E-5-15 Technical data reports, Inspection records master forms, and personnel forms, various sizes, c. 40 tracings on linen, c. 1940's. The most interesting TD report is #703 (9-8-44, 30"x31") entitled "Diesel engine wear limit chart" which covers the Baldwin VO and 14 engines by five other manufacturers.

cave #18

Four to eight dimensions are given for each of seven categories: main bearings, connecting rod, piston & liner, piston rings, camshaft, valves, and injectors; 44 dimensions in all. At the bottom of the chart are 59 notes. Another TD report -- #770 (4-12-49) 11"x16"-- covers 608 supercharged engine with "saucer" pistons 600-08-007 and Elliott supercharger.

The Inspection Record forms include three for the model VO; one each for the piston head, bed plate, and frame.

**VALUE ASSIGNED: $80.00**

E-5-14 TD 12 to TD 790, 11"x8.5" & 14"x9", c. 390 tracings on linen in one of six sections, good condition, c. 1935 to 1952. This is a treasure trove on the inner workings of a diesel manufacturing factory. There are instructions for constructing and assembling the engines, directions for testing, performance ratings, specifications, wiring diagrams, layouts, etc.

cave # 18 4

**VALUE ASSIGNED: $750.00**

**Tool Drawings**

E-5-11 HT 117 to BLH T5984, 35.5"x24", c. 165 drawings on paper [good condition] and photocopy [poor condition], 1935 to 1955. The earlier drawings on photocopy are from the Hamilton works.

" The drawings cover jigs, plates, bars, holding fixtures, templates, etc. to assure that holes will be drilled precisely.

**VALUE ASSIGNED: $41.00**

E-5-12 "Tool Drawings", 34"x24" & 35.5"x24", c. 285 drawings on paper, good condition, c. 1940's to 1950's. These drawings are organized by engine model and then by the drawing groups used on the 60 and 600 series, e.g. 02, 03, 04, 08: bedplate,

" crankshaft, frame and piston. The drawings are the same as described above to assure precise drilling and assembly of parts.

**VALUE ASSIGNED: $86.00**

**VP Drawings & Tracings**

Addenda "VP Drawings, 1000 & up" index, 8.25"x10.5", bound book with binding in poor condition, spine torn, shaken, 152 pp. Covers VP drawings from number 1000 to 2607, c.9-31 to 10-2-63, in 126 pages. Interior good condition with some soiling and wear.

Covers foundations or "settings" of stationary engines, extension shafts, arrangements of engines, of piping, of wiring,etc.; plant layouts, intake and exhaust piping & silencers, cooling towers, closed water systems, engine arrangements, etc. Basically devoted to stationary engines used for municipal electrical power. By the mid-1930's references to locomotive engines, the VG and VO, appear.

**VALUE ASSIGNED: $25.00**

E-8-2 VP 101 to VP 2590, 14"x12", 14"x9", 13"x11" & 11"x8.5", c. 1045 tracings, drawings, and blueprints in five of six sections, fair to poor condition, 1922 to 1960. Covers all the areas described in the index above. The blueprint drawings tend to come from the New York City era, before 1928. Most of the tracings in the Baldwin-Southwark era are on linen.

cave #11

**VALUE ASSIGNED: $157.00**

E-10-9&10 VP 1100 to VP 2000 & up, 30"x24", c. 295 tracings on linen and paper, good to fair condition, c. 1930's to 1950's. Covers layout of municipal power plant for New Castle, IN; general arrangement for an 8 cylinder, 8"x8" model LV diesel engine; plant layout for three generators and three 608 S.C. engines; and general arrangement for a model 606 S.C. locomotive engine.

cave #5

**VALUE ASSIGNED: $148.00**

E-5-7,8&9 VP 993 to VP 2603, rolls, 51 paper and linen rolls, in mixed condition from good to poor, c. 1931 to 1961. Covers setting plan for Baldwin Model VO Diesel Engine; general arrangement for a 606 engine, direct reversing supercharged, left handed; outline for engine and generator for U.S. Army Corps of Engineers; and general arrangement for 606 S.C. engine with 600 KW generator set.

cave #19

**VALUE ASSIGNED: $50.00**

**SUB-TOTAL FOR LOCOMOTIVE AND DIESEL ENGINE TRACINGS, DRAWINGS AND RELATED MATERIALS: $31,252.00**

## Engineering and Technological Developments

The work of the Baldwin Locomotive Works and ultimately the Baldwin-Lima-Hamilton Corporation Diesel Engineering Department is represented in the present collection of materials by the equivalent of eleven file drawers -- over 22 lineal feet of correspondence, reports, test data, product information and the like. This is an accidental accumulation of data; it is a random sample which gives access to several levels of management and to the several functions of the Engineering Department. Included are the files of B. G. Mellin and G. L. Bader, Assistant Chief Engineers for the Diesel Department during WWII; the reports of C. T. Gleason, member of the subordinate Test Department; the trouble-shooting reports into equipment failures by L. F. Smith and D. P. Cryor; in short the files that document the Diesel Engineering Department role in solving operating problems, deciding liability for failure, developing new equipment, and adapting new equipment to older operating units.

