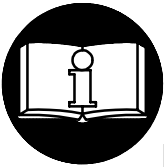


# OPERATION AND MAINTENANCE MANUAL FOR 100SQ1 IMPULSE WRENCH

## NOTICE

Model 100SQ1 Impulse Wrench is designed for assembly operations which require high speed rundown of fasteners with consistent torque delivery and reduced torque reaction.

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



## ⚠ WARNING

**IMPORTANT SAFETY INFORMATION ENCLOSED.  
READ THIS MANUAL BEFORE OPERATING TOOL.**

**IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PLACE THE INFORMATION  
IN THIS MANUAL INTO THE HANDS OF THE OPERATOR.**

**FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.**

### PLACING TOOL IN SERVICE

- Always operate, inspect and maintain this tool in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1).
- For safety, top performance, and maximum durability of parts, operate this tool at 90 psig (6.2 bar/620 kPa) maximum air pressure at the inlet with 3/8" (10 mm) inside diameter air supply hose.
- 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.
- Do not use damaged, frayed or deteriorated air hoses and fittings.
- Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905–1 for a typical piping arrangement.
- Always use clean, dry air at 90 psig (6.2 bar/620 kPa) maximum air pressure. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Do not remove any labels. Replace any damaged label.

### USING THE TOOL

- Always wear eye protection when operating or performing maintenance on this tool.
- Always wear hearing protection when operating this tool.
- Keep hands, loose clothing and long hair away from rotating end of tool.
- Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.
- Keep body stance balanced and firm. Do not overreach when operating this tool. High reaction torques can occur at or below the recommended air pressure.
- Tool shaft may continue to rotate briefly after throttle is released.
- Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.
- Use accessories recommended by Ingersoll–Rand.
- Use only impact sockets and accessories. Do not use hand (chrome) sockets or accessories.
- This tool is not designed for working in explosive atmospheres.
- This tool is not insulated against electric shock.

## 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.

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

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

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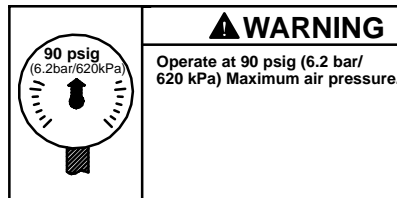
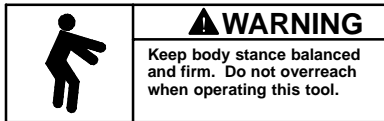
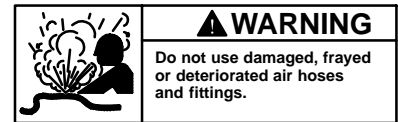
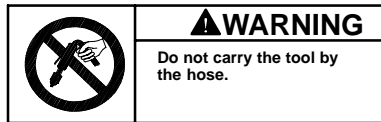
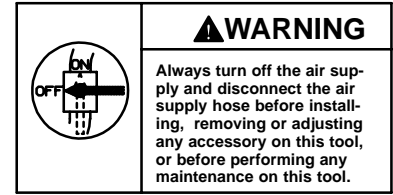
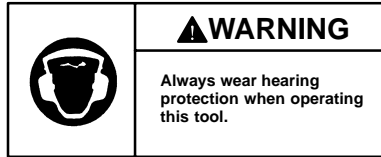
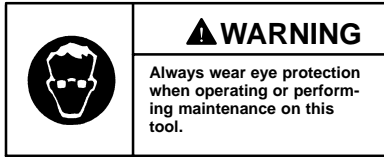
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**PROFESSIONAL TOOLS**

## WARNING LABEL IDENTIFICATION



**FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.**



## ADJUSTMENTS

### TORQUE ADJUSTMENT

To adjust the torque on these Twin Blade Impulse Wrenches, proceed as follows:

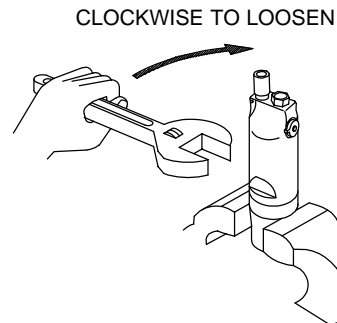
1. Remove the Adjustment Hole Plug.
2. Rotate the Drive Shaft until the Torque Adjustment Screw is visible in the opening.
3. Using a 1.5 mm hex wrench, rotate the Adjustment Screw clockwise to increase the torque output and counterclockwise to decrease the torque output. Do not rotate the Oil Plug.

#### NOTICE

**Make all final adjustments at the job.**

4. Replace the Adjustment Hole Plug.

2. Using leather-covered or copper-covered vise jaws, carefully grasp the flats of the Mechanism Cover with the output end of the Drive Shaft downward.
3. Using an adjustable wrench, unscrew the the Motor Housing Assembly from the Mechanism Cover. This is a **left-hand thread**, rotate the Motor Housing **clockwise** to remove it. See Dwg. TPD1292.



(Dwg. TPD1292)

### CHANGING THE MECHANISM FLUID

To change the Mechanism Fluid in the Impulse Mechanism, proceed as follows:

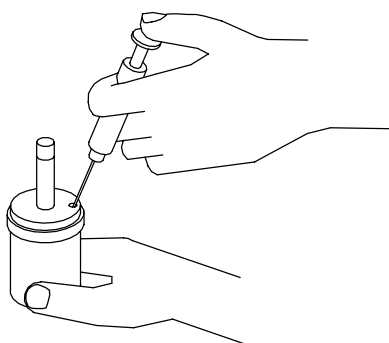
1. Use a pointed probe to push the Spring Seat against the Retaining Sleeve Spring. While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring. Lift the Spring Seat, Spring and Bit Retaining Sleeve off the Drive Shaft and remove the Bit Retaining Ball.
4. Lift the assembled motor off the Mechanism Cover and pull the mechanism assembly out of the Cover.
5. Using a 1.5 mm hex wrench, rotate the Torque Adjustment Screw clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
6. Using the special Tee Wrench furnished in the Tool Kit (Part No. 180PQ-99), remove the Oil Plug and Oil Plug Seal.

## ADJUSTMENTS

- With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
- Using the syringe and fluid from the Fluid Replacement Kit (Part No. EQ106S-K400), fill the mechanism with the fluid furnished in the Kit. See Dwg. TPD1265.

### NOTICE

**DO NOT SUBSTITUTE ANY OTHER FLUID. Failure to use the fluid provided could damage the tool, increase maintenance and decrease performance. Use only clean fluid in these tools.**

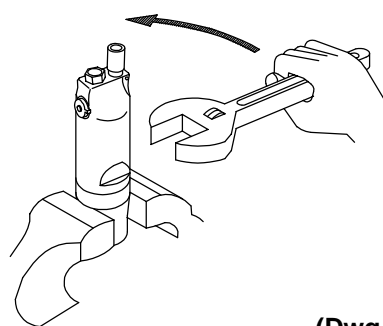


(Dwg. TPD1265)

- Submerge the fill opening in the remainder of the fluid, and using a wrench, rotate the Drive Shaft to purge any remaining air from the system.

- Thread the Oil Plug with the Oil Plug Seal into the mechanism until it is snug.
- Using a 1.5 mm hex wrench, turn the Torque Adjustment Screw clockwise until it stops. This is the maximum torque position.
- Wipe the outside of the mechanism dry and clean and remove the Oil Chamber Plug. Using the syringe, withdraw 0.4 cc of fluid.
- Install the Oil Chamber Plug and tighten it between 20 and 25 in-lb (2.3 and 2.8 Nm) torque.
- Insert the mechanism assembly, output end leading, into the Mechanism Cover clamped in the vise jaws.
- Insert the hex end of the rotor shaft into the hex recess at the rear of the Drive Shaft and thread the assembled Motor Housing onto the Mechanism Cover. This is a **left-hand thread**. Rotate the Housing **counterclockwise** to tighten it. See Dwg. TPD1294.

COUNTERCLOCKWISE TO TIGHTEN



(Dwg. TPD1294)

## PLACING TOOL IN SERVICE

### LUBRICATION



Ingersoll-Rand No. 50



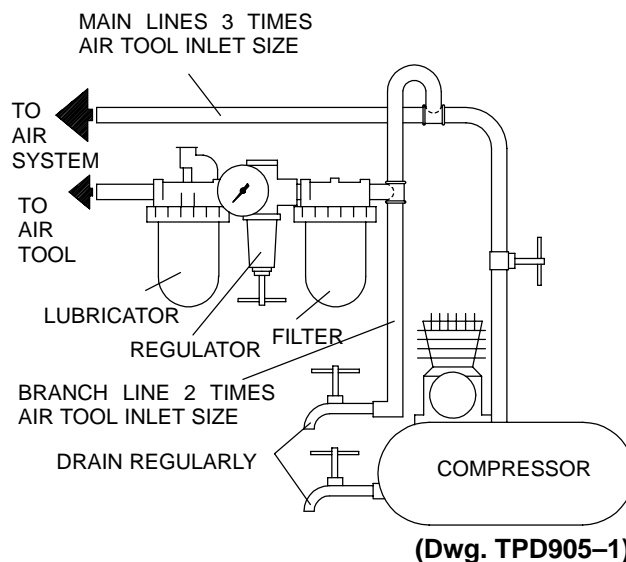
Ingersoll-Rand No. 67

Ingersoll-Rand Fluid Part  
No. EQ106S-400-1

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

USA – No. C28-04-FKG0-28

After each 20,000 cycles, or as experience indicates, drain and refill the Impulse Unit Drive Assembly as instructed in this manual using the Fluid Replacement Kit (Part No. EQ106S-K400). Lubricate the hex drive and the output shaft before assembly.



# PLACING TOOL IN SERVICE

## SPECIFICATIONS

Model	Type of Handle	Chuck/Drive	Free Speed	Recommended Torque Range	
				Soft Draw ft-lb (Nm)	Hard Slam ft-lb (Nm)
		in.			
100SQ1	straight	1/4	10,000	3-6 (4-8)	4-9 (5-12)

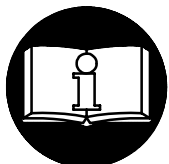
# MANUEL D'EXPLOITATION ET D'ENTRETIEN LA CLÉ HYDRO-PNEUMATIQUE MODÈLE 100SQ1

## NOTE

Le clé hydro-pneumatique Modèle 100SQ1 est destinée aux opérations d'assemblage nécessitant une grande vitesse de serrage avec une régularité du couple et un serrage virtuellement sans réaction.

Ingersoll-Rand ne peut être tenu responsable de la modification des outils par le client pour les adapter à des applications qui n'ont pas été approuvées par Ingersoll-Rand.

