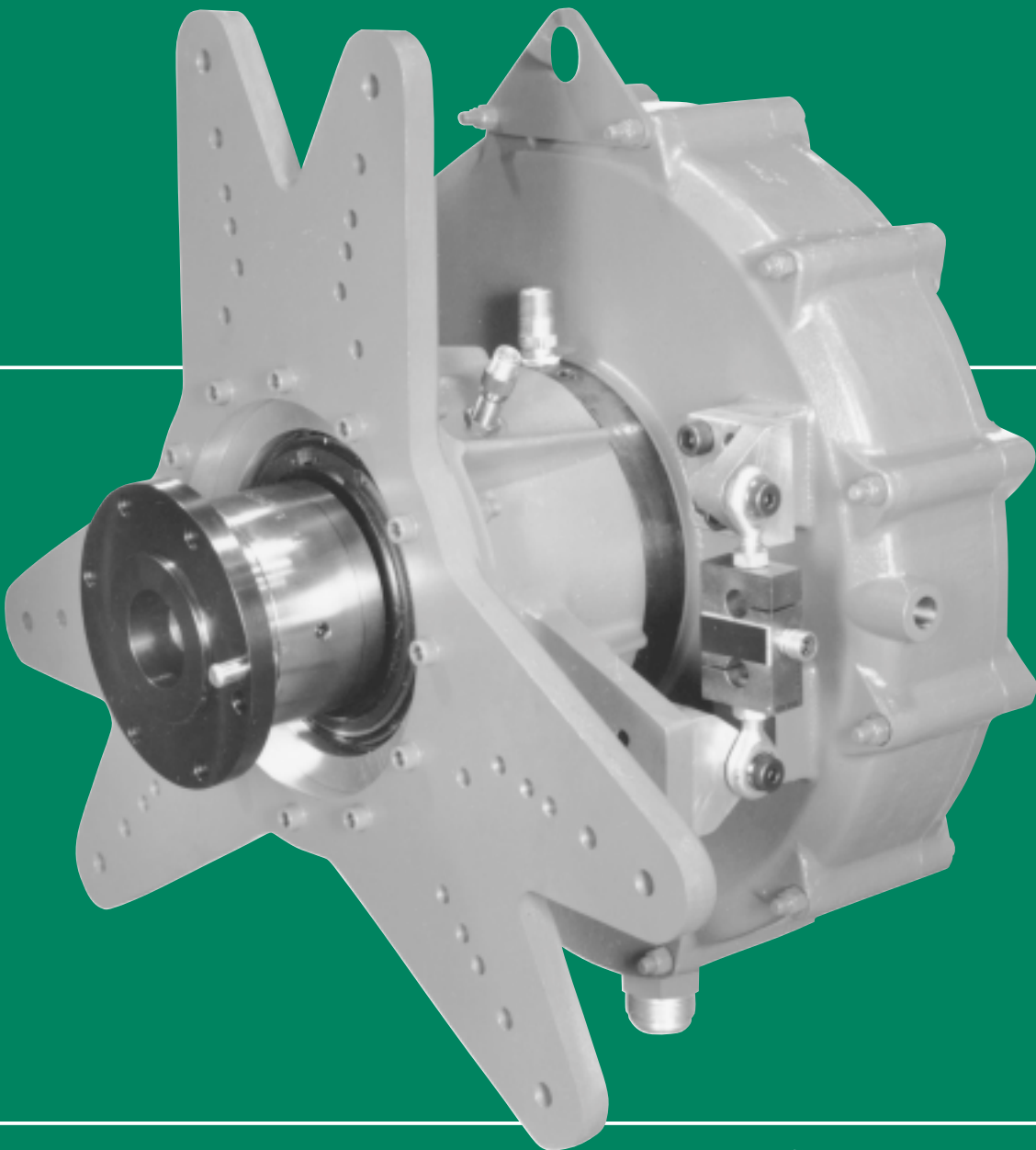


PORTABLE
DYNAMOMETERS
FOR TESTING
AUTOMOTIVE
ENGINES

KAHN SERIES
301



KAHN
KAHN INDUSTRIES INC.

