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April, 2000

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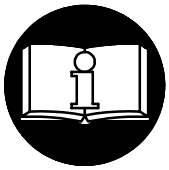
OPERATION AND MAINTENANCE MANUAL FOR SERIES QS AIR DRILLS

NOTICE

Series QS Drills are designed for drilling operations in the aerospace, automotive, appliance, electronic, machining and furniture industries.
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 1/4" (6 mm) inside diameter air supply hose.**
- **Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.**
- **Do not use damaged, frayed or deteriorated air hoses and fittings.**
- **Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905–1 for a typical piping arrangement.**
- **Always use clean, dry air at 90 psig (6.2 bar/620 kPa) maximum air pressure. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool.**
- **Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.**
- **Do not remove any labels. Replace any damaged label.**

USING THE TOOL

- **Always wear eye protection when operating or performing maintenance on this tool.**
- **Always wear hearing protection when operating this tool.**
- **Keep hands, loose clothing and long hair away from rotating end of tool.**
- **Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.**
- **Keep body stance balanced and firm. Do not overreach when operating this tool. High reaction torques can occur at or below the recommended air pressure.**
- **Tool accessories 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.**
- **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.

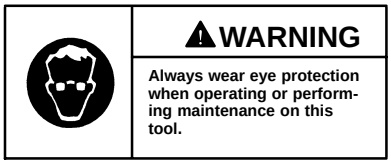
Printed in U.S.A.

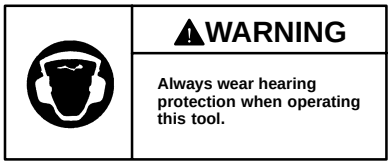
Ingersoll-Rand®

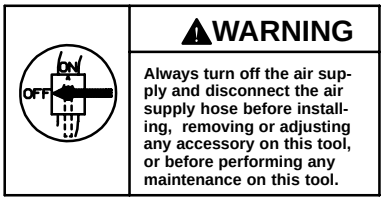
WARNING LABEL IDENTIFICATION

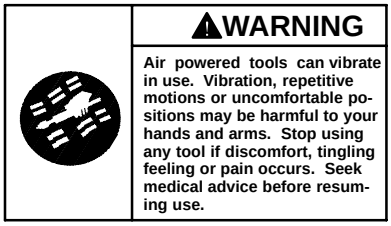
⚠ WARNING

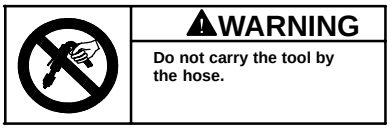
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

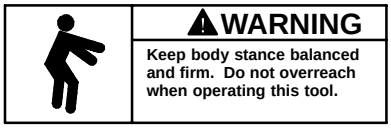


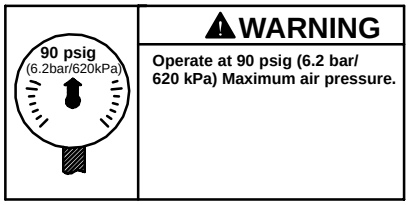












PLACING TOOL IN SERVICE

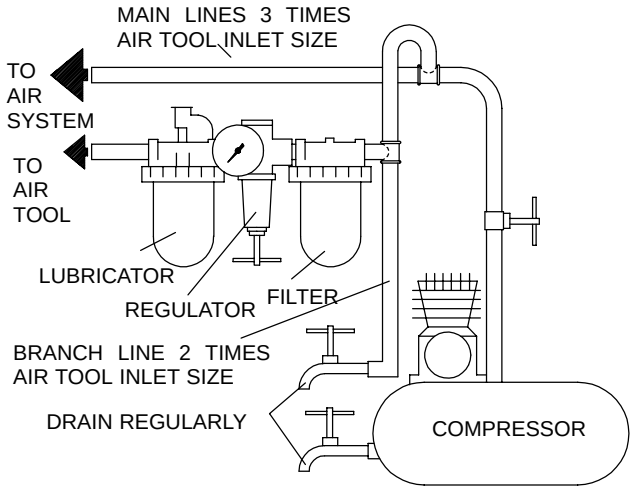
LUBRICATION

Ingersoll–Rand No. 10 **Ingersoll–Rand No. 67**

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

For USA – No. C08–02–FKG0–28

After each 40,000 cycles or each month, whichever occurs first, lubricate the gear train with Ingersoll–Rand No. 67 Grease.



(Dwg. TPD905–1)

SPECIFICATIONS

IN–LINE HANDLE WITH LEVER THROTTLE

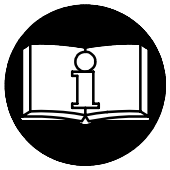
Model	Free Speed rpm	Chuck Capacity in	Chuck Capacity mm
QS511, QS511B, QS511BD, QS511D	5,100	1/4	6
QS381, QS381B, QS381BD, QS381D	3,800	1/4	6
QS301, QS301B, QS301BD, QS301D	3,000	1/4	6
QS201, QS201B, QS201BD, QS201D	2,000	1/4	6
QS151, QS151B, QS151BD, QS151D	1,500	1/4	6
QS091, QS091B, QS091BD, QS091D	900	1/4	6
QS051, QS051B, QS051BD, QS051D	500	1/4	6

