

03800B HYDRAULIC RAIL PREHEATER

The Pandrol Preheater is a compact, light weight and easy-to-use tool for heating the rail-ends before welding. It features a hydraulically driven blower and uses bottled Liquid Propane (LP). The Pandrol Hydraulic Preheater utilizes Oxygen pulled in from the air, eliminating the need for bottled Oxygen. This Hydraulic Preheater ensures the rail-ends never melt during preheating with the QP Process and the torch safely extinguishes once removed from the molds. The Pandrol Hydraulic Preheater is designed to be safe and economical to use for any welding crew.

THIS PRODUCT IS PROPRIETARY OF
PANDROL

U.S. PATENT NO. 6,460,536B2

ACCESSORIES:

HYDRAULIC PREHEATER COMPLETE: 22900000
(CONTAINS ALL ITEMS LISTED BELOW)

HYDRAULIC PREHEATER:	22500000
PRECISION TORCH STAND:	26110000
HYDRAULIC TORCH:	22600001
50" AIR-PROPANE HOSE:	22700000
20" FLEX HOSE:	22800000
450°F TEMPIL STICK:	TS-450F



FLOW
10 gpm (38 lpm)

PRESSURE
2000psi (140 bar)

RPM
3600

DIMENSIONS
A: 18 ¾" (47.6cm)
B: 15 ¾" (40cm)
C: 14" (35.5cm)

WEIGHT
87 lbs
(39.5kg)

GENERAL NOTES:

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 TO 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.

PANDROL HAS NO CONTROL OVER TOOL USE OR OPERATION ONCE IT LEAVES THE PANDROL PLANT. PANDROL 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 ARE 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 NONESSENTIAL 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 NONCONDUCTIVE.
- 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.

GENERAL SAFETY PRECAUTIONS:

- 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.

HAVE SUPERVISOR ADD ADDITIONAL PRECAUTIONS RELATING TO THE SPECIFIC WORK AREA AND LOCAL SAFETY REGULATIONS BELOW:

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SAFETY PRECAUTIONS:

1. **ALWAYS** WEAR PROTECTIVE EQUIPMENT SUCH AS GLOVES, SAFETY GLASSES, EAR PROTECTION AND SAFETY SHOES.
2. DO NOT WEAR CLOTHING WHICH MAY BECOME ENTANGLED IN THE TOOL.
3. **ALWAYS** KEEP WORK AREA FREE OF TOOLS OR ANY OTHER OBJECTS WHICH MAY IMPAIR SOUND FOOTING.
4. **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, DO NOT CARRY THE TOOL BY HYDRAULIC HOSES, AND REPAIR LEAKS IMMEDIATELY.
5. **NEVER** ATTEMPT TO CARRY THE HYDRAULIC PREHEATER WITH THE POWER SOURCE VALVE(S) IN THE "ON" POSITION, TURN THE POWER SOURCE "OFF".
6. **ALWAYS** CHECK THE WORK AREA FOR ANY TRASH, WHICH MAY IGNITE FROM SPARKS, WELD SPLATTER OR SLAG.
7. **ALWAYS** CHECK THE AREA FOR SMOLDERING TIES OR TRASH BEFORE LEAVING THE SITE.
8. DO NOT OPERATE THE PRE-HEATER UNTIL YOU HAVE BEEN PROPERLY TRAINED OR UNDER THE SUPERVISION OF A QUALIFIED INSTRUCTOR.
9. MOST HYDRAULIC OILS HAVE A FLASHPOINT OF 500°F. MAKE SURE HOSES ARE COMPLETELY CLEAR OF SPARKS AND HOT DEBRIS. HAVE ANOTHER PERSON STAND CLOSE TO HYDRAULIC POWER SOURCE CONTROLS TO OBSERVE OPERATION AND FOR EMERGENCY SHUTDOWN, IF NECESSARY.
10. NEVER STORE GEAR CASE AND/OR HYDRAULIC OIL NEAR OXYGEN TANKS AND LINES.
11. **NEVER** ADD GEAR CASE AND/OR HYDRAULIC OIL WHEN A SPILL MIGHT COME IN CONTACT WITH YOUR OXYGEN LINES, TORCH, FITTINGS HOT WELDS AND/OR OPEN FLAMES.
12. CLEAN UP ANY SPILLS IMMEDIATELY.
13. INSPECT THE PROPANE FUEL TANK, FUEL LINE AND FITTINGS FOR CRACKS OR LEAKS DAILY 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.
17. **ALWAYS** AVOID EXTENDED EXPOSURE IN CLOSE PROXIMITY TO MACHINERY WHICH EXCEEDS SAFE NOISE LEVELS.

SAFETY PRECAUTIONS:

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 PREHEATER FOR APPLICATIONS BEYOND IT 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 WORK AREA SHOULD BE WARNED AND TRAINED TO EXERCISE ADEQUATE GENERAL SAFETY PRECAUTIONS AND COMMON SENSE.

IMPORTANT NOTES:

- TORCH HOSE (PART NO. 22700000) IS TO BE 3/4" I.D. AIR AND 3/8" I.D. PROPANE.
- NEVER USE HOSE LENGTHS LONGER THAN 50FT.
- NEVER SPLICE HOSE LENGTHS TOGETHER.
- FOLLOW ALL INSTRUCTIONS OUTLINED IN THIS MANUAL.

FRONT PANEL OVERVIEW

PROPANE REGULATOR
VALVE & GAUGES

HYDRAULIC CONTROL
VALVE (ON/OFF)

HYDRAULIC POWER
SOURCE CONNECTION



AIR
TORCH HOSE

PROPANE
TORCH HOSE

PROPANE
TANK FLEX HOSE

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FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

1. MAKE SURE THE POWER SOURCE IS IN THE “OFF” POSITION.
2. MAKE SURE ALL KNOBS ARE TURNED TO THE “OFF” POSITION ON THE PREHEATER
3. CONNECT THE HYDRAULIC HOSES, ENSURING A PROPER FIT.
4. 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.
5. TURN THE POWER SOURCE “ON” TO SUPPLY 10 GPM TO THE PREHEATER.
6. START THE PREHEATER UNIT BY TURNING THE HYDRAULIC CONTROL VALVE TO “ON”.

NOTE:

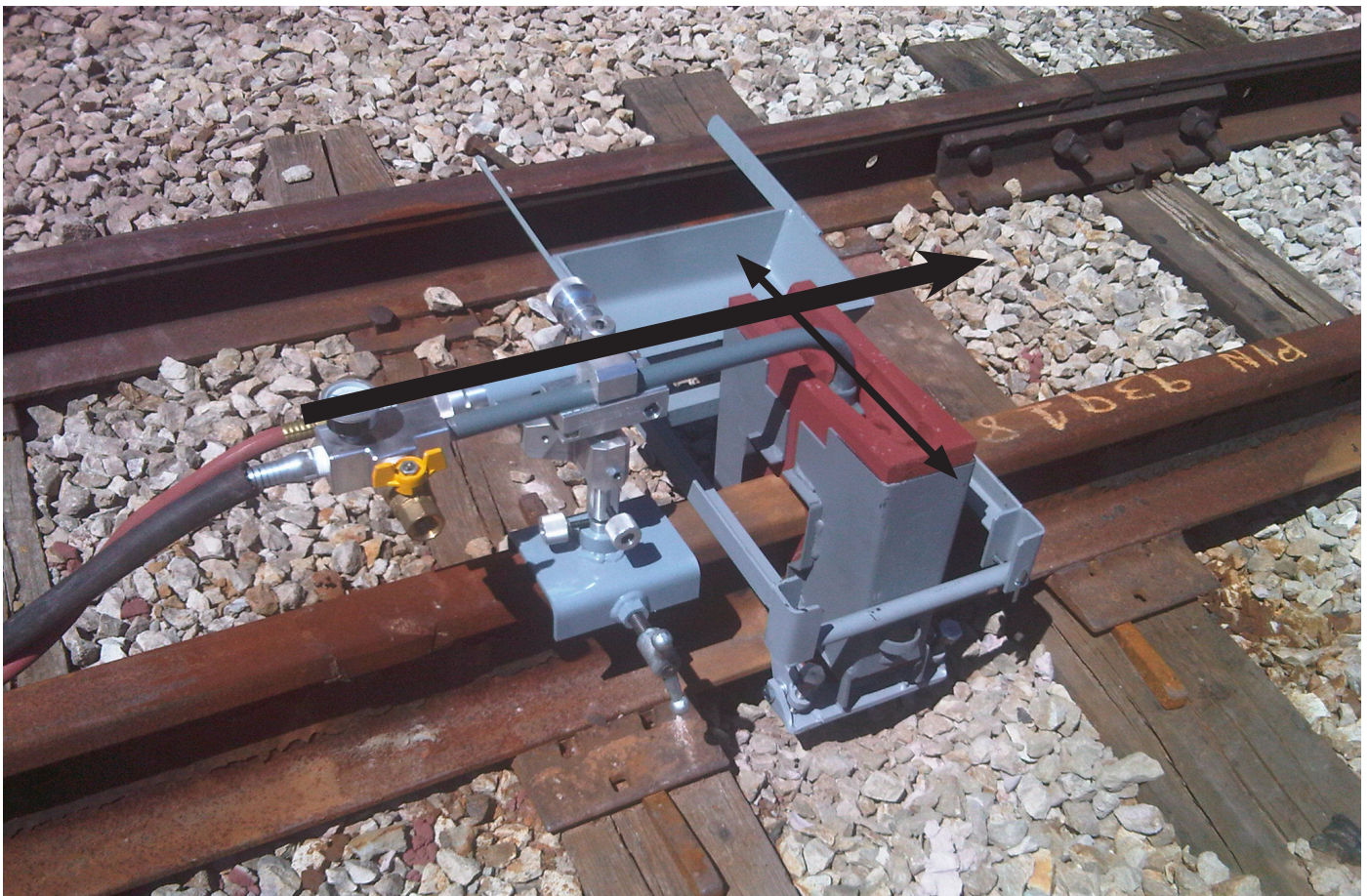
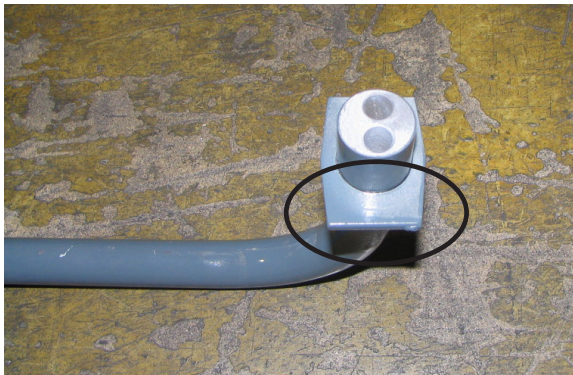
LET THE PREHEATER RUN 2-3 MINUTES TO ALLOW THE UNIT TO WARM UP, THEN TURN THE HYDRAULIC CONTROL VALVE TO THE “OFF” POSITION.