## ⚠ ATTENTION



**D'IMPORTANTES INFORMATIONS DE SÉCURITÉ SONT JOINTES.  
LIRE CE MANUEL AVANT D'UTILISER L'OUTIL.  
L'EMPLOYEUR EST TENU DE COMMUNIQUER LES INFORMATIONS  
DE CE MANUEL AUX EMPLOYÉS UTILISANT CET OUTIL.**

**LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.**

### MISE EN SERVICE DE L'OUTIL

- Toujours exploiter, inspecter et entretenir cet outil conformément au Code de sécurité des outils pneumatiques portatifs de l'American National Standards Institute (ANSI B186.1).
- Pour la sécurité, les performances optimales et la durabilité maximale des pièces, cet outil doit être connecté à une alimentation d'air comprimé de 6,2 bar (620 kPa) maximum à l'entrée, avec un flexible de 10 mm de diamètre intérieur.
- Couper toujours l'alimentation d'air comprimé et débrancher le flexible d'alimentation avant d'installer, déposer ou ajuster tout accessoire sur cet outil, ou d'entreprendre une opération d'entretien quelconque sur l'outil.
- Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.
- S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905-1 pour un exemple type d'agencement des tuyauteries.
- Utiliser toujours de l'air sec et propre à une pression maximum de 6,2 bar (620 kPa). La poussière, les fumées corrosives et/ou une humidité excessive peuvent endommager le moteur d'un outil pneumatique.
- Ne jamais lubrifier les outils avec des liquides inflammables ou volatiles tels que le kérosène, le gasoil ou le carburant d'aviation.
- Ne retirer aucune étiquette. Remplacer toute étiquette endommagée.

### UTILISATION DE L'OUTIL

- Porter toujours des lunettes de protection pendant l'utilisation et l'entretien de cet outil.
- Porter toujours une protection acoustique pendant l'utilisation de cet outil.
- Tenir les mains, les vêtements fous et les cheveux longs, éloignés de l'extrémité rotative de l'outil.
- Prévoir, et ne pas oublier, que tout outil motorisé est susceptible d'à-coups brusques lors de sa mise en marche et pendant son utilisation.
- Garder une position équilibrée et ferme. Ne pas se pencher trop en avant pendant l'utilisation de cet outil. Des couples de réaction élevés peuvent se produire à, ou en dessous de, la pression d'air recommandée.
- La rotation des accessoires de l'outil peut continuer pendant un certain temps après le relâchement de la gâchette.
- Les outils pneumatiques peuvent vibrer pendant l'exploitation. Les vibrations, les mouvements répétitifs et les positions inconfortables peuvent causer des douleurs dans les mains et les bras. N'utiliser plus d'outils en cas d'inconfort, de picotements ou de douleurs. Consulter un médecin avant de recommencer à utiliser l'outil.
- Utiliser les accessoires recommandés par Ingersoll-Rand.
- N'utiliser que les douilles et les accessoires pour clés à chocs. Ne pas utiliser les douilles et accessoires (chromés) de clés manuelles.
- Cet outil n'est pas conçu pour fonctionner dans des atmosphères explosives.
- Cet outil n'est pas isolé contre les chocs électriques.

## NOTE

L'utilisation de rechanges autres que les pièces d'origine Ingersoll-Rand peut causer des risques d'insécurité, réduire les performances de l'outil et augmenter l'entretien, et peut annuler toutes les garanties.

Les réparations ne doivent être effectuées que par des réparateurs qualifiés autorisés. Consultez votre Centre de Service Ingersoll-Rand le plus proche.

Adressez toutes vos communications au Bureau Ingersoll-Rand ou distributeur le plus proche.

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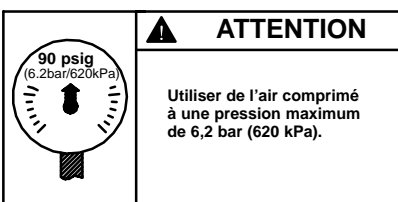
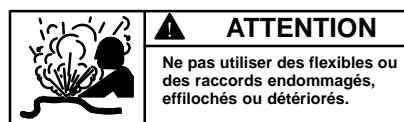
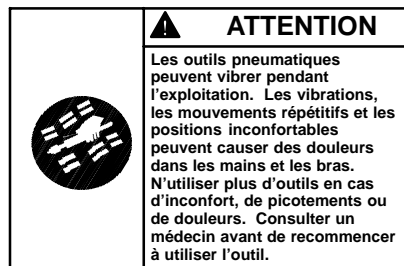
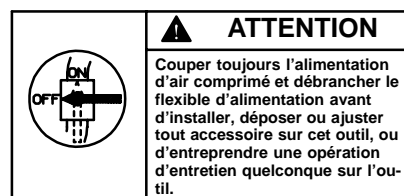
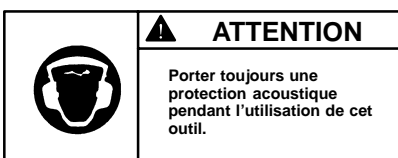
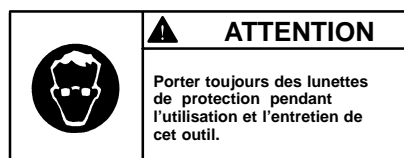
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# SIGNIFICATION DES ÉTIQUETTES D'AVERTISSEMENT

## ATTENTION

LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.



## RÉGLAGES

### RÉGLAGE DU COUPLE

Pour ajuster le couple sur ces clés à impulsion double palette, procéder comme suit:

1. Retirer le bouchon du trou de réglage.
2. Tourner l'arbre d'entraînement jusqu'à ce que la vis de réglage de couple soit visible dans l'ouverture.
3. A l'aide d'une clé pour six pans creux de 1,5 mm, tourner la vis dans le sens des aiguilles d'une montre pour augmenter le couple de serrage, ou dans le sens inverse des aiguilles d'une montre pour réduire le couple. Ne pas tourner le bouchon d'huile.

### NOTE

Effectuer tous les réglages finaux sur l'écrou à serrer.

4. Remonter le bouchon dans le trou de réglage.

### CHANGEMENT DU FLUIDE DU MECANISME

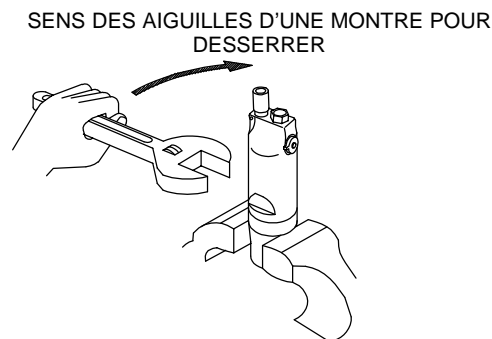
Le fluide du mécanisme d'impulsion est changé de la façon suivante :

1. Utiliser un outil pointu pour pousser le siège de ressort contre le ressort du manchon de retenue. Lorsque le ressort est comprimé, utiliser un autre outil pointu ou un tournevis à lame fine pour déposer la bague de retenue. Retirer le siège de ressort, le ressort et le manchon de retenue d'embout de l'arbre d'entraînement et retirer la bille de retenue d'embout.
2. Serrer soigneusement les plats du couvercle du mécanisme dans un étau de mordaches en cuir ou en

cuir, côté sortie de l'arbre d'entraînement dirigé vers le haut.

3. A l'aide d'une clé à molette, dévisser l'ensemble du corps de moteur du couvercle du mécanisme.

Ce filetage a un pas à gauche, tourner le corps de moteur dans le sens des aiguilles d'une montre pour le dévisser. Voir Plan TPD1292.



(Plan TPD1292)

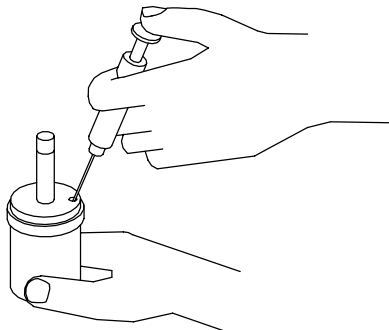
4. Retirer le moteur assemblé du couvercle du mécanisme et extraire le mécanisme du couvercle.
5. A l'aide d'une clé pour six pans creux de 1,5 mm, tourner la vis de réglage de couple dans le sens des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée. Tourner la vis dans le sens inverse des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée, ou après six tours complets.
6. Utiliser la clé en T spéciale fournie dans le nécessaire d'outillage (Réf. No. 180PQ-99) et ôter le bouchon d'huile et le joint du bouchon.

## RÉGLAGES

7. Tout en tenant le trou du bouchon d'huile vers le bas au-dessus d'un récipient, tourner l'arbre d'entraînement pour purger le fluide contenu dans le mécanisme.
8. A l'aide de la seringue et du fluide fourni dans le nécessaire de fluide de remplacement (Réf. No. EQ106S-K400), remplir le mécanisme avec le fluide fourni dans le nécessaire. Voir Plan TPD1265.

### NOTE

**NE PAS UTILISER D'AUTRE FLUIDE.** La non-utilisation du fluide de mécanisme hydro-pneumatique fourni pourrait causer l'endommagement de l'outil, augmenter l'entretien et réduire les performances. N'utiliser que du fluide propre dans ces outils.



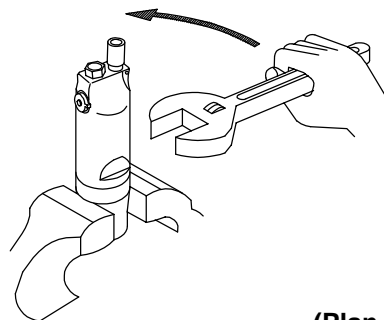
(Plan TPD1265)

9. Submerger l'ouverture de remplissage dans le reste du fluide et, à l'aide d'une clé, tourner l'arbre d'entraînement pour purger tout l'air du système.
10. Visser le bouchon équipé du joint dans le mécanisme et le serrer fermement.

11. A l'aide d'une clé pour six pans creux de 1,5 mm, tourner le vis de réglage de couple dans le sens des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée. C'est la position de couple maximum.
12. Essuyer l'extérieur du mécanisme pour le sécher et retirer le bouchon de la chambre d'huile. A l'aide de la seringue, retirer 4 cm<sup>3</sup> de fluide
13. Remonter le bouchon de la chambre d'huile et le serrer à un couple de 2,3 à 2,8 Nm.
14. Insérer le mécanisme, côté sortie en premier, dans le couvercle de mécanisme serré dans les mâchoires de l'étau.
15. Insérer l'extrémité hexagonale de l'arbre de rotor dans l'emmanchement hexagonal à l'arrière de l'arbre d'entraînement et visser le corps de moteur assemblé sur le couvercle du mécanisme.

**Ce filetage a un pas à gauche.** Tourner le corps dans le sens inverse des aiguilles d'une montre pour le serrer. Voir Plan TPD1294.