F

MANUEL D'EXPLOITATION ET D'ENTRETIEN DES PERCEUSES PNEUMATIQUES DE LA SÉRIE QS

NOTE

Les perceuses de la Série QS sont destinées aux opérations de perçage dans les industries de l'aérospatiale, de l'automobile, des appareils ménagers, de l'électronique, de l'usinage et des meubles.
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 6 mm de diamètre intérieur.**
- **Couper toujours l'alimentation d'air comprimé et débrancher le flexible d'alimentation avant d'installer, déposer ou ajuster tout accessoire sur cet outil, ou d'entreprendre une opération d'entretien quelconque sur l'outil.**
- **Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.**
- **S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905–1 pour un exemple type d'agencement des tuyauteries.**
- **Utiliser toujours de l'air sec et propre à une pression maximum de 6,2 bar (620 kPa). La poussière, les fumées corrosives et/ou une humidité excessive peuvent endommager le moteur d'un outil pneumatique.**
- **Ne jamais lubrifier les outils avec des liquides inflammables ou volatiles tels que le kérosène, le gasoil ou le carburant d'aviation.**
- **Ne retirer aucune étiquette. Remplacer toute étiquette endommagée.**

UTILISATION DE L'OUTIL

- **Porter toujours des lunettes de protection pendant l'utilisation et l'entretien de cet outil.**
- **Porter toujours une protection acoustique pendant l'utilisation de cet outil.**
- **Tenir les mains, les vêtements 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.**
- **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.

Ingersoll-Rand®

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

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

⚠ 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

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

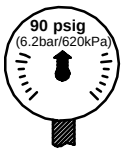
Ne pas transporter l'outil par son flexible.

⚠ ATTENTION

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

⚠ ATTENTION

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



⚠ ATTENTION

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

MISE EN SERVICE DE L'OUTIL

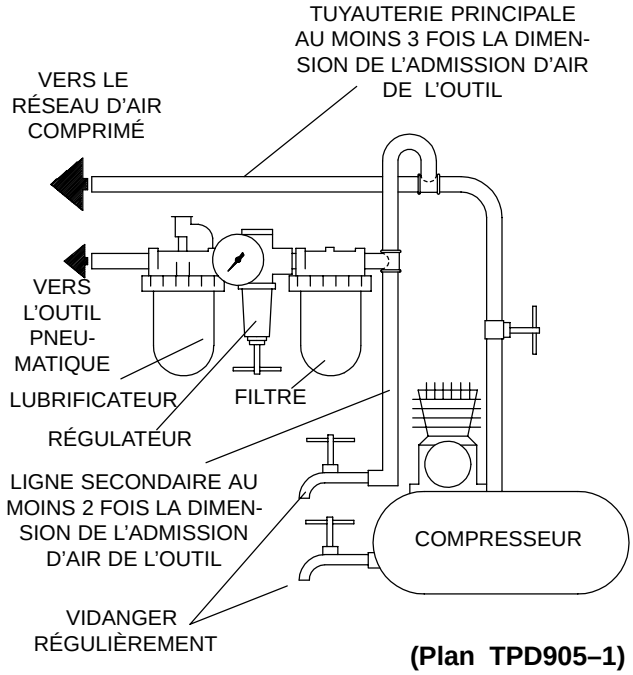
LUBRIFICATION

Ingersoll–Rand No. 10 **Ingersoll–Rand No. 67**

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

É.U. – No. C08–02–FKG0–28

Tous les 40.000 cycles ou au moins tous les mois, lubrifier le train d'engrenages avec de la graisse Ingersoll–Rand No. 67.



(Plan TPD905–1)

SPÉCIFICATIONS

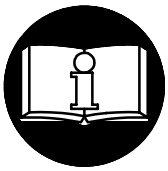
Modèle	Type de poignée	Vitesse à vide	Capacité du mandrin	
		tr/mn	pouces	mm
QS511, QS511B, QS511BD, QS511D	en ligne	5.100	1/4	6
QS381, QS381B, QS381BD, QS381D	en ligne	3.800	1/4	6
QS301, QS301B, QS301BD, QS301D	en ligne	3.000	1/4	6
QS201, QS201B, QS201BD, QS201D	en ligne	2.000	1/4	6
QS151, QS151B, QS151BD, QS151D	en ligne	1.500	1/4	6
QS091, QS091B, QS091BD, QS091D	en ligne	900	1/4	6
QS051, QS051B, QS051BD, QS051D	en ligne	500	1/4	6

E

MANUAL DE FUNCIONAMIENTO Y MANETNIMIENTO PARA TALADROS NEUMÁTICOS DE LA SERIE QS

NOTA

Los taladros de la serie QS están diseñados para las operaciones de taladrado en las industrias aeroespacial, del automóvil, de electrodomésticos, electrónica, mecánica y del mueble. 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 6 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

- **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 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.**
- **Los accesorios de la herramienta podrían 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.**
- **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.

Impreso en EE. UU.

Ingersoll-Rand®

ETIQUETAS DE AVISO

⚠ AVISO

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

⚠ ADVERTENCIA

Use siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.

⚠ 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

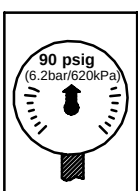
Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.

⚠ ADVERTENCIA

Use siempre protección para los oídos cuando utilice esta herramienta.

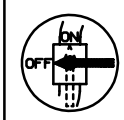
⚠ ADVERTENCIA

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.

