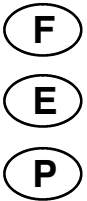


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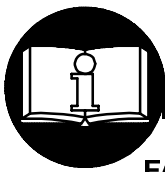
Form P5691
Edition 16
August, 1998

**OPERATION AND MAINTENANCE MANUAL
for REVERSIBLE MULTI-VANE DRILLS
MODELS 33H, 33J, 33SJ, 33SKA and 33SMA,
and REVERSIBLE BASE-MOUNTED MULTI-VANE MOTORS
MODELS 33H51, 33J51, 33SK51 and 33SM51**

NOTICE

Series 33 Reversible Multi-Vane Drills are designed for heavy drilling and reaming in shipbuilding, railroad car shops, fabricated metal and construction applications. 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 3/4" (19 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.
- Note the position of the reversing lever before operating the tool so as to be aware of the direction of rotation when operating the throttle.
- 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 can exert strong forces on the operator. Use proper support to control these forces.
- 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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INGERSOLL-RAND®
PROFESSIONAL TOOLS


WARNING LABEL IDENTIFICATION

⚠ WARNING


FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.


	<p>⚠ WARNING</p> <p>Always wear eye protection when operating or performing maintenance on this tool.</p>
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	<p>⚠ WARNING</p> <p>Always wear hearing protection when operating this tool.</p>
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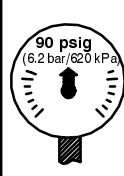
	<p>⚠ WARNING</p> <p>Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.</p>
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	<p>⚠ WARNING</p> <p>Air powered tools 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.</p>
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	<p>⚠ WARNING</p> <p>Do not carry the tool by the hose.</p>
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	<p>⚠ WARNING</p> <p>Do not use damaged, frayed or deteriorated air hoses and fittings.</p>
---	---

	<p>⚠ WARNING</p> <p>Keep body stance balanced and firm. Do not overreach when operating this tool.</p>
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	<p>⚠ WARNING</p> <p>Operate at 90 psig (6.2 bar/620 kPa) Maximum air pressure.</p>
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PLACING TOOL IN SERVICE

LUBRICATION



Ingersoll-Rand No. 50 Ingersoll-Rand No. 28

Always use an air line lubricator with this tool.

We recommend the following Filter-Lubricator-Regulator Unit:

For USA - No. C22-04-G00

Before starting the tool and after each hour of operation, unless the air line lubricator is used, detach the air hose, unscrew the Oil Chamber Plug (19, 211) and fill the chamber in the Backhead (15, 210) with Ingersoll-Rand No. 50 Oil.

Weekly, or as experience indicates, inject 1 – 2 cc of Ingersoll-Rand No. 28 Grease into the Grease Fitting (16, 103, or 213).

Occasionally, inject 2 or 3 drops of light oil into the oil hole in the Throttle Sleeve (64).

OILER ADJUSTMENT

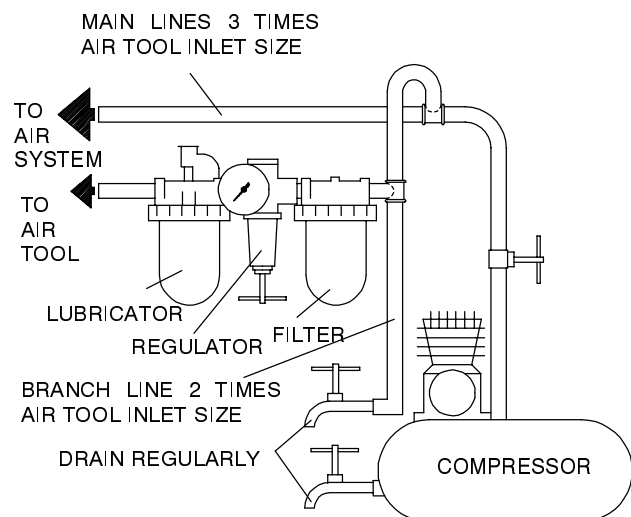
To adjust oiler, remove the Backhead (15, 210) and turn one or both of the Oiler Adjusting Screws (17). Turning the Screws in (clockwise) reduces the oil flow. Backing the Screws out increases the oil flow. The oil flow can be controlled by turning either Screw. Never back out the Oiler Adjusting Screws beyond the Backhead. If sufficient oil flow is not obtained before the screwheads are flush with this face, the Oiler Felts (18) are clogged. If this occurs, install new Oiler Felts.

INSTALLATION

Air Supply and Connections

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. An air line filter can greatly increase the life of an air tool. The filter removes dust and moisture. Be sure all hoses and fittings are the correct size and are tightly secured.

See Dwg. TPD905-1 for a typical piping arrangement.



(Dwg. TPD905-1)

PLACING TOOL IN SERVICE

HOW TO ORDER A LARGE DRILL

REVERSIBLE ROLL THROTTLE

Model	Free Speed, rpm	Capacity in Steel				Morse Taper Socket	Length of Feed	
		Drilling		Reaming			in.	mm
		in.	mm	in.	mm			
33H	800	29/32	23	3/4	19	No. 2	3-7/8	98
33J	450	1	25	15/16	24	No. 2	4-1/4	108
33SJ	450	1	25	15/16	24	No. 3	4-1/4	108
33SKA	300	1-1/4	32	1	25	No. 3	4-1/4	108
33SMA	185	1-1/4	32	1-1/4	25	No. 3	4-1/4	108

HOW TO ORDER A MOTOR

REVERSIBLE BASE-MOUNTED MULTI-VANE MOTOR

Model	Free Speed, rpm
33H51	800
33J51	450
33SK51	300
33SM51	185

MODE D'EMPLOI DES PERCEUSES MULTI-PALETTES REVERSIBLES F

33H, 33J, 33SJ, 33SKA ET MOTEURS MULTI-PALETTES REVERSIBLES

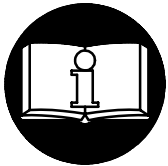
MONTES SUR EMBASE MODELES 33H51, 33J51, 33SK51 ET 33SM51

NOTE

Les perceuses d'angle réversibles multi-palettes de la Série 33 sont destinées aux grosses opérations de perçage et d'alésage dans les constructions navales, les ateliers de chemin de fer, la mécanosoudure et les fabrications mécaniques.

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 19 mm de diamètre intérieur.
- Couper toujours l'alimentation d'air comprimé et débrancher le flexible d'alimentation avant d'installer, déposer ou ajuster tout accessoire sur cet outil, ou d'entreprendre une opération d'entretien quelconque sur l'outil.
- Ne pas utiliser des flexibles ou des raccords endommagés, effilochés ou détériorés.
- S'assurer que tous les flexibles et les raccords sont correctement dimensionnés et bien serrés. Voir Plan TPD905-1 pour un exemple type d'agencement des tuyauteries.
- Utiliser toujours de l'air sec et propre à une pression maximum de 6,2 bar. La poussière, les fumées corrosives et/ou une humidité excessive peuvent endommager le moteur d'un outil pneumatique.
- Ne jamais lubrifier les outils avec des liquides inflammables ou volatiles tels que le kérosène, le 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.
- Noter la position du levier d'inversion avant de mettre l'outil en marche de manière à savoir dans quel sens il va tourner lorsque la commande est actionnée.
- 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 peut exercer des forces importantes sur l'opérateur. Utiliser un support correct pour contrôler ces forces.
- Cet outil est conçu pour être actionné par deux personnes.

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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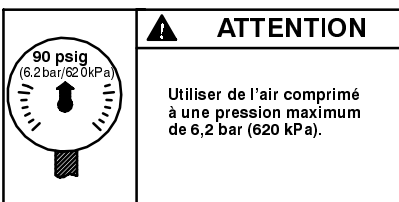
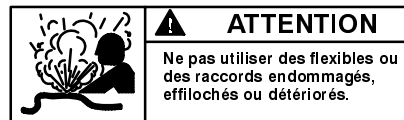
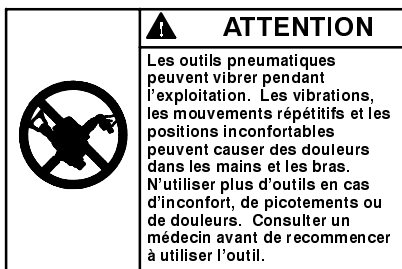
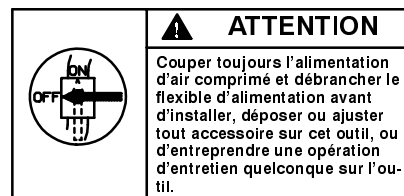
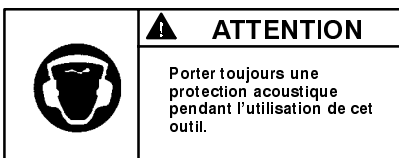
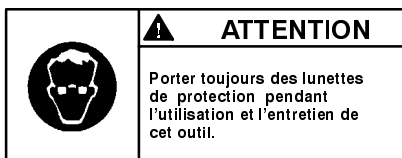
Imprimé aux É.U.

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PROFESSIONAL TOOLS

SIGNIFICATION DES ETIQUETTES D'AVERTISSEMENT

ATTENTION

LE NON RESPECT DES AVERTISSEMENTS SUIVANTS PEUT CAUSER DES BLESSURES



RÉGLAGES

RÉGLAGE DE L'HUILEUR

Pour régler l'huileur, retirer la tête arrière et tourner l'une ou les deux vis de réglage. Le débit d'huile diminue lorsque les vis sont vissées (sens des aiguilles d'une montre) et il augmente lorsque elles sont dévissées (sens inverse des

aiguilles d'une montre). Le dévissage augmente le débit. Le débit d'huile peut être contrôlé en tournant l'une quelconque des deux vis. Ne jamais dévisser la vis de réglage de l'huileur au-delà de la tête arrière. Si un débit d'huile suffisant n'est pas obtenu lorsque la vis affleure cette face, les feutres de l'huileur sont colmatés et devront être changés.

