

1992 Census of Manufactures

MC92-I-35A

INDUSTRY SERIES

Engines and Turbines and Farm Machinery and Equipment

Industries 3511, 3519, 3523, and 3524



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Economics and Statistics Administration
Everett M. Ehrlich, Under Secretary
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BUREAU OF THE CENSUS
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Manufacturing and Construction Division prepared this report. **David W. Cartwright**, Assistant Chief for Census and Related Programs, was responsible for the overall planning, management, and coordination of the census of manufactures. Planning and implementation were under the direction of **Kenneth I. Hansen**, Chief, Metals and Industrial Machinery Branch, assisted by **J. Michael Brown**, Section Chief, with primary staff assistance by **Mary Jane Gwynn**.

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If you have any questions concerning the statistics in this report, call 301-457-4755.



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Introduction to the Economic Census

PURPOSES AND USES OF THE ECONOMIC CENSUS

The economic census is the major source of facts about the structure and functioning of the Nation's economy. It provides essential information for government, business, industry, and the general public.

The economic census furnishes an important part of the framework for such composite measures as the gross domestic product, input/output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions.

Policymaking agencies of the Federal Government use the data, especially in monitoring economic activity and providing assistance to business.

State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.

Trade associations study trends in their own and competing industries and keep their members informed of market changes.

Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.

AUTHORITY AND SCOPE

Title 13 of the United States Code (sections 131, 191, and 224) directs the Census Bureau to take the economic census every 5 years, covering years ending in 2 and 7. The 1992 Economic Census consists of the following eight censuses:

- Census of Retail Trade
- Census of Wholesale Trade
- Census of Service Industries
- Census of Financial, Insurance, and Real Estate Industries
- Census of Transportation, Communications, and Utilities
- Census of Manufactures
- Census of Mineral Industries
- Census of Construction Industries

Special programs also cover enterprise statistics and minority-owned and women-owned businesses. (The 1992 Census of Agriculture and 1992 Census of Governments are conducted separately.) The next economic census is scheduled to be taken in 1998 covering the year 1997.

AVAILABILITY OF THE DATA

The results of the economic census are available in printed reports for sale by the U.S. Government Printing Office and on compact discs for sale by the Census Bureau. Order forms for all types of products are available on request from Customer Services, Bureau of the Census, Washington, DC 20233-8300. A more complete description of publications being issued from this census is on the inside back cover of this document.

Census facts are also widely disseminated by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. Finally, State data centers in every State as well as business and industry data centers in many States also supply economic census statistics.

WHAT'S NEW IN 1992

The 1992 Economic Census covers more of the economy than any previous census. New for 1992 are data on communications, utilities, financial, insurance, and real estate, as well as coverage of more transportation industries. The economic, agriculture, and governments censuses now collectively cover nearly 98 percent of all economic activity.

Among other changes, new 1992 definitions affect the boundaries of about a third of all metropolitan areas. Also, the Survey of Women-Owned Businesses has now been expanded to include all corporations.

HISTORICAL INFORMATION

The economic census has been taken as an integrated program at 5-year intervals since 1967 and before that for 1963, 1958, and 1954. Prior to that time, the individual subcomponents of the economic census were taken separately at varying intervals.

The economic census traces its beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for 1840 and subsequent censuses to include mining and some commercial activities. In 1902, Congress established a permanent Census Bureau and directed that a census of manufactures be taken every 5 years. The 1905 Manufactures Census was the first time a census was taken apart from the regular every-10-year population census.

The first census of business was taken in 1930, covering 1929. Initially it covered retail and wholesale trade and construction industries, but it was broadened in 1933 to include some of the service trades.

The 1954 Economic Census was the first census to be fully integrated—providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. It was the first census to be taken by mail, using lists of firms provided by the administrative records of other Federal agencies. Since 1963, administrative records also have been used to provide basic statistics for very small firms, reducing or eliminating the need to send them census questionnaires. The Enterprise Statistics Program, which publishes combined data from the economic census, was made possible with the implementation of the integrated census program in 1954.

The range of industries covered in the economic censuses has continued to expand. The census of construction industries began on a regular basis in 1967, and the scope of service industries was broadened in 1967, 1977, and 1987. The census of transportation began in 1963 as a set of surveys covering travel, transportation of commodities, and trucks, but expanded in 1987 to cover business establishments in several transportation industries. For 1992, these statistics are incorporated into a broadened census of transportation, communications, and utilities. Also new for 1992 is the census of financial, insurance, and real estate industries. This is part of a gradual expansion in coverage of industries previously subjected to government regulation.

The Survey of Minority-Owned Business Enterprises was first conducted as a special project in 1969 and was incorporated into the economic census in 1972 along with the Survey of Women-Owned Businesses.

An economic census has also been taken in Puerto Rico since 1909, in the Virgin Islands of the United States and Guam since 1958, and in the Commonwealth of the Northern Mariana Islands since 1982.

Statistical reports from the 1987 and earlier censuses provide historical figures for the study of long-term time series and are available in some large libraries. All of the census data published since 1967 are still available for sale on microfiche from the Census Bureau.

AVAILABILITY OF MORE FREQUENT ECONOMIC DATA

While the census provides complete enumerations every 5 years, there are many needs for more frequent data as well. The Census Bureau conducts a number of monthly, quarterly, and annual surveys, with the results appearing in publication series such as Current Business Reports (retail and wholesale trade and service industries), the Annual Survey of Manufactures, Current Industrial Reports, and the Quarterly Financial Report. Most of these surveys, while providing more frequent observations, yield less kind-of-business and geographic detail than the census. The County Business Patterns program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county.

SOURCES FOR MORE INFORMATION

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1992 Economic Census and Related Statistics*. More information on the methodology, procedures, and history of the census will be published in the *History of the 1992 Economic Census*. Contact Customer Services for information on availability.

Census of Manufactures

GENERAL

This report, from the 1992 Census of Manufactures, is one of a series of 83 industry reports, each of which provides statistics for individual industries or groups of related industries. Additional separate reports will be issued for each State and the District of Columbia and for special subjects such as manufacturers' shipments to the federal government and concentration ratios in manufacturing.

The industry reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, capital expenditures, product shipments, etc.

State reports present similar statistics for each State and its important metropolitan areas (MA's), counties, and places. Selected statistical totals for "all manufacturing" have been shown in the State reports for MA's with 250 employees or more and for counties and places with 500 employees or more.

The *General Summary* report contains industry, product class, and geographic area statistics summarized in one report. The introduction to the *General Summary* discusses, at greater length, many of the subjects described in this introduction. For example, the *General Summary* text discusses the relationship of value added by manufacture to national income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

SCOPE OF CENSUS AND DEFINITION OF MANUFACTURING

The 1992 Census of Manufactures covers all establishments with one paid employee or more primarily engaged in manufacturing as defined in the *1987 Standard Industrial Classification (SIC) Manual*¹. This is the system of industrial classification developed by experts on classification in Government and private industry under the guidance of the Office of Information and Regulatory Affairs, Office of

¹*Standard Industrial Classification Manual: 1987*. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

Management and Budget. This classification system is used by Government agencies as well as many organizations outside the Government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of substances or materials into new products. The assembly of component parts of products also is considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

RELATIONSHIP BETWEEN ANNUAL SURVEY OF MANUFACTURES AND CENSUS OF MANUFACTURES

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is a probability-based sample of approximately 62,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, costs of purchased services, and foreign content of materials consumed. Except for supplemental labor costs, the extra ASM items are collected only in census years.

