

Instruction manual & spare parts list



IW-PRO 1"



IW-PRO 3/4"



IW-PRO 1/2"

IW-PRO SERIES AIR DRIVEN IMPACT WRENCHES

1. General Safety and Operation Instruction

1. Unpacking

When unpacking this product, carefully inspect for any damage that may have occurred during transit. Make sure any loose fittings, bolts, etc, are tightened before putting this product into service.

2. This product is a part of a high pressure system and the following safety precautions must be followed at all times along with any other existing safety rules.
3. Read all manuals included with this product carefully. Be thoroughly familiar with the controls and the proper use of the equipment.
4. Only persons well acquainted with these rules of safe operation should be allowed to use the air tool.

Do not exceed maximum operation pressure of the air tool (6.2BAR/90 PSI).

The air tool could explode and result in death or serious personal injury.

5. Do not exceed any pressure rating of any component in the system.
6. Disconnect the air tool from air supply before changing tools or attachments, servicing and during non-operation.
7. Always wear safety glasses during operation.
8. Do not wear loose fitting clothing, scarves, or neck ties. Loose clothing may become caught in moving parts and result serious personal injury.
9. Do not wear jewelry when operation any tool. Jewelry may become caught in moving parts and result in serious personal injury.
10. Do not depress trigger when connecting the air supply hose.
11. Always use attachments designed for use with air powered tools.
Do not use damaged or worn attachments.

Do not use hand-tool sockets. Use impact-quality sockets only. Hand-tool socket are "Glass-Hard" and will shatter and can cause serious personal injury if used with air tools.

12. Never trigger the tool when not applied to a work object. Attachments must be securely attached. Loose attachments can cause serious injury.
13. Protect air lines from damage or puncture.
14. Never point an air tool at oneself or any other person. Serious injury could occur.

15. Check air hoses for weak or worn condition before each use. Make sure all connections are secured.

Release all pressure from the system before attempting to install, service, relocate or performs any maintenance.

16. Keep all nuts, bolts and screws tight and ensure equipment is in safe working condition.

17. Do not put hands near or under moving parts.

18. Speed Adjustment

The impact wrench should never be used to set torque. Use a torque wrench to set the torque and equipped with regulators for speed adjustment. To remove nuts, set the regulator to the maximum setting. To install nuts, set the regulator to the minimum to medium setting. Do not over-tighten the nuts.

19. Air Hose

It is not recommended to install a quick coupler between the impact wrench and leader (whip) hose. Using fittings or air hoses which are too small can create a pressure drop and reduce the power of the tool. For 12.7 mm (1/2") and 19.05 mm (3/4") impact wrench, using 9.525mm (3/8") I.D. fittings with 6.35 mm (1/4") NPT threads are recommended. Most compressors are shipped with a short, 6.35 mm (1/4") I.D. hose. For proper performance and more convenience, use a 9.525 mm (3/8") I.D. hose. Hoses longer than 15.24m (50 feet) should have a 12.7mm (1/2") I.D. For 25.4 mm (1") Impact wrench, using 12.7mm (1/2") I.D. fittings with 12.7mm (1/2") NPT threads are recommended. For proper performance and more convenience, use 12.7 mm (1/2") I.D. hose. Hose longer than 15.24m (50 feet) should have a 19 mm (3/4") I.D.

Never carry a tool by the hose or pull the hose to move the tool or a compressor. Keep hoses away from heat, oil and sharp edges. Replace any hose that is damaged, weak or worn.

20. Storage

The scaling hammer must be lubricated before storing. Follow the air cylinder lubrication instructions with an exception to step 4. Only run the scaling hammer for 2 to 3 seconds instead of 20 to 30 seconds because more oil needs to remain in the scaling hammer when storing.

2. Particular Safety Instruction

1. Information of Noise Level

(1)The noise level at the operator's position is about:

Model No.:	A-weighted sound pressure level (L _{pf})	A-weighted sound power level (L _w)	Uncertainty K _{WA}
IW-PRO 1"	107.5(dB)	117.6(dB)	3(dB)
IW-PRO 3/4"	105.1(dB)	115.3(dB)	3(dB)
IW-PRO 1/2"	103.7(dB)	113.9(dB)	3(dB)

(2)Reference standard :ISO 15744.

(3)Always wear ear protectors during operation.

2. Information of Vibration Level

(1)The vibration level at the handle is about :

Model No.:	Vibration Level (m/s ²)	Uncertainty K (m/s ²)
IW-PRO 1"	5.6	0.15
IW-PRO 3/4"	4.6	0.17
IW-PRO 1/2"	3.1	0.21

(2)Reference standard: EN 28927-2.

3. Warnings

- (1)The power tools shall not be used in explosive atmospheres unless specially designed for that purpose.
- (2)Unexpected tool movement due to reaction forces or breakage of inserted tool or reaction bar may cause injuries to hands or feet.
- (3)The power tools shall be isolated from the energy source before changing or adjusting the inserted tool.
- (4)Pay attention to the risk of crushing by torque between a reaction bar and the work piece.
- (5)Pay attention to the risk of loose clothing, hair etc. being caught in the rotating spindle of the power assembly tool.
- (6) Pay attention to the risk of being injured if hands are not kept away from the reaction bar, specially observed when unscrewing in confined work places.
- (7) Pay attention to the risk of being injured if hands are not kept away from the nut runner sockets.
- (8) Pay attention to the danger to persons from high speed splinters being emitted in the case of a nut-runner socket failure, in particular relevant of impact wrenches.
- (9) Pay attention to the risk of being injured by whipping air hoses.

