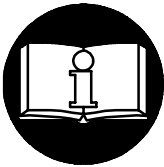
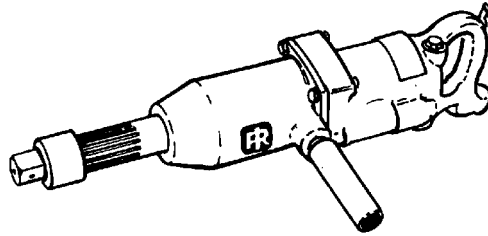


OPERATION AND MAINTENANCE MANUAL for MODEL 5340TO TORQUE CONTROL IMPACT TOOL WITH OVERRIDE (1" SQUARE DRIVE)



⚠ WARNING

**IMPORTANT INFORMATION CONTAINED IN OPERATION AND
MAINTENANCE MANUAL FOR SAFE TOOL OPERATION.
THIS MATERIAL MUST BE READ PRIOR TO OPERATING THE TOOL.**

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

1. Always operate, inspect and maintain this tool in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1) and Recommendations for Proper Use of Hand Operated/Hand Held Pneumatic Tools (PNEUROP 18/1986).
2. For safety, top performance and maximum durability of parts, operate this tool at 90 psig (6.2 bar/620 kPa) maximum air pressure with 3/4" (19 mm) inside diameter air supply hose.
3. Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.
4. Keep hands, loose clothing and long hair away from rotating end of tool.
5. Anticipate and be alert for sudden changes in motion during start up and operation of any power tool. High reaction torques can occur with tools that control output rpm through stall, geared or clutch type mechanisms at or below the recommended air pressure. Injury may result!
6. Check for excessive speed and vibration before operating.
7. Tool shaft may continue to rotate briefly after throttle is released.
8. Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
9. For personal protection, do not remove any labels. Replace any damaged label.
10. Use only recommended Ingersoll-Rand accessories.
11. Use only impact sockets and accessories. Do not use hand (chrome) sockets or accessories.

NOTICE

The use of other than genuine Ingersoll-Rand replacement parts may result in safety hazards, decreased tool performance, and increased maintenance, and may invalidate all warranties.

Ingersoll-Rand is not responsible for customer modification of tools for applications on which Ingersoll-Rand was not consulted.

Repairs should be made only by authorized trained personnel. Consult your nearest Ingersoll-Rand Authorized Servicenter.

Specific test data, when applicable, can be found in the Special Instructions Section of this manual.

It is the responsibility of the employer to place the information in this manual into the hands of the operator.

Refer All Communications to the Nearest
Ingersoll-Rand Office or Distributor.

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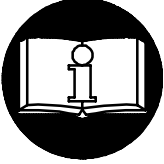
Printed in U.S.A.

INGERSOLL-RAND®
PROFESSIONAL TOOLS

WARNING LABEL IDENTIFICATION

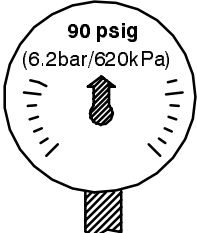
WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

	 WARNING Important information contained in Operation and Maintenance Manual for safe tool operation. This material must be read prior to operating the tool.
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	 WARNING Do not use damaged, frayed or deteriorated air hoses and fittings.
--	---

	 WARNING Always wear hearing protection when operating this tool.
---	---

	 WARNING Operate at 90 psig (6.2 bar/620 kPa) Maximum air pressure.
--	---

	 WARNING Do not carry the tool by the hose.
---	---

PLACING TOOL IN SERVICE

LUBRICATION



Ingersoll-Rand No. 50

Ingersoll-Rand No. 28

Ingersoll-Rand No. 100



Always use an air line lubricator with these Impacttools. We recommend the following Filter-Lubricator-Regulator Unit:

For USA – No. C22-04-G00

For International – No. C22-04-G29

After each eight hours of operation, unless an air line lubricator is used, unscrew the Oil Chamber Plug (15) from the Housing (1) and fill the chamber with oil.

After each forty-eight hours of operation or as experience indicates, inject a small amount of Ingersoll-Rand No. 28 Grease into the two Grease Fittings (39) located in the Motor Housing (1).

Twice weekly, or as experience indicates, remove the Hammer Case (75) and using Ingersoll-Rand No. 100 Grease, coat the jaws of the Hammer (71) and Anvil (78) as well as the pilot of the Torsion Bar (79) and the bearing surfaces of the Anvil. Also insert about 3 cc of the above lubricant into one of the holes in the side of the Hammer from where it will work into the Hammer Spring Thrust Bearing (71) and the grooves in the Ball Cam.

NOTICE

Because of the consistency of Impactool Grease, the impact unit can be over-lubricated and in such cases the power will be reduced and the impact action impaired. Never apply grease to the outside wall of the Hammer or otherwise load up the unit with lubricant. For best results, lubricate frequently and use only a small quantity of grease.

AIR STRAINER

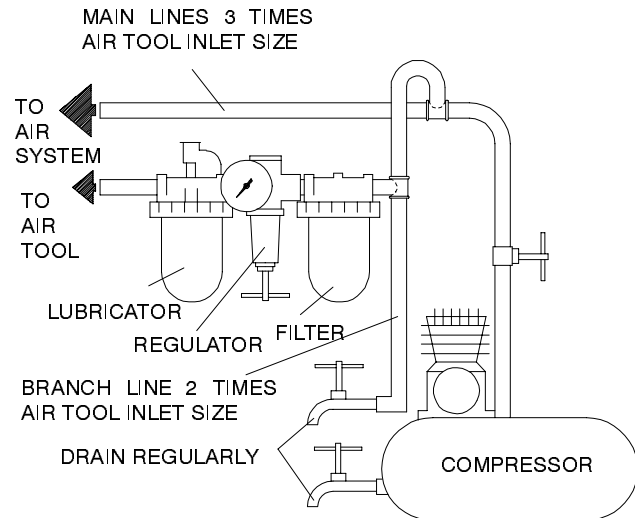
Weekly, or as experience indicates, unscrew the Governor Valve Cap (24) from the Motor Housing and remove the Air Strainer Screen (23). Wash the Screen in a suitable solution and reassemble, being sure to include the Governor Valve Spring (25).