While the Diesel Engineering Department's surviving files show the process of evolution of the old into the new, there is one section of files which documents a radical change. Circumstances alluded to in previous sections prevented Baldwin from developing a competitive diesel engine, thus the B-L-H management turned to the Maybach Corporation of Germany for an engine and transmission. This section of files charts the light-weight passenger train fever of the 1950's which led B-L-H to construct two Maybach powered locomotives, one for the New Haven and the other for the New York

Central. There are some detailed reports on poor performance and the various actions to make the locomotives work.

The most interesting set of files belonged to Albert Hoefer, long term employee who worked his way up from the drafting department in the late 1930's to a position of major authority. His files start in the 1950's and continue to 1971 when the B-L-H Corporation went out of business. They reflect the changes in the diesel engine and the activities of the Diesel Engineering Department over a significant time period.

Unless noted otherwise all records in this section are in good condition.

Box 122 — Correspondence of G. L. Bader and B. G. Mellin, Assistant Chief Engineers in the Diesel Department during WWII, 1942 to 1945, with (among others) the U. S. Army Transportation Corps, Bureau of Ships, Maritime Commission, and Navy with regard to both stationary and locomotive engines. The files show testing, purchasing, changing parts and specifications, quality of parts, and correspondence with subcontractors.

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Box 3 — C. T. Gleason files in Test Department, c. 1943 to 1955, describing test techniques and results on all aspects of diesel engines -- crank shaft deflection, cylinder head wear, bearings, etc.

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Addenda Box 2 — Test data and reports, 2 envelopes, 1944 to 1946. The first envelope has two pamphlets and loose material relating to confidential performance test data from the Pennsylvania RR facilities at Altoona, PA, on its 6-8-6 type, Class S-2 geared turbine locomotive #6200. The second envelope contains reports, tests, and correspondence with the Elliott supercharger company over trouble on the AT&SF RR locomotive #103.

"Home box # 2)
7 12
1 12-0725

12 C-12-3 — Large envelope on the experiments and results of an experimental, opposed piston engine, 1949 to 1950.

Boxes 1, 2, & 4 — Louis F. Smith files, Diesel Engineering Department, c. 1949 to 1957. This group of files covers field failure reports, concentrates on turbocharger problems (22 8x10 BW record photographs), fuel and lubrication standards, etc. As member of the Department, he was kept current on many subjects. He

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had correspondence with laboratories and companies involved.

Of all the Diesel Engineering Department files L. F. Smith's records best show the process: of overseeing the solution of operating problems; of deciding the cause and thus the responsibility for equipment failure; of adapting new equipment to older operating units, e.g. adding a new turbocharger to an engine for which it was not designed. Much of the work was hands-on testing equipment in the field.

Box 5 — D. P. Cryer files, Diesel Engineering Department, 1950 to 1954. Covers investigations of equipment failures; provides insights into the manufacture, materials, and maintenance of diesel engines. The files cover such specifics as oil filters, impellers, pumps and lubrication oil specifications.

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**The Maybach Engine Experience**

Box 119 — F. G. Geittman, Managing Engineer, Transportation Products Division, B-L-H Corp., 1954 to 1955. Geittman, an experienced diesel engineer came to Philadelphia with the Lima-Hamilton managers and was given a key role in diesel engine development. He announced the interest of B-L-H to acquire the Maybach engine and transmission. The files contain the Owen D. Young report to railroad presidents on the need and cost benefits of light-weight trains and much information on the experience of getting the Maybach engine into service.

Bxes 119 &123 — C. P. Gleesom files, Transportation Engineering Dept., c. 1954 to 1957. As "design calculator" Gleesom was right in the middle of Project 706 the Maybach light-weight train. The files contain the early design work this 1800 HP road locomotive with a hydraulic transmission, tests, reports, correspondence, and dealings with suppliers. One of his concerns was hypoid gears from various suppliers. Included are the specifications and data on many Maybach engines.

Box 120 — H. B. Peterson files, Diesel Engineering Dept., 1955. This is a remarkably detailed file on adapting the Maybach engine to the light-weight train concept. The Maybach engineering standards had to be translated from German to English. There is a lot of correspondence with Germany.

Box 121 — Albert Hoefer files, Diesel Engineering Dept., 1954 to 1957. Hoefer was right in the middle of the Maybach engine development. This box of records contains a large, important body of correspondence between Hoefer and F. G. Geittman who was in Germany testing a diesel engine in 1956.