4. Instructions

- (1) On the proper adaptation of the reaction bar to the application.
- (2) Use only sockets and adapters which are in good condition and are intended for use with power tools.
- (3) Ensure that the assembly power tool is securely fixed to suspension advice, if used.
- (4) Adopt a suitable postures to counteract normal or unexpected movement of the power tool due to reaction forces from the power assembly tool.
- (5) Ensure that the pressure of the air or fluid supply is not lower than the lowest pressure specified by the manufacturer for clutch controlled assembly tools and make sure that the air or fluid supply pressure does not fail after the clutch has been set.
- (6) Release the start and stop device in the case of an interruption of the energy supply.
- (7) Only lubricants recommended by the manufacturer shall be used.

5. Explanations Of Warning Signs Used For This Tool

			
The operator's instruction must be read before work starts	Warning: Risk of crushing (intended for open-ended spanners)	Warning: Risk of crushing (between the reaction bar and the working piece)	Direction of rotation

6. Application

Rotary power tool, with a reversible spindle driving a hammer which periodically strikes an anvil which includes a drive adapter for the purpose of tightening or loosening nuts and bolts without producing any major torque reaction on the power tool.

7. The weight of this tools:

Model No.:	IW-PRO 1"	IW-PRO 3/4"	IW-PRO 1/2"
Weight	10.6 kg	5.84 kg	2.64 kg

Note : If the weight of this tool exceeds 15 Kgs, the following attention shall be paid to :

- (1) Be sure that you can afford the weight.
- (2) Be sure to wear foot protection, to prevent the risk of impact due to the drop of tool.

3. Maintenance Instruction

1. Lubrication

Proper lubrication is the owner's responsibility. Failure to lubricate the air tool properly will dramatically shorten the life of the tool and will void the warranty.

This impact wrench requires lubrication before the initial use and before and after each additional use.

2. Impact wrench require lubrication throughout the life of the tool and must be lubricated in two separate areas : the air motor and the impact mechanism. Follow the outlined procedures and refer to Figure I for details.
3. Air Motor Lubrication The motor must be lubricated daily. An air motor cannot be oiled too often.

Disconnect the impact wrench from the air supply before lubricating.

1. Disconnect the impact wrench from the air supply.
2. Turn the impact wrench upside down.
3. Simultaneously (at the same time), pull the trigger and pour a teaspoon of oil in the air inlet. Then, push the forward and reverse button in both directions.

After an air tool has been lubricated, oil will discharge through the exhaust port during the first few seconds of operation. Thus, the exhaust port must be covered with a towel before applying air pressure. Failure to cover the exhaust port can result in serious injury.

4. Connect the impact wrench to the air supply and cover the exhaust port with a towel (See Figure 1). Run the impact wrench in both the forward and reverse directions for 20 to 30 seconds. Oil will discharge from the exhaust port when air pressure is applied.
5. Impact mechanism lubrication
The impact wrench should be lubricated monthly.

Disconnect the impact wrench from the air supply before lubricating.

1. Disconnect the impact wrench from the air supply.
2. Remove the slotted screw or allen head screw from the oil port hole on the right side of the tool that has "OIL" stamped below the hole for .
3. Put three teaspoons of air tool oil in the oil port hole. Replace the screw.

5.

4. Reconnect the air supply to the impact wrench and run for 20 to 30 seconds.
Lubricate the entire impact mechanism by rotating the tool upside down and sideways while running the tool.
5. Remove the screw and hold the oil port hole over a suitable container to allow excess oil to drain.
6. If the oil is dirty, repeat the procedure above until the oil comes out clear. Install the screw and tighten. The residual oil remaining in the impact mechanism chamber is all that is needed for proper lubrication.

General Troubleshooting Guide

Symptom	Possible Cause(s)	Corrective Action
Tool runs slowly or will not operate	1. Grit or gum in tool.	1.Flush the tool with air tool oil, gum solvent, or an equal mixture of SAE # 10 motor oil and kerosene. Lubricate the tool after cleaning.
	2. No oil in tool.	2.Lubricate the tool according to the lubrication instructions in this manual.
	3. Low air pressure.	3.Adjust the compressor regulator to tool maximum while the tool is running free.
	4. Air hose leaks.	4.Tighten and seal hose fittings if leaks are found.
	5. Pressure drops.	5-1.Be sure the hose is the proper size. Long hoses or tools using large volumes of air may require a hose with an I.D. of 12.7 mm (1/2") or larger depending on the total length of the hose. 5-2.Do not use a multiple number of hoses connected together with quick connect fittings. This causes additional pressure drops and reduces the tool power Directly connect the hoses together.
	6. Worn ball bearing in motor.	6.Remove and inspect bearing for rust, dirt and grit or worn race. Clean and regress bearing with bearing grease.