MISE EN SERVICE DE L'OUTIL

LUBRIFICATION



Ingersoll-Rand No. 50

Ingersoll-Rand No. 28

Utiliser toujours un lubrificateur avec cet outil.

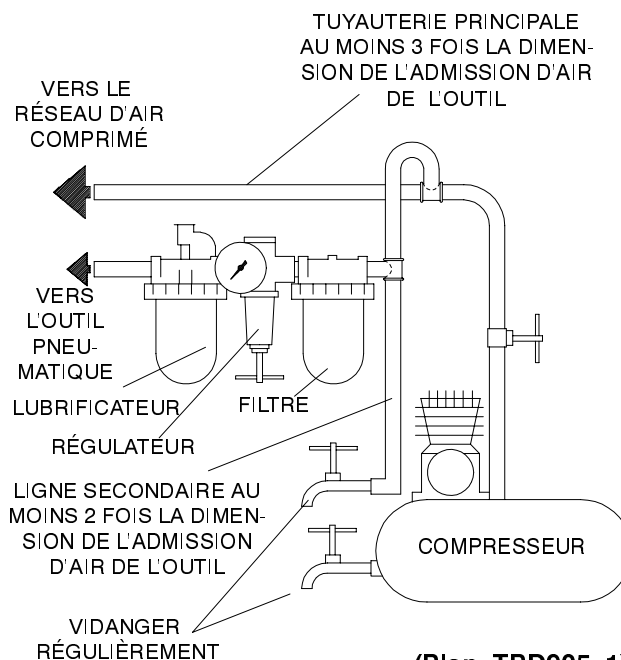
Nous recommandons l'emploi du filtre-régulateur-lubrificateur suivant :

USA - C22-04-G00

Avant de mettre l'outil en marche et après chaque heure de fonctionnement, si un lubrificateur de ligne n'est pas utilisé, détacher le flexible d'alimentation, dévisser le bouchon de la chambre d'huile et remplir la chambre de la tête arrière avec de l'huile Ingersoll-Rand No. 50.

Toutes les semaines, ou en fonction de l'expérience, injecter 1 ou 2 cm³ de graisse Ingersoll-Rand No. 28 dans le raccord de graissage.

De temps à autre, injecter 2 ou 3 gouttes d'huile légère dans le trou d'huile du fourreau de commande.



(Plan TPD905-1)

MISE EN SERVICE DE L'OUTIL

SPÉCIFICATIONS

Perceuses	Type de commande	Vitesse libre tr/mn	Capacité dans l'acier	
			Perçage (mm)	Alésage (mm)
33H	Bague tournante, réversible	800	29/32 (23)	3/4 (19)
33J	Bague tournante, réversible	450	1 (25)	15/16 (24)
33SJ	Bague tournante, réversible	450	1 (25)	15/16 (24)
33SKA	Bague tournante, réversible	300	1-1/4 (32)	1 (25)
33SMA	Bague tournante, réversible	185	1-1/4 (32)	1-1/4 (32)

Perceuses	Douille conique	Longueur d'avance
		pouces mm
33H	Morse No. 2	3-7/8 (98)
33J	Morse No. 2	4-1/4 (108)
33SJ	Morse No. 3	4-1/4 (108)
33SKA	Morse No. 3	4-1/4 (108)
33SMA	Morse No. 3	4-1/4 (108)

Moteurs	Type de commande	Vitesse libre
		tr/mn
33H51	Réversible	800
33J51	Réversible	450
33SK51	Réversible	300
33SM51	Réversible	185

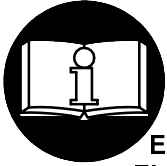
INSTRUCCIONES PARA TALADROS REVERSIBLES MULTI-ALETA MODELOS 33H, 33J, 33SJ, 33SKA Y 33SMA Y MOTORES REVERSIBLES MULTI-ALETA MONTADOS EN BASE MODELOS 33H51, 33J51 Y 33SM51

NOTA

Los taladros reversibles multi-aleta de la serie 33 están diseñados para escariado y taladrado pesado en la construcción naval, talleres de vagones de ferrocarril, metales fabricados y aplicaciones de construcción.

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 19 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/o el exceso de humedad pueden estropear el motor de una herramienta neumática.
- No lubrique las herramientas con líquidos inflamables o volátiles tales como queroseno, gasoil o combustible para motores a reacción.
- No saque ninguna etiqueta. Sustituya toda etiqueta dañada.

UTILIZACIÓN DE LA HERRAMIENTA

- Lleve siempre protección ocular cuando utilice esta herramienta o realice operaciones de mantenimiento en la misma.
- Lleve siempre protección para los oídos cuando utilice esta herramienta.

- Mantenga las manos, la ropa suelta y el cabello largo alejados del extremo giratorio de la herramienta.
- Tome nota de la posición de la palanca de inversión antes de hacer funcionar la herramienta para tener en cuenta el sentido de rotación al accionar el estrangulador.
- Anticipe y esté atento a los cambios repentinos en el movimiento durante la puesta en marcha y utilización de toda herramienta motorizada.
- Mantenga una postura del cuerpo equilibrada y firme. No estire demasiado los brazos al manejar la herramienta. Pueden darse elevados pares de reacción a la presión de aire recomendada, e incluso a presiones inferiores.
- El eje de la herramienta puede seguir girando brevemente después de haberse soltado la palanca de mando.
- Las herramientas neumáticas pueden vibrar durante el uso. La vibración, los movimientos repetitivos o las posiciones incómodas pueden dañarle los brazos y manos. En caso de incomodidad, sensación de hormigueo o dolor, deje de usar la herramienta. Consulte al médico antes de volver a utilizarla.
- Utilice únicamente los accesorios recomendados por Ingersoll-Rand.
- Utilice únicamente bocas y accesorios para llaves de impacto. No utilice bocas o accesorios manuales (cromados).
- Esta herramienta puede ejercer mucha fuerza sobre el operario. Use un soporte apropiado para controlar esta fuerza.
- Se necesitan dos personas para utilizar esta herramienta.
- Esta herramienta no ha sido diseñada para trabajar en ambientes explosivos.
- Esta herramienta no está aislada contra descargas eléctricas.

NOTA

El uso de piezas de recambio que no sean las auténticas piezas Ingersoll-Rand puede poner en peligro la seguridad, reducir el rendimiento de la herramienta y aumentar los cuidados de mantenimiento necesarios, así como invalidar toda garantía. Las reparaciones sólo se deben encomendar a personal debidamente cualificado y autorizado. Consulte con el centro de servicio autorizado Ingersoll-Rand más próximo.

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

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ETIQUETAS DE AVISO


AVISO


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


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

	<p>ADVERTENCIA</p> <p>Mantener una postura del cuerpo equilibrada y firme. No estirar demasiado los brazos al manejar la herramienta.</p>
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	<p>ADVERTENCIA</p> <p>Manejar la herramienta a una presión de aire máxima de 90 psi (6,2 bar/620 kPa).</p>
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AJUSTES

AJUSTE DEL LUBRICADOR

Para ajustar el lubricador, saque la cubierta trasera y gire los tornillos de ajuste del lubricador. Al girar los tornillos a derechas se reduce el flujo de aceite. Al girarlos a izquierdas, se aumenta el flujo. El flujo de aceite puede regularse girando

cualquiera de los dos tornillos. No desenrosque nunca los tornillos de ajuste más allá de la cubierta trasera. Si no se obtiene suficiente flujo de aceite antes de que las cabezas de tornillo estén a ras de esta superficie, significa que están obstruidos los filtros del lubricador. En tal caso, cambie los filtros.

PARA PONER LA HERRAMIENTA EN SERVICIO

LUBRICACIÓN



Ingersoll-Rand N° 50

Ingersoll-Rand N° 28

Utilice siempre un lubricador de aire comprimido con esta herramienta.

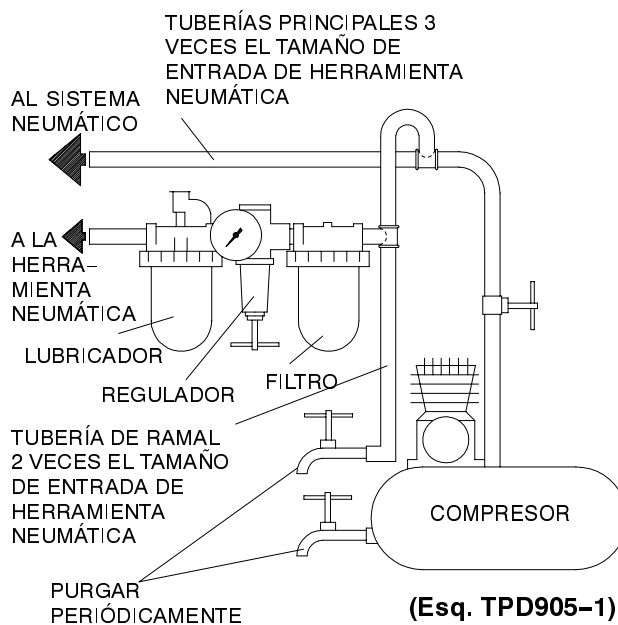
Recomendamos utilizar el siguiente conjunto de filtro-lubricador-regulador:

USA - N° C22-04-G00

Antes de comenzar a utilizar la herramienta y después de cada hora de funcionamiento, salvo que se utilice un lubricador de aire comprimido, desconecte la manguera de aire, desenrosque el tapón de la cámara de aceite y llene de aceite Ingersoll-Rand N° 50 la cámara situada en la cubierta trasera.