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Addenda — Westinghouse Electric Corp., Proposal (binder, 8.5"x11"), Electrical equipment for light weight locomotives for New York Central and New Haven Railroads, Negotiation #26969, August

1, 1955, 10 sections, c. 60pp.

Bxes 44 &45

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Maybach Engine general files, c. 1955 to 1960. These two boxes contain a great deal of printed and duplicate material supporting the Maybach Diesel Engine M D 655 and the locomotive, RP 210 in which it was installed. There are seven envelopes with duplicate copies of elevations and placement sheets, six sets of the bills of materials and specifications for the MD 655, Maybach blue prints, and renewal parts books for Model RP 210 both propulsion and auxiliary power units for both the New Haven and New York Central railroads.

Also of interest a folder with lists of spare parts purchased from Maybach, a folder on problems with the New Haven and New York Central, a series of Maybach promotional pamphlets on other diesel engine models in both English and German, and a Maybach renewable parts book in German.

?? Addenda Bx1-23

Check able before 0724

Lightweight trains, two folders, 1956 to 1958. First folder has daily performance reports for NYNHH RR; second folder contains internal correspondence giving general comment on "X-plorer" train and the Maybach propulsion and auxiliary units.

Box 48

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Maybach operational files, c. 1956 to 1959. These materials include daily reports of operations on the New Haven and New York Central railroads, 1957-58; advertisements in several copies, "Application of Baldwin-Lima-Hamilton Diesel Hydraulic Locomotives on the Electric and Harlem Divisions of the N. Y. Central Railroad Company," and a similar flyer for the N.Y. New Haven, and Hartford RR; folders on problems with the locomotives on both railroads; and instructions, data and reports on Maybach engines and transmissions.

Box 46

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Albert Hoefer files, Diesel Engineering Dept., c. 1956 to 1959. These files provide a detailed record of building and operating the Maybach MD 655 12 cylinder diesel engine which was installed in the light-weight train. Included are test stand results for fuel injectors and transmission, engine parts in stock, governor instructions, engine assembly instructions, engine reports, correspondence with Maybach 1957 & 1958, New York Central service reports, and the New York Central service record, 10-18-56 to 8-29-1957.

## Albert Hoefer General Files

C-12-2& 5

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A. Hoefer, general correspondence on diesel engines, c.1940 to 1971. One important section includes five thick folders on the improvement and modernization of the VO engine. On the whole the files are organized alphabetically by objects and subjects. Objects include: bearings, bedplates, camshafts, exhaust piping, fuel oil & lube oil, instruments, selenoids, switches, shutdown controls, etc.

Subjects include: Diesel Club meetings, 1946-, Russian locomotives, Diesel engine cost reduction meetings, high-speed+high-output engines, critical speed calculations, engine repair, modernization, and rebuilding, memo on Oct. 1959 conference on modernization of VO and 600 series locomotive engines, etc.

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C-12-1& C-2-4

A. Hoefer, miscellaneous engine data, c. 1950 to 1971. These two boxes are arranged in rough, alphabetical order. At the front of the first box is test data and A.S.M.E. reports. First box includes data on air systems, bearing metal, bedplates & crankshafts, camshafts, cooling systems, engines, exhaust emissions, fuel injection connectors, fuel oils, misc. pistons, specifications, water pumps, etc.

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Second box includes many blueprints with Southern Pacific wiring diagrams, valve distribution, Westinghouse specifications, Westinghouse diagrams, Pelton Water Wheel Company, Schedule of Electrical equipment on various models of diesel electric engines, etc.

**VALUE ASSIGNED FOR LOT: $1,500.00**

## Standards and Specifications

This section of eight cubic feet of records operates at two distinct levels. The first, and smaller section (two cubic feet), concerns the specifications and standards for the products, methods, and materials that were used in building Baldwin locomotives. Here is detailed information of the process and quality control that made Baldwin locomotives and diesel engines reliable and respected among purchasers. There is some data on practice to allow scholars of technology to access the state of the art in manufacturing. The period covered starts in the early 1920's with the De La Vergne "SY" books and ends in the mid-1950's.

The second level and section consists mostly of locomotive specifications but there are some diesel engine specifications.