INSTALLATION

Air Supply and Connections

Always use clean dry air. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool. An air line filter can greatly increase the life of an air tool. The filter removes dust and moisture. Low pressure (under 90 psig; 6.2 bar/620 kPa) reduces the speed of all air tools.

Low air pressure not only wastes time, but also costs money. High air pressure (over 90 psig; 6.2 bar/620 kPa) raises performance beyond the rated capacity of the tool and could cause injury. Be sure all hoses and fittings are the correct size and are tightly secured. See diagram below for a typical piping arrangement.



(Dwg. TPD905-1)

HOSE AND HOSE CONNECTIONS

A 3/4" (19 mm) air hose, assembled with a T01-46 Hose Nipple (3/4" hose to 3/8" male pipe) for connecting it to the air inlet is recommended. However, for greater flexibility and easier handling of the Tool, a whip of 1/2" (13 mm) hose not exceeding 25 feet in length can be used for connecting the Tool to the trunk line.

OIL ADJUSTMENT

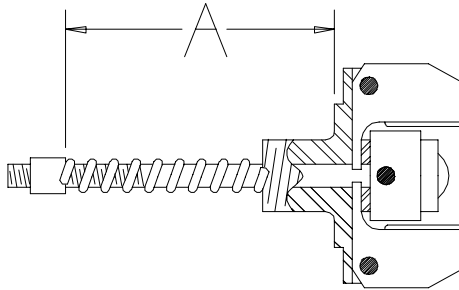
The oiler is adjusted for proper feed at the factory and should not be changed unless lubrication difficulties are experienced. Adjustment may be made by removing the Oiler Protection Screw (38) located directly under the Grease Fitting in the handle end of the Housing and turning the Oiler Adjusting Screw (14). Turning the Screw **in** (clockwise) reduces the oil flow. Turning the screw **out** (counterclockwise) increases the oil flow.

NOTICE

The top of the Oiler Adjusting Screw must at all times be below the small drilled port leading from the side of the tapped hole.

PLACING TOOL IN SERVICE

GOVERNOR ADJUSTMENT



(Dwg. TPD497)

A = 1-29/32" (48 mm)

The above view illustrates the sensitive weight-type Governor which controls the speed of the Multi-Vane Motor. It is adjusted at the factory to produce a socket speed of 690 to 710 rpm which is the most efficient speed for this tool. However, the adjustment indicated is approximate and if a check with a tachometer indicates that the anvil speed is not within the proper limits, remove and readjust the Governor. **Turning the adjusting nut farther onto the stem increases the speed; turning it out decreases the speed.** One-half turn of the nut usually results in changing the speed 20 rpm.

TORQUE CONTROL ADJUSTMENT

This Impactool is adjusted at the factory to deliver approximately the required minimum torque for 3/4" high strength bolts. However, as the application will have some effect on the torque, the actual torque delivered may vary with different applications. Adjustment may therefore be necessary to produce the desired torque for a given application.

NOTICE

After making any torque adjustment, run at least six nuts before checking the delivered torque. This permits the splines on the Torsion Bar Assembly to properly seat and thereby stabilize the adjustment. If the torque reading is lower than the required minimum for this particular application, proceed as follows:

1. Turn the Jig Adjusting Screw (89) on the Torque Jig Assembly until the Torque Jig Arm (93) reaches its lowest position.
2. Remove the Torque Locking Sleeve Retainer (80A) from the groove in the front end of the Torsion Bar (79). Position the Impactool in the Torque Setting Jig so that

the marked tooth on the Anvil (78) is visible. Enter the square driver on the Torsion Bar (79) to full depth in the square recess in the Torque Jig Arm and mate the anvil teeth with those in the bottom half of the Torque Jig Clamp (96). Swing the upper half of the Clamp over the top of the Anvil, enter the Jig Clamp Eyebolt (101) in the slot in the upper half of the Clamp and securely tighten the Eyebolt Thumb Nut (99).

3. Note the number stamped on the Torque Locking Sleeve (80) opposite the marked tooth on the Anvil. Turn the Jig Adjusting Screw clockwise until the Torque Locking Sleeve is free and slide it forward from engagement with the Anvil.

CAUTION

When freeing the Torque Locking Sleeve, do not rotate the Jig Adjusting Screw more than 10 complete turns after taking up the slack between the square driver on the Torsion Bar and the square recess in the Jig. If the Sleeve is not free after 10 turns of the Screw, a burr on the teeth is probably responsible. Tap the Sleeve forward by striking the back face lightly with a plastic hammer.

Rotate the Sleeve until the next higher number is in alignment with the marked tooth on the Anvil and start the Sleeve onto the Anvil in this new position. Turn the Jig Adjusting Screw clockwise until the Sleeve can be slid to full depth over the teeth on the Torsion Bar. After the Sleeve has been fully engaged, turn the Jig Adjusting Screw counterclockwise until there is play in the Torque Jig Arm. Loosen the Thumb Nut and remove the Impactool from the Jig.

CAUTION

Do not loosen the Thumb Nut while the Torque Jig Arm is stressed.

Remove the Tool from the Jig and spring the Torque Locking Sleeve Retainer (80A) into the groove in the end of the Torsion Bar. Test the Tool on the application. Repeat the foregoing procedure if the delivered torque is still too low.

If the torque reading is higher than required for this particular application, proceed as follows:

4. Position the Torque Jig Arm approximately one inch from the top of the Jig Adjusting Screw and proceed as in Step 2.

PLACING TOOL IN SERVICE

5. Note the number stamped on the Torque Locking Sleeve (80) opposite the marked tooth on the Anvil.

▲ CAUTION

When freeing the Torque Locking Sleeve, do not rotate the Jig Adjusting Screw more than 10 complete turns after taking up the slack between the square driver on the Torsion Bar and the square recess in the Jig. If the Sleeve is not free after 10 turns of the Screw, a burr on the teeth is probably responsible. Tap the Sleeve forward by striking the back face lightly with a plastic hammer.