Symptom	Possible Cause(s)	Corrective Action
Moisture blowing out of tool	1. Water in tank. 2. Water in the air lines/hoses.	1. Drain tank. (See air compressor manual). Oil tool and run until no water is evident. Oil tool again and run 1-2 seconds. 2-1. Install a water separator/filter. Note: Separators only work properly when the air passing through the separator is cool. Locate the separator/filter as far as possible from the compressor. 2-2. Install an air dryer.
Impacts slowly or Will not impact	1. Lack of lubrication. 2. Tool regulator set in wrong position. 3. In-line regulator or compressor regulator set too low.	1. Lubricate the air motor and the impact mechanism. (See lubrication section of this manual) 2. Adjust the regulator setting of the tool. 3. Adjust regulators in the air system.
Impacts rapidly But will not remove bolts	1. Worn impact mechanism.	1-1 Replace impact mechanism. 1-2 Return impact wrench to your supplier for repair.
Does not impact	1. Worn impact mechanism.	1-1 Replace impact mechanism. 1-2 Return impact wrench to your supplier for repair.

UNITOR IW-PRO 1"

SPECIFICATIONS :

* SQUARE DRIVE ----- 1"

* MAX TORQUE----- 1800FT-LBS

* AIR PRESSURE ----- 90 -115 PSI

* AIR INLET ----- 1/2" PT(NPT)

* BOLT CAPACITY----- 1-3/4"

* FREE SPEED ----- 4,200 RPM

* HOSE SIZE ----- 1/2" ID

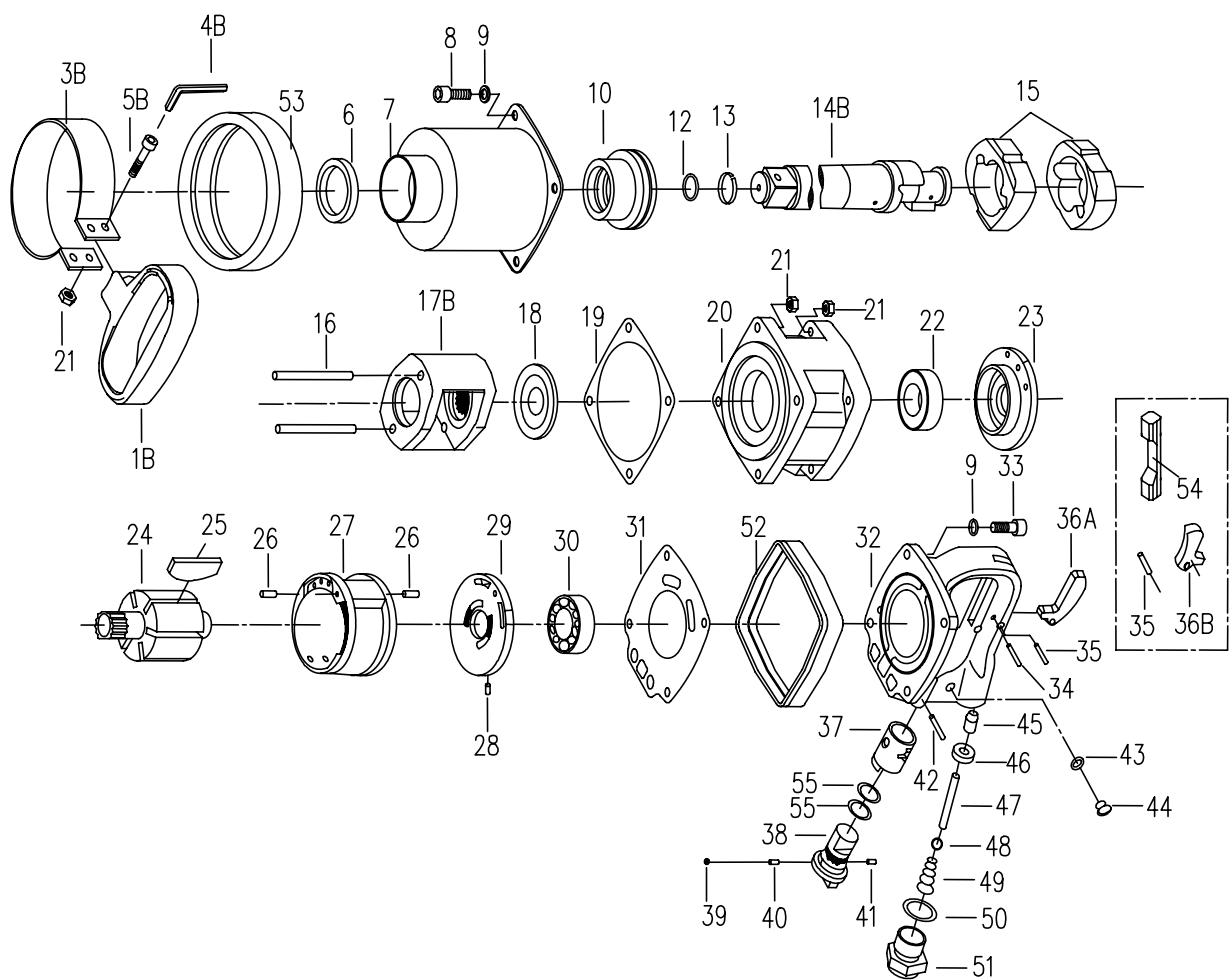