TURN THE POWER SOURCE OFF AT THIS TIME.

FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

7. CONNECT THE PROPANE FLEX-HOSE FROM THE REGULATOR/PROPANE TANK TO THE PREHEATER
8. THE INOX HEATING NOZZLE MUST BE ALIGNED IN THE MOLDS SO THAT THE FLAT PIECE 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.

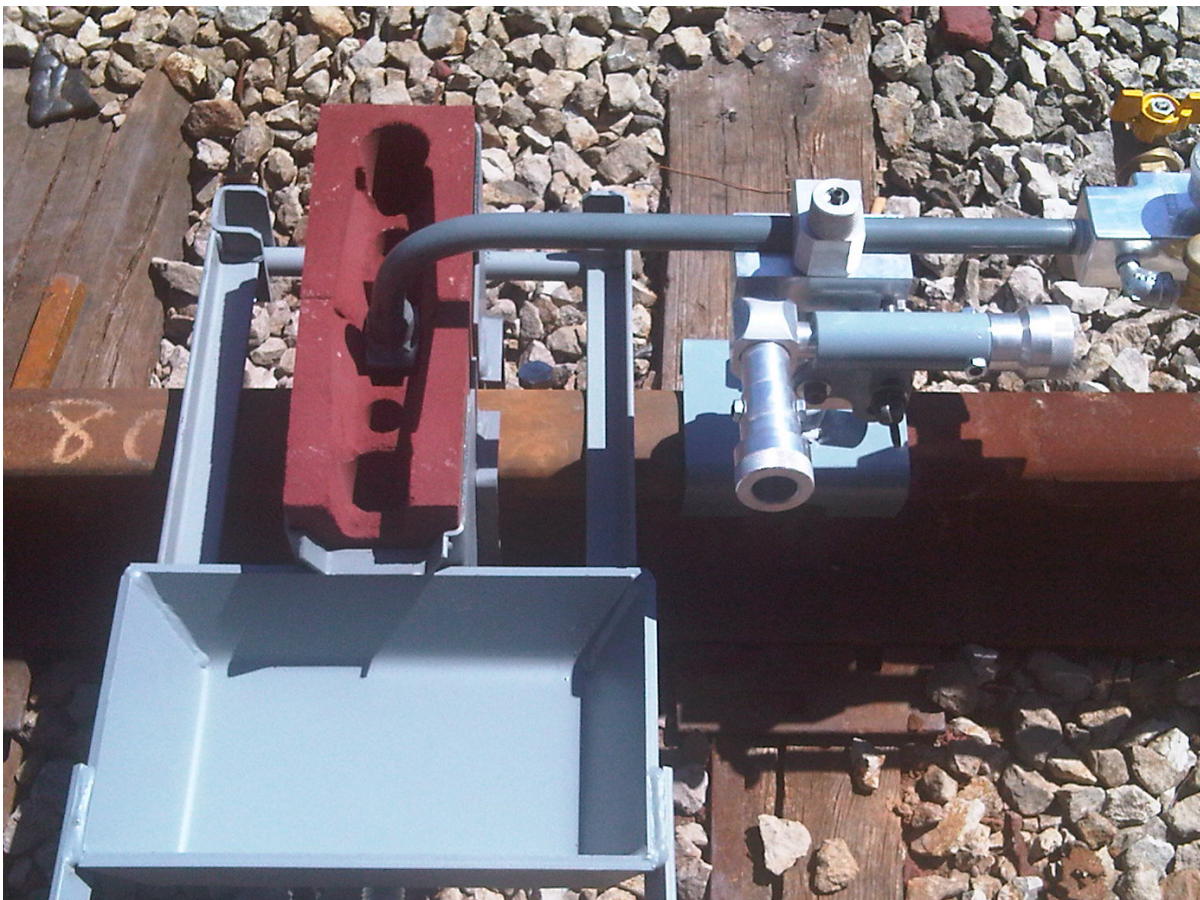


FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

NOTE: THE HEIGHT OF THE TORCH WILL AFFECT THE AIR PRESSURE. THIS WILL AFFECT THE OVERALL PREHEAT.

MAKE SURE THE HEIGHT IS ADJUSTED APPROPRIATELY.

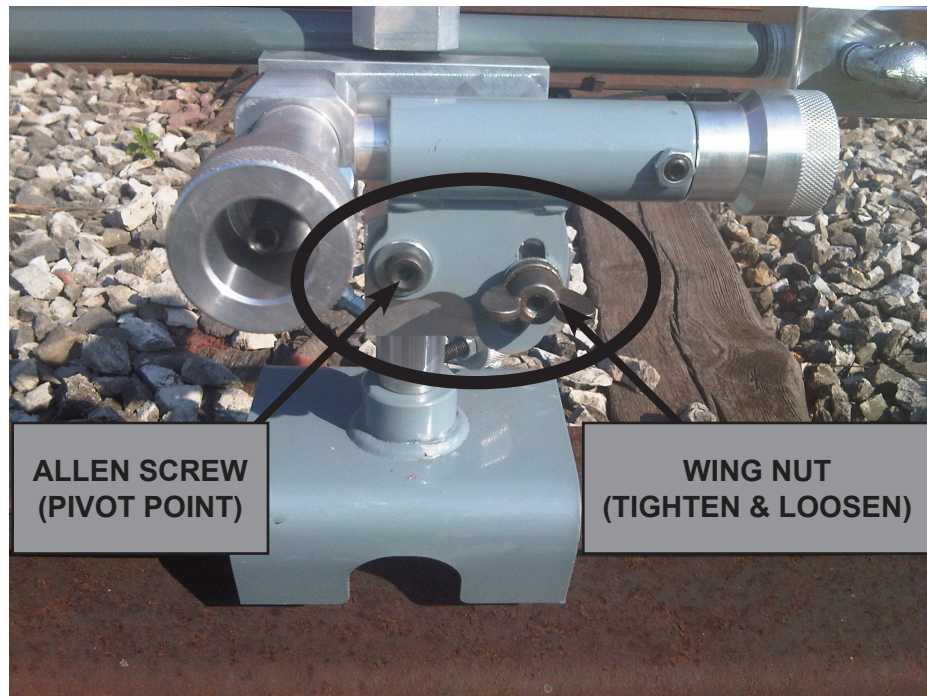


FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

TORCH STAND: ADJUST PIVOT

LOSEN WING NUT AND ALLEN SCREW, BUT DO NOT REMOVE EITHER FROM THE TORCH STAND.
 ADJUST PIVOT AS NEEDED. TIGHTEN WING NUT FOR DESIRED POSITION.



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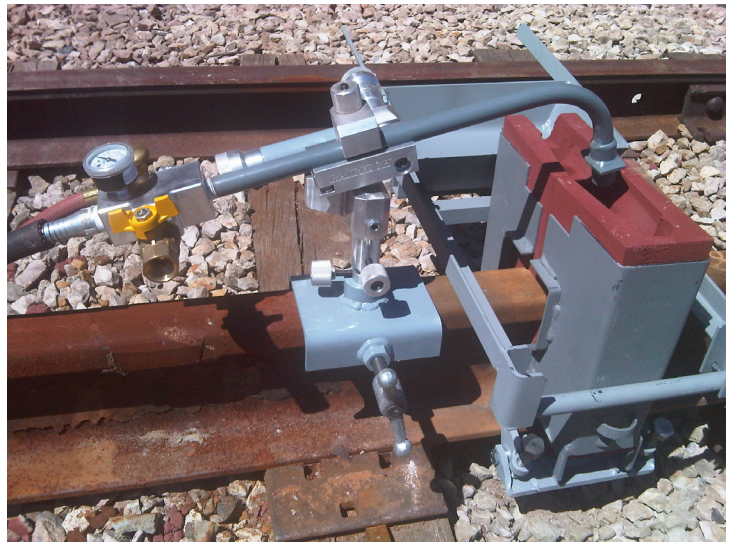
FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

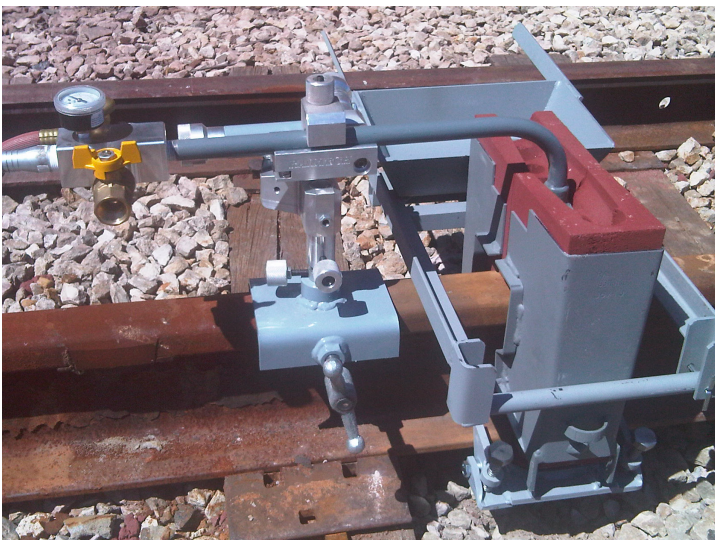
9. PRIOR TO STARTING THE RAIL PREHEATER, THE NOZZLE/TORCH TIP NEEDS TO BE TILTED ALL THE WAY BACK SO IT IS POINTING TO THE SIDE OF THE MOLD. THIS IS NECESSARY TO HELP START THE FLAME.