ESTABLISHMENT BASIS OF REPORTING

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each

location. The ASM also is conducted on an establishment basis, but separate reports are filed for just those establishments selected in the sample. Companies engaged in distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1992, as in earlier years, a minimum size limit was set for inclusion of establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

MANUFACTURING UNIVERSE AND CENSUS REPORT FORMS

The 1992 Census of Manufactures universe includes approximately 380,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

1. **Small single-establishment companies not sent a report form.** In the 1992 Census of Manufactures, approximately 143,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of Federal agencies. The cutoffs were selected so that these administrative-records cases would account for no more than 3 percent of the value of shipments for all manufacturing. Generally, all single-establishment companies with less than 5 employees were excused, while all establishments with more than 20 employees were mailed forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials

were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative-records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded at the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative-records cases were only given a two- or three-digit SIC group. For the 1992 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassification has no significant effect on the statistics other than on the number of companies and establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

2. **Establishments sent a report form.** The over 237,000 establishments covered in the mail canvass were divided into three groups:

- a. **ASM sample establishments.** This group consisted of approximately 62,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see Appendix B, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. See appendix A, section 2, for an explanation of these items.

The census part of the report form is 1 of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of these many forms to canvass the 459 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant material not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

- b. **Large and medium establishments (non-ASM).** Approximately 112,000 establishments were included in this group. A variable cutoff, based on administrative-records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive 1 of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.
- c. **Small single-establishment companies (non-ASM).** This group consisted of approximately 63,000 establishments. For those industries where application of the variable cutoff for administrative-records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received 1 of the approximately 80 versions of the short form, which requested summary product and

material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same data were collected on the short form as on the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the value of the n.s.k. categories.

AUXILIARIES

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the manufacturing auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 11,000 separately operated auxiliaries are included in the geographic area series and in a report issued as part of the 1992 Enterprise Statistics Survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include the following:

1. Program planning, including sales research and coordination of purchasing, production, and distribution
2. Company purchasing, including general contracts and purchasing methods
3. Company financial policy and accounting
4. General engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations
5. Company personnel matters
6. Legal and patent matters

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

INDUSTRY CLASSIFICATION OF ESTABLISHMENTS

Each of the establishments covered in the census was classified in 1 of 459 manufacturing industries in accordance with the industry definitions in the 1987 SIC Manual. The 1987 edition of this manual represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. Appendix A of the 1987 Manual notes the revisions in the four-digit industry levels between 1972/77 and 1987.

An industry is generally defined as a group of establishments producing the same product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively become narrower with successive additions of numerical digits. For 1992, there are 20 major groups (two-digit SIC), 139 industry groups (three-digit SIC), and 459 industries (four-digit SIC). This represents an expansion of four-digit industries from 452 in 1972/77 and a reduction of three-digit groups from 143 in 1972/77. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 11,000 products identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in operations. Refining of nonferrous metals from ore or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or if the change has occurred for 2 successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see Appendix B, Annual Survey of Manufactures). However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The results of these rules covering the switching of plants from one industry classification to another are that, at the aggregate level, some industries comprise different mixes of establishments between survey years and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-records cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of companies and establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in table 6a represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that

put only the finishing touches on an already highly fabricated item. For example, the refrigeration equipment industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfers of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

VALUE OF SHIPMENTS FOR THE INDUSTRY COMPARED WITH VALUE OF PRODUCT SHIPMENTS

This report shows value of shipments data for industries and products. In tables 1a through 5b, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Value of product shipments shown in table 6a represents the total value of all products shipped that are classified as primary to an industry.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this information may be released even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed except for new capital expenditures. However, the suppressed data are included in higher-level totals. A separate disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1992 Census of Manufactures may be obtained on computer diskette or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Manufacturing and Construction Division, Bureau of the Census, Washington, DC 20233.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

- Represents zero.
- (D) Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
- (NA) Not available.
- (NC) Not comparable.
- (S) Withheld because estimate did not meet publication standards.
- (X) Not applicable.
- (Z) Less than half the unit shown.
- n.e.c. Not elsewhere classified.
- n.s.k. Not specified by kind.
- pt. Part.
- r Revised.
- SIC Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

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Industry analysis and forecasting	International Trade Administration	202-377-4356

Users' Guide for Locating Statistics in This Report by Table Number

[For explanation of terms, see appendixes]

Item	Four-digit industry statistics							Five-digit product class and seven-digit product statistics			
	Historical	Operating ratios	By geographic area	Summary and supplemental	By employment size	By industry and product class specialization	Materials consumed by kind	Industry-product analysis	Product shipments	Product class by geographic area	Historical product class
Number of companies	1a			3a					*6a		
Number of establishments	1a		2	3a	4	5a					
Employment and payroll:											
Number of employees	1a	1b	2	3a	4	5a					
Payroll	1a	1b	2	3a	4	5a					
Supplemental labor costs				3a							
Production workers	1a	1b	2	3a	4	5a					
Production-worker hours	1a	1b	2	3a	4	5a					
Production-worker wages	1a	1b	2	3a	4	5a					
Shipments, cost of materials, and value added:											
Value of shipments (four-digit)	1a	1b	2	3a	4	5a		5b			
Product class shipments (five-digit)									6a	6b	6c
Product shipments (seven-digit)									6a		
Value added by manufacture	1a	1b	2	3a	4	5a					
Cost of materials	1a	1b	2	3a	4	5a					
Fuels and electric energy				3a							
Materials consumed by kind							7				
Inventories:											
Total, end of year	1a			3a	4						
By stage of fabrication				3a							
Capital expenditures, assets, rental payments, and purchased services:											
New capital expenditures	1a		2	3b	4	5a					
Used plant and equipment expenditures				3b							
Gross assets				3b							
Depreciation				3b							
Retirements of buildings and machinery				3b							
Rental payments				3b							
Foreign content of materials consumed				3c							
Purchased services				3c							
Ratios:											
Specialization	1a							5b			
Coverage	1a							5b			

*Number of companies with shipments of more than \$100 thousand.

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Engines and Turbines and Farm Machinery and Equipment

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Description of Industries and Summary of Findings

This report shows 1992 Census of Manufactures statistics for establishments classified in each of the following industries:

SIC code and title

3511	Turbines and Turbine Generator Sets
3519	Internal Combustion Engines, N.E.C.
3523	Farm Machinery and Equipment
3524	Lawn and Garden Equipment

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account in comparing industry statistics (tables 1 through 5a) with product statistics (table 6) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Establishment data were tabulated based on industry definitions included in the *1987 Standard Industrial Classification (SIC) Manual*¹. The 1987 edition represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. In addition to the 1987 SIC revision, changes were made to the product class (five-digit) and product code (seven-digit) categories. The product class and product code comparability between the 1992 and 1987 censuses is shown in appendix C. This appendix presents, in tabular form, the linkage from 1992 to 1987, and 1987 to 1992.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

¹*Standard Industrial Classification Manual: 1987*. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS

This industry is made up of establishments primarily engaged in manufacturing steam turbines; hydraulic turbines; gas turbines, except aircraft; and complete steam, gas, and hydraulic turbine generator set units. Also included in this industry are the manufacture of wind and solar powered turbine generators and windmills for generating electric power. Establishments primarily engaged in manufacturing nonautomotive type generators are classified in industry 3621; those manufacturing aircraft turbines are classified in industry 3724; and those manufacturing windmill heads and towers for pumping water for agricultural use are classified in industry 3523.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3511, Turbines and Turbine Generator Sets, had employment of 27.1 thousand. The employment figure was 18 percent above the 22.9 thousand reported in 1987. Compared with 1991, employment increased 24 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were California, Connecticut, New York, and South Carolina. This represents a shift from 1987 when Connecticut, New York, California, and Massachusetts were the leading States.

The total value of shipments for establishments classified in this industry was \$5.8 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3511 shipped \$4.8 billion of turbines and turbine generator sets considered primary to the industry, \$641.1 million of secondary products, and had \$401.8 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 88 percent (specialization ratio). In 1987, the specialization ratio was 83 percent.

