



Pin & Vee Block Test Machine



Used in Standard Test Methods

- ASTM Standards
D 2670, D2626, D3233, D5620
- Federal Test Methods
FTM-791-3807.1, FTM-791-3812.1
- Chrysler Corporation
461-C-84-01, 461-C-84-02, 461-C-84-03
- Ford Motor Company
FMC-BJ1-1
- Institute For Petroleum
IP 241

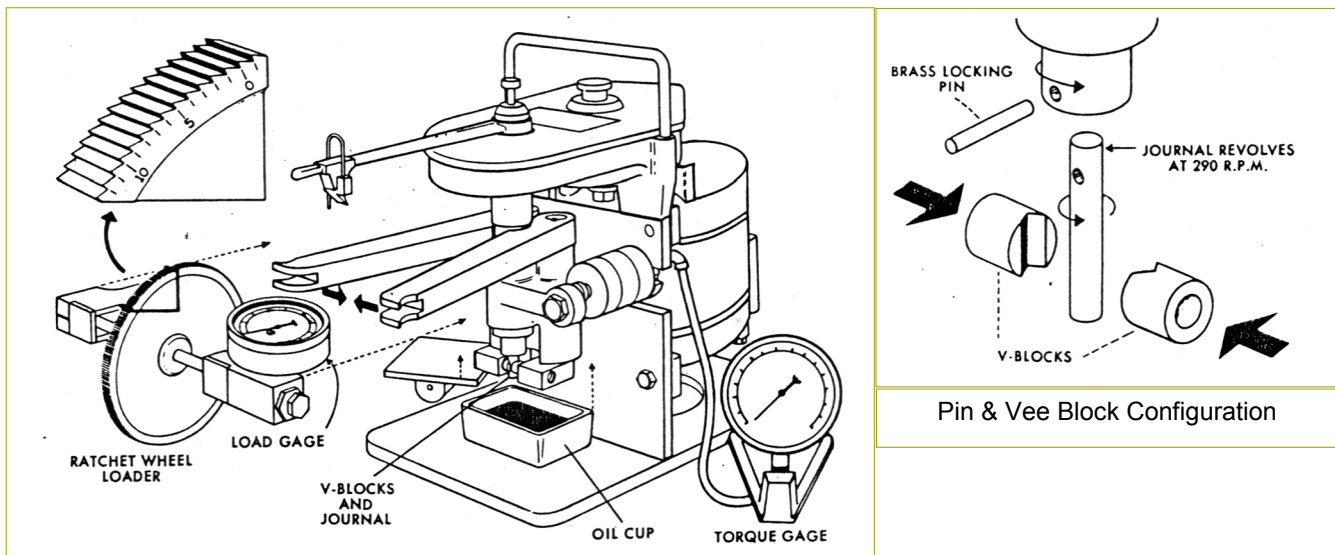
Suitable for Testing

- Fluid and Dry Lubricants
- Additive Packages and Base Stocks
- Dry Film Bonded Coatings
- Materials
- Hardface Coatings
- Metal Working Lubricants
- Refrigerant Lubricants

GENERAL INFORMATION

The **Falex Pin & Vee Block Test Machine** is a laboratory tool for **evaluating wear, friction and extreme pressure properties** of materials and lubricants.

The equipment rotates a 1/4 inch diameter test pin (journal) against two 1/2 inch diameter vee blocks. A four line contact region is established as load is applied through a mechanical gage by a ratchet wheel and an eccentric arm.



SPECIFICATIONS AND FEATURES

LOAD:

Load is applied to the vee blocks against a rotating test pin by use of a ratchet wheel mechanism and spring type gage. The Falex Dual Range Load Gage applies from 200 to 3000 lbs direct load (4500 lbs reference load) $\pm 2\%$ full scale accuracy, up to 300 psi average initial Hertzian stress.

Optional low load gage (200 to 800 lbs) is available when improved accuracy at low loads is needed.

Electronic load systems provide digital display of 3000 lbs direct load gage.

SPEED:

Shaft speed: 290 rpm ± 10 rpm (18.98 ft/min)

WEAR:

Ratchet wheel system allows rate of wear measurement during test and total wear.

14.4 ratchet teeth = 0.001 inch (0.025 mm)

TORQUE:

0 to 100 in-lb load cell with digital display. Accuracy $\pm 2\%$ full scale.