ELEVATED POSITION FOR LIGHTING FLAME

DO NOT TURN ON THE PROPANE GAS
UNTIL THE TORCH IS ELEVATED OUT
OF THE MOLD CHAMBER!



THE PRECISION TORCH STAND PIVOTS FOR THIS PURPOSE.



LEVEL POSITION FOR PREHEATING
THE RAIL ENDS

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FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

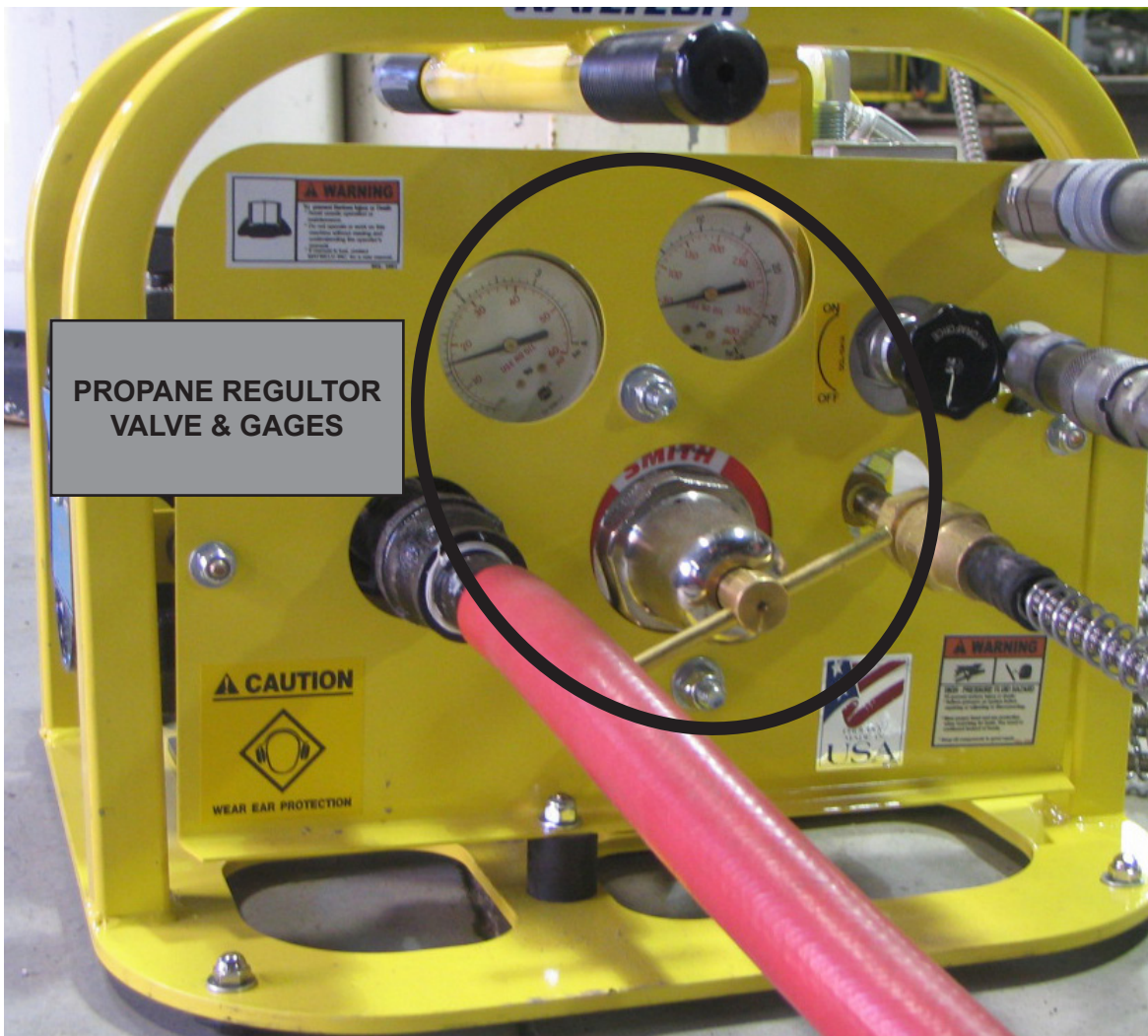
10. MAKE SURE THE PROPANE REGULATOR VALVE (LOCATED ON THE PREHEATER) IS TURNED ALL THE WAY OUT (COUNTERCLOCKWISE).
11. TURN THE HYDRAULIC POWER SOURCE TO THE “ON” POSITION TO SUPPLY 10 GPM.
12. TURN HYDRAULIC CONTROL VALVE KNOB CLOCKWISE, ON THE RAIL PREHEATER, TO ACTIVATE THE PREHEATER.
13. WITH THE RAIL PREHEATER UNIT OPERATING, OPEN THE SHUT OFF VALVE ON THE PROPANE TANK ALL THE WAY.



FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

14. WITH THE PROPANE SHUT-OFF VALVE LOCATED ON THE INOX BURNER COMPLETELY OPEN, ADJUST THE PROPANE REGULATOR TO 8-10 PSI.
IT MAY BE NECESSARY TO ADJUST PROPANE TO 15 PSI IF FLASHBACK ARRESTORS ARE INSTALLED



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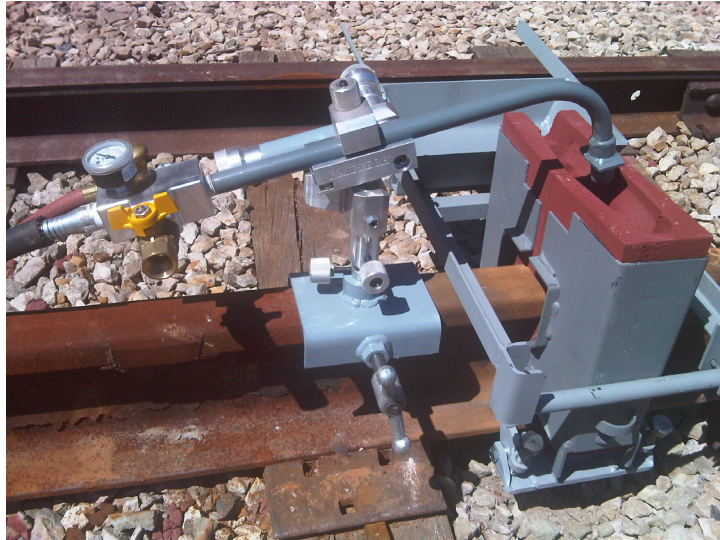
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FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

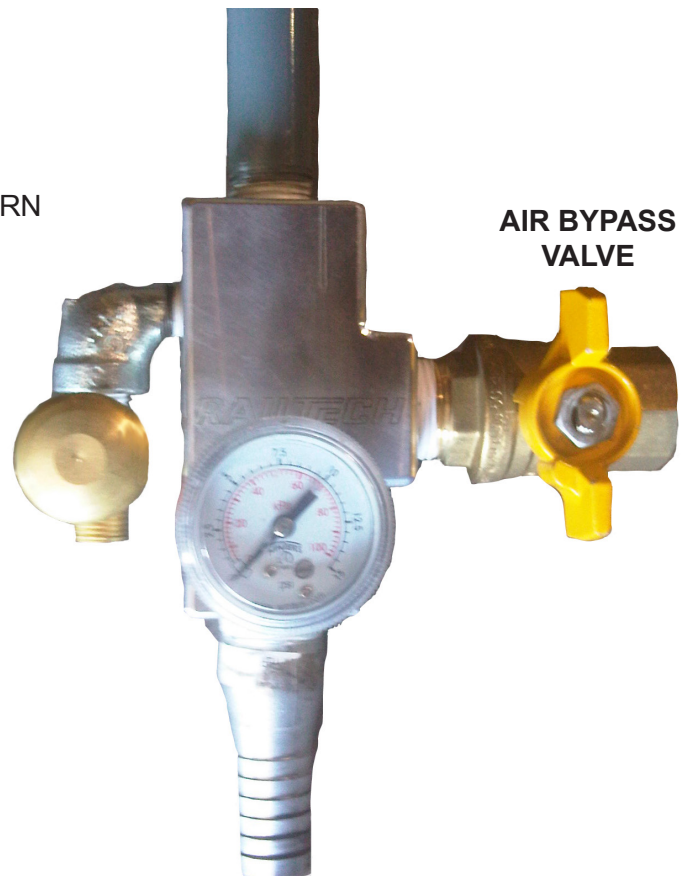
15. WITH THE RAIL PREHEATER UNIT OPERATING, OPEN THE AIR BYPASS VALVE LOCATED AT THE HYDRAULIC TORCH MANIFOLD TO ADJUST AIR PRESSURE FOR EASE OF LIGHTING THE HYDRAULIC TORCH. THE TORCH SETUP SHOULD STILL BE PIVOTED BACK SO THE TORCH TIP IS ELEVATED.