Semanalmente, o según indique la experiencia, inyecte 1-2 cc de grasa Ingersoll-Rand N° 28 en el engrasador.

De vez en cuando, inyecte 2 o 3 gotas de aceite ligero en el orificio de lubricación del manguito del estrangulador.



PARA PONER LA HERRAMIENTA EN SERVICIO

ESPECIFICACIONES

Taladros	Tipo de mando	Velocidad en vacío	Capacidad en acero	
			Taladrado pulg. (mm)	Escariado pulg. (mm)
		rpm		
33H	Reversible, accionam. giratorio	800	29/32 (23)	3/4 (19)
33J	Reversible, accionam. giratorio	450	1 (25)	15/16 (24)
33SJ	Reversible, accionam. giratorio	450	1 (25)	15/16 (24)
33SKA	Reversible, accionam. giratorio	300	1-1/4 (32)	1 (25)
33SMA	Reversible, accionam. giratorio	185	1-1/4 (32)	1-1/4 (32)

Taladros	Boca cónica	Longitud de avance
		pulg. (mm)
33H	N° 2 Morse	3-7/8 (98)
33J	N° 2 Morse	4-1/4 (108)
33SJ	N° 3 Morse	4-1/4 (108)
33SKA	N° 3 Morse	4-1/4 (108)
33SMA	N° 3 Morse	4-1/4 (108)

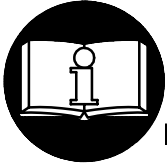
Motores	Tipo de mando	Velocidad en vacío
		rpm
33H51	Reversible	800
33J51	Reversible	450
33SK51	Reversible	300
33SM51	Reversible	185

INSTRUÇÕES PARA PERFURADORAS DE PALHETAS REVERSÍVEIS MODELOS 33H, 33J, 33SJ, 33SK E 33SMA MOTORES MULTI-VANE DE BASE MONTADA REVERSÍVEIS MODELOS 33H51, 33J51, 33SK1 E 33SM51

AVISO

As Perfuradoras de Palhetas Reversíveis Séries 33 são concebidas para a aplicações de perfuração e reaming pesadas em construção de navios, oficinas de vagões ferroviários, metais fabricados e construção.

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



⚠️ ADVERTÊNCIA

**INFORMAÇÃO DE SEGURANÇA IMPORTANTE EM ANEXO.
LEIA ESTE MANUAL ANTES DE OPERAR A FERRAMENTA.
É DA RESPONSABILIDADE DO EMPREGADOR COLOCAR A INFORMAÇÃO
DESTE MANUAL NAS MÃOS DO OPERADOR.**

O NÃO CUMPRIMENTO DAS SEGUINTE ADVERTÊNCIAS PODE RESULTAR EM FERIMENTOS.

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

- Sempre opere, inspecione e mantenha esta ferramenta de acordo com o Código de Segurança do Instituto Americano de Padrões Nacionais para Ferramentas Pneumáticas Portáteis (ANSI B186.1).
- Para segurança, máximo desempenho e máxima durabilidade das peças, opere esta ferramenta com uma pressão de ar máxima de 6,2 bar/620 kPa (90 psig) na entrada da mangueira de alimentação de ar com diâmetro interno de 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.
- Observe a posição da alavanca de reversão antes de operar a ferramenta de modo a estar atento ao sentido de rotação ao operar a válvula reguladora de pressão.
- Antecipe e esteja alerta a mudanças repentinas no movimento quando ligar e operar qualquer ferramenta motorizada.
- Mantenha a posição do corpo equilibrada e firme. Não exagere quando operar esta ferramenta. Torques de reacção elevados podem ocorrer na ou abaixo da pressão de ar recomendada.
- O eixo da ferramenta pode continuar a girar brevemente após a pressão tenha sido aliviada.
- Ferramentas accionadas pneumáticamente podem vibrar em uso. Vibração, movimentos repetitivos ou posições desconfortáveis podem ser prejudiciais às mãos e aos braços. Pare de usar a ferramenta caso ocorra algum desconforto, sensação de formigueiro ou dor. Procure assistência médica antes de retornar ao trabalho.
- Use acessórios recomendados pela Ingersoll-Rand.
- Use somente soquetes e acessórios de impacto. Não use soquetes ou acessórios de mão (cromo).
- Esta ferramenta pode exercer forças intensas sobre o operador use suporte adequado para controlar estas ferramentas.
- Esta Ferramenta não foi concebida para trabalhos em atmosferas explosivas.
- Esta Ferramenta não está isolada contra choques eléctricos.

AVISO

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

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

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

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PROFESSIONAL TOOLS


IDENTIFICAÇÃO DO RÓTULO DE ADVERTÊNCIA

⚠ ADVERTÊNCIA


O NÃO CUMPRIMENTO DAS 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 formiguento 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 90-100 psig (6,2-6,9 bar).

AJUSTES

AJUSTE DO RESERVATÓRIO DE ÓLEO

Para ajustar o reservatório de óleo, remova o Cabeçote Traseiro e gire os Parafusos de Ajuste do Reservatório de

Óleo. Ao girar os Parafusos (sentido horário) reduz-se o fluxo de óleo. O fluxo de óleo pode ser controlado ao se girar qualquer um dos Parafusos.

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

LUBRIFICAÇÃO



Ingersoll-Rand No. 50



Ingersoll-Rand No. 28

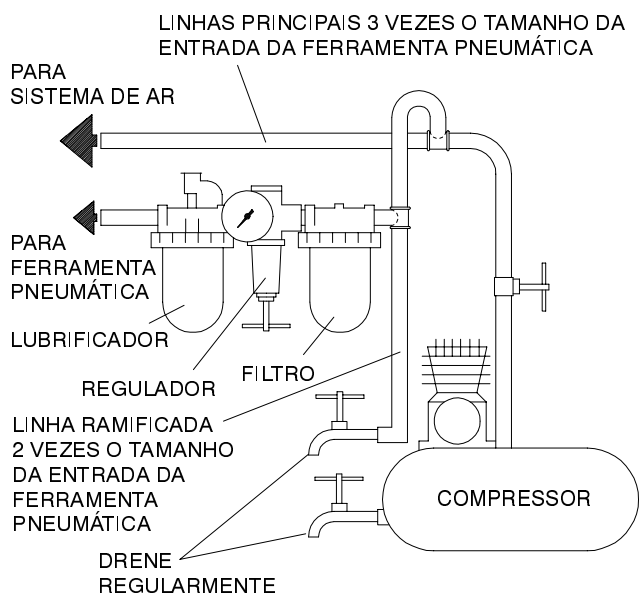
Use sempre um lubrificador de conduta de ar com estas ferramentas. Nós recomendamos a seguinte Unidade Filtro-Lubrificador-Regulador:

USA - No. C22-04-G00

Antes de ligar a ferramenta e depois de cada oito horas de operação, a menos que esteja usando um lubrificador de ar de linha, desligue a mangueira de ar, remova o Bujão da Câmara de Óleo e encha a câmara no Cabeçote Traseiro com Óleo Ingersoll-Rand No. 50.

Semanalmente, ou conforme a experiência indicar, injecte de 1 a 2 cc de Massa Ingersoll-Rand No. 28 no Adaptador de Massa.

Ocasionalmente, injecte de 2 a 3 gotas de Óleo Ingersoll-Rand No. 50 no orifício de óleo na Camisa da Válvula Reguladora de Pressão



(Desenho TPD905-1)

COLOCANDO A FERRAMENTA EM FUNCIONAMENTO

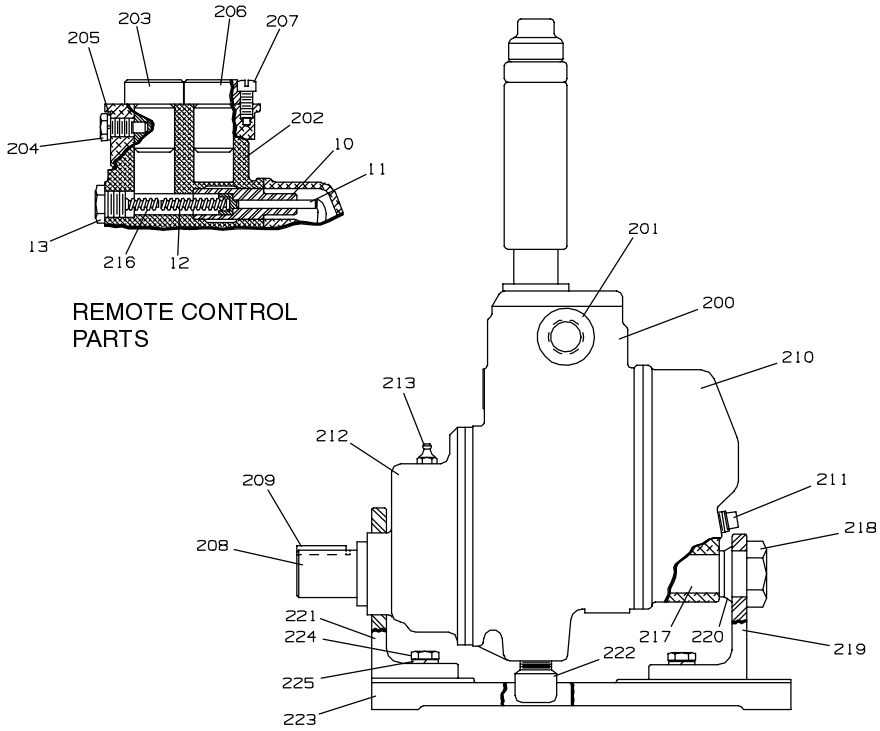
ESPECIFICAÇÕES

Perfuradoras	Tipo de Regulador de Pressão	Velocidade Livre	Capacidade da Barrena	
		rpm	Perfurando mm (Pol)	Alargando mm (Pol)
33H	Rolo, Reversível	800	29/32 (23)	3/4 (19)
33J	Rolo, Reversível	450	1 (25)	15/16 (24)
33SJ	Rolo, Reversível	450	1 (25)	15/16 (24)
33SKA	Rolo, Reversível	300	1-1/4 (32)	1 (25)
33SMA	Rolo, Reversível	185	1-1/4 (32)	1-1/4 (32)

