

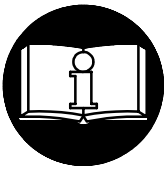
OPERATION AND MAINTENANCE MANUAL FOR MODELS 180PQ1, 280P AND 280PQ1 TWIN BLADE IMPULSE WRENCHES

NOTICE

Models 180PQ1, 280P and 280PQ1 Impulse Wrenches are designed for use in assembly operations requiring consistent torque. They are ideally suited to appliance assembly and applications requiring low noise levels.

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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WARNING LABEL IDENTIFICATION



FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

	WARNING Always wear eye protection when operating or performing maintenance on this tool.
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	WARNING Always wear hearing protection when operating this tool.
--	--

	WARNING Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.
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	WARNING 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.
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	WARNING Do not carry the tool by the hose.
--	--

	WARNING Do not use damaged, frayed or deteriorated air hoses and fittings.
--	--

	WARNING Keep body stance balanced and firm. Do not overreach when operating this tool.
--	--

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

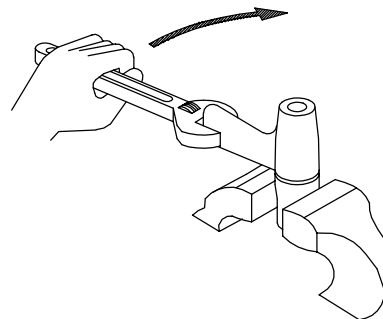
CHANGING THE MECHANISM FLUID

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

1. **For model 180PQ1 or 280PQ1**, 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.
2. Remove the Rubber Housing Boot.

3. Using 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. TPD1264.

CLOCKWISE TO LOOSEN



(Dwg. TPD1264)

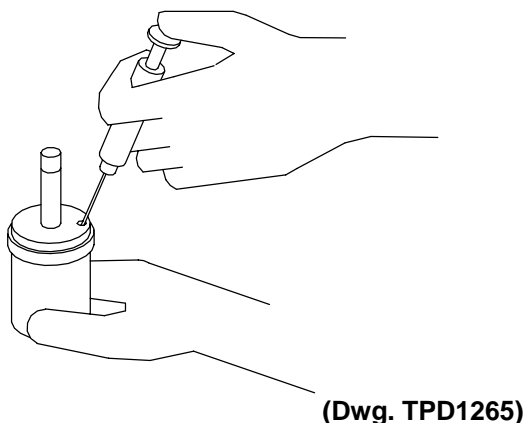
5. Lift the assembled motor off the Mechanism Cover and pull the mechanism assembly out of the Cover.
6. Using a 1.5 mm hex wrench, rotate the Torque Adjustment Screw clockwise until the Screw stops. Rotate the Screw counterclockwise until it stops or makes six complete revolutions.
7. Using the special 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. TPD1265.

NOTICE

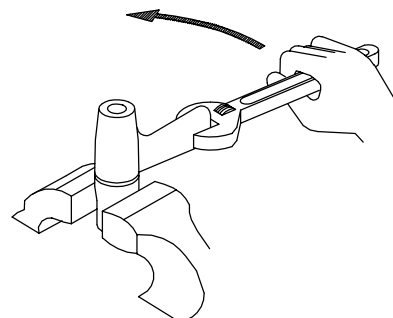
DO NOT SUBSTITUTE ANY OTHER FLUID. Failure to use the fluid provided could damage the tool, increase maintenance and decrease performance. Use only clean fluid in these tools.



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 from 180PQ1 models and .3 cc of fluid from 280P and 280PQ1 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 **counter-clockwise** to tighten it. See Dwg. TPD1266.

COUNTERCLOCKWISE TO TIGHTEN



PLACING TOOL IN SERVICE

LUBRICATION



Ingersoll-Rand No. 50



Ingersoll-Rand No. 67

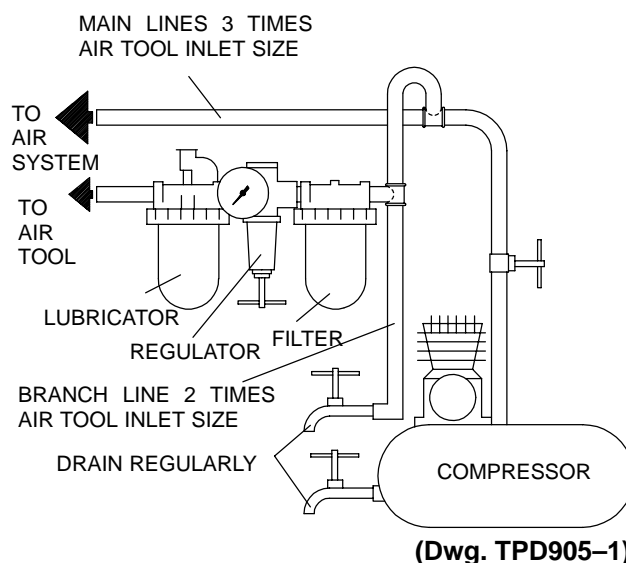


Ingersoll-Rand Fluid Part
No. EQ106S-400-1

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

For USA – No. C18-03-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.



HOW TO ORDER AN IMPULSE WRENCH

Model	Free Speed	Recommended Torque Range			
		Soft Draw		Hard Slam	
		ft-lb	Nm	ft-lb	Nm

PISTOL GRIP with 1/4" INSERT BIT CHUCK

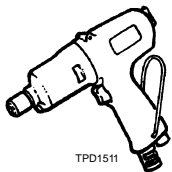
180PQ1	10,500	6-11	8-15	14-22	19-30
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PISTOL GRIP with 3/8" INSERT BIT CHUCK

280PQ1	9,500	10-16	14-22	16-26	22-35
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PISTOL GRIP with 3/8" SQUARE DRIVE

280P	9,500	12-18	16-24	18-28	24-38
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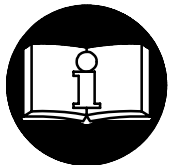
MANUEL D'EXPLOITATION ET D'ENTRETIEN DES CLÉS HYDRO-PNEUMATIQUES À DOUBLE PALETTE MODELES 180PQ1, 280P ET 280PQ1

NOTE

Les clés hydro-pneumatiques Modèles 180PQ1, 280P et 280PQ1 sont destinées aux opérations d'assemblage nécessitant des couples réguliers. Elles conviennent particulièrement à l'assemblage d'appareils et aux applications demandant un faible niveau sonore.

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 SECURITÉ 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 volatils tels que le kérosène, le gasol 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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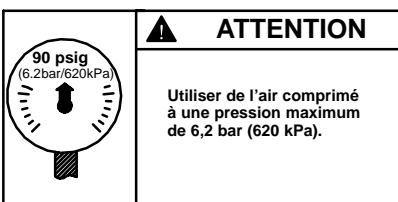
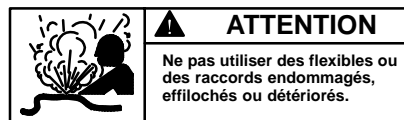
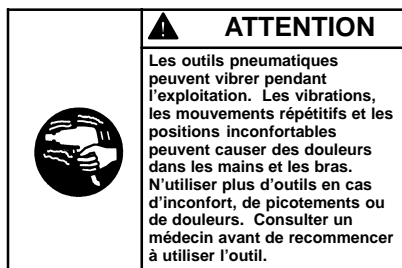
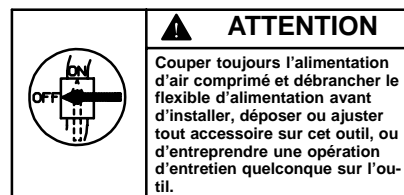
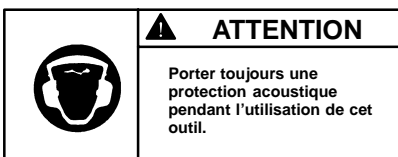
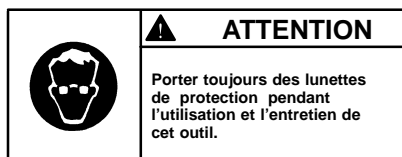
Imprimé aux É.U.



SIGNIFICATION DES ETIQUETTES 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 bi-lame, 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

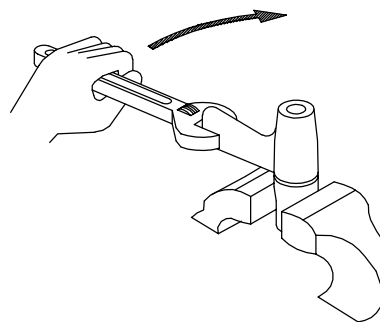
Le fluide du mécanisme d'impulsion est changé de la façon suivante :

1. Pour le Modèle 180PQ1 ou 280PQ1, 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. Déposer 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 TPD1264.

