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Form P7075
Edition 3
November, 1998

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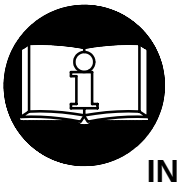
OPERATION AND MAINTENANCE MANUAL FOR MODEL 380SQ1 TWIN BLADE IMPULSE WRENCH

NOTICE

Model 380SQ1 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 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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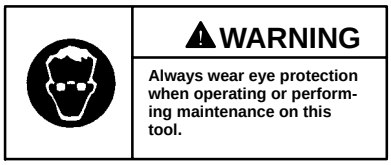
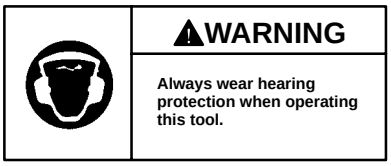
PROFESSIONAL TOOLS

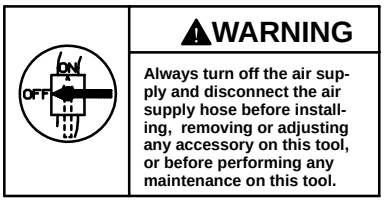
WARNING LABEL IDENTIFICATION

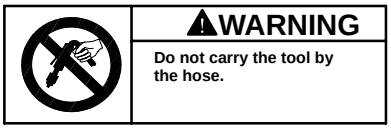
⚠ WARNING

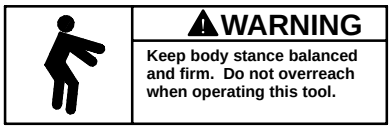
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

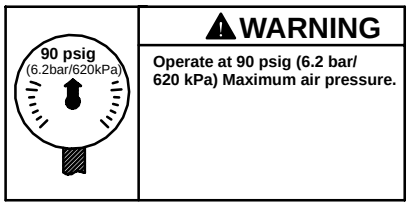












ADJUSTMENTS

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

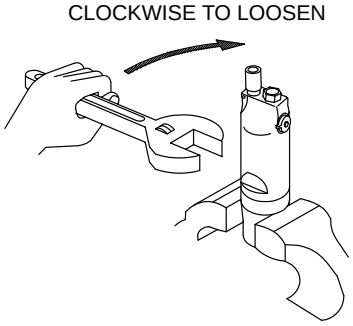
Make all final adjustments at the job.

4. Replace the Adjustment Hole Plug.

CHANGING THE MECHANISM FLUID

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

1. Use a pointed probe to 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.
2. Remove the Rubber Housing Boot.
3. 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.
4. 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)

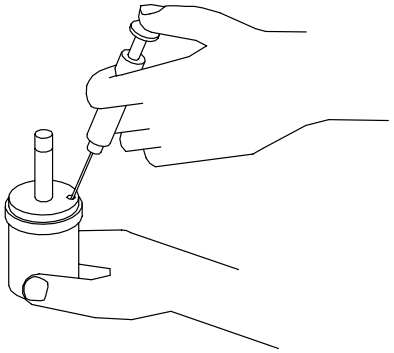
5. Lift the assembled motor off the Mechanism Cover and pull the mechanism assembly out of the Cover.
6. Using a 1.5 mm hex wrench, rotate the Torque adjustment Screw clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
7. Using the special Tee Wrench furnished in the Tool Kit (Part No. 180PQ–99), remove the Oil Plug and Oil Plug Seal.

ADJUSTMENTS

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. See Dwg. TPD1293.

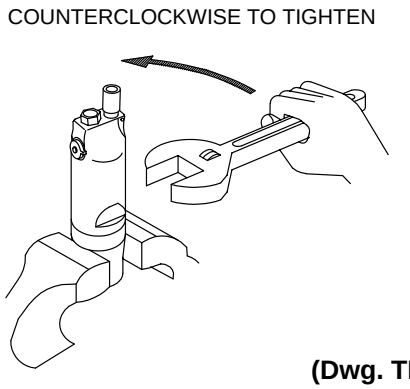
NOTICE

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. TPD1293)

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 0.4 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. See Dwg. TPD1294.



(Dwg. TPD1294)

PLACING TOOL IN SERVICE

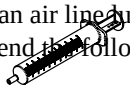
LUBRICATION

Ingersoll–Rand No. 50

Ingersoll–Rand No. 67

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

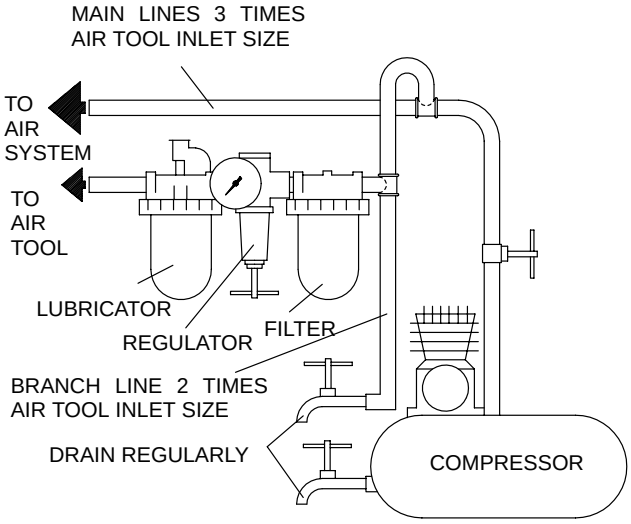
Always use an air line lubricator with these tools.



We recommend the following Filter–Lubricator–Regulator Unit:

USA – No. C22–04–G00

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.



(Dwg. TPD905–1)

SPECIFICATIONS

Model	Type of Handle	Chuck/Drive	Free Speed	Recommended Torque Range	
		in.		Soft Draw ft–lb (Nm)	Hard Slam ft–lb (Nm)
380SQ1–EU	straight	1/4	8 500	15–32 (20–44)	22–32 (30–44)

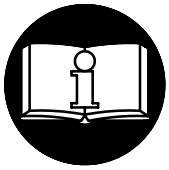
F

MANUEL D'EXPLOITATION ET D'ENTRETIEN DE CLÉ HYDRO–PNEUMATIQUE À DOUBLE PALETTE MODÈLE 380SQ1

NOTE

La clé hydro–pneumatique à double palette Modèle 380SQ1 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. 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 flous 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.

Imprimé aux É.U.

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PROFESSIONAL TOOLS

SIGNIFICATION DES ÉTIQUETTES D'AVERTISSEMENT

⚠ ATTENTION

LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES.

⚠ ATTENTION

Porter toujours des lunettes de protection pendant l'utilisation et l'entretien de cet outil.

⚠ ATTENTION

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.

⚠ ATTENTION

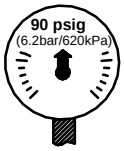
Garder une position équilibrée et ferme. Ne pas se pencher trop en avant pendant l'utilisation de cet outil.

⚠ ATTENTION

Porter toujours une protection acoustique pendant l'utilisation de cet outil.

⚠ ATTENTION

Ne pas transporter l'outil par son flexible.



⚠ ATTENTION

Utiliser de l'air comprimé à une pression maximum de 6,2 bar (620 kPa).

⚠ ATTENTION

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.

⚠ ATTENTION

Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.

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.