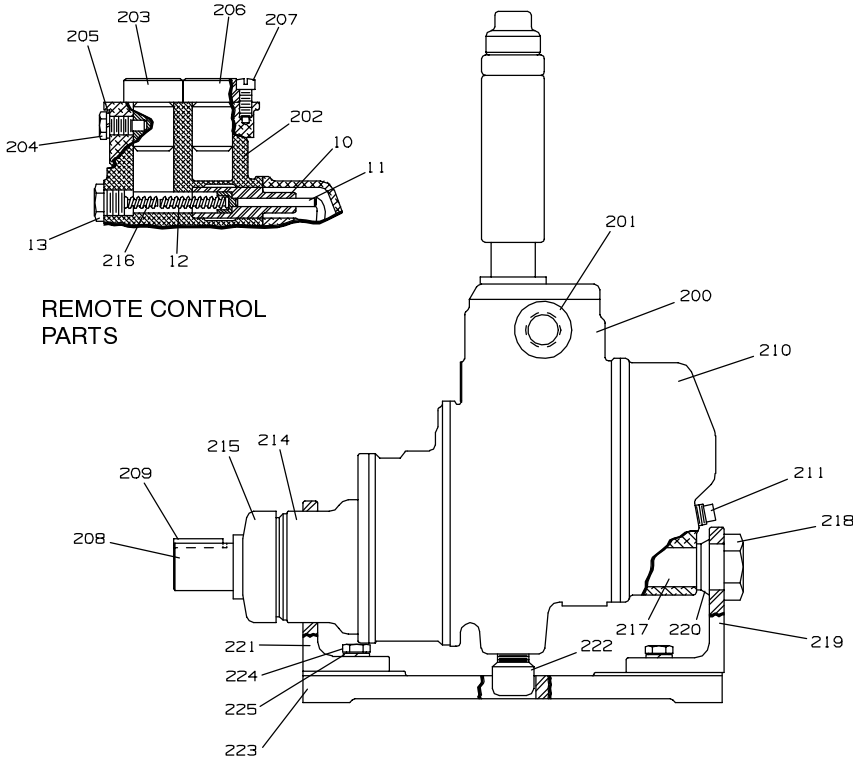
Perfuradoras	Soquete Taper	Comprimento de Alimentação
		mm (pol)
33H	Morse No. 2	98 (3-7/8)
33J	Morse No. 2	108 (4-1/4)
33SJ	Morse No. 3	108 (4-1/4)
33SKA	Morse No. 3	108 (4-1/4)
33SMA	Morse No. 3	108 (4-1/4)

Motores	Tipo de Regulador de Pressão	Velocidade Livre
		rpm
33H51	Reversível	800
33J51	Reversível	450
33SK51	Reversível	300
33SM51	Reversível	185

BASE-MOUNTED MULTI-VANE MOTORS

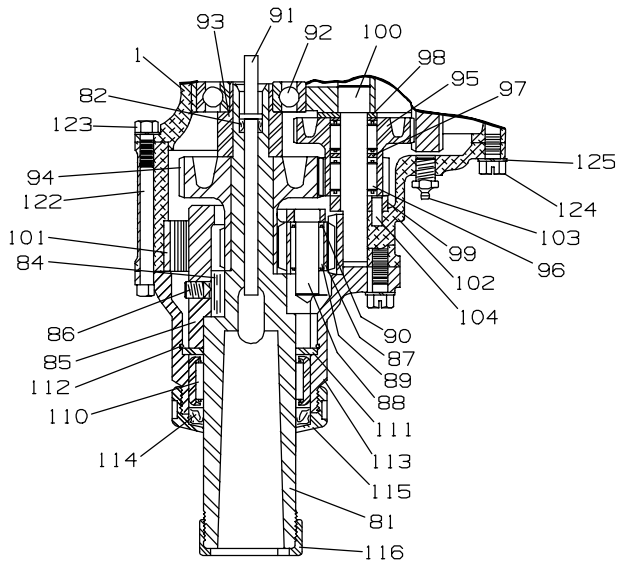


MODELS 33H51, 33J51 OR 33SK51 BASE-MOUNTED MOTOR

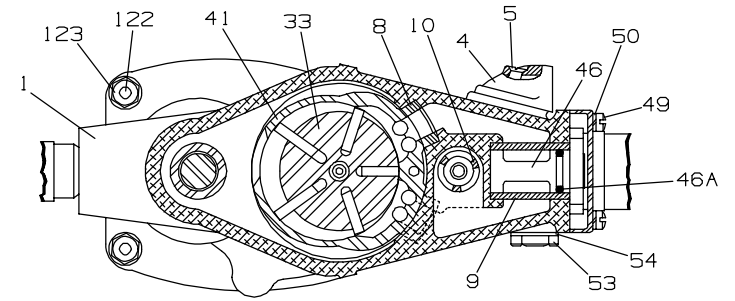


MODELS 33SM51 BASE-MOUNTED MOTOR

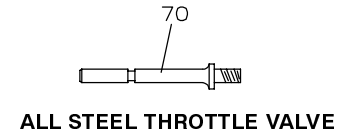
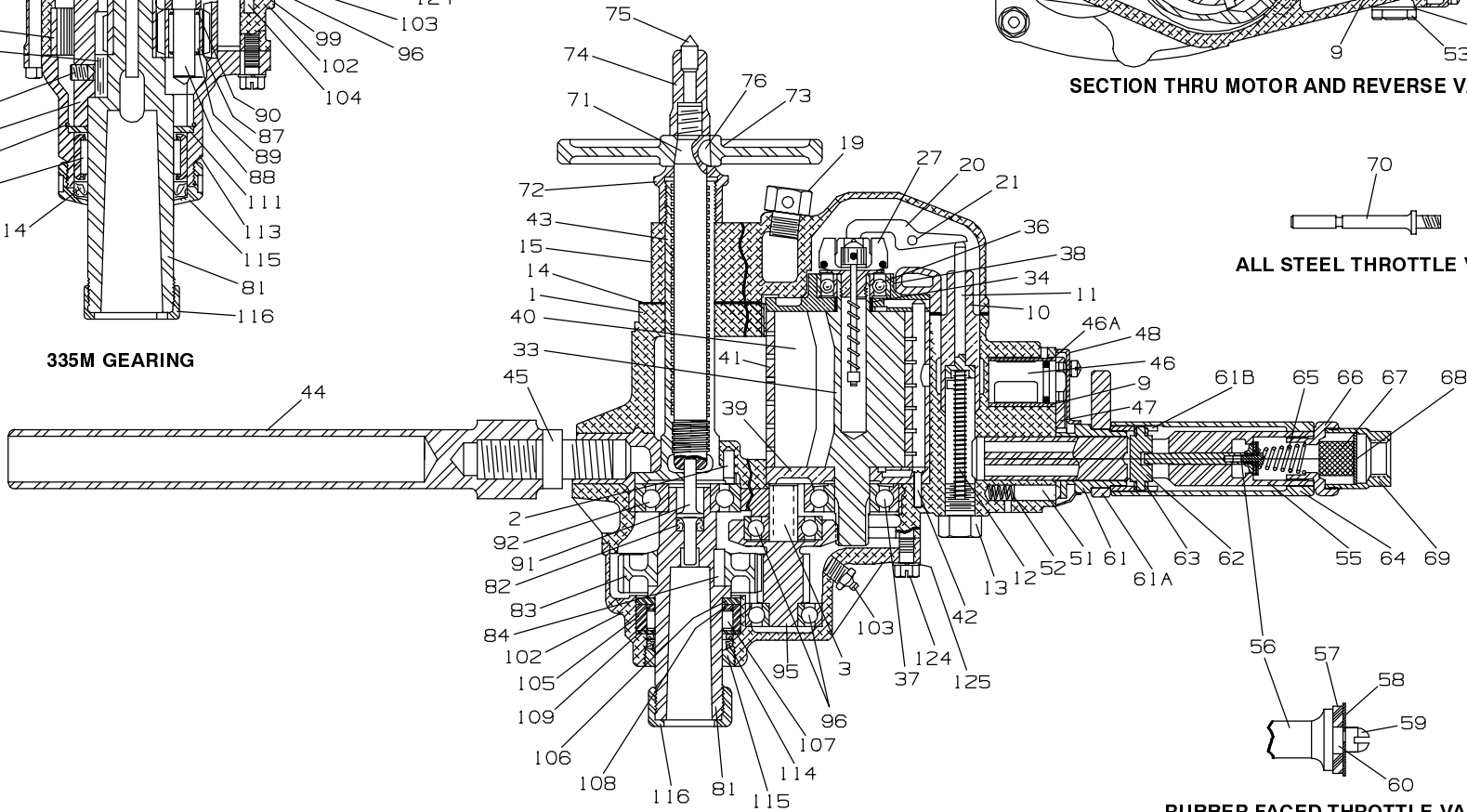
MAINTENANCE SECTION