PARA PONER LA HERRAMIENTA EN SERVICIO

LUBRICACIÓN

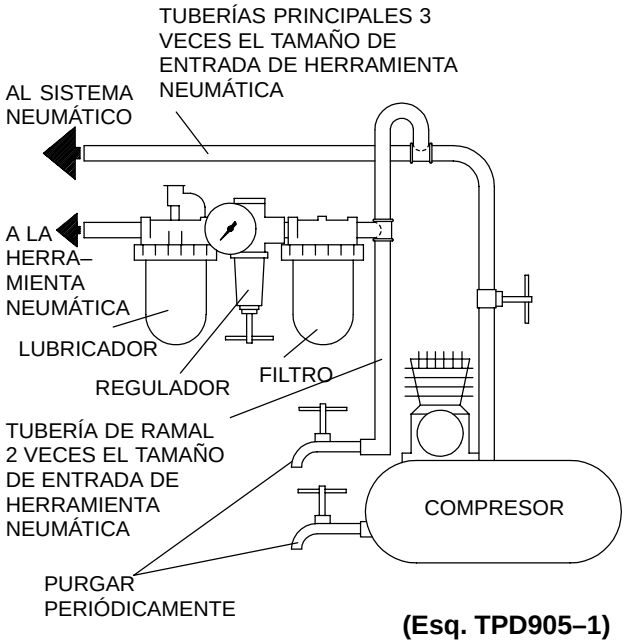
Ingersoll–Rand Nº 10

Ingersoll–Rand Nº 67

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

Para EE.UU. – No. C08–02–FKG0–28

Después de cada 40.000 ciclos o mensualmente (lo que ocurra primero), lubrique el tren de engranajes con grasa Ingersoll–Rand Nº 67.



(Esq. TPD905–1)

ESPECIFICACIONES

Modelo	Tipo de empuñadura	Velocidad en vacío	Capacidad del portabrocas	
		rpm	mm	pulg.
QS511, QS511B, QS511BD, QS511D	recta	5.100	6	1/4
QS381, QS381B, QS381BD, QS381D	recta	3.800	6	1/4
QS301, QS301B, QS301BD, QS301D	recta	3.000	6	1/4
QS201, QS201B, QS201BD, QS201D	recta	2.000	6	1/4
QS151, QS151B, QS151BD, QS151D	recta	1.500	6	1/4
QS091, QS091B, QS091BD, QS091D	recta	900	6	1/4
QS051, QS051B, QS051BD, QS051D	recta	500	6	1/4

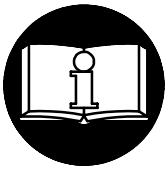
P

MANUAL DE FUNCIONAMENTO E MANUTENÇÃO PARA OS BERBEQUINS PNEUMÁTICOS SÉRIES QS

AVISO

Os Berbequins Séries QS são concebidos para aplicações de perfuração em indústrias aeroespacial, de automóveis, de equipamentos, electrónica, de maquinaria aeroespaciais e de mobiliário.
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 com 6 mm (1/4").**
- **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.**
- **Os acessórios da ferramenta podem continuar a emitir impactos 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.**
- **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.

Impresso nos E.U.A.

Ingersoll-Rand®

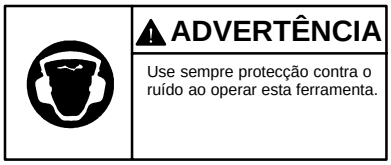
IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA

⚠ ADVERTÊNCIA

O NÃO CUMPRIMENTO DAS SEGUINTES ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.

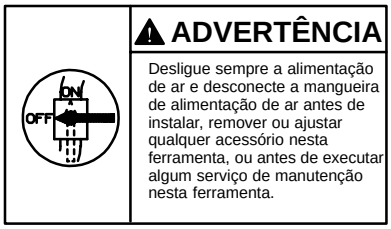
⚠ ADVERTÊNCIA

Use sempre óculos de protecção quando estiver operando ou executando algum serviço de manutenção nesta ferramenta.



⚠ ADVERTÊNCIA

Use sempre protecção contra o ruído ao operar esta ferramenta.

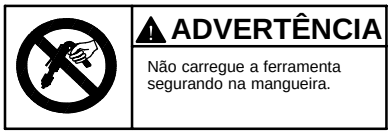


⚠ ADVERTÊNCIA

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.

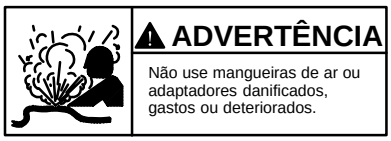
⚠ ADVERTÊNCIA

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 formigueiro ou dor . Procure assistência médica antes de retornar ao trabalho.



⚠ ADVERTÊNCIA

Não carregue a ferramenta segurando na mangueira.

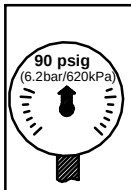


⚠ ADVERTÊNCIA

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 reacção elevados podem ocorrer sob a pressão de ar recomendada.



⚠ ADVERTÊNCIA

Opere com pressão do ar Máxima de 90 psig (6,2–6,9 bar).

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

LUBRIFICAÇÃO

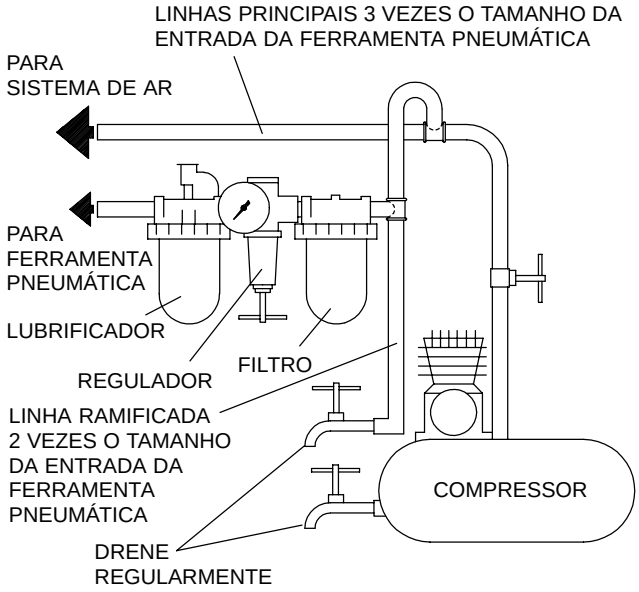
Ingersoll–Rand No. 10

Ingersoll–Rand No. 67

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

Para EUA – No. C08–02–FKG0–28

Depois de 40.000 ciclos ou cada mês, o que ocorrer primeiro, lubrifique o trem de engrenagem com Massa Ingersoll–Rand No. 67.