Turn the Jig Adjusting Screw clockwise until the Torque Locking Sleeve is free and slide it from engagement with the Anvil. Rotate the Sleeve until the next lower number is in alignment with the marked tooth on the Anvil. Slide the Sleeve toward the rear, engaging its teeth with those on the Anvil and Torsion Bar. Turn the Jig Adjusting Screw counterclockwise until there is play in the Torque Jig Arm. Loosen the Thumb Nut and remove the Impactool.

▲ CAUTION

Do not loosen the Thumb Nut while the Torque Jig Arm is stressed.

Remove the Tool from the Jig and spring the Torque Locking Sleeve Retainer into the groove in the end of the Torsion Bar. Test the Tool on the application. Repeat

the foregoing procedure if the torque is still higher than required.

Initial adjustment: The following procedure is recommended for adjusting the torque control mechanism starting with the Torsion Bar unstressed.

6. Turn the Jig Adjusting Screw on the Torque Jig Assembly until the Torque Jig Arm reaches its lowest position. Position the Impactool in the Torque Setting Jig, as in Step 2.
7. Rotate the Sleeve, locating the position where it will slide freely onto both the Torsion Bar and the Anvil. From this position, rotate it counterclockwise (when facing end of square driver) to the first position where it will not slide onto the Torsion Bar, and note the number on the Sleeve opposite the marked anvil tooth. This is the initial torque position. From the initial position, rotate the Sleeve counterclockwise four teeth for 3/4" work and seven teeth for 7/8" work and restart it on the Anvil. Turn the Jig Adjusting Screw clockwise until the Sleeve can be slipped to full depth onto the Torsion Bar. Turn the Jig Adjusting Screw counterclockwise until there is a play in the Torque Jig Arm. Unscrew the Thumb Nut and remove the Impactool from the Jig.

▲ CAUTION

Do not loosen the Thumb Nut while the Torque Jig Arm is stressed.

TORQUE CHART FOR MODEL 5340TO IMPACTTOOLS

FOOT POUNDS	BOLTS
550	7/8" ALLOY STEEL
535	1" HEAT TREAT. C. STEEL
525	1 1/4" SOFT STEEL
470	7/8" HIGH TENSILE
380	7/8" HEAT TREAT. C. STEEL
350	1 1/8" SOFT STEEL
330	3/4" ALLOY STEEL
320	3/4" HIGH TENSILE
260	1" SOFT STEEL
250	3/4" HEAT TREAT C. STEEL

(Dwg. TPD1359)

PLACING TOOL IN SERVICE

Remove the Tool from the Jig and spring the Torque Locking Sleeve Retainer (80A) into the groove in the end of the Torsion Bar. The delivered torque resulting from either setting is approximate. If actual tests prove them to be unsatisfactory for a given application, readjust as previously instructed.

— HOW TO USE THE BUILT-IN TORQUE — CONTROL OVERRIDE MECHANISM

Model 5340TO contains a built-in override mechanism

which locks the Torque Control Valve (35F) out of operation so that the Impactool will not automatically stop when the predetermined torque has been reached. Turn the Torque Control Valve Lock Knob (35E) clockwise to lock the Torque Control Valve out of operation. Turn the Torque Control Valve Lock Knob **counterclockwise** to allow the Torque Control Valve to automatically stop the Tool when the predetermined torque has been reached.

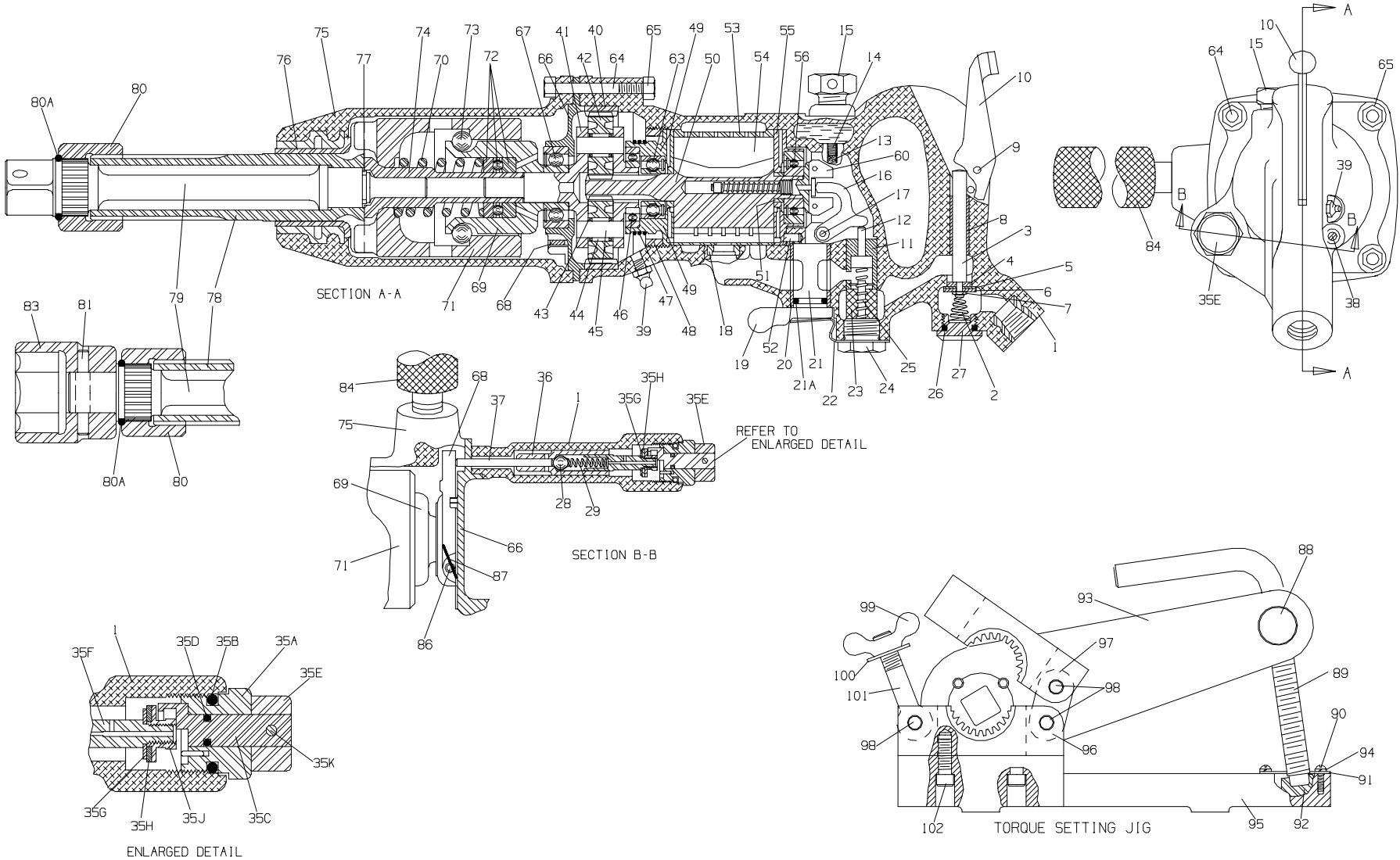
The Model 5340 Torque Control Impactool is designed for jobs having specific final torque requirements. Typical applications include assembly of machinery, large vehicles, electrical equipment, power transmission equipment and home appliances.