SENS INVERSE DES AIGUILLES D'UNE MONTRE POUR SERRER



(Plan TPD1294)

## MISE EN SERVICE DE L'OUTIL

### LUBRIFICATION



Ingersoll-Rand No. 50



Ingersoll-Rand No. 67

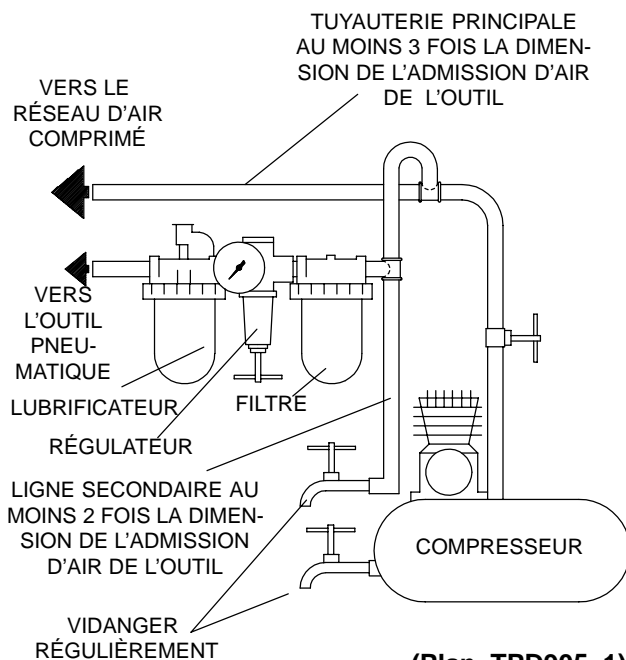


Fluide Ingersoll-Rand  
Réf. EQ106S-400-1

Utiliser toujours un lubrificateur avec ces outils. Nous recommandons l'emploi du filtre-régulateur-lubrificateur suivant :

USA - NO. C28-04-FKG0-28

Tous les 20.000 cycles, ou en fonction de l'utilisation, vider et remplir l'ensemble de mécanisme d'impulsion conformément aux instructions du manuel en utilisant le nécessaire de fluide de remplacement (Réf. No. EQ106S-K400). Lubrifier l'entraîneur hexagonal et l'arbre de sortie avant l'assemblage.



(Plan TPD905-1)

## MISE EN SERVICE DE L'OUTIL

### SPÉCIFICATIONS

Modèle	Type de Poignée	Limiteur/ Entraînement	Vitesse à vide	Gamme de couples recommandée	
				Serrage élastique Nm	Serrage fort Nm
100SQ1	en ligne	1/4" rapide	10.000	4-8	5-12



# MANUAL DE FUNCIONAMIENTO Y MANTENIMIENTO LLAVE DE IMPULSO MODELO 100SQ1

E

## NOTA

La llave de impulso modelo 100SQ1 está diseñada para operaciones de ensamblaje que requieran alta velocidad de fijación con un par consistente y reducida reacción de par. Ingersoll–Rand no aceptará responsabilidad alguna por la modificación de las herramientas efectuada por el cliente para las aplicaciones que no hayan sido consultadas con Ingersoll–Rand.

## ⚠ AVISO

**SE ADJUNTA INFORMACIÓN IMPORTANTE DE SEGURIDAD.  
LEA ESTE MANUAL ANTES DE UTILIZAR LA HERRAMIENTA.**

**ES RESPONSABILIDAD DE LA EMPRESA ASEGURARSE DE QUE EL OPERARIO  
ESTÉ AL TANTO DE LA INFORMACIÓN QUE CONTIENE ESTE MANUAL.**

**EL HACER CASO OMISO DE LOS AVISOS SIGUIENTES PODRÍA OCASIONAR LESIONES.**

### PARA PONER LA HERRAMIENTA EN SERVICIO

- Utilice, examine y mantenga siempre esta herramienta conforme al código de seguridad para herramientas neumáticas portátiles de la American National Standards Institute (ANSI B186.1).
- Para mayor seguridad, rendimiento óptimo y larga vida útil de las piezas, utilice esta herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa) con una manguera de suministro de aire con diámetro interno de 10 mm.
- Corte siempre el suministro de aire y desconecte la manguera de suministro de aire antes de instalar, desmontar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.
- No utilice mangueras de aire y racores dañados, desgastados o deteriorados.
- Asegúrese de que todos los racores y mangueras sean del tamaño correcto y estén bien apretados. El Esq. TPD905–1 muestra una disposición característica de las tuberías.
- Use siempre aire limpio y seco a una presión máxima de 90 psig (6,2 bar/620 kPa). El polvo, los gases corrosivos y el exceso de humedad pueden estropear el motor de una herramienta neumática.
- No lubrique las herramientas con líquidos inflamables o volátiles tales como queroseno, gasoil o combustible para motores a reacción.
- No saque ninguna etiqueta. Sustituya toda etiqueta dañada.

### UTILIZACIÓN DE LA HERRAMIENTA

- Lleve siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.
- Lleve siempre protección para los oídos cuando utilice esta herramienta.
- Mantenga las manos, la ropa suelta y el cabello largo alejados del extremo giratorio de la herramienta.
- Anticipe y esté atento a los cambios repentinos en el movimiento durante la puesta en marcha y utilización de toda herramienta motorizada.
- Mantenga una postura del cuerpo equilibrada y firme. No estire demasiado los brazos al manejar la herramienta. Pueden darse elevados pares de reacción a la presión de aire recomendada, e incluso a presiones inferiores.
- El eje de la herramienta puede seguir girando brevemente después de haberse soltado la palanca de mando.
- Las herramientas neumáticas pueden vibrar durante el uso. La vibración, los movimientos repetitivos o las posiciones incómodas pueden dañarle los brazos y manos. En caso de incomodidad, sensación de hormigueo o dolor, deje de usar la herramienta. Consulte con el médico antes de volver a utilizarla.
- Utilice únicamente los accesorios Ingersoll–Rand recomendados.
- Utilice únicamente bocas y accesorios para llaves de impacto. No utilice bocas o accesorios manuales (cromados).
- Esta herramienta no ha sido diseñada para trabajar en ambientes explosivos.
- Esta herramienta no está aislada contra descargas eléctricas.

## NOTA

El uso de piezas de recambio que no sean las auténticas piezas Ingersoll–Rand puede poner en peligro la seguridad, reducir el rendimiento de la herramienta y aumentar los cuidados de mantenimiento necesarios, así como invalidar toda garantía.

Las reparaciones sólo se deben encomendar a personal debidamente cualificado y autorizado. Consulte con el centro de servicio autorizado Ingersoll–Rand más próximo.

Toda comunicación se deberá dirigir a la oficina o al distribuidor Ingersoll–Rand más próximo.

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## ETIQUETAS DE AVISO


### ⚠ AVISO


EL HACER CASO OMISO DE LOS AVISOS SIGUIENTES PODRÍA OCASIONAR LESIONES.


	<p><b>⚠ ADVERTENCIA</b></p> <p>Usar siempre protección ocular al manejar o realizar operaciones de mantenimiento en esta herramienta.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>Usar siempre protección para los oídos al manejar esta herramienta.</p>
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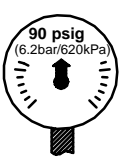
	<p><b>⚠ ADVERTENCIA</b></p> <p>Cortar siempre el suministro de aire y desconectar la manguera de suministro de aire antes de instalar, retirar o ajustar cualquier accesorio de esta herramienta, o antes de realizar cualquier operación de mantenimiento de la misma.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>Las herramientas neumáticas pueden vibrar durante el uso. La vibración, los movimientos repetitivos o las posiciones incómodas podrían dañarle los brazos y las manos. En caso de incomodidad, sensación de hormigueo o dolor, dejar de usar la herramienta. Consultar al médico antes de volver a utilizarla.</p>
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	<p><b>⚠ ADVERTENCIA</b></p> <p>No coger la herramienta por la manguera para levantarla.</p>
---	---

	<p><b>⚠ ADVERTENCIA</b></p> <p>No utilizar mangueras de aire y accesorios dañados, desgastados ni deteriorados.</p>
---	---

	<p><b>⚠ ADVERTENCIA</b></p> <p>Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.</p>
---	--

	<p><b>⚠ ADVERTENCIA</b></p> <p>Manejar la herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa).</p>
---	--

## AJUSTES

### AJUSTE DE PAR

Para ajustar el par de estas llaves de impulso de doble paleta, proceda como sigue:

1. Saque el tapón del orificio de ajuste.
2. Gire el eje de accionamiento hasta que el tornillo de ajuste de par sea visible a través de dicho orificio.
3. Con una llave hexagonal de 1,5 mm, gire el tornillo de ajuste de par a la derecha para incrementar el par y a la izquierda para disminuirlo. No gire el tapón del aceite.

### NOTA

Haga todos los ajustes finales trabajando.

4. Vuelva a poner en su sitio el tapón del orificio de ajuste.

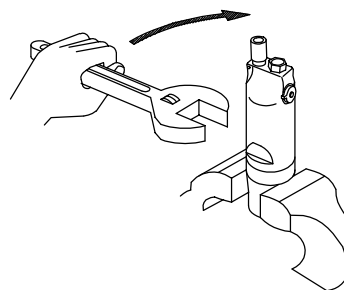
### CAMBIO DEL LÍQUIDO DEL MECANISMO

Para cambiar el líquido del mecanismo en el mecanismo impulsor, proceda como sigue:

1. Utilice una varilla puntiaguda para empujar el asiento de muelle contra muelle del manguito retenedor. Mientras el muelle está comprimido, utilice otra varilla puntiaguda o un destornillador de hoja fina para sacar el aro retenedor. Saque el asiento de muelle, muelle y manguito retenedor de punta fuera del eje de accionamiento, y saque la bola retenedora de punta.
2. Sujete con cuidado los lados planos de la cubierta del mecanismo en un tornillo de banco con mordazas cubiertas de cobre o cuero, con el extremo de salida del eje de accionamiento hacia abajo.

3. Utilizando una llave ajustable, desatornille el conjunto de la carcasa del motor de la cubierta del mecanismo. Puesto que se trata de **una rosca hacia la izquierda**, gire la carcasa del motor **en sentido horario** para quitarla. Vea Esq. TPD1292.

GIRAR EN SENTIDO HORARIO PARA AFLOJAR



(Esq. TPD1292)

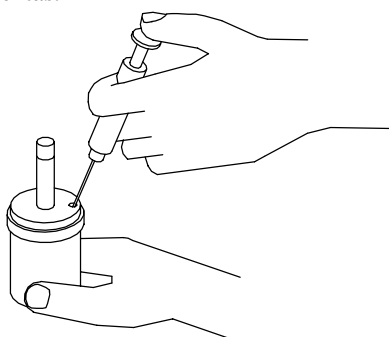
4. Levante el motor ensamblado y sáquelo de la carcasa del mecanismo, y saque el conjunto del mecanismo fuera de la cubierta.
5. Con una llave hexagonal de 1,5 mm, gire el tornillo de ajuste de par en sentido horario hasta que se pare. Gire el tornillo en sentido antihorario hasta que se pare o dé seis vueltas completas.
6. Utilizando la llave en "T" especial suministrada con el juego de herramientas (Pieza N° 180PQ-99), saque el tapón del aceite y el retén de dicho tapón.