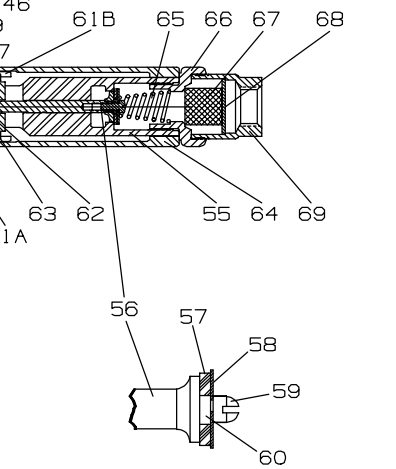
335M GEARING



SECTION THRU MOTOR AND REVERSE VALVE



ALL STEEL THROTTLE VALVE



RUBBER FACED THROTTLE VALVE



PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

1	Motor Housing		24	1/4" Lock Washer (4)	L01-67
	for 33SMA	R33SM-40A	24A	Backhead Cap Screw Washer (2) (Copper) ..	DLC-504B
	for 33SMA-EU	R33SM-EU-40A	27	Weight-type Governor Assembly	R3H-A424
	for 33H, 33J, 33SJ and 33SKA	R33H-40A	33	Rotor	R33H-53B
	for 33H-EU, 33J-EU, 33SJ-EU		34	Rotor Bearing Spacer	R3H-65
	and 33SKA-EU	R33H-EU-40A	• 36	Rear Rotor Bearing	R3H-22
*	Nameplate		• 37	Front Rotor Bearing	R3H-24
	for models ending in -EU	R2H-EU-99	• 38	Rear End Plate	R33H-12
	for all other models	R2H-99	• 39	Front End Plate	R33H-11
*	Warning Label		• 40	Vane Packet (set of 5 Vanes)	R3H-42A-5
	for models ending in -EU	EU-99	41	Cylinder	
	for all other models	WARNING-8-99		for maximum power in counter-	
2	Feed Screw Dowel	R3H-527		clockwise rotation (when facing	
3	Intermediate Gear Bearing Stud			spindle end) (standard for Drill;	
	(not used on 33SMA or 33SMA-EU) . . .	R3H-502		special for Base-Mounted Motors) ..	R33H-3A
4	Exhaust Deflector	R33H-23		for equal power in either direction	
5	Exhaust Deflector Screw	R33H-312		(standard for Base-Mounted Motors;	
8	Air Port Gasket (2)	R22H-210		special for Drills)	R33H51-3
9	Reverse Valve Bushing	534-330		for maximum power in clockwise	
10	Governor Valve Bushing	R3H-429A		rotation (special for Drills and	
*	Muffler Screen	R33H-311		Base-Mounted Motors)	R33H-203
*	Muffler Screen Retainer	R00B1-159	42	Cylinder Dowel	R3H-98A
11	Governor Valve	R3H-425A	43	Outer Feed Screw	R3H-290A
12	Governor Valve Spring	R3H-431	44	Dead Handle	TC-48
13	Governor Valve Cap	R3H-433	45	Dead Handle Stud	TC-364
• 14	Backhead Gasket	R3H-283	46	Reverse Valve	R33H-A329
15	Backhead	R3H-102A	• 46A	Reverse Valve Seal	R18LF-21
16	Grease Fitting	23-188	47	Reverse Valve Sector	TCC-428
17	Oiler Adjusting Screw (2)	JA4-71	48	Sector Cover	TCC-429A
18	Oiler Felt (8)	JA4-75	49	Sector Cover Screws (4)	TCC-430
19	Oil Chamber Plug	P25-227	50	Sector Cover Screw Lock Washers (4)	T05-58
20	Governor Lever	R4F-436	51	Stop Pin	TCC-431
21	Governor Lever Pin	MP1-15A	52	Stop Pin Spring	B01-11
22	Backhead Short Cap Screw (4)	R3H-57	53	Throttle Body Set Screw	TCCW-433
23	Backhead Long Cap Screw (2)	R3H-66	54	Throttle Body Set Screw Lock Washer	D02-537

MAINTENANCE SECTION

* Not illustrated.

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

PART NUMBER FOR ORDERING



PART NUMBER FOR ORDERING



	Roll Throttle Assembly	R33H-A518	70	All-Steel Throttle Valve	R4H-302
*	Rotation Label	R22H-100		Feed Screw Assembly	R3H-A291
◆ 55	Throttle Body	R33H-409	71	Inner Feed Screw	R3H-291
⊗ 56	Rubber-Faced Throttle Valve	R4H-402	72	Feed Screw Cap	TC-392
• 57	Throttle Valve Face	R4H-159	73	Feed Handle	TC-2
58	Throttle Valve Face Cap	R4H-157	74	Feed Handle Lock Nut	TC-388A
59	Throttle Valve Face Retaining Screw	R4-158	75	Feed Screw Center	TC-244
60	Retaining Screw Lock Washer	H54U-352	76	Feed Handle Key	TC-18
61	Throttle Sector	R33P5-1487			
61A	Reverse Lever	R55H-314			
*	Reverse Lever Set Screw (2)	R2J-561			
61B	Throttle Cam	R4H-317			
62	Throttle Valve Lift Pin	R4H-306			
63	Lift Pin Roller (2)	TAA-426			
64	Throttle Sleeve	R4H-305			
65	Throttle Valve Spring	R33H-418			
	Air Strainer Assembly	R4H-A565			
66	Air Strainer Cap	R4H-566			
67	Air Strainer Screen	R3H-61			
68	Air Strainer Screen Support	R3H-567			
69	Air Strainer Body	R3H-565			

* Not illustrated.

◆ If ordered as a replacement for a Throttle Body equipped with an All-Steel Throttle Valve, also order the Rubber-Faced Throttle Valve (56). The All-Steel Valve is discontinued.

⊗ Cannot be used as a replacement for the All-Steel Throttle Valve.

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

MAINTENANCE SECTION

GEAR CASE, GEARING AND SPINDLE PARTS

PART NUMBER FOR ORDERING



	Spindle Assembly	
	for Model 33H or 33H-EU	R3H-A108
	for Model 33J or 33J-EU	R3J-A108
	for Model 33SJ or 33SJ-EU	R3SJ-A108
	for Model 33SKA or 33SKA-EU	R3SK-A108
	for Model 33SMA or 33SMA-EU	R3SM-B108
81	Spindle	
	for Model 33H, 33H-EU, 33J or 33J-EU	R3H-108
	for Model 33SMA or 33SMA-EU	R3SM-108
	for Model 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	R3SH-108
82	Ejecting Pin Packing	
	for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	R3H-408
	for Model 33SMA or 33SMA-EU	R3SM-408
83	Spindle Gear	
	for Model 33H or 33H-EU	R33W-9A
	for Model 33J, 33J-EU, 33SJ or 33SJ-EU	R3J-9
	for Model 33SKA or 33SKA-EU	R3SK-9
84	Spindle Gear Key or Planet Gear Frame Key	
	for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	TB-410
	for Model 33SMA or 33SMA-EU	R3SM-410
	Planet Gear Frame Assembly (for Model 33SMA or 33SMA-EU only)	R3SM-A367
85	Planet Gear Frame	R3SM-367
86	Planet Gear Frame Set Screws (3)	R3SM-574
87	Planet Gear (3)	533-652
88	Planet Gear Shaft (3)	R3SM-191
89	Planet Gear Roller (54)	533-654
90	Roller Retaining Plate (6)	533-655
91	Drill Ejecting Pin	
	for Models 33H, 33H-EU, 33J or 33J-EU	R3H-114
	for Model 33SMA or 33SMA-EU	R3SM-114
	for Model 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	R3SH-114
• 92	Spindle Thrust Bearing	D04-366
93	Spindle Thrust Bearing Spacer (for Model 33SMA or 33SMA-EU)	R3SM-100
94	Spindle Gear	R3SM-9
95	Intermediate Gear	
	for Model 33H or 33H-EU	R33W-82A
	for Model 33J, 33J-EU, 33SJ or 33SJ-EU	R3J-82A
	for Model 33SKA or 33SKA-EU	R3SK-82A
96	Intermediate Gear Bearing	
	for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	TB-394
	for Model 33SMA or 33SMA-EU	R3SM-501

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

MAINTENANCE SECTION

GEAR CASE, GEARING AND SPINDLE PARTS (Continued)

PART NUMBER FOR ORDERING

97	Intermediate Gear Bearing Spacer (for Model 33SMA or 33SMA-EU)	R3SM-573
98	Intermediate Gear Thrust Washer (for Model 33SMA or 33SMA-EU)	R3SM-498
99	Intermediate Gear Thrust Plate (for Model 33SMA or 33SMA-EU)	R3SM-570
100	Intermediate Gear Shaft (for Model 33SMA or 33SMA-EU)	R3SM-502
101	Internal Gear (for Model 33SMA or 33SMA-EU)	R3SM-406
102	Gear Case for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	RM3H-37A
	for Model 33SMA or 33SMA-EU	R3SM-37
103	Grease Fitting	23-188
104	Thrust Plate Dowel (for Model 33SMA or 33SMA-EU)	R4-265
105	Spindle Bearing Race (for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU)	R3H-510 R3H-510
106	Spindle Bearing Top Plate (for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU)	R3H-511
107	Spindle Bearing Roller (16) (for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU)	R3H-512
108	Spindle Bearing Cage (for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU)	R3H-513
109	Spindle Bearing Bottom Plate (for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU 33SKA or 33SKA-EU)	R3H-514
110	Spindle Bearing (for Model 33SMA or 33SMA-EU)	R3H4-510
111	Spindle Thrust Ring (for Model 33SMA or 33SMA-EU)	R4H-511
112	Thrust Ring Retainer (for Model 33SMA or 33SMA-EU)	R3SM-83
113	Gear Case Cover (for Model 33SMA or 33SMA-EU)	R3SM-378
114	Spindle Packing for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	R3H-14
	for Model 33SMA or 33SMA-EU	R3H4-14
115	Spindle Packing Nut for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	R3H-15
	for Model 33SMA or 33SMA-EU	R3H4-15
116	Protection Nut	T02-43A
122	Gear Case Bolt (3) for Model 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA or 33SKA-EU	R3H-103
	for Model 33SMA or 33SMA-EU	R3SM-103
123	Gear Case Bolt Nut (1 for each bolt)	T06-139
124	Gear Case Cap Screw (3)	R3H-68A
*	Gear Case Long Cap Screw (for Model 33SMA or 33SMA-EU)	R3SM-126
125	1/4" Lock Washer (7 for 33SMA or 33SMA-EU; 6 for others)	L01-67

* Not illustrated.