ENVIRONMENT:

Dry or lubricated



Test Area

SYSTEM DESCRIPTION

The Pin & Vee Block Test Machine is offered in two models:

000-001-001 Falex Pin & Vee Block Test Machine with 301 Test Data Acquisition System

System Includes Standard Pin and Vee Block Test Machine equipped with Digital Load Gage and Ratchet Wheel Assembly, Sample Fluid Cup, Manual Heater Control, Shear Pin Clip, Puller and Knock-out Tool, and Falex PC Based Data Acquisition System. Requires optional PC Kit or customer supplied PC with Windows® XP Operating System)

Options for Falex 301 Test Data Acquisition System

000-201-301 Digital Load Assembly for Falex 301 Data System:

For use with the Falex Data Acquisition System to display Test Load and Coefficient of Friction Values. Available with new units or as a kit for field installation on existing units.

F-1500-301-TFT Digital Test Fluid Temperature Assembly for Falex 301 Data System:

For use with the Falex Data Acquisition System to display Test Fluid Temperature Values. Available with new units or as a kit for field installation on existing units.

F-1500C Pin & Vee Block Test Machine with Data Acquisition and Control System

System Includes Standard Pin and Vee Block Machine equipped with Digital Load Gage and Ratchet Wheel Assembly, Sample Fluid Cup, Heater Control, Shear Pin Clip, Puller, and Knock-out Tool, and Falex PC Based Data Acquisition and Control System. (PC Kit Included)

Options for Data Acquisition and Control System

F-1500AL Automatic Loading Option:

Provides controlled maintenance of test load. User programmable test load and differential load point for the automatic maintenance of test loads. User defined and Standard Test Load Programs for evaluating wear and extreme pressure properties of fluid lubricants and bonded solid lubricants. Load is applied in positive direction only. Option available with systems using the Falex SoftWEAR™ Data Acquisition Program. Available with new units or as a kit for field installation on existing units.

F-1500-24 Wear Measurement Display:

For use with the F-1500C Pin & Vee Block Test Machine with Data Acquisition System to display wear as indicated in number of ratchet teeth or inches. Available with new units or as a kit for field installation on existing units.

F-1500CU Falex SoftWEAR™ Data Acquisition System

Upgrade:

For use with the standard Falex Pin and Vee Block Test machines. Provides users of current machines to acquire and store friction, load, and temperature signals at user-selected predetermined time intervals. Data is presented in real time graphic and alpha numeric (spreadsheet) format compatible with Excel® and other commercial spreadsheet programs. Load displayed in Direct Load (150 to 3000 Lb) or Reference Load (200 to 4500 Lb) scales. Coefficient of friction and optional wear data are calculated and displayed simultaneously. Complete system with PC, Falex SoftWEAR™ program, and electronic interface. F-1500AL Automatic Loading capability can be added for programmable control of loading.

F-1500-11 Dual Range Load Gage:

Combines 3000 lb Direct Reading and 4500 lb Reference Reading Load Scales on a Single Gage

F-1500-26 High Pressure Test Chamber:

Sealed chamber surrounding test area and fluid reservoir for performing evaluations of test oil saturated with refrigerant or other gases. Prevents gases from escaping continuously into atmosphere. Capable of initial temperatures from ambient room temperature to 150°C (302°F) and pressures from atmospheric to 225 psig. Pressure source not included.

PLEASE NOTE: This must be installed on a new Pin & Vee Block Test Machine by factory trained personnel; it cannot be field installed.

PIN & VEE BLOCK OPTIONS & ACCESSORIES (continued)

F-1500-31A High Precision Scar Measurement System:

Binocular microscope with X-Y base and digital display of measurement accurate to 0.001 mm.

F-1500-31B Digital Scar Measurement System:

Binocular microscope with CCD camera for on screen measurement to 0.01 mm.

F-1500-36 Load Calibration Kit:

Includes one Brinell ball, back-up plug, support block and copper Brinell coupon.

F-1500-36A Copper Brinell Coupon:

Used for checking calibration of load gage. BHN 37-39

000-107-002 Electronic Load and Torque Calibration Assembly:

System includes a high precision digital meter for displaying load and torque values and load cells and fixturing for calibration of test load and torque.

657-000-008 Calibration Fluid Blend A:

0.5 liter, 0.10% Sulfur Calibration Fluid per ASTM D2670

657-000-009 Calibration Fluid Blend B:

0.5 liter, 0.20% Sulfur Calibration Fluid per ASTM D2670

F-1500-37A Shear pin Clip and Puller:

Clip holds shear pin secure during test and puller facilitates removal of clip.

