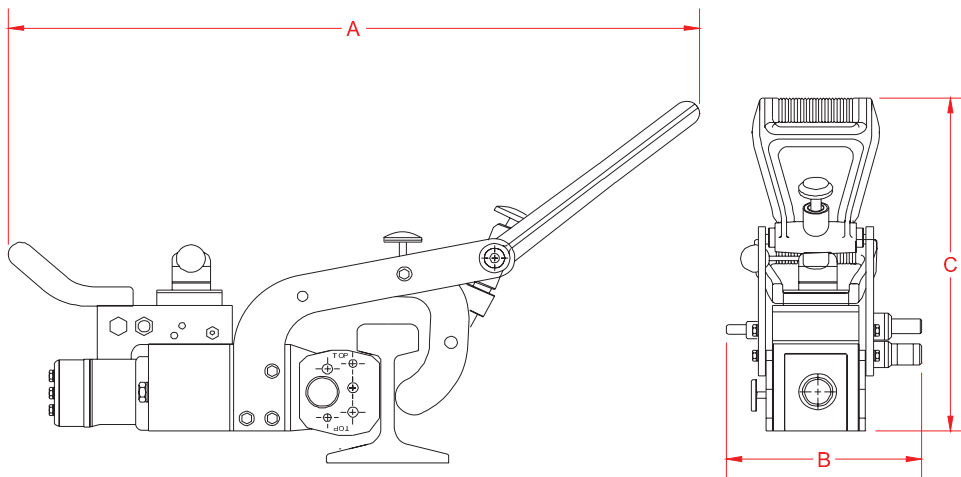


## 03500 SELF FEED RAIL DRILL

The Matweld Self Feed Rail Drill is a light weight maintenance tool that offers cost effective operation. Maintenance crews will appreciate the simple clamp for quick setup on track. The use of Arrowhead inserts (patented), allows for quick drilling time and precision holes. The drill includes a lubrication system.



FLOW	PRESSURE	DIMESIONS	WEIGHT
10 GPM (38 LPM)	2000 PSI (140 BAR)	A - 35" B - 9" C - 15-1/2"	66 lbs. (30 kg)

### ACCESSORIES:

- 03532 RAIL TEMPLATES (SPECIFY RAIL PROFILE)
- 01540 INDEX BARS (SPECIFY RAIL PROFILE)
- 03598 STORAGE CASE
- 03599 BIODEGRADABLE CUTTING FLUID (1 OR 5 US GALLONS)

**MATWELD INC.  
SELF FEED RAIL DRILL BIT OPTIONS**



ARROW HEAD INSERT  
(PATENTED)

**INSERT SPECIFICATIONS:**

<b>PART NO.</b>	<b>INSERT DIAMETERS ENGLISH</b>	<b>INSERT DIAMETERS METRIC</b>
03570-1	7/8", 15/16", 1"	22MM, 23MM, 24MM, 25MM
03571-1	1 1/16", 1 1/8", 1 3/16", 1 1/4", 1 5/16", 1 3/8"	26MM, 27MM, 28MM, 29MM, 30MM, 31MM, 32MM, 33MM, 34MM, 35MM
03572-1	1 7/16", 1 1/2", 1 5/8"	36MM, 37MM, 38MM

*PART NO. DESIGNATES WHICH DIAMETER INSERTS ARE AVAILABLE FOR THAT PARTICULAR HOLDER.*

**ACCESSORIES:**

03532	Rail Templates (Specify rail profile)
01540	Index Bars (Specify rail profile)
03598	Storage Case
03599	Biodegradable Cutting Fluid in 1 or 5 US Gallons (specify size)
Arrowhead Inserts	(See chart above)

## 03500 SELF FEED RAIL DRILL

### RAIL TEMPLATES:

<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
03532-1	112-115-119 / 131-132-136	03532-13	85 A.S.C.E.
03532-3	100 AREA - U.P. / 105 DUDLEY	03532-15	100 A.R.A.-A.
03532-4	133 AREA / 140 AREA	03532-16	22 KG/M
03532-5	127 DUDLEY / 130 PS	03532-17	30 KG/M
03532-06	90 A.R.A.-B	03532-18	48 KG/M
03532-7	90 A.R.A.-A	03532-19	57 KG/M
03532-8	110 AREA / 110 AREA - U.P.	03532-20	152 PS
03532-9	112-115-119 / 141 AB		
03532-10	100 AREA (2-45/64" TO CENTERLINE OF HOLE)		
03532-11	131-132-136 RE / 133 RE		
03532-12	100 A.R.A.-B.		