MAINTENANCE SECTION

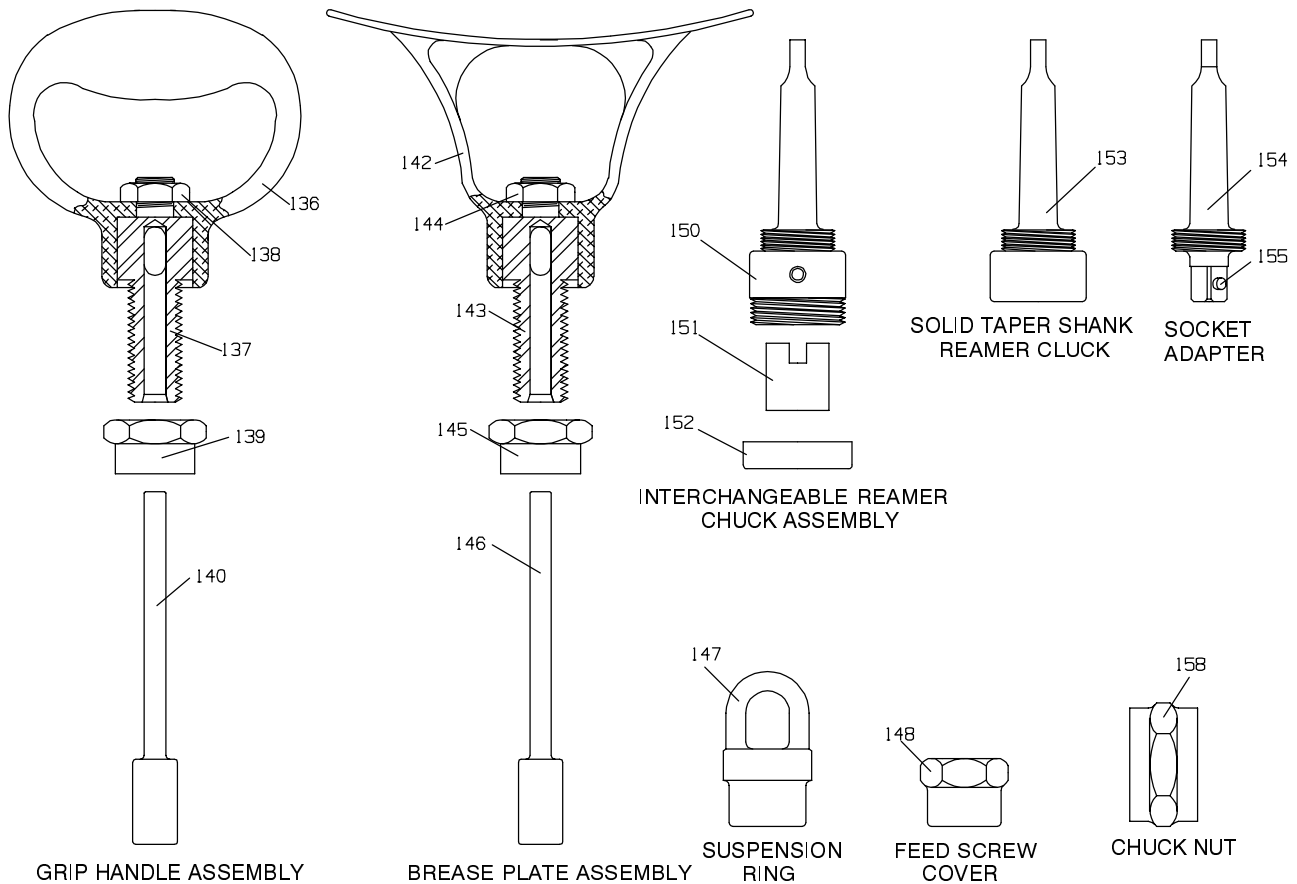
USE-EM-UP SPINDLES AND EXTENSION SPINDLES

Order a Use-Em-Up Spindle or Extension Spindle by the part number shown in the table below. With the exception of the Spindle, the same parts are included in a Use-Em-Up Spindle Assembly or an Extension Spindle Assembly as in a standard Spindle Assembly.

The following table also lists the Use-Em-Up Ejecting Pins that must be used with the Use-Em-Up Spindles.

Extension Spindles are available for Models 33SJ and 33SKA only.

	33H, 33H-EU	33J, 33J-EU	33SJ, 33SJ-EU	33SKA, 33SKA-EU	33SMA, 33SMA-EU
Use-Em-Up Spindle Assembly	R3H-A294	R3J-A294	R3SJ-A294	R3SK-A294	R3SM-B294
Use-Em-Up Spindle	R3H-294	R3SH-294	R3SH-294	R3SH-294	R3SM-294
Use-Em-Up Ejecting Pin	R3H-395	R3SH-395	R3SH-395	R3SH-395	R3SM-114
Extension Spindle Assembly	---	---	R3SJ-A327	R3SK-A327	---
Extension Spindle	---	---	R3SH-327	R3SH-327	---



(Dwg. TPA1366-1)

MAINTENANCE SECTION

PART NUMBER FOR ORDERING 

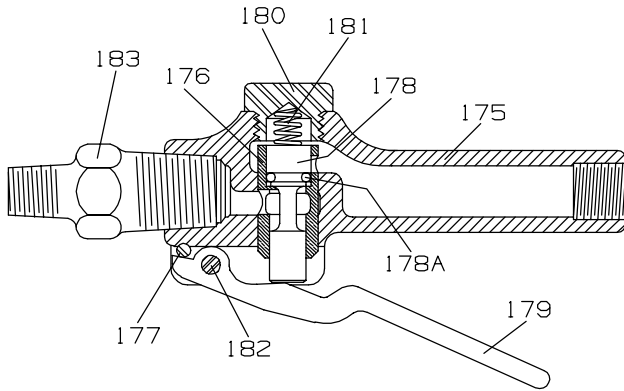
	Grip Handle Assembly	R33H-A41
136	Grip Handle	TA-41
137	Grip Handle Stud	TC-448
138	Grip Handle Stud Nut	B12-249
139	Grip Handle Nut	TC-447
140	Grip Handle Ejecting Pin	R3H-50
	Breast Plate Assembly	R3H-A79
142	Breast Plate	TC-79
143	Breast Plate Stud	TC-448
144	Breast Plate Stud Nut	B12-249
145	Breast Plate Nut	TC-447
146	Breast Plate Ejecting Pin	R3H-50
147	Suspension Ring	TC-365
148	Feed Screw Cover	TC-461
	Interchangeable Reamer Chuck Assembly (specify size of Bushing required) (for Model 33SJ, 33SJ-EU, 33SKA, 33SKA-EU, 33SMA or 33SMA-EU)	T02-A45A
150	Taper Shank Reamer Chuck for Interchangeable Bushing (for Model 33SJ, 33SJ-EU, 33SKA, 33SKA-EU, 33SMA or 33SMA-EU)	T02-45A
151	Interchangeable Reamer Chuck Bushing (5/8", 11/16", 3/4", 13/16", 7/8", or 1" square drive hole as specified) (for Model 33SJ, 33SJ-EU, 33SKA, 33SKA-EU, 33SMA or 33SMA-EU)	T01-38
152	Interchangeable Reamer Chuck Cap (for Model 33SJ, 33SJ-EU, 33SKA, 33SKA-EU, 33SMA or 33SMA-EU)	T01-54
153	Solid Taper Shank Reamer Chuck (5/8", 3/4", 7/8", or 1" square drive as specified) (for Model 33SJ, 33SJ-EU, 33SKA, 33SKA-EU, 33SMA or 33SMA-EU)	T02-255A
154	Socket Adapter No. 3 Morse Taper, 3/4" square drive (for Model 33SJ, 33SJ-EU, 33SKA, 33SKA-EU, 33SMA or 33SMA-EU)	R4J-214
155	Socket Retainer (consists of plunger, spring, and washer) (for Model 33H, 33H-EU, 33J or 33J-EU)	504-816
158	Chuck Nut	T12-347
*	Male Hose Nipple	
	3/4" hose to 1/2" male pipe	A03-46
	1/2" hose to 1/2" male pipe	D02-455

* Not illustrated.

