MODEL 3BMGA20RH-34F STARTER

WARNING

The Model 3BMGA20RH-34F Starter is designed for gas operation. It is not totally sealed in dynamic operation since the exhaust must be vented or piped away and there is a possibility of leakage around the output shaft when rotating.

Caution should be taken when operating this Starter on gas because of the danger of fire, explosion, or inhalation.

After reassembling the 3BMGA20RH-34F Starter, always test it in accordance with the procedures outlined in this manual. Never install a reassembled Starter that has not been tested in accordance with the procedures outlined in this manual.

If the Starter is gas operated, the exhaust must be piped away to a location where it will not be ignited or inhaled. The Starter should be installed with the exhaust down.

LUBRICATION

For temperatures above $32^{\circ} F (0^{\circ} C)$, use a good quality SAE 20 nondetergent motor oil. For temperatures below $32^{\circ} F (0^{\circ})$, use diesel fuel.

OPERATING INSTRUCTIONS

Do not operate the Model 3BMGA20RH-34F Starter on air or gas pressures greater than 150 psig (10.2 bar/1034 kPa). Use 3/4" (19 mm) hose, or larger, for maximum efficiency.

Model 3BMGA20RH-34F Starters and replacement Drives are shipped from the factory with the drive pinion in the retracted position. However, should the pinion become extended and appear to be locked, the situation can be overcome by installing the Starter on the engine and initiating a normal start. As the engine starts and overspeeds the drive, the pinion will return to its normal retracted position for the next start. WARNING: Do not remove the springs and pins in the Drive in an attempt to unlock the pinion.

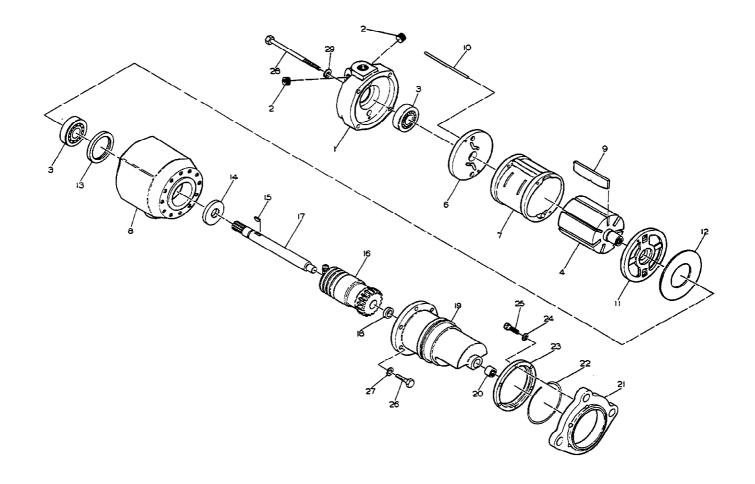
Caution: Do not engage Starter while engine is running.

MAINTENANCE INSTRUCTIONS

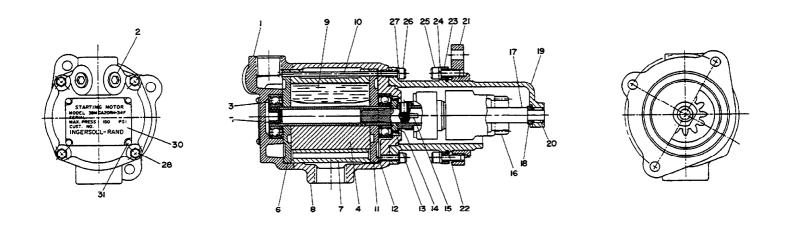
Remove and install the Starter as a unit. Never immerse the Starter Drive (16) in solvent. Doing so will remove or dilute the factory-applied lubricant within the drive.

Notice: The use of other than genuine Ingersoll-Rand replacement parts may result in decreased Starter performance and increased maintenance, and may invalidate all warranties.





(Dwg. TPA1186)



PART NUMBER FOR ORDERING -



Motor Housing Cover JBM-102B Plug (2) Plug (2) HSPPS-3 Rotor Bearing (2) (special; purchase from Ingersoll-Rand) JBMG-24 Rotor JBMG-24 Rotor JBMG-25 Rotor Plug (for gas sealing) JBMG-31 JB			
Plug (2)	1	Motor Housing Cover	3BM-102B
Rotor Bearing (2) (special; purchase from Ingersoll-Rand) 3BMG-24	2		HSPPS-3
Rotor SBM-53 SBM-53 SBM-53 SBM-56 Rear End Plate SBM-12A Cylinder SBM-12A Cylinder SBM-3 SBM-3 SBM-3 SBM-3 SBM-4020 Vane Packet (set of 7 Vanes) SBM-3 SBM-4020 Vane Packet (set of 7 Vanes) SBM-4020 Vane Packet (set of 7 Vanes) SBM-42-7 Cylinder Dowel SBM-98 SBM-42-7 SBM-98 SBM-11A Seal SBM-11A SBM-30	_		
5 Rotor Plus (for gas sealing) 3BMG-531 6 Rear End Plate 3BM-12A 7 Cylinder 3BM-3 8 Motor Housing 3BM-4020 9 Vane Packet (set of 7 Vanes) 3BM-42-7 10 Cylinder Dowel. 3BM-98 11 Front End Plate 3BM-11A 12 Front Motor Gasket 3BM-24 13 Seal 91RN 271 14 Drive Shaft Collar 3BM-30 15 Drive Shaft Key TC-18 16 Starter Drive 3BM-29-1 17 Drive Shaft 3BM-29-1 19 Drive Housing Thrust Washer 3BM-300 19 Drive Housing Bearing 3BM-300 20 Drive Housing Bearing 3BM-300-1 21 Mounting Flange Snap Ring 3BM-301-1 22 Mounting Flange Cap Screw (3) R44H-490-3 23 Mounting Flange Cap Screw (4) R4H-490A 24 Mounting Flange Cap Screw (5) R0-34 25	4		
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1-5/8" thick (for some Wisconsin Engines)			· ·
1-23/32" thick (for some Wisconsin Engines)			· ·
35/12 3		1-23/32" thick (for some Wisconsin Engines)	•