SENS DES AIGUILLES D'UNE MONTRE POUR DESSERRER



(Plan TPD1264)

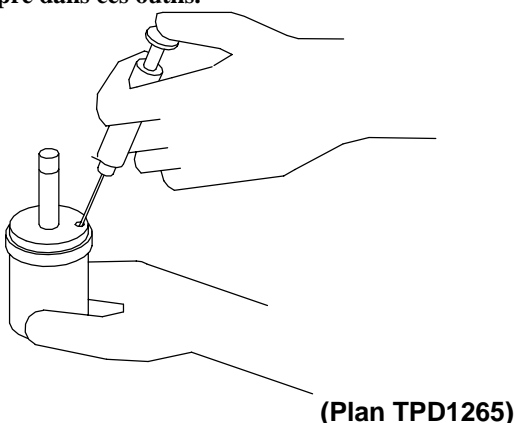
5. Retirer le moteur assemblé du couvercle du mécanisme et extraire le mécanisme du couvercle.
6. A l'aide d'une clé pour six pans creux de 1,5 mm, tourner la vis de réglage de couple dans le sens des aiguilles d'une montre jusqu'à ce qu'elle vienne en butée. Tourner la vis dans le sens inverse des aiguilles 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 retirer 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 TPD1265.

NOTE

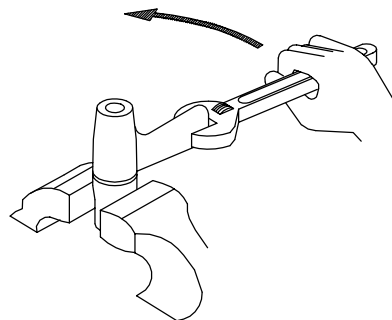
NE PAS UTILISER D'AUTRE FLUIDE. La non utilisation du fluide de mécanisme hydro-pneumatique fourni pourrait causer l'endommagement de l'outil, augmenter l'entretien et réduire les performances. N'utiliser que du fluide propre dans ces outils.



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 0,25 cm³ de fluide sur le modèle 180PQ1 et 0,3 cm³ sur les modèles 280P et 280PQ1.
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 TPD1266.

SENS INVERSE DES AIGUILLES
D'UNE MONTRE POUR LE SERRER



MISE EN SERVICE DE L'OUTIL

LUBRIFICATION



Ingersoll-Rand No. 50



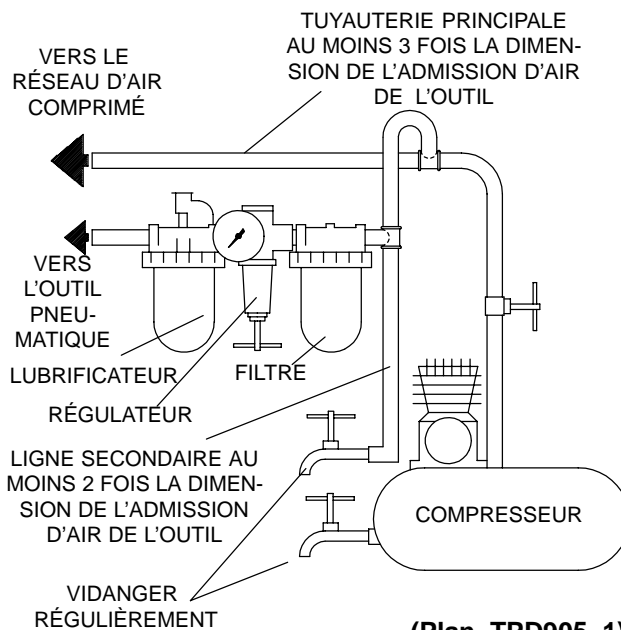
Ingersoll-Rand No. 67

Fluide Ingersoll-Rand
Réf. No. EQ106S-400-1

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

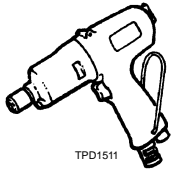
Pour E.U. – No. C18-03-FKG0-28

Tous les 20 000 cycles, ou en fonction de l'expérience, 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



SPÉCIFICATIONS

Modèle	Poignée à levier	Limiteur/ Entraînement	Vitesse libre	Gamme de couples recommandée	
				pouces	tr/mn
180PQ1	pistolet	embout 1/4"	10.500	6-11 (8-15)	14-22 (19-30)
280PQ1	pistolet	embout 3/8"	9.500	10-16 (14-22)	16-26 (22-35)
280P	pistolet	3/8" entr. carré	9.500	12-18 (16-24)	18-28 (24-38)



MANUAL DE USO Y MANTENIMIENTO PARA LLAVES DE IMPULSO DE DOBLE PALETA MODELOS 180PQ1, 280P Y 280PQ1

NOTA

Las Llaves de Impulso Modelos 180PQ1, 280P y 280PQ1 están diseñadas para operaciones de montaje que requieran un par constante. Resultan especialmente eficaces en montaje de máquinas y aplicaciones que requieren niveles de ruido bajos.

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 USAR 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 seguridad, máximo rendimiento y vida de servicio de las piezas, use esta herramienta a una presión de aire máxima de 90 psig (6,2 bar/620 kPa) en la 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 accesorios dañados, desgastados ni deteriorados.
- Asegúrese de que todas las mangueras y accesorios sean del tamaño correcto y estén bien apretados. Vea Esq. TPD905-1 para un típico arreglo de tuberías.
- Use siempre aire limpio y seco a una presión máxima de 90 psig. El polvo, los gases corrosivos y/o el exceso de humedad podrían 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.

USO DE LA HERRAMIENTA

- Use siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.
- Use 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 alerta sobre los cambios repentinos en el movimiento durante la puesta en marcha y el manejo de toda herramienta motorizada.
- Mantenga una postura de cuerpo equilibrada y firme. No estire demasiado los brazos al manejar la herramienta. Pueden ocurrir reacciones de alto par a, o a menos de, la recomendada presión de aire.
- El eje de la herramienta podría seguir girando brevemente después de haber soltado la palanca de estrangulación.
- Las herramientas neumáticas pueden vibrar durante el uso. La vibración, repetición o posiciones incómodas pueden dañarle los brazos y manos. En caso de incomodidad, sensación de hormigueo o dolor, deje de usar la herramienta. Consulte a un médico antes de volver a usarla otra vez.
- 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 podría 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 serán realizadas por personal cualificado y autorizado. Consulte con el centro de servicio Ingersoll-Rand autorizado más próximo.

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

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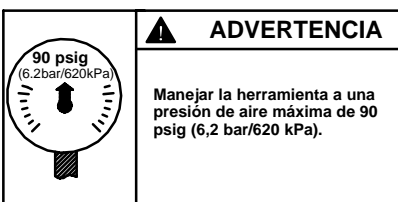
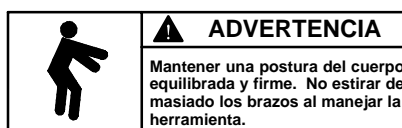
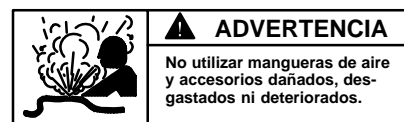
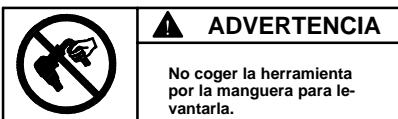
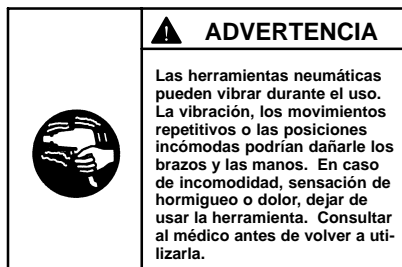
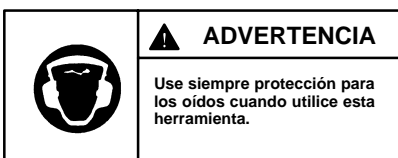
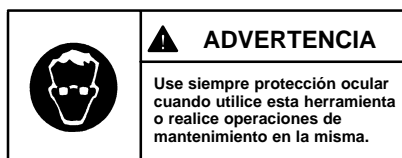
Impreso en EE. UU.



ETIQUETAS DE AVISO

AVISO

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



AJUSTES

AJUSTE DE PAR

Para ajustar el par de estas Llaves de Impulso de Doble Paleta, proceda como sigue:

1. Saque el Tapón de 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 de Aceite.

NOTA

Haga todos los ajustes finales trabajando.