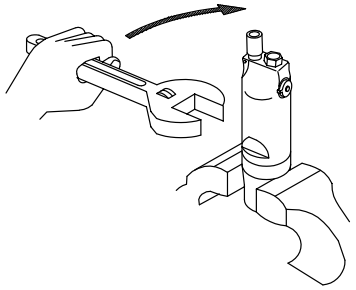
4. Remonter le bouchon dans le trou de réglage.

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. Retirer la gaine en caoutchouc du corps.
3. Serrer soigneusement les plats du couvercle du mécanisme dans un étau de mordaches en cuir ou en cuivre, côté sortie de l'arbre d'entraînement dirigé vers le haut.
4. 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.

SENS DES AIGUILLES D'UNE MONTRE POUR DESSERRER



(Plan TPD1292)

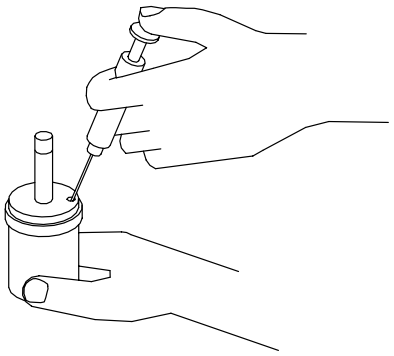
5. Retirer le moteur assemblé du couvercle du mécanisme et extraire le mécanisme du couvercle.
6. A l'aide d'une clé pour six pans creux de 1,5 mm, tourner la vis de réglage de couple dans le sens des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée. Tourner la vis dans le sens inverse des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée, ou après six tours complets.
7. 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

8. 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.
9. 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 TPD1293.

NOTE

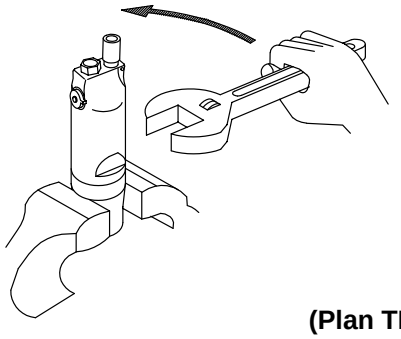
NE PAS UTILISER D'AUTRE FLUIDE. La non–utilisation du fluide de mécanisme hydro–pneumatique fourni pourrait causer l'endommagement de l'outil, augmenter l'entretien et réduire les performances. N'utiliser que du fluide propre dans ces outils.



(Plan TPD1293)

10. 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.
11. Visser le bouchon équipé du joint dans le mécanisme et le serrer fermement.
12. 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. C'est la position de couple maximum.
13. 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^3 de fluide
14. Remonter le bouchon de la chambre d'huile et le serrer à un couple de 2,3 à 2,8 Nm.
15. Insérer le mécanisme, côté sortie en premier, dans le couvercle de mécanisme serré dans les mâchoires de l'étau.
16. 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



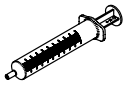
(Plan TPD1294)

MISE EN SERVICE DE L'OUTIL

LUBRIFICATION

Ingersoll–Rand No. 50

Ingersoll–Rand No. 67

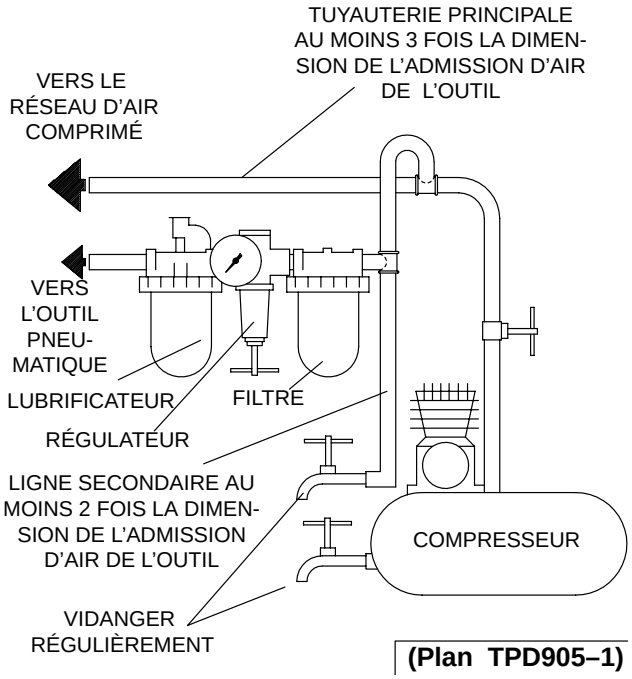


Fluide Ingersoll–Rand Réf. EQ106S–400–1

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

USA – No. C22–04–G00

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)

SPÉCIFICATIONS

Modèle	Type de Poignée	Limiteur/ Entraînement	Vitesse à vide	Gamme de couples recommandée	
		pouces		Serrage élastique Nm	Serrage fort Nm
380SQ1	en ligne	1/4" rapide	8 500	20–44	30–44

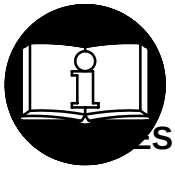
E

MANUAL DE USO Y MANTENIMIENTO PARA LLAVE DE IMPULSO DE DOBLE PALETA MODELO 380SQ1

NOTA

La llave de impulso Modelo 380SQ1 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.

⚠ ADVERTENCIA

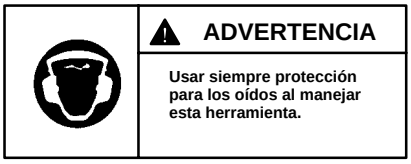
Usar siempre protección ocular al manejar o realizar operaciones de mantenimiento en esta herramienta.

⚠ ADVERTENCIA

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.

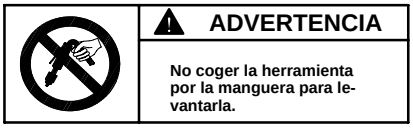
⚠ ADVERTENCIA

Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.



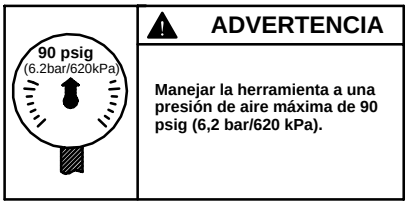
⚠ ADVERTENCIA

Usar siempre protección para los oídos al manejar esta herramienta.



⚠ ADVERTENCIA

No coger la herramienta por la manguera para levantarla.



⚠ ADVERTENCIA

Manejar la herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa).

⚠ ADVERTENCIA

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.

⚠ ADVERTENCIA

No utilizar mangueras de aire y accesorios dañados, desgastados ni deteriorados.

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.

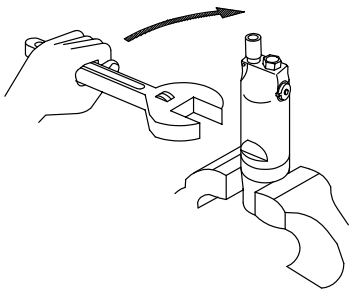
4. Vuelva a poner en su sitio el tapón del orificio de ajuste.