KAHN SERIES 301 DYNAMOMETERS FOR LOAD TESTING DIESEL AND GASOLINE ENGINES

Developed for performance testing of automotive diesel and gasoline engines, the Kahn Series 301 hydraulic dynamometer product line includes four models with capacities up to 1350 hp (1000 kW) and rotational speeds up to 7500 rpm.

DESIGN BENEFITS

Designed and built to meet the most demanding engine test requirements, the Kahn Series 301 dynamometers offer a number of important design benefits:

- Easy to install and to operate.
- Compact, portable design configuration permits direct, alignment-free installation on the engine flywheel housing.
- Nickel-aluminum-bronze power elements provide superior resistance to cavitation and corrosion.
- Modular design permits quick and easy overhaul; mechanical seal can be replaced in less than one hour.
- Vaned power elements absorb full power in both directions of rotation.
- Positive sealing between water chamber and bearings permits starting under load and performing a full emergency shutdown under load down to zero speed.
- Capable of operating in horizontal and vertical attitude positions.

POWER ABSORPTION MECHANISM

The power output from the engine is absorbed by water vortices generated in the pockets between rotor and stator vanes. The resulting drag applies a moment to the dynamometer housing which is measured by a strain-gage load cell mounted at a fixed distance from the centerline of the dynamometer.

Absorbed power varies with rotational speed and with the mass of water contained in the rotor chamber. With a fully filled rotor chamber, power varies with the cube of speed. Power is modulated with the inlet and outlet control valves.

WATER SUPPLY REQUIREMENTS

A continuous flow of water through the dynamometer is required to provide resistance to rotation and to remove the heat generated by the power absorption process. Depending solely on absorbed power and allowable temperature rise, typical water flow requirements range from 4 gal/hr hp (20 l/hr kW) for waste water systems to 6 gal/hr hp (30 l/hr kW) for recirculating water systems.

The following water flow rate and temperature data apply for a recirculating water system with an evaporative cooling tower:

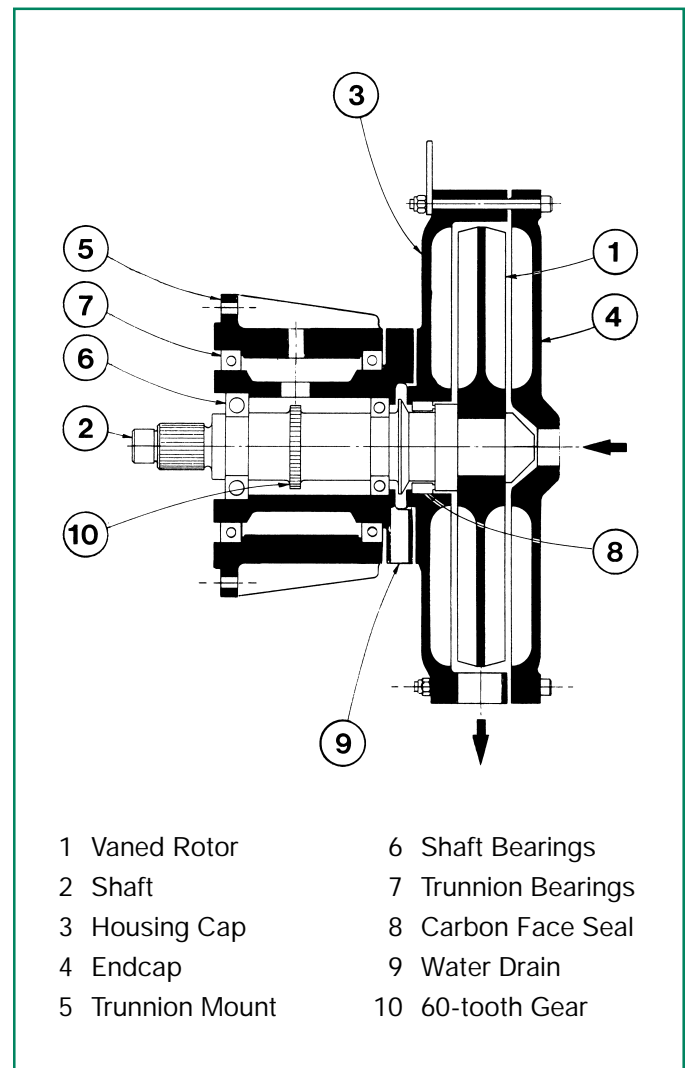
Specific Water Flow Rate	6.0 gal/hr hp (30 l/hr kW)
Water Supply Pressure	50 psig (3.5 bar)
Water Supply Temperature	90°F (32°C)
Water Discharge Temperature	140°F (60°C)
Filtration	340 micron