4. Vuelva a poner en su sitio el Tapón de Orificio de Ajuste.

CAMBIO DE FLUIDO DE MECANISMO

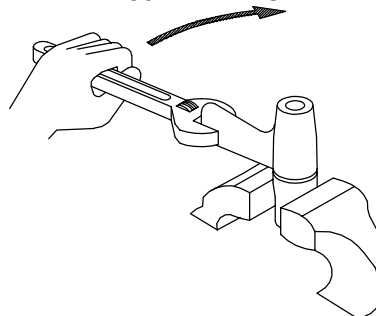
Para cambiar el fluido de mecanismo del mecanismo de impulso, proceda como sigue:

1. **Para los Modelos 180PQ1 o 280PQ1**, utilizar una varilla puntiaguda para empujar el asiento de muelle contra el muelle de manga retenedora. Mientras el muelle está comprimido, use otra varilla puntiaguda o destornillador de hoja fina para sacar el Aro Retenedor. Saque el asiento de muelle, muelle y manga retenedora de broca fuera del eje de accionamiento y saque la bola retenedora de broca.
2. Saque la funda de carcasa de caucho.
3. Sujete con cuidado los lados planos de la cubierta de 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 carcasa de motor de la cubierta de mecanismo. Puesto que se trata de **una rosca hacia la izquierda**, gire la carcasa de motor **en el sentido de las agujas del reloj** para quitarla. Vea Esq. TPD1264

SENTIDO DE LAS AGUJAS DEL RELOJ PARA DESATAR



(Esq. TPD1264)

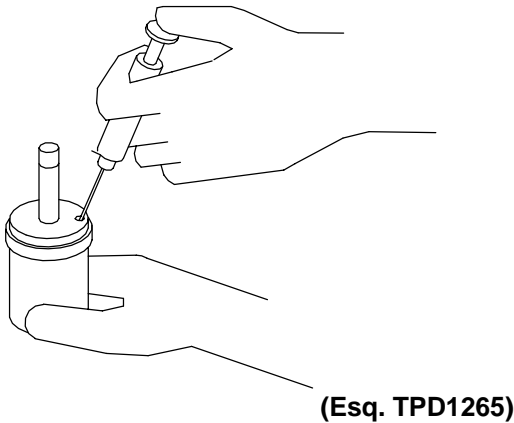
5. Levante el motor ensamblado y sáquelo de la carcasa de mecanismo y saque el conjunto de mecanismo fuera de la cubierta.
6. Con una llave hexagonal de 1,5 mm, gire el Tornillo de Ajuste de Par a la derecha hasta que se pare. Gire el tornillo a la izquierda hasta que se pare o dé seis vueltas completas.
7. Utilizando la llave en T especial suministrada con la caja de herramientas (Pieza N° 180PQ-99), saque el tapón de aceite y el retén de dicho tapón de aceite.

AJUSTES

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

NOTA

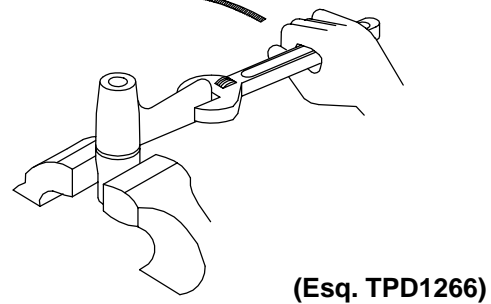
NO SUSTITUYA NINGÚN OTRO FLUIDO. Si no se usa el fluido suministrado, se podría dañar la herramienta, incrementar su mantenimiento y disminuir su rendimiento. Use solamente fluido limpio en estas herramientas.



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

- Con una llave hexagonal de 1,5 mm, gire el Tornillo de Ajuste de Par a la derecha 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 0,25 cc de fluido de los modelos 180PQ1 y 0,3 cc de los modelos 280P y 280PQ1.
- Instale el Tapón de Cámara de Aceite y apriételo entre 20 y 25 pulg.-lb (2,3 a 2,8 Nm) de par.
- Inserte el conjunto de mecanismo, con el extremo de salida primero, en la cubierta del mecanismo fijado en un tornillo de banco.
- Inserte el extremo hexagonal del eje rotor en el hueco hexagonal de la parte trasera del eje de accionamiento, y enrosque la carcasa de motor ensamblado en la cubierta de mecanismo. Ésta es **una rosca hacia la izquierda**. Gire la carcasa en el **sentido opuesto al de las agujas del reloj** para apretarla. Vea Esq. TPD1266.

SENTIDO OPUESTO AL DE LAS AGUJAS DEL RELOJ PARA APRETAR

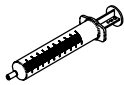


PARA PONER LA HERRAMIENTA EN SERVICIO

LUBRICACIÓN



Ingersoll-Rand N° 50



Utilice siempre un lubricador de aire comprimido con estas herramientas. Recomendamos la siguiente unidad de Filtro-Lubricador-Regulador:

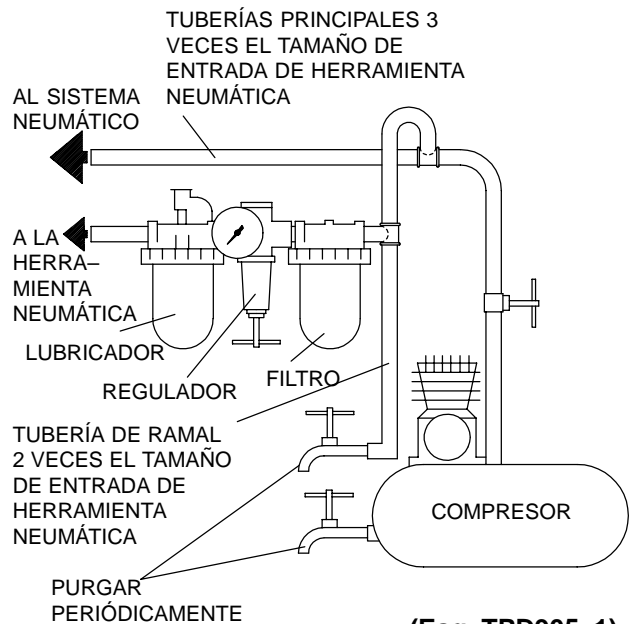
Para EE.UU. - N°. C18-03-FKG0-28

Después de cada 20 000 ciclos, o como indique la experiencia, drene y vuelva a llenar el Conjunto de Accionamiento de Unidad de Impulso tal y como se indica en este manual, usando el equipo de cambio de fluido (Pieza N° EQ106S-K400). Lubrique el eje de salida y accionamiento hexagonal antes del montaje.



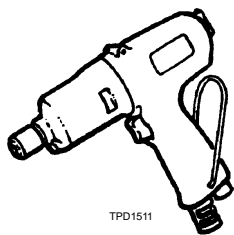
Ingersoll-Rand N° 67

Pieza de fluido
Ingersoll-Rand
N°. EQ106S-400-1



ESPECIFICACIONES

Modelo	Tipo de Empuñadura	Portabroca/Accionamiento	Velocidad Libre	Gama de par recomendada	
				Retroceso Suave ft-lbs (Nm)	Golpe Fuerte ft-lbs (Nm)
		pulg.	rpm		
180PQ1	pistola	1/4 pulg. broca de inserción	10.500	6-11 (8-15)	14-22 (19-30)
280PQ1	pistola	3/8 pulg. broca de inserción	9.500	10-16 (14-22)	16-26 (22-35)
280P	pistola	cuadradillo de 3/8 pulg.	9.500	12-18 (16-24)	18-28 (24-38)



TPD1511

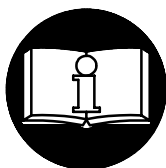


MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA FERRAMENTAS PNEUMÁTICAS DE IMPULSO DE LÂMINAS DUPLAS MODELOS 180PQ1, 280P E 280PQ1

AVISO

As Ferramentas Pneumáticas de Impulso Modelos 180PQ1, 280P e 280PQ1 são concebidas para uso em operações de montagem que necessitem torque consistente. Elas são adequadas idealmente para montagens de equipamento e aplicações que exijam níveis baixos de ruído.

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, 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 ter 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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IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA


▲ ADVERTÊNCIA


O NÃO CUMPRIMENTO DAS SEGUINTE ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.


	▲ ADVERTÊNCIA Use sempre óculos de proteção quando estiver operando ou executando algum serviço de manutenção nesta ferramenta.
---	---


	▲ ADVERTÊNCIA Use sempre proteção contra o ruído ao operar esta ferramenta.
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	▲ ADVERTÊNCIA 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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	▲ ADVERTÊNCIA 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.
---	---

	▲ ADVERTÊNCIA Não carregue a ferramenta segurando na mangueira.
---	---

	▲ ADVERTÊNCIA Não use mangueiras de ar ou adaptadores danificados, gastos ou deteriorados.
---	--

	▲ ADVERTÊNCIA 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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	▲ ADVERTÊNCIA Opere com pressão do ar Máxima de 90–100 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 dos 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.

