

**1-inch
Hydraulic Impact Wrench
910088
Operating and Maintenance Manual**



910088

1-inch Hydraulic Impact Wrench

Record of Changes

No.	Date	Description of Changes
Rev 1	10.2018	Branding Updates
Rev 2	1.2019	Added Common Spare Parts List

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Warranty Terms and Conditions

Warranty Period

Each new machine and new parts of our manufacture are warranted against defects in material and workmanship for one year from the date of shipment from our factory.

When contacting customer service for factory parts, service or warranty support please provide the:

- Racine Railroad Products Model
- Serial Number
- Any locally assigned identification

Vendor Parts Warranty Period

Other equipment and parts used, but not manufactured by Racine Railroad Products, Inc., are covered directly by the manufacturer's warranty for their products.

Warranty Parts and Service

We will repair or replace, without charge, F.O.B. factory, Racine, Wisconsin, USA, any part Racine Railroad Products manufactures which is proven to be defective during the warranty period.

Material claimed defective must be returned, if requested, to the factory within 30 days from the date of the claim for replacement. Ordinary wear and tear, abuse, misuse and neglect are not covered by this warranty. Depending upon the circumstances, we may provide technical assistance and/or technical service support, without charge, to assist in the correction of warranty related problems.

Non-Warranty Parts and Service

Material damaged through normal wear and tear, abuse, misuse and/or neglect are not covered by our warranty and should be ordered directly from our Customer Service.

Note: Parts for models that are no longer in production may not be available.

Non-Warranty Parts Orders

When placing a parts order please provide the following information:

- Company Name and Billing Address
- Purchase Order Number and Issuing Authority
- Shipping Address
- Special Handling Instructions
- Contact Phone Number
- Machine Model and Serial Number
- Part Numbers and Quantities Being Ordered

Note: *Please use Racine Railroad Products part numbers when ordering parts.* Racine Railroad Products part numbers are shown in the parts lists and drawings of this manual and have only six (6) numbers.

Any part number with other than six numbers (e.g. contains alpha-numeric characters) is a Vendor Part Number and **not** a Racine Railroad Products part number

Overview

The Racine Railroad's 1-Inch Impact Wrench is designed to tighten and loosen bolts.

The Impact Wrench requires a flow of 10 GPM (40 LPM) at 2000 psi (138 bar) for best performance. Use this tool on an open center hydraulic system only with a maximum pressure of 2150 psi (148.3 bar). The impact wrench uses a 1-inch square drive and requires high impact sockets.

The Impact Wrench is operated from an enclosed box style handle. The handle features a trigger and trigger locking mechanism. The tool is equipped with a spool which reverses the drive direction.

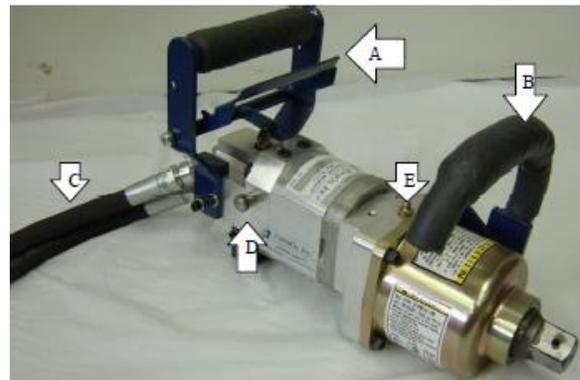
This tool will help eliminate the use of other methods that increase the likely hood of injury. When properly used this tool will help reduce back strain and reduce operator fatigue. Racine Railroad reserves the right to make changes at any time without notice and without incurring any obligation.

Features

Flow Range	5-10 GPM / 20-38 LPM
Max Pressure	2000 psi / 140 bar
Length	14.25 in. / 36.8 cm
Width	7.0 in. / 17.8 cm
Height.....	8.75 in. / 22.2 cm
Weight (Dry)	26-lbs /11.77 kg
Drive Size	1-inch square
Torque	2600 ft/lbs / 3536 NM

The Impact Wrench is operated from an enclosed style handle.

- A. On the handle is a trigger that is used to operate the impact wrench.
On some models a trigger lock prevents accidental operation of the tool
- B. A forward handle provides for two handed operation for better control.
This handle can be rotated 180-degrees for use in vertical applications.
- C. Hose whips move the hydraulic couplers away for operator's hands making the tool easy to handle.
- D. The manifold features a push button to reverse the direction of rotation. The driver is a 1-inch square drive.
- E. A grease zerk allows lubrication of the internal impact components without disassembling the tool.