POSITION FOR LIGHTING
THE HYDRAULIC TORCH



TO LIGHT THE HYDRAULIC TORCH:
 OPEN THE PROPANE SHUT OFF VALVE $\frac{1}{2}$ TO $\frac{3}{4}$ TURN
 AND STRIKE ABOVE THE MOLD CHAMBER. THE
 HYDRAULIC TORCH CAN BE LIT WITH A STRIKER.

**PROPANE
SHUTOFF VALVE**

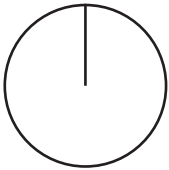


FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION: LIGHTING THE HYDRAULIC TORCH FOR BOUTET PREHEAT

WITH TORCH TILTED BACK, OPEN PROPANE SHUT OFF VALVE 3/4 TURN AND OPEN AIR BYPASS VALVE TO LIGHT. RUN FOR 10-20 SECONDS TO ALLOW MOLDS TO WARM UP. AS YOU LOWER THE TORCH, ADJUST PROPANE SHUT OFF VALVE BACK 1/2 TO 3/4 TURN AND CLOSE AIR BYPASS TO REACH 2.5-3 PSI AIR. FLAMES SHOULD BE APPROX. 6" CONES AND SOUND LIKE A TURBINE.

**PROPANE SHUT OFF
VALVE**



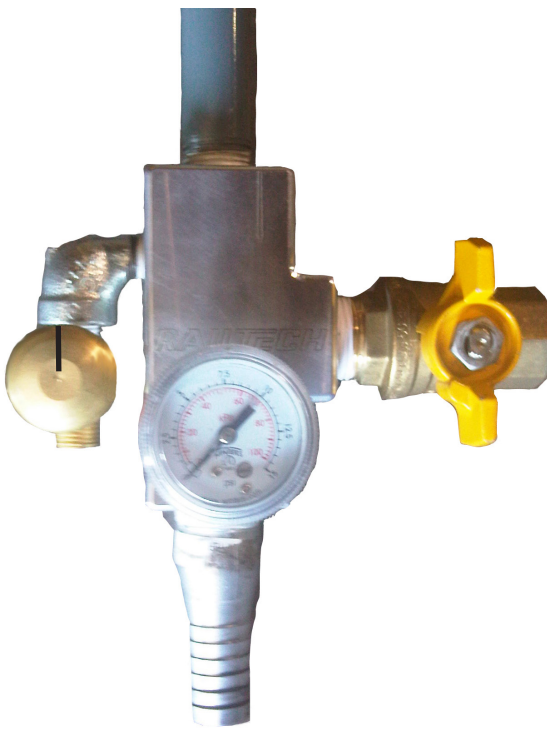
OFF POSITION



3/4 LIGHTING

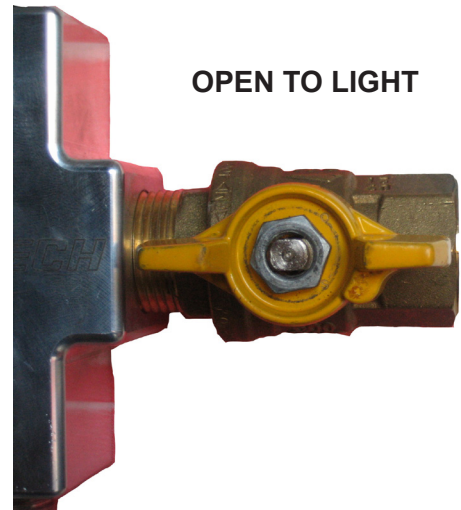


1/2 OPERATING



**AIR BYPASS
VALVE**

OPEN TO LIGHT



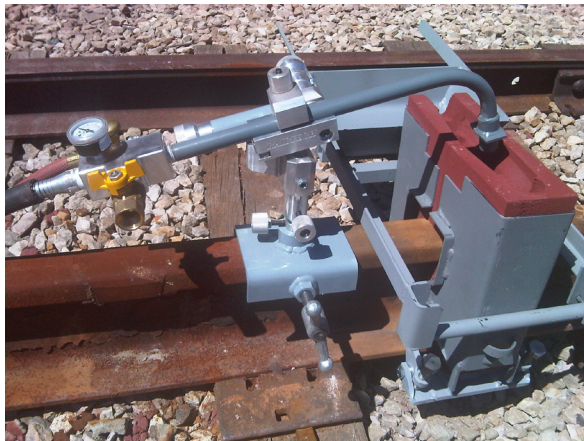
**CLOSE UNTIL AIR IS
2.5-3 PSI TO PREHEAT**



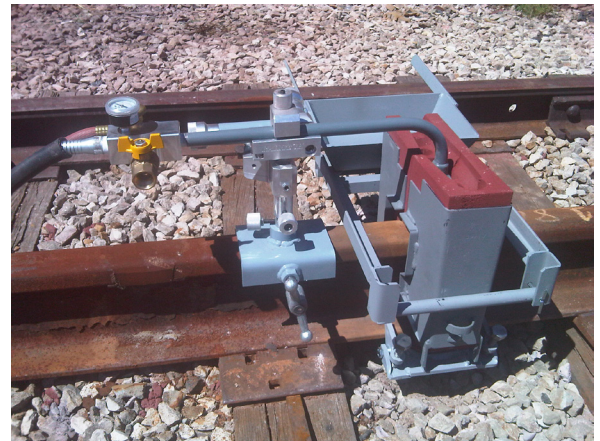
FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

16. AFTER LIGHTING, LET THE FLAMES WARM THE MOLDS FOR 10-20 SECONDS. SLOWLY LOWER TORCH AND CLOSE AIR BYPASS VALVE SO AIR IS 2.5-3PSI. POSITION 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.
IT MAY BE NECESSARY TO ADJUST PROPANE TO 15 PSI IF FLASHBACK ARRESTORS ARE INSTALLED



POSITION FOR LIGHTING
THE HYDRAULIC TORCH



POSITION FOR PREHEATING



WARM THE MOLDS FOR
10-20 SECONDS.

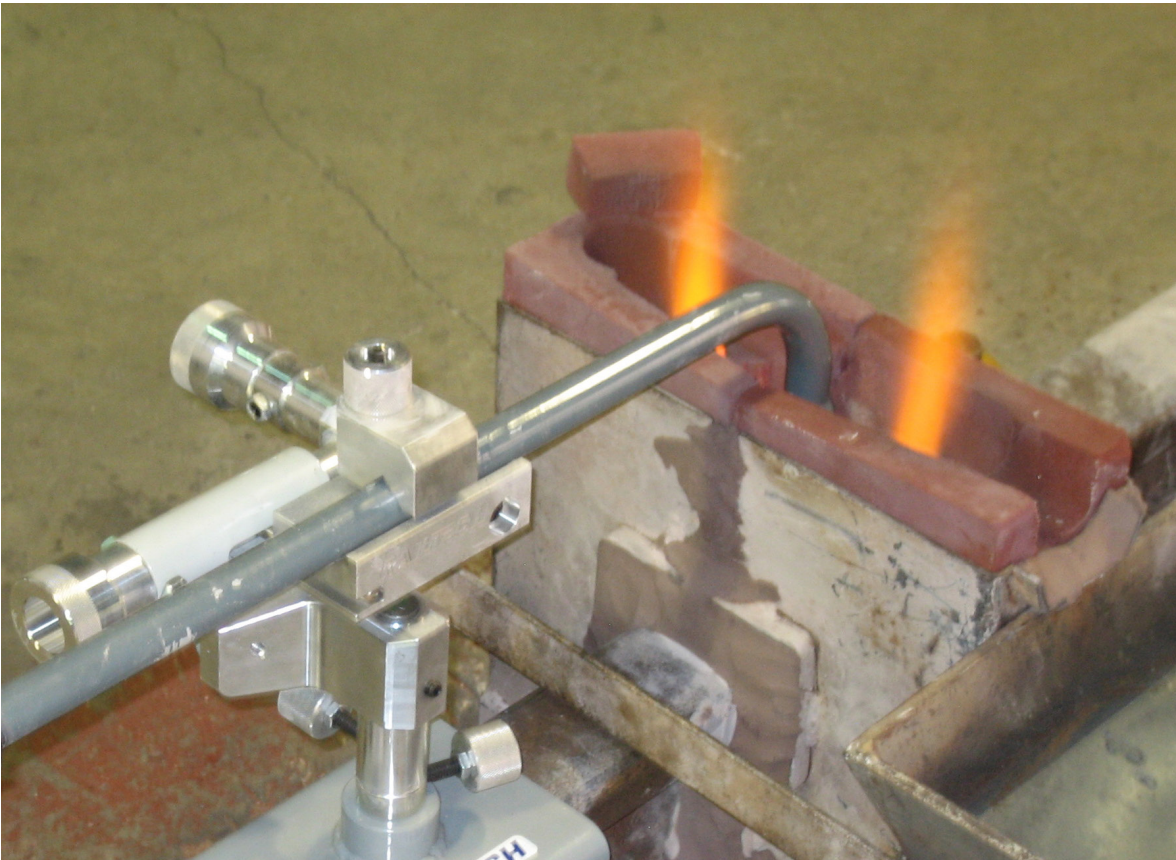


6" - 8" CONE-SHAPED FLAMES

FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

17. REMEMBER, THE PREHEAT IS DEPENDENT ON THE SOUND AS IT MAY BE DIFFICULT TO SEE THE FLAME WHEN OPERATING IN SUNNY WEATHER. IT IS NECESSARY TO ADJUST THE FLAME AT THE PROPANE SHUT OFF VALVE TO FINE TUNE THE FLAME AND TO BECOME FAMILIAR WITH THIS SOUND. 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.
18. FOR THE PREHEAT, THE PRESSURES FOR THE TORCH SHOULD BE ADJUSTED SO THAT AIR IS SET TO 2 ½ - 3 PSI AND PROPANE IS SET TO 8-10 PSI.