HOW TO ORDER AN IMPACTOOL

GRIP HANDLE with OUTSIDE TRIGGER and 1" SQUARE DRIVE ADJUSTABLE BUILT-IN TORSION BAR

Model	Impacts/min.	Recommended Torque Range	
		ft-lb	Nm
5340TOAH1	1 270	250 – 400	339 – 542

MODEL 5340TOAH1 TORQUE CONTROL IMPACTTOOL



PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

1	Motor Housing with Outside Trigger Handle	5340T-A40	25	Governor Valve Spring	534-431
♦ 2	Throttle Valve Spring	24SR-106	♦ 26	Throttle Valve Cap Seal	R4-210
3	Throttle Valve	5340T-302	27	Throttle Valve Cap	R4-266
4	Throttle Valve Face Support	5340T-357	28	Torque Control Trip Valve	G601-65
♦ • 5	Throttle Valve Face	R4-159A	• 29	Torque Control Valve Spring	5340T-151
6	Throttle Valve Face Cap	5340T-157		Torque Control Override Conversion Unit	5340TO-C450
7	Throttle Valve Face Nut	4U-353	35A	Torque Control Override Body Assembly	5340TO-A450
8	Throttle Valve Bushing	5340T-615	♦ 35B	Override Body Seal	BU-948
9	Throttle Lever Pin	R1A-191	35C	Torque Control Valve Lock	5340TO-A451
10	Throttle Lever	H02-134	♦ 35D	Torque Control Valve Lock Seal	R0BR1C-283
11	Governor Valve Bushing	503-429	35E	Torque Control Valve Lock Knob	5340TO-452
12	Governor Valve	R2-425A	35F	Torque Control Valve	5340T-161
♦ 13	Oiler Felt	R2-75	35G	Torque Control Valve Face Support	5340T-257
∞ 14	Oiler Adjusting Screw	R2-71	♦ • 35H	Torque Control Valve Face Torque Control Valve Face Nut	5340T-359 5340T-453
15	Oil Chamber Plug	P25-227	35J	Valve Lock Knob Retaining Pin	502B-120
16	Governor Lever	534-436	35K	Torque Control Valve Bushing	5340T-262
♦ 17	Governor Lever Pin	5340T-437	36	Trip Valve Plunger	5340T-64
♦ 18	Air Port Gasket (2)	R22H-210	37	Oiler Protection Screw	534-72
19	Reverse Lever	534-658	38	Grease Fitting (2)	R1-188
20	Reverse Valve Bushing	534-330	39	Internal Gear	534-406
21	Reverse Valve	R33H-A329	40	Governor Lever Pin Lock Screw	5340T-445
♦ 21A	Reverse Valve Seal	R18LF-21	+		
22	Reverse Lever Latch	534-660			
♦ • 23	Air Strainer Screen	503-61			
24	Governor Valve Cap	534-433			

• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (•) for every four tools in service.

♦ Indicates Tune-up Kit part.

+ Illustration No. 114 is in a view of Housing with Inside Trigger Handle on page 11.

PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

	Planet Gear Frame Assembly	534-A8	72	Hammer Spring Thrust Bearing (consists of three pieces)	5340T-695
41	Planet Gear	534-8	73	Cam Ball (2) (1/2" dia. steel)	D10-280
42	Planet Gear (2)	534-10	74	Arbor	5340T-725
43	Roller Retaining Plate (4)	511-655	75	Hammer Case	5340T-727
44	Planet Gear Roller (50)	511-654	76	Hammer Case Bushing (standard size)	5340T-641
45	Planet Gear Shaft (2)	534-191	76	Hammer Case Bushing .005" oversize	5340T-641-5
46	Gear Frame Rear Bearing	T13-22		.010" oversize	5340T-641-10
47	Locknut Spring	534-208		.015" oversize	5340T-641-15
48	Motor Locknut	534-207	77	Torsion Bar Retainer	4U-933-7
• 49	Front End Plate	534-11	78	Anvil	5340T-726
50	Rotor	534-53A	• 79	Torsion Bar Light (150 to 260 ft-lb torque)	5340T-L735B
51	Rotor Bearing Spacer	R3H-65		Heavy (250 to 400 ft-lb torque)	5340T-H735B
52	Cylinder Dowel	R4F-98		Extra Heavy (350 to 475 ft-lb torque)	5340T-EH735B
• 53	Cylinder	534-3		Super Heavy (450 to 550 ft-lb torque)	5340T-SH735B
♦ 54	Vane Packet (set of 5 Vanes)	R2V-42-5	• 80	Torque Locking Sleeve	5340T-733A
• 55	Rear End Plate	534-12	• 80A	Locking Sleeve Retainer	HU-362
♦ • 56	Rear Rotor Bearing	R3H-22	81	Socket Retaining Ring	RR10015S
60	Governor Assembly	534-A424	# 83	Socket	
♦ • 63	Front Rotor Bearing	R3H-24	84	Dead Handle	834-48
64	Hammer Case Bolt (4)	503-44	86	Trip Valve Lever Pin	5UT-757
65	Hammer Case Bolt Nut (4)	503-639	87	Trip Valve Lever Spring	5340T-28A
66	Housing Cover	5340T-720			
67	Gear Frame Front Bearing	555-24			
68	Trip Valve Lever	5340T-94			
	Hammer Assembly	5340T-A724			
69	Ball Cam	534-721A			
70	Hammer Spring	5340T-728			
71	Hammer	5340T-724			

• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (•) for every four tools in service.

♦ Indicates Tune-up Kit part.

Ingersoll-Rand offers a complete line of Sockets and other accessories for Impacttools. See your Ingersoll-Rand distributor for sizes and prices.

PART NUMBER FOR ORDERING

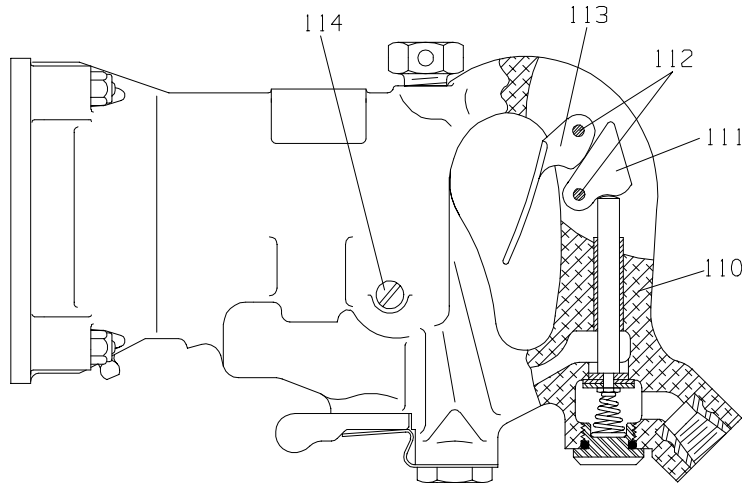
PART NUMBER FOR ORDERING

10	*	Male Hose Nipple (3/4" hose to 3/8" male pipe) (for attaching 3/4" hose to Tool)	T01-46	95	Torque Jig Base	5340T-950
	*	Male Hose Nipple (1/2" hose to 3/8" male pipe) (for use with whip of 1/2" hose)	A01-46	96	Torque Jig Clamp (2 matched pieces)	5340T-951
	*	Horizontal Hanger	834-366A	97	Jig Clamp Link	5340T-958
	*	Horizontal Hanger Cap Screw (2)	R30-638	98	Jig Clamp Pin (3)	HU-527
	*	Horizontal Hanger Spacer (2)	538-140	99	Eyebolt Thumb Nut	5340T-964
		Torque Jig Assembly	5340T-A950	100	Thumb Nut Washer	23-725
	88	Jig Arm Trunnion	5340T-960	101	Jig Clamp Eyebolt	5340T-959
	89	Jig Adjusting Screw	5340T-955	102	Base Clamp Screw (4)	R3F-7
	90	Retainer Screw (4)	R2-312	*	Jig Arm Retaining Plug	5340T-954
	91	Retainer Screw Lock Washer (4)	510-67	*	Grease Gun	P25-228
	92	Jig Adjusting Screw Pad	5340T-956	*	Motor Locknut Wrench	534-284
	93	Torque Jig Arm	5340T-952	*	Tune-up Kit (includes illustrated items 2, 5, 13, 18 [2], 21A, 23, 26, 35B, 35D, 35H, 54, 56 and 63)	534-TK2
	94	Jig Adjusting Screw Retainer	5340T-957			

* Not illustrated.

MAINTENANCE SECTION

MOTOR HOUSING WITH INSIDE TRIGGER HANDLE



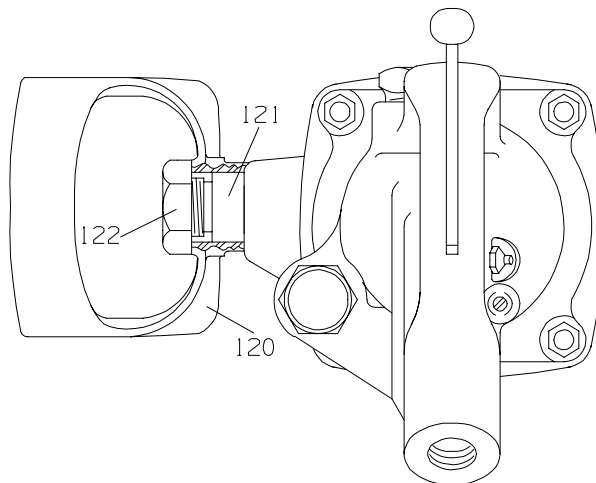
(Dwg. TPD1131)

PART NUMBER FOR ORDERING

++	110	Motor Housing with Inside Trigger Handle.	5340T-A140
	111	Intermediate Lever	514-156
	112	Intermediate Lever Pin or Inside Trigger Pin (2).	R1A-191
	113	Inside Trigger	514-93
	114	Governor Lever Lock Pin Screw	5340T-445

++ The 5340T-A140 Motor Housing with Inside Trigger Handle also includes illustrated parts 2, 3, 4, 5, 6, 7, 8, 11, 12, 13 [2], 14 [2], 15, 16, 17, 18 [2], 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 35A, 35B, 35C, 35D, 35E, 35F, 35G, 35H, 35J, 35K, 36, 37, 38, 39 [2] and 40.

