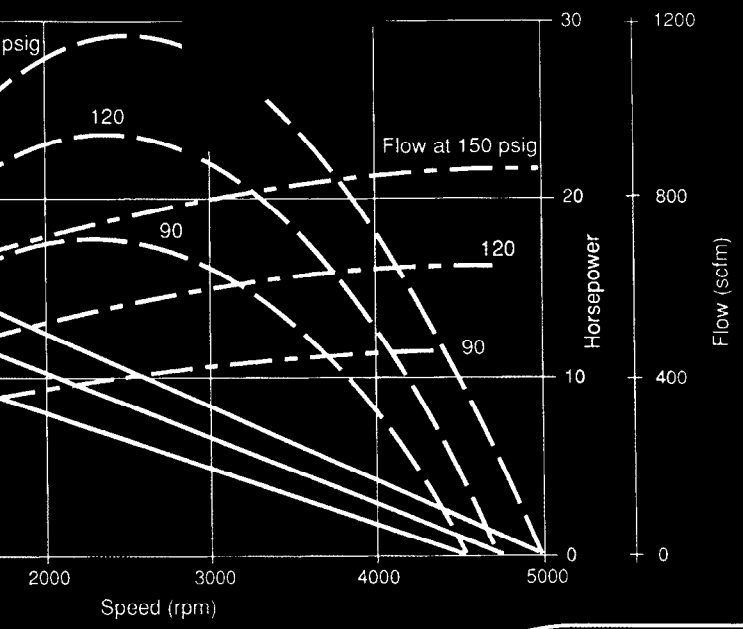
TS700 Turbine Engine Starters



INGERSOLL-RAND

ENGINE STARTING SYSTEMS

More than just a new application... based on more than 50 years of leadership in engine starting.

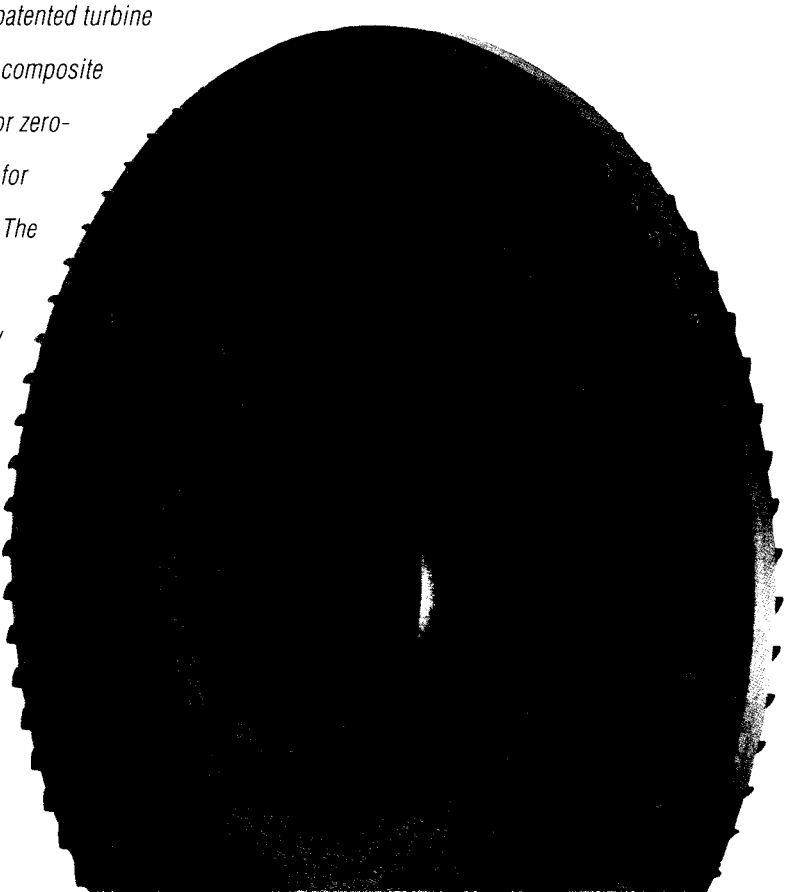
The Ingersoll-Rand TS700 Series of Turbine Engine Starters.