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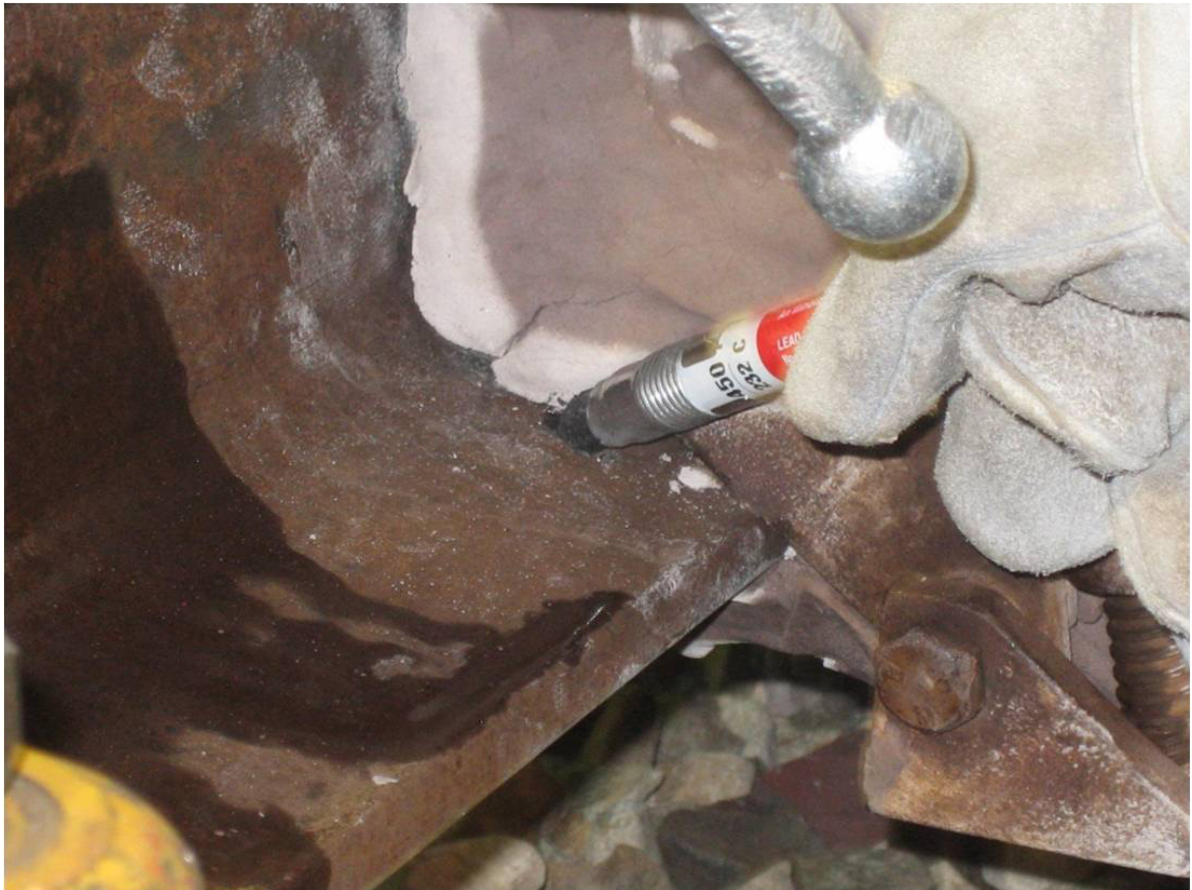
FLOW: 10GPM (38 LPM)
PRESSURE: 2000 PSI (140 BAR)
RPM: 3.600

OPERATION:

18. ONCE THE FLAME IS FINE TUNED, START THE PREHEAT TIME.
DURING PRE-HEAT THE FLAME WILL BURN MORE EFFICIENTLY. PROPANE CAN BE ADDED
TO FLUTTER AND REDUCED TO SOUND LIKE TURBINE.

**PLEASE REFER TO YOUR COMPANY MANUAL OR SPECIFIC RAILROAD GUIDELINES
ON PREHEATING PROCEDURES FOR THERMITE WELDING.**

DO NOT HEAT RAIL ENDS MORE THAN 8 MINUTES.



**DURING THE PREHEAT, THE TOP OF THE BASE OF THE RAIL SHOULD BE 450°F
MINIMUM AT 2-1/2 INCHES FROM THE RAIL ENDS, TESTED WITH A TEMPSTICK.**

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MAINTENANCE:

1. CHECK TOOL DAILY FOR PROPER OPERATION, LEAKS, OR DAMAGE.
2. INSPECT HOSES DAILY. REPLACE CUT, BURNED, OR OTHERWISE DAMAGED HOSES.
3. KEEP QUICK DISCONNECT COUPLERS CLEAN AND LUBRICATED.
4. USE HYDRAULIC FLUIDS THAT COMPLY WITH HTMA SPECIFICATION 5.7, THE HYDRAULIC FLUID SHOULD HAVE A VISCOSITY BETWEEN 100 AND 400 SSU (20-82 CENTISTOKES) AT THE MAXIMUM AND MINIMUM EXPECTED OPERATING TEMPERATURES. PETROLEUM BASED HYDRAULIC FLUIDS WITH ANTI-WEAR PROPERTIES AND A VISCOSITY INDEX OF OVER 140 WORK FOR A WIDE RANGE OF OPERATING CONDITIONS.

THE FOLLOWING OILS MEET HTMA SPECIFICATION 5.7:

AMOCO RYKON MV	CITGO A/W ALL TEMP
SUNVIS 706	MOBIL D.T.E. 13
CHEVRON EP-MV	TEXACO "RANDO" HDAZ

OTHER FLUIDS THAT MEET OR EXCEED THIS SPECIFICATION CAN BE USED.

COLD WEATHER OPERATION

HYDRAULIC SYSTEM PERFORMANCE IS AFFECTED WHEN THE TEMPERATURE DROPS BELOW 50°F. THEREFORE, MEASURES SHOULD BE TAKEN TO PRE-WARM TOOLS AND FLUIDS BEFORE OPERATING.

5. HAVE TOOL INSPECTED BY PANDROL, OR A PANDROL QUALIFIED SERVICE REPRESENTATIVE, TO DETERMINE IF TOOL IS IN NEED OF SAFETY CHANGES OR WORN PART REPLACEMENT, AT LEAST ONCE A YEAR.
6. CONTACT RAILTECH BOUTET ON A PERIODIC BASIS, AT LEAST ANNUALLY, FOR SERVICE BULLETINS, SAFETY NOTICES, OR OTHER IMPORTANT INFORMATION PERTAINING TO THIS TOOL.

RECOMMENDED GEARBOX OIL GRADES

AMBIENT TEMP: 32F-90F (0C-32C)
VISCOSITY RANGE SSU @ 100F: 0C-32C) 7000-10,000
ISO NO.: 220
OIL SUMP CAPACITY: 3.4 FL. OZ (.1 LITER)

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. THEREAFTER, 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.

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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.

PROBLEM:	POSSIBLE CAUSE:	SOLUTION:
NO AIR FLOW	1. SPEED TOO 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.
LOW AIR PRESSURE	4. SPEED TOO LOW 5. OBSTRUCTION IN PIPING	CHECK HOSES, VALVES, AIR FILTER TO ASSURE OPEN FLOW. CHECK HYDRAULIC POWER SOURCE TO INSURE PROPER FLOW AND PRESSURE (10 GPM @ 2000 PSI).
HIGH AIR PRESSURE	6. SPEED TOO HIGH 7. AIR DISCHARGE TOO HIGH	CHECK HYDRAULIC POWER SOURCE TO INSURE PROPER FLOW AND PRESSURE (10 GPM @ 2000 PSI)
OVERHEATING OF BEARINGS AND/OR GEARS	8. INADEQUATE LUBRICATION 9. EXCESSIVE LUBRICATION 10. SPEED TOO LOW	RESTORE CORRECT OIL LEVELS IN GEARBOX AND LUBRICATE. CHECK GEAR OIL LEVEL. IF CORRECT, DRAIN AND REFILL WITH CLEAN OIL OF REC. GRADE. SPEEDS LOWER THAN REC. WILL CAUSE OVERHEATING. CHECK BELT CONDITION OR TENSION
NO AIR FLOW	11. IMPELLARS RUBBING 12. WORN BEARINGS/GEARS 13. UNBALANCED OR RUBBING IMPELLARS 14. DRIVER OR BLOWER LOOSE 15. BELT CONDITION	INSPECT OUTSIDE OF CYLINDER AND HEAD PLATES 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 BUILDUP TO RESTORE ORIGINAL CLEARANCES AND IMPELLER BALANCE. TIGHTEN MOUNTING BOLTS SECURELY. CHECK BELT FOR PROPER TENSION AND WEAR.