REF NO.	PARTS NO.	DESCRIPTION	Q'TY	REF NO.	PARTS NO.	DESCRIPTION	Q'TY
1	752859	HANDLE	1	30	752886	BALL BEARING③	1
3B	752860	CLAMPER	1	31	752887	REAR GASKET①③	1
4B	752861	HEX. WRENCH (6 MM)	1	32	752888	HANDLE FRAME	1
5B	752862	CAP SCREW (M8×50L)	2	33	752889	CAP SCREW	4
6	752863	OIL SEAL	1	34	752890	SPRING PIN	1
7	752864	HAMMER CASE	1	35	752891	PIN①④	1
8	752865	CAP SCREW	4	##36	752892	OUTER TRIGGER	1
9	752866	SPRING WASHER	8	36B	752893	INNER TRIGGER①④	1
10	752867	BUSHING	1	37	-	REVERSE VALVE BUSHING	1
12	752868	"O" RING (d17.8×W2.4)①②	1	38	752894	REVERSE VALVE	1
13	752869	ANVIL COLLAR①②	1	39	752895	STEEL BALL	1
14B	752870	8"ANVIL②	1	40	752896	SPRING	1
15	752871	HAMMER②	2	41	752897	SPRING PIN	1
16	752872	HAMMER PIN②	2	42	752898	SPRING PIN	1
17B	752873	HAMMER CAGE	1	43	752899	"O" RING	1
18	752874	REAR WASHER	1	44	752900	OIL CHAMBER SCREW	1
19	752875	FRONT GASKET①②	1	45	752901	VALVE BUSHING	1
20	752876	MOTOR HOUSING	1	46	752902	BUSHING①④	1
21	752877	LOCK NUT (M8)	10	47	752903	VALVE STEM④	1
22	752878	BALL BEARING③	1	48	752904	STEEL BALL①④	1
23	752879	FRONT END PLATE③	1	49	752905	SPRING①④	1
24	752880	ROTOR	1	50	752906	"O" RING①④	1
25	752881	ROTOR BLADE①③③	6	51	752907	AIR INLET④	1
26	752882	SPRING PIN③	2	52	752908	HOUSING BAND	1
27	752883	CYLINDER③	1	53	752909	FRONT RUBBER	1
28	752884	SPRING PIN③	1	54	752910	RUBBER PROTECTOR	1
29	752885	REAR END PLATE③	1	55	752911	"O" RING (d18.0×W2.0)①	2