## AJUSTES

- Con el orificio del tapón del aceite apuntando hacia abajo sobre un contenedor, gire el eje de accionamiento para purgar el líquido del mecanismo.
- Con la jeringuilla y el líquido del juego de cambio de líquido (Pieza N°. EQ106S-K400 ), llene el mecanismo con el líquido suministrado con dicho juego. Vea Esq. TPD1265.

### NOTA

**NO SUSTITUYA CON NINGÚN OTRO LÍQUIDO. Si no se usa el líquido suministrado, se podría dañar la herramienta, incrementar su mantenimiento y disminuir su rendimiento. Use solamente líquido limpio con estas herramientas.**

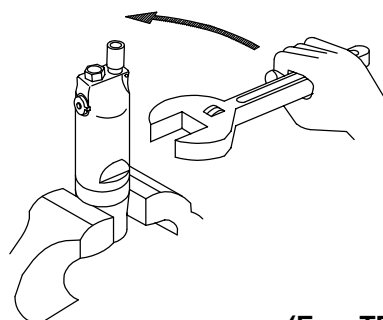


(Esq. TPD1265)

- Sumerja el orificio de llenado en el resto del líquido y, utilizando una llave, gire el eje de accionamiento para purgar el aire que pudiera quedar en el sistema.
- Enrosque el tapón del aceite, con el retén del tapón del aceite, en el mecanismo hasta que quede bien ajustado.

- Con una llave hexagonal de 1,5 mm, gire el tornillo de ajuste de par en sentido horario hasta que se pare. Ésta es la posición de máximo par.
- Limpie la parte de fuera del mecanismo y séquelo, y saque el tapón de la cámara de aceite. Utilizando la jeringuilla, saque 0,4 cc de líquido.
- Instale el tapón de la cámara de aceite y apriételo entre 20 y 25 pulg.-lb (2,3 2,8 Nm) de par.
- Introduzca el conjunto de mecanismo, con el extremo de salida por delante en la cubierta del mecanismo fijado en un tornillo de banco.
- Inserte el extremo hexagonal del eje rotor en el receso hexagonal de la parte trasera del eje de accionamiento, y enrosque la carcasa del motor ensamblado en la cubierta del mecanismo. Ésta es de **rosca hacia la izquierda**. Gire la carcasa en **sentido antihorario para apretarla**. Vea Esq. TPD1294.

GIRAR EN SENTIDO ANTIHORARIO PARA AFLOJAR



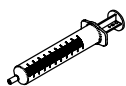
(Esq. TPD1294)

## PARA PONER LA HERRAMIENTA EN SERVICIO

### LUBRICACIÓN



Ingersoll-Rand N° 50



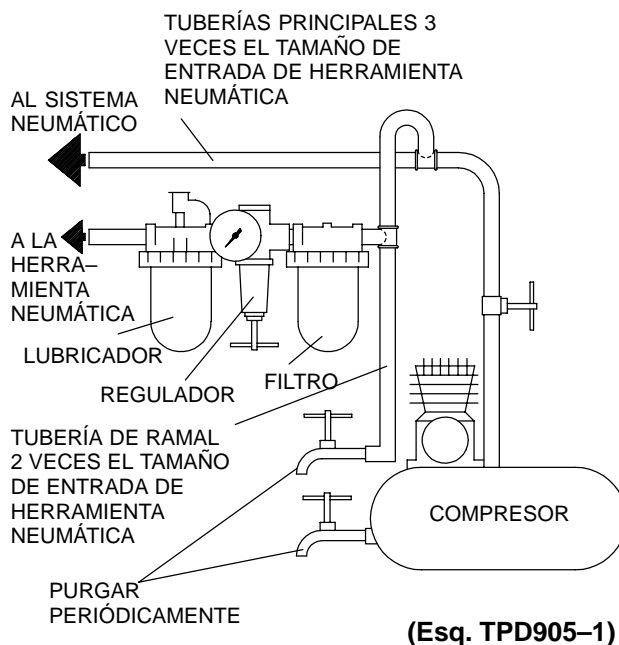
Ingersoll-Rand N° 67

Pieza de líquido  
Ingersoll-Rand  
N° EQ106S-400-1

Utilice siempre un lubricador de aire comprimido con estas herramientas. Recomendamos utilizar el siguiente conjunto de filtro-lubricador-regulador:

USA – No. C28-04-FKG0-28

Después de cada 20.000 ciclos, o como indique la experiencia, drene y vuelva a llenar el conjunto de accionamiento del mecanismo impulsor tal y como se indica en este manual, utilizando el juego de cambio de líquido (Pieza N° EQ106S-K400). Lubrique el eje de salida y el de accionamiento hexagonal antes del montaje.



(Esq. TPD905-1)

## **PARA PONER LA HERRAMIENTA EN SERVICIO**

### **ESPECIFICACIONES**

<b>Modelo</b>	<b>Tipo de empuñadura</b>	<b>Portapuntas/Accionamiento</b>	<b>Velocidad en vacío</b>	<b>Gama de par recomendada</b>	
				<b>Junta elástica ft-lbs (Nm)</b>	<b>Junta rígida ft-lbs (Nm)</b>
100SQ1	recta	1/4 Cambio rápido	10.000	3-6 (4-8)	4-9 (5-12)

# MANUAL DE FUNCIONAMENTO E MANUTENÇÃO A CHAVE DE IMPULSO MODELO 100SQ1

## AVISO

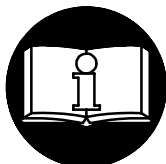
A Chave Dinamométrica de Impulso Modelo 100SQ1 é concebida para operações de montagem que exijam velocidade de aperto elevada com torque exercido consistente e reacção de torque reduzida.

A Ingersoll-Rand não é responsável por modificações feitas pelo cliente em ferramentas nas quais a Ingersoll-Rand não tenha sido consultada.

## ⚠️ ADVERTÊNCIA

**INFORMAÇÃO DE SEGURANÇA IMPORTANTE EM ANEXO.  
LEIA ESTE MANUAL ANTES DE OPERAR A FERRAMENTA.**

**É DA RESPONSABILIDADE DO EMPREGADOR COLOCAR A INFORMAÇÃO  
DESTE MANUAL NAS MÃOS DO OPERADOR.  
O NÃO CUMPRIMENTO DAS SEGUINTE ADVERTÊNCIAS PODE  
RESULTAR EM FERIMENTOS.**



### COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

- Sempre opere, inspecione e mantenha esta ferramenta de acordo com o Código de Segurança do Instituto Americano de Padrões Nacionais para Ferramentas Pneumáticas Portáteis (ANSI B186.1).
- Para segurança, máximo desempenho e máxima durabilidade das peças, opere esta ferramenta com uma pressão de ar máxima de 6,2 bar/620 kPa (90 psig) na entrada da mangueira de alimentação de ar com diâmetro interno de 10 mm (3/8").
- Desligue sempre a alimentação de ar e desconecte a mangueira de alimentação de ar antes de instalar, remover ou ajustar qualquer acessório nesta ferramenta, ou antes de executar qualquer serviço de manutenção nesta ferramenta.
- Não use mangueiras de ar ou adaptadores danificados, gastos ou deteriorados.
- Certifique-se de que todas as mangueiras e adaptadores sejam do tamanho correcto e estejam apertados com firmeza. Veja o Desenho TPD905-1 para um arranjo típico de tubagem.
- Use sempre ar seco e limpo com pressão máxima de 6,2 bar/620 kPa (90 psig). Pó, fumos corrosivos e/ou humidade excessiva podem arruinar o motor de uma ferramenta pneumática.
- Não lubrifique as ferramentas com líquidos inflamáveis ou voláteis tais como querosene, diesel ou combustível de jactos.
- Não remova nenhum rótulo. Reponha qualquer rótulo danificado.

### USANDO A FERRAMENTA

- Use sempre óculos de protecção quando estiver operando ou executando serviço de manutenção nesta ferramenta.
- Use sempre protecção contra ruído ao operar esta ferramenta.
- Mantenha as mãos, partes do vestuário soltas e cabelos compridos afastados da extremidade em rotação.
- Antecipe e esteja alerta a mudanças repentinas no movimento quando ligar e operar qualquer ferramenta motorizada.
- Mantenha a posição do corpo equilibrada e firme. Não exagere quando operar esta ferramenta. Torques de reacção elevados podem ocorrer na ou abaixo da pressão de ar recomendada.
- O eixo da ferramenta pode continuar a girar brevemente após a pressão tenha sido aliviada.
- Ferramentas accionadas pneumáticamente podem vibrar em uso. Vibração, movimentos repetitivos ou posições desconfortáveis podem ser prejudiciais às mãos e aos braços. Pare de usar a ferramenta caso ocorra algum desconforto, sensação de formigueiro ou dor. Procure assistência médica antes de retornar ao trabalho.
- Use acessórios recomendados pela Ingersoll-Rand.
- Use somente soquetes e acessórios de impacto. Não use soquetes ou acessórios de mão (cromo).
- Esta Ferramenta não foi concebida para trabalhos em atmosferas explosivas.
- Esta Ferramenta não está isolada contra choques eléctricos.

## AVISO

O uso de peças de substituição que não sejam genuinamente da Ingersoll-Rand podem resultar em riscos de segurança, diminuição do desempenho da ferramenta, aumento da necessidade de manutenção e pode invalidar todas as garantias.

As reparações devem ser feitas somente por pessoal treinado autorizado. Consulte o Centro de Serviços da Ingersoll-Rand mais próximo.

Envie Todos os Comunicados Para o Distribuidor  
ou Escritório da Ingersoll-Rand Mais Próximo.

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**PROFESSIONAL TOOLS**

# IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA

## ⚠️ ADVERTÊNCIA


O NÃO CUMPRIMENTO DAS SEGUINTE ADVERTÊNCIAS  
PODE RESULTAR EM FERIMENTOS.