MAINTENANCE SECTION

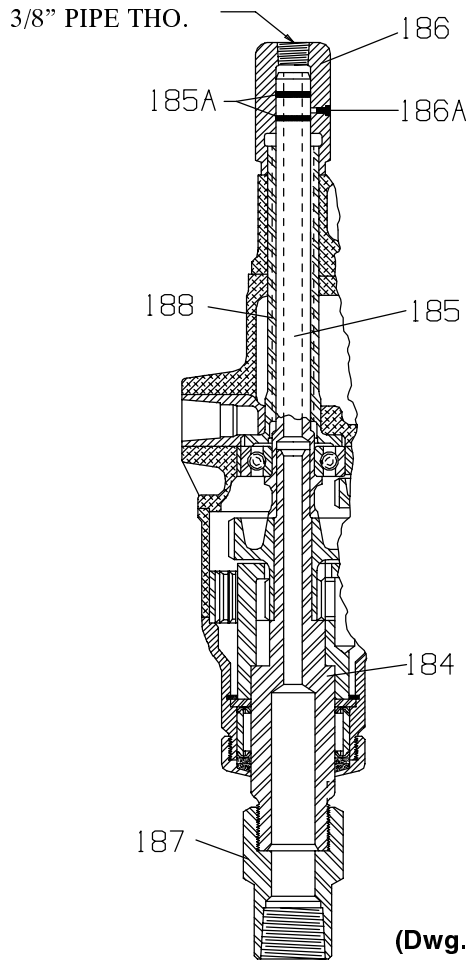
MODEL 33SM54 DRILL WITH WATER ATTACHMENT FOR EARTH WORK

Parts used only in Model 33SM54 Drill with Water Attachment.

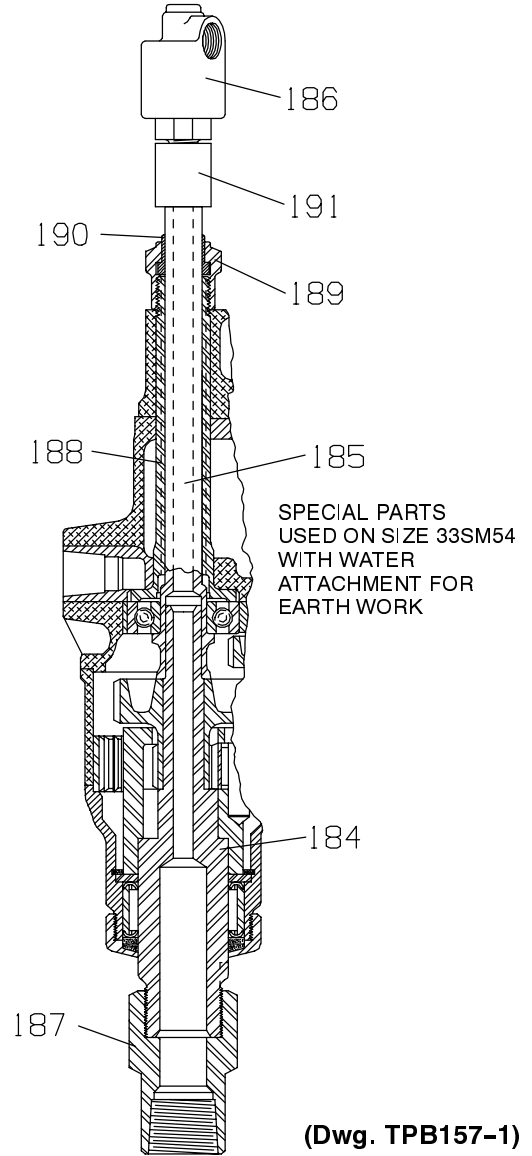


LEVER THROTTLE FOR DRILLS WITH WATER ATTACHMENT

(Dwg. TPC117-1)



(Dwg. TPB497)



(Dwg. TPB157-1)

MAINTENANCE SECTION

PART NUMBER FOR ORDERING



	Lever Throttle Assembly	R33SM54-A160
175	Lever Throttle Body	33SR-160
176	Lever Throttle Valve Bushing	33SR-162S
177	Throttle Lever Stop Pin	13SR-265
178	Lever Throttle Valve	33SR-161
178A	Throttle Valve Face	435-159
179	Throttle Lever	33SR-163
180	Lever Throttle Valve Cap	33SR-164
181	Lever Throttle Valve Spring	12SR-262
182	Throttle Lever Pin	13SR-264
183	Lever Throttle Connector	TCC-334
184	Water Attachment Spindle	R33SM54-708
185	Spindle Water Tube	
	Old Style	R33SM54-709
	New Style	R33SM54-A809
⊗ 185A	Water Tube Seal (2)	410-283
186	Swivel Joint	
	Old Style	R44L54-712
	New Style	R33SM54-A812
⊗ 186A	Grease Fitting	D0F9-879
187	Auger Adapter (1" pipe tap)	R33SM54-713-1
188	Water Tube Sleeve	R33SM54-790
189	Water Tube Sleeve Cap	R33SM54-792
190	Cap Bushing	R33SM54-793
191	Coupling	R44L54-115
*	Stop Cock	N16-12

* Not Illustrated.

⊗ Used only on New Style Water Attachment.

NOTICE

The new style Spindle Water Tube (185) and Swivel Joint (186) can be used in combination to replace the old style Spindle Water Tube and Swivel Joint. However, one new style part cannot be used in conjunction with the other old style part.

MAINTENANCE SECTION

BASE- -MOUNTED MULTI- -VANE MOTORS

Ingersoll-Rand Base-Mounted Multi-Vane Motors, Models 33H51, 33H51-EU, 33J51, 33J51-EU, 33SK51, 33SK51-EU, 33SM51 and 33SM51-EU are essentially Models 33H, 33H-EU, 33J, 33J-EU, 33SKA, 33SKA-EU, 33SMA and 33SMA-EU Multi-Vane Drills with certain parts omitted for mounting purposes and with Spindles changed to round, keyed shafts. Parts used only on Base-Mounted Motors are illustrated in the accompanying view. The balance of parts is illustrated in the sectional view of Drills titled “H”, “J” or “K” Gearing.

Parts not included in the following list for Base-Mounted Motors are the same as corresponding parts of Drills. Order them by the part names and part numbers stated for Drills in the part list titled “MOTOR HOUSING, MOTOR AND THROTTLE PARTS”.

		PART NUMBER FOR ORDERING	
		↓	↓
		Models 33H51, 33H51-EU 33J51, 33J51-EU 33SK51, 33SK51-EU	Model 33SM51, 33SM51-EU
200	Motor Housing for Roll Throttle (also includes illustrated parts 2, 8 (2), 9 and 10; illustrated part 3 also included for Models 33H51, 33H51-EU, 33J51, 33J51-EU, 33SK51 and 33SK51-EU) for models ending in -EU for all other models	R33H51-EU-40 R33H51-40	R33SM51-EU-40 R33SM51-40
*	Nameplate for models ending in -EU for all other models	R2H-EU-99 R2H-99	R2H-EU-99 R2H-99
*	Warning Label for models ending in -EU for all other models	EU-99 WARNING-10-99	EU-99 WARNING-10-99
201	Exhaust Bushing	R33H51-439	R33H51-439
202	Motor Housing for Remote Control (also includes illustrated parts 2, 8 (2), 10 and 201; illustrated part 3 also included for Models 33H51, 33H51-EU, 33J51, 33J51-EU, 33SK51, and 33SK51-EU) for models ending in -EU for all other models	R33H51-EU-RC40 R33H51-RC40	R33SM51-EU-RC40 R33SM51-RC40
*	Nameplate for models ending in -EU for all other models	R2H-EU-99 R2H-99	R2H-EU-99 R2H-99
*	Warning Label for models ending in -EU for all other models	EU-99 WARNING-10-99	EU-99 WARNING-10-99
203	Forward Inlet Stud	R22H-471	R22H-471
204	Forward Inlet Stud Lock Screw	TCCW-433	TCCW-433
205	7/16" Lock Washer	D02-537	D02-537
206	Reverse Inlet Stud	R33H-472	R33H-472
207	Reverse Inlet Stud Lock Screw	T05-44	T05-44
	Spindle Assembly (also includes illustrated parts 83 and 84 for Models 33H51, 33H51-EU, 33J51, 33J51-EU, 33SK51 and 33SK51-EU; illustrated parts 84, 85, 86 (3), 87 (3), 88 (3), 89 (54) and 90 (6) for Models 33SM51 and 33SM51-EU) for Model 33H51 or 33H51-EU for Model 33J51 or 33J51-EU for Model 33SK51 or 33SK51-EU for Model 33SM51 or 33SM51-EU	R3H51-A8 R3J51-A8 R3SK51-A8 ---	--- --- --- R33SM51-B8
208	Spindle	R3H51-8	R33SM51-8

* Not illustrated.