Ingersoll-Rand now meets the starting requirements of turbine engines, with unique IR turbine drive technology in a versatile, supremely reliable package. The new TS700 Series starters are based on the well-established IR Multi-Torque™ starter motors, with new mounting flange configurations and drive pinions specifically suited to the products of all major turbine engine manufacturers.

The rise of power.

The key to TS700 performance is in Ingersoll-Rand's patented turbine wheel. Its innovative composite construction allows for zero-tolerance clearances, for increased efficiency. The exclusive, two-stage radial design not only applies air to both sides of the turbine wheel, but also to two rows of blading. This concept extracts amazing power and efficiency, with a balanced load to the turbine bearings, and reduced overall motor wear. It also affords precise speed management — without the need for internal or external overspeed shut-off devices. The IR turbine wheel is inherently quieter than competitive types — a function of advanced design and materials. The reduced pitch level of the turbine blading actually creates a "whisperized" effect for the operator.

The unique, composite IR turbine wheel – two stage design, with two rows of blading for superior efficiency.



The development of power.

Lighter, faster, and more flexible than other starting systems, the TS700 Series quickly generates maximum torque. Its unique arc design permits operation in both low and high pressure applications, with full or partial arc versions, and all are factory tested for use with air or natural gas.

The modular design of the motor package interfaces easily with a variety of engine configurations, and incorporates key durability and safety factors:

- *A splash lubrication system internally lubricates the planetary gears and motor bearings—no oil in the drive air is required.*
- *Air cooling likewise extends the life of bearings and seals.*
- *The operator is always in full control of the start cycle, as there are no internal or external shut-off devices.*

The delivery of power.