### INDEXING BARS:

<u>PART NO.</u>	<u>DESCRIPTION</u>
01540-1	2-11/16 x 5-1/2
01540-2	2-1/2 x 6-1/2
01540-3	3-1/2 x 6 x 6
01540-4	2-13/32 x 5 x 5
01540-5	2-3/4 x 5-5/8 x 5-5/8
01540-6	2-11/32 x 5 x 5
01540-7	2-23/32 x 6 x 7
01540-8	2 x 7
01540-9	2-3/16 x 4-1/2
01540-10	2-5/8 x 5-1/2
01540-11	2-5/16 x 6-1/2 x 6-1/2
01540-12	2-1/2 x 6
01540-13	3 x 6-1/2 x 6-1/2
01540-14	2-1/2 x 5-1/2
01540-15	2-1/2 x 5
01540-16	2 x 4-1/2
01540-17	2-3/4 x 5.6 x 5.6
01540-18	2-7/16 x 6-1/2

### ACCESSORIES:

<u>PART NO.</u>	<u>DESCRIPTION</u>
03598	STORAGE CASE
03599-1	BIODEGRADABLE CUTTING FLUID - 1 GALLON
03599-5	BIODEGRADABLE CUTTING FLUID - 5 GALLONS

03500 SELF FEED RAIL DRILL

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 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.

MATWELD HAS NO CONTROL OVER TOOL USE OR OPERATION ONCE IT LEAVES THE MATWELD PLANT. MATWELD HAS NO CONTROL OVER OPERATOR OR MAINTAINER SELECTION. THE CUSTOMER MUST ASSUME RESPONSIBILITY FOR THE TOOL'S SUITABILITY FOR A PARTICULAR FUNCTION. DURING USE OF TOOL, GOOD JUDGEMENT MUST BE USED TO WORK SAFELY AND EFFICIENTLY WITHOUT ENDANGERING THEMSELVES OR BYSTANDERS. UNDERSTANDING OF THE OPERATION AND MAINTENANCE MANUAL IS ESSENTIAL FOR ANYONE USING OR MAINTAINING THE TOOL.

- 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 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.
- 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.



## **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 THE HYDRAULIC HOSES, AND REPAIR LEAKS IMMEDIATELY.
5. **DO NOT** INSPECT, REPLACE THE DRILL BIT OR CLEAN THE TOOL WHILE THE HYDRAULIC POWER SOURCE IS CONNECTED. ACCIDENTAL ENGAGEMENT OF THE TOOL CAN CAUSE SERIOUS INJURY.
6. **ALWAYS** CONNECT HOSES TO THE TOOL HOSE COUPLERS BEFORE ENERGIZING THE HYDRAULIC POWER SOURCE. BE SURE ALL HOSE CONNECTIONS ARE TIGHT.
7. **DO NOT** OPERATE THE TOOL AT OIL TEMPERATURES ABOVE 140°F/60°C. OPERATION AT HIGHER TEMPERATURES CAN CAUSE HIGHER THAN NORMAL TEMPERATURES AT TOOL WHICH CAN RESULT IN OPERATOR DISCOMFORT.
8. **NEVER** TRANSPORT OR CARRY TOOL WITH UNIT ENERGIZED.
9. **DO NOT** OPERATE A DAMAGED, IMPROPERLY ADJUSTED, OR INCOMPLETELY ASSEMBLED TOOL.
10. **KEEP** HANDS AND FINGERS AWAY FROM ROTATING PARTS.
11. SAFETY SYMBOLS ARE USED TO EMPHASIZE ALL OPERATOR, MAINTENANCE AND REPAIR ACTIONS WHICH, IF NOT STRICTLY FOLLOWED, COULD RESULT IN A LIFE THREATENING SITUATION, BODILY INJURY OR DAMAGE TO EQUIPMENT. ALWAYS OBSERVE SAFETY SYMBOLS. THEY ARE INCLUDED FOR YOUR SAFETY AND PROTECTION OF THE TOOL.
12. **ALWAYS** STORE THE TOOL IN A CLEAN DRY SPACE, SAFE FROM DAMAGE OR PILFERAGE.
13. **DO NOT** EXCEED THE RATED LIMITS OR USE THE TOOL FOR APPLICATIONS BEYOND ITS DESIGN CAPACITY.

## **HYDRAULIC SYSTEM REQUIREMENTS:**

1. THE HYDRAULIC SYSTEM SHOULD PROVIDE A FLOW OF 10 GPM / 38LPM AT AN OPERATING PRESSURE OF 2000 PSI / 140 BAR. RECOMMENDED RELIEF VALVE SETTING IS 2100-2250 PSI / 145-155 BAR.
2. THE SYSTEM SHOULD HAVE NO MORE THAN 250 PSI / 17 BAR BACK PRESSURE MEASURED AT THE TOOL END OF THE OPERATING HOSES. THE SYSTEM CONDITIONS FOR MEASUREMENT ARE AT MAXIMUM FLUID VISCOSITY AT MINIMUM OPERATING TEMPERATURES.
3. THE HYDRAULIC SYSTEM SHOULD HAVE ENOUGH HEAT REJECTION CAPACITY TO LIMIT THE MAXIMUM OIL TEMPERATURE TO 140°F/60°C AT THE MAXIMUM EXPECTED AMBIENT TEMPERATURE.
4. THE HYDRAULIC SYSTEM SHOULD HAVE A MINIMUM OF 25-MICRON FILTRATION. USE OF FILTER ELEMENTS SIZED FOR A FLOW OF AT LEAST 30 GPM / 114 LPM FOR COLD TEMPERATURE START-UP AND MAXIMUM DIRT HOLDING CAPACITY IS RECOMMENDED.