Establishments in this industry also accounted for 80 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 83 percent.

The products primary to industry 3511, no matter in what industry they were produced, appear in table 6a and aggregate to \$6.0 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the turbines and turbine generator sets industry amounted to \$2.7 billion. Data on specific materials consumed appear in table 7.

No establishments in this industry were excluded from the mail portion of the census. However, for a small number of establishments, reports were not received at the time the data were tabulated. For these establishments data were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for less than 1 percent of the total value of shipments.

INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.

This industry is made up of establishments primarily engaged in manufacturing diesel, semidiesel, or other internal combustion engines, not elsewhere classified, for stationary, marine, traction, and other uses. Establishments primarily engaged in manufacturing aircraft engines are classified in industry 3724. Establishments primarily engaged in manufacturing automotive engines, except diesel are classified in industry 3714.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3519, Internal Combustion Engines, N.E.C., had employment of 56.6 thousand. The employment figure was 12 percent below the 64.0 thousand reported in 1987.

The leading States in employment in 1992 were Wisconsin, Illinois, Indiana, and Michigan. These same States were the leaders in 1987.

The total value of shipments for establishments classified in this industry was \$11.8 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3519 shipped \$10.5 billion of internal combustion engines, not elsewhere classified, considered primary to the industry, \$811.8 million of secondary products, and had \$499.1 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 93 percent (specialization ratio). In 1987, the specialization ratio was 94 percent.

Establishments in this industry also accounted for 90 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 91 percent.

The products primary to industry 3519, no matter in what industry they were produced, appear in table 6a and aggregate to \$11.6 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the internal combustion engines, not elsewhere classified, industry amounted to \$7.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 1 percent of the total value of shipments.

INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT

This industry is made up of establishments primarily engaged in manufacturing farm machinery and equipment, including wheel tractors, for use in the preparation and maintenance of soil; planting and harvesting of the crop; preparing crops for market on the farm; or for use in performing other farm operations and processes. Included in this industry are establishments primarily engaged in manufacturing commercial mowing and other turf and grounds care equipment. Establishments primarily engaged in manufacturing farm handtools are classified in industry group 342, and those manufacturing garden tractors, lawnmowers and other lawn and garden equipment are classified in industry 3524.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3523, Farm Machinery and Equipment, had employment of 61.4 thousand. The employment figure was 8 percent above the 57.0 thousand reported in 1987. Compared with 1991, employment decreased 6 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were Illinois, Iowa, Nebraska, and Wisconsin. These same States were the leaders in 1987.

The total value of shipments for establishments classified in this industry was \$9.6 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3523 shipped \$8.5 billion of farm machinery and equipment considered primary to the industry, \$548.0 million of

secondary products, and had \$581.0 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 94 percent (specialization ratio). In 1987, the specialization ratio was 90 percent.

Establishments in this industry also accounted for 95 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 91 percent.

The products primary to industry 3523, no matter in what industry they were produced, appear in table 6a and aggregate to \$8.9 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the farm machinery and equipment industry amounted to \$4.4 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 5 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 6 percent of the total value of shipments.

INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT

This industry is made up of establishments primarily engaged in manufacturing lawnmowers, lawn and garden tractors, and other lawn and garden equipment used for home lawn and garden care. Also included are establishments primarily engaged in manufacturing snowblowers and throwers for residential use. Establishments primarily engaged in manufacturing farm machinery and equipment (including commercial mowing and other turf and grounds care equipment) are classified in industry 3523; those manufacturing hand lawn and garden shears and pruners are classified in industry 3421; and those manufacturing other garden handtools are classified in industry 3423.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3524, Lawn and Garden Equipment, had employment of 24.8 thousand. The employment figure was 1 percent below the 24.9 thousand reported in 1987.

The leading States in employment in 1992 were Georgia, South Carolina, Tennessee, and Wisconsin. These same States were the leaders in 1987.

The total value of shipments for establishments classified in this industry was \$5.2 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3524 shipped \$4.0 billion of lawn and garden equipment considered primary to the industry, \$838.4 million of secondary products, and had \$292.8 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 83 percent (specialization ratio). In 1987, the specialization ratio was 89 percent.

Establishments in this industry also accounted for 93 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 94 percent.

The products primary to industry 3524, no matter in what industry they were produced, appear in table 6a and aggregate to \$4.3 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the lawn and garden equipment industry amounted to \$3.1 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 20 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 2 percent of the total value of shipments.

Table 1b. Selected Operating Ratios for the Industry: 1992 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS									
1992 Census	40 830	55	2 007	18.38	46	65	108 959	37	98.10
1991 ASM	44 165	60	2 108	18.54	53	71	132 243	33	105.22
1990 ASM	39 215	57	2 024	16.97	53	73	103 160	38	89.30
1989 ASM	37 486	54	1 862	17.87	47	66	100 341	37	99.41
1988 ASM	35 939	52	1 958	16.63	44	66	95 835	38	94.60
1987 Census	37 672	52	2 263	13.71	46	71	86 188	44	73.92
1986 ASM	35 231	54	2 075	14.87	44	71	73 478	48	65.76
1985 ASM	34 635	53	2 079	14.89	42	67	77 147	45	70.52
1984 ASM	31 593	53	1 986	13.82	37	61	78 145	40	74.10
1983 ASM	29 720	60	1 946	12.54	40	63	67 992	44	58.61
1982 Census	26 877	58	1 979	11.54	41	65	66 448	40	57.56
1981 ASM	24 515	59	2 046	9.71	44	67	58 173	42	48.04
1980 ASM	22 717	60	2 028	9.27	43	67	55 471	41	45.31
1979 ASM	20 492	59	2 027	8.48	42	66	47 624	43	39.54
1978 ASM	18 499	61	2 017	7.82	44	71	37 438	49	30.55
1977 Census	17 362	61	2 065	7.21	46	72	38 054	46	30.40
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.									
1992 Census	36 601	67	2 032	16.86	59	77	84 703	43	62.26
1991 ASM	33 899	69	1 907	15.96	58	75	83 075	41	63.03
1990 ASM	34 545	70	1 998	16.01	59	77	79 931	43	57.17
1989 ASM	34 451	70	2 040	15.84	57	74	86 181	40	59.93
1988 ASM	34 341	71	2 088	15.42	57	76	82 433	42	55.40
1987 Census	31 923	70	1 996	15.05	54	73	79 153	40	56.41
1986 ASM	31 368	69	1 935	15.07	52	71	78 516	40	59.18
1985 ASM	30 452	69	1 918	14.82	52	72	72 007	42	54.06
1984 ASM	30 294	71	1 973	14.47	53	73	72 795	42	52.27
1983 ASM	26 895	65	1 849	13.75	53	74	57 973	46	48.32
1982 Census	24 862	66	1 821	12.82	55	76	49 201	51	41.05
1981 ASM	24 599	71	1 994	11.68	55	74	58 893	42	41.65
1980 ASM	21 978	71	1 973	10.56	54	74	51 059	43	36.49
1979 ASM	19 889	73	1 938	9.55	57	77	44 727	44	31.45
1978 ASM	18 543	73	2 003	8.69	60	78	41 821	44	28.61
1977 Census	17 214	74	1 992	7.96	58	78	38 361	45	26.18
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT									
1992 Census	29 062	69	1 958	13.18	46	65	84 121	35	62.08
1991 ASM	27 449	70	1 941	12.65	48	65	80 922	34	59.80
1990 ASM	27 049	72	1 956	12.31	48	64	85 898	31	61.26
1989 ASM	26 235	72	1 978	11.90	49	66	77 383	34	54.26
1988 ASM	25 712	70	2 018	11.38	48	67	75 184	34	53.31
1987 Census	24 847	69	1 923	11.20	47	67	65 079	38	49.33
1986 ASM	24 242	67	1 945	10.46	48	68	59 793	41	45.95
1985 ASM	24 313	67	1 884	11.34	47	66	62 617	39	49.66
1984 ASM	23 801	68	1 885	11.06	48	66	67 845	35	52.68
1983 ASM	22 291	65	1 837	10.69	49	70	55 198	40	46.14
1982 Census	21 513	65	1 806	10.61	49	68	54 119	40	45.78
1981 ASM	21 050	70	1 837	10.35	54	73	50 145	42	38.86
1980 ASM	19 317	72	1 870	9.36	52	72	45 405	43	33.88
1979 ASM	17 545	74	1 939	8.24	56	75	42 932	41	29.83
1978 ASM	16 381	74	1 911	7.78	53	73	39 639	41	28.13
1977 Census	15 018	73	1 899	7.19	53	72	36 972	41	26.57
INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT									
1992 Census	22 940	80	1 833	10.71	60	71	86 831	26	59.32
1991 ASM	21 221	77	1 862	9.88	59	69	76 430	28	52.98
1990 ASM	21 404	75	1 967	9.82	61	72	81 898	26	55.74
1989 ASM	20 529	75	1 918	8.86	61	73	65 938	31	45.55
1988 ASM	20 575	76	1 915	9.55	62	73	73 414	28	50.29
1987 Census	20 104	77	1 853	9.69	59	70	76 944	26	54.12
1986 ASM	19 995	77	1 855	9.42	61	73	66 898	30	47.00
1985 ASM	18 717	77	1 936	8.50	60	72	59 283	32	39.70
1984 ASM	19 095	77	1 905	9.04	63	77	53 720	36	36.55
1983 ASM	17 957	74	1 914	8.26	60	73	56 750	32	40.11
1982 Census	17 871	70	1 984	8.08	58	72	53 118	34	38.43
1981 ASM	16 586	71	1 891	7.52	61	76	43 127	38	31.99
1980 ASM	15 438	70	1 888	7.09	58	72	45 852	34	34.47
1979 ASM	13 980	76	1 883	6.53	60	74	43 254	32	30.30
1978 ASM	12 539	76	1 831	5.91	59	74	36 913	34	26.59
1977 Census	11 405	75	1 884	5.14	60	74	32 395	35	22.97