MAINTENANCE SECTION

PART NUMBER FOR ORDERING



		Models 33H51, 33H51-EU 33J51, 33J51-EU 33SK51, 33SK51-EU	Model 33SM51 33SM51-EU
209	Spindle Key	R40-610	R40-610
210	Backhead (also includes illustrated parts 16, 17 (2), 18 (8), 20 and 21)	R3H-102A	R3H-102A
211	Oil Chamber Plug	T1SE-368	T1SE-368
212	Gear Case	R3H51-37	---
213	Grease Fitting	23-188	---
214	Gear Case Cover	---	R33SM51-378
215	Spindle Packing Nut	---	R44SM51-15
216	Governor Valve Auxiliary Spring (used only in Motors with Remote Control)	P35-431	P35-431
217	Motor Mounting Stud	R33SM51-290	R33SM51-290
218	Motor Mounting Stud Cap	R33SM51-461	R33SM51-461
219	Rear Mounted Bracket	R33SM51-304	R33SM51-304
220	Rear Mounted Bracket Spacer	R33SM51-277	R33SM51-277
221	Front Mounting Bracket	R3H51-303	R33SM51-303
222	Motor Housing Anchor	R33SM51-364	R33SM51-364
223	Motor Mounting Base	R22N51-564A	R22N51-564A
225	Base Cap Screw Lock Washer (4)	D02-321	D02-321

MAINTENANCE SECTION

MAINTENANCE TOOLS

TOOL NAME	OPERATION	TOOL NUMBER FOR ORDERING
Packing Nut Spanner Wrench	Tightening or loosening the Spindle Nut (115), (Part Number R3H-15).	R3H-26
Packing Nut Spanner Wrench	Tightening or loosening the Spindle Nut (115 or 215) (Part Number R3H4-15 and R44SM51-15).	T1SE-59
Grease Gun	Inserting grease into the Backhead (15, 210) and Gear Case (102, 212).	P25-228
Throttle Valve Puller and Lapping Tool	Removing the All-Steel Throttle Valve (70) from the Throttle Body. Also used as a tool for lapping the All-Steel Throttle Valve to the valve seat in the Throttle Body.	T01-371
Planet Gear Frame Set Screw Wrench (5/32" hexagon)	Tightening or loosening the Planet Gear Frame Set Screws (86) in the Planet Gear Frame (85).	4U-478

WARNING

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

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

LUBRICATION

Each time the Models 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA, 33SKA-EU, 33SMA and 33SMA-EU Drills and Models 33H51, 33H51-EU, 33J51, 33J51-EU, 33SK51, 33SK51-EU, 33SM51 and 33SM51-EU Motors are disassembled for maintenance, repair or replacement of parts, lubricate as follows:

1. Work 1 - 2 cc of Ingersoll-Rand No. 28 Grease through the Grease Fitting (16, 103, or 213).
2. Remove the Oil Chamber Plug (19, 211) and fill the chamber in the Backhead (15, 210) with Ingersoll-Rand No. 50 Oil.
3. Inject 2 or 3 drops of Ingersoll-Rand No. 50 Oil into the oil hole in the Throttle Sleeve (63, 236).

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 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 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 new gaskets and O-rings for replacement.

Disassembly of the Tool

1. Keep the Air Strainer Screen (67) clean. Periodically, as experience indicates, unscrew the Air Strainer Body (69) from the Air Strainer Cap (66) and wash the Air Strainer Screen in a clean, suitable, cleaning solution. Push the prongs on the Screen Support (68) into one end of the Screen and insert the screen end first, into the body when assembling the strainer.

NOTICE

The external thread on the Outer Feed Screw (43) or Motor Mounting Stud (217) is left-hand.

2. Rotate the Feed Screw Cap (72) or Motor Mounting Stud Cap (218) clockwise to remove.
3. Do not pry the Backhead (15, 210) from the Motor Housing (1, 200, 202). Grasp the Oil Chamber Plug (19, 211) in a copper-covered or leather-covered vise jaws and pull on the Housing if the Backhead can not be lifted off with the fingers.

NOTICE

The Governor Assembly (27) has left-hand threads.

4. Rotate the Governor Assembly clockwise to remove it.

MAINTENANCE SECTION

5. Never clamp the Cylinder (41) in a vise. When disassembling the Motor:
 - a. Grasp the Cylinder in one hand.
 - b. Insert a small rod into the rotor bore and drive the hub on the Rotor out of the Rear Rotor Bearing (36).
 - c. Support the Front End Plate (39) and press the rotor front hub out of the Front Rotor Bearing (37).
6. Remove the Throttle Body Set Screw (52) or Forward Inlet Stud Set Screw (204) from the side of the Motor Housing before attempting to pull the Throttle Body (55) or Forward Inlet Stud (203) from the Motor Housing.

For Drills and Motors with Planetary Gearing

Unscrew the three Planet Gear Frame Set Screws (86) from the Planet Gear Frame (85) before attempting to press the Spindle out of the Planet Gear Frame.

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. Unless otherwise noted, always press on the stamped end of a needle bearing when installing the needle bearing in a recess.
4. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws. Take extra care with threaded parts and housings.
5. Always clean every part and wipe every part with a thin film of oil before installation.
6. Apply a film of O-ring lubricant to all O-rings before final assembly.
7. 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 bearing should never be cleaned.** Work grease thoroughly into every open bearing before installation.

Assembly of the Tool

1. Press the Rear Rotor Bearing (36), shielded side first, into the recess in the Rear End Plate (38) with an arbor that will contact only the bearing outer race. Press on the bearing inner race when installing the assembly on the hub of the Rotor (33).
2. Press the Front Rotor Bearing (37), shielded side first, onto the front hub of the Rotor with a sleeve that will clear the pinion and contact only the bearing inner race.
3. After installing one End Plate and Rotor Bearing on the rotor hub, insert a Vane (40) into each slot in the Rotor. Place the Cylinder (41) over the Rotor and

against the installed End Plate being sure the Cylinder is positioned with its flattened rim toward the pinion end of the Rotor so that the flats will coincide with those on the Front End Plate when the motor is assembled.

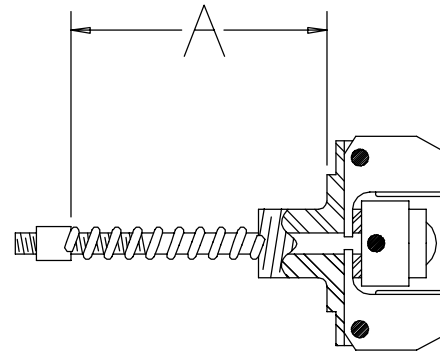
NOTICE

The Governor Assembly (27) has left-hand threads.

4. When installing a new Governor Assembly, screw the Adjusting Nut onto the governor stem until the proper dimension "A" as shown in Dwg. TPD497. This will usually result in the proper governed free speed. However, this is only an approximate setting and further adjustment may be necessary. Screw the nut farther onto the stem to increase the speed; back it off to decrease the speed.

GOVERNOR ADJUSTMENT

- A = 1-29/32" (48 mm) For Drills and Motors with Standard Throttle
 A = 2-1/32" (52 mm) For Motors with Remote Control



(Dwg. TPD497)

The correct governed free speeds for these Models are:

Model	Speed, rpm
33H, 33H-EU, 33H51 and 33H51-EU	800
33J, 33J-EU, 33SJ, 33SJ-EU, 33J51 and 33J51-EU	450
33SKA, 33SKA-EU, 33SK51 and 33SK51-EU	300
33SM, 33SM-EU, 33SM51 and 33SM51-EU	185

5. Be sure both rubber Air Port Gaskets (8) are in good condition and are positioned, lip side first, in the air ports in the Motor Housing (1, 200, 202) before installing the Multi-Vane motor in the Motor Housing.

MAINTENANCE SECTION

6. Draw the Backhead (15) evenly against the Backhead Gasket (14) on the face of the Motor Housing by turning each Backhead Cap Screw (22, 23) a little at a time until all are tight.

NOTICE

The two sets of Housing Studs, Nut and Lock Washer have been replaced by two Backhead Short Cap Screws (22) using Copper Washers (24A).

7. If the Housing Studs need replacing in an old Motor Housing, order two Backhead Short Cap Screws R3H-57 and two Copper Washers DLC-504B.
8. Note the stamping “THRUST HERE” on one side of the Spindle Thrust Bearing (92). Install the Bearing unstamped side first on the spindle hub.

For Drill and Motors with Spur Gearing

Install an Intermediate Gear Bearing (96) at each end of the Intermediate Gear (95). Mesh the small gear of the compound Intermediate Gear with the gear on the Spindle (81, 208) and install the Spindle Assembly and Intermediate Gear simultaneously in either the Gear Case (102, 212) or the Motor Housing (1, 200 or 202).

For Drills and Motors with Planetary Gearing

Assemble the Spindle (81 or 208) and gearing in the Gear Case (102) and Gear Case Cover (113 or 214). Install this assembly as a unit on the Motor Housing.

MAINTENANCE SECTION

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Low power or low free speed	Dirty Inlet Bushing or Air Strainer Screen and/or Muffler Screen	Using a clean, suitable, cleaning solution in a well-ventilated area, clean the Air Strainer Screen and Muffler Screen. Allow to air dry.
	Worn or broken Vanes	Replace complete set of Vanes.
	Worn or broken Cylinder and/or scored End Plates.	Examine Cylinder and replace it if it is worn or broken or if bore is scored or wavy. Replace End Plates if they are scored.
	Dirty motor parts.	Disassemble the tool and clean all parts with a clean, suitable, cleaning solution, in a well-ventilated area. Reassemble the tool as instructed in this manual.
	Improper positioning of Reverse Valve.	Make certain Reverse Valve is fully engaged.
Motor will not run	Incorrect assembly of motor.	Disassemble motor, replace worn or broken parts and reassemble as instructed.
Rough operation	Worn or broken Rear Rotor Bearing or Front Rotor Bearing	Examine each bearing. Replace if worn or damaged.
	Worn or broken Gear teeth	Check for a worn or broken gearing or if a replacement is necessary.
Air leaks	Worn Throttle Valve Face or Throttle Valve Face Cap	Replace worn parts.
	Oil Chamber Plug worn or not tight	Tighten the Plug. If the problem persists, replace the Plug.
Gear Case gets hot	Insufficient grease	Clean and inspect the Gear Case gearing parts and lubricate as instructed in LUBRICATION .
	Worn or damaged parts	Clean and inspect the Gear Case and gearing. Replace worn or broken components.

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.