^{*} Not illustrated.

GAS-OPERATED STARTERS

Warning: When repairing or converting Air Starters for gas operation, it is imperative that the motors be properly sealed. In the procedure below, "Sealant" is Ingersoll-Rand No. SMB-431 Gasket Eliminator or General Electric No. RTV 102.

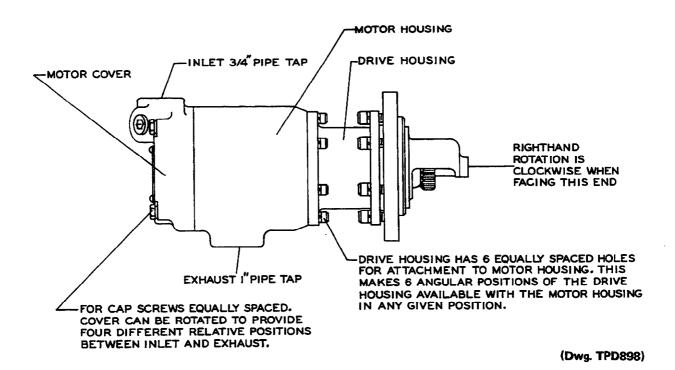
- 1. Inspect the Rotor (4). If it does not have a plastic plug, order and press in a No. 3BMG-531 Rotor Plug (5) for gas sealing.
- 2. If the shaft seal is being replaced, it must be installed with sealant between the seal outside diameter and housing box. The lip of the seal must be inward toward the ball bearing.
- 3. Apply a thin film of sealant between the Motor Housing Cover (1) and the Motor Housing (8). Apply the Cover to the Housing.
- 4. Apply sealant to both sides of the copper sealing washers and under the head of the Motor Cover Cap Screws (28). Assemble, install and tighten to 100 in-lb (11.3 N m) torque.
- 5. Plugs for the lubricator connection (2) will normally be supplied with sealant previously applied. When substitute plugs are used, sealant must be applied to the threads.
- 6. Apply sealant to the nameplate screw holes; install the Nameplate (30) and Nameplate Screws (31).
- 7. Assemble the Drive Shaft (17), Starter Drive (16), Drive Shaft Key (15) and Drive Shaft Collar (14). Loctite the Drive Shaft Collar to the Drive Shaft after installing the Starter Drive.
- 8. Finish assembling using sealant on the threads of the Drive Housing Cap Screws (26) and on both sides of the Housing Cap Screw Lock Washers (27).
- 9. Allow four hours drying time.
- 10. Plug the exhaust, apply 40 psig (2.8 bar/280 kPa) air to the inlet. Immerse the unit for 30 seconds in a nonflammable solvent. If the unit is properly sealed, no bubbles will appear.

STARTER REORIENTATION

Starters can be assembled in various angular positions to provide a selection of locations for the inlet, exhaust, pinion opening and mounting flange holes. Reorientation should not be done unless necessary to mount the Starter to the engine or connect air lines to the Starter.

WARNING

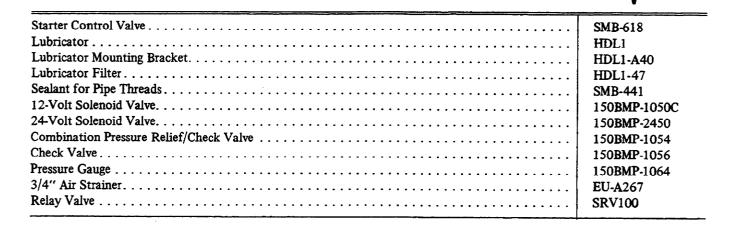
If a reoriented Starter is to be used for gas operation, it is imperative that it be properly sealed. See GAS-OPERATED STARTERS above.



REORIENTATION OF SIZE 3BMG STARTERS

ACCESSORIES

PART NUMBER FOR ORDERING -



Ingersoil-Rand Company

Engine Starting Systems P. O..Box 1776 Liberty Corner, NJ 07938 201-647-6000

SALES HEADQUARTERS

Ingersoll-Rand Company Engine Starting Systems 888 Industrial Drive Elmhurst, III. 60126 312-530-3800 Canadian Ingersoll-Rand Co., Ltd. 255 Lesmill Road, Don Mills Toronto, Ontario M3B2V1 416-445-4470

DISTRIBUTION:

Ingersoll-Rand Company Engine Starting Systems 3940 Blackgold Drive Dallas, Texas 75247 214-631-2007



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