CONSTRUCTION

The Kahn Series 301 dynamometers are designed for long service life and ease of overhaul. In contrast to other hydraulic dynamometers which use less expensive materials such as cast iron or aluminum, the Series 301 dynamometers are equipped with power elements (rotor and housing) made from highly corrosion- and cavitation-resistant nickel-aluminum-bronze castings. The dynamometer shaft is manufactured from a high-strength stainless steel. To reduce downtime, the Series 301 dynamometers are designed in a modular configuration. This feature, coupled with the absence of cumbersome heat shrink fits, permits replacement of the carbon face seal in less than one hour.

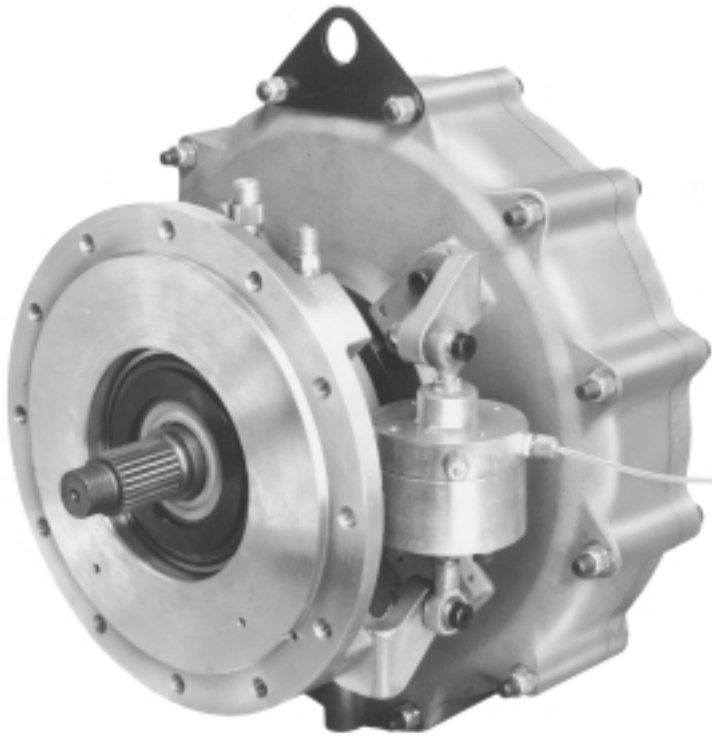
Mounted on a cantilevered shaft by means of an involute spline connection, the vaned rotor absorbs full power in both directions of rotation. The shaft is supported by two grease-packed, spring-loaded precision ball bearings and is equipped with a 60-tooth gear for speed measurement. The rotating assembly is dynamically balanced in accordance with ANSI Standard S2.19-1975, Grade 2.5.

A mechanical carbon face seal provides positive sealing between the water chamber and the bearings. To prevent overheating and cracking, the seal is continuously cooled with water. This seal configuration permits starting the dynamometer under load and performing a full emergency shutdown under load down to zero speed.