Note: The handles are insulated to reduce vibration which increases operator comfort.

The impact wrench can have a stand-up handle added to it for operating from the standing position.



An additional handle kit can be added to the impact wrench to position a handle directly across from the main operating handle.

This handle is used for vertical applications also.

Safety

Tool operators and maintenance personnel must always comply with the safety precautions given in this manual and on the stickers and tags attached to the tool and hoses.

These safety precautions are given for your safety. Review them carefully before operating the tool and before performing maintenance or repairs. Supervising personnel should develop additional precautions relating to the specific work area and local safety regulations.

General Safety Precautions

Racine Railroad tools are designed to provide safe and dependable service if operated according to the instructions provided in this manual.

Read and understand this manual and any stickers attached to the power unit before operating. Failure to do so could result in personal injury or equipment damage. Check the rules and regulations at your location. The rules may include an employer's work safety program. Regulations may identify hazards such as working around utility supply lines or hazardous slopes.

Warning and Caution Statements

Warning and caution statements have been strategically placed throughout the text prior to operating or maintenance procedures, practices, or conditions considered essential for the protection of personnel, equipment, and property.



WARNING indicates a hazardous operating procedure, practice, or condition. If the hazardous situation is not avoided death or serious injury could occur.



CAUTION indicates a potentially hazardous operating procedure, practice, or condition. If the hazardous situation is not moderate or minor injury could occur.

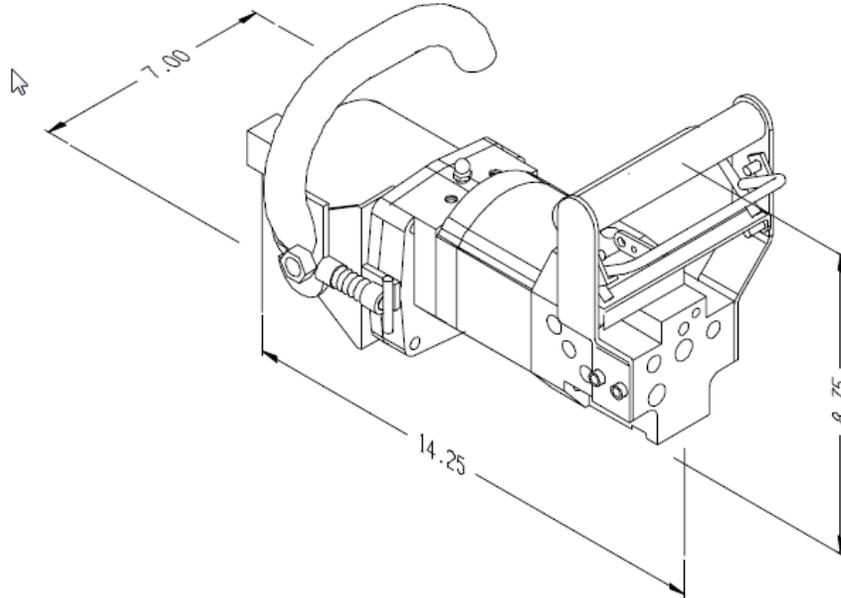
Training Requirements

Operator training for the Impact Wrench should consist of information found in this manual. The operator must receive instructions, both verbally and through demonstrations for applications in which the tool is going to be used. The new operator must start in an area without bystanders and use the tool until able to fully operate the tool under the conditions for the work area

Work Area Safety Precautions

- Never operate the tool when you are tired, angry, emotionally disturbed, or under the influence of alcohol, drugs, medications, or anything that could affect your vision, alertness, coordination or judgement.
- Establish a training program for all operators to ensure safe operation.
- Do not operate the tool unless thoroughly trained or under the supervision of an instructor.
- Do not allow others to be near the tool when starting it or while operating. Keep bystanders and animals out of the work area.
- Always wear safety goggles, ear, leg, and head protection devices, safety footwear, and snug fitting clothes.
- Do not operate the tool near energized transmission lines.
- Do not overreach. Maintain proper footing and balance at all times.
- Always hold the tool with both hands, using a firm grip when activating and operating. Be sure to keep hands and other body parts clear and free from all moving parts.
- Always connect hydraulic hoses to the tool before activating the hydraulic circuit on your power unit. Check that hydraulic couplers are secure before activating the circuit.
- Keep handles clean and dry.
- Disconnect tool from hydraulic source before inspection or cleaning.
- Only a properly trained person should perform any maintenance, service, and or repairs to a tool.
- Make sure the tool's socket was stopped turning before setting down tool.
- At the work site, never carry the tool with the socket rotating.
- Always use sockets that meet the minimum requirements of the tool.
- Never operate a tool that is damaged, improperly adjusted, or not completely and securely assembled.
- Do not operate the tool until you have a clear work area and a secure balance.
- Never carry or pick this tool up by the hydraulic hose.