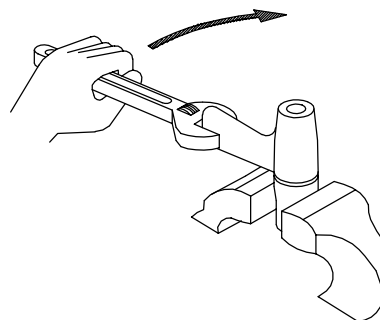
MUDANDO O FLUIDO DO MECANISMO

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

1. Para o modelo 180PQ1 ou 280PQ1, 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 mordentes de morsa de cobre, agarre com cuidado as pás da Capa do Mecanismo com a extremidade de saída do Eixo de Comando para baixo.
4. Usando uma chave ajustável, desparafuse o Conjunto do Corpo do Motor da Cobertura do Mecanismo. Esta é uma **rosca à esquerda**, gire o Corpo do Motor **no sentido horário** para removê-lo. Veja o Desenho TPD1264.

SENTIDO HORÁRIO PARA SOLTAR



(Desenho TPD1264)

5. Erga para fora o motor montado 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 dos ponteiros do relógio até que ele pare ou execute seis voltas completas.

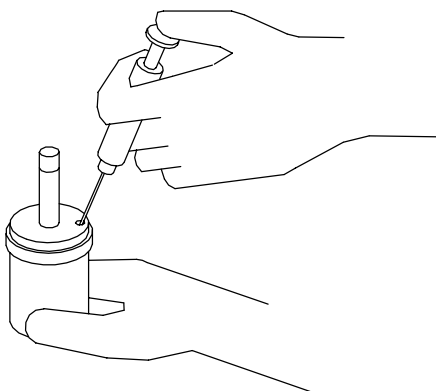
AJUSTES

7. Usando uma Chave em T (Tee) 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 fluido do mecanismo.
9. 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.

AVISO

NÃO SUBSTITUA POR QUALQUER OUTRO FLUIDO.

Caso o fluido fornecido não for usado danos podem ocorrer à ferramenta, aumento da manutenção e diminuição do desempenho. Use somente fluido limpo nestas ferramentas.

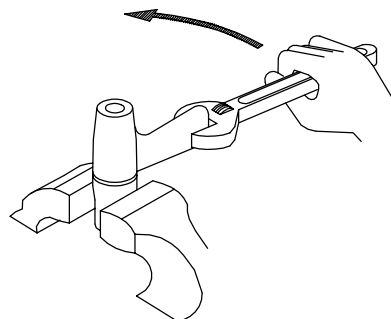


(Desenho TPD1265)

10. A abertura de enchimento deve ser submersa no restante do fluido, e usando uma chave, gire o Eixo de 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 seco e limpe e remova o Bujão da Câmara de Óleo. Usando uma seringa, retire 0,25 cc de fluido dos modelos 180PQ1 e 0,3 cc dos modelos 280P e 280PQ1.
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 grampeada nas garras da morsa.
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 TPD1266.

SENTIDO CONTRÁRIO AO DOS PONTEIROS DO RELÓGIO PARA APERTAR



(Desenho TPD1266)

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

LUBRIFICAÇÃO



Ingersoll-Rand No. 50



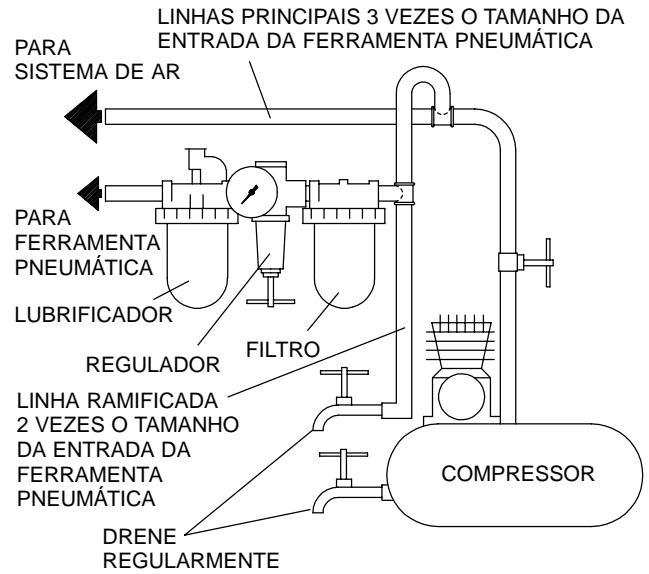
Ingersoll-Rand No. 67

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 E.U.A. – No. C18-03-FKG0-28

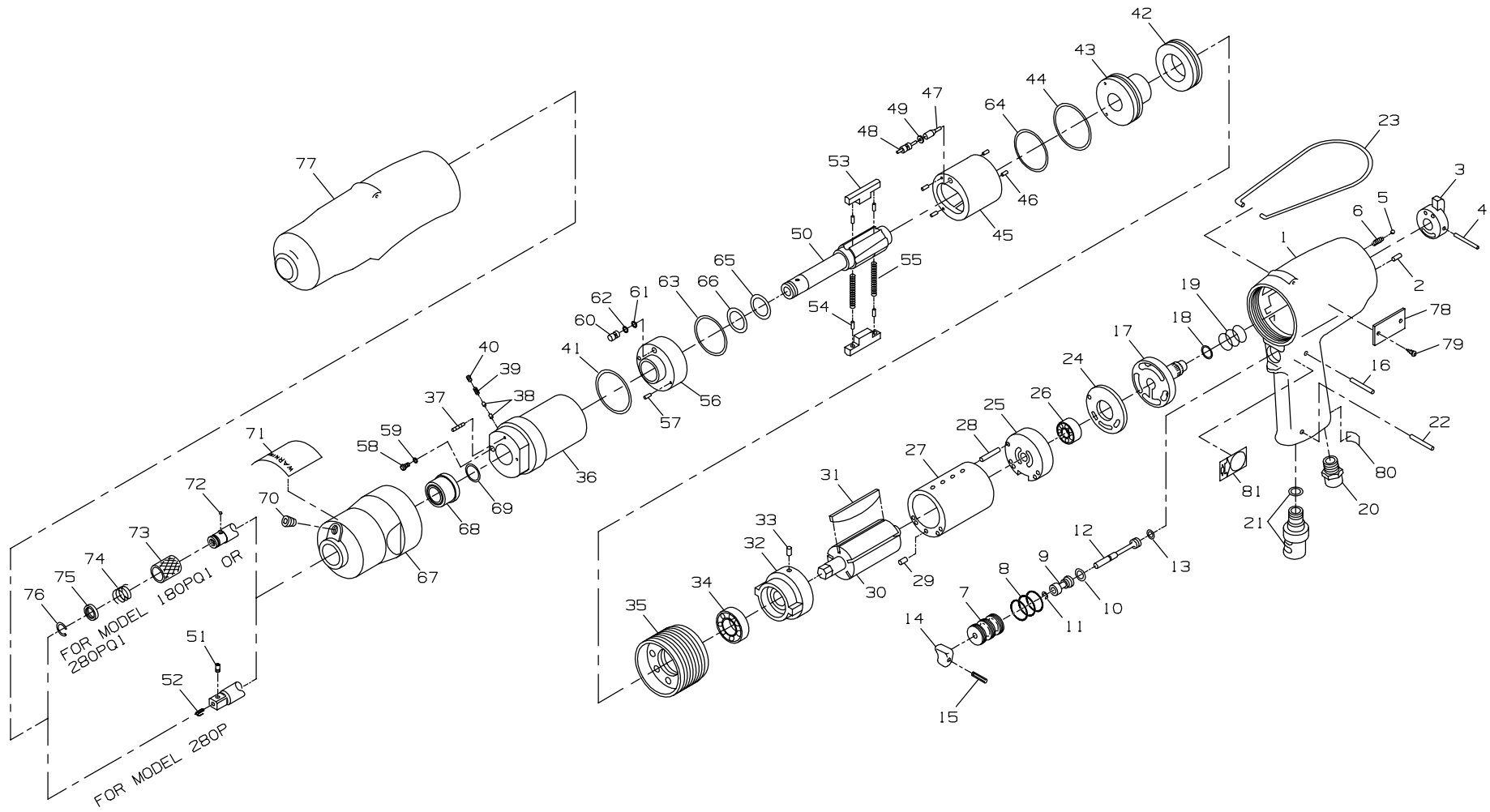
Depois de cada 20 000 ciclos, ou como a experiência indicar, drene e encha o Conjunto do Comando da Unidade de Impulso como instruído neste manual usando o Kit de Reposição de Flúido (Número de Pedido EQ106S-K400). Lubrifique o comando hexagonal e o eixo de saída antes de montar.