Optional Parts

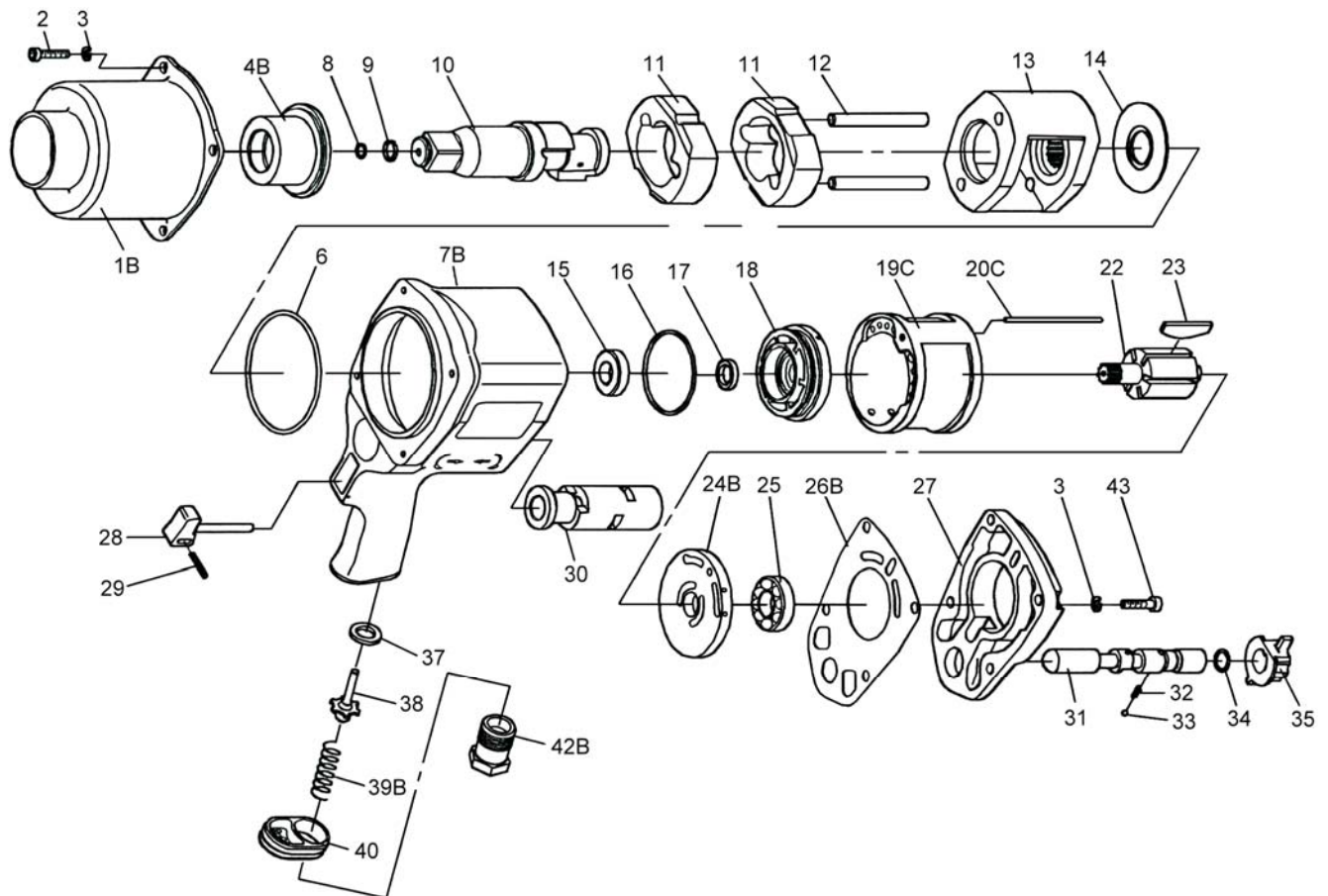
403 722199

To get maximum performance and life of your tool, replace the whole set of parts included in the Spare part kits:

- | | | |
|---|------------------------|--------|
| ① | Tune-up kit | 722256 |
| ② | Hammer overhaul kit | 722249 |
| ③ | Air motor overhaul kit | 722264 |
| ④ | Valve overhaul kit | 722272 |



UNITOR IW-PRO 3/4"



SPECIFICATIONS :

* SQUARE DRIVE ----- 3/4"
 * MAX TORQUE ----- 900 FT/LBS
 * AIR PRESSURE ----- 90 PSI
 * AIR INLET ----- 3/8" PT(NPT)

* BOLT CAPACITY ----- 1-1/16"
 * FREE SPEED ----- 4000 RPM
 * HOSE SIZE ----- 3/8" ID

REF NO.	PARTS NO.	DESCRIPTION	Q'TY	REF NO.	PARTS NO.	DESCRIPTION	Q'TY
1B	752951	HAMMER CASE	1	23	752971	ROTOR BLADE②	6
2	752952	CAP SCREW (M6×15L)	4	24B	752972	REAR END PLATE②	1
3	752953	SPRING WASHER (M6)	8	25	752973	BALL BEARING (6202)②	1
4B	752954	BUSHING	1	26B	752974	GASKET②	1
6	752955	O-RING (d68.0×W1.9 mm)①	1	27	752975	REAR COVER	1
7B	752956	MOTOR HOUSING	1	28	752976	TRIGGER③	1
8	752957	O-RING (d10.0×W1.5 mm)①	1	29	752977	SPRING PIN (Ø2×18L)③	1
9	752958	ANVIL COLLAR①	1	30	752978	VALVE SLEEVE	1
10	752959	ANVIL①	1	31	752979	REVERSE VALVE	1
11	752960	HAMMER①	2	32	752980	SPRING	1
12	752961	HAMMER PIN①	2	33	752981	STEEL BALL (1/8")	1
13	752962	HAMMER CAGE	1	34	752982	O-RING (d11.0×W4.0)	1
14	752963	REAR WASHER	1	35	752983	REGULATOR KNOB	1
15	752964	BALL BEARING (6004 Z)②	1	37	752984	BUSHING③	1
16	752965	O-RING (d58.0×W3.0 mm)②	1	38	752985	VALVE STEM③	1
17	752966	OIL SEAL (20×29×5)②	1	39B	752986	SPRING ③	1
18	752967	FRONT END PLATE②	1	40	752987	EXHAUST DEFLECTOR③	1
19C	752968	CYLINDER②	1	42B	752988	AIR INLET③	1
20C	752969	PIN②	1	43	752989	CAP SCREW (M6×20L)	4
22	752970	ROTOR	1				