Technical Specifications



Max Pressure	2000 psi/150 bar
Max Flow	5-10 gpm/20-40 lpm
Drive Size	1 inch /25.4mm square
Torque	2600 ft/lbs 3536NM
Hydraulic System	Open Center

Hydraulic Fluid Requirements

Viscosity (Fluid Thickness)

Metric	USA
10 C 95 Centistokes	50 F 450 SSU Max
38 C 27-42 C.S.	100 F 130-200 SSU
60 C 16.5 C.S., Min.	140 F 85 SSU Min.

Pour Point..... 10° F /-23° C Minimum (for cold startup)

Viscosity Index (ASTM D 2220) 140 Minimum

Demulsibility (ASTM D-1401)..... 30 Minutes Maximum

Flash Point (ASTM D-92) 340° F / 171° C Minimum

Rust Inhibition (ASTM D-665 A & B)..... Pass

Oxidation (ASTM D943) 1000 Hours Minimum

Pump West Test (ASTM D2882) 60 mg Maximum

Recommend Hydraulic Fluids

Type	Hydraulic fluid
Chevron	Clarity AW 15032
Exxon	Univis J 32
Mobil	D.T.E. 13M
Gulf	Harmony AW-HVI-150-32
Shell	Tellus T 32
Texaco	Rando HDZ 32
Union	Unax AW-WR-32
Amsoil	AWH 15032
Sunvis	Low Pour H/032-product code 19300

Coupler Recommendation

3/8 inch flat face HTMA couplers rated at 2500 psi working pressure. Threads are to match fittings used on hoses or fittings used as adapters.

Bolt Size	Torque
#10-32	38 in. lbs
¼-20	76 in. lbs
5/16-18	13 ft lbs
3/8-16	23 ft lbs

Installation Instructions

Unpacking Instructions

Upon receiving your Impact Wrench promptly remove it from the shipping container. Always keep top side of container up. Inspect unit for damage which may have incurred during shipping and report it to carrier for claim.

Tool Preparations

The impact wrench is ready for use after unpacking and no special preparation is required. If the tool is used in cold weather, preheat the hydraulic fluid by running power source at low engine speed.

Fluid temperature should be at or above 50° F/10° C (400-ssu / 82 centistoke) before use, when using recommended fluids. Using too thick of fluid may result in tool damage.

Testing



Never stick foreign objects, fingers, or other extremities into moving mechanism. Failure to follow these instructions may lead to severe personal injury or tool damage.

Before operating the Impact Wrench, it is important to inspect the trigger linkage mechanism for obstructions. Make sure all sockets are securely mounted. Follow all safety precautions when inspecting tool.

- Connect the tool to the power source.
- Hold the impact by the handles resting it on the ground.
- When the trigger is pulled, the socket should rotate.
- Release the trigger and allow the socket to stop rotating.
- Press the button to reverse the rotation and check that the tool rotates in both directions.



When operating the Impact Wrench do not change the rotation without letting the socket stop rotating completely. Be sure to follow all safety guidelines.

Hose Requirements

It is not often necessary or advisable to use long hoses. All hoses must have an oil resistant inner surface and an abrasion resistant outer surface. Each hose must have male pipe ends for most application.

Longer hoses can be used when necessary but can affect the operation of the tool due to resistance in the hose.

If small diameter or long hoses are used, or if restrictive fittings are connected to the supply and return ports, the pressure required to push the fluid through the system and back to the tank will be higher. This will reduce tool power.

Important: Oil should always flow from the male coupler through the female coupler.

Note: The pressure increases in uncoupled hoses left in the sun. This may make them difficult to connect. When possible after use, connect the free ends of the operating hoses together.

Hose Types

Hydraulic hose types authorized for use with the Impact Wrench are:

1. Labeled and certified nonconductive.
 - This is the only hose authorized for use near electrical conductors.
2. Wire braided (conductive)
 - This hose is conductive and must never be used near electrical conductors.
3. Fabric braided (not certified or labeled non-conductive)
 - This hose is conductive and must never be used near electrical conductors.