## **PRE-OPERATION PROCEDURES:**

1. THE TOOL AS SHIPPED HAS NO SPECIAL UNPACKING OR ASSEMBLY REQUIREMENTS BEFORE USAGE. INSPECTION TO ASSURE THE TOOL WAS NOT DAMAGED IN SHIPPING AND THAT IT DOES NOT CONTAIN PACKING DEBRIS IS ALL THAT IS REQUIRED.
2. CHECK HYDRAULIC POWER SOURCE USING A CALIBRATED FLOWMETER AND PRESSURE GAUGE TO CONFIRM FLOW RATES AND BACK PRESSURE AS OUTLINED IN THE HYDRAULIC SYSTEM REQUIREMENTS.
3. THE HYDRAULIC CIRCUIT CONTROL VALVE MUST BE IN THE "OFF" POSITION WHEN COUPLING OR UNCOUPLING THE TOOL. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE QUICK COUPLERS AND CAUSE OVERHEATING OF THE HYDRAULIC SYSTEM.
4. CONNECT THE HOSES FROM THE HYDRAULIC POWER SOURCE TO THE HOSE COUPLERS ON THE TOOL. IT IS A GOOD PRACTICE TO CONNECT THE RETURN HOSE FIRST AND DISCONNECT IT LAST TO MINIMIZE OR AVOID TRAPPED PRESSURE WITHIN THE TOOL.
5. OBSERVE THE "P" AND "T" PORT LETTERING ON THE VALVE BLOCK ASSEMBLY TO ENSURE THAT THE HYDRAULIC FLOW IS IN THE PROPER DIRECTION. THE "P" PORT LETTERING INDICATES THE INLET (PRESSURE) SIDE.

## 03500 SELF FEED RAIL DRILL

6. THE PRESSURE INCREASES IN UNCOUPLED HOSES LEFT IN THE SUN, RESULTING IN MAKING THEM DIFFICULT TO CONNECT. WHEN POSSIBLE, CONNECT THE FREE ENDS OF OPERATING HOSES TOGETHER.
7. THE 03500 SELF-FEED RAIL DRILL COMES COMPLETE WITH A SEPARATE COOLANT CONTAINER ASSEMBLY THAT IS USED TO DELIVER COOLANT TO THE DRILL BIT. FOLLOW INSTRUCTIONS ON SIDE OF COOLANT TANK OR BELOW FOR MIXING COOLANT.
  - A. POUR 12 OZ. OF MATWELD PART NO. 03599 OR EQUAL BIODEGRADABLE COOLANT CONCENTRATE INTO COOLANT TANK.
  - B. ADD 2 GAL. OF WATER (20:1 RATIO).
  - C. SCREW IN PUMP MECHANISM AND SHAKE COOLANT TANK TO MIX COOLANT AND WATER.
  - D. PRESSURIZE THE COOLANT TANK USING THE CARRYING HANDLE PUMP.
  - E. CONNECT THE COOLANT TANK ASSEMBLY TO THE DRILL USING THE SUPPLIED HOSE ON THE COOLANT TANK AND THE QUICK DISCONNECT COUPLER ON THE DRILL.

## OPERATING PROCEDURES:

1. OBSERVE ALL SAFETY PROCEDURES AND PRECAUTIONS.
2. MAKE SURE THE DRILL BIT HOLDER INTENDED TO USE CONTAINS INSERT WITH GOOD CUTTING SURFACES. IF SURFACES ARE WORN OR CHIPPED, UNSCREW THE RETAINING SCREWS AND REPLACE INSERT. MAKE SURE THE DRILL HOLDER IS NOT DAMAGED.
3. INSTALL THE DRILL HOLDER INTO THE DRILL PISTON AND THEN TURN IT CLOCKWISE UNTIL IT STOPS.
4. INSTALL THE FORM BLOCK TEMPLATES ONTO THE SELF-FEED RAIL DRILL WITH THE DESIRED RAIL PROFILE FACING THE RAIL. TEMPLATES ARE MARKED WITH AN “←”, “TOP” AND THE RAIL PROFILE DESIGNATION i.e.: “133RE”. WHEN ATTACHING TEMPLATE TO DRILL MAKE SURE RAIL PROFILE DESIGNATION IS TOWARDS RAIL WEB AND ARROW IS POINTING TOWARD RAIL AND THE WORD “TOP” IS UP ON TEMPLATE.
5. INSTALL AN INDEXING BAR ONTO RAIL AND POSITION IT WHERE YOU WANT TO DRILL. SEE CHART IN MANUAL FOR SELECTION OF INDEXING BARS AVAILABLE AND CORRESPONDING PART NUMBERS.