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. Saque la funda de carcasa de caucho.
3. 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.
4. 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)

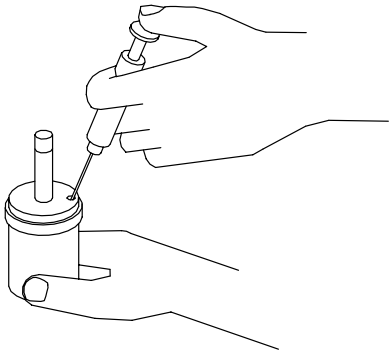
5. Levante el motor ensamblado y sáquelo de la carcasa del mecanismo, y saque el conjunto del mecanismo fuera de la cubierta.
6. Con una llave hexagonal de 1,5 mm, gire el tornillo de ajuste de par en sentido horario hasta que se pare. Gire el tornillo en sentido antihorario hasta que se pare o dé seis vueltas completas.
7. Utilizando la llave en “T” especial suministrada con el juego de herramientas (Pieza Nº 180PQ–99), saque el tapón del aceite y el retén de dicho tapón.

AJUSTES

8. Con el orificio del tapón del aceite apuntando hacia abajo sobre un contenedor, gire el eje de accionamiento para purgar el líquido del mecanismo.
9. Con la jeringuilla y el líquido del juego de cambio de líquido (Pieza Nº. EQ106S–K400), llene el mecanismo con el líquido suministrado con dicho juego.
   Vea Esq. TPD1293.

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. TPD1293)

10. 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.
11. Enrosque el tapón del aceite, con el retén del tapón del aceite, en el mecanismo hasta que quede bien ajustado.
12. 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.
13. 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.
14. Instale el tapón de la cámara de aceite y apriételo entre 20 y 25 pulg.–lb (2,3 2,8 Nm) de par.
15. Introduzca el conjunto de mecanismo, con el extremo de salida por delante en la cubierta del mecanismo fijado en un tornillo de banco.
16. 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.

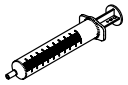
(Esq. TPD1294)

PARA PONER LA HERRAMIENTA EN SERVICIO

LUBRICACIÓN

Ingersoll–Rand Nº 50

Ingersoll–Rand Nº 67

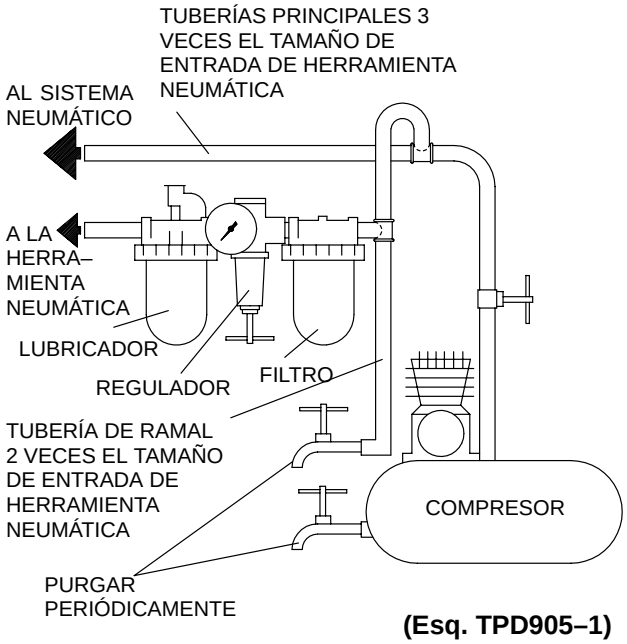


Pieza de líquido Ingersoll–Rand Nº EQ106S–400–1

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

USA – Nº C22–04–G00

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 Nº EQ106S–K400). Lubrique el eje de salida y el de accionamiento hexagonal antes del montaje.



(Esq. TPD905–1)

ESPECIFICACIONES

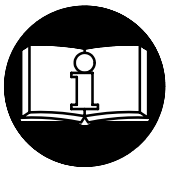
Modelo	Tipo de empuñadura	Portapuntas/Accionamiento	Velocidad en vacío	Gama de par recomendada	
		pulg.		Junta elástica ft–lbs (Nm)	Junta rígida ft–lbs (Nm)
380SQ1	recta	1/4 Cambio rápido	8 500	15–32 (20–44)	22–32 (30–44)

P

MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA FERRAMENTA PNEUMÁTICA DE IMPULSO DE LÂMINAS DUPLAS MODELO 380SQ1

AVISO

A Ferramenta Pneumática de Impulse Modelo 380SQ1 é concebidas 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 SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

- **Sempre opere, inspeccione 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 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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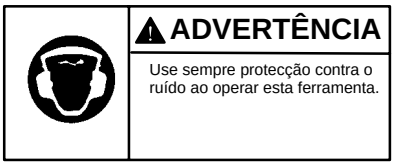
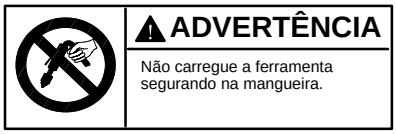
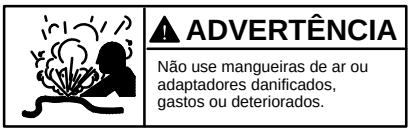
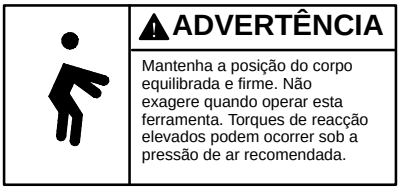
⚠ ADVERTÊNCIA

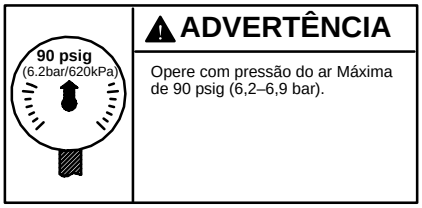
O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.











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.

AVISO

Faça todos os ajustes finais no serviço.

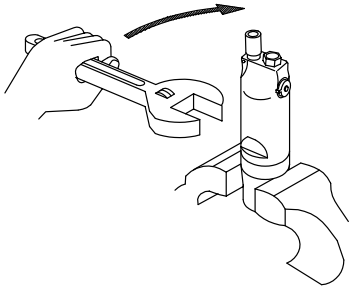
4. Reponha o Bujão do Furo de Ajuste.

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 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. Remova o Calço do Corpo de Borracha.
3. 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.
4. 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

SENTIDO HORÁRIO PARA SOLTAR

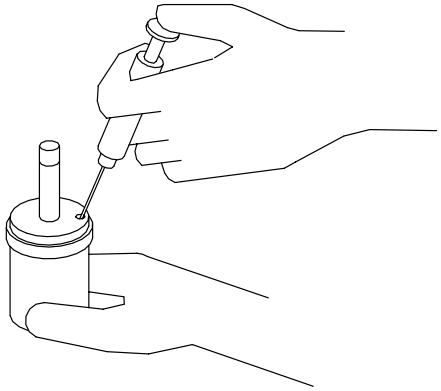


(Desenho TPD1292)

5. Erga o motor montado para fora da Cobertura do Mecanismo e puxe o conjunto do mecanismo para fora da capa.
6. 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.
7. 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.
8. Com a abertura do bujão de óleo para baixo sobre um recipiente, gire o Eixo de Comando para expelir o fluído do mecanismo.
9. Usando uma seringa e fluído do Kit de Reposição de Fluído (Número de Pediddo EQ106S–K400), encha o mecanismo com fluído fornecido no Kit.
   Veja Desenho TPD1293

AVISO

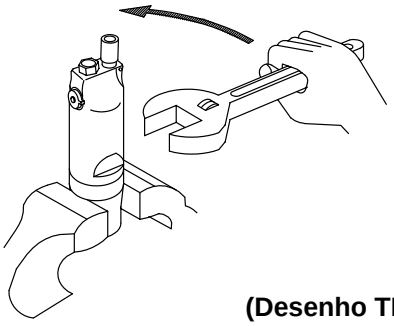
NÃO SUBSTITUA POR QUALQUER OUTRO FLUIDO.
O não cumprimento ao uso do fluido fornecido poderá danificar a ferramenta, aumentar a manutenção e diminuir a performance. Use somente fluído limpo nestas ferramentas.