Hose Pressure Rating

The rated working pressure of the hydraulic hose must be at least 175 bar (2500 psi).

HYDRAULIC HOSE RECOMMENDATION

FLOW PER CIRCUIT		LENGTH EACH HOSE		USE	INSIDE DIAMETER		SAE SPEC HOSE (WIRE DRAID)	SAE SPEC HOSE (FIBER BRAID)
GPM	LPM	FEET	METERS		INCH	MM		
5 to 8	19 to 30	To 50	To 15	Both	½	13	SAE 100R1-8	100R7-8
5 to 8	19 to 30	51-100	15 to 30	Both	5/8	16	SAE 100R2-10	SAE 100R8-10
5 to 8	19 to 30	100-300	30 to 90	Pressure Return	5/8 ¾	16 19	SAE 100R2-10 SAE 100R1-12	SAE 100R8-10 SAE 100R7-12
9 to 12	34 to 45	To 50	To 15	Both	5/8	16	SAE 100R2-10	SAE 100R8-10
9 to 12	34 to 45	51-100	15 to 30	Pressure Return	5/8 ¾	16 19	SAE 100R2-10 SAE 100R3-12	SAE 100R8-10 SAE 100R7-12
9 to 12	24 to 45	100-200	30 to 60	Pressure Return	¾ 1	19 25.4	SAE 100R2-12 SAE 100R1-16	SAE 100R8-12 SAE 100R7-16

Tool Connecting Procedures

1. Stop the engine before connecting the tool and or hoses to the OFF power unit, and when switching hoses or tools.
2. Turn the hydraulic on/off valve to the off position before starting the engine.

Make sure all hoses are connected for correct flow direction to and from the tool being used.

When routing hose in the work area, position them where personnel will not be at risk of tripping over them where vehicles can run over the hoses. Do not lay hose over sharp objects.



WARNING Pressurized fluid escaping from a damaged hose can penetrate the skin and be injected in the body causing injury or death.

Do not pull on hoses to drag the power unit or tool.

Operating Instructions

The forward handle rotates 180° for use in a vertical application.

To rotate the handle, pull the tee handle locking pin back, rotate handle and make sure the locking pin secures it in place before using the tool.

A grease zerk allows lubrication of the internal impact components without disassembling the tool.



Connecting Hoses

1. Wipe quick couplers with a clean lint free cloth before connecting them.
2. Connect hoses from power source to the tool.

It is recommended that you connect the return hoses first and disconnect last to minimize or avoid trapping pressure within the tool.

3. When connecting the quick couplers, the flow should run from male coupler to the female coupler. The female coupler on the tool is the inlet. Quick couplers are marked with a flow direction arrow.



WARNING Pressurized fluid escaping from a damaged hose can penetrate the skin and be injected in the body causing injury or death.

Do not pull on hoses to drag the power unit or tool.

Note: When possible, connect the free ends of uncoupled hoses to prevent build up in the hoses. The sun can also increase pressure in the hoses and make connecting them difficult.

Tool Operation

1. Position the socket end over the bolt to be installed or removed.

Use only sockets rated for impact use.

Sockets not designed to be used with impacts can break apart causing injury to operator or bystanders.
2. Shift the spool to the direction of rotation desired, when holding the tool with the trigger in the right hand pushing the spool to the right for clockwise rotation.

Pushing the spool to the left rotates the socket counter clockwise.
3. Hold the tool securely with both hands, pull the trigger lock, and pull the trigger.
4. To stop the driver, release the trigger.



- When the nut contacts the surface of the material being fastened, limit impact time to 10 seconds.
- Excessive wear will occur to the hammer mechanism due to the heat buildup if allowed to impact for extended periods.



CAUTION Do not shift the spool while the tool is operating, damage to internal components may occur.

Disconnecting Hoses

1. Stop the hydraulic power source.
2. Depressurize the system.
3. Allow system and hydraulic fluid to cool.
4. Disconnect the supply (pressure) hose to the power source (pressure port) from the tool (IN port).
5. Disconnect the return (tank) hose to the hydraulic power source (return port) from the tool (OUT port).
6. To prevent contamination, always install dust caps over the hydraulic ports of the tool when disconnected.



If injury results from escaping hydraulic fluid, seek immediate medical attention. Serious bodily injury may occur if proper medical attention is not administered immediately.