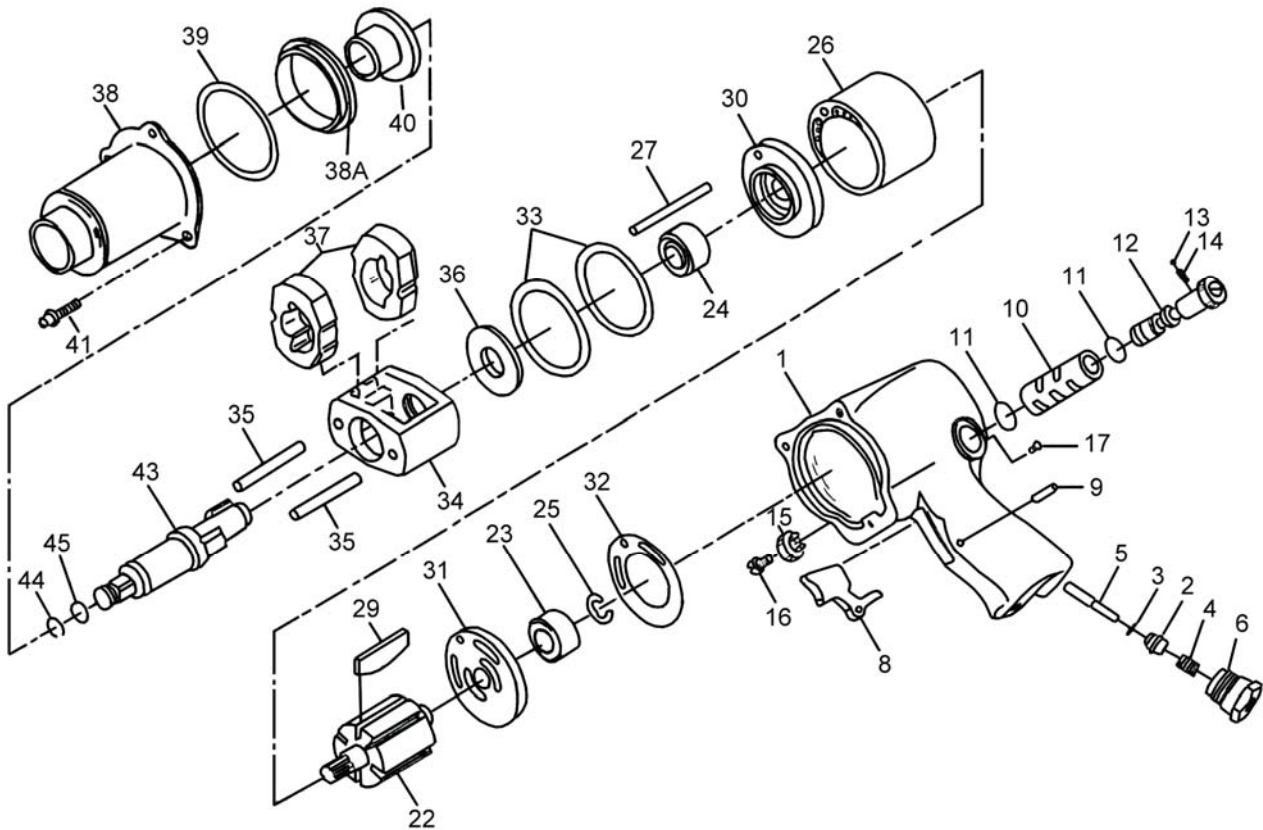
Optional Parts

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To get maximum performance and life of your tool, replace the whole set of parts included in the Spare part kits:

- ① Hammer overhaul kit 722280
- ② Air motor overhaul kit 722348
- ③ Valve overhaul kit 722355

UNITOR IW-PRO 1/2"



SPECIFICATIONS :

* SQUARE DRIVE-----1/2"
 * MAX TORQUE-----400 FT/LBS
 * AIR PRESSURE-----90 PSI
 * AIR INLET-----1/4" PT(NPT)

* BOLT CAPACITY-----5/8"
 * FREE SPEED-----7000 RPM
 * HOSE SIZE-----3/8" ID

REF NO.	PARTS NO.	DESCRIPTION	Q'TY	REF NO.	PARTS NO.	DESCRIPTION	Q'TY
1	752912	MOTOR HOUSING	1	31	752936	REAR END PLATE	1
2	752913	THROTTLE VALVE	1	32	752937	END PLATE GASKET	1
3	752914	THROTTLE VALVE FACE	1	33	752938	MOTOR CLAMP WASHER	2
4	752915	THROTTLE VALVE SPRING	1	34	752939	HAMMER FRAME	1
5	752916	THROTTLE VALVE STEM	1	35	752940	HAMMER PIN	2
6	752917	AIR STRAINER ASSEMBLY	1	36	752941	HAMMER FRAME REAR WASHER	1
8	752918	TRIGGER	1	37	752942	HAMMER	2
9	752919	TRIGGER PIN (Ø4×19.8)	1	38	752943	HAMMER CASE	1
10	752920	REVERSE VALVE BUSHING	1	38A	752944	HAMMER CASE PILOT	1
11	752921	SEAL (d10.8×W1.78)	2	39	752945	HAMMER CASE GASKET	1
12	752922	REVERSE VALVE	1	40	752946	HAMMER CASE BUSHING	1
13	752923	STEEL BALL (1/8")	1	41	752947	CAP SCREW (3/16"×5/8")	3
14	752924	SPRING	1	43A	752948	STANDARD ANVIL	1
15	752925	REVERSE VALVE KNOB	1	44	752949	SCOKET RETAINER	1
16	752926	REVERSE VALVE KNOB SCREW	1	45	752950	RETAINER O-RING (d7.8×W1.9)	1
17	752927	GREASE FITTING	1	**46	722363	TUNE-UP KIT (INCLUDES ILLUSTRATED 3,4,11(2),25,29(6),32,39,44,45)	
22	752928	ROTOR	1				
23	752929	REAR ROTOR BEARING (6001)	1				
24	752930	FRONT ROTOR BAERING (R 8)	1	**K01	722371	HAMMER OVERHAUL KIT : (35,37,43A,44,45)	1SET
25	752931	BEARING RETAINER (E-10)	1				
26	752932	CYLINDER	1				
27	752933	CYLINDER DOWEL	1	**K02	722389	AIR MOTOR OVERHAUL KIT : (23,24,25,26,27,29,30,31,32)	1SET
29	752934	ROTOR BLADE	6				
30	752935	FRONT END PLATE	1				
				**K03	722397	VALVE OVERHAUL KIT : (2,3,4,5,6,8,9)	1SET

Optional Parts

403 722173

To get maximum performance and life of your tool, replace the whole set of parts included in the Spare part kits

Notes

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Instruction manual & spare parts list

We service your needs in 2 200 ports...