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A. TOOL CIRCUIT

$$\text{GPM} = \frac{\text{CID} \times \text{RPM}}{231} \qquad \text{HP} = \frac{\text{GPM} \times \text{PSI}}{1714 (.85)}$$
$$\frac{10 \text{ GPM} \times 1500 \text{ PSI}}{1456.9} = \frac{15000}{1456.9} = 10.3 \text{ HP}$$

(subtract back pressure for tool HP)

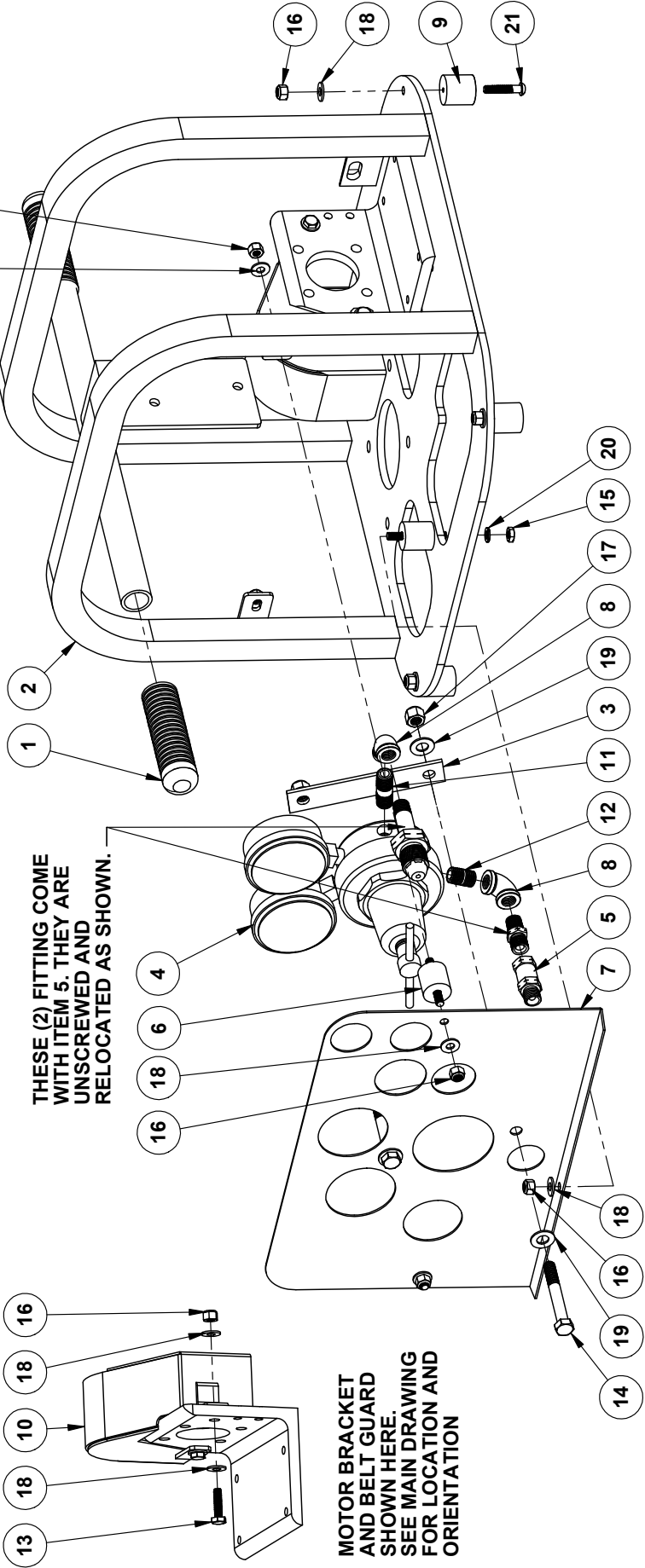
GPM	PSI					
	500	1,000	1,500	2,000	2,500	3,000
3	1.03	2.06	3.09	4.12	5.15	6.18
5	1.72	3.43	5.15	6.86	8.58	10.30
10	3.43	6.86	10.30	13.70	17.20	20.60
15	5.15	10.30	15.40	20.60	25.70	30.90

BACK PRESSURE MEASURED AT THE TOOL RETURN PORT MUST NOT EXCEED THE MANUFACTURER'S BACK PRESSURE RATING. MOST MANUFACTURERS LIST THE MAXIMUM BACK PRESSURE FOR THEIR HYDRAULIC TOOLS AT 250 PSI. BACK PRESSURE MEASURED ON THE RETURN SIDE OF THE TOOL IS THE FORCE REQUIRED TO GET THE OIL BACK TO THE TANK. IN ALMOST ALL CASES THE LOWER THE BACK PRESSURE THE BETTER THE TOOL PERFORMANCE. FIRST, THE BACK PRESSURE IS SUBTRACTED FROM THE MAXIMUM TOOL PRESSURE TO ARRIVE AT A MAXIMUM TOOL OPERATING PRESSURE. FOR EXAMPLE, TOOLS WITH 2000 PSI OPERATING PRESSURE ARE INSTALLED ON A SYSTEM WITH 250 PSI BACK PRESSURE. THIS LEAVES 1750 PSI AS A MAXIMUM TOOL PRESSURE. IMAGINE A SYSTEM WITH 500 PSI BACK PRESSURE. 2000 MINUS 500 PSI BACK PRESSURE LEAVES ONLY 1500 PSI FOR THE TOOL. SECOND, TOOLS ARE DESIGNED FOR PRESSURE TO BUILD ON THE PRESSURE SIDE OF THE TOOL. IF TOO MUCH PRESSURE BUILDS ON THE RETURN SIDE, NOT ONLY IS PERFORMANCE EFFECTED, BUT SEALS MAY BLOW. THIS IS WHY IT IS VERY IMPORTANT TO DIRECT THE FLOW INTO THE TOOL CORRECTLY. REVERSING THE HOSES TO TEST MAY RESULT IN BLOWN SEALS, DAMAGE TO THE TOOL, AND PERSONAL INJURY.

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03800B FRAME DETAILS

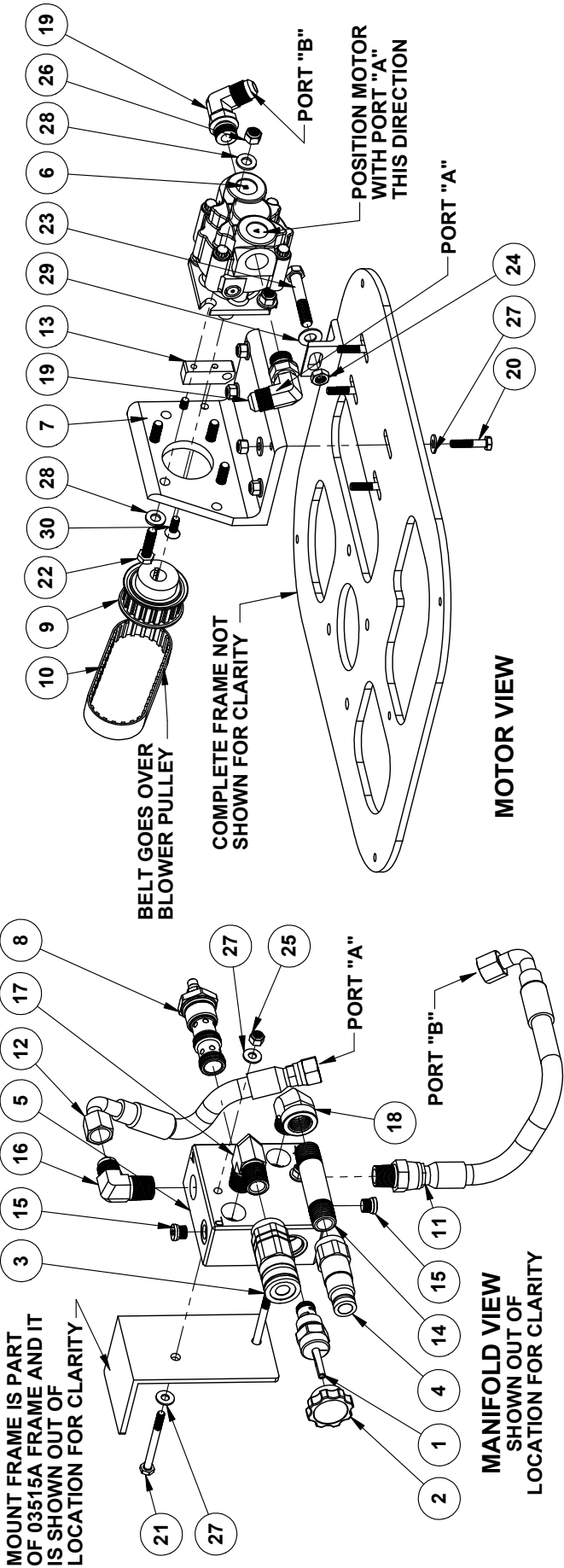
ITEM NO.	PART NUMBER	DESCRIPTION	QTY	ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	00106	GRIP	2	12	1/4-80 CLOSE	1/4 NPT x 7/8 SCH. 80 BRASS NIPPLE	1
2	03815A	MAIN FRAME	1	13	A1002	1/4-20 x 1 HEX HEAD BOLT	2
3	03819A	REGULATOR MOUNT PLATE	1	14	A1063	3/8-16 X 2 3/4 HEX HEAD BOLT	2
4	03823	REGULATOR ASSEMBLY	1	15	A1450	1/4-20 HEX JAM NUT	1
5	03824	CHECK VALVE	1	16	A2046	1/4-20 NYLOCK NUT	11
6	03860	VIBRATION MOUNT	3	17	A2050	3/8-16 NYLOCK NUT	2
7	03862	FRONT PANEL	1	18	A2190	1/4 SAE FLAT WASHER	13
8	03869	1/4 NPT FEMALE 90 ELBOW	2	19	A2192	3/8 SAE FLAT WASHER	4
9	03874	VIBRATION FEET	4	20	A3809	1/4 LOCK WASHER	1
10	03883	BELT GUARD	1	21	A6352	1/4-20 x 1 1/4 BHCS	4
11	1/4-80 1 1/2"	1/4 NPT x 1 1/2 SCH. 80 BRASS NIPPLE	1				