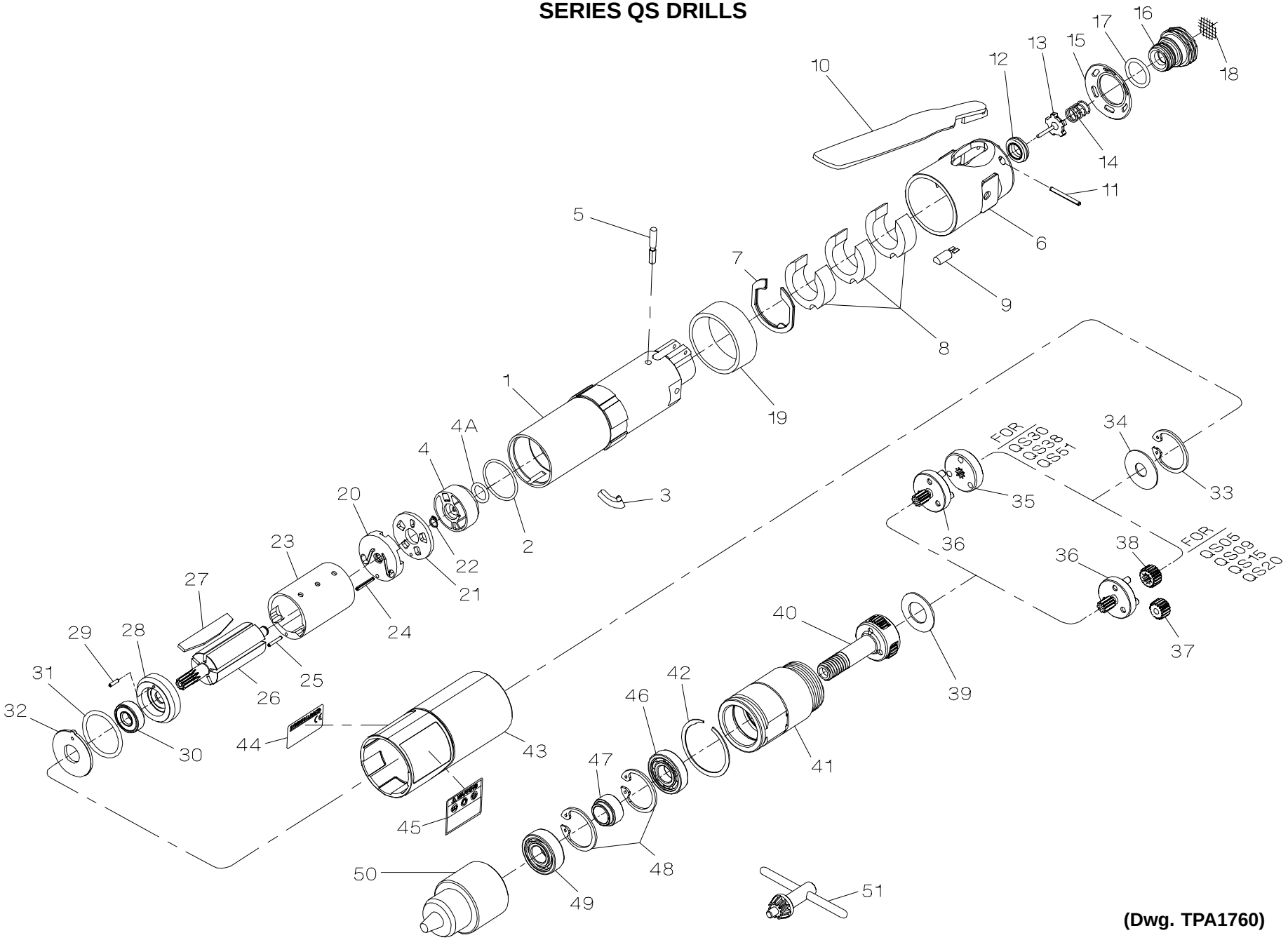


(Desenho TPD905–1)

ESPECIFICAÇÕES

Modelo	Tipo de Punho	Velocidade Livre	Capacidade do Encabadouro	
		rpm	mm	pol.
QS511, QS511B, QS511BD, QS511D	em linha	5.100	6	1/4
QS381, QS381B, QS381BD, QS381D	em linha	3.800	6	1/4
QS301, QS301B, QS301BD, QS301D	em linha	3.000	6	1/4
QS201, QS201B, QS201BD, QS201D	em linha	2.000	6	1/4
QS151, QS151B, QS151BD, QS151D	em linha	1.500	6	1/4
QS091, QS091B, QS091BD, QS091D	em linha	900	6	1/4
QS051, QS051B, QS051BD, QS051D	em linha	500	6	1/4

SERIES QS DRILLS



(Dwg. TPA1760)