	<b>⚠️ ADVERTÊNCIA</b> Use sempre óculos de proteção quando estiver operando ou executando algum serviço de manutenção nesta ferramenta.
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	<b>⚠️ ADVERTÊNCIA</b> Use sempre proteção contra o ruído ao operar esta ferramenta.
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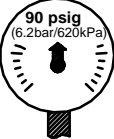
	<b>⚠️ ADVERTÊNCIA</b> Desligue sempre a alimentação de ar e desconecte a mangueira de alimentação de ar antes de instalar, remover ou ajustar qualquer acessório nesta ferramenta, ou antes de executar algum serviço de manutenção nesta ferramenta.
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	<b>⚠️ ADVERTÊNCIA</b> Ferramentas accionadas pneumáticamente podem vibrar em uso. Vibração, movimentos repetitivos ou posições desconfortáveis podem ser prejudiciais às mãos e aos braços. Pare de usar a ferramenta caso ocorra algum desconforto, sensação de formigamento ou dor. Procure assistência médica antes de retornar ao trabalho.
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	<b>⚠️ ADVERTÊNCIA</b> Não carregue a ferramenta segurando na mangueira.
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	<b>⚠️ ADVERTÊNCIA</b> Não use mangueiras de ar ou adaptadores danificados, gastos ou deteriorados.
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	<b>⚠️ ADVERTÊNCIA</b> Mantenha a posição do corpo equilibrada e firme. Não exagere quando operar esta ferramenta. Torques de reação elevados podem ocorrer sob a pressão de ar recomendada.
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	<b>⚠️ ADVERTÊNCIA</b> Opere com pressão do ar Máxima de 90 psig (6,2-6,9 bar).
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## AJUSTES

### AJUSTE DE TORQUE

Para ajustar o torque nestas Chaves Dinamométricas de Impulsão de Lâminas Duplas, proceda da seguinte maneira:

1. Remova o Bujão do Furo de Ajuste.
2. Gire o Eixo de Comando até o Parafuso de Ajuste de Torque estar visível na abertura.
3. Usando uma chave Allen de 1,5 mm, gire o Parafuso de Ajuste no sentido horário para aumentar o torque de saída e no sentido contrário aos do ponteiros do relógio para diminuir o torque de saída. Não gire o Bujão de Óleo.

ou chave de fenda de lâmina fina para remover o Anel de Retenção. Erga o Assento da Mola, a Mola e a Camisa de Retenção do bite para fora do Eixo de Comando e remova a Esfera de Retenção do Bite.

2. Usando um torno revestido de cobre ou couro, segure com cuidado a pás da Capa do Mecanismo com a extremidade de saída do Eixo de Comando para baixo.
3. Usando uma chave ajustável, desaparafuse o Conjunto do Corpo do Motor da Capa do Mecanismo. Esta é uma **rosca à esquerda**, gire o Corpo do Motor **no sentido horário** para removê-lo. Veja Desenho TPD1292

## AVISO

Faça todos os ajustes finais no serviço.

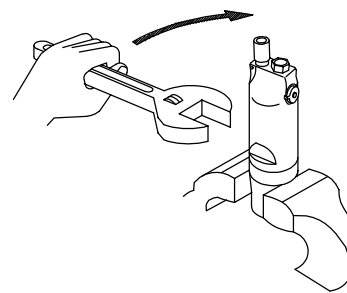
4. Reponha o Bujão do Furo de Ajuste.

### MUDANDO O FLUIDO DO MECANISMO

Para mudar o Fluido do Mecanismo no Mecanismo de Impulso, proceda da seguinte maneira:

1. Use uma ponta de prova para empurrar o Assento da Mola contra a Mola da Camisa Retentora. Enquanto a Mola for comprimida utilize uma outra ponta de prova

SENTIDO HORÁRIO PARA SOLTAR



(Desenho TPD1292)

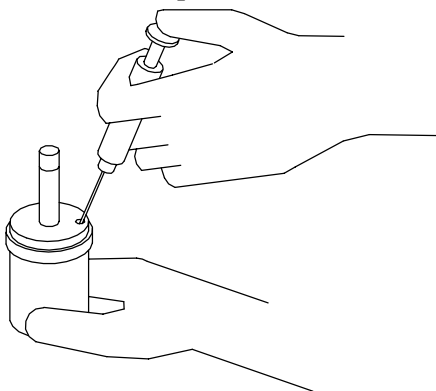
## AJUSTES

- Erga o motor montado para fora da Cobertura do Mecanismo e puxe o conjunto do mecanismo para fora da capa.
- Usando uma chave Allen de 1,5 mm, gire o Parafuso de Ajuste de Torque no sentido horário até o Parafuso parar. Gire o Parafuso no sentido contrário ao do dos ponteiros do relógio até que ele pare ou execute seis voltas completas.
- Usando uma Chave em T fornecida no Kit da Ferramenta, (Número de Pedido 180PQ-99), remova o Bujão de Óleo e o Lacre do Bujão de Óleo.
- Com a abertura do bujão de óleo para baixo sobre um recipiente, gire o Eixo de Comando para expelir o fluido do mecanismo.
- Usando uma seringa e fluido do Kit de Reposição de Fluido (Número de Pedido EQ106S-K400), encha o mecanismo com fluido fornecido no Kit. Veja Desenho TPD1265
- A abertura de enchimento deve ser submersa no restante do fluido, e usando uma chave, gire o Eixo do Comando para expelir qualquer ar remanescente do sistema.
- Rosqueie o Bujão de Óleo com o Lacre do Bujão de Óleo no mecanismo até que ele esteja apertado.
- Usando uma chave Allen de 1,5 mm, gire o Parafuso de Ajuste de Torque no sentido horário até o Parafuso parar. Esta é a posição de máximo torque.
- Limpe a parte externa do mecanismo a seco e limpe e remova o Bujão da Câmara de Óleo. Usando uma seringa, retire 0,40 cc de fluido.
- Instale o Bujão da Câmara de Óleo e aperte-o com um torque de 2,3 a 2,8 Nm (20 a 25 pol-lb).
- Insira o conjunto do mecanismo, com a extremidade de saída liderando, na Capa do Mecanismo apertada pelo torno.
- Insira a extremidade hexagonal do eixo do rotor no recesso na traseira do Eixo de Comando e rosqueie o Corpo do Motor montado na Capa do Mecanismo. Esta é uma **rosca à esquerda**. Gire o Corpo **no sentido contrário ao do dos ponteiros do relógio** para apertá-lo. Veja Desenho TPD1294

### AVISO

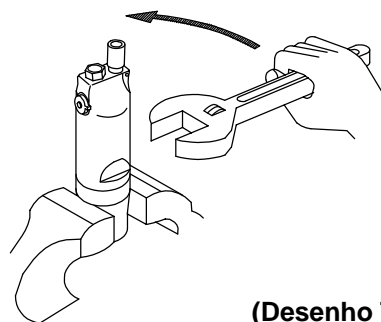
#### NÃO SUBSTITUA POR QUALQUER OUTRO FLUIDO.

O não cumprimento ao uso do fluido fornecido poderá danificar a ferramenta, aumentar a manutenção e diminuir a performance. Use somente fluido limpo nestas ferramentas.



(Desenho TPD1265)

SENTIDO ANTI-HORÁRIO PARA APERTAR



(Desenho TPD1294)

# COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

## LUBRIFICAÇÃO



Ingersoll-Rand No. 50

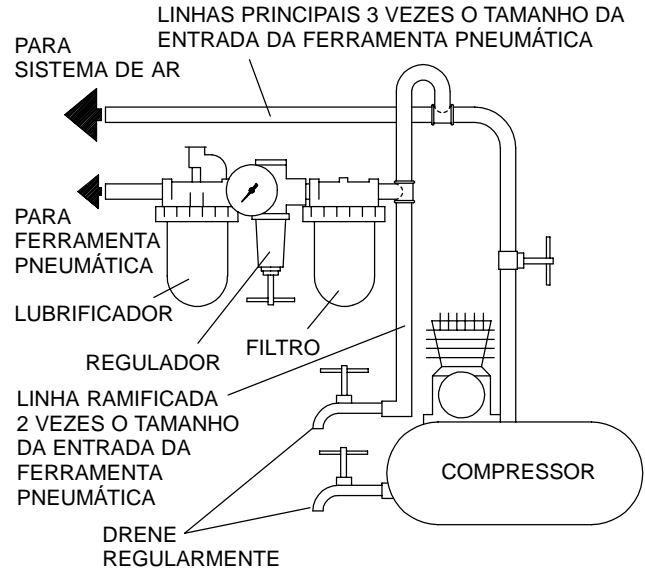


Ingersoll-Rand No. 67  
Fluído Ingersoll-Rand  
Número de Pedido  
EQ106S-400-1

Use sempre um lubrificador de ar de linha com estas ferramentas. Nós recomendamos a seguinte Unidade Filtro-Lubrificador-Regulador:

For USA – No. C28-04-FKG0-28

Depois de cada 20.000 ciclos, ou como a experiência indicar, drene e encha o Conjunto do Comando da Unidade de Impulso como instruído neste manual usando o Kit de Reposição de Fluido (Número de Pedido EQ106S-K400). Lubrifique o comando hexagonal e o eixo de saída antes de montar.

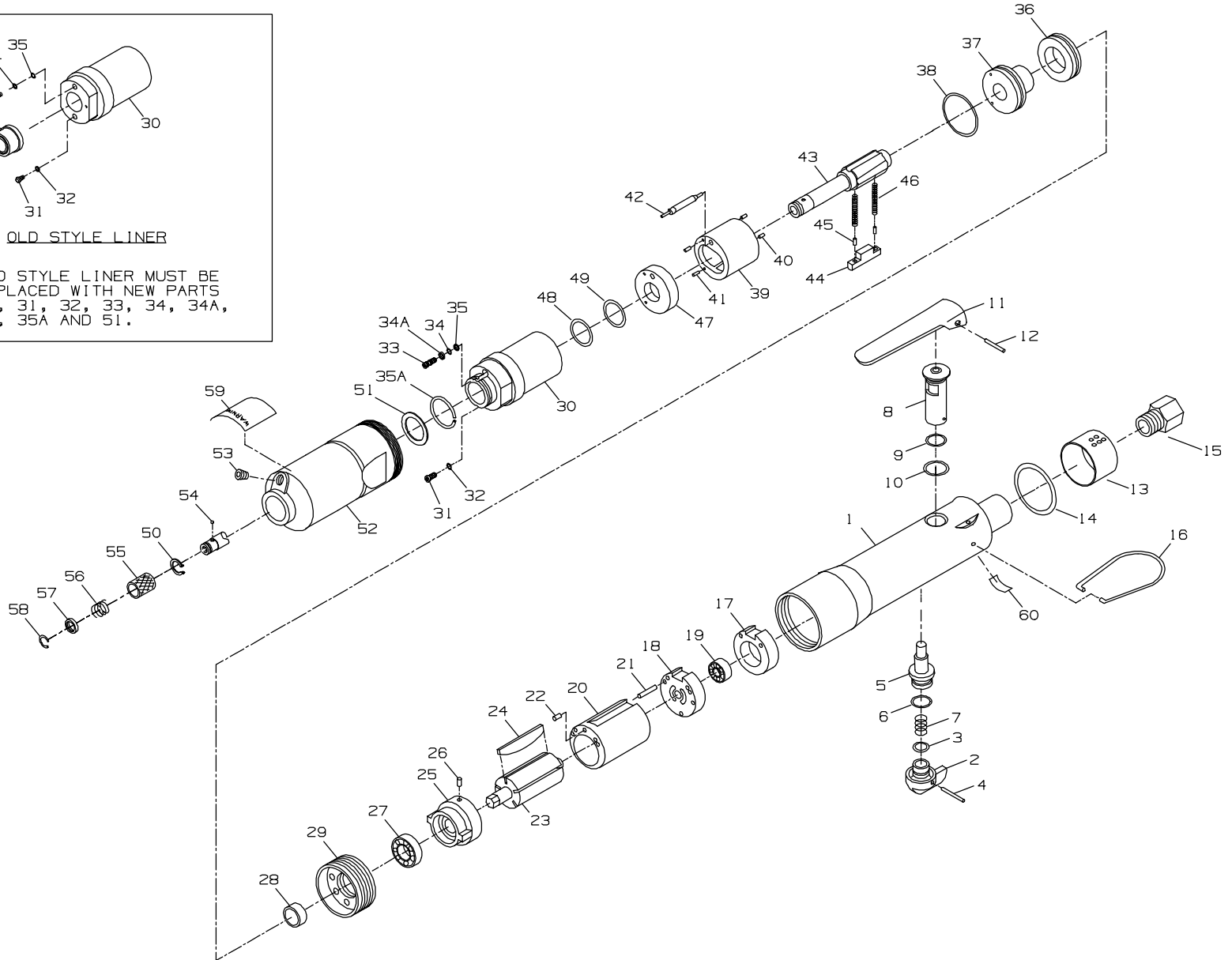
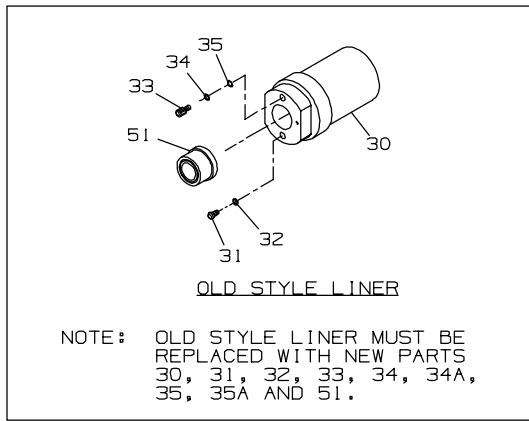