SIDE SPADE HANDLE



(Dwg. TPD225-1)

PART NUMBER FOR ORDERING

		Side Spade Handle Assembly	534-A1
120		Side Spade Handle	T15-41
121		Side Spade Handle Stud	534-448
122		Side Spade Handle Stud Nut	107-73A

MAINTENANCE SECTION

⚠ WARNING

Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

DISASSEMBLY

General Instructions

1. Always wear eye protection when operating or performing maintenance on this tool.
2. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
3. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
4. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
5. Do not disassemble the Impactool unless you have a complete set of new gaskets and O-rings for replacement.

Throttle Maintenance

If a throttle leak develops, unscrew the Throttle Valve Cap (27) and withdraw the Throttle Valve Spring (2) and Throttle Valve (3). Clean the valve and the shoulder in the Housing on which it seats. Examine the Throttle Valve Face (5) and install a new one if it is visibly worn or damaged.

Disassembly of the Impactool

1. Unscrew the Hammer Case Bolt Nuts (65) from each of the four Hammer Case Bolts (64) and remove the Hammer Case (75) and Anvil (78) with assembled parts from the Housing Cover (66).
2. Lift the Hammer (71) with assembled parts from the Planet Gear Frame (41).
3. Clamp the square on the Gear Frame in leather-covered or copper-covered vise jaws and pull on the Housing (1) to remove the Housing Cover and gearing. Support the Housing Cover and press the pilot end of the Gear Frame out of the Gear Frame Front Bearing (67). Invert the Cover and press the Bearing from the recess.
4. Unhook and remove the Lock Nut Spring (47) from the Motor Housing.
5. Unscrew the Motor Lock Nut (48) with the No. 534-284 Motor Lock Nut Wrench. Jar the motor from its seat in the Housing by striking the housing face on a wood block.

Disassembly of the Motor

1. Grasp the pinion on the Rotor (50) between leather-covered or copper-covered vise jaws and unscrew the Governor Assembly.

NOTICE

This is a left-hand thread. Turn clockwise to remove.

NOTICE

Never clamp the Cylinder (53) in a vise.

2. Grasp the Cylinder in one hand and strike the end of the pinion with a soft hammer until the Front Rotor Bearing (63) and Front End Plate (49) are removed, freeing the Cylinder and Vanes (54).
3. Support the Rear End Plate (55) as near the Rotor as possible. Insert a 5/16" dia. rod, at least 6" long, into the governor end of the Rotor and press on it to force the rotor hub out of the Rear Rotor Bearing (56), allowing the removal of the Rear End Plate. Slide the Rotor Bearing Spacer (51) from the rotor hub.

Disassembly of the Planet Gear Frame

1. Clamp the pilot end of the Gear Frame (41) in leather-covered or copper-covered vise jaws and pry the Gear Frame Rear Bearing (46) from the short hub on the Frame.
2. Support the Gear Frame, pilot end up, and press the Planet Gear Shaft (45) out of the bottom of the Frame.

NOTICE

Press the Shafts out in the direction indicated as they are a tighter fit in the web near the pilot.

3. Carefully slide each Planet Gear (42) from the Frame. The Planet Gear Rollers (44) and Roller Plates (43) will drop from the Gear when it is removed from the Frame. There are 25 Rollers and 2 Plates in each Gear.

Disassembly of the Impact Mechanism

1. Thoroughly wash the unit in a suitable solution to remove the grease.
2. Withdraw the Arbor (74) from the jaw end of the Hammer (71).
3. Stand the unit upright, jaw end down, on an arbor press and press on the Ball Cam, telescoping it into the Hammer against the compression of the Hammer Spring (70) until a Cam Ball (73) drops from each hole in the hammer wall. Slowly release the pressure on the Ball Cam. Slide the Hammer and Ball Cam apart and remove the Hammer Spring and Hammer Spring Thrust Bearing (72).

MAINTENANCE SECTION

Disassembly of the Hammer Case

1. Arrange the Torque Jig Assembly so that the Torque Jig Arm (93) is approximately one inch from the top of the Jig Adjusting Screw (89). Remove the Torque Locking Sleeve Retainer (80A) from the groove in the front end of the Torsion Bar (79). Place the Anvil (78) in the Torque Setting Jig as in step 2 of **Torque Control Adjustment** on page 4.

⚠ CAUTION

When freeing the Torque Locking Sleeve, do not rotate the Jig Adjusting Screw more than 10 complete turns after taking up the slack between the square driver on the Torsion Bar and the square recess in the Jig. If the Sleeve is not free after 10 turns of the Screw, a burr on the teeth is probably responsible. Tap the Sleeve forward by striking the back face lightly with a plastic hammer.

2. Rotate the jig Adjusting Screw clockwise, until the Torque Locking Sleeve (80) will slide from the Anvil. Then screw the Jig Adjusting Screw **counterclockwise** until the Torsion Bar is free of all torsional stress.
3. Loosen the Thumb Nut (99) and remove the Anvil from the Jig.

⚠ CAUTION

Do not unscrew the Thumb Nut while the Torque Jig Arm is stressed.

4. Remove the Torque Locking Sleeve and slide the Anvil and assembled parts from the bore of the Hammer Case.
5. Remove the Torsion Bar Retainer (77) from the groove in the pilot end of the Torsion Bar (79) and withdraw the Bar from the Anvil.
6. Using a suitable arbor (1-3/4" dia. at least 2" long), press the Hammer Case Bushing (76) from the bore of the Hammer Case.

Disassembly of the Housing

1. Pull the Internal Gear (40) from the Housing (1) using a gear puller.
2. Unscrew the Governor Valve Cap (24) and remove the Reverse Lever Latch (22), Air Strainer Screen (23), Governor Valve Spring (25) and Governor Valve (12).
3. If replacement of the Governor Valve Bushing (11) is necessary, run a 5/8" tap into the bushing bore and pull the Bushing with a similar size pull bolt.
4. Slide the Reverse Valve (21) from the Reverse Valve Bushing (20). If it is necessary to replace the Bushing, run a 7/8" tap into the bushing bore and pull the Bushing with a similar size pull bolt.