		PART NUMBER FOR ORDERING			PART NUMBER FOR ORDERING
1	Motor Housing	TRL–40	23	Cylinder Assembly	TRH–A3–D
2	Housing O–ring	TRH–104	24	Cylinder Rear Alignment Pin	TRH–98
3	Housing Plug	TRD–982	25	Cylinder Front Alignment Pin	TRH–98–1
4	Reverse Valve Assembly	TRH–A3291	26	Rotor	TRH–53
4A	Reverse Valve Seal	R1A–159	27	Vane Packet (set of 5 Vanes)	TRH–42–5
5	Throttle Plunger	TRL–302	28	Front End Plate Assembly	TRH–A11
6	Back Cap	TRL–231	29	End Plate Alignment Pin	TRH–98–2
7	Back Cap Gasket	TRL–A283	30	Front Rotor Bearing	TRH–24
8	Muffler Element (3)	TRL–311	31	Motor Seal	TRH–211
9	Memory Chip (only for models ending in D having a memory chip)	TRH–800	32	Motor Clamp Washer	TRH–207
			33	Gear Retainer	TRH–28
10	Throttle Lever	TRL–273	34	Gear Head Spacer	TRH–81
11	Throttle Lever Pin	TRL–98	35	Planet Gear Head Drive Plate (for Series QS30, QS38 and QS51)	TRH–17
12	Throttle Valve Seat	TRH–303			
13	Throttle Valve	TRD–A302	36	Planet Gear Head Assembly (includes gear shafts)	
14	Throttle Valve Spring	TRL–51			
15	Exhaust Diffuser	TRH–123		for Series QS05, QS09, QS30 and QS51	TRH–A2169–16
16	Inlet Bushing Assembly			for Series QS15	TRH–A2169–12
	for 1/4–18 NPT thread	TRH–A465		for Series QS38	TRH–A216–12
	for 1/4–19 BSPT thread	TRH–A465–B		for Series QS20	TRH–A2169–10
17	Inlet Bushing Seal	AF120–290	37	Planet Gear (3 for each Gear Head)	
18	Inlet Screen	TRH–61		for Series QS05 and QS09	TRH–10–16
19	Housing Plug Cover	TRD–981		for Series QS15	TRH–10–12
20	Rear End Plate Assembly (includes rear rotor bearing)	TRH–A12–1		for Series QS20	TRH–10–10
21	Rear End Plate Face Plate	TRH–12–2			
22	Rear End Plate Assembly Retainer	8SL–305			

		PART NUMBER FOR ORDERING			PART NUMBER FOR ORDERING
38	Gear Head Pinion		43	Housing Grip	TRH–40–A136
	for Series QS15	TRH–17–18	44	Nameplate	TRH–301
	for Series QS20	TRH–17–21	45	Warning Label	TRH–99
39	Planet Gear Head Spacer	TRH–82	46	Spindle Bearing	R00H–97
40	Spindle Assembly (includes all spindle gearing)		47	Spindle Bearing Spacer	TRD–111
			48	Bearing Stop (2)	TRH–28
	for Series QS05 and QS30	TRD–A8–16	49	Spindle Cap Bearing	TRH–510
	for Series QS38	TRD–A8–15	50	Drill Chuck (1/4”)	R0H–99
	for Series QS09, QS15 and QS51	TRD–A8–12	51	Chuck Key	R1H–J253
	for Series QS20	TRD–A8–10	*	Suspension Bail	7L–365
41	Gear Case	TAD–37	*	Piped–Away Exhaust Kit (optional)	LG1–K284
42	Grip Retainer	TRH–197			

* Not illustrated.

⚠ 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.

LUBRICATION

Each time a Series QS Drill is disassembled for maintenance and repair or replacement of parts, lubricate the tool as follows:

1. Coat all exposed gears with Ingersoll–Rand No. 67 Grease and work some of the Grease into the gearing of the Spindle Assembly (40).
2. Use Ingersoll–Rand No. 10 Oil to lubricate the motor. Inject approximately 1 to 2 cc of oil into the air inlet before attaching the air hose to the tool.

SPEED ADJUSTMENT

Series QS Inline Drills are furnished with the ability to precisely control speed, within certain ranges. Setting the speed requires a tachometer. Therefore, the adjustment, although simple, should only be attempted by a competent technician using the proper equipment.

The Back Cap (6) has a small, molded stud on the end face of the Cap nearest the Exhaust Diffuser (15). Take an initial reading of the tool speed by applying a tachometer to the end of the Chuck (50) without a drill bit and with the Lever (10) completely depressed. If the tachometer has a concave tip, close the Chuck completely; if the tip is convex, open the Chuck completely.

After determining the actual velocity, shut off the air supply and disconnect the air line. Use a 3/4” wrench to loosen the Inlet Bushing. The longest slot in the Exhaust Diffuser will contain the molded stud on the Back Cap. Rotate the Diffuser to open the exhaust ports to increase speed or rotate it to restrict the exhaust to reduce speed. Being careful not to allow the Diffuser to damage the molded stud, tighten the Inlet Bushing to 15 ft–lbs. (20 Nm) torque. Connect the air line and restore the air supply and check the velocity again. Determine which direction you need to rotate the Diffuser to obtain the desired speed and then rotate it accordingly. Best results are achieved by using gradual increments and frequent tachometer readings. Be sure to turn off the air supply and disconnect the line when making adjustments.

DISASSEMBLY

General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Whenever grasping a tool or part in a vise, always use leather–covered or copper–covered vice 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 a subassembly 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 gaskets and o–rings for replacement.

Disassembly of the Tool

Each Series QS Lever Inline Drill is made using three modules or units which include a housing and throttle unit, a motor unit and a combined gearing with spindle unit. The tool can be disassembled for repairs to each individual unit without disturbing the other units. To separate the modules, proceed as follows:

1. Remove the Chuck (50) using the following technique:
   a) Insert the short leg of a 1/4” hex wrench into the jaws of the Chuck and tighten the Chuck.
   b) Using a brass hammer, sharply rap the long leg of the wrench in a counterclockwise direction to loosen the Chuck.
   c) Unscrew and remove the Chuck from the spindle.
2. Use a thin blade screwdriver to spiral the Grip Retainer (42) out of the groove in the Gear Case (41) and pull the Housing Grip (43) off the front of the tool.
3. Using a wrench on the flats of the Gear Case, unscrew and separate the Gear Case from the Motor Housing (1).