(Desenho TPD1293)

10. A abertura de enchimento deve ser submersa no restante do fluído, e usando uma chave, gire o Eixo do Comando para expelir qualquer ar remanescente do sistema.
11. Rosqueie o Bujão de Óleo com o Lacre do Bujão de Óleo no mecanismo até que ele esteja apertado.
12. 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.
13. Limpe a parte externa do mecanismo a sêco e limpe e remova o Bujão da Câmara de Óleo. Usando uma seringa, retire 0,40 cc de fluído.
14. 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).
15. Insira o conjunto do mecanismo, com a extremidade de saída liderando, na Capa do Mecanismo apertada pelo torno.
16. 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

SENTIDO ANTI–HORÁRIO PARA APERTAR



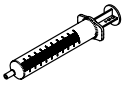
(Desenho TPD1294)

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

LUBRIFICAÇÃO

Ingersoll–Rand No. 50

Ingersoll–Rand No. 67

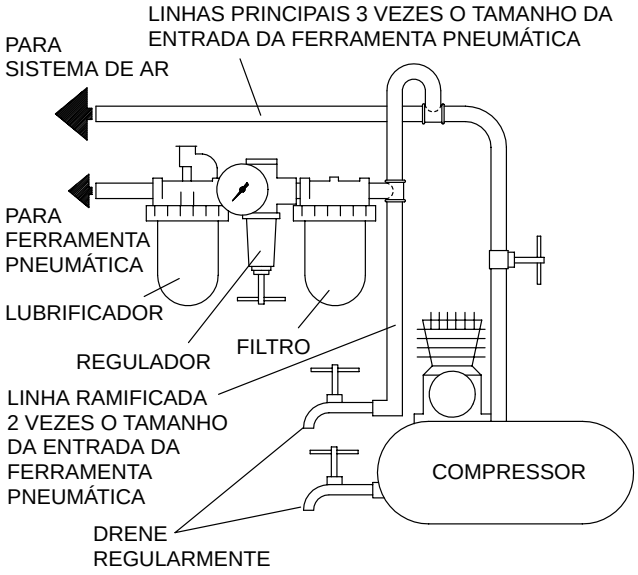


Fluído Ingersoll–Rand
Número de Pedido
EQ106S–400–1

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

Para USA – No. C22–04–G00

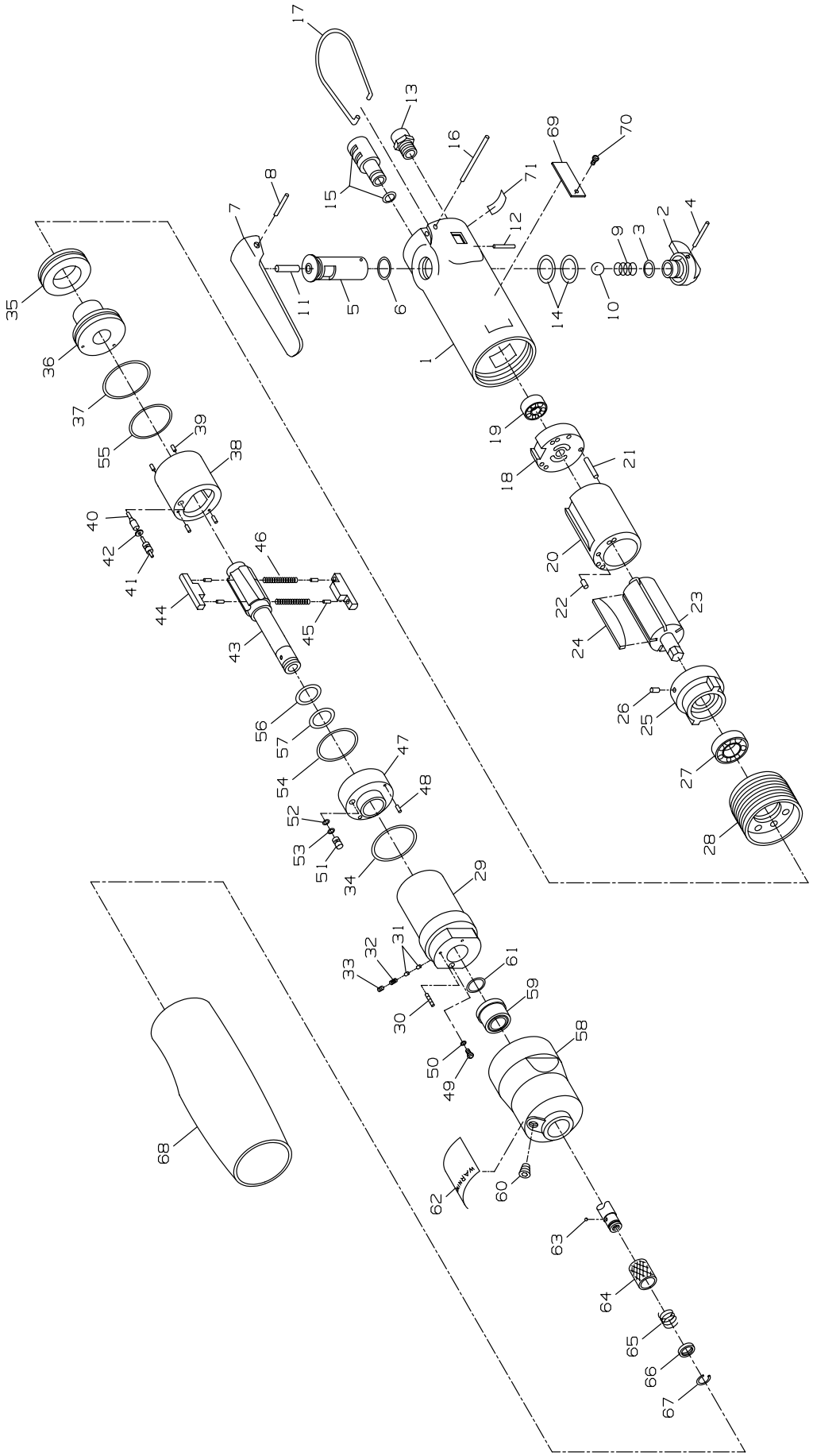
Depois de cada 20 000 ciclos, ou como a experiência indicar, drene e encha o Conjunto do Comando da Unidade de Impulso como instruído neste manual usando o Kit de Reposição de Fluido (Número de Pedido EQ106S–K400). Lubrifique o comando hexagonal e o eixo de saída antes de montar.