F-1500-37B Thermocouples:

Thermocouple used to measure fluid temperature during testing. For use with F-1500-32.

(Included with F-1500C & F-1503 models)

F-1500-37D Shear pin Knock-Out Assembly:

Shear Pin Removal Tool, facilitates safe extraction of brass shear pin from test machine shaft at end of test.

F-1500-37H Reaming Tool:

Used to remove debris from inside test machine shaft at end of test.

PIN & VEE BLOCK UTILITIES & DIMENSIONS

Power requirements:

220 V, 60 Cycle, Single Phase, 8 Amps (50 Cycle optional)

Shipping information:

Model F-1500 150 lbs (68 kg) 31 in x 31 in x 36 in (79 cm x 79 cm x 91 cm)

Model F-1500C 242 lbs (110 kg) 43 in x 36 in x 42 in (109 cm x 91 cm x 190 cm)

Shipping weights & dimensions are typical and may vary depending options ordered.

Space Requirements:

Bench top: Model F-1500: 30 in x 24 in x 24 in (76 cm x 61 cm x 61 cm)

Models F-1500C 60 in x 24 in x 24 in (152 cm x 61 cm x 61 cm)

TEST SPECIMENS

These specimens conform to ASTM Standards: D 2670, D 2625, D 3233 and D 5620

000-500-002 Complete Sets with #8 Test Pin:

Two (2) Standard Vee Blocks (AISI 1137 Steel) , One (1) #8 Test Pin (SAE 3135 Steel), and One (1) Brass Shear Pin

000-500-003 Complete Sets with #10 Test Pin:

Two (2) Standard Vee Blocks (AISI 1137 Steel) , One (1) #10 Test Pin (SAE 3135 Steel), and One (1) Brass Shear Pin

000-502-100 Standard Falex Vee Blocks:

AISI 1137 Steel, 96° block angle, Rc 20-24, 10 rms maximum

F-1500-51T Standard Falex Vee Block with Thermocouple Hole

AISI 1137 Steel, 96° block angle, Rc 20-24, 10 rms maximum

000-503-017 Standard Falex #8 Test Pin (journal):

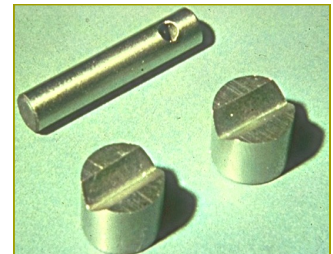
SAE 3135 steel, Rb 87-91, 10 rms maximum

000-503-002 Standard Falex #10 Test Pin (journal):

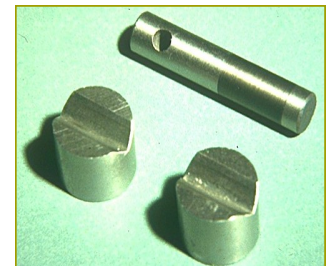
SAE 3135 steel, Rb 100-104, 10 rms maximum

000-005-004 Standard Falex Shear Pins:

1/2 hard yellow brass (ASTM spec. B-16) bag of 50



New Test Specimens



After ASTM D 2670 Wear Test



For All of Your Lubricant and Materials Testing

Lubricants

- Pin and Vee Block
- Block-on-Ring
- Timken EP
- Tapping Torque
- Panel Coker
- High Temperature/High Speed Bearing
- Four Ball Wear
- Four Ball EP
- High Temperature Wheel Bearing
- Thermal Oxidation Stability (L60-1)
- Fretting Wear
- Hydrolytic Stability
- Grease Corrosion Test
- Isothermal Oxidation
- Hydraulic Fluid Pump Stand (Vickers and Conestoga)

Fuels and Solvents

- Ball on Three Disk Fuel Lubricity
- Thin Film Evaporator
- Fuel Deposit Simulator

Materials

- Journal Bearing
- Multi-Specimen
- Crossed Cylinders
- Low Velocity Friction Apparatus
- Pin on Disk
- Coefficient of Stoption
- Magnetic Media and Paper Wear
- Life Performance Face Clutch System
- Thin Coating Wear (Electrical Contacts)
- Dual Drive Rolling Contact Fatigue
- High Speed Bearing/Mechanical Clutch

Abrasion and Erosion

- Dry Sand/Rubber Wheel
- Air Jet Erosion
- Miller Number Slurry