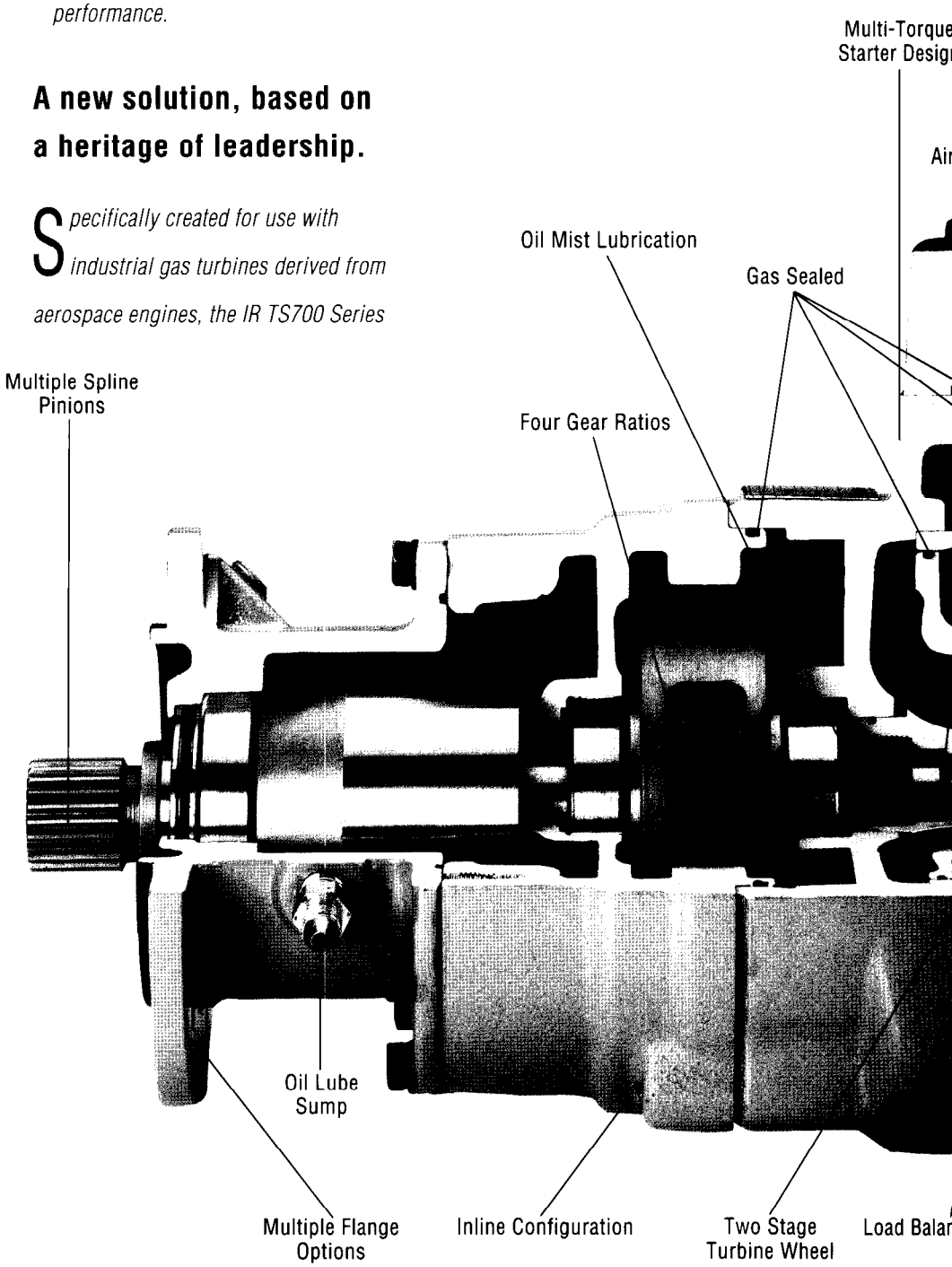
The newly-developed drive pinions and mounting flanges for the TS700 Series facilitate application to the most popular turbine engines from all manufacturers. In addition, IR offers a special flange for piped-away exhaust.

Other features include . . .

- *A selection of gear ratios for optimum matching of starter and engine characteristics.*
- *Rotatable flanges for ease of installation.*
- *Sprague-type clutch for optimum performance.*

A new solution, based on a heritage of leadership.