**NOTE: TO AVOID DRILL BIT DAMAGE, MAKE SURE THE DRILL BIT/PISTON ASSEMBLY IS FULLY RETRACTED BEFORE PLACING THE SELF-FEED RAIL DRILL ON THE CLEAN SECTION RAIL.**

## 03500 SELF FEED RAIL DRILL

6. SET THE SELF FEED RAIL DRILL OVER THE INDEXING BAR ON THE RAIL SO THAT THE FORM BLOCK TEMPLATES ARE NESTED BETWEEN THE BALL AND THE BASE OF THE RAIL AND THE ADJUSTING SCREW (ITEM 52) FITS IN THE SLOT ON THE INDEXING BAR.
7. ADJUST THE THREADED SHAFT (ITEM 44) UNTIL THERE IS NO MOVEMENT OF THE SELF-FEED RAIL DRILL AS IT SITS ON THE RAIL AND INDEXING BAR. WIGGLE THE DRILL TO REMOVE ALL LOOSENESS. LIFT THE HANDLE (ITEM 49) UP AND TURN THE THREADED SHAFT (ITEM 44) CLOCKWISE APPROXIMATELY ½ TURN. PUSH HANDLE (ITEM 49) DOWN HARD TO FIRMLY CLAMP DRILL TO THE RAIL. REPEAT PROCEDURE AS NEEDED TO OBTAIN REQUIRED RIGIDITY OF DRILL.

***IF DRILL IS NOT FIRMLY CLAMPED TO RAIL, BREAKAGE OF DRILL BITS AND OUT OF TOLERANCE HOLES WILL RESULT.***

8. TURN THE CONTROL VALVE(S) ON THE HYDRAULIC SOURCE TO THE “ON” POSITION.
9. TO BEGIN DRILLING, MOVE THE CONTROL LEVER ON THE SELF FEED RAIL DRILL TO THE “**DRILL**” SYMBOL AS INDICATED BY THE DECAL ON THE VALVE, OR MOVE THE CONTROL LEVER TOWARD THE RAIL. THE DRILL BIT WILL TURN AND ADVANCE SIMULTANEOUSLY. **MAKE SURE COOLANT IS SPRAYING ON DRILL BIT.**
10. TO STOP DRILLING MOVE THE CONTROL LEVER TO CENTER POSITION OR THE “**STOP**” SYMBOL.
11. TO RETRACT THE DRILL BIT MOVE THE CONTROL LEVER TO THE “**RETRACT**” SYMBOL OR AWAY FROM THE RAIL.
12. WHEN DRILLING IS COMPLETE:
  - A. UNCOUPLE THE COOLANT HOSE FROM THE RAIL DRILL.
  - B. REMOVE DRILL BIT BY TURNING THE BIT COUNTERCLOCKWISE AND PULL OUT.
  - C. RETRACT THE PISTON
  - D. CLEAN THE DRILL THOROUGHLY.
  - E. STORE IN A DRY AREA.

## **IMPORTANT**

ARROWHEAD INSERTS ARE NOT COVERED UNDER ANY WARRANTY. OPERATORS MUST BE CAREFUL TO ENSURE THAT THE INSERT IS NOT DAMAGED DURING HANDLING OF THE TOOL. MATWELD ASSUMES NO LIABILITY FOR DAMAGES TO INSERT, INSERT HOLDERS OR THE TOOL AS A RESULT OF IMPROPER USAGE OF INSERT, INSERT HOLDERS OR THE TOOL NOT FURNISHED BY MATWELD, INC.

IMPROPER USAGE IS DEFINED AS:

**FAILURE TO FOLLOW ANY OF THE INSTRUCTIONS CONTAINED IN THIS MANUAL.**

**STORING OR TRANSPORTING THE TOOL WITHOUT TAKING CARE TO PROTECT THE CUTTING INSERT.**

**ALLOWING THE CUTTING INSERT TO CRASH INTO THE RAIL DURING SETUP OR REMOVAL PROCEDURES.**

**USING THE TOOL WITH THE WRONG OR WORN TEMPLATES OR NO TEMPLATES.**

**USING THE TOOL WITHOUT DRILLING LUBRICATE AND EXCEEDING FLOW AND PRESSURE REQUIREMENTS AS DEFINED IN THIS MANUAL.**

**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 WITH OPERATION OF THE DRILL, ALWAYS CHECK THAT THE HYDRAULIC POWER SOURCE IS SUPPLYING THE CORRECT HYDRAULIC FLOW AND PRESSURE TO THE DRILL AS LISTED IN THE SPECIFICATIONS. USE A FLOWMETER TO BE ACCURATE. CHECK THE FLOW WITH THE HYDRAULIC OIL TEMPERATURE AT LEAST 80°F/27°C.