(Desenho TPD905–1)

ESPECIFICAÇÕES

Modelo	Tipo de Punho	Encabadouro/Comando	Velocidade Livre	Intervalo de Torque Recomendado	
		pol.	rpm	Aperto Ligeiro Nm (pés–lb)	Aperto Elevado Nm (pés–lb)
380SQ1	em linha	1/4 Q.C.	8 500	20–44 (15–32)	30–44 (22–32)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(Dwg. TPA1341)

PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

	Motor Housing Assembly	380SQ–A40		23 Rotor	380PQ–53
1	Motor Housing	380SQ–40	+	24 Vane Packet (set of 6 Vanes)	380PQ–42–6
2	Reverse Lever Assembly	180SQ–A328		25 Front End Plate Assembly	380PQ–A11
3	Reverse Lever Seal	EQ106S–119		26 Alignment Pin	380SQ–298
4	Reverse Lever Pin	EQ106S–152	+	27 Front End Plate Bearing	500P–22
5	Reverse Valve Assembly	180SQ–A329		28 Front End Plate Spacer	380PQ–41
6	Reverse Valve Seal	EQ106P–283		Impulse Unit Drive Assembly	380PQ–A200
7	Throttle Lever	EQ106S–273		29 Housing Assembly	380PQ–A31
8	Throttle Lever Pin	EQ106S–120		30 Torque Adjustment Screw	180PQ–230
9	Throttle Valve Spring	380SQ–219		31 Adjustment Screw Plug Lock (2)	180PQ–283
10	Throttle Ball	180PQ–929		32 Plug Lock Spring	180PQ–219
11	Throttle Plunger	180SQ–298		33 Plug Lock Screw	500A–230
12	Cylinder Alignment Pin	EQ106P–99	♦	34 Liner O–ring	EQ208S–237
13	Inlet Bushing	EQ106S–565		35 Housing Cap	380PQ–207
14	Reverse Valve Bushing Seal (2)	EQ106P–283		36 Rear Liner Cover Assembly	380PQ–A212
15	Exhaust Deflector Assembly	180PQ–A23	♦	37 Liner Cover O–ring	380PQ–236
16	Deflector Retaining Pin	EQ106P–152		38 Liner Assembly	380PQ–A203
17	Suspension Bail	EQ106S–365		39 Liner Pin (4)	180PQ–298
	Motor Assembly	380SQ–A53		40 Relief Valve	380PQ–222
18	Rear End Plate Assembly	380SQ–A12		41 Spring Guide Assembly	380PQ–A255
+ 19	Rear Rotor Bearing	500A–22	♦	42 Spring Guide Seal	180PQ–272
20	Cylinder Assembly	380SQ–A3		43 Drive Shaft	380PQ–626
21	Rear End Plate Alignment Pin	EQ112P–99			
22	Front End Plate Alignment Pin	EQ112P–99			

\+ Indicates Motor Tune–up Kit part.

♦ Indicates Mechanism Tune–up Kit part.

		PART NUMBER FOR ORDERING
	44	Blade Assembly (2) 380PQ–A627
	45	Blade Assembly Pin (2 per assembly) . 500A–120
♦	46	Blade Spring (2) 380PQ–568
	47	Front Liner Cover Assembly 380PQ–A211
	48	Liner Cover Pin 180PQ–232
	49	Oil Plug 180PQ–277
♦	50	Oil Plug Seal EQ110P–288
	51	Oil Stop Cap Assembly 180PQ–A38
	52	Stop Cap O–ring EQ106P–288
♦	53	Back–up Ring 380SQ–272
♦	54	Front Liner Seal EQ104S–236
♦	55	Rear Liner Seal 180PQ–273
♦	56	Drive Shaft Seal 180PQ–271
♦	57	Seal Back–up Ring 380PQ–272
	58	Mechanism Cover Assembly 380PQ–A727
	59	Cover Bushing 180PQ–641
	60	Adjustment Hole Plug 180PQ–95
	61	Bushing Spacer 180PQ–229
	62	Warning Label
		for 380SQ1 . . . . . EQ104S–999
		for models ending in –EU EU–99
		Bit Chuck Assembly 180PQ–A667
	63	Bit Retaining Ball EQ104S–929
	64	Bit Retaining Sleeve EQ104S–930
	65	Retaining Sleeve Spring EQ104S–931
	66	Spring Seat EQ104S–932
	67	Retaining Ring EQ104S–933
	68	Rubber Housing Boot 380PQ–2

		PART NUMBER FOR ORDERING
	69	Nameplate
		for model 380SQ1 . . . . . 380SQ–301
		for models ending in–EU 380SQ1–EU–301
	70	Nameplate Driver Screw (2) EQ106S–322
	71	Oil Daily Label 500P–69
*		Motor Tune–up Kit (includes illustrated items 19, 24, 26, 27) 380PQ–K500
*		Mechanism Tune–up Kit (includes illustrated items 34, 37, 42, 46, 50, 52, 53, 54, 55, 56, 57) . . 380PQ–K600
*		Fluid Replacement Kit (includes Fluid Syringe, Fill Tube and 4 oz. [31 mL] of Replacement Fluid) EQ106S–K400
*		Replacement Fluid (4 oz.) EQ106S–400–1
*		Tool Kit (includes all the specialized tooling required to repair these tools and consists of two Spanner Plugs, a Tee Wrench with a special tip, an O–ring Installer
*		Fixture and a pressing fixture that has a Disassembly Arbor and Pressing Sleeve) 180PQ–99
		Rotation Label (for–EU models only)
		forward 7802R–EU–F99
		reverse 7802R–EU–F99

* Not illustrated.

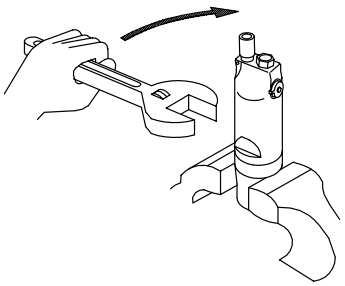
♦ Indicates Mechanism Tune–up Kit part.

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 (66) against the Retaining Sleeve Spring (65). While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (67). Lift the Spring Seat, Spring and Bit Retaining Sleeve (64) off the Drive Shaft (43) and remove the Bit Retaining Ball (63).
2. Remove the Rubber Housing Boot (68).
3. Using copper–covered vise jaws, carefully grasp the flats of the Mechanism Cover (58) 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.

CLOCKWISE TO LOOSEN

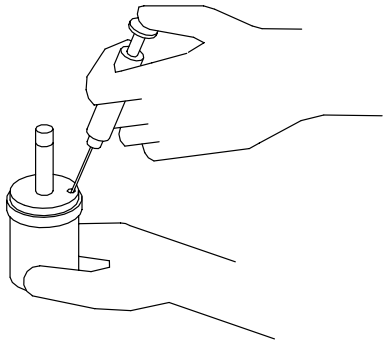


(Dwg. TPD1292)

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 (30) clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
7. Using the special Tee Wrench furnished in the Tool Kit (Part No. 180PQ–99), remove the Oil Plug (49) and Oil Plug Seal (50).
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. TPD1293.