(Desenho TPD905-1)

ESPECIFICAÇÕES

Modelo	Tipo de Punho	Encabadouro/Comando	Velocidade Livre	Intervalo de Torque Recomendado	
				Aperto Ligeiro Nm (pés-lb)	Batimento Duro Nm (pés-lb)
		pol.	rpm		
180PQ1	pistola	1/4" bite de inserção	10.500	8-15 (6-11)	19-30 (14-22)
280PQ1	pistola	3/8" bite de inserção	9.500	14-22 (10-16)	22-35 (16-26)
280P	pistola	3/8" quadrada	9.500	16-24 (12-18)	24-38 (18-28)



(Dwg. TPA1329)



PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

	Motor Housing Assembly		21	Exhaust Deflector Assembly	180PQ-A23
	for model 180PQ1	180PQ-A40	22	Deflector Retaining Pin	EQ106P-152
	for model 280P or 280PQ1	280PQ-A40	23	Suspension Bail	EQ106S-365
1	Motor Housing		24	Rear End Plate Spacer	180PQ-43
	for model 180PQ1	180PQ-40		Rear End Plate Assembly	180PQ-A12
	for model 280P or 280PQ1	280PQ-40	25	Rear End Plate	180PQ-12
2	Reverse Lever Alignment Pin	EQ104S-299	+ 26	Rear Rotor Bearing	500A-22
3	Reverse Lever	180PQ-328	27	Cylinder Assembly	
4	Reverse Lever Pin	380PQ-298		for model 180PQ1	180PQ-A3
5	Reverse Lever Detent Ball	EQ104S-333		for model 280P or 280PQ1	280PQ-A3
6	Reverse Lever Detent Spring	180PQ-566	28	Rear End Plate Alignment Pin	180PQ-152
7	Throttle Bushing Assembly	EQ106P-A503	29	Front End Plate Alignment Pin	2400P-152
8	Throttle Bushing Seal (3)	EQ106P-283	30	Rotor	
9	Throttle Valve Assembly	EQ106P-A304		for model 180PQ1	180PQ-53
10	Throttle Valve Seal	EQ106S-159		for model 280P or 280PQ1	280PQ-52
11	Valve Retaining Ring	EQ106P-303	+ 31	Vane Packet (set of 5 Vanes)	
12	Throttle Rod Assembly	EQ106P-A302		for model 180PQ1	180PQ-42-5
13	Throttle Rod Seal	EQ106P-288		for model 280P or 280PQ1	280PQ-42-5
14	Trigger	EQ106P-93		Front End Plate Assembly	180PQ-A11
15	Trigger Pin	EQ106P-265	32	Front End Plate	180PQ-11
16	Throttle Retaining Pin	180PQ-120	33	Alignment Pin	380SQ-298
17	Reverse Valve Assembly	180PQ-A329	+ 34	Front End Plate Bearing	500P-22
18	Reverse Valve Assembly	180PQ-67	35	Front End Plate Spacer	180PQ-41
19	Reverse Valve Spring	180PQ-567			
20	Inlet Bushing	EQ106S-565			

+ Indicates Motor Tune-up Kit part.

PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

	Impulse Unit Drive Assembly		53	Blade Assembly (2)	
	for model 180PQ1	180PQ-A200		for model 180PQ1	180PQ-A627
	for model 280P	280P-A200		for model 280P or	
	for model 280PQ1	280PQ-A200		280PQ1	280PQ-A627
36	Housing Assembly		54	Blade Assembly Pin	
	for model 180PQ1	180PQ-A31		(2 per assembly)	—
	for model 280P or 280PQ1 ...	280PQ-A31	55	Blade Spring (2)	180PQ-568
37	Torque Adjustment Screw	180PQ-230	56	Front Liner Cover Assembly	180PQ-A211
38	Adjustment Screw Plug Lock (2)	180PQ-283	57	Liner Cover Pin	180PQ-232
39	Plug Lock Spring	180PQ-219	58	Oil Plug	180PQ-277
40	Plug Lock Screw	500A-230	59	Oil Plug Seal	EQ110P-288
41	Liner O-ring	180PQ-236	60	Oil Stop Cap Assembly	180PQ-A38
42	Housing Cap	180PQ-207	61	Stop Cap O-ring	EQ106S-288
43	Rear Liner Cover Assembly	180PQ-A212	62	Back-up Ring	380SQ-272
44	Liner Cover O-ring	180PQ-273	63	Front Liner Seal	EQ104S-236
45	Liner Assembly		64	Rear Liner Seal	180PQ-273
	for model 180PQ1	180PQ-A203A	65	Drive Shaft Seal	180PQ-271
	for model 280P or 280PQ1 ...	280PQ-A203A	66	Seal Back-up Ring	380PQ-272
46	Liner Pin (4)	180PQ-298		Mechanism Cover Assembly	
47	Relief Valve	180PQ-298		for model 180PQ1	180PQ-A727
	for model 180PQ1	180PQ-222		for model 280P or 280PQ1	280PQ-727
	for model 280P or 280PQ1 ...	280PQ-222	67	Mechanism Cover	
48	Spring Guide Assembly			for model 180PQ1	180PQ-727
	for model 180PQ1	180PQ-A255		for model 280P or 280PQ1	280PQ-727
	for model 280P or 280PQ1 ...	280PQ-A255	68	Cover Bushing	180PQ-641
49	Spring Guide Seal	180PQ-272	69	Bushing Spacer	180PQ-229
50	Drive Shaft		70	Adjustment Hole Plug	180PQ-95
	for model 180PQ1	180PQ-626A	71	Warning Label	
	for model 280PQ1	280PQ-626C		for models ending in -EU	EU-99
50	Drive Shaft Assembly (for			for all other models	WARNING-2-99
	model 280P)	280P-A626A			
51	Socket Retaining Pin	5020-716			
52	Retaining Pin Spring	401-718			

PART NUMBER FOR ORDERING 

PART NUMBER FOR ORDERING 

	Bit Chuck Assembly (for model 180PQ1 or 280PQ1)	180PQ-A667	*	Mechanism Tune-up Kit (includes illustrated items 39, 41, 44, 49, 51, 52, 55, 59, 61, 62, 63, 64, 65, 66 and 69)	180PQ-K600A
72	Bit Retaining Ball	EQ104S-929			
73	Bit Retaining Sleeve	EQ104S-930	*	Fluid Replacement Kit (includes Fluid Syringe, Fill Tube and 4 oz. [31mL] of Replacement Fluid)	EQ106S-K400
74	Retaining Sleeve Spring	EQ104S-931			
75	Spring Seat	EQ104S-932			
76	Retaining Ring	EQ104S-933	*	Replacement Fluid (4 oz.)	EQ106S-400-1
77	Rubber Housing Boot		*	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
	for model 180PQ1	180PQ-2			
	for model 280P or 280PQ1	280PQ-2			
78	Nameplate		*	Square Drive Anvil (for model 180PQ1)	180P-626
	for model 180PQ1	180PQ-301			
	for model 280P	280P-301			
	for model 280PQ1	280PQ-301			
	for all models ending in -EU	280P-EU-301	*	Drive Shaft/Liner Replacement Kit (includes illustrated items 45 and 50)	
79	Nameplate Driver Screw (for model 280P) (2)	EQ106S-322		for model 180PQ1	180PQ-K203
80	Oil Daily Label	500P-69		for model 280PQ1	280PQ-K203
81	Two Speed Throttle Label	180PQ-68		for model 280P	280P-K203
*	Motor Tune-up Kit (includes illustrated items, 26, 31 and 34)				
	for model 180PQ1	180PQ-K500			
	for model 280P or 280PQ1	280PQ-K500			

* Not illustrated.

MAINTENANCE SECTION

⚠ WARNING

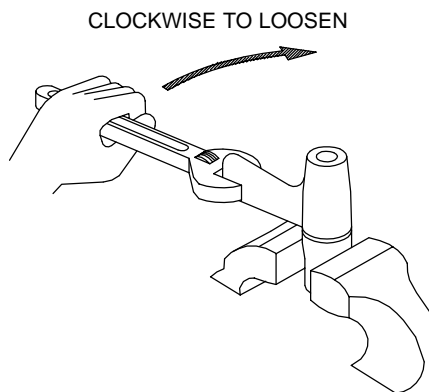
Always wear eye protection when operating or performing maintenance on this tool.

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.