4. Remove the Motor Clamp Washer (32) and the Motor Seal (31) from the assembled motor in the Housing.
5. Tap the Motor Housing on a block of wood to remove the motor assembly from the Motor Housing.
6. Lightly grasp the flats of the Motor Housing in leather–covered or copper–covered vise jaws with the Inlet Bushing (16) upward.
7. Place a 1–3/16" open end wrench on the flats of the Back Cap (6) to prevent it from rotating, and use a 3/4" wrench to unscrew and remove the Inlet Bushing.
8. Lift the Exhaust Diffuser (15) off the Back Cap.
9. If the Throttle Valve Spring (14) did not come out of the tool with the Inlet Bushing, use needle nose pliers to remove it and the Throttle Valve (13) from the Motor Housing.
10. To remove the Throttle Valve Seat (12), insert a hooked tool through the central opening of the Seat and pull it from the Motor Housing.
11. Using a 1/16" pilot punch, tap the Throttle Lever Pin (11) out of the Back Cap and remove the Throttle Lever (10).
12. Pull the Throttle Plunger (5) out of the Motor Housing and remove the assembly from the vise.
13. Holding the assembly horizontally, remove the Back Cap, the Memory Chip (9) (if included with the tool), and the Back Cap Gasket (7).
14. If the Muffler Elements (8) need to be cleaned or replaced, pull them out of the Back Cap.

Disassembly of the Gearing

1. Using snap ring pliers, remove the Gear Retainer (33) from inside the Gear Case and remove the Gear Head Spacer (34).
2. **For Series QS30, QS38 and QS51,** lightly rap the motor end of the Gear Case on a wooden work bench top to remove the Planet Gear Head Drive Plate (35), Planet Gear Head Assembly (36) and the Planet Gear Head Spacer (39).
   For Series QS05 and QS09, lightly rap the motor end of the Gear Case on a wooden work bench top to remove the three Planet Gears (37), the Planet Gear Head Assembly (36) and the Planet Gear Head Spacer (39).
   For Series QS15 and QS20, lightly rap the motor end of the Gear Case on a wooden work bench top to remove the three Planet Gears (37), the Rotor Pinion (38), the Planet Gear Head Assembly (36) and the Planet Gear Head Spacer (39).

NOTICE

If the Spindle Assembly is being removed or replaced, the Spindle Bearing and Spindle Cap Bearing may be damaged during the removal process. We recommend that new replacement bearings be available for installation when the tool is reassembled.

3. Stand the Gear Case on the table of an arbor press with the threaded end of the Spindle Assembly (40) upward. Using a rod slightly smaller than the spindle shaft, press the Spindle Assembly out of the Spindle Cap Bearing (49) and Spindle Bearing (46).
4. Insert a long, small drift through the central opening of the Spindle Bearing and push the Bearing Spacer (47) off to one side. Using a hammer with the drift, tap the inner ring of the Spindle Cap Bearing. Repeat the process at several points until the Bearing is free from the Gear Case. Remove the Bearing Spacer from the Gear Case.
5. Using snap ring pliers, remove the two Bearing Stops (48).
6. Stand the Gear Case on the table of an arbor press with the threaded end upward, and press the Spindle Bearing out of the Gear case.

Disassembly of the Motor

1. If the motor was not removed from the Housing (1) when the tool was disassembled, slide the Motor Clamp Washer (32) off the shaft of the Rotor (26) and remove the Motor Seal (31).
2. Tap the Motor Housing on a block of wood to remove the motor assembly from the Motor Housing.
3. Using snap ring pliers, remove the Rear End Plate Assembly Retainer (22) from the shaft of the Rotor.
4. Pull the Rear End Plate Face Plate (20) and Rear End Plate Assembly (21) off the hub of the Rotor.
5. Using a piece of leather or other type of protective material, grasp the shaft of the Rotor and pull the Rotor out of the Cylinder (23).

6. Remove the Vanes (27) from the Rotor.
7. Support the Front End Plate Assembly (28), as near the rotor body as possible, on the table of an arbor press and press the Rotor from the Front Rotor Bearing (30). Remove the Bearing from the Front End Plate.

Disassembly of the Housing

1. Pull the Housing Plug Cover (19) off the inlet end of the Motor Housing (1).
2. If the Housing Plug (3) does not drop out of the Housing when the Cover is removed, tap the inlet end of the Housing on a block of wood to dislodge the Plug from the Housing.
3. Insert a 5/16" wooden dowel between 6 and 8 inches long, into the inlet end of the Motor Housing and push the Reverse Valve Assembly (4) out the motor end of the Housing.
4. Use a hooked tool to pull the Housing O–ring (2) out of the Motor Housing.

ASSEMBLY

General Instructions

1. Always press on the **inner** ring of a ball–type bearing when installing the bearing on a shaft.
2. Always press on the **outer** ring of a ball–type bearing when pressing the bearing into a bearing recess.
3. Whenever grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
4. Except for bearings, always clean every part and wipe every part with a thin film of oil before installation.
5. Apply o–ring lubricant to all o–rings before final assembly.
6. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in a clean, suitable cleaning solution and dry with a clean cloth. **Sealed or shielded bearings should never be cleaned.** Work grease into every open bearing before installation.