Note: For qualifications of data, see footnotes on table 1a.

Table 2. Industry Statistics for Selected States: 1992 and 1987

[Excludes data for auxiliaries. States with 100 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1992											1987		
	E1	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS														
United States	-	79	48	27.1	1 106.5	15.0	30.1	553.2	2 952.8	2 690.9	5 842.6	312.0	22.9	1 973.7
Alabama	-	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California	-	8	6	3.3	136.9	1.5	3.6	47.7	386.2	208.7	651.0	(D)	(NA)	(D)
Connecticut	-	4	4	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Florida	-	4	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Indiana	-	2	2	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Iowa	-	2	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maine	-	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Massachusetts	-	10	7	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Michigan	-	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Jersey	-	2	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
New York	-	8	4	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
North Carolina	-	3	2	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Ohio	-	3	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Pennsylvania	-	4	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
South Carolina	-	3	3	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Texas	-	9	4	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Wisconsin	-	4	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.														
United States	-	294	135	56.6	2 071.6	37.9	77.0	1 298.0	4 794.2	6 996.1	11 826.9	461.1	64.0	5 065.8
Alabama	-	5	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Arkansas	-	3	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
California	-	31	9	3.3	122.8	1.1	2.7	94.1	152.6	115.4	267.7	(D)	(NA)	(D)
Colorado	-	2	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Connecticut	-	4	3	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Florida	E4	24	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Georgia	-	5	2	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Illinois	-	23	15	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	5.8	983.5
Indiana	-	9	8	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Iowa	-	4	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Kentucky	-	2	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Maryland	-	2	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Michigan	-	19	9	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Mississippi	-	4	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Missouri	-	11	5	1.3	28.1	1.1	2.2	20.3	113.2	125.9	240.3	3.7	E	(D)
New York	-	12	3	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
North Carolina	-	10	9	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Ohio	-	19	12	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Oklahoma	-	6	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Pennsylvania	E1	9	4	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
South Carolina	-	2	2	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
South Dakota	-	2	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Tennessee	-	9	6	1.5	32.4	1.3	2.8	25.5	114.9	210.4	320.0	(D)	G	(D)
Texas	E2	17	6	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Utah	-	3	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Virginia	-	2	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Wisconsin	-	23	18	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT														
United States	-	1 631	465	61.4	1 784.4	42.5	83.2	1 096.3	5 165.0	4 435.8	9 617.0	196.2	57.0	3 709.5
Alabama	-	26	8	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Arizona	E1	11	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Arkansas	E1	38	11	.6	13.0	.4	.7	6.8	29.6	32.8	61.9	(D)	F	(D)
California	E2	139	26	1.9	45.2	1.3	2.6	25.3	92.3	90.4	183.8	(D)	G	(D)
Colorado	-	21	7	.7	16.1	.5	1.1	11.3	34.5	40.6	79.4	(D)	E	(D)
Florida	E1	41	7	.8	17.4	.6	1.2	10.6	40.0	46.2	90.2	3.6	.7	33.8
Georgia	E1	59	21	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Idaho	-	37	11	.8	16.3	.5	1.1	8.9	32.8	31.4	64.0	(D)	F	(D)
Illinois	-	97	32	8.6	322.4	6.2	11.9	219.5	1 092.9	766.1	1 867.6	43.5	9.1	852.2
Indiana	E1	54	23	1.9	49.2	1.4	2.6	28.7	120.2	122.2	245.6	(D)	G	(D)
Iowa	-	140	58	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Kansas	E1	79	28	4.0	90.5	3.0	5.5	56.7	173.4	206.9	384.3	(D)	3.9	146.3
Kentucky	E2	16	4	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.1	E
Louisiana	E4	16	7	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Michigan	E1	34	7	.5	16.7	.3	.7	8.3	43.4	38.9	80.1	(D)	F	(D)
Minnesota	E1	91	30	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Mississippi	-	20	8	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.6	24.6
Missouri	-	39	10	1.2	31.8	.8	1.5	17.2	132.3	88.7	200.5	(D)	G	(D)
Nebraska	-	90	29	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	4.1	243.0
New York	E1	31	6	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1992 and 1987—Con.