NOTICE

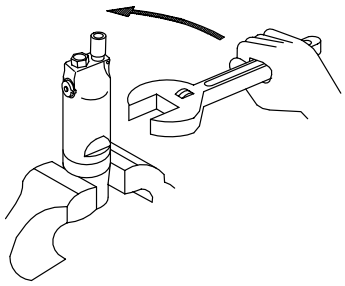
DO NOT SUBSTITUTE ANY OTHER FLUID. Failure to use the fluid provided could damage the tool, increase maintenance and decrease performance. Use only clean fluid in these tools.



(Dwg. TPD1293)

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. Back the Screw off between 3/4 and 1–1/4 turns to avoid erratic readings.
13. Wipe the outside of the mechanism dry and clean and remove the Oil Chamber Plug. Using the syringe, withdraw .25 cc of fluid from 180SQ1 models and .3 cc of fluid from 280SQ1 models.
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.

COUNTERCLOCKWISE TO TIGHTEN



(Dwg. TPD1294)

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.

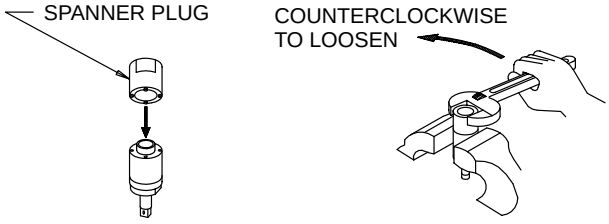
Disassembly of the Impulse Mechanism

1. Use a pointed probe to push the Spring Seat (66) against the Retaining Sleeve Spring (65). While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (67). Lift the Spring Seat, Spring and Bit Retaining Sleeve (64) off the Drive Shaft (43) and remove the Bit Retaining Ball (63).
2. Remove the Rubber Housing Boot (68).
3. Using copper–covered vise jaws, carefully grasp the flats of the Mechanism Cover (58) with the output end of the Drive Shaft downward.
4. Using an adjustable wrench, unscrew the Motor Housing Assembly (1) from the Mechanism Cover.

NOTICE

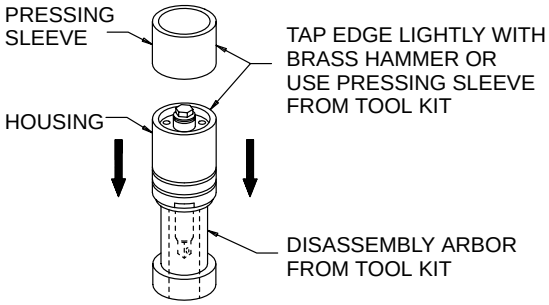
This is a left–hand thread, rotate the Motor Housing clockwise to remove it. Refer to Dwg. TDP1292.

5. Lift the assembled motor off the Mechanism Cover and pull the mechanism assembly out of the Cover. Remove the Bushing Spacer (61).
6. Using a 1.5 mm hex wrench, rotate the Torque Adjustment Screw (30) clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
7. Using the special Tee Wrench furnished in the Tool Kit (Part No. 180PQ–99), remove the Oil Plug (49) and Oil Plug Seal (50).
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 Housing Assembly (29) in vise jaws with the output end of the Drive Shaft downward.
10. Insert the pins of the spanner plug from the No. 180PQ–99 Tool Kit into the two holes in the Housing Cap (35). Using a wrench on the plug, unscrew and remove the Housing Cap from the Housing Assembly. Refer to Dwg. TPD1295.



(Dwg. TPD1295)

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. TPD1296.

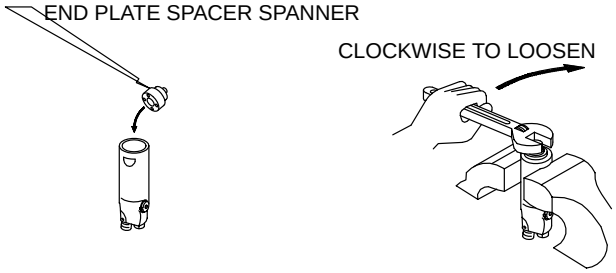


(Dwg. TPD1296)

12. Disassemble the components of the mechanism in the sequence shown in Drawing TPA1341 on Page 17.

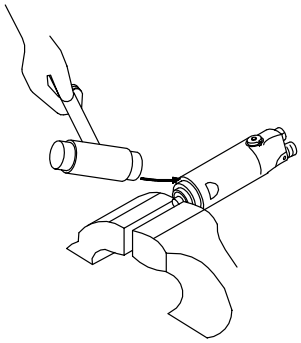
Disassembly of the Motor

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 (28). 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.



(Dwg. TPD1297)

3. Reposition the Motor Housing in the vise jaws so that the vise jaws grip the end of the rotor shaft and the Housing is horizontal. 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.

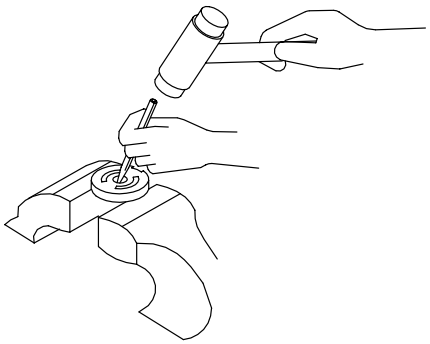


(Dwg. TPD1298)

4. Remove the motor from the vise jaws and remove the Front End Plate (25), Front End Plate Bearing (27), Cylinder Assembly (20) and Vanes (24) from the Rotor.
5. On the table of an arbor press, support the Rear End Plate (18) with blocks as close to the Rotor as possible and press the Rotor out of the Rear End Plate and Rear Rotor Bearing (19).
6. 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. TPD1299.

NOTICE

Do not enlarge or damage the shaft hole in the End Plate.



(Dwg. TPD1299)

7. Press the Reverse Lever Pin (4) out of the Reverse Lever (2) and remove the Reverse Lever, Reverse Lever Seal (3), Throttle Valve Spring (9) and the Throttle Ball (10).
8. Spread the end of the Suspension Bail (17), where the ends enter the Motor Housing, and remove the Bail.
9. Using a pin punch, tap the Throttle Lever Pin (8) and the Deflector Retaining Pin (16) out of the Handle. Remove the Throttle Lever (7), Throttle Plunger (11) and the Exhaust Deflector Assembly (15).
10. Push the Reverse Valve Assembly (5) out the throttle lever end of the Housing and Remove the two Reverse Valve Bushing Seals (14) if they need to be replaced.
11. Unscrew and remove the Inlet Bushing (13).

ASSEMBLY

General Instructions

1. 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.
2. Always press on the inner ring of a ball–type bearing when installing the bearing on a shaft.
3. Always press on the outer ring of a ball–type bearing when pressing the bearing into a bearing recess.
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.

Assembly of the Motor

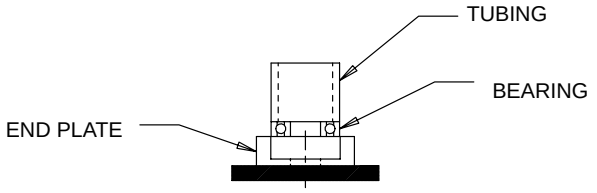
1. Thread the Inlet Bushing (13) into the threaded hole at the rear of the handle of the Motor Housing (1) and tighten it between 30 and 35 ft–lb (40 and 47 Nm) torque.
2. Position the Exhaust Deflector Assembly (15) in the hole at the rear of the motor housing handle and install the Deflector Retaining Pin (16) to secure it in position.