<b>PROBLEM</b>	<b>CAUSE</b>	<b>REMEDY</b>
DRILL DOES NOT RUN	HYDRAULIC POWER SOURCE NOT FUNCTIONING COUPLERS OR HOSES BLOCKED HYDRAULIC MOTOR FAILURE HYDRAULIC LINES NOT CONNECTED	CHECK POWER SOURCE FOR PROPER FLOW AND PRESSURE (10 GPM @ 2000PSI) LOCATE AND REMOVE RESTRICTION INSPECT AND REPAIR CONNECT LINES
DRILL BIT DULLS QUICKLY	INCORRECT OIL FLOW INSUFFICIENT AMOUNT OF COOLANT	CHECK POWER SOURCE FOR PROPER FLOW AND PRESSURE (10 GPM @ 2000PSI) REPLACE INSERT, INCREASE FLOW OF COOLANT MAKE SURE PRESSURE TANK IS FULLY PUMPED. CHECK FOR CLOGS IN SUPPLY LINE FROM COOLANT TANK.
DRILL MOVES ON RAIL DURING DRILLING OPERATION	NOT CLAMPED PROPERLY WRONG TEMPLATES TEMPLATE KNOBS LOOSE	SEE CLAMPING INSTRUCTIONS USE CORRECT TEMPLATES AND VERIFY FIT TIGHTEN KNOBS SECURELY
DRILL VIBERATES DURING DRILLING	WRONG TEMPLATES TEMPLATE KNOBS LOOSE NOT CLAMPED PROPERLY	USE CORRECT TEMPLATES AND VERIFY FIT TIGHTEN KNOBS SECURELY SEE CLAMPING INSTRUCTIONS
INSERTS CHIPPED	SOME CHIPPING IS NORMAL INCORRECT TEMPLATES INSUFFICIENT AMOUNT OF COOLANT  NOT CLAMPED PROPERLY TEMPLATE KNOBS LOOSE HANDLING DAMAGE	REPLACE IS POOR HOLE FINISH IS NOTICED USE CORRECT TEMPLATES AND VERIFY FIT REPLACE INSERT, INCREASE FLOW OF COOLANT MAKE SURE PRESSURE TANK IS FULLY PUMPED. CHECK FOR CLOGS IN SUPPLY LINE FROM COOLANT TANK. SEE CLAMPING INSTRUCTIONS TIGHTEN KNOBS SECURELY MAKE SURE DRILL BIT IS RETRACTED WHEN INSTALLING THE DRILL ON THE RAIL. AVOID INSERT CONTACT WITH HARD OBJECTS.
INSERT SCREW DIFFICULT TO REMOVE	NOT ASSEMBLED WITH LUBRICANT	INSTALL SCREW WITH ANTISEIZE LUBRICANT ON THE THREADS

**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.

\*SEE **COLD WEATHER OPERATION** HYDRAULIC OIL NOTE.

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

**COLD WEATHER OPERATION:**

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

## REVIEW OF HYDRAULIC PRINCIPLES

### A. TOOL CIRCUIT

#### 1. HYDRAULIC FORMULAS:

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

Example: HP required to deliver 10 GPM at 1500 PSI.

$$\frac{10 \text{ GPM X } 1500 \text{ PSI}}{1456.9} = \frac{15000}{1456.9} = 10.3 \text{ HP}$$