CHANGING THE MECHANISM FLUID

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

1. For model 180PQ1 or 280PQ1, use a pointed probe to push the Spring Seat (75) against the Retaining Sleeve Spring (74). While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (76). Lift the Spring Seat, Spring and Bit Retaining Sleeve (73) off the Drive Shaft (50) and remove the Bit Retaining Ball (72).
2. Remove the Rubber Housing Boot (77).
3. Using copper-covered vise jaws, carefully grasp the flats of the Mechanism Cover (67) with the output end of the Drive Shaft downward.
4. Using an adjustable wrench, unscrew the 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)



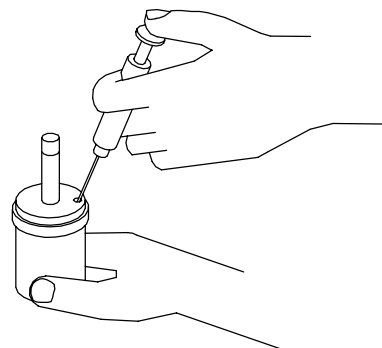
(Dwg. TPD1264)

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 (37) 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 (58) and Oil Plug Seal (59).
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

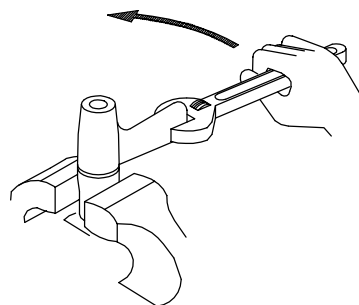
DO NOT SUBSTITUTE ANY OTHER FLUID. Failure to use the fluid provided could damage the tool, increase maintenance and decrease performance. Use only clean fluid in these tools.



(Dwg. TPD1265)

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 .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. (Refer to Dwg. TPD1266)

COUNTERCLOCKWISE TO TIGHTEN



(Dwg. TPD1266)

MAINTENANCE SECTION

DISASSEMBLY

General Instructions

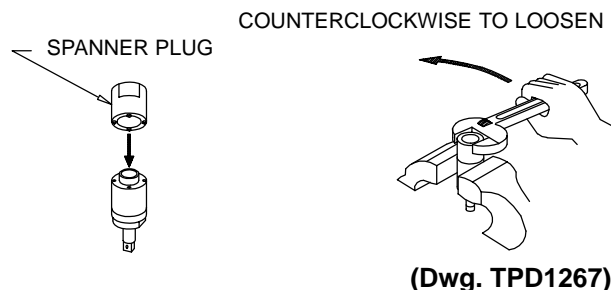
1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members 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 replacements.

Disassembly of the Impulse Mechanism

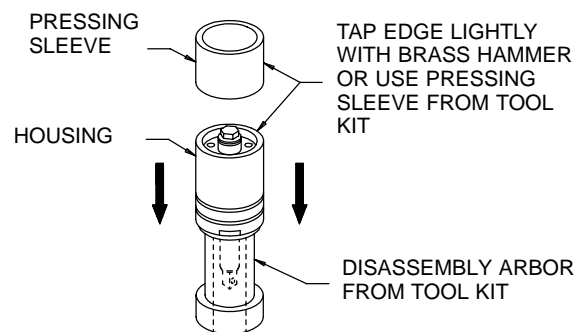
1. **For model 180PQ1 or 280PQ1**, use a pointed probe to push the Spring Seat (75) against the Retaining Sleeve Spring (74). While the Spring is compressed, use another pointed probe or thin blade screwdriver to remove the Retaining Ring (76). Lift the Spring Seat, Spring and Bit Retaining Sleeve (73) off the Drive Shaft (50) and remove the Bit Retaining Ball (72).
- For model 280P**, use a hooked wire to pull the Retaining Pin Spring (52) out of the end of the Drive Shaft (50) and remove the Socket Retaining Pin (51).
2. Remove the Rubber Housing Boot (77).
3. Using copper-covered vise jaws, carefully grasp the flats of the Mechanism Cover (67) with the output end of the Drive Shaft downward.
4. Using an adjustable wrench, unscrew the 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 Bushing Spacer (69).
6. Grasp the flats of the Housing Assembly (36) in vise

jaws with the output end of the Drive Shaft downward.

7. Insert the pins of the spanner plug from the No. 180PQ-99 Tool Kit into the two holes in the Housing Cap (42). Using a wrench on the plug, unscrew and remove the Housing Cap from the Housing Assembly. (Refer to Dwg. TPD1267)



8. 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)

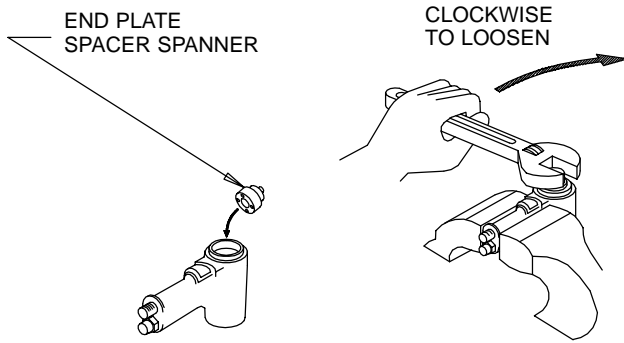


9. Disassemble the components of the mechanism in the sequence shown in Drawing TPA1329 on Page 17.

MAINTENANCE SECTION

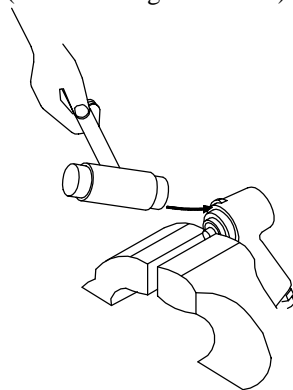
Disassembly of the Motor

1. Grasp the Motor Housing (1) in vise jaws with the shaft of the Rotor (30) upward.
2. Insert the pins of the end plate spacer spanner into the holes in the Front End Plate Spacer (35). 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. TPD1269)



(Dwg. TPD1269)

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. TPD1270)

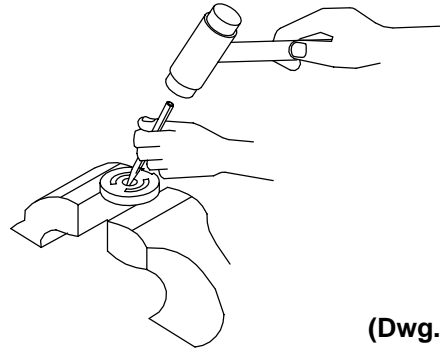


(Dwg. TPD1270)

4. Remove the motor from the vise jaws and remove the Front End Plate (32), Front End Plate Bearing (34), Cylinder Assembly (27) and Vanes (31) from the Rotor.
5. On the table of an arbor press, support the Rear End Plate (25) with blocks as close to the Rotor as possible and press the Rotor out of the Rear End Plate and Rear Rotor Bearing (26).
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. TPD1271)

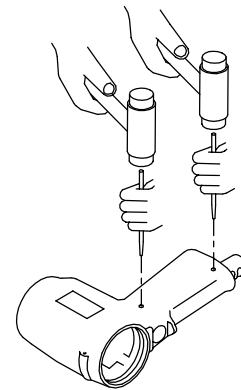
NOTICE

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



(Dwg. TPD1271)

7. Press the Reverse Lever Pin (4) out of the Reverse Lever (3) and remove the Reverse Lever Detent Ball (5), Reverse Lever Detent Spring (6), Reverse Valve Assembly (17) and the Reverse Valve Spring (19).
8. Using a pin punch, tap the Throttle Retaining Pin (16) and the Deflector Retaining Pin (22) out of the Handle. The Throttle Retaining Pin is protected by an embossed circular pad of metal. Insert the pin punch into the middle of the pad to locate the Pin. (Refer to Dwg. TPD1272)



(Dwg. TPD1272)

9. Grasp the Trigger (14) and pull the assembled throttle out of the Motor Housing.
10. Using a pin punch and without damaging the Trigger (14), remove the Trigger Pin (15).
11. Slide the Throttle Bushing Assembly (7) off the shaft of the Throttle Rod Assembly (12).
12. Using a thin blade screwdriver, remove the Valve Retaining Ring (11) and slide the Throttle Valve Assembly (9) off the shaft of the Throttle Valve Rod.
13. Grasp the Exhaust Deflector Assembly (21) and pull it out of the Housing.
14. Unscrew and remove the Inlet Bushing (20).

MAINTENANCE SECTION

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

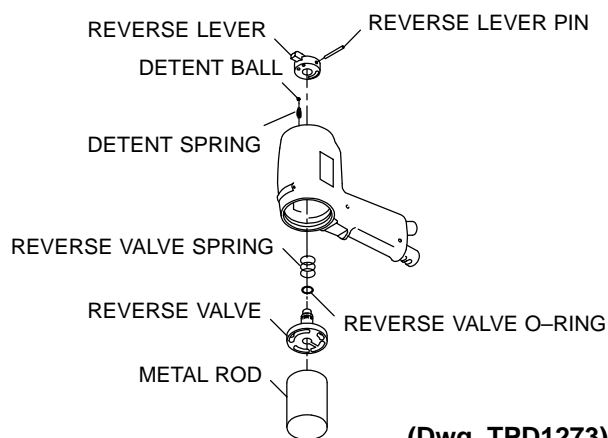
1. Thread the Inlet Bushing (20) into the bottom of the handle of the Motor Housing (1) and tighten it between 30 and 35 ft-lb (40 and 47 Nm) torque.
2. Position the Exhaust Deflector Assembly (21) in the bottom of the motor housing handle and install the Deflector Retaining Pin (22) to secure it in 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 the Throttle Rod Seal (13) in the groove on the large hub of the Throttle Rod (12).
4. Install the Throttle Valve Seal (10) in the groove on the large hub of the Throttle Valve (9).
5. Slide the Throttle Valve, Valve Seal end first, onto the Throttle Valve Rod.
6. Secure the Throttle Valve Assembly by installing the Valve Retaining Ring (11) in the small groove on the Throttle Valve Rod.
7. Install the three Throttle Bushing Seals (8) in the grooves on the Throttle Bushing (7).
8. Slide the Throttle Bushing Assembly onto the shaft of the Throttle Valve Rod and position the Trigger (14) on the same shaft. Install the Trigger Pin (15).