Assembly of the Housing

1. Lubricate the Housing O–ring (2) with o–ring lubricant and install it at the bottom of the cylinder bore in the Motor Housing (1).
2. Inspect the face and o–ring on the hub of the Reverse Valve Assembly (4) for nicks or damage. Replace the Reverse Valve Assembly if any damage is evident.
3. Lubricate the o–ring on the hub of the Reverse Valve Assembly with o–ring lubricant and insert the Assembly, o–ring end leading, into the cylinder bore of the Motor Housing. Push the Assembly toward the bottom of the cylinder bore until it "snaps" into its proper location.
4. While holding the Motor Housing with the inlet end facing you and the reverse valve slot upward, rotate the Reverse Valve Assembly until the threaded hole in the valve body is positioned at the right hand edge of the slot.
5. Insert the pin end of the Housing Plug (3) into the hole in the Reverse Valve while fitting the remainder of the Plug into the recess in the Motor Housing.
6. While holding the Plug in position, from the inlet end of the Housing, slide the Housing Plug Cover (19) onto the Housing. Make certain it captures the Plug when it moves along the Housing and stops against the housing shoulder.

Assembly of the Motor

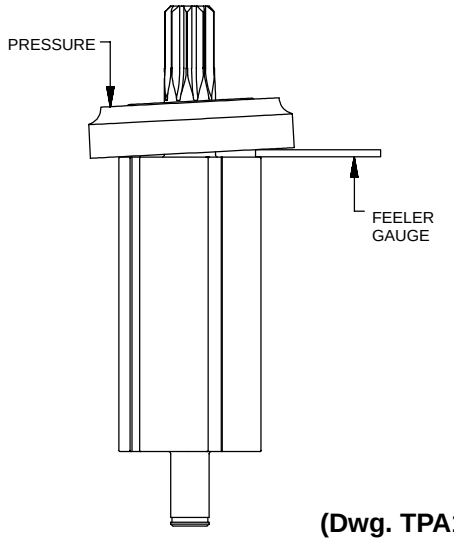
1. Place the Front End Plate (28) on the splined shaft of the Rotor (26) with the bearing recess away from the rotor body.
2. Place the Front Rotor Bearing (30) onto the shaft and using a sleeve or piece of tubing that contacts the inner race of the Bearing, press the Bearing onto the shaft until the Front End Plate nearly contacts the rotor body.

NOTICE

In the following step, the measurement must be made at the end corner of the large rotor body.

3. The clearance between the Front End Plate and Rotor is critical. While pressing down with your finger on the outer edge of the Front End Plate on the bearing side, insert a 0.004" (0.1 mm) feeler gauge between the face of the rotor body and the face of the End Plate at a point that is 180 degrees from where the pressure is applied. Refer to Dwg. TPA1740. To increase the gap, support the End Plate and lightly tap the rotor shaft with a plastic hammer; to decrease the gap, press the Bearing farther onto the rotor shaft.

Measurement of Front End Plate Clearance



(Dwg. TPA1740)

4. Wipe each Vane (27) with a light film of Ingersoll–Rand No. 10 Oil and place a Vane in each slot in the Rotor.
5. One end of the Cylinder Assembly (23) has a notch that breaks the outer wall and end face of the Cylinder. With that end trailing, install the Cylinder Assembly over the Rotor and Vanes against the Front End Plate. Make certain the Cylinder Front Alignment Pin (25) enters the hole in the Front End Plate.
6. Install the Rear End Plate Assembly (20), flat face leading, on the rear hub of the Rotor. Make certain the Cylinder Rear Alignment Pin (24) enters the hole in the Rear End Plate.
7. Examine the Rear End Plate Face Plate (21) for scratches. If it is scratched, replace it. If it is not, slide it onto the rear hub of the Rotor and onto the Cylinder Rear Alignment Pin against the Rear End Plate. Some pressure may be required to fit the hole in the Plate onto the Alignment Pin.
8. Using snap ring pliers, install the Rear End Plate Assembly Retainer (22) in the annular groove on the rear rotor hub to secure the assembly in position.
9. Set the assembled motor aside.

Assembly of the Gearing

1. Work some Ingersoll–Rand No. 67 Grease into the gearing of the Spindle Assembly (40).
2. Insert the threaded end of the Spindle Assembly into the threaded end of the Gear Case (41) while meshing the teeth of the gears with the spline inside the Gear Case.
3. Support the gear end of the Spindle Assembly on the table of an arbor press while leaving clearance for the Gear Case. Using a piece of tubing that will clear the shaft and contact the inner ring of the Spindle Bearing (46), press the Bearing onto the shaft of the Spindle Assembly until it contacts the gear hub.
4. Using snap ring pliers, install one of the Bearing Stops (48) in the internal groove nearest the Bearing.
5. Apply some Ingersoll–Rand No. 67 Grease to the Bearing Spacer (47) and slide it onto the shaft of the Spindle Assembly with the smaller end trailing.
6. Using snap ring pliers, install the second Bearing Stop in the internal gear case groove nearest the threaded spindle end.
7. Stand the assembled Gear Case on the table of an arbor press with the output Spindle upward. Install the Spindle Cap Bearing (49) over the output shaft, and using a piece of tubing that contacts the outer ring of the Bearing, press the Bearing into the Gear Case against the Bearing Stop.
8. Insert the Planet Gear Head Spacer (39) and Planet Gear Head Assembly (36), spline hub leading into the open end of the Gear Case.
9. **For Series QS05, QS09, QS15 and QS20,** apply Ingersoll–Rand No. 67 Grease to the three Planet Gears (37) and install them on the shafts of the Planet Gear Head Assembly.
10. **For Series QS15 and QS20,** apply Ingersoll–Rand No. 67 Grease to the Gear Head Pinion (38) and while meshing the gear teeth, insert it in the opening between the three Planet Gears.
11. **For Series QS30, QS38 and QS51,** install the Planet Gear Head Drive Plate (35) on the shafts of the Planet Gear Head Assembly.
12. Place the Gear Head Spacer (34) in the Gear Case and secure the assembly by using snap ring pliers to install the Gear Retainer (33) in the annular groove inside the Gear Case.