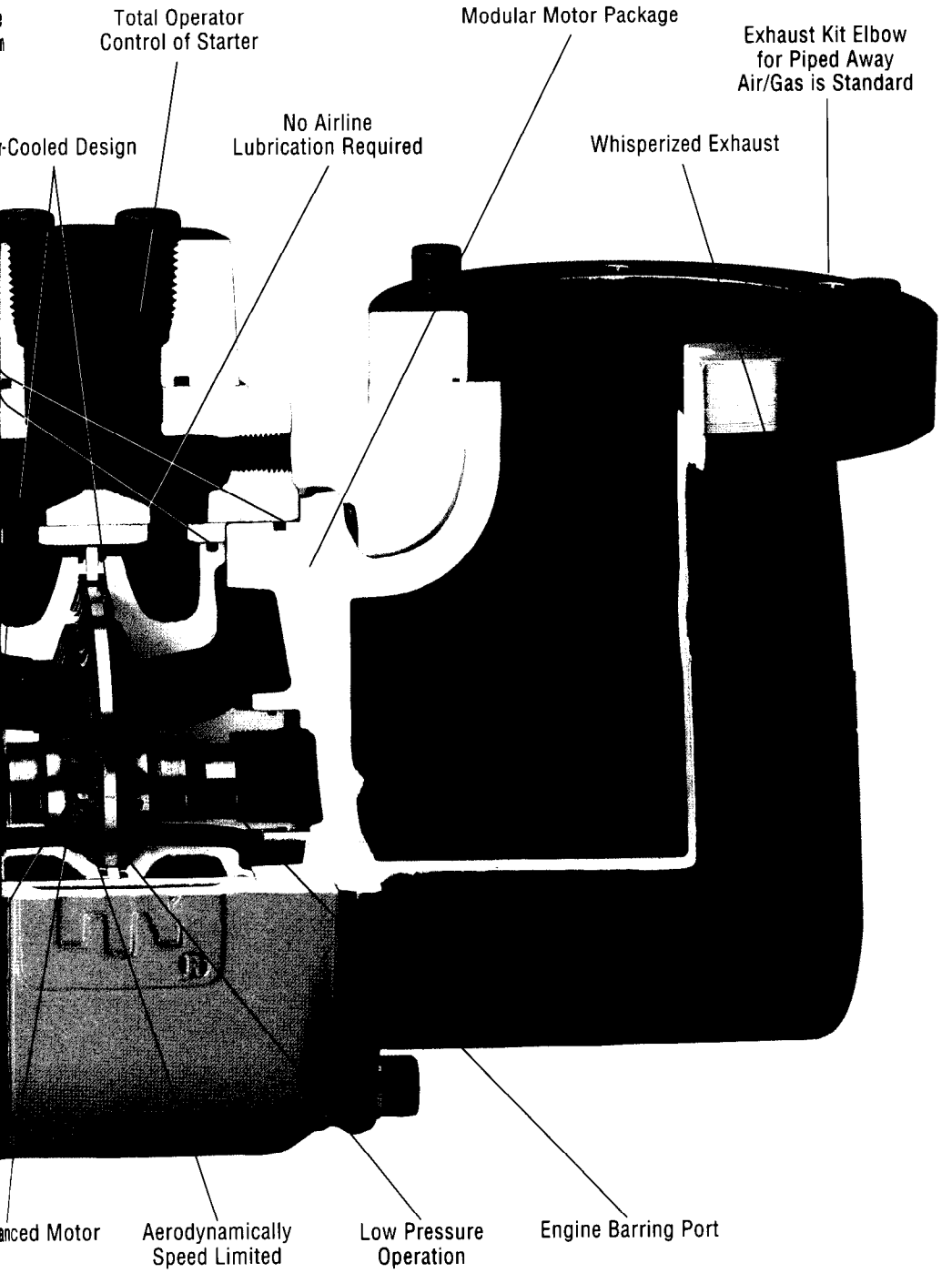
Specifically created for use with industrial gas turbines derived from aerospace engines, the IR TS700 Series meets emerging demands for technical sophistication . . . as well as traditional demands for reliability and power on command. They provide the perfect starting solution for electric power generation, industrial drives, marine propulsion, and similar applications.



Ingersoll-Rand's unique, composite radial turbine delivers tremendous cranking power for air or natural gas operation, with no lubrication requirements, minimal maintenance, and demonstrated performance and durability.

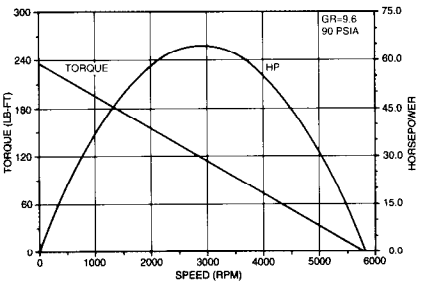
Consult your authorized distributor or Ingersoll-Rand Engine Starting Systems representative for complete details.

A model of efficiency – the IR TS700 starter in cutaway display.