These materials were created for actual and potential customers and showed them in systematic detail exactly what they receive. The format varied. Early the specifications might be copied with the customer's name and a date on the cover sheet followed by a certain amount of standard data on the locomotive. Since Baldwin, however, did tailor many of its locomotives to the exact needs of a customer, a specification would often be a "supplement" to a standard specification. The latter were typed on onion skin paper and could be over thirty pages in length. Later, with the creation of the Baldwin-Lima-Hamilton Corportation, the specifications were printed and put in spiral plastic binders with a picture of the locomotive on the front cover and an elevation inside. Some of the specifications were "preliminary" and were developed to meet customer inquiries or to test the market place. One fascinating example of this was done (5-23-55) for the Norfolk & Western Railroad perhaps as a follow-up on "Jawn Henry," the 4500 HP electric, coal-fired steam turbine locomotive. These preliminary specifications (4 pages) were for a 7000 HP condensing steam turbine electric locomotive, 4-4-6-4-6 with auxiliary car and tender powered by 12 traction motors.

The contents of the specifications did vary in content and completeness but generally they would deal with such topics as general description, arrangement of locomotive, locomotive weights, dimensions, and ratings, locomotive tractive effort curve, locomotive construction, diesel engine, electrical equipment, brake equipment, and modifications. In the printed 1950's, versions

there would be general provisions section to cover design, safety appliances, material specification, clearance, weight distribution, and test procedure.

These locomotive specifications are dated and cover "as built" units as well as ideas examined and abandoned. Thus it is possible to follow in detail the evolution of the diesel electric locomotive from the late-1930's to the mid-1950's when the B-L-H Corporation went out of that business.

Box 127 This very full box contains a miscellany of specifications, standards and practices, c. 1927 to 1966. There is a significant amount of blueprint material in order to provide multiple copies for use in various plant and office locations. Among the items included: De La Vergne "SY" specifications, two copies, c. 500 pp each, one A. Hoefer's copy, blueprint from SY drawings described above; heat treating specifications, 1930's; BLW material specs. for foundry, c. 1947-52; standard practice, Engineering Dept., 1940's; BLH Standards Book, post-binder, printed, c. 400 pages, 3-1-53; Engineering Standards, 1966, etc.

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Box 63 Specifications and standards for parts and materials, c. 1927 to 1955. Two binders, blueprint copies, 1927-38, A to BS. Folders W, D, I, P, H, and BS. Also covers welding, forging and heat treatment for specific products.

Box 62 Materials specifications and standards for materials to be purchased, c. 1933 to 1956. Much blueprint material. Some pictures, emphasis on metallic composition and quality.

**VALUE ASSIGNED THREE LOTS: $95.00**

**Locomotive and Diesel Engine Specifications**

Box 25 Standard and custom specifications, 1938 to 1953. These specifications are largely for diesel electric locomotives athough a few diesel hydraulics are included. The first section consists of about 80 folders with typewritten data, 20 to 30 pages each. These folders are dated from 1939 to 1944. They cover standard types of switchers and "as built" locomotives.

The second section is made up of two three-ring binders on the

development of locomotives from 750 HP to 3000 HP. There are many illustrations and foldouts of elevations for both switcher and road locomotives.

**VALUE ASSIGNED: $1,300.00**

Box 37 Standard and "as built" locomotive specifications, c. 1944 to 1955. The first segment consists of about 70 specs. (each one in its own folder), 1944-45. These specs. are typed on onion skin paper and average 20 or more pages. Included are the specs. for the Russian locomotives built in 1945.

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The second section is made up of the printed post-1949 specifications. Included are: AS-616-12, AS-616-13GE, RT-624-1, RT-624-2, RT-624-3, RF-16-2, and RF-16-3. There are multiple copies except for RT-624-3 and RF-16-2.

**VALUE ASSIGNED: $1,500.00**

Box 41 Standard and special specifications for diesel electric and hydraulic locomotive, c. 1940's and 1950's. The large percentage of specs. are for locomotives built before 1949 and deal with switching, road and transfer models in the 660, 750, 1000, 1200, and 1500 HP range. There are multiple, mimeographed copies of pull-out elevations to show the locomotive arrangement of features. The remaining section is filled with the post-1949 printed specs. also in multiple copies.

Covered are the RS and AS-616, DR and RF-16, RR-616, AS-616-E, AS-616-E-1, and the ASB-616. The latter is the 1600 HP 0-6-6-0 booster power unit.

**VALUE ASSIGNED: $950.00**

Box 39 Locomotive and diesel engine specifications and data, about 60 folders, 1950's. About 10 of the folders are devoted to specifications and test data for the 606 and 608 diesel engines. The rest of the space is filled with the specifications of 18 different models. Included among others are the specs. for the high speed RT 210, the two unit 3200 HP locomotive, the RTH 424, and the RF7000-1&2. A certain number of the AS 618's was labeled "export."

**VALUE ASSIGNED: $500.00**

Box 42 Specifications for locomotives and for diesel engines used in locomotives, c. 1950's. This seems to be a master file for pages to be included in instructional manuals; there are multiple copies of routine and special pages. Some of the latter have to do with bearings, electrical equipment and European variations. Both 600 series and Hamilton engines are