Do not attempt to locate hydraulic leaks by feeling around hoses and fittings with your hands. Pinhole leaks can penetrate the skin.

Cold Weather Operation

Hydraulic fluids are thicker in cold weather; therefore, run the engine at low idle long enough to bring the fluid temperature up to minimum of 10°C/50°F or until the top of the hydraulic tank feels warm, before operating tool.

Storage Preparation

The tool should be stored in a cool, dry environment which is not subjected to rapid temperature changes.

- Cover male and female hose whips.
- Store in the upright position.
- Secure tool to prevent it from being knocked over.
- Store the Impact Wrench on a smooth level surface.

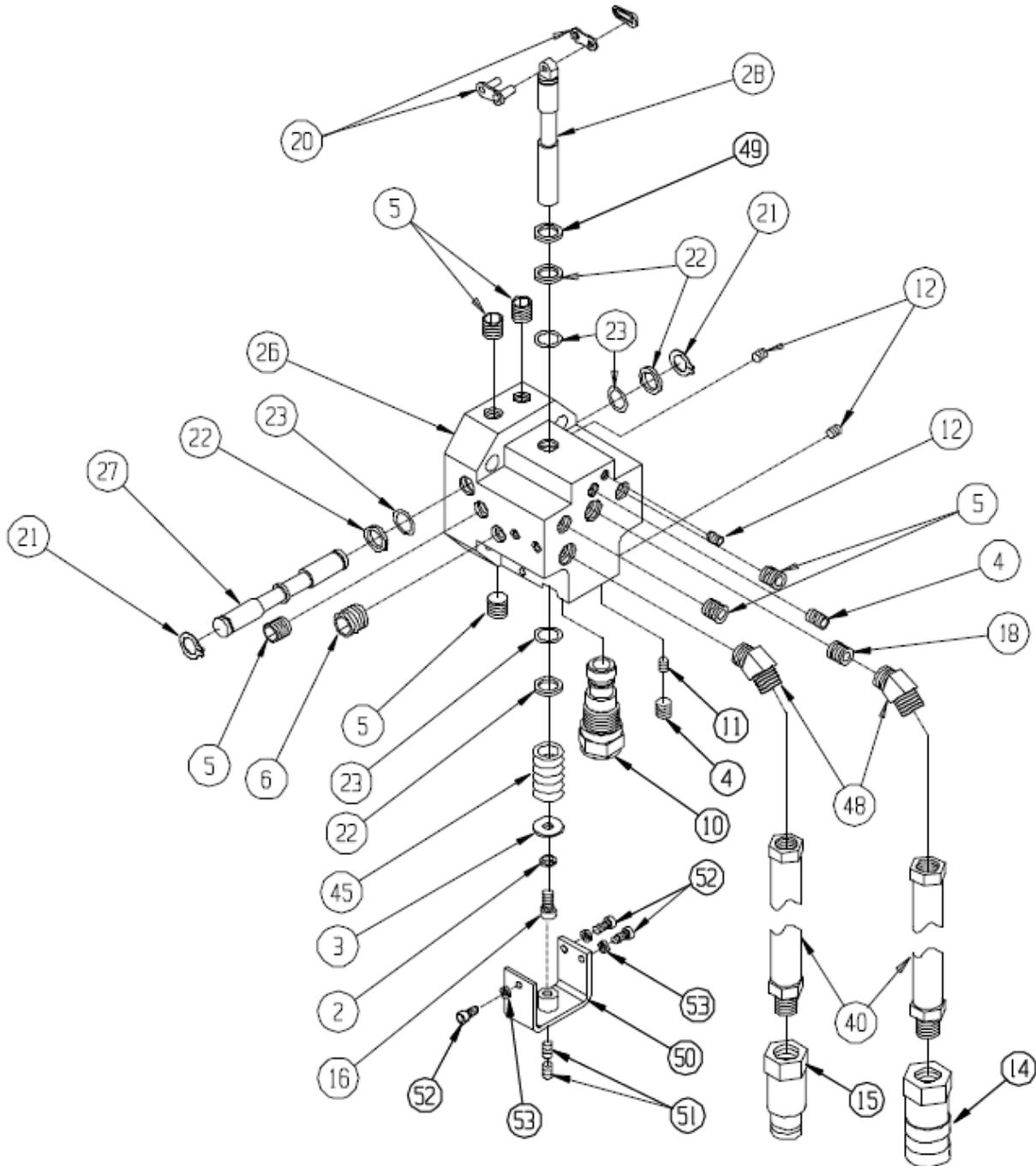
Common Spare Parts

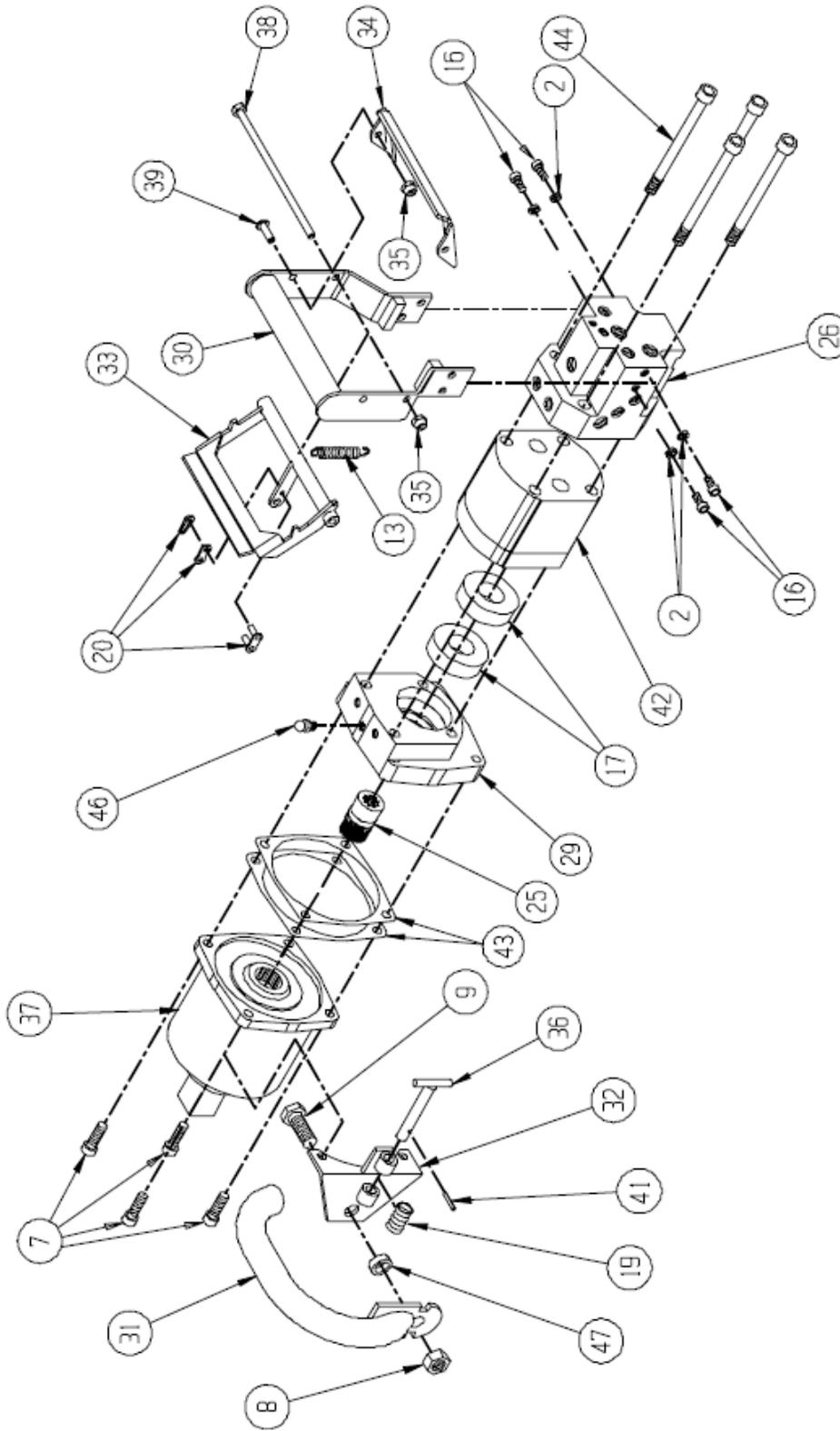
Description	RRP Part Number
Hydraulic Motor	466441
On/Off Spool	466163
Spool Stop	466173
Directional Spool	466746
Seal Kit	10000244
Front Handle	395245
Trigger Handle	466536
Motor Adapter	466616
Trigger	467015
Lock Trigger	467016
Control Manifold	467560
Whip Hose	467904