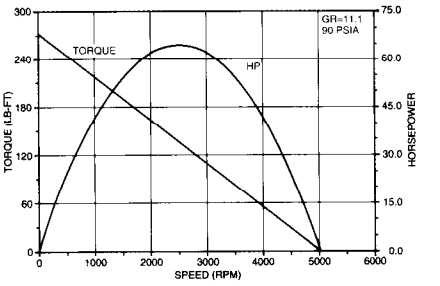


TS700 Starter Performance Data

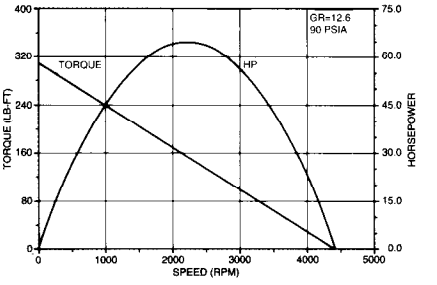
Version A



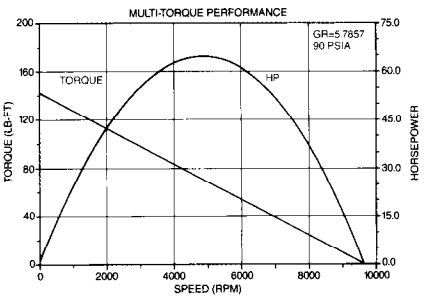
Version B



Version C



Version D

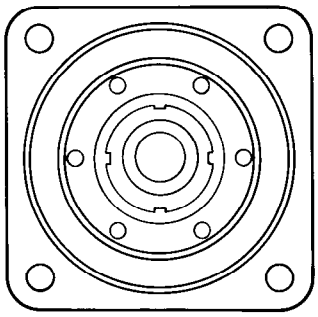


TS700 Versatility

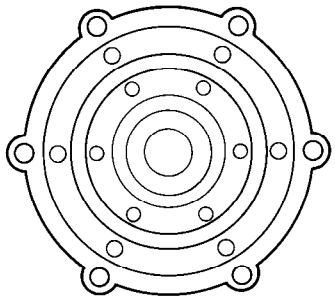
Ingersoll-Rand offers TS700 configurations to match the products of all major turbine engine manufacturers:

ALLISON 501KC
DRESSER-RAND 990
TEXTRON-LYCOMING
TURBOMECA
SOLAR SATURN
SOLAR CENTAUR (no clutch)
SOLAR MARS (no clutch)
RUSTON TYPHOON (no clutch)
RUSTON TORNADO (no clutch)
RUSTON HURRICANE (no clutch)
HISPANO SUIZA
GELM1600 (DR)
GELM2500 (DR)
PRATT & WHITNEY V64.3
PRATT & WHITNEY V64.4
PRATT & WHITNEY V84.2
PRATT & WHITNEY V84.4
PRATT & WHITNEY FT8
COOPER-ROLLS
MITSUBISHI
SIEMENS (PRATT & WHITNEY)

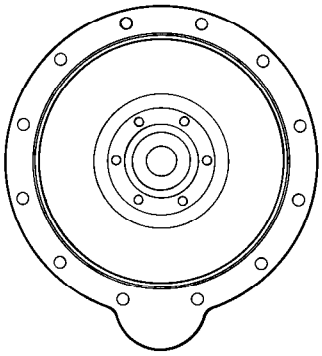
TS700 Mounting Flange Options



Option 1



Option 2



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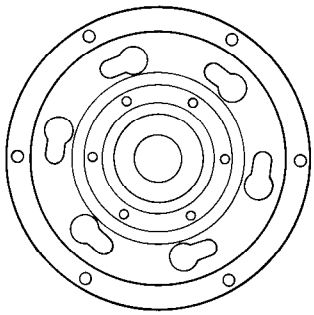
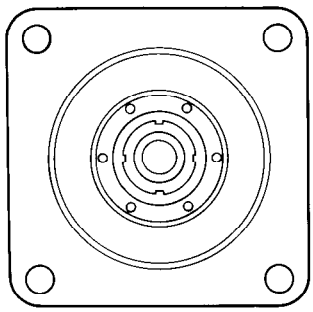
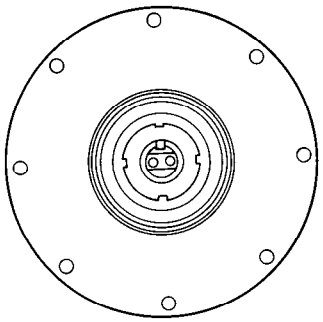