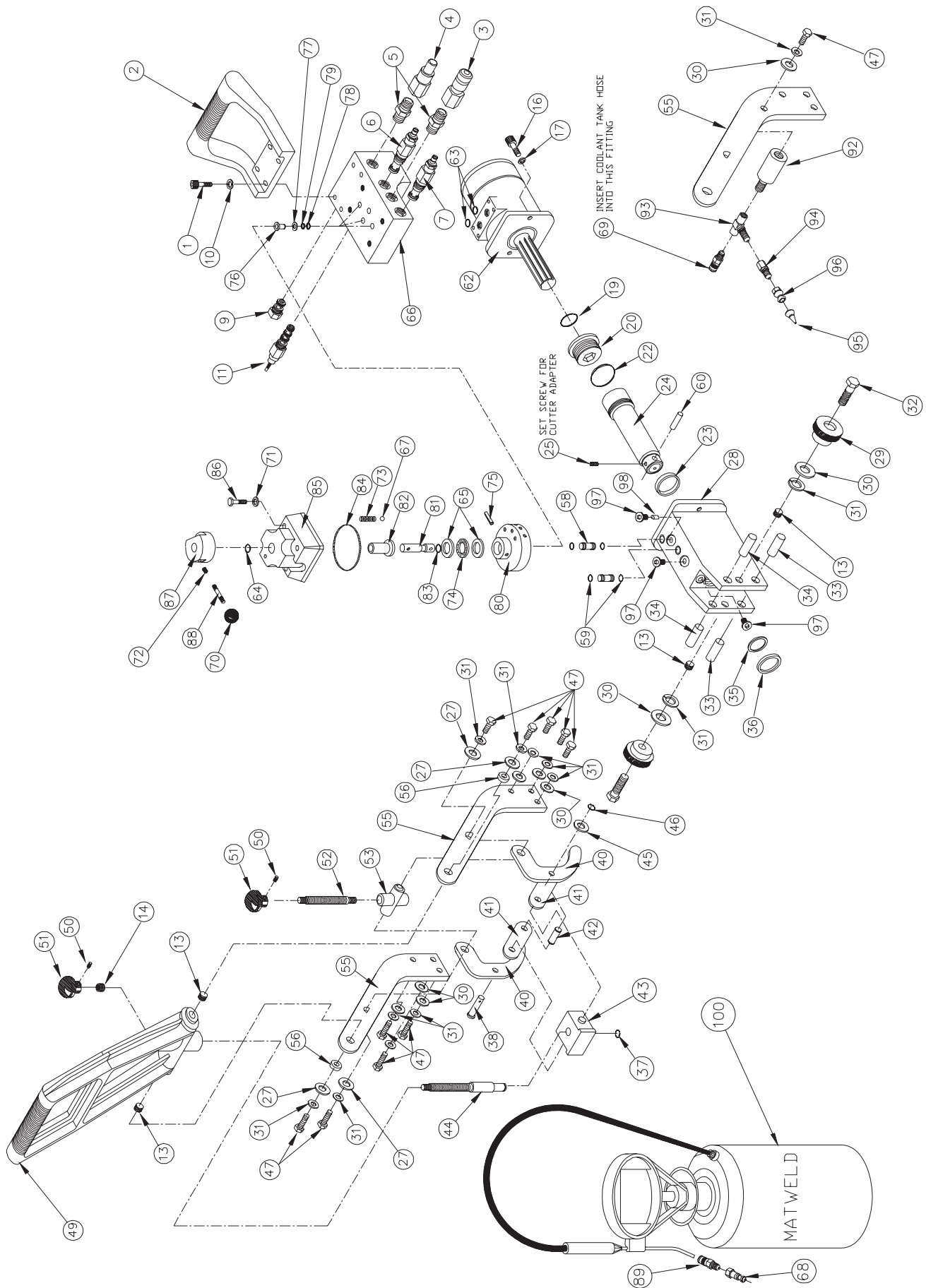
(subtract back pressure for tool HP)

#### Estimated HP delivered by pump or used by tool.

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	10.3	13.70	17.20	20.60
15	5.15	10.30	15.40	20.60	25.70	30.90

#### 2. BACK PRESSURE

BACK PRESSURE MEASURED AT THE TOOL RETURN PORT MUST NOT EXCEED THE MANUFACTURERS 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.