[Excludes data for auxiliaries. States with 100 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1992											1987		
	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)	
	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)							
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT—Con.														
North Carolina	—	24	6	1.2	25.6	.9	1.8	14.7	48.6	58.6	106.4	1.5	(D)	
North Dakota	—	45	14	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	
Ohio	—	48	14	1.6	39.3	1.0	1.9	21.2	96.0	81.0	188.0	2.2	1.7	74.9
Oklahoma	E2	36	6	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Oregon	E4	28	5	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Pennsylvania	—	41	7	1.6	46.4	1.2	2.5	33.8	144.7	127.9	269.9	2.0	G	(D)
South Carolina	E1	5	2	.2	4.4	.2	.3	2.1	10.7	7.0	17.5	.1	(NA)	(D)
South Dakota	—	25	7	.5	11.0	.4	.8	7.2	27.6	22.7	51.6	.8	.4	17.9
Tennessee	E2	18	7	.4	7.6	.2	.4	3.6	19.2	18.9	37.7	.4	E	(D)
Texas	E1	91	14	1.2	27.0	.8	1.7	14.7	55.5	57.3	116.2	(D)	G	(D)
Virginia	E4	17	3	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Washington	E1	33	6	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Wisconsin	—	93	36	6.0	165.3	4.1	8.1	98.7	619.9	571.2	1 204.0	17.2	5.2	393.1
INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT														
United States	—	144	73	24.8	568.9	19.8	36.3	388.9	2 153.4	3 080.1	5 168.7	125.1	24.9	1 915.9
Arizona	—	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Arkansas	—	2	2	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
California	—	7	2	.2	6.6	.2	.3	3.0	24.2	26.8	50.4	(D)	G	(D)
Georgia	—	9	6	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Illinois	E3	9	3	.7	14.9	.5	.8	7.6	45.8	63.9	110.5	.9	.8	37.2
Indiana	—	9	4	.6	12.3	.5	.9	8.9	50.7	49.1	101.9	(D)	F	(D)
Iowa	E3	3	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Kansas	—	4	2	.3	6.5	.2	.4	3.6	17.7	14.2	31.5	(D)	.3	16.5
Kentucky	E2	3	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Michigan	—	2	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Minnesota	—	10	5	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Mississippi	—	4	3	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.8	103.3
Missouri	—	7	2	.1	2.4	.1	.2	1.4	7.1	8.3	15.0	(D)	.2	7.5
New York	—	1	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
North Carolina	—	6	4	1.4	32.4	.9	1.5	15.9	175.3	119.7	292.1	(D)	F	(D)
Ohio	—	12	8	1.5	33.6	1.3	2.6	28.3	163.4	242.4	399.9	1.4	1.7	105.1
Pennsylvania	—	7	3	.4	9.1	.3	.6	6.5	19.4	45.4	65.0	1.8	E	(D)
South Carolina	—	2	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Tennessee	—	8	7	5.4	120.8	4.8	9.4	101.2	384.8	765.7	1 121.2	(D)	(NA)	(D)
Wisconsin	—	10	8	3.0	104.4	1.9	3.4	57.7	462.8	454.2	916.6	20.7	4.2	608.6

Note: For qualifications of data, see footnotes on table 1a.

¹Payroll and sales data for some small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those States where estimated value of shipments data based on administrative-record data account for 10 percent or more of figure shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 100 employees or more, number of establishments is shown and employment-size range is indicated by one of the following symbols: C—100 to 249 employees; E—250 to 499 employees; F—500 to 999 employees; G—1,000 to 2,499 employees; H—2,500 to 4,999 employees; I—5,000 to 9,999 employees; J—10,000 to 24,999 employees; K—25,000 to 49,999 employees; L—50,000 to 99,999 employees; M—100,000 employees or more.

Table 3a. Summary Statistics for the Industry: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)	Internal combustion engines, n.e.c. (SIC 3519)	Farm machinery and equipment (SIC 3523)	Lawn and garden equipment (SIC 3524)
Companies	64	250	1 578	127
All establishments	79	294	1 631	144
With 1 to 19 employees	31	159	1 166	71
With 20 to 99 employees	18	57	347	34
With 100 employees or more	30	78	118	39
Employment and labor costs:				
Employees	27.1	56.6	61.4	24.8
Compensation, total	1 410.1	2 712.2	2 413.2	727.1
Annual payroll	1 106.5	2 071.6	1 784.4	568.9
Fringe benefits	303.6	640.6	628.8	158.3
Social Security and other legally required payments	101.1	211.2	204.8	70.1
Employer voluntary payments	202.5	429.4	423.9	88.2
Production workers:				
Average for year	15.0	37.9	42.5	19.8
March	15.2	38.0	43.7	22.4
May	15.0	37.6	43.4	21.1
August	14.9	37.8	41.8	16.1
November	14.9	38.4	41.3	19.7
Hours	30.1	77.0	83.2	36.3
Wages	553.2	1 298.0	1 096.3	388.9

See footnotes at end of table.

35A-10 ENGINES, TURBINES; FARM MACHINERY & EQUIP.

MANUFACTURES—INDUSTRY SERIES

Table 3a. Summary Statistics for the Industry: 1992—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)	Internal combustion engines, n.e.c. (SIC 3519)	Farm machinery and equipment (SIC 3523)	Lawn and garden equipment (SIC 3524)
Cost of materials ¹	2 690.9	6 996.1	4 435.8	3 080.1
Materials, parts, containers, etc., consumed ²	2 464.3	6 478.4	3 975.4	2 889.8
Resales	85.3	317.7	317.9	150.4
Fuels	10.5	28.8	30.6	9.9
Purchased electricity	37.6	93.4	73.0	22.1
Contract work	93.2	77.8	38.9	7.9
Quantity of electric energy used for heat and power:				
Purchased	597.5	1 980.3	1 596.9	414.7
Generated less sold	(D)	(D)	(D)	(D)
Total value of shipments	5 842.6	11 826.9	9 617.0	5 168.7
Value added	2 952.8	4 794.2	5 165.0	2 153.4
Inventories by stage of fabrication:				
Beginning of 1992	1 949.0	1 395.6	1 563.2	758.4
Finished goods	182.7	501.5	656.8	424.0
Work in process	1 501.8	608.8	448.2	128.1
Materials and supplies	264.5	285.2	458.2	206.3
End of 1992	1 699.4	1 365.5	1 546.0	853.7
Finished goods	188.4	480.1	660.0	512.2
Work in process	1 297.2	593.7	428.8	104.6
Materials and supplies	213.8	291.7	457.3	236.8

Note: For qualifications of data, see footnotes on table 1a.

¹Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3c.

²Data on materials consumed by type are shown in table 7. Data on amount purchased or transferred from foreign sources are shown in table 3c.

Table 3b. Gross Book Value of Depreciable Assets, Capital Expenditures, Retirements, Depreciation, and Rental Payments: 1992

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)	Internal combustion engines, n.e.c. (SIC 3519)	Farm machinery and equipment (SIC 3523)	Lawn and garden equipment (SIC 3524)
Gross book value of depreciable assets:				
Total:				
Beginning of year	2 135.1	5 566.1	3 152.5	1 049.6
New capital expenditures ¹	312.0	461.1	196.2	125.1
Used capital expenditures	17.9	13.3	16.7	14.7
Retirements	49.9	293.3	83.4	65.9
End of year	2 415.1	5 747.2	3 282.0	1 123.4
Buildings and other structures:				
Beginning of year	475.0	1 257.7	681.4	263.4
New capital expenditures	50.0	58.0	28.6	13.3
Used capital expenditures	(D)	1.7	5.0	.1
Retirements	(D)	10.7	5.7	4.9
End of year	534.0	1 306.7	709.3	271.8
Machinery and equipment:				
Beginning of year	1 660.1	4 308.4	2 471.1	786.2
New capital expenditures ¹	262.0	403.1	167.6	111.8
Used capital expenditures	(D)	11.6	11.7	14.7
Retirements	(D)	282.6	77.7	61.0
End of year	1 881.1	4 440.5	2 572.7	851.6
Depreciation charges during 1992:				
Total	169.5	432.5	198.0	88.1
Buildings and other structures	33.3	53.0	30.1	9.7
Machinery and equipment	136.2	379.5	167.9	78.4
Rental payments:				
Total	26.2	90.5	54.8	19.8
Buildings and other structures	19.1	56.2	30.3	10.0
Machinery and equipment	7.1	34.2	24.5	9.8

¹Data on new machinery and equipment expenditures by type are provided in table 3c.

Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Turbines and turbine generator sets (SIC 3511)		Internal combustion engines, n.e.c. (SIC 3519)		Farm machinery and equipment (SIC 3523)		Lawn and garden equipment (SIC 3524)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:								
Cost of purchased services for the repair of—								
Buildings and other structures	12.6	(X)	21.9	(X)	16.1	(X)	7.8	(X)
Response coverage ratio (percent) ²	95.3	(X)	89.9	(X)	83.5	(X)	88.2	(X)
Machinery	26.8	(X)	80.7	(X)	41.8	(X)	28.5	(X)
Response coverage ratio (percent) ²	91.9	(X)	88.3	(X)	83.2	(X)	88.2	(X)
Other purchased services:								
Communications	10.0	(X)	12.7	(X)	15.8	(X)	6.3	(X)
Response coverage ratio (percent) ²	95.3	(X)	89.5	(X)	84.2	(X)	91.7	(X)
Legal	7.3	(X)	7.6	(X)	19.9	(X)	4.1	(X)
Response coverage ratio (percent) ²	93.1	(X)	72.1	(X)	85.0	(X)	81.8	(X)
Accounting and bookkeeping7	(X)	1.9	(X)	6.5	(X)	.7	(X)
Response coverage ratio (percent) ²	86.1	(X)	69.7	(X)	84.6	(X)	81.8	(X)
Advertising	4.9	(X)	12.2	(X)	26.3	(X)	48.8	(X)
Response coverage ratio (percent) ²	89.7	(X)	69.2	(X)	83.3	(X)	91.7	(X)
Software and other data processing	19.8	(X)	30.4	(X)	17.9	(X)	2.2	(X)
Response coverage ratio (percent) ²	91.9	(X)	87.4	(X)	82.3	(X)	90.9	(X)
Refuse removal, including hazardous waste	6.3	(X)	12.2	(X)	6.2	(X)	4.2	(X)
Response coverage ratio (percent) ²	94.6	(X)	89.3	(X)	83.5	(X)	91.7	(X)
New machinery and equipment expenditures	262.0	(X)	403.1	(X)	167.6	(X)	111.8	(X)
Automobiles, trucks, etc., for highway use	17.1	1	3.4	2	6.4	15	.9	2
Computers and peripheral data processing equipment	14.4	1	29.5	3	13.5	4	5.6	1
All other	230.4	1	370.2	1	147.7	1	105.3	1
Adjustment ratio ³	1.1	(X)	1.0	(X)	1.2	(X)	1.2	(X)
Cost of materials, components, parts, etc., used	2 464.3	(X)	6 478.4	(X)	3 975.4	(X)	2 889.8	(X)
Materials purchased or transferred from foreign sources ⁴	47.8	1	1 044.8	2	221.9	6	189.4	1
Materials purchased or transferred from domestic sources	2 416.5	1	5 433.7	1	3 753.5	1	2 700.4	1
Adjustment ratio ³	1.7	(X)	1.4	(X)	1.4	(X)	1.3	(X)

Note: The amounts shown for purchased services reflect only those services that establishments purchase from other companies. Amounts purchased by separate central administrative offices and services provided to establishments by central administrative offices are excluded.

¹For description of relative standard error of estimate, see Qualifications of the Data in appendixes.
²A response coverage ratio is derived for this item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported to the weighted total employment for all ASM establishments classified in the industry.
³Detail has been adjusted upwards to account for nonresponse. Inverse of the ratio shown represents a measure of the response of the inquiry. (See appendixes for further explanation.)
⁴Data may understate the true cost of imported parts, components, and supplies since some respondents do not know the origin of these materials. Includes cases where materials were purchased from secondary suppliers or where they were transferred from company-operated warehouses or other distribution points. Direct purchases from foreign suppliers and importers by domestic manufacturing establishments are believed to be reported accurately.

Table 4. Industry Statistics by Employment Size of Establishment: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS												
Total	-	79	27.1	1 106.5	15.0	30.1	553.2	2 952.8	2 690.9	5 842.6	312.0	1 699.4
Establishments with an average of—												
1 to 4 employees	E7	13	(Z)	.8	(Z)	(Z)	.3	1.8	1.3	2.9	.1	1.1
5 to 9 employees	E6	12	.1	3.1	.1	.1	1.6	6.6	5.0	11.2	.4	3.2
10 to 19 employees	-	6	.1	1.9	.1	.1	1.3	3.5	2.0	5.4	.2	1.5
20 to 49 employees	E1	8	.2	7.7	.2	.3	4.8	13.0	9.8	23.4	.4	4.5
50 to 99 employees	-	10	.7	24.4	.5	1.0	13.5	49.9	33.1	86.3	2.4	15.7
100 to 249 employees	-	11	1.7	61.9	.9	1.8	27.6	134.0	90.3	231.6	6.8	38.3
250 to 499 employees	-	7	2.6	105.3	1.9	4.1	67.4	292.2	154.3	455.8	69.0	90.5
500 to 999 employees	-	6	4.8	203.8	2.8	5.8	104.8	626.2	346.0	1 021.0	(D)	193.6
1,000 to 2,499 employees	-	4	16.9	697.6	8.6	16.8	331.9	1 825.5	2 049.0	4 005.0	232.6	1 351.0
2,500 employees or more	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.												
Total	-	294	56.6	2 071.6	37.9	77.0	1 298.0	4 794.2	6 996.1	11 826.9	461.1	1 365.5
Establishments with an average of—												
1 to 4 employees	E8	82	.1	3.6	.1	.2	2.4	8.7	10.8	19.3	.8	2.3
5 to 9 employees	E6	42	.3	6.3	.2	.4	4.0	13.7	16.5	30.1	1.1	4.0
10 to 19 employees	E2	35	.5	12.2	.3	.7	6.9	29.4	34.1	63.4	2.0	11.6
20 to 49 employees	-	33	1.0	23.8	.7	1.4	14.0	43.6	62.5	107.1	2.9	20.2
50 to 99 employees	-	24	1.7	49.8	1.0	2.2	24.2	123.0	126.3	244.3	7.4	62.5
100 to 249 employees	-	29	4.5	119.5	3.3	7.0	76.7	301.5	354.2	658.9	26.1	78.2
250 to 499 employees	-	18	6.5	208.2	4.7	10.0	137.2	541.7	937.6	1 482.8	17.7	204.8
500 to 999 employees	-	19	14.0	530.5	10.0	19.8	328.1	1 379.8	1 735.8	3 139.3	115.6	465.0
1,000 to 2,499 employees	-	8	10.2	371.8	6.2	13.5	272.6	621.9	1 127.5	1 744.9	99.0	193.2
2,500 employees or more	-	4	17.8	745.9	11.4	21.9	431.9	1 731.0	2 590.9	4 336.7	188.5	323.7
Covered by administrative records ²	E9	100	.3	7.6	.2	.5	4.9	14.1	19.4	33.5	1.5	4.3

See footnotes at end of table.

35A-12 ENGINES, TURBINES; FARM MACHINERY & EQUIP.