Assembly View and Parts List

ITEM	P/N	DESCRIPTION	QTY
1		LOCK WASHER 3/8	5
2		LOCK WASHER ¼	5
3		WASHER, ¼	1
4		FITTING 1/8 ALLOY PLUG ALL HD	2
5		PLUG, 1/4 PIPE PLUG HEX	6
6		FLUSH PLUG	1
7		BOLT 5/16nc X 1 ALLEN HEAD	4
8		NUT ½ NC SELF LOCK	1
9		BOLT ½ NC X 1-1/4	1
10	467724	VALVE	1
11		ORFICE .024	1
12		PLUG 1/16 NPT ALLEN HEAD	3
13	466534	SPRING RETURN	1
14		COUPLER HYD. NPT F	1
15		COUPLER HYD. NPT M	1
16		BOLT 1/4ncX 1/2 SOCK. HEAD	5
17	466176	BEARING BALL	2
18		ORFICE	1

19	395246	SPRING RETURN	1
20	466535	LINK VALVE	1
21		SNAP RING 1/2	2
22		O-RING BACK UP .014 TEF	4
23	466162	QUAD RING .014	4
24		BOLT ¼ NC X ¾ BUTTON HEAD	1
25	466177	COUPLER SPLINE	1
26		MANIFOLD CONTROL	1
27	466746	SPOOL DIRECTIONAL	1
28	466163	SPOOL ON/OFF	1
29	466616	PLATE MOTOR ADAPTER	1
30	466536	TRIGGER HANDLE	1
31	395245	FRONT HANDLE	1
32	395247	BRACKET HAND FORWARD	1
33	467015	TRIGGER	1
34	467016	LOCK TRIGGER	1
35	468598	BRACKET TRIGGER	1
36	395248	PIN HANDLE LOCK	1
37		HEAD IMPACT	1
38		BOLT ¼ X 7.00	1
39		BOLT ¼ X .75 BHSC	2
40	467904	HOSE WHIP 16"	2
41		PIN ROLL	1
42	466441	MOTOR HYD.	1
43	466178	SHIM .010 STEEL	2
44	468311	BOLT 3/8 X4.5 SHCS	4
45	466164	SPRING	1
46	401987	ZERK GREASE	1
47	467388	SPACER HANDLE	1
48	468457	FITTING 45°	2
49	466864	WIPER SEAL	1
50	466173	STOP SPOOL	1
51		SET SCREW ¼ X 3/8	2
52		BOLT #10-24 X 1/2" SOCK HD. CAP SCREW	3
53		#10 LOCK WASHER	3



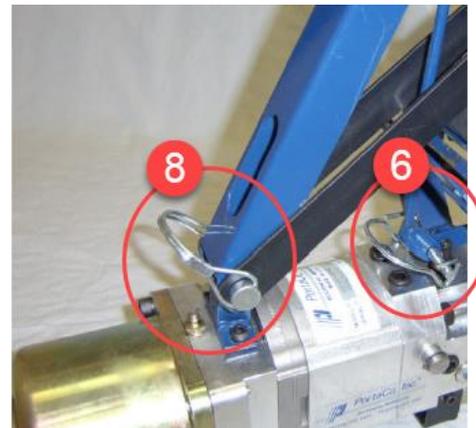


Impact Extension Handle Mounting Instructions- Tee Handle

1. Attach the anchor eye to the impact wrench using the two 1/4" bolts and two lock washers provided.
2. While holding the trigger lock on the impact wrench against the handle, position the Tee Handle assemble over the impact handle.
3. Position the brace arm as shown, lower the braces so that all the holes are aligned with the anchor eye, and insert retaining pin (C 5/16" diameter).
4. Locate the retainer clip.



5. Pull back on the handle to align the upper holes in the handle pole and the holes in brace arm.
6. Insert a 1/4" pin into the hole as illustrated.
7. Align trigger linkage with the hole in the end of the On / Off spool lever.
8. Insert a 1/4" pin through the holes to connect the linkage.
Locate the retainer clip



Removing the Upright Handle

1. Remove the pin and the pin at the trigger linkage
2. Pull the handle assembly off the impact's handle.
3. Replace the clips in the Tee Extension Handle for storage.
Removal of the anchor eye is **not** required.

Maintenance

Complete disassembly of the Impact Wrench **is not** recommended. Return to Racine Railroad for repairs.



All maintenance must be done with the tool disconnected from a power source.