(Desenho TPD905-1)

## ESPECIFICAÇÕES

Modelo	Tipo de Punho	Encabadoiro/Comando	Velocidade Livre	Intervalo de Torque Recomendado	
				Aperto Ligeiro Nm (pés-lb)	Aperto Elevado Nm (pés-lb)
		pol.	rpm		
100SQ1	em linha	1/4 Q.C.	10.000	3-6 (4-8)	4-9 (5-12)





**MAINTENANCE SECTION**

(Dwg. TPA1360-1)



PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

	Motor Housing Assembly . . . . .	100SQ-A40		25	Front End Plate Assembly . . . . .	100SQ-A11	
1	Motor Housing . . . . .	100SQ-40		26	End Plate Alignment Pin . . . . .	100PQ-298	
2	Reverse Lever . . . . .	100SQ-328	◆	27	Front Rotor Bearing . . . . .	500A-22	
◆	Reverse Lever Seal . . . . .	EQ104S-119		28	Dust Washer . . . . .	100SQ-229	
4	Reverse Lever Retaining Pin . . . . .	EQ106S-152		29	Front End Plate Spacer . . . . .	100PQ-41	
5	Throttle Rod Assembly . . . . .	100SQ-A302			Impulse Unit Drive Assembly		
6	Throttle Rod Seal . . . . .	EQ208S-238			for old style units . . . . .	100PQ-A200	
7	Throttle Rod Spring . . . . .	100SQ-219			for new style units . . . . .	100PQ-A200A	
8	Reverse Valve Assembly . . . . .	100SQ-A329		30	Liner Housing		
9	Reverse Valve Seal . . . . .	100SQ-289			for old style units . . . . .	100PQ-31	
◆	Reverse Bushing Seal . . . . .	180SQ-289			for new style units . . . . .	100PQ-31A	
11	Throttle Lever . . . . .	100SQ-273		31	Oil Plug . . . . .	180PQ-277	
12	Lever Retaining Pin . . . . .	100SQ-152	+	32	Oil Plug Seal . . . . .	EQ110P-288	
13	Exhaust Deflector . . . . .	100SQ-310		33	Torque Adjustment Bolt Assembly . . . . .	100PQ-A230A	
◆	Exhaust Deflector Seal . . . . .	100SQ-238	+	34	Adjustment Bolt Seal . . . . .	EQ106S-288	
15	Inlet Bushing . . . . .	EQ106S-565		34A	Seal Washer (for new style units only) . . . . .	04351631	
16	Hanger . . . . .	EQ106S-365		+	35	Seal Back-up Ring . . . . .	380SQ-272
17	Rear End Plate Spacer . . . . .	100SQ-41		35A	Adjustment Bolt Stop Ring (for new style units only) . . . . .	04351623	
18	Rear End Plate Assembly . . . . .	100SQ-A12		36	Housing Cap . . . . .	100PQ-207	
◆	Rear Rotor Bearing . . . . .	500A-22		37	Rear Liner Cover Assembly . . . . .	100PQ-A212	
20	Cylinder Assembly . . . . .	100SQ-A3		+	38	Rear Liner Cover O-ring . . . . .	100PQ-236
21	Rear End Plate Dowel . . . . .	100SQ-299					
22	Front End Plate Dowel . . . . .	500A-299					
23	Rotor . . . . .	100SQ-53					
◆	Vane Packet (set of 5 Vanes) . . . . .	100SQ-42-5					

◆ Indicates Tune-up Kit part.

+ Indicates Mechanism Tune-up Kit part.

**PART NUMBER FOR ORDERING** 

**PART NUMBER FOR ORDERING** 

39	Liner Assembly .....	100PQ-A203	59	Warning Label	
40	Liner Rear Pin (2) .....	180PQ-298		for 100SQ1 .....	WARNING-2-99
41	Liner Front Pin (2) .....	100SQ-298		for 100SQ1-EU .....	EU-99
42	42 Relief Valve .....	100PQ-222	60	Oil Daily Label .....	500P-69
43	43 Drive Shaft .....	100PQ-626	*	Fluid Replacement Kit (includes Fluid	
44	44 Blade Assembly .....	100PQ-A627		Syringe, Fill Tube and 4 oz. [31 mL] of	
45	45 Blade Spring Pin (2) .....	100PQ-120		Replacement Fluid) .....	EQ106S-K400
+ 46	+ 46 Blade Spring (2) .....	100PQ-569	*	Replacement Fluid (4 oz.) .....	EQ106S-400-1
47	47 Front Liner Cover Assembly .....	100PQ-A211	*	Replacement Fluid (1 gal.) .....	EQ106S-BF400-1
+ 48	+ 48 Drive Shaft Seal .....	100PQ-237	*	Motor Tune-up kit (includes illustrated	
+ 49	+ 49 Seal Back-up Ring .....	100PQ-272		items 3, 10, 14, 19, 24, and 27) .....	100SQ-K500
50	50 Retaining Sleeve Spring Stop .....	100PQ-303	*	Mechanism Tune-up Kit (includes	
51	51 Mechanism Cover Spacer			illustrated items 32, 34, 35, 38, 46[2],	
	for old style units .....	100PQ-274		48 and 49) .....	100PQ-K600
	for new style units .....	04351656	*	Repair Tool Kit (includes all the specialized	
	Mechanism Cover Assembly .....	100PQ-A727		tooling required to repair these tools and	
52	52 Mechanism Cover .....	100PQ-727		consists of two Spanner Plugs, a Tee	
53	53 Adjustment Hole Plug .....	100PQ-95		Wrench with a special tip, an O-ring	
	Bit Chuck Assembly .....	180PQ-A667		Installer Fixture and a pressing fixture that	
54	54 Bit Retaining Ball .....	EQ104S-929		has a Disassembly Arbor and Pressing	
55	55 Bit Retaining Sleeve .....	EQ104S-930		Sleeve) .....	100PQ-99
56	56 Retaining Sleeve Spring .....	EQ104S-931			
57	57 Spring Seat .....	EQ104S-932			
58	58 Retaining Ring .....	EQ104S-933			

\* Not illustrated.

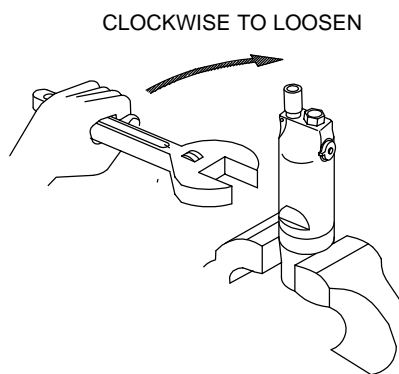
+ Indicates Mechanism Tune-up Kit part.

## MAINTENANCE SECTION

### — CHANGING THE MECHANISM FLUID —

To change the Mechanism Fluid in the Impulse Mechanism, proceed as follows:

1. Use a pointed probe to push the Spring Seat (57) against the Retaining Sleeve Spring (56). While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (58). Lift the Spring Seat, Spring and Bit Retaining Sleeve (55) off the Drive Shaft (43) and remove the Bit Retaining Ball (54).
2. Using snap ring pliers, remove the Retaining Sleeve Spring Stop (50) from the Drive Shaft.
3. Using copper-covered vise jaws, carefully grasp the flats of the Mechanism Cover (52) with the output end of the Drive Shaft downward.
4. Using an adjustable wrench, unscrew the Motor Housing Assembly (1) from the Mechanism Cover. This is a **left-hand thread**, rotate the Motor Housing **clockwise** to remove it. (Refer to Dwg. TPD1292.)

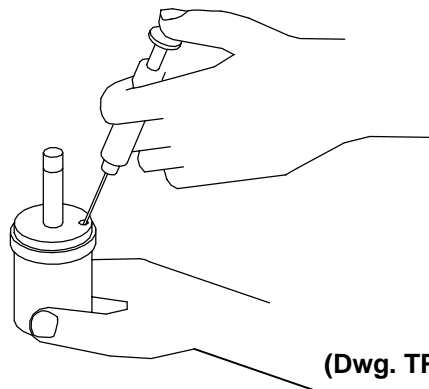


(Dwg. TPD1292)

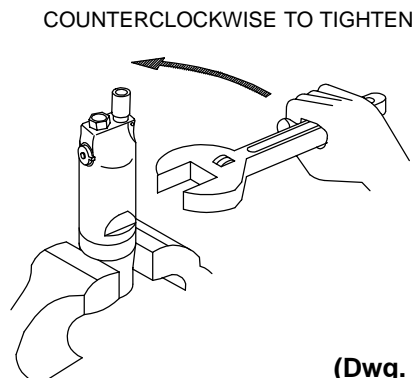
5. Lift the assembled motor off the Mechanism Cover and pull the mechanism assembly out of the Cover.
6. Using a 1.5 mm hex wrench, rotate the Torque Adjustment Bolt (33) clockwise until the Bolt stops. Rotate the Bolt counterclockwise until it stops in new style Liner Housings. Do not rotate the Bolt more than 3-1/2 turns counterclockwise in old style Liner Housings or the Bolt will fall out of the Housing.
7. Using the special Tee Wrench furnished in the Tool Kit (Part No. 100PQ-99), remove the Oil Plug (31) and Oil Plug Seal (32).
8. With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
9. Using the syringe and fluid from the Fluid Replacement Kit (Part No. EQ106S-K400), fill the mechanism with the fluid furnished in the Kit. (Refer to Dwg. TPD1265.)