5. Unscrew the Torque Control Override Body (35A) from the Motor Housing (1).
6. Withdraw the Torque Control Valve (35F), Torque Control Valve Spring (29), Torque Control Trip Valve (28) and Trip Valve Plunger (37) from the Housing.
7. If replacement of the Torque Control Valve Bushing (36) is necessary, run a 7/16" tap into the bushing bore and pull the Bushing with a similar size pull bolt.
8. Unscrew the Throttle Valve Cap (27) and remove the Throttle Valve Spring (2) and Throttle Valve (3).
9. If replacement of the Throttle Valve Bushing (8) is necessary, remove the Throttle Lever (10) and drive the Bushing from the Housing with an 11/32" diameter rod having a 1/4" pilot to keep it centered on the Bushing.
10. Unscrew the Governor Lever Pin (17) and remove the Governor Lever (16) if either part requires replacement.

ASSEMBLY

General Instructions

1. Always press on the **inner** ring of a ball-type bearing when installing the bearing on a shaft.
2. Always press on the **outer** ring of a ball-type bearing when pressing the bearing into a bearing recess.
3. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws. Take extra care with threaded parts and housings.
4. Always clean every part and wipe every part with a thin film of oil before installation.
5. Apply a film of O-ring lubricant to all O-rings before final assembly.

Assembly of the Housing

1. Insert the Throttle Valve Bushing (8) into the Housing through the threaded hole. Using a suitable arbor, press the Bushing in flush with the face of the small bore in the Housing. Ream the Bushing to size with a throttle valve bushing reamer and a throttle valve bushing reamer guide.
2. Enter the Torque Control Valve Bushing (36), small end first, into the Housing.
3. Place a 9/16" dia. arbor against the large end and press in the Bushing until its trailing face is 11/16" beyond the bottom of the large counterbore in the housing boss. Ream the Bushing with a standard (0.375") reamer and a valve bushing reamer guide.
4. Align the long narrow groove in the side of the Reverse Valve Bushing (20) with the guide pin in the Housing and press the Bushing in until it is flush with the face of the Housing. Ream the Bushing with a reverse valve bushing reamer.

MAINTENANCE SECTION

5. Enter the Governor Valve Bushing (11), small bore end first, into the Housing through the tapped opening. Insert a 1/2" dia. flat-faced arbor into the bushing bore and press in the Bushing until its trailing face is 1-13/16" beyond the face of the housing boss. Ream the Bushing with a governor valve bushing reamer.
6. Remove all reamer chips from the Housing.
7. Place the Throttle Lever (10) in position in the Housing and retain it with the Throttle Lever Pin (9).
8. Examine the Throttle Valve Face (5). If it is worn or damaged, replace it with a new one. Insert the Throttle Valve (3) and the Throttle Valve Spring (2), small end first, into the Housing and screw the Throttle Valve Cap (27) securely into place.
9. Insert the Trip Valve Plunger (37), large diameter first, followed by the Torque Control Trip Valve (28) into the bore of the Torque Control Valve Bushing (36).
10. Examine the Torque Control Valve Face (35H). If it is worn or damaged, replace it with a new one. Examine the Override Body Seal (35B) and Torque Control Valve Lock Seal (35D) and replace if necessary.
11. Insert the Torque Control Valve (35F) into the bore of the Torque Control Override Body as far as possible.
12. Slide the Torque Control Valve Spring (29) into the open end of the Torque Control Valve (35C) and screw the assembly into the Motor Housing.
13. Install the Reverse Valve Seal (21A) on the Reverse Valve (21) and fit it into the Reverse Valve Bushing. If necessary, lap in the Valve to obtain a free turning air tight fit.
14. Install the Governor Valve (12) in the Governor Valve Bushing. If necessary, lap in the Valve to obtain a good sliding fit.
15. Place the Air Strainer Screen (23) and Reverse Lever Latch (22) in position. Slip the Governor Valve Spring (25) over the stem of the Governor Valve Cap (24) and screw the Cap securely into the Housing.
16. Place the Governor Lever (16) in position and retain it by screwing the Governor Lever Pin (17) into the Housing.
17. Support the handle end of the Housing and engage the lugs of the Internal Gear (40) in the notches in the Housing Cover (66) and place the Gear on the Housing.
18. Insert two bolts through diagonally opposite holes in the Cover allowing them to extend into the housing bolt holes. These bolts maintain the alignment as the Gear is pressed in. Press against the front face of the Cover until the flange contacts the Housing. Remove the Cover from the Housing.

Assembly of the Motor

1. Press each Rotor Bearing, **shielded side first**, into its respective End Plate. Do all pressing against the **outer ring** of the Bearing, being sure that each Bearing is seated on the bottom of the end plate recess.
2. Slide the Front End Plate (49) containing the Front Rotor Bearing (63) over the pinion on the Rotor (50).
3. Using a sleeve that will contact only the **inner ring** of the Bearing, press the Bearing onto the pinion until only running clearance remains between the face of the End Plate and the body of the Rotor.
4. Position the Rotor upright, clamping the pinion in leather-covered or copper-covered vise jaws. Place the Vanes (54) in the slots in the Rotor making sure that each Vane fits freely.
5. Place the Cylinder (53) over the Rotor and onto the End Plate.

NOTICE

The flat end of the Cylinder must be at the top.

6. Slide the Rotor Bearing Spacer (51), beveled end first, onto the hub of the Rotor.
7. Position the Rear End Plate (55) on the assembly and press the Rear Rotor Bearing (56), contained in the End Plate, onto the rotor hub until the Bearing contacts the Spacer. Press against the **inner ring** of the Bearing.
8. Screw the Governor Assembly securely into the Rotor.

NOTICE

This is a left-hand thread; turn counterclockwise to tighten.