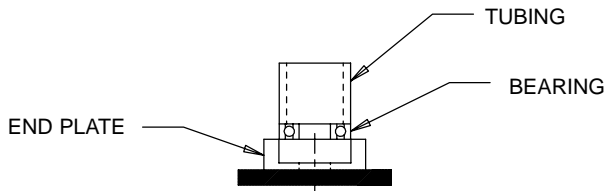
9. Insert the assembled Trigger into the Housing. Make certain the widest end of the Trigger is nearest the motor bore and the narrowest portion of the Throttle Valve aligns with hole for the Throttle Retaining Pin (16). Install the Pin making certain it captures the Throttle Valve and secures the assembled Trigger.
10. Install the Reverse Valve Seal (18) on the hub of the Reverse Valve (17).
11. Place the Reverse Valve Spring (19) over the hub of the Reverse Valve and insert the assembly, small hub leading, into the motor bore of the Housing. Insert the small hub through the Housing until it protrudes through the rear of the Housing. Position a 1-1/4" (32 mm) diameter metal rod about 3" (75 mm) long against the face of the Reverse Valve and stand the rod on a workbench with the weight of the Housing compressing the Reverse Valve Spring.
12. Place the Reverse Lever Detent Spring (6) followed by the Reverse Lever Detent Ball (5) into the hole in the face at the rear of the Motor Housing. Capture the Ball and Spring in position by installing the Reverse Lever (3) onto the hub of the Reverse Valve. Make certain the Reverse Lever Alignment Pin (2) enters the notch on the face of the Lever and that the crosshole in the hub of the Reverse Valve aligns with the crosshole in the Lever. (Refer to Dwg. TPD1273).



13. Lightly tap the Reverse Lever Pin (4) into the hole in the Lever and into the hole in the hub of the Reverse Valve. Remove the assembly from the metal rod and work the Lever several times to make certain all parts function smoothly.

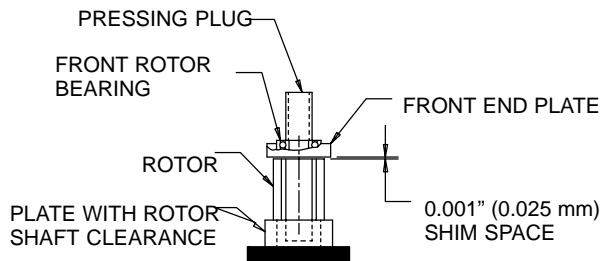
MAINTENANCE SECTION

14. Using an arbor press and a piece of tubing that contacts the outer ring of the bearings, press the Front End Plate Bearing (34) into the Front End Plate (32) and the Rear End Plate Bearing (26) into the Rear End Plate (25). (Refer to Dwg. TPD1274)



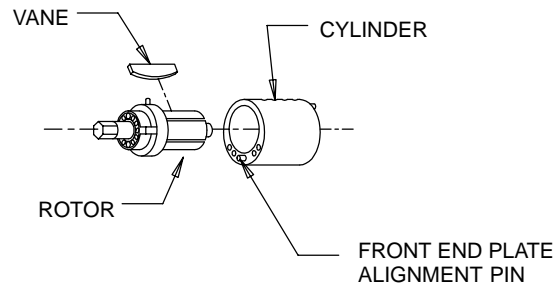
(Dwg. TPD1274)

15. Stand the Rotor (30) 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.
16. 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. TPD1275)



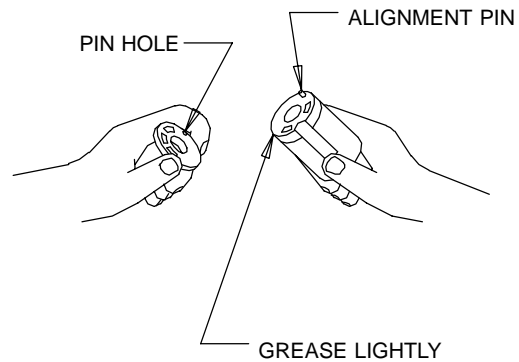
(Dwg. TPD1275)

17. Coat each Vane (31) 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.
18. Install the Cylinder (27) over the Vanes and Rotor with the end of the Cylinder having the Alignment Pin (29) in the middle of the four holes positioned toward the Front End Plate. (Refer to Dwg. TPD1276). Make certain the Pin enters the hole in the face of the Front End Plate.



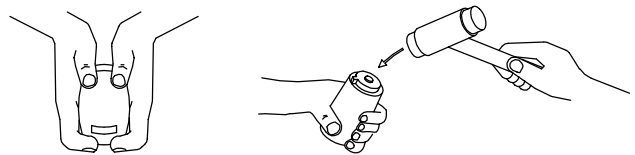
(Dwg. TPD1276)

19. Place the Rear End Plate and Bearing against the face of the Cylinder, Bearing end trailing. Make certain the Rear End Plate Alignment Pin (28) protrudes through hole in the End Plate.
20. Apply a thin film of Ingersoll-Rand No. 67 Grease to the face of the Rear End Plate and place the Rear End Plate Spacer (24) against the end plate face. Make certain the Alignment Pin enters the hole in the Spacer and there is sufficient grease to hold the Spacer against the End Plate. (Refer to Dwg. TPD1278)



(Dwg. TPD1278)

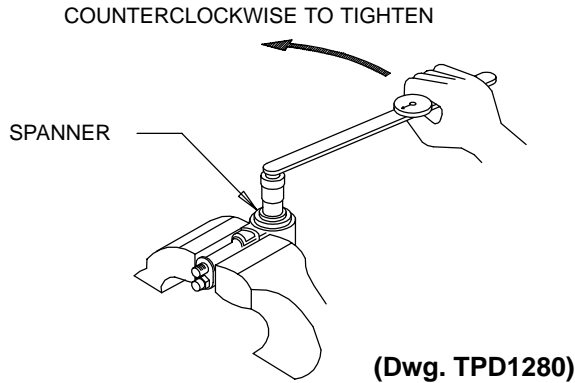
21. Insert the assembly, End Plate Spacer leading, into the Motor Housing making sure the Alignment Pin protruding through the Spacer enters the proper hole in the Reverse Valve. It may be necessary to tap the assembly into position with a brass or plastic hammer. (Refer to Dwg. TPD1279)



(Dwg. TPD1279)

MAINTENANCE SECTION

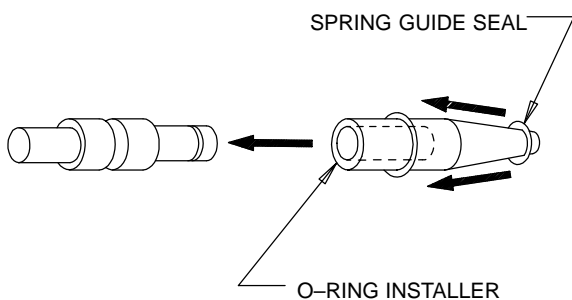
22. Grasp the handle of the Motor Housing in vise jaws with the rotor shaft upward. Thread the Front End Plate Spacer (35) into the Housing and using the end plate spacer spanner, tighten the Spacer to 12 ft-lb (16 Nm) torque. This is a **left-hand thread**; rotate the wrench **counterclockwise** to tighten. (Refer to Dwg. TPD1280).



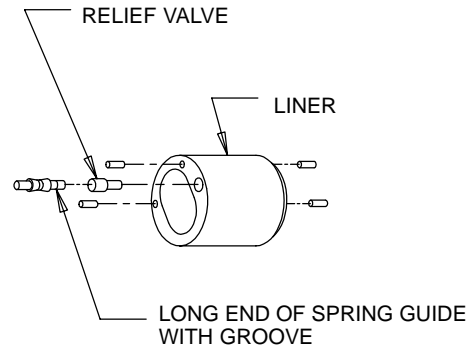
23. After installing the Front End Plate Spacer, grasp the shaft of the Rotor and rotate it by hand. If the Rotor does not turn easily, disassemble the motor unit and determine where the assembly is binding. The motor must rotate freely before proceeding further with the assembly.