### NOTICE

**DO NOT SUBSTITUTE ANY OTHER FLUID. Failure to use the fluid provided could damage the tool, increase maintenance and decrease performance. Use only clean fluid in these tools.**



10. Submerge the fill opening in the remainder of the fluid, and using a wrench, rotate the Drive Shaft to purge any remaining air from the system.
11. Thread the Oil Plug with the Oil Plug Seal into the mechanism until it is snug.
12. Using a 1.5 mm hex wrench, turn the Torque Adjustment Screw clockwise until it stops. This is the maximum torque position.
13. Wipe the outside of the mechanism dry and clean and remove the Oil Chamber Plug. Using the syringe, withdraw .25 cc of fluid.
14. Install the Oil Chamber Plug and tighten it between 20 and 25 in-lb (2.3 and 2.8 Nm) torque.
15. Insert the mechanism assembly, output end leading, into the Mechanism Cover clamped in the vise jaws.
16. Insert the hex end of the rotor shaft into the hex recess at the rear of the Drive Shaft and thread the assembled Motor Housing onto the Mechanism Cover. This is a **left-hand thread**. Rotate the Housing **counterclockwise** to tighten it. (Refer to Dwg. TPD1294.)



(Dwg. TPD1294)

# MAINTENANCE SECTION

## DISASSEMBLY

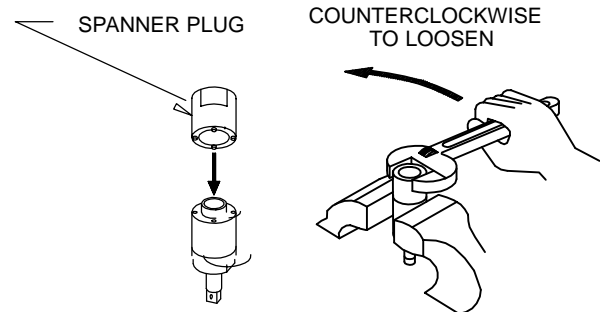
### General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When 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.
3. Do not remove any part which is a press fit in or on an assembly unless the removal of that part is necessary for repairs or replacement.
4. Do not disassemble the tool unless you have a complete set of new gaskets and O-rings for replacement.

### Disassembly of the Impulse Mechanism

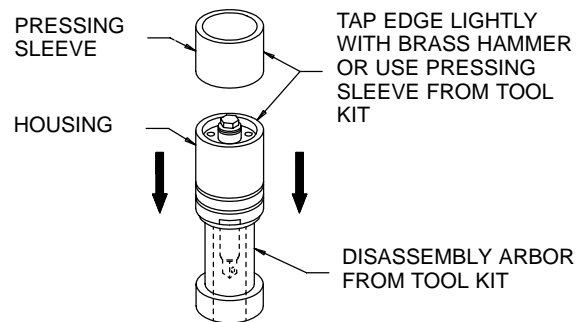
1. Use a pointed probe to push the Spring Seat (57) against the Retaining Sleeve Spring (56). While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (58). Lift the Spring Seat, Spring and Bit Retaining Sleeve (55) off the Drive Shaft (43) and remove the Bit Retaining Ball (54).
2. Using snap ring pliers, remove the Retaining Sleeve Spring Stop (50) from the Drive Shaft.
3. Using copper-covered vise jaws, carefully grasp the flats of the Mechanism Cover (52) with the output end of the Drive Shaft downward.
4. Using an adjustable wrench, unscrew the Motor Housing Assembly (1) from the Mechanism Cover. This is a **left-hand thread**, rotate the Motor Housing **clockwise** to remove it. (Refer to Dwg. TPD1264.)
5. Lift the assembled motor off the Mechanism Cover and pull the mechanism assembly out of the Cover. Remove the Mechanism Cover Spacer (51).
6. Using a 1.5 mm hex wrench, rotate the Torque Adjustment Bolt (33) clockwise until the Screw stops. Rotate the Bolt counterclockwise until it stops in new style Liner Housings. Do not rotate the Bolt more than 3-1/2 turns counterclockwise in old style Liner Housings or the Bolt will fall out of the Housing.
7. Using the special Tee Wrench furnished in the Tool Kit (Part No. 100PQ-99), remove the Oil Plug (31) and Oil Plug Seal (32).
8. With the oil plug opening downward over a container, rotate the Drive Shaft to purge the fluid from the mechanism.
9. Grasp the flats of the Liner Housing (30) in vise jaws with the output end of the Drive Shaft downward.

10. Insert the pins of the spanner plug from the No. 100PQ-99 Tool Kit into the two holes in the Housing Cap (36). Using a wrench on the plug, unscrew and remove the Housing Cap from the Housing Assembly. (Refer to Dwg. TPD1267.)



(Dwg. TPD1267)

11. Stand the disassembly arbor from the Tool Kit, large end downward, on a workbench or the table of an arbor press. Insert the output end of the Drive Shaft into the central opening and either tap the Housing downward off the components or use the pressing sleeve in the Kit to press the Housing downward off the components. (Refer to Dwg. TPD1268.)



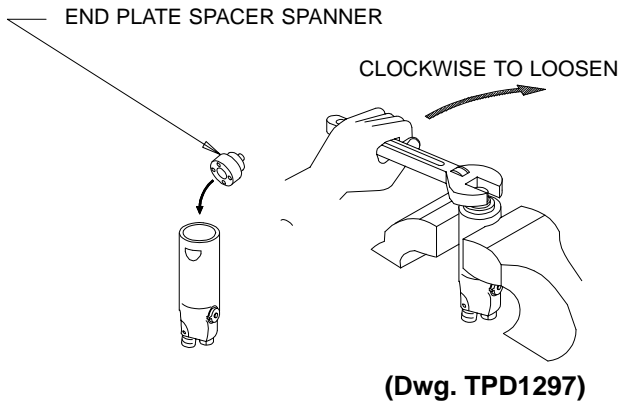
(Dwg. TPD1268)

12. Disassemble the components of the mechanism in the sequence shown in Drawing TPA1360-1 on Page 17.

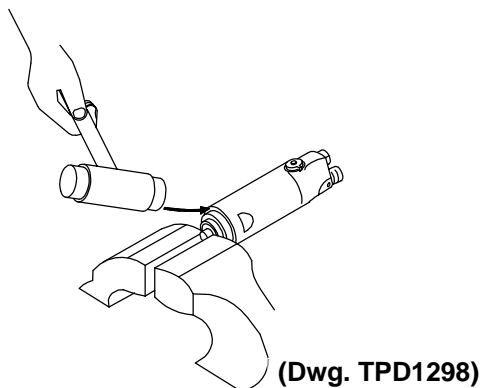
### Disassembly of the Motor

1. Grasp the Motor Housing (1) in vise jaws with the shaft of the Rotor (23) upward.
2. Insert the pins of the end plate spacer spanner into the holes in the Front End Plate Spacer (29). Using a wrench, unscrew and remove the Spacer. This is a **left-hand thread**; rotate the wrench **clockwise** to remove the Spacer. (Refer to Dwg. TPD1297) Remove the Dust Washer (28).

## MAINTENANCE SECTION



3. Reposition the Motor Housing in the vise jaws so that the vise jaws grip the end of the rotor shaft and the handle grip of the Housing is downward. Tap the edges of the Housing surrounding the motor bore with a plastic hammer to separate the Housing from the motor. (Refer to Dwg. TPD1298.)



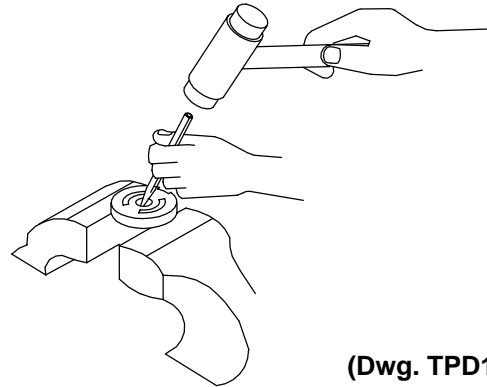
4. Remove the motor from the vise jaws and remove the Front End Plate (25), Front Rotor Bearing (27), Cylinder Assembly (20) and Vanes (24) from the Rotor.
5. Remove the Rear End Plate Spacer (17) from the Motor Housing or the Rear End Plate (18).
6. On the table of an arbor press, support the Rear End Plate with blocks as close to the Rotor as possible and press the Rotor out of the Rear End Plate and Rear Rotor Bearing (19).

### NOTICE

**In the following step, do not enlarge or damage the shaft hole in the End Plate when removing the Bearing.**

7. To remove the Rear Rotor Bearing from the Rear End Plate, use a small drift or pin punch through the central

opening of the Rear End Plate to tap the Bearing out of the End Plate. (Refer to Dwg. TPD1271.)



8. Using an adjustable wrench, unscrew and remove the Inlet Bushing (15). Remove the Exhaust Deflector (13) and Exhaust Deflector Seal (14).
9. Using a pin punch and without damaging the Reverse Lever (2), remove the Reverse Lever Retaining Pin (4) and separate the Lever from the Reverse Valve Assembly (8). Remove the Reverse Valve Seal (9) from the Lever.
10. Remove the Throttle Rod Assembly (5) and Throttle Rod Spring (7) from the Reverse Valve Assembly (8).
11. Using a pin punch, tap the Lever Retaining Pin (12) out of the Throttle Lever (11) and Housing and remove the Lever.
12. Push the Reverse Valve Assembly out the lever side of the Housing.

## ASSEMBLY

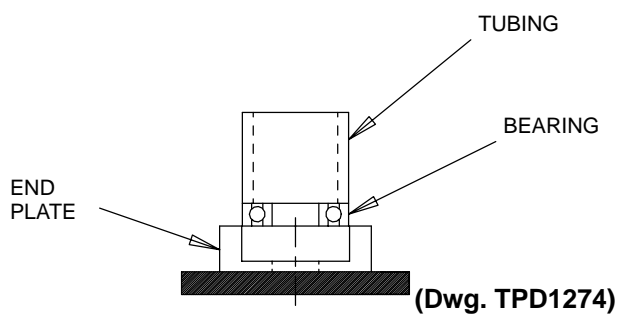
### General Instructions

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. When 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. Except for bearings and mechanism parts, always clean every part and wipe every part with a thin film of oil before installation.
5. Wipe a thin film of mechanism fluid on all internal mechanism components before installing them in the mechanism.
6. Apply a film of o-ring lubricant to every o-ring before installation.