**MATWELD, INC.**

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

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY	ITEM NO.	PART NO.	DESCRIPTION	QUANTITY
1	A5469	5/16-18 x 4 LG. SHCS	4	51	03551	KNURLED PLASTIC KNOB	2
2	03502	CARRY HANDLE	1	52	03552	ADJUSTMENT SCREW	1
3	00145	QUICK DISCONNECT COUPLER	1	53	03553	ADJUSTMENT NUT	1
4	00146	QUICK DISCONNECT NIPPLE	1	54			
5	249-08-08	SAE-8 MALE x 1/2 MALE NIPPLE	2	55	03555	CLAMP ARM	2
6	03506	PRESSURE REDUCING VALVE	1	56	03555-01	CLAMP ARM BEARING	2
7	03507	FLOW CONTROL VALVE	1	57			
8				58	03558	MANIFOLD OIL TUBE	2
9	03509	CHECK VALVE	1	59	03550	O-RING	4
10	A3812	5/16 HIGH COLLAR LOCK WASHER	4	60	03560	DRILL CHUCK DOWEL PIN	1
11	03510	FLOW CONTROL VALVE	1	61			
12				62	03562	HYDRAULIC MOTOR	1
13	03513	3/8-16 KEENINSERT	4	63	03504	O-RING	2
14	03514	5/8-11 KEENINSERT	1	64	00905-30	O-RING	1
15				65	045041	THRUST WASHER	2
16	A5445	1/2-13 UNC x 1 1/2 SHCS	2	66	03566	VALVE MANIFOLD	1
17	A3813	1/2 LOCK WASHER	2	67	045026	DETENT BALL	1
18				68	23-2	SHUT OFF PLUG - 1/8 FPT	1
19	03519	END CAP O-RING	1	69	2202	SHUT OFF SOCKET - 1/8 MPT	1
20	03520	END CAP	1	70	00905-09	SELECTOR KNOB	1
21				71	A2191	5/16 SAE FLAT WASHER	4
22	03522	CYLINDER BODY END CAP O-RING	1	72	A5627	3/8-16 UNC x 1/4 LG. SET SCREW	1
23	03523	PISTON SEAL	1	73	00905-11	DETENT SPRING	1
24	03524	CYLINDER PISTON	1	74	045014	THRUST BEARING	1
25	A5604	1/4-20 UNC x 1/2 LG. SET SCREW	1	75	A6081	3/16 x 1 3/8 ROLL PIN	1
26				76	00905-02	VALVE INSERT	3
27	A3860	3/8 x 1 1/4 FENDER WASHER	4	77	00905-10	VALVE WASHER	9
28	03528	CYLINDER HOUSING	1	78	00419	O-RING	3
29	03529A	FORM BLOCK TIGHTENING KNOB	2	79	00905-14	BACK UP RING	3
30	A2192	3/8 FLAT WASHER	9	80	00905-04	ROTOR VALVE	1
31	A3811	3/8 LOCK WASHER	13	81	00905-05	SELECTOR SHAFT	1
32	A5475	3/8-16 UNC x 2 LG. BHCS	2	82	00905-06	ROTOR HOUSING BEARING	1
33	03533	DOWEL PIN	2	83	00420	O-RING	1
34	03534	DOWEL PIN	2	84	03584	CONTROL VALVE MOUNTING RING	1
35	03535	2.00 I.D. QUAD RING	1	85	00905-03	ROTOR HOUSING - DETENT VERSION	1
36	03536	ROD WIPER	1	86	A1024	5/16-18 x 1 1/2 HEX HEAD	4
37	03537	E-RING	1	87	00905-07	SELECTOR CAP	1
38	03538	LEVER ASSEMBLY CLEVIS PIN	1	88	00905-13	HANDLE	1
39				89	12-425-0518	5/16 x 1/8 MP TUBE FITTING	1
40	03540	LEVER ASSEMBLY HOOK PLATE	2	90			
41	03541	LEVER ASSEMBLY LINK	2	91			
42	03542	LEVER ASSEMBLY SPACER	1	92	03595	MOUNTING STUD	1
43	03543	LEVER ASSEMBLY STOP BLOCK	1	93	5604-02	1/8 MP x 1/8 FP x 1/8 FP TEE	1
44	03544	THREADED SHAFT	1	94	2405-04-02	1/4 MJIC x 1/8 FP	1
45	A2196	5/8 SAE FLAT WASHER	1	95	03567	1/16 NOZZLE	1
46	03546	KLIPRING RETAINER	1	96	03568	1/4 SAE FLARE NUT ADAPTER	1
47	A1042	3/8-16 UNC x 1 LG. HEX HEAD	11	97	231P-04	SAE -4 O-RING PLUG	3
48				98	03528-04	BRASS PLUG	1
49	03549	LEVER HANDLE	1	99			
50	A5592	10-32 x 3/8 LG. SET SCREW	2	100	01533A	COOLANT TANK	1

**MATWELD, INC.**

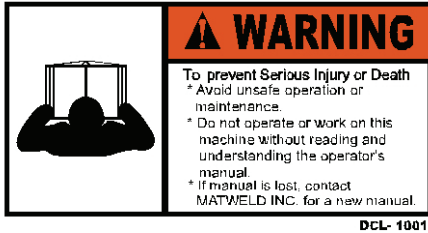
**PHONE:(270) 444-0085**

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

03500 SELF FEED RAIL DRILL

DECAL LEGEND



### **LIMITED WARRANTY**

MATWELD, INC., PADUCAH, KY., WARRANTS TO THE ORIGINAL PURCHASE OF THIS PRODUCT THAT THE PRODUCT WILL BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP FOR THE PERIOD OF ONE (1) YEAR AFTER THE DELIVERY OF SUCH PRODUCT TO THE CUSTOMER. OTHER EQUIPMENT AND PARTS USED, BUT NOT MANUFACTURED BY MATWELD INC. ARE COVERED DIRECTLY BY THE WARRANTY OF THE MANUFACTURER OF THOSE PRODUCTS. PROOF OF PURCHASE MUST BE DOCUMENTED INCLUDING REFERENCE TO A SERIAL NUMBER LOCATED ON EACH TOOL. THE PURCHASER'S ONLY REMEDIES UNDER THIS LIMITED WARRANTY SHALL BE LIMITED AT MATWELD'S SOLE OPTION TO THE FOLLOWING: REPAIR, REPLACEMENT OR REFUND OF THE PURCHASE PRICE OF THE DEFECTIVE PRODUCTS. EACH OF THESE REMEDIES REQUIRES TIMELY NOTIFICATION OF THE DEFECT IN THE PRODUCT AND SUBSTANTIATION THAT THE PRODUCT HAS BEEN PROPERLY STORED, MAINTAINED AND USED. MATWELD'S OBLIGATIONS HEREUNDER EXTEND ONLY TO THE PURCHASER OF THE PRODUCT AND NOT TO ANY THIRD PARTY.

AS A CONDITION PRECEDENT TO MATWELD'S OBLIGATION HEREUNDER, THE DEFECTIVE PRODUCT MUST NOT HAVE BEEN ALTERED OR MODIFIED WITHOUT THE EXPRESS WRITTEN APPROVAL OF MATWELD, INC. THE PRODUCT MUST NOT HAVE BEEN SUBJECTED TO DELIBERATE DAMAGE, SHIPPING DAMAGE, NEGLIGENCE, TAMPERING BY UNAUTHORIZED PERSONNEL OR DAMAGE BY IMPROPER USE, STORAGE OR MAINTENANCE. SERIAL NUMBERS MUST NOT HAVE BEEN ALTERED, DEFACED OR REMOVED. SUCH ACTION VOIDS LIMITED WARRANTY.

