CHANGE NORMALLY IS MADE AFTER 1000 OPERATING HOURS, OR LESS DEPENDING ON THE TYPE OF OIL AND OIL OPERATION TEMPERATURE.

**WHEN SERVICING SHAFT BEARINGS**, USE A NLGI #2 PREMIUM GRADE, PETROLEUM BASE GREASE WITH HIGH TEMPERATURE (300° SERVICE TEMPERATURE), MOISTURE RESISTANCE AND GOOD MECHANICAL STABILITY. USING A PRESSURE GUN, FORCE NEW LUBRICANT INTO EACH DRIVE END BEARING HOUSING UNTIL TRACES OF CLEAN GREASE COMES OUT OF THE RELIEF FITTING. **IT IS RECOMMENDED THAT THE SHAFT BEARINGS ARE LUBRICATED ON A WEEKLY BASIS.**

**03800B RAIL PRE-HEATER**

**REPAIR AND TROUBLESHOOTING:**

IF SYMPTOMS OF POOR PERFORMANCE DEVELOP, THE FOLLOWING CHART CAN BE USED AS A GUIDE TO CORRECT THE PROBLEM. WHEN DIAGNOSING PROBLEMS, ALWAYS CHECK THAT THE HYDRAULIC POWER SOURCE IS SUPPLYING THE CORRECT FLOW AND PRESSURE AS LISTED IN THE SPECIFICATIONS. USE A FLOW AND PRESSURE TEST GAUGE TO BE ACCURATE WHEN CHECKING FLOW. MAKE SURE THE HYDRAULIC OIL TEMPERATURE IS AT LEAST 80°F/27°C.

<b>PROBLEM:</b>	<b>POSSIBLE CAUSE:</b>	<b>SOLUTION:</b>
NO AIR FLOW	1. SPEED TO LOW 2. WRONG DIRECTION  3. OBSTRUCTION IN PIPING	BROKEN DRIVE BELT COMPARE ACTUAL ROTATION CHANGE HOSES IF NEEDED CHECK PIPING, SCREEN, VALVES, AIR FILTER TO ASSURE OPEN FLOW PATH
LOW CAPACITY	4. SPEED TO LOW 5. OBSTRUCTION IN PIPING	CHECK UNIT WITH TACH (3400 RPM) CHECK HOSES, VALVES, AIR FILTER TO ASSURE OPEN FLOW PATH
HIGH CAPACITY	6. SPEED TOO HIGH 7. AIR DISCHARGE TOO HIGH	CHECK UNIT WITH TACH (3400 RPM) AFTER SHIPMENT, POINTER MAY NOT REST AT ZERO DUE TO INTERNAL CASE PRESSURE BUILDUP CAUSED BY TEMPERATURE VARIATIONS. ACCURACY MAY BE SIGNIFICANTLY REDUCED. TO RESTORE GAUGE TO OPERATING CONDITION MOVE LEVER OF FILL PLUG TO THE "OPEN" POSITION. IF GAUGE IS NOT MOUNTED UPRIGHT, MOVE LEVER TO "CLOSED" POSITION AFTER VENTING. REPEAT PROCEDURE AT REGULAR INTERVALS TO MAINTAIN GAUGE ACCURACY.
OVERHEATING OF BEARINGS AND/OR GEARS	8. INADEQUATE LUBRICATION  9. EXCESSIVE LUBRICATION  10. SPEED TO LOW	RESTORE CORRECT OIL LEVELS IN GEARBOX AND LUBRICATE CHECK GEAR OIL LEVEL. IF CORRECT, DRAIN AND REFILL WITH CLEAN OIL OF RECOMMENDED GRADE SPEEDS LOWER THAN RECOMMENDED WILL CAUSE OVERHEATING. CHECK BELT CONDITION OR TENSION
VIBRATION	11. IMPELLERS RUBBING  12. WORN BEARINGS/GEARS  13. UNBALANCED OR RUBBING IMPELLERS  14. DRIVER OR BLOWER LOOSE	INSPECT OUTSIDE OF CYLINDER AND HEADPLATES FOR HIGH TEMPERATURE AREAS, THEN CHECK FOR IMPELLER CONTACTS AT THESE POINTS, CORRECT BLOWER MOUNTING, DRIVE ALIGNMENT CHECK GEAR BACKLASH AND CONDITION OF BEARINGS SCALE OR PROCESS MATERIAL MAY BUILD UP ON CASING AND IMPELLERS, OR INSIDE IMPELLERS. REMOVE BUILD-UP TO RESTORE ORIGINAL CLEARANCES AND IMPELLER BALANCE. TIGHTEN MOUNTING BOLTS SECURELY.