Fraser/surrey Gaspe Gros Caouana Halifax Hamilton Harbour Grace H Westminster Bc Pictou/halifax Pointe Aux Pic.quebec Port Alfred Port C Port Of Quebec Port Weller Powell River Prince Rupert Roberts Bank Sa halifax Squamish St. Catherines St.john's, Nfld St.romuald Stephens alleyfield Vancouver Victoria Weymouth Windsor Yarmouth Ancud / **Lima** Antofagasta Arica Caldera Concepcion Bay Cuzco Coronel Corral Huasco Las Ventanas Lirquen Lota Penco Puerto Montt Puerto Williams Punta Arenas Quintero San Antonio San Vicente Talcahuano Tocopilla Valparaiso Antilla Bahia Honda Banes Baracoa Cabanas Caibarien Cardenas Casilda Ceiba Hueca Cienfuegos Guantanamo Guayabal Havana Isabel De Sagua Manati Mariel Media Luna Moa Nicaro Niquero Nuevitas Pilon Puerto Padre Santiago De Cuba Sigloo **Genoa** Finn Tanamo Tunas De Zaza Vita Balao Esmeraldas Guayaquil La Libertad Manta Puerto Bolivar Freeport/bahamas Guam Mahdia Acapulco Campeche Ciudad Del Carmen Coatzacoaloos Cozumel Dos Bocas Ensenada Guaymas La Paz Lazaro Cardenas Mazatlan Progreso Puerto Vallarta Salina Cruz Tampico Topolobampo Tuxpan Vera Cruz Bonaire Bullen Bay Curacao Aguadulce Almirante Armuelles Bahia Las Minas Balboa Cristobal Manzanillo Int.term. Vacamonte Callao Chimbote Ilo Matarani Paita Pisco Guayama Guayanilla Mayaguez Ponce San Juan Yabucoa St. Vincent Chaguaramas La Brea Point Fortin Point Lisas Pointe-a-pierre Port Of Spain Tembladora Aberdeen,wa Alameda Albany,n.y. Alexandria, Va Algiers Point Amelia Anacortes, Wa Anchorage,ak Annapolis,md Antioch Aransas Pass Tx Astoria, Or Baltimore Baton Rouge Bayonne Baytown Beaumont Bellingham, Ma Bellingham, Wa Benicia, Ca Boston, Ma Bridgeport Bridgeport, Conn Brooklyn, Ny Brownsville Tx Brunswick Brunswick, Ga ucksport,me Buras Camden Camden, Nj Cameron La Chalmette Charleston, Sc Cheasapeake Chester Chicago Claymont Convent Coos Bay, Or Corpus Chr.tx Crockett Darrow Davant Deer Park Delaware City Destrehan Donaldsonville Dutch Harbor, Ak Eastport, Me Eureka Everett, Wa Fairless Hills Famausta Ferndale wa Freeport Tx Galveston Tx Garville Geismar Georgetown, Sc Gloucester, Nj Good Hope Gramercy Grand Isl aii Hoquiam, Wa Houma Jacksonville Kalama Kalama, Wa Kenai Key V a Loop Terminal Los Angeles Manchester, Wa Manhattan, Ny N ad City, Nc Morgan City Morrisville, Pa Myrtle Grove Naples Nederland Tx New Haven, Conn New Iberia New London New Orleans New York Newington, Nh Newport News, Va Newport, Or Newport, Ri Nikiski Norco Norfolk Oakland Olympia, Wa Orange, **Rotterdam** Tx Palm Beach Panama City, Fl Pasadena Pascagoula, Ms Paulsboro, Nj Pennsauken, Nj Pensacola, Fl Petaluma Philadelphia Piney Point, Md Pittsburg Plaquemine Point Comfort Tx Port Allen Port Angeles, Wa Port Arthur Tx Port Canaveral Port Everglades Port Hueneme Port Isabel Tx Port Manatee, Fl Port Neches Tx Port Royal, Sc Port St. Joe, Fl Port Townsend, Wa Portland, Me Portland, Or Portsmouth Portsmouth, Nh Providence, Ri Queens, Ny Redwood City Reserve Revere, Ma Richmond Richmond, Va Sacramento Salem Salem, Ma San Diego San Francisco Sandwich, Ma Savannah Searsport, Me Seattle Seward Sparrows Point St.petersburg, Fl St.rose Staten Island, Ny Stockton Tacoma, Wa Tampa Texas City The Bronx, Ny The Loop Valdez Vancouver, Wa Venice West Palm Beach Westville, Nj Wilmington, Ca Wilmington, De **Houston** Wilmington,nc Yonkers, Ny Yorktown, Va Fray Bentos Jose Ignacio Montevideo Nueva Palmira Amuay Bay Bajo Grande