Option 4

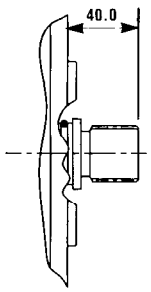


Option 5

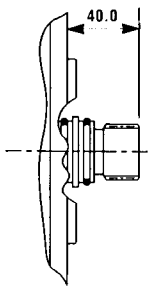


Option 6

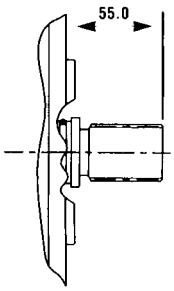
Shaft Configurations



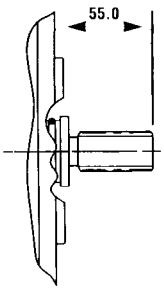
MODEL A
SPLINED SHAFT
CONFIGURATION
24 TEETH
20/40 D.P.
30.48 PITCH DIA.



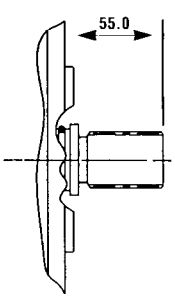
MODEL B
SPLINED SHAFT
CONFIGURATION
24 TEETH
20/40 D.P.
30.48 PITCH DIA.



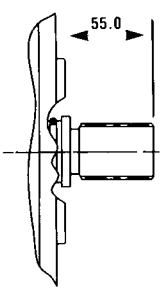
MODEL C
SPLINED SHAFT
CONFIGURATION
14 TEETH
12/24 D.P.
29.63 PITCH DIA.



MODEL D
SPLINED SHAFT
CONFIGURATION
16 TEETH
20/30 D.P.
20.32 PITCH DIA.



MODEL E
SPLINED SHAFT
CONFIGURATION
24 TEETH
20/30 D.P.
30.48 PITCH DIA.



MODEL F
SPLINED SHAFT
CONFIGURATION
24 TEETH
20/40 D.P.
30.48 PITCH DIA.

TS700 Application Guide

Customer _____ Date _____

Address _____

IR District Sales Manager _____

Key Contact _____ Phone Number _____

Package Model _____ Make _____

Engine Model _____ Make _____

Gear Box _____ Make _____

Current Starter Model _____ Make _____

Provide an engine drag curve; or answer the following questions if possible:

Starter Speed at:	Starter Torque at:
1. Engine Full Speed	1. 0 RPM
2. Starter Drop Out	2. Ignition
3. Ignition	3. Drop Out
4. Water Wash	4. Water Wash

Direction of Rotation _____

Starter Flange Shaft Detail or:

1. No. Teeth _____

2. DIA. Pitch _____

3. Pitch DIA. _____

4. Length from flange face to end of spline _____

Gas or air pressure _____

Lubrication available at starter _____

Photocopy, complete, and return to: Ingersoll-Rand Co., PO Box 1776, Liberty Corner, NJ 07938
ATTN: Marketing Manager/ Engine Starting Systems

Sales Headquarters/United States
National Sales Office/Engine Starting Systems
P.O. Box 1776
Liberty Corner, NJ 07938
(908) 647-6000
(908) 647-6007 (Fax)

Canada
National Sales Office/Engine Starting Systems
51 Worcester Road
Rexdale, Ontario
M9W 4K2
(416) 675-5611
(416) 675-6920 (Fax)

International
Distributors in principal cities throughout the world. Contact the nearest Ingersoll-Rand office for the name and address of the distributor in you country, or write to: Ingersoll-Rand Power Tool Division
P.O. Box 1776, Liberty Corner, NJ 07938 USA

Form 52231

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ENGINE STARTING SYSTEMS