### **EXCLUSIONS TO LIMITED WARRANTY**

*THIS LIMITED WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY OTHER WARRANTY, WRITTEN OR ORAL, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.*

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

### **LIMITATION OF LIABILITY**

EXCEPT AS PROVIDED ABOVE, MATWELD SHALL IN NO EVENT BE LIABLE OR RESPONSIBLE FOR ANY INJURY, LOSS OR DAMAGE, DIRECT, INCIDENTAL OR CONSEQUENTIAL, ARISING OUT OF THE USE OR MISUSE OR INABILITY TO USE THE PRODUCT, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY INCLUDING, WITHOUT LIMITATIONS, BREACH OF CONTRACT, TORT, (INCLUDING NEGLIGENCE OR STREET LIABILITY) AND NOT WITHSTANDING ANY FAILURE OF ANY REMEDY HEREIN OF ITS ESSENTIAL PURPOSE, EVEN IF MATWELD WAS AWARE OF THIS POSSIBILITY OF SUCH DAMAGE. MATWELD'S LIMITED WARRANTY AS SET FORTH ABOVE SHALL NOT BE ENLARGED, DIMINISHED OR AFFECTED BY, AND NO OBLIGATION OR LIABILITY SHALL ARISE OR GO OUT OF THE RENDERING OF TECHNICAL ADVICE OR SERVICE BY MATWELD OR ITS AGENTS. THE FOREGOING MAY NOT BE CHANGED EXCEPT BY WRITTEN AGREEMENT SIGNED BY AN AUTHORIZED OFFICER OF MATWELD, THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE.

## **CUSTOMER INFORMATION:**

Name \_\_\_\_\_

Company \_\_\_\_\_

Serial # of your Matweld tool \_\_\_\_\_

(Upon receiving your Matweld tool, make sure to list serial number above so that a good record is kept for order information.)

## **MATWELD HYDRAULIC TOOL LIST**

*All Matweld Hydraulic Tools operate at 5 or 10 GPM @ 2000 PSI*

### **POWER UNITS:**

00100K – GASOLINE POWERED 1-10 GPM OR 2-5 GPM

02900A – DIESEL 1-10 GPM OR 2-5 GPM

*(OPTIONAL CATALYTIC EXHAUST AND/OR MSHA CERTIFIED)*

05500 – TWIN POWER DUAL CIRCUIT 1-10 GPM OR 2-5 GPM & 5000 WATT GENERATOR

02050K – GASOLINE POWERED 1-5 GPM

03700A – ELECTRIC POWER 1-10 GPM OR 2-5 GPM

### **GRINDERS:**

09200A – PRECISION FROG GRINDER

06000 – PROFILE GRINDER

06900 & 06900A – MULTI-PURPOSE GRINDER (TRIGGER VERSION AVAILABLE)

05900 – FROG/PROFILE GRINDER (TRIGGER VERSION AVAILABLE)

00700 – RAIL SURFACING GUIDE

04600 – STRAIGHT STONE CW ROTATION (TRIGGER VERSION AVAILABLE)

04700 – STRAIGHT STONE CCW ROTATION (TRIGGER VERSION AVAILABLE)

07500 – CHAMFER TOOL

04800 – CUP STONE GRINDER (TRIGGER VERSION AVAILABLE)

00600C – CUP STONE GRINDER

05400 – ANGLE GRINDER

05600 – BULL NOSE GRINDER

02400 – 10" OR 14" FROG AND SWITCH GRINDER

### **TRACK TOOLS:**

03900A – REVERSING RAIL SAW

05100A & 05100B – POWER WELD SHEAR

03500 – SELF FEED RAIL DRILL

01600A – 5 GPM 1" IMPACT WRENCH

04500D – HYDRAULIC DRILL IMPACT WRENCH

08200 – TAMPER

02800 – 60 TON BRIDGE SPREADER

01200 – SPRING ANCHOR APPLICATOR

01100A – SPIKE PULLER (SINGLE, 2 STAGE & TRIGGER VERSIONS AVAILABLE)

00800A – 16" RAIL SAW

05000 – HAND PUMP WELD SHEAR

01500 – RAIL DRILL

02500 – 10 GPM 1" IMPACT WRENCH

03100C – RAIL PULLER

08300 – SPIKE DRIVER

07650 – HYDRAULIC CLIP TOOL

### **OTHER PRODUCTS:**

HYDRAULIC MANIFOLDS

HYDRAULIC TEST GAUGES

HOSE REELS

HYDRAULIC HOSES

ACCESSORIES

MATWELD, INC.

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FAX:(270) 443-6180

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