NOTICE

It may be necessary to slide the Assembly in or out in order to align the groove in the Assembly with the pin hole.

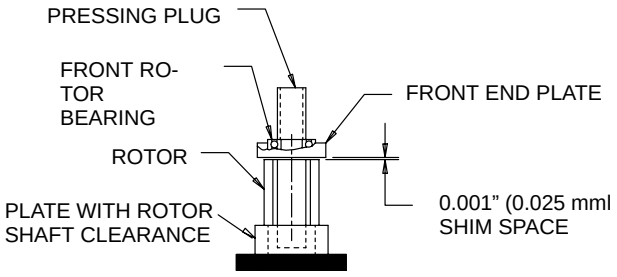
3. Install two new Reverse Valve Bushing Seals (14) in the grooves inside the reverse valve bushing, if they were removed.
4. Install the Reverse Valve Seal (6) in the groove next to the large hub of the Reverse Valve (5).
5. Install the Reverse Valve Assembly, seal end trailing, into the lever side oif the Motor Housing. Make certain the square depression on the shft of the Valve faces forward toward the output end of the tool.
6. Install the Reverse Lever Seal (3) in the groove on the small hub of the Reverse Lever (2).

7. Insert the Throttle Ball (10) followed by the Throttle Valve Spring (9) into the Reverse Valve Assembly.
8. Position the Reverse Lever Assembly on the Reverse Valve Assembly with the indicator lever rearward. Make certain the crossholes in the Lever align with the pin holes in the Valve. Press the Reverse Lever Pin (4) into the Lever and Valve.
9. Insert the Throttle Plunger (11) into the Reverse Valve Assembly.
10. Position the Throttle Lever (7) on the Motor Housing and secure it by pressing the Throttle Lever Pin (8) into the Housing and Lever.
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. TPD1300.



(Dwg. TPD1300)

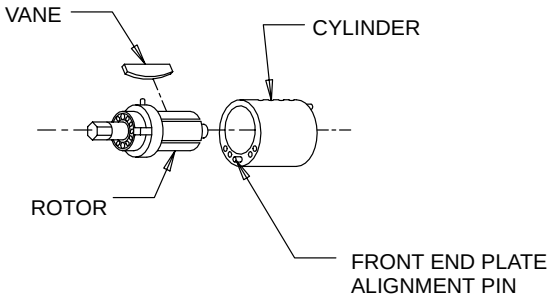
12. Stand the Rotor (23) on the table of an arbor press. It should be upright on a flat metal plate having a clearance hole for the shaft. The shaft with the hex must be upward.
13. Place a 0.001” (0.025 mm) shim on the upward surface of the large portion of the rotor body. Using a piece of tubing that contacts the inner ring of the bearing, press the Front Rotor Bearing and Front End Plate, End Plate leading, onto the shaft of the Rotor until the End Plate contacts the shim. Remove the shim. Refer to Dwg. TPD1301.



(Dwg. TPD1301)

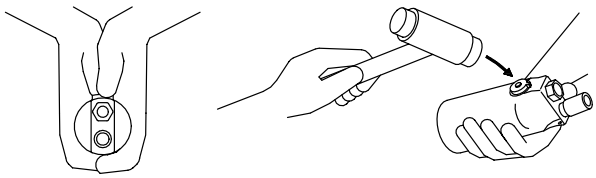
14. Coat each Vane (24) with a thin film of oil and insert a Vane into each of the rotor vane slots with the straight edge of the Vane outward.

15. Install the Cylinder (20) over the Vanes and Rotor with the end of the Cylinder having the Alignment Pin (22) in the middle of the four holes positioned toward the Front End Plate. Refer to Dwg. TPD1302. Make certain the Pin enters the hole in the face of the Front End Plate.



(Dwg. TPD1302)

16. Place the Rear End Plate and Bearing against the face of the Cylinder, Bearing end trailing. Make certain the Rear End Plate Alignment Pin (21) protrudes through the hole in the End Plate.
17. Insert the assembly, Rear End Plate leading, into the Motor Housing making sure the Alignment Pin protruding through the End Plate enters the proper hole in the Housing. It may be necessary to tap the assembly into position with a brass or plastic hammer. Refer to Dwg. TPD1303.

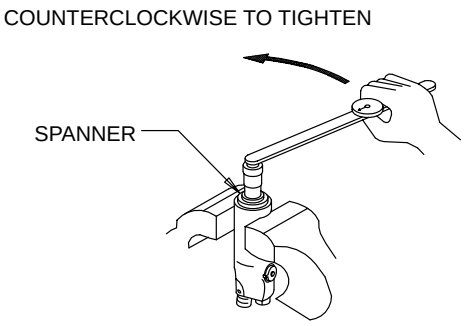


(Dwg. TPD1303)

18. Grasp the Motor Housing in vise jaws with the rotor shaft upward. Thread the Front End Plate Spacer (28) into the Housing and using the end plate spacer spanner, tighten the Spacer to 12 ft.–lb. (16 Nm) torque.

NOTICE

This is a left–hand thread; rotate the wrench counterclockwise to tighten. Refer to Dwg. TPD1304.

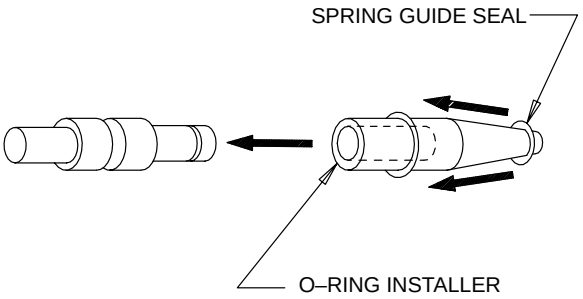


(Dwg. TPD1304)

19. 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.

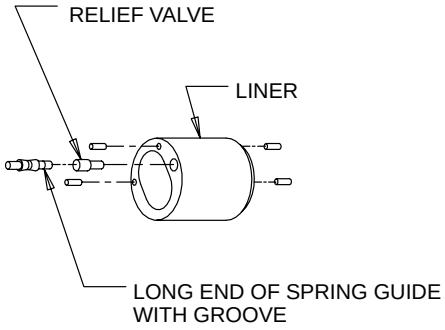
Assembly of the Impulse Mechanism

1. Insert the long shaft with the annular groove of the Spring Guide (41) into the central opening of the O–ring Installer furnished with the Tool Kit (Part No. 180PQ–99). Place the Spring Guide Seal (42) on the tapered end of the installer and roll the Seal up the taper and into the groove on the large body of the Spring Guide. Refer to Dwg. TPD1305.



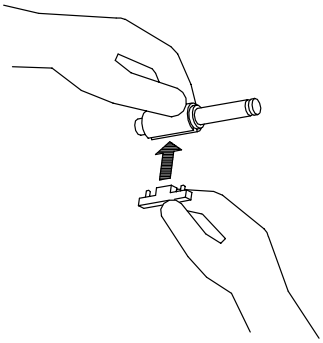
(Dwg. TPD1305)

2. Insert the Relief Valve (40), large end trailing, into the Liner (38). Insert the assembled Spring Guide, long hub with annular groove leading, into the Liner against the Relief Valve. Refer to Dwg. TPD1306.