MANUFACTURES—INDUSTRY SERIES

Table 4. Industry Statistics by Employment Size of Establishment: 1992—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT												
Total	-	1 631	61.4	1 784.4	42.5	83.2	1 096.3	5 165.0	4 435.8	9 617.0	196.2	1 546.0
Establishments with an average of—												
1 to 4 employees	E9	597	.9	20.9	.7	1.3	13.6	60.8	56.2	117.1	2.2	17.9
5 to 9 employees	E6	296	1.9	37.4	1.4	2.8	24.0	97.2	91.5	188.4	3.3	29.6
10 to 19 employees	E2	273	3.7	75.5	2.6	5.0	44.3	177.5	161.2	337.8	6.0	68.4
20 to 49 employees	-	228	7.0	151.9	4.9	9.9	87.9	335.9	330.0	666.3	11.4	140.3
50 to 99 employees	-	119	8.3	199.1	5.6	11.1	108.4	422.6	460.8	886.9	15.9	202.4
100 to 249 employees	E1	82	12.1	301.9	8.2	17.0	171.2	645.9	683.4	1 346.0	25.1	351.8
250 to 499 employees	-	17	5.8	147.6	3.9	7.8	85.2	490.0	459.2	956.4	12.4	128.3
500 to 999 employees	-	13	9.3	282.6	6.5	12.2	174.6	912.3	725.4	1 627.9	120.0	294.7
1,000 to 2,499 employees	-	4	12.3	567.7	8.7	16.0	387.0	2 022.8	1 468.0	3 490.3	(D)	312.7
2,500 employees or more	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	779	2.4	42.6	1.8	3.5	27.9	116.9	107.9	224.9	4.3	34.0
INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT												
Total	-	144	24.8	568.9	19.8	36.3	388.9	2 153.4	3 080.1	5 168.7	125.1	853.7
Establishments with an average of—												
1 to 4 employees	E9	38	.1	1.2	(Z)	.1	.8	3.9	5.9	9.8	.2	1.8
5 to 9 employees	E9	15	.1	2.3	.1	.2	1.5	8.9	13.7	22.6	.4	3.8
10 to 19 employees	E5	18	.2	4.5	.2	.3	2.8	14.7	20.8	35.7	.5	6.8
20 to 49 employees	E1	21	.7	17.8	.5	1.0	10.0	48.6	87.7	136.3	3.5	24.3
50 to 99 employees	-	13	1.0	22.4	.7	1.4	12.7	72.2	92.4	163.5	3.6	36.2
100 to 249 employees	-	15	2.6	59.1	2.1	3.9	37.8	192.7	291.7	472.7	9.3	90.0
250 to 499 employees	-	11	4.0	95.7	2.9	5.2	58.5	293.3	430.8	726.3	16.8	133.4
500 to 999 employees	-	8	6.0	124.7	4.9	8.6	88.9	535.9	799.8	1 325.1	17.0	196.3
1,000 to 2,499 employees	-	4	10.2	241.3	8.5	15.7	175.9	983.2	1 337.2	2 276.7	73.8	361.1
2,500 employees or more	-	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	41	.1	1.5	.1	.1	1.0	4.8	7.2	11.9	.2	2.2

Note: For qualifications of data, see footnotes on table 1a. Data shown as (D) are included in underscored figures above.

¹Payroll and sales data for some small single-establishment manufacturing companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those employment-size classes where estimated data based on administrative-record data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Report forms were not mailed to small single-establishment companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1992 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective employment-size classes shown.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1992

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3511	Turbines and turbine generator sets:										
	All establishments in industry	79	27.1	1 106.5	15.0	30.1	553.2	2 952.8	2 690.9	5 842.6	312.0
3519	Internal combustion engines, n.e.c.:										
	All establishments in industry	294	56.6	2 071.6	37.9	77.0	1 298.0	4 794.2	6 996.1	11 826.9	461.1
	Establishments with this product class primary:										
35191	Gasoline and gas-gasoline engines (except aircraft, automobile, highway truck, bus, tank, and outboard marine)	13	10.1	314.0	8.6	15.0	245.6	694.4	888.1	1 564.9	68.0
35193	Diesel, semidiesel, and dual-fuel engines (except automobile, highway truck, bus, and tank)	6	2.4	101.6	1.3	2.6	48.9	306.7	465.0	793.2	(D)
35194	Diesel, semidiesel, and dual-fuel engines for automobiles, highway trucks, and buses	12	13.3	589.6	9.3	21.0	392.3	1 583.5	2 588.0	4 200.9	154.6
35195	Outboard motors (internal combustion)	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35196	Piston-type natural gas engines, including LPG engines (excluding gas turbines)	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35197	Tank (except gas turbine) and converted internal combustion engines	8	1.6	55.4	1.0	2.1	24.6	113.0	349.2	452.3	10.8
35199	Parts and accessories for internal combustion engines, except aircraft and gasoline automotive engines and gas turbines	102	23.5	826.2	15.1	31.1	448.5	1 849.3	2 069.7	3 928.3	188.3

See footnotes at end of table.

MANUFACTURES—INDUSTRY SERIES

ENGINES, TURBINES, FARM MACHINERY & EQUIP. 35A-13

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1992—
Con.

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3523	Farm machinery and equipment:										
	All establishments in industry -----	1 631	61.4	1 784.4	42.5	83.2	1 096.3	5 165.0	4 435.8	9 617.0	196.2
	Establishments with this product class primary:										
35231	Farm-type (power take off hp) wheel tractors (2- and 4-wheel drive) (sold with or without attachments).....	7	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35232	Farm dairy equipment, sprayers and dusters (except aerial types), farm elevators, and farm blowers.....	58	3.3	80.6	2.0	4.1	38.2	171.5	192.9	362.3	5.4
35233	Planting, seeding, and fertilizing machinery, excluding turf machinery -----	50	3.2	77.7	2.3	4.3	43.2	148.4	144.3	296.6	7.0
35235	Harvesting machinery, except hay and straw -----	59	9.5	379.2	6.9	12.6	260.9	1 420.3	888.5	2 299.2	48.4
35236	Haying machinery -----	11	3.6	126.7	2.6	4.9	84.5	308.5	288.7	594.4	10.9
35239	Parts for farm machinery, for sale separately -----	104	7.9	207.1	5.3	11.4	123.7	476.4	424.0	914.6	25.2
3523C	Plows, including plowshares (primary tillage), harrows, rollers, pulverizers, and cultivators and weeders -----	46	2.6	60.9	1.7	3.4	32.3	99.6	121.8	229.8	3.2
3523E	All other farm machinery and equipment (excluding parts) -----	215	13.9	338.0	9.6	18.9	183.1	720.3	861.3	1 587.2	23.0
3523F	Commercial turf and grounds care equipment -----	49	4.7	128.1	3.0	6.2	75.2	406.9	357.1	769.3	9.1
3524	Lawn and garden equipment:										
	All establishments in industry -----	144	24.8	568.9	19.8	36.3	388.9	2 153.4	3 080.1	5 168.7	125.1
	Establishments with this product class primary:										
35241	Consumer nonriding lawn, garden, and snow equipment -----	30	9.5	205.4	7.4	13.2	128.8	860.1	1 177.7	2 010.7	48.8
35244	Consumer riding lawn, garden, and snow equipment ..	16	12.3	299.6	10.2	18.5	219.2	1 122.0	1 676.1	2 763.9	63.9
35246	Parts and attachments for consumer lawn, garden, and snow equipment -----	21	2.3	51.5	1.8	3.6	32.7	131.4	166.6	294.6	10.7

Note: For qualifications of data, see footnotes on table 1a.

Table 5b. Industry-Product Analysis—Value of Industry and Primary Product Shipments; Specialization and Coverage Ratios: 1992 and Earlier Census Years

[Million dollars. An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work (total miscellaneous receipts). Subtotals for total value of shipments show this product pattern for an industry. Primary products specialization ratio is the primary products value of shipments divided by the sum of primary products value of shipments plus secondary products value of shipments. The extent of which an industry's primary products are shipped by establishments classified both in and out of an industry is the coverage ratio and is calculated by dividing the primary products value of shipments by the value of primary products shipments made in all industries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	1992	1987	1982
INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS			
Total value of shipments -----	5 842.6	3 447.8	3 676.3
Primary products value of shipments -----	4 799.7	2 645.3	2 948.1
Secondary products value of shipments -----	641.1	549.5	186.1
Total miscellaneous receipts -----	401.8	253.1	542.1
Value of resales -----	124.8	27.0	27.4
Contract receipts -----	1.9	3.5	(D)
Other miscellaneous receipts -----	275.1	222.6	(D)
Sales of scrap and refuse -----	1.5	(D)	(D)
Receipts for installation (or construction) of products of this establishment -----	(D)	(D)	(D)
Receipts for maintenance contracts -----	(D)	(D)	(NA)
Receipts for research and development -----	(D)	(D)	36.3
Receipts for repair work -----	129.4	(D)	195.8
Other miscellaneous receipts -----	(D)	(D)	207.2
Other miscellaneous receipts, n.s.k. -----	(Z)	.2	(D)
Primary products specialization ratio -----	88	83	94
Value of primary products shipments made in all industries -----	5 998.5	3 196.0	3 662.3
Value of primary products shipments made in this industry -----	4 799.7	2 645.3	2 948.1
Value of primary products shipments made in other industries -----	1 198.8	550.8	714.3
Coverage ratio -----	80	83	80
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.			
Total value of shipments -----	11 826.9	11 122.6	9 363.4
Primary products value of shipments -----	10 516.0	9 924.0	7 818.0
Secondary products value of shipments -----	811.8	635.8	973.1
Total miscellaneous receipts -----	499.1	562.9	572.3
Value of resales -----	397.1	500.0	460.3
Contract receipts -----	21.4	11.3	(D)
Other miscellaneous receipts -----	80.5	51.6	(D)
Sales of scrap and refuse -----	15.2	(D)	8.7
Receipts for installation (or construction) of products of this establishment -----	(D)	(D)	(D)
Receipts for maintenance contracts -----	—	—	(NA)
Receipts for research and development -----	2.3	.2	(D)
Receipts for repair work -----	14.5	7.6	12.0
Other miscellaneous receipts -----	(D)	(D)	3.6
Other miscellaneous receipts, n.s.k. -----	.2	.3	2.1
Primary products specialization ratio -----	93	94	89