03800B HYDRAULIC DETAILS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY	ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	00137	CONTROL VALVE w/KNOB	1	16	405-08-08	1/2 NPT x -08 JIC 90 ELBOW	1
2	00138A	REPLACEMENT KNOB ONLY	1	17	5500-08-08	1/2 NPT 90 ELBOW	1
3	00145	QUICK DISCONNECT COUPLER	1	18	5502-08-08	1/2 NPT STREET 90 ELBOW	1
4	00146	QUICK DISCONNECT NIPPLE	1	19	6801-08-08	-08 JIC x -08 O-RING 90 ELBOW	2
5	00795	FLOW CONTROL MANIFOLD	1	20	A1003	1/4-20 x 1 1/4 HEX HEAD BOLT	4
6	03801A	HYDRAULIC MOTOR	1	21	A1009	1/4-20 x 2 3/4 HEX HEAD BOLT	2
7	03812C	HYDRAULIC MOTOR MOUNT	1	22	A1023	5/16-18 x 1 1/4 HEX HEAD BOLT	4
8	03846	FLOW REGULATOR VALVE	1	23	A1047	3/8-16 x 2 1/4 HEX HEAD BOLT	1
9	03855	HYDRAULIC MOTOR PULLEY	1	24	A1454	3/8-16 HEX JAM NUT	1
10	03856	DRIVE BELT	1	25	A2046	1/4-20 NYLOCK NUT	6
11	03872	PORT "B" HOSE	1	26	A2048	5/16-18 NYLOCK NUT	4
12	03873	PORT "A" HOSE	1	27	A2190	1/4 SAE FLAT WASHER	12
13	03875	ADJUSTMENT LUG	1	28	A2191	5/16 SAE FLAT WASHER	8
14	1/2 X 3 1/2 NIP	1/2 NPT x 3 1/2 SCH. 80 NIPPLE	1	29	A2192	3/8 SAE FLAT WASHER	1
15	231P-04	-04 O-RING PLUG	2	30	A6307	1/4-20 x 3/4 FLAT HEAD SCREW	2

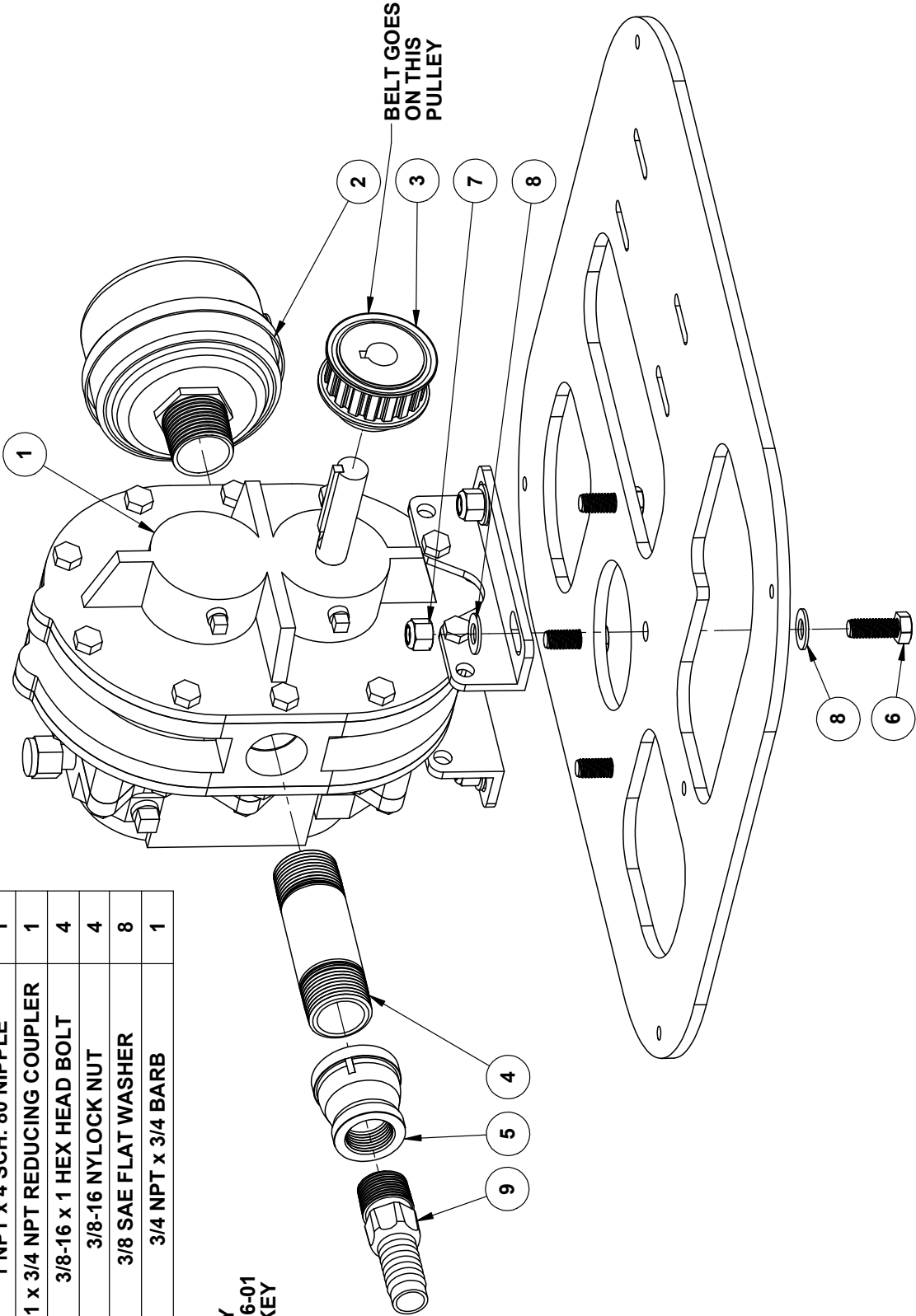
NOTE:
REPLACEMENT
KEY FOR 03801A
IS 00704 1/8" SQ X
7/8" LG KEY



03800B BLOWER DETAILS

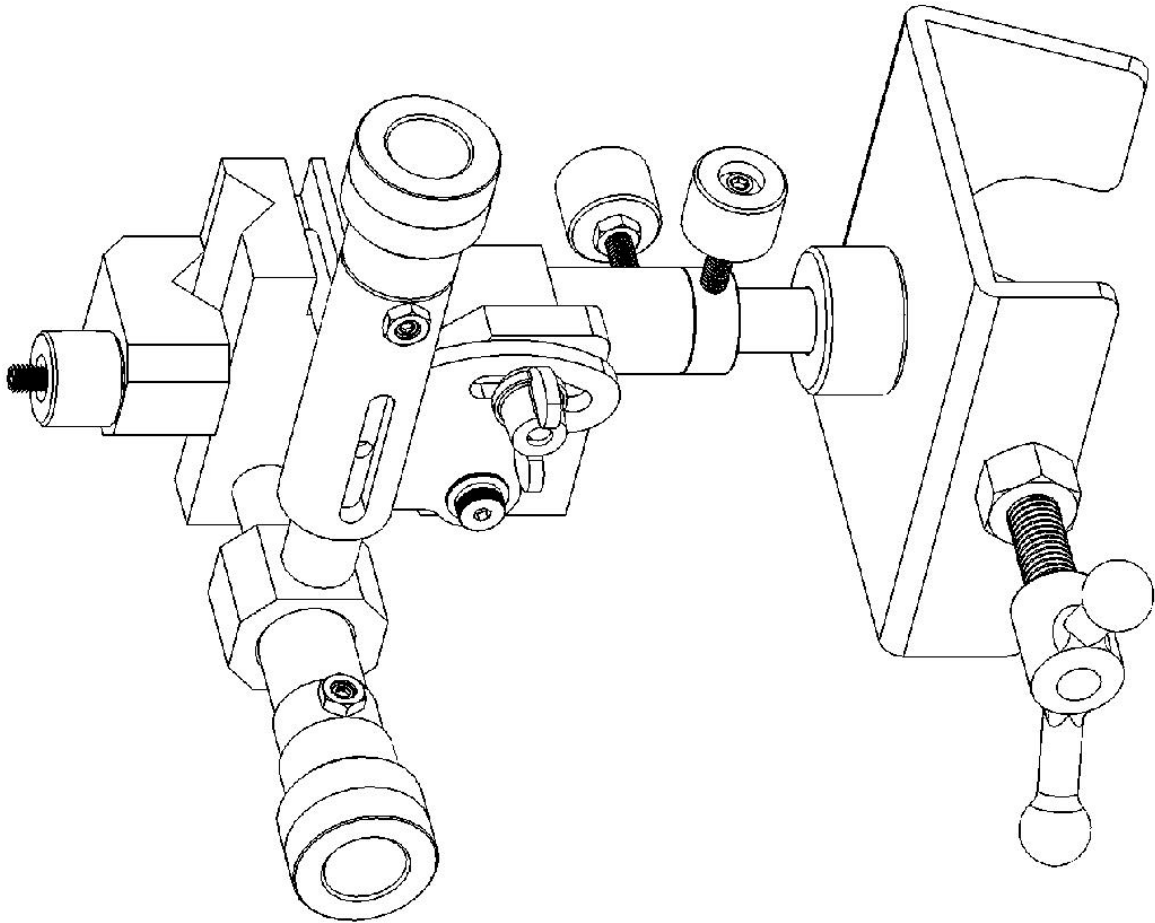
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	03802A	ROOTS BLOWER 22	1
2	03803A	INLET AIR FILTER	1
3	03854	BLOWER PULLEY	1
4	03857	1 NPT x 4 SCH. 80 NIPPLE	1
5	03858	1 x 3/4 NPT REDUCING COUPLER	1
6	A1042	3/8-16 x 1 HEX HEAD BOLT	4
7	A2050	3/8-16 NYLOCK NUT	4
8	A2192	3/8 SAE FLAT WASHER	8
9	STC-5	3/4 NPT x 3/4 BARB	1