Assembly of the Impulse Mechanism

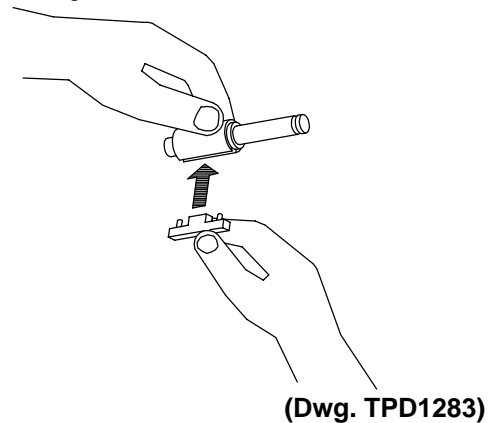
1. Insert the long shaft with the annular groove of the Spring Guide (48) into the central opening of the O-ring installer furnished with the Tool Kit (Part No. 180PQ-99). Place the Spring Guide Seal (49) on the tapered end of the installer and roll the Seal up the taper and into the groove on the large body of the Spring Guide. (Refer to Dwg. TPD1281)



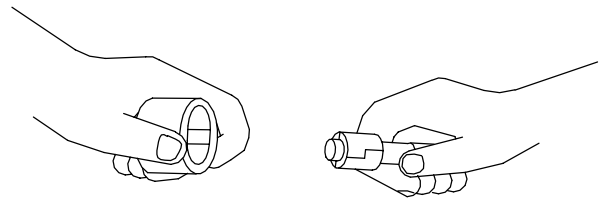
2. Insert the Relief Valve (47), large end trailing, into the Liner (45). Insert the assembled Spring Guide, long hub with annular groove leading, into the Liner against the Relief Valve. (Refer to Dwg. TPD1282)



3. Place a Blade (53) into one of the slots of the Drive Shaft (50) with the Blade Assembly Pins (54) inward.
4. From the opposite side of the Shaft, encircle each Pin with a Blade Spring (55).
5. Install the Assembly Pins of the remaining Blade in the open ends of the Springs. (Refer to Dwg. TPD1283).

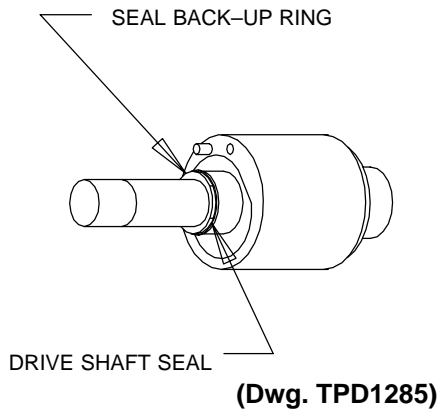


6. Compress the Springs with the Blades until both Blades are flush with the Drive Shaft and install the assembly in the Liner with the output end of the Drive Shaft protruding out the end of the Liner containing the Spring Guide. (Refer to Dwg. TPD1284). Make certain the ends of the Blades are flush with the ends of the Liner.

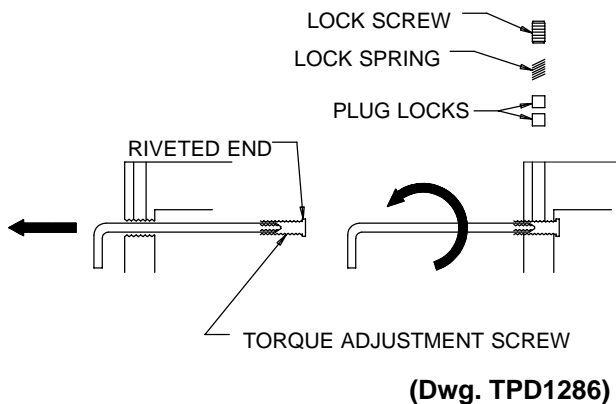


MAINTENANCE SECTION

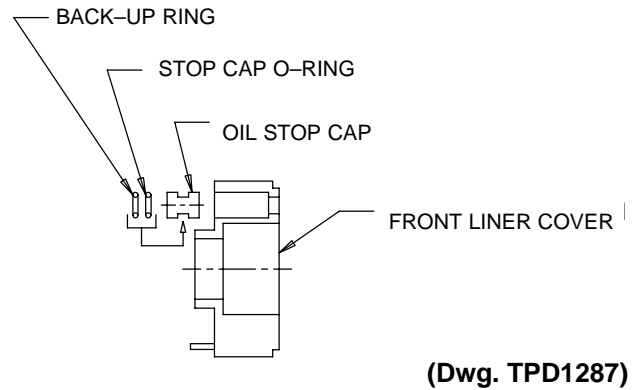
7. Install the Drive Shaft Seal (65) followed by the Seal Back-up Ring (66) on the Drive Shaft against the hub. (Refer to Dwg. TPD1285)



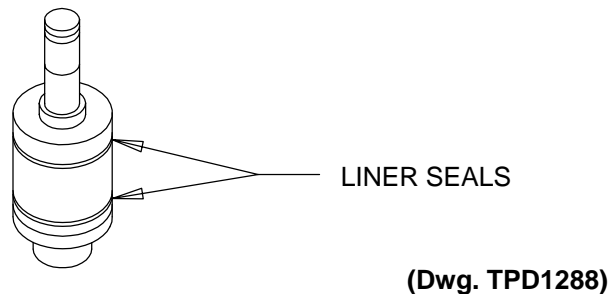
8. The Torque Adjustment Screw (37) can only be installed from the liner end of the Impulse Housing (35). If the Torque Adjustment Screw was removed, proceed as follows:
- Insert a 1.5 mm hex wrench into the threaded hole for the Torque Adjustment Screw from the oil plug end of the Housing.
 - From the opposite end of the Housing, install the hex of the Torque Adjustment Screw onto the hex wrench.
 - Push the Screw and wrench toward the threaded hole until it contacts the face of the Housing.
 - 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.
 - Insert the two Adjustment Screw Plug Locks (38) and the Plug Lock Spring (39) into the crosshole leading to the Adjustment Screw. Thread the Plug Lock Screw (40) into the same hole to capture the components. (Refer to Dwg. TPD1286)



9. If the Oil Stop Cap Assembly (60) was removed from the Front Liner Cover (56), install the Stop Cap O-ring (61) and Back-up Ring (62) in the groove of the Cap and insert the assembly into the Cover. (Refer to Dwg. TPD1287)



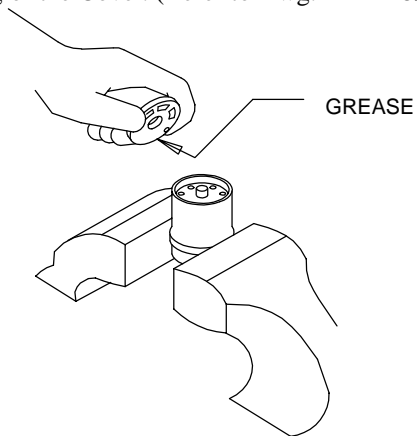
10. Install the Liner Cover O-ring (44) in the groove on the large hub of the Rear Liner Cover (43). Align the pin holes in the face of the Cover with the two Liner Pins (46) at the rear of the Liner and place the Cover against the Liner. A groove will be formed between the Liner and Cover for the Rear Liner Seal (64). Do not attempt to put the Seal in the groove at this time.
11. Align the pin holes in the Front Liner Cover (56) 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 (63). 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. TPD1288)



12. Apply a thin film of grease to the Liner O-ring (41) 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.

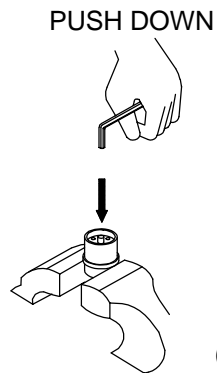
MAINTENANCE SECTION

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. TPD1289)



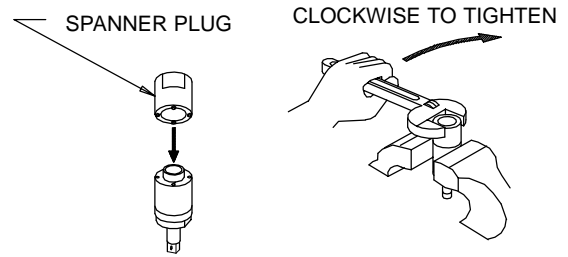
(Dwg. TPD1289)

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. TPD1290)



(Dwg. TPD1290)

16. Install the Housing Cap (42) and using the spanner plug furnished in the Tool Kit, tighten the Cap between 5 and 6 ft-lb (8 and 9 Nm) torque. (Refer to Dwg. TPD1291)



(Dwg. TPD1291)

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.**