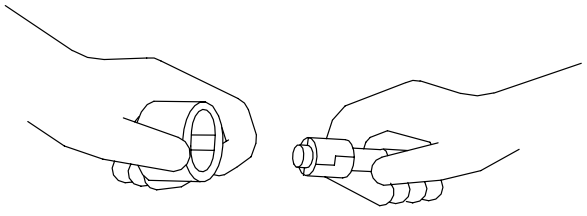
(Dwg. TPD1306)

3. Place a 3lade (44) into one of the slots of the Drive Shaft (42) with the Blade Assembly Pins (45) inward.
4. From the opposite side of the Shaft, encircle each Pin with a Blade Spring (46).
5. Install the Assembly Pins of the remaining Blade in the open ends of the Springs. Refer to Dwg. TPD1307.



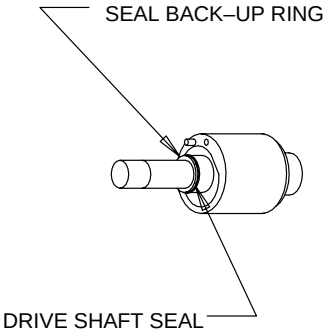
(Dwg. TPD1307)

6. Compress the Springs with the Blades until both Blades are 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 Spring Guide. Refer to Dwg. TPD1308. Make certain the ends of the Blades are flush with the ends of the Liner.



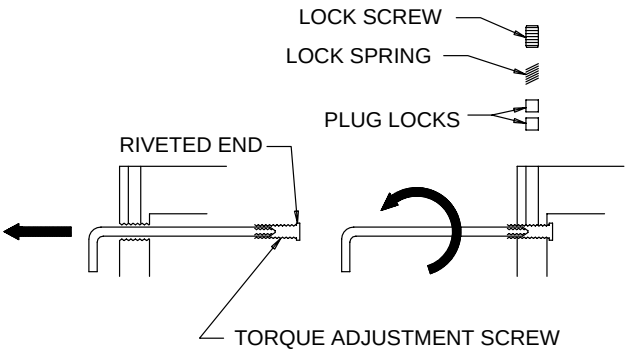
(Dwg. TPD1308)

7. Install the Drive Shaft Seal (56) followed by the Seal Back–up Ring (57) on the Drive Shaft against the hub. Refer to Dwg. TPD1309.



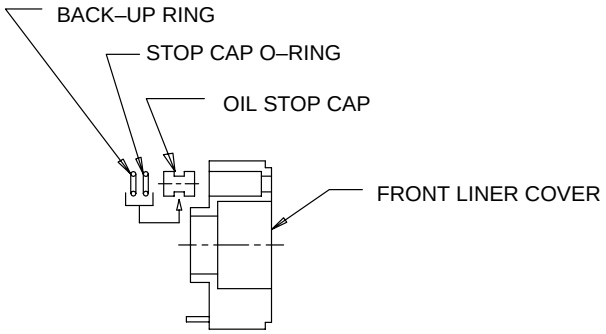
(Dwg. TPD1309)

8. The Torque Adjustment Screw (30) can only be installed from the liner end of the Impulse Housing (29). If the Torque Adjustment Screw was removed, proceed as follows:
   a. Insert a 1.5 mm hex wrench into the threaded hole for the Torque Adjustment Screw from the oil plug end of the Housing.
   b. From the opposite end of the Housing, install the hex of the Torque Adjustment Screw onto the hex wrench.
   c. Push the Screw and wrench toward the threaded hole until it contacts the face of the Housing.
   d. While applying finger pressure to the rivet end of the Screw, rotate the wrench counterclockwise to thread the Screw into the Housing. Continue rotating the Screw until the rivet end stops against the face of the Housing.
   e. Insert the two Adjustment Screw Plug Locks (31) and the Plug Lock Spring (32) into the crosshole leading to the Adjustment Screw. Thread the Plug Lock Screw (33) into the same hole to capture the components. Refer to Dwg. TPD1310.



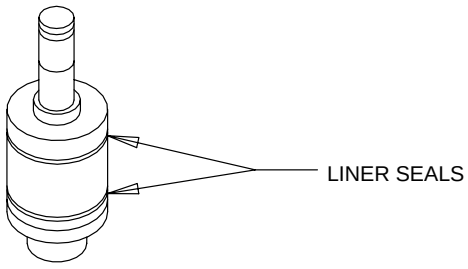
(Dwg. TPD1310)

9. If the Oil Stop Cap Assembly (51) was removed from the Front Liner Cover (47), install the Stop Cap O–ring (52) and Back–up Ring (53) in the groove of the Cap and insert the assembly into the Cover. Refer to Dwg. TPD1311.



(Dwg. TPD1311)

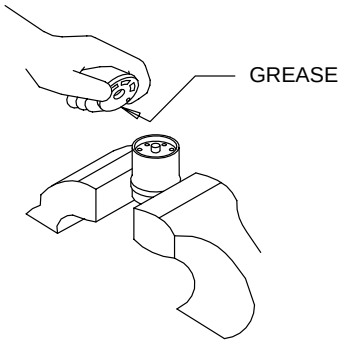
10. Install the Liner Cover O–ring (37) in the groove on the large hub of the Rear Liner Cover (36). Align the pin holes in the face of the Cover with the two Liner Pins (39) at the rear of the Liner and place the Cover against the Liner. A groove will be formed between the Liner and Cover for the Rear Liner Seal (55). Do not attempt to put the Seal in the groove at this time.
11. Align the pin holes in the Front Liner Cover (47) with the Pins in the front face of the Liner and place the Cover against the face of the Liner. Another groove will be formed between the Liner and Cover for the Front Liner Seal (54). Install both the Front and Rear Liner Seals in the grooves at this time and stand the assembly on the workbench with the output end of the Drive Shaft upward. Refer to Dwg. TPD1312.



(Dwg. TPD1312)

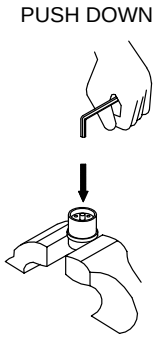
12. Apply a thin film of grease to the Liner O–ring (34) and install it in the forward bore of the Housing.
13. Lubricate the Front and Rear Liner Seals and after orienting the Housing to the proper position, install the Housing over the Liner.

14. 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. TPD1313.



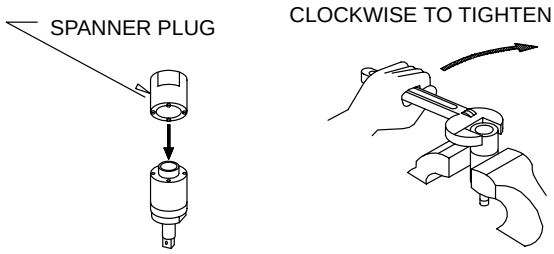
(Dwg. TPD1313)

15. Reinstall the Cover Assembly and use a hex wrench to push it below the threads at the rear of the Housing. Refer to Dwg. TPD1314.



(Dwg. TPD1314)

16. Install the Housing Cap (35) 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. TPD1315.



(Dwg. TPD1315)

17. Make certain the Drive Shaft rotates freely and then fill the mechanism with fluid and reassemble the tool as instructed in the section, **CHANGING THE MECHANISM FLUID**.

NOTES