NOTE:
REPLACEMENT KEY
FOR 03802A IS 00806-01
3/16" SQ X 3/4" LG KEY

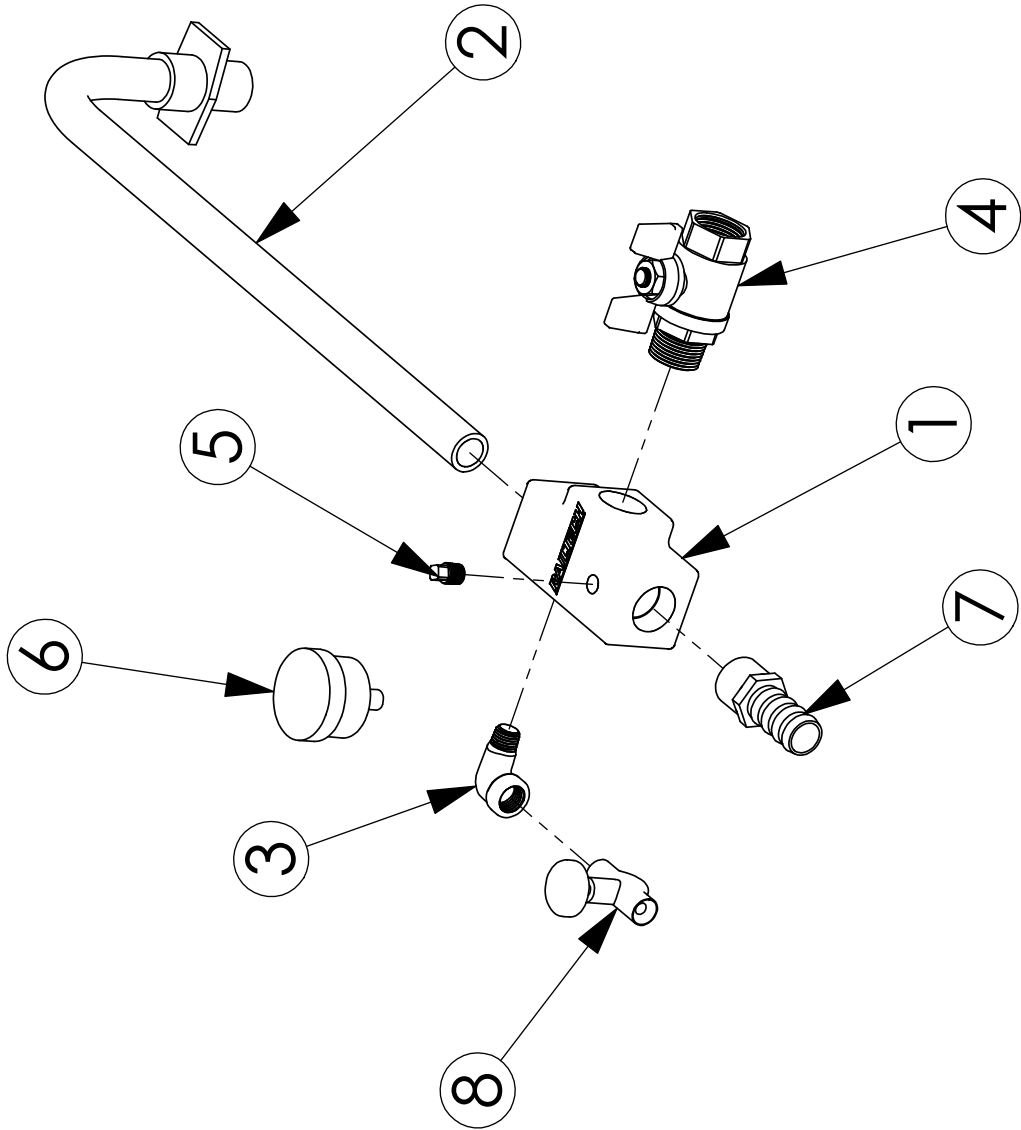


PRECISION TORCH STAND

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	06814	CLAMP SCREW ASSEMBLY	1
2	06817	5/16-18 x 1 1/2 DOUBLE ENDED STUD	1
3	06818	5/16-18 WING NUT	1
4	06819	3/8 WAVE WASHER	2
5	06820	CLAMP BASE BODY	1
6	06821	HEIGHT ADJUSTMENT SHAFT	1
7	06822	HEIGHT ADJUSTMENT BLOCK	1
8	06823	ANGLE BRACKET	1
9	06824	ALIGNMENT SHAFT	1
10	06825	SUPPORT TUBE	1
11	06826	SUPPORT SHAFT	1
12	06827	TORCH CLAMP	1
13	06828	SADDLE BLOCK	1
14	06829	POSITIONING ROD	1
15	06830	3/8-16 x 3 1/4 SET SCREW	2
16	06831	ALIGNMENT SHAFT KNOB	1
17	06833	CLAMP KNOB	3
18	06835	SUPPORT SHAFT KNOB	1
19	06836	5/16-18 x 3 1/4 SET SCREW	1
20	06837	EXTENSION NECK	1
21	LC-075	3/4 ID LOCK COLLAR	1
22	A1452	5/16-18 HEX JAM NUT	6
23	A2191	5/16 SAE FLAT WASHER	2
24	A3810	5/16 LOCK WASHER	1
25	A5620	5/16-18 x 1/2 SET SCREW	2
26	A5630	5/16-18 x 1/2 DOG POINT SET SCREW	4
27	A6314	3/6-16 x 1 FLAT HEAD SCREW	1
28	A6925	DIA. 3/8 x 5/16 SHOULDER BOLT	1
29	A6357	5/16-18 x 1 1/2 BHCS	1
30	A6362	5/16-18 x 1 3/4 BHCS	2



03800B HYDRAULIC TORCH



ITEM NO.	PART NUMBER	QTY.
1	HT-1 Manifold	1
2	HT-2 Burner	1
3	HT-3 Street Elbow	1
4	HT-4 Air Dump Valve	1
5	HT-5 Sq. Head Plug	1
6	HT-6 Air Gauge	1
7	HT-7 Air Hose Fitting	1
8	HT-8 Gas Valve	1

03800B HYDRAULIC RAIL PREHEATER
DECAL LEGEND:



DCL 1078



DCL 1002



DCL 1062



DCL 1027



DCL 1001



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LIMITED WARRANTY DOES NOT COVER NORMAL WEAR AND TEAR ITEMS SUCH AS FILTERS, HOSES, COUPLERS, BITS, SOCKETS, AUGERS, AND BATTERIES.

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CUSTOMER INFORMATION:

Name _____

Company _____

Serial # of your Pandrol tool _____

*(Upon receiving your Pandrol tool, make sure to list serial number above so that a good record is kept for order information.)***PANDROL HYDRAULIC TOOL LIST**All Pandrol Hydraulic Tools operate at **5GPM or 10 GPM @ 2000 PSI****POWER UNITS:**

00100K – GASOLINE POWERED (1) 10 GPM OR (2) 5 GPM CIRCUITS
 02900A – DIESEL (1) 10 GPM OR (2) 5 GPM CIRCUITS (OPTIONAL CATALYTIC EXHAUST)
 05500 – TWIN POWER DUAL CIRCUIT (1) 10 GPM OR (2) 5 GPM CIRCUITS & 5000 WATT GENERATOR
 02050RM – MODULAR POWER UNIT (1) 9 GPM
 03700A – ELECTRIC POWER (1) 10 GPM OR (2) 5 GPM CIRCUITS

GRINDERS:

09200A – PRECISION FROG GRINDER
 06000 – PROFILE GRINDER
 06950 & 06950A – MULTI-PURPOSE GRINDER
 05900 – FROG/PROFILE GRINDER (TRIGGER VERSION AVAILABLE)
 00700 – RAIL SURFACING GUIDE
 04600 – STRAIGHT STONE GRINDER CW ROTATION (TRIGGER VERSION AVAILABLE)
 04700 – STRAIGHT STONE GRINDER CCW ROTATION (TRIGGER VERSION AVAILABLE)
 07500 – CHAMFER TOOL
 04800 – 6" CUP STONE GRINDER (TRIGGER VERSION AVAILABLE)
 00600 – 8" CUP STONE GRINDER
 05400 – ANGLE GRINDER
 09300 - HEAD WASH GRINDER

TRACK TOOLS:

03900A – REVERSING RAIL SAW	00800A – 16" RAIL SAW
05100A & 05100B – POWER WELD SHEAR	05000 – HAND PUMP WELD SHEAR
03500 – SELF FEED RAIL DRILL	01500 – RAIL DRILL
01600A – 5 GPM 1" IMPACT WRENCH	02500 – 10 GPM 1" IMPACT WRENCH
04500D – 1/2" HYDRAULIC DRILL IMPACT WRENCH	03100C – RAIL PULLER
08200 – TAMPER	08300 – SPIKE DRIVER
02800A – 60 TON BRIDGE SPREADER	
01100RM – LIGHT-WEIGHT SPIKE PULLER	

OTHER PRODUCTS:

HYDRAULIC MANIFOLDS
 HYDRAULIC TEST GAUGES
 HOSE REELS
 HYDRAULIC HOSES
 ACCESSORIES

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