## MAINTENANCE SECTION

### Assembly of the Motor

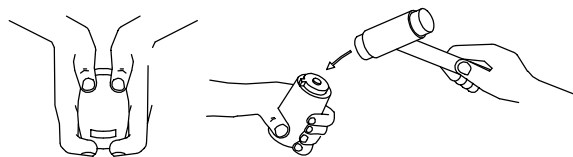
1. If the Reverse Valve Bushing Seal (10) was removed from the reverse valve bushing, install a new Seal inside the bushing.
2. Install a new Reverse Valve Seal (9) on the Reverse Valve (8).
3. Being careful not to cut or nick the Seals, insert the Reverse Valve, large hub trailing, into the Motor Housing (1) from the lever side of the Housing. Make certain the hole for the Reverse Lever Retaining Pin (4) and the valve porting are properly aligned.
4. Position the Throttle Lever (11) on the Housing and secure it by pressing the Lever Retaining Pin (12) through the Housing and Lever.
5. Install the Throttle Rod Seal (6) in the groove on the large hub of the Throttle Rod (5).
6. Install the Reverse Lever Seal (3) on the hub of the Reverse Lever (2).
7. Insert the Throttle Rod Assembly, small end leading, into the Reverse Valve Assembly followed by the Throttle Rod Spring (7) and assembled Reverse Lever.
8. Align the hole in the Reverse Lever with the hole in the Reverse Valve and install the Reverse Lever Retaining Pin in the aligned holes.
9. Place the Exhaust Deflector Seal (14) on the inlet and of the Motor Housing followed by the Exhaust Deflector.
10. Thread the Inlet Bushing (15) into the small hub the Housing and, after rotating the Deflector to the desired position, tighten the Inlet Bushing between 30 and 35 ft-lb (40 and 47 Nm) torque.
11. Using an arbor press and a piece of tubing that contacts the outer ring of the bearings, press the Front End Plate Bearing (27) into the Front End Plate (25) and the Rear End Plate Bearing (19) into the Rear End Plate (18). (Refer to Dwg. TPD1274.)



12. Stand the Rotor (25) on the table of an arbor press. It should be upright on a flat metal plate having a clearance hole for the shaft. The shaft with the hex must be downward.
13. Place a 0.001" (0.025 mm) shim on the upward surface of the large portion of the rotor body. Using a piece of

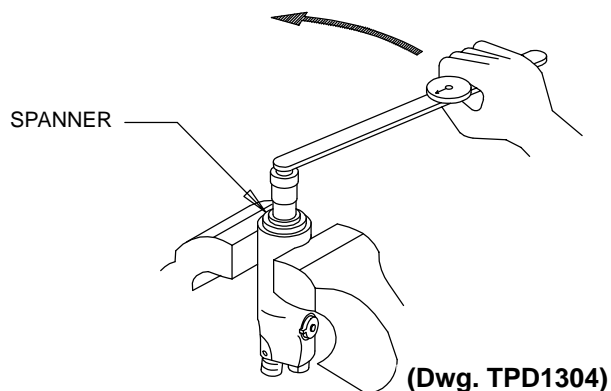
tubing that contacts the inner ring of the bearing, press the Rear Rotor Bearing and Rear End Plate, End Plate leading, onto the shaft of the Rotor until the End Plate contacts the shim. Remove the shim.

14. Coat each Vane (24) with a thin film of oil and insert a Vane into each of the rotor vane slots with the straight edge of the Vane outward.
15. Install the Cylinder (20) over the Vanes and Rotor with the end of the Cylinder having the two holes in straight alignment nearest the end face positioned away from the Rear End Plate. Make certain the End Plate Dowel (24) enters the hole in the face of the Rear End Plate and not the porting slot.
16. Place the Front End Plate and Bearing against the face of the Cylinder, Bearing end trailing. Make certain the End Plate Dowel in that end of the cylinder enters the hole in the End Plate and not the porting slot.
17. Place the Rear End Plate Spacer (17) against the Rear End Plate making certain that the Rear End Plate Dowel enters the hole in the Spacer and the external slots align.
18. Insert the assembled motor, Rear End Plate leading, into the Motor Housing making sure the End Plate Alignment Pin (26) enters the proper notch in the Housing. It may be necessary to tap the assembly into position with a brass or plastic hammer. (Refer to Dwg. TPD1279.)



(Dwg. TPD1279)

19. Grasp the handle of the Motor Housing in vise jaws with the rotor shaft upward. Thread the Front End Plate Spacer (29) into the Housing and using the end plate spacer spanner, tighten the Spacer to 33 ft-lb (45 Nm) torque. This is a **left-hand thread**; rotate the wrench **counterclockwise** to tighten. (Refer to Dwg. TPD1304.)

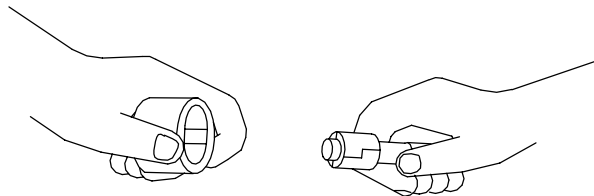


## MAINTENANCE SECTION

20. After installing the Front End Plate Spacer, grasp the shaft of the Rotor and rotate it by hand. If the Rotor does not turn easily, disassemble the motor unit and determine where the assembly is binding. The motor must rotate freely before proceeding further with the assembly.
21. When the motor rotates freely, install the Dust Washer (28) on the rotor shaft and slide it downward against the Front Rotor Bearing.

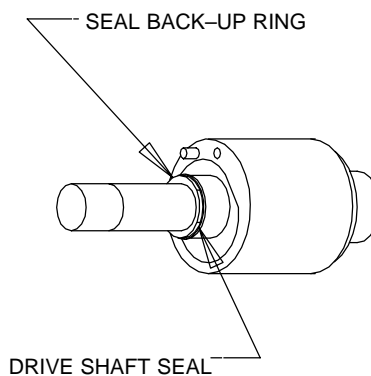
### Assembly of the Impulse Mechanism

1. Install the Rear Liner Cover O-ring (38) in the annular groove around the Rear Liner Cover (37).
2. Insert the Relief Valve (42) into the Liner (39).
3. Place a Blade Spring (46) into each hole in one of the slots of the Drive Shaft (43).
4. Place the Blade (44) against the Springs so that each Spring encircles a Blade Spring Pin (45).
5. Compress the Springs with the Blade until the Blade is flush with the Drive Shaft and install the assembly in the Liner with the output end of the Drive Shaft protruding out the end of the Liner containing the Relief Valve. (Refer to Dwg. TPD1284.) Make certain the ends of the Blade are flush with the ends of the Liner.



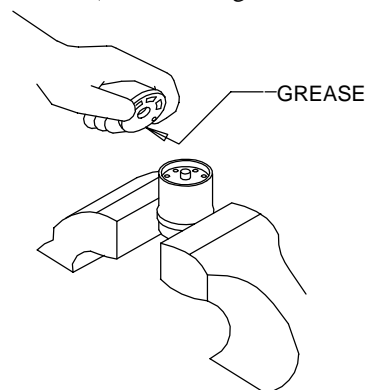
(Dwg. TPD1284)

6. Place the Rear Liner Cover Assembly against the motor end of the Liner making sure that the two Liner Rear Pins (40) enter the holes in the Cover and the rear hub of the Drive Shaft enters the central opening of the Cover.
7. Install the Front Liner Cover Assembly (47) over the Drive Shaft against the spindle end of the Liner making sure that the two Liner Front Pins (41) enter the holes in the Cover and the Relief Valve aligns with the opening in the Cover.
8. Install the Drive Shaft Seal (48) followed by the Seal Back-up Ring (49) on the Drive Shaft against the hub. (Refer to Dwg. TPD1285.)



(Dwg. TPD1285)

9. Install the assembled Liner and Covers in the Liner Housing (30) making certain that the Relief Valve is in alignment with the opening for the Torque Adjustment Bolt (33).
10. Install the Adjustment Bolt Seal (34) followed by the Seal Washer (34A) and Seal Back-up Ring (35) on the Torque Adjustment Bolt and thread the assembled Bolt into the Liner Housing.
11. Install the Adjustment Bolt Stop Ring (35A) in the groove of the Liner Housing to keep the Bolt Assembly from backing out.
12. Install the Oil Plug (31) and Oil Plug Seal (32) in the liner housing hole 180 degrees from the Torque Adjustment Bolt.
13. Grasp the flats of the Housing in vise jaws with the output spindle downward. Remove the Rear Liner Cover Assembly and put grease in the central opening of the Cover. (Refer to Dwg. TPD1289.)

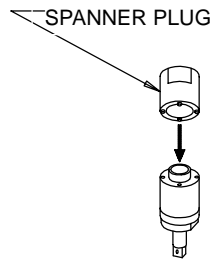
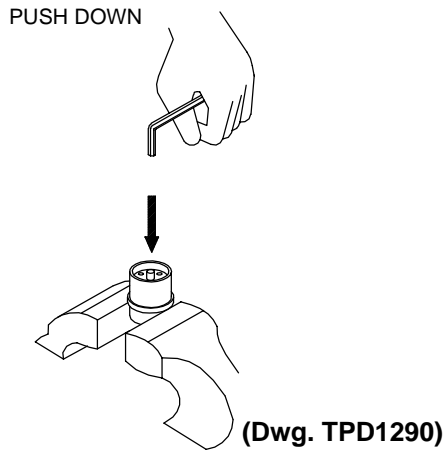


(Dwg. TPD1289)

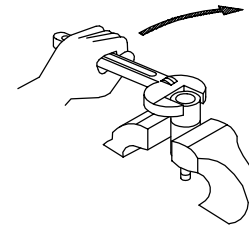


## MAINTENANCE SECTION

14. Reinstall the Cover Assembly and use a hex wrench to push it below the threads at the rear of the Housing. (Refer to Dwg. TPD1290.)



CLOCKWISE TO TIGHTEN



(Dwg. TPD1291)

16. Make certain the Drive Shaft rotates freely. Install the Mechanism Cover Spacer (51) and then fill the mechanism with fluid and reassemble the tool as instructed in the section, **CHANGING THE MECHANISM FLUID.**

15. Install the Housing Cap (36) and using the spanner plug furnished in the Tool Kit, tighten the Cap between 58 and 65 ft-lb (78 and 88 Nm) torque. (Refer to Dwg. TPD1291.)