Cumarebo El Palito El Tablazo Guanta Guaranao Jose Bay La Guaira La Salina Maracaibo Pertigalete Puerto Cabello Puerto La Cruz Puerto Miranda Puerto Ordaz Punta Cardon Punta De Palmas Punto Fijo San Lorenzo, Vz St.croix Aeroskobing Assens Bagenkop Bogense Copenhagen Ebeltoft Enstedvaerket Havn Esbjerg Fakse Ladeplads Havn Fredericia Frederiksund Frederiksvaerk Fredrikshavn Faaborg Gedser Great Belt Grenaa Graasten Gulfhavn Haderslev Halsskov Hanstholm Helsingor Hirtshals Hobro Holbaek Horsens Kalundborg Kertminde Koge Kolding Korsor Lemvig Mariager Marstal **Oslo** Middlefart Naestved Naskov Nyborg Nykobing Falster Nykobing Mors Nykobing Skjaelland Odense Orehoved Falster Randers Ronne Rudkobing Sakskobing Skaelskor Skaerbaek Skagen Skive Sonderborg Stege Stigsnaesvaerkets Havn Svendborg Studstrupvaerkets Havn Thisted Thorshavn Vejle Vordingborg Aabenraa Aalborg Aarhus Kunda Loksa Muuga Paldiski Paljassaare Parnu Tallinn Dalsbruk Hamina/fr.havn Hanko/hangoe Helsinki Ingaa/inkoo Jakobstad Kalajoki Kantvik Kaskinen/kasko Kemi Kemio Korkkola/karleby Kotka Koverhar Kristinestad Lappvik Lovisa Mariehamn Merikarvia Nystad Naantali Oulu Pargas Pori Porvoo/borgaa Rauma Raahe/brahestad Skoeldvik Tammisaari Teijo Tolkis Torneaa Turku Valkom/valko Vaasa Akureyri Isafjordur Reykjavik Arklow Aughinish Bantry Cork Drogheda Dublin Dun Laoghaire Dundalk Foynes Galway Limerick Moneypoint Ringaskiddy Tarbert Waterford Liepaja Mersrags Riga Roja Salacgriva Skulte Ventspils Butinge Klaipeda Agnefest Alta **Piraeus** Arendal Asker Askoy Aukra Aure Averoe Bergen Berlevaag Bodo Boemlo Brattvag Breivika Brevik Baatsfjord Dirdal Drammen Dusavik Egersund Eide Elnesvaagen Eydehavn Fagerstrand Farsund Finnsnes Flekkefjord Floroe Flaam Fosnavaag Fraena Fredrikstad Frei Gamvik **Genoa** Geiranger Gjemnes Glomfjord Gravdal Grimstad Gudvangen Halden Halsaa Hammerfest Harstad Haugesund Hellesylt Heroeya Hjelmeland Hoeyanger Holla Holmestrand Hommelvik Honningsvaag Horten Husnes Jelsa Jessheim Joerpeland Joessinghamn Kambo Karmoey Kirkenes **Singapore** Krageroe Kristiansand Kristiansund Kvinesdal Kyrksaeterora Kaarsto Larvik Leknes Lillesand Lyngdal Mandal Mehavn Mo I Rana Molde Mongstad Mosjoen Moss Muruvik Maaloey Namsos Narvik Nettet Odda Oelen Oersta Orkanger Porsgrunn Rafnes Randaberg Raubergvika Risoer Sandefjord Sandnes Sandnessjoen Sarpsborg Sauda Skien Skjervoe Slagen Slagentangen Smoela Soevik Sola Sorreisa Sortland Stavanger Stord Sture Sunndalsoera **Dubai** Surnadal Svelgen Svolvaer Tananger Tau Thamshamn Tingvoll Tjeldbergodden Toensberg Tofte Tomrefjord Tromsø Trondheim Tustna Tvedestrand Tyssedal Tysvaer Ulsteinvik Vadsoe Vardoe Verdal Vik Volda Aagotnes Aaheim Aalesund Aalvik Aardal i Ryfylke Aardalstangen Gdansk Gdynia Kolobrzeg Police Swinoujscie Szczecin Arkangelsk Baltiysk De Kastri Kaliningrad Kandalaksha Kavkaz Kronshtadt Lomonosov Murmansk Nakhodka Novorossiysk Primorsk Sakhalin Sakhalin Severomorsk St. Petersburg Svetlyi Taman Temruk Temryuk Tuapse Vladivostok Vostochniy, Port Vostochnyi Vyborg Bohus Brofjorden Falkenberg Gavle Gothenburg Hallstavik Halmstad Helsingborg Hoganas Holmsund Hudiksvall Iggesund Kalmar Karlshamn Karlskrona Karlstad Koeping Landskrona Lidkoping Lilla Edet Luleaa Lysekil Malmoe Mariestad Marstrand Munkedal Norrkoeping Norrsundet Norrtalje Nvnashamn **Rotterdam** Ornskoldsvik Oskarshamn Oxelosund Pitea **Shanghai** Simrishamn Skarhamn Skelleftehamn Skutskar Slite