Assembly of the Tool

1. Lightly grasp the flats on the Motor Housing (1) in leather–covered or copper–covered vise jaws with the inlet end of the tool upward.
2. Insert a 5/8” dowel through the opening in the Back Cap (6), and using the dowel as an alignment device, install the three Muffler Elements (8) in the cavity of the Back Cap. Make certain the notches in the outer edge of the Elements fit over the memory chip pocket in the bottom of the Cap.

3. **If the tool is equipped with a Memory Chip (9),** install it (with the leads entering first) in the pocket at the bottom of the Back Cap.
4. Make certain the tab on the inside edge of the Back Cap Gasket (7) is aligned with the pocket for the Memory Chip and install the Gasket, metal face leading, in the recess of the Back Cap against the face with the cavity containing the Muffler Elements.
5. Position the gasket end of the alignment dowel against the inlet hub on the Motor Housing. Align the flats on the Cap with the flats on the Housing. Orient the Back Cap and slide the Back Cap Assembly off the alignment dowel and onto the Motor Housing.
6. The Exhaust Diffuser (15) has one slot that is longer than the other five slots. The Back Cap has a short, molded stud projecting from inlet end. Place the Exhaust Diffuser against the Back Cap with the long slot encircling the molded stud. Rotate the Diffuser counterclockwise until the wall of the slot stops against the stud. The exhaust ports are now in the full open position which will provide maximum free speed.
7. Being careful not to damage it, insert the Throttle Valve Seat (12) into the central opening at the inlet end of the Motor Housing at an angle until it clears the threads in the Housing. Using a rod with a flat end and no sharp edges, push the Seat to the bottom of the opening until it seats flush.
8. Using needle nose pliers, insert the Throttle Valve (13), long stem leading, into the opening against the Seat. Center the Valve in the Seat.
9. Install the Throttle Valve Spring (14) in the opening so that it encircles the Valve.
10. If the Inlet Screen (18) required replacement, use a wooden dowel to carefully push a new one into the Inlet Bushing (16).
11. If the Inlet Bushing Seal (17) is nicked or damaged, carefully install a new one over the threads of the Inlet Bushing.
12. Thread the Inlet Bushing Assembly through the Diffuser and Back Cap into the Motor Housing. Using a 1–3/16" wrench on the flats of the Back Cap to keep it from turning, tighten the Inlet Bushing between 15 and 20 ft–lbs. (20 and 27 Nm) torque.
13. The Throttle Plunger (5) has a lengthwise flat on the outer edge at one end of the Plunger. Insert the Plunger, flat end first, into the cross hole in the Housing. Push on the end of the Plunger to make certain it springs back from contact with the stem of the Throttle Valve.
14. Position the Throttle Lever (10) in the slot in the Back Cap and Motor Housing and using a 1/16" diameter rod, align the holes through the Back Cap, Motor Housing and Throttle Lever. While maintaining alignment, install the Throttle Lever Pin (11) in place of the rod by tapping it through all three pieces.
15. Remove the assembled Housing from the vise jaws.
16. Lightly grasp the flats at the inlet end of the Motor Housing in leather–covered or copper–covered vise jaws with the motor bore upward.
17. Grasp the spline of the Rotor (26) in the assembled motor and after aligning the End Plate Alignment Pin (29) with the internal notch in the motor end of the housing bore, insert the assembled motor into the Motor Housing. Make certain the motor is far enough into the Housing to have the undercut below the internal housing thread visible.
18. Lubricate the Motor Seal (31) with o–ring lubricant and install it around the Front End Plate (28) and into the undercut in the Housing.
19. Align the tab of the Motor Clamp Washer (32) with the internal notch in the Housing and install it over the rotor hub and End Plate Alignment Pin against the Motor Seal. Make certain the Pin enters the hole in the Washer and the Washer is flat against the Seal.
20. Apply some Ingersoll–Rand No. 67 Grease to the spline on the rotor shaft.
21. Thread the assembled Gear Case (41) and Spindle Assembly (40), gear case end leading, into the Motor Housing and tighten the joint between 15 and 20 ft–lbs. (20 and 27 Nm) torque.
22. Install the Housing Grip (43), internal slotted end leading, over the Gear Case and Housing and engage the slots in the Grip with the projections on the Housing.
23. Install the Grip Retainer (42) in the groove on the Gear Case to secure the Grip.
24. Remove the tool from the vise jaws and thread the Chuck (50) onto the Spindle.
25. Check the free speed of the tool using a tachometer and following the instructions in the **SPEED ADJUSTMENT** section of this manual.

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Loss of Power	Low air pressure	Check air supply. For top performance, the air pressure must be 90 psig (6.2 bar/620 kPa) at the inlet.
	Plugged Inlet Bushing Screen	Clean the Inlet Bushing Screen using a clean, suitable cleaning solution. If the Screen cannot be cleaned, replace it.
	Worn or broken Vanes	Replace a **complete** set of Vanes.
	Worn or broken Cylinder	Replace the Cylinder if it is cracked or if the bore appears wavy or scored.
	Exhaust control restricted	Make certain the Exhaust Diffuser is in the fully open position.
Motor won't run	Motor Clamp Washer binding	Remove the Gear Case make certain the Washer is flat and the Motor Seal is properly positioned.
	Gears binding	Clean and inspect all gearing. Replace any worn or damaged gearing.
Leaky Throttle Valve	Worn Throttle Valve and/or Throttle Valve Seat	Install a new Valve and/or Seat.
	Dirt accumulation on Throttle Valve and/or Throttle Valve Seat	Clean or replace the Throttle Valve and/or Throttle Valve Seat.
Gear Case gets hot	Excessive grease	Clean and inspect Gear Case and gearing parts and lubricate as instructed.
	Worn or damaged parts	Clean and inspect the Gear Case and gearing. Replace worn or broken components.

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.