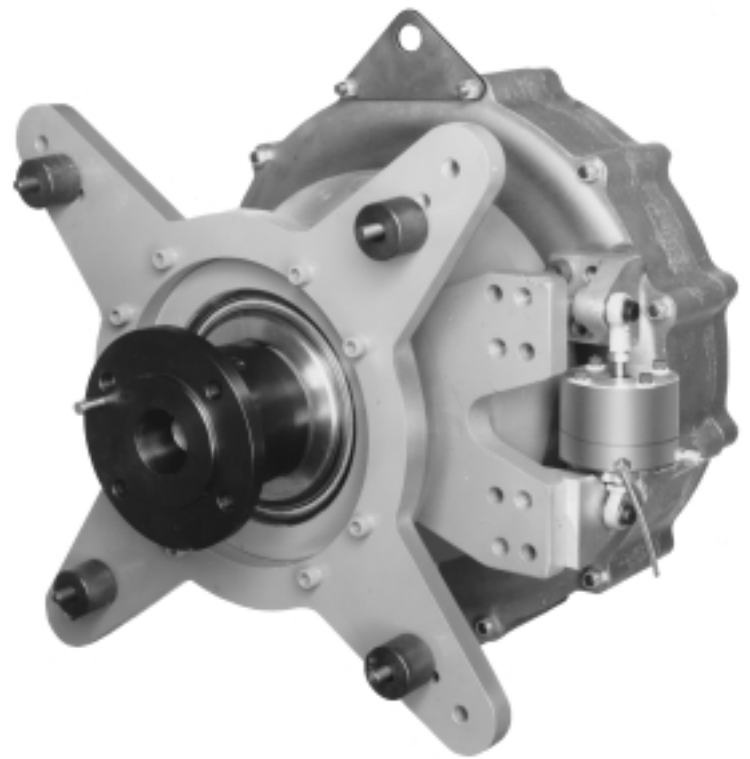
MODEL 301-130

FOR LOAD TESTING
GASOLINE ENGINES



MODEL 301-160

FOR LOAD TESTING
ON-HIGHWAY DIESEL ENGINES

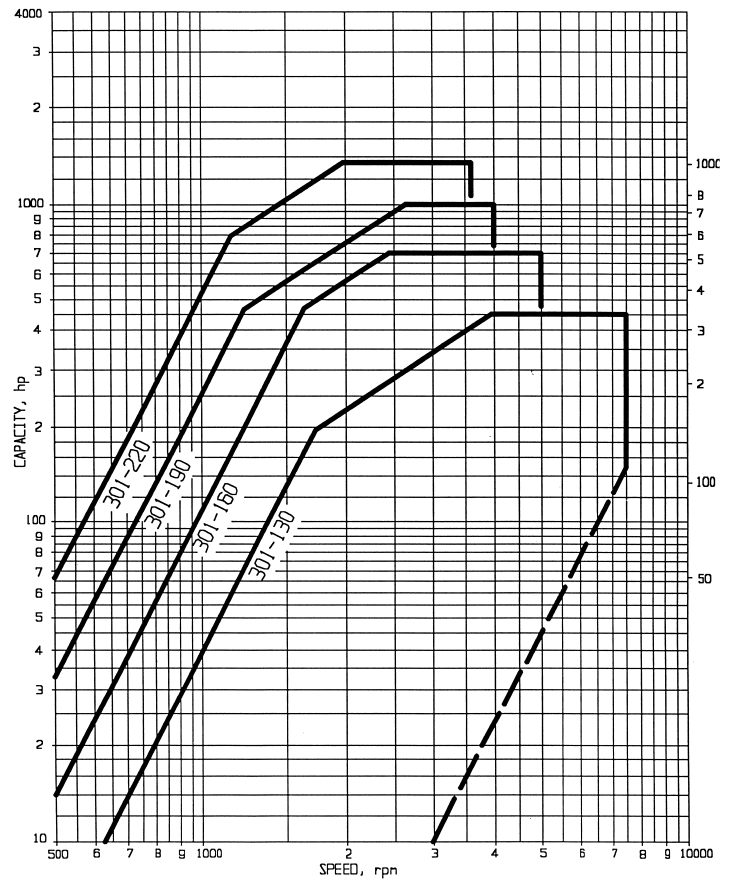


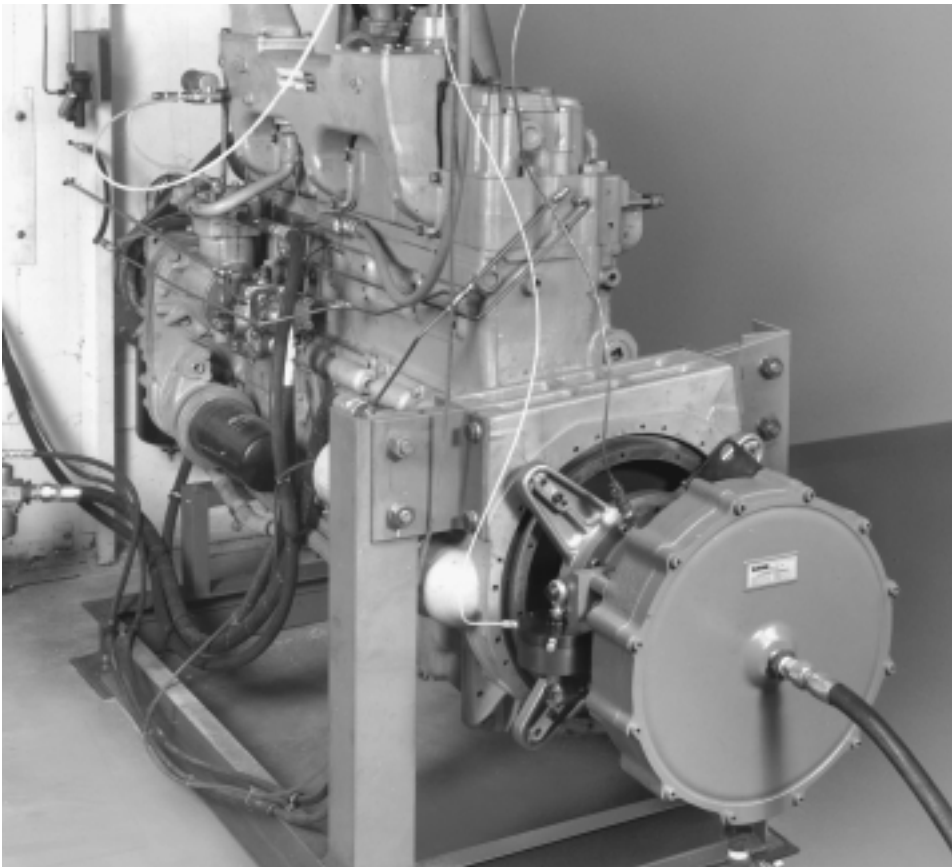
SPECIFICATIONS

Model	Max. Power hp	Max. Speed rpm	Max. Torque lb-ft	Dry Weight lb
301-130	450	7500	600	120
301-160	700	5000	1500	230
301-190	1000	4000	2000	280
301-220	1350	3600	3600	500

Model 301-190 with star-shaped flywheel housing adapter and gear coupling is illustrated on the front cover.

OPERATING RANGE





Model 301-160 portable dynamometer mounted via X-shaped flywheel housing adapter to Cummins NTC 270 diesel engine.

DIESEL ENGINE ADAPTER KITS SERIES 509

These adapter kits are used for direct, alignment-free installation of Series 301 dynamometers to a diesel engine. The Series 509 adapter kits include X-shaped or star-shaped flywheel housing adapters, double engagement gear couplings, flywheel adapters and mounting hardware. Flywheel housing adapters are available for SAE flywheel housings number 00 to 5. Gear couplings are rated at 600 lb-ft, 1260 lb-ft, 2000 lb-ft and 3600 lb-ft. Standard flywheel adapters and premachined "blank" flywheel adapters are available for Caterpillar, Cummins, Detroit Diesel and many other diesel engines.

GASOLINE ENGINE ADAPTER KIT SERIES 507

This adapter kit is used for direct, alignment-free installation of the Kahn Model 301-130 dynamometer to a gasoline engine. It includes premachined bell-housing and pilot adapters, a splined quillshaft and a premachined flywheel adapter.

ACCESSORIES

- Cooling Columns Series 518 for use with water-cooled engines during performance testing.
- Universal Engine Test Stands Series 505 for mounting engines during performance testing.

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