- Wipe all external surfaces after each use with a clean, lint free cloth to remove surface contaminants from the tool.
- To extend the life of the handle padding, do not allow sharp edges or foreign objects to rub on the padding.
- Store all tools in an enclosed area to prevent weather from contaminating their systems.

Daily

1. Wipe all tool surfaces, fittings, and couplings free of grease, dirt, and foreign materials.



Do not attempt to locate hydraulic leaks by feeling around hoses and fittings with your hands. Pinhole leaks can penetrate the skin.

2. Inspect the tool, hydraulic system, hoses, and fittings for signs of leaks, cracks, wear, and/or damage. Replace if necessary.
3. To prevent contamination, always install dust caps over the hydraulic ports when disconnected.

Weekly

1. Grease the impact mechanism using the grease zerk located on top of the motor adapter plate.
2. Apply 2 to 3 strokes (approximately 4 cc's) from a standard grease gun using Mobil HP 53019-6 or equivalent grease.

Grease leakage from around the square drive is common after lubrication and during hard use. Wipe the grease off to prevent it from splattering all over.

Note: Do not attempt to repair this product. Only properly trained personnel should perform any maintenance service, and or repair to this tool.

Monthly

1. Perform a detailed inspection of the systems hoses, and fittings according to the hydraulic hose operator's manual and as stated in SAE standard j1273, May 1989 or latest revision.

Replace the hoses and/or fittings if necessary.

Semi-annually

1. Remove the impact head (Item 41) and clean the grease off the impact components.
2. Remove the grease from the impact housing.
3. Before assembly, check for damage and replace any components in poor condition. Mount the impact head (Item 41) to the motor adapter plate (Item 40) after placing the assembled hammer mechanism in the impact head.
4. Make sure all the shims (Item 44) are in position before mounting the impact head. There may be more than one shim. After assembly, apply 100 strokes of grease (133 cc's) to the lubricating zerk.

Troubleshooting

The following chart can be used as a guide to correct any problem you may experience with the tool.

To determine the problem in operation of the lag driver always check that the hydraulic power source is supplying the correct hydraulic flow and pressure to the tool as listed in the table. Be sure you are using an accurate flow meter. Check the flow with the hydraulic fluid temperature at least 80° F / 27° C.

Note: Stop and depressurize the hydraulic system before connecting or disconnecting a tool.

Failure to follow these instructions can lead to severe personal injury. Read and follow the instructions in this manual for the proper way to connect and disconnect tools from the hydraulic systems.

Problem	Cause	Remedy
Tool will not run or runs slow.	Power source.	Check power source flows and pressure (5-10 gpm / 20-38 lpm at 1500-2000 psi / 100-140 bar).
	Coupler or hose.	Check for /remove obstruction.
	Directional spool not fully shifted.	Shift spool to either position.
	If after impact mechanism has been serviced.	Check that all shims have been placed back between the impact head and adapter. Run impact to circulate grease.
	Mechanical failure.	Disassemble tool and check for damage.
Poor impact performance.	Pressure and return hoses reversed.	Correct for proper flow direction.
	Worn impact components.	Disassemble front half of impact and check for damaged or severely worn parts.
	Incorrect grease.	Remove and clean impact head (see maintenance section for procedures).
	Lubricated bolt head.	Remove grease and lubricate threads only.
	Improper socket or adapters.	Check socket and limit adapters to as few as possible.
	Cold hydraulic fluid.	Allow power source to warm up.

Troubleshooting Continued

Trigger hard to pull.	Back pressure too high.	Should not exceed 250 psi / 17 Bar and 10 gpm / 38 lpm.
	Dirty spool.	Remove and clean spool and replace O-rings and backups.
	Control linkage.	Inspect linkage between trigger and valve spool.
Hydraulic fluid leaks between motor and manifold block.	Damaged seal.	Disassemble tool and replace seal.
Hydraulic fluid leaks between adapter and motor.	Damaged shaft seal.	Split tool between adapter and motor and replace seal.
Hydraulic fluid leaks from control spools.	Damaged seals.	Replace all O-rings and backups on leaking spool.
Grease leaks between impact head and adapter.	Loose fasteners.	Tighten bolts.
Grease leaks around impact drive shaft.	Heavy duty use.	Normal due to heat buildup.
	Impact mechanism over greased.	Wipe clean until grease stops leaking, adjust greasing maintenance to match duty cycle.
Grease leaks around impact drive shaft when cold.	Anvil bushing worn.	Replace anvil bushing.