Assembly of Gearing

1. Stand a Planet Gear Shaft (45) upright on a workbench and place one Roller Retaining Plate (43) over the end of the Shaft.
2. Coat the bore of the Planet Gear (42) with grease and place the Gear over the Shaft.
3. Insert 25 Planet Gear Rollers (44) between the Shaft and the Gear and slide the other Retaining Plate over the end of the Shaft.
4. Carefully remove the Shaft and slide the Gear into the Gear Frame (41). Retain the Gear in position by pressing the Shaft in from the short end of the Gear Frame. (The grease coating the bore of the Gear will retain the Rollers sufficiently to allow installation). Repeat this foregoing procedure to install the second Planet Gear.
5. Press the Gear Frame Rear Bearing (46) onto the short hub of the Gear Frame.

MAINTENANCE SECTION

6. Press the Gear Frame Front Bearing (67), open side first, into the recess in the Housing Cover (66). Slip the cover and bearing assembly over the pilot end of the Gear Frame and using a sleeve that contacts only the inner ring of the Bearing, press the Bearing onto the Gear Frame until it contacts the shoulder.

Assembly of the Impact Mechanism

1. Stand the Ball Cam (69), open end up, on the table of an arbor press.
2. Place the retainer and balls between the grooved faces on the rings of the Hammer Spring Thrust Bearing (72) and enter the Bearing, wide ring first, into the Ball Cam.
3. Stand the Hammer Spring (70) upright on the Bearing.
4. Align the holes in the hammer wall with the points of the cam grooves in the Ball Cam and slide the open end of the Hammer over the Cam.
5. Press on the jaw end of the Hammer, compressing the Hammer Spring and telescoping the Hammer and Ball Cam, until a Cam Ball (73) can be inserted through each of the two holes in the hammer wall and entered in the cam groove. Slowly release the press pressure; the Balls will lock the components into a self contained unit.
6. Insert the Arbor (74) into the central hole in the jaw end of the Hammer.

Assembly of the Hammer Case

1. Slide the Torsion Bar (79), pilot end first, into the bore of the Anvil (78), engaging the square on the Bar with the square recess in the Anvil.
2. Slide the Torsion Bar Retainer (77) over the pilot of the Bar and enter it into the groove adjacent to the square.
3. Slide the Anvil and assembled parts through the bore of the Hammer Case and slip the Torque Locking Sleeve (80) over the square driver.
4. Remove the Tool from the Jig and spring the Torque Locking Sleeve Retainer (80A) into the groove in the end of the Torsion Bar.

To adjust to the proper torque see **Torque Control Adjustment** on pages 4 and 5.

Assembly of the Impactool

1. Grasp the grip section of the Housing in leather-covered or copper-covered vise jaws.
2. Align the dowel hole in each End Plate with the one in the Cylinder and insert a 3/16" diameter rod approximately 12" long through the dowel holes, allowing the excess rod to protrude from the governor end of the motor.

3. Place an Air Port Gasket (18), lip side first, in each of the two counterbores in the housing wall.
4. Enter the end of the rod protruding from the governor end of the motor assembly into the dowel hole at the bottom of the housing bore and slide the motor into position in the Housing. Remove the rod and insert the Cylinder Dowel (52).
5. Screw the Motor Lock Nut (48) into the Housing with the No. 5340T-284 Motor Lock Nut Wrench.

NOTICE

The recommended procedure is to tighten the Nut gradually and to occasionally remove the Wrench and turn the Rotor with the fingers. Binding is an indication that the motor is not properly seated but is slightly "cocked" in the Housing. Striking the handle end of the Housing with a soft hammer or wood block will usually jar the motor into position and relieve the binding. The Rotor must spin freely with the Nut tight.

6. Attach the air hose and operate the motor intermittently, a few seconds at a time, until it is determined that it operates satisfactorily.
7. Enter the Lock Nut Spring (47), short tang end first, into the Housing and over the protruding end of the Front End Plate, engaging the short tang with a lug on the Lock Nut. Force the long tang around, winding the Spring. After considerable tension is obtained and the Spring is contracted to the extent that it will not slip over the end plate flange, hook the long tang behind a housing lug.
8. Place the Gear Frame (41) assembled to the Housing Cover (66) and Gear Frame Front Bearing (67) into the Motor Housing, meshing the teeth on the Planet Gears with those of the rotor pinion and Internal Gear. The Gear Frame Rear Bearing (46), will enter the recess in the Front End Plate and the lugs on the Internal Gear will enter the mating notches in the Housing Cover.
9. Place the impact unit over the protruding end of the Gear Frame entering the square on the Gear Frame into the square hole in the Ball Cam.
10. Slide the assembled Hammer Case (75) over the impact mechanism and onto the Housing Cover, positioned so that the Dead Handle (54) is on the same side of the Impactool as the boss containing the Torque Control Valve. Insert one Hammer Case Bolt (64) into each of the four aligned holes through the flanges on the Hammer Case, Housing Cover, and Motor Housing and apply the Hammer Case Bolt Nuts (65).

MAINTENANCE SECTION

TROUBLESHOOTING GUIDE		
Trouble	Probable Cause	Solution
Low power	Dirty Air Strainer	Using a suitable cleaning solution, in a well ventilated area, clean the Air Strainer Screen. Blow dry with compressed air.
	Worn or broken Vanes	Replace complete set of Vanes.
	Worn or broken Cylinder and/or scored End Plates	Examine Cylinder and replace it if it is worn or broken or if bore is scored or wavy. Replace End Plates if they are scored.
	Dirty motor parts	Disassemble tool and clean all parts with a suitable cleaning solution, in a well-ventilated area. Reassemble tool as instructed in this manual.
	Improper positioning of Reverse Valve	Make certain that Reverse Valve is fully engaged to the left or right.
Motor will not run	Incorrect assembly of motor	Disassemble motor and replace worn or broken parts and reassemble as instructed.
	Insufficient lubricant in the impact mechanism	Remove Hammer Case Assembly and lubricate impact mechanism.
Tool will not impact	Broken or worn impact mechanism parts	Remove Hammer Case and examine impact mechanism parts. Replace any worn or broken parts.
	Impact mechanism not assembled correctly	Refer to Assembly of the Impact Mechanism .

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.