35A-14 ENGINES, TURBINES; FARM MACHINERY & EQUIP.

MANUFACTURES—INDUSTRY SERIES

Table 5b. Industry–Product Analysis—Value of Industry and Primary Product Shipments; Specialization and Coverage Ratios: 1992 and Earlier Census Years—Con.

[Million dollars. An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work (total miscellaneous receipts). Subtotals for total value of shipments show this product pattern for an industry. Primary products specialization ratio is the primary products value of shipments divided by the sum of primary products value of shipments plus secondary products value of shipments. The extent of which an industry's primary products are shipped by establishments classified both in and out of an industry is the coverage ratio and is calculated by dividing the primary products value of shipments by the value of primary products shipments made in all industries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	1992	1987	1982
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.— Con.			
Value of primary products shipments made in all industries	11 633.8	10 908.7	8 972.4
Value of primary products shipments made in this industry	10 516.0	9 924.0	7 818.0
Value of primary products shipments made in other industries	1 117.8	984.7	1 154.4
Coverage ratio	90	91	87
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT			
Total value of shipments	9 617.0	6 879.9	10 743.0
Primary products value of shipments	8 488.1	5 840.4	9 835.3
Secondary products value of shipments	548.0	682.2	598.2
Total miscellaneous receipts	581.0	357.3	309.5
Value of resales	509.7	322.9	245.2
Contract receipts	23.6	11.3	29.2
Other miscellaneous receipts	47.7	23.1	35.1
Sales of scrap and refuse	6.1	(D)	7.1
Receipts for research and development	1.9	(D)	(D)
Other miscellaneous receipts	36.9	17.1	23.6
Other miscellaneous receipts, n.s.k.	2.8	1.1	(D)
Primary products specialization ratio	94	90	94
Value of primary products shipments made in all industries	8 924.6	6 384.7	10 370.0
Value of primary products shipments made in this industry	8 488.1	5 840.4	9 835.3
Value of primary products shipments made in other industries	436.5	544.3	534.7
Coverage ratio	95	91	95
INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT			
Total value of shipments	5 168.7	4 594.4	2 365.2
Primary products value of shipments	4 037.5	3 820.5	2 096.9
Secondary products value of shipments	838.4	491.9	197.0
Total miscellaneous receipts	292.8	282.0	71.2
Value of resales	272.4	272.2	63.0
Contract receipts	(D)	3.5	4.9
Other miscellaneous receipts	(D)	6.3	3.3
Sales of scrap and refuse	5.6	(D)	(D)
Receipts for research and development	(D)	(Z)	(D)
Other miscellaneous receipts	(D)	(D)	2.3
Other miscellaneous receipts, n.s.k.	—	.1	—
Primary products specialization ratio	83	89	91
Value of primary products shipments made in all industries	4 348.6	4 061.0	2 385.2
Value of primary products shipments made in this industry	4 037.5	3 820.5	2 096.9
Value of primary products shipments made in other industries	311.1	240.5	288.3
Coverage ratio	93	94	88

Note: For qualifications of data, see footnotes on table 1a.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1992 and 1987

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	1992			1987		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3511—	TURBINES, TURBINE GENERATORS, AND TURBINE GENERATOR SETS						
	Total	(NA)	(X)	5 998.5	(NA)	(X)	3 196.0
35110	Turbine generator sets, turbines, turbine generators, and parts	(NA)	(X)	5 998.5	(NA)	(X)	3 196.0
	Turbine generator sets and parts:						
35110 05	Turbine generator sets	10	(S)	1 838.8	(NA)	(NA)	(³)
35110 09	Parts and accessories (sold separately)	15	(X)	(D)	(NA)	(X)	(³)
	Steam, gas, hydraulic, and wind turbines and parts:						
35110 11	Steam turbines and other vapor turbines	8	868	242.7	(NA)	1 145	215.5
	Kilowatt or horsepower capacity (rated or normal) for all vapor turbines:						
35110 21	Less than 373 kW (500 hp)	(NA)	(D)	(X)	}	(NA)	1 109
35110 22	373 kW (500 hp) to 745 kW (999 hp)	(NA)	(D)	(X)			
35110 23	746 kW (1,000 hp) to 7,459 kW (9,999 hp)	(NA)	(D)	(X)			
35110 24	7,460 kW (10,000 hp) or more	(NA)	(D)	(X)			
35110 61	Hydraulic turbines (all sizes)	1	(D)	(D)	1	(D)	(⁴)
35110 75	Gas turbines, except aircraft (all sizes)	18	(S)	1 965.1	(NA)	(S)	905.9
35110 79	Wind turbines	4	(D)	(D)	1	(D)	(⁴)
	Parts and accessories (sold separately):						
35110 72	For steam and other vapor turbines	16	(X)	423.4	12	(X)	(⁴)
35110 71	For hydraulic turbines	(NA)	(X)	—	2	(X)	(⁴)
35110 81	For gas turbines, except aircraft	34	(X)	426.4	13	(X)	134.8
35110 83	For wind turbines	1	(X)	(D)	3	(X)	*390.7
	Turbine generators and parts:						
35110 91	Turbine generators	6	(S)	162.7	(NA)	(NA)	(³)
35110 95	Parts and accessories (sold separately)	13	(X)	(D)	(NA)	(X)	³¹ 502.1
35110 00	Turbines, turbine generators, and turbine generator sets, n.s.k.	(NA)	(X)	38.4	(NA)	(X)	46.9
35110 02	Turbines, turbine generators, and turbine generator sets, n.s.k. ⁵	(NA)	(X)	—	(NA)	(X)	—
3519—	INTERNAL COMBUSTION ENGINES, N.E.C.						
	Total	(NA)	(X)	11 633.8	(NA)	(X)	10 908.7
35191	Gasoline and gas-gasoline engines (except aircraft, automobile, highway truck, bus, tank, and outboard marine)	(NA)	(X)	1 550.4	(NA)	(X)	1 474.3
35191 00	Gasoline and gas-gasoline engines (except aircraft, automobile, highway truck, bus, tank, and outboard marine) ⁶	17	(X)	1 550.4	15	(X)	1 474.3
35193	Diesel, semidiesel, and dual-fuel engines (except automobile, highway truck, bus, and tank)	(NA)	(X)	1 487.4	(NA)	(X)	1 198.3
35193 00	Diesel, semidiesel, and dual-fuel engines (except automobile, highway truck, bus, and tank) ⁶	18	(X)	1 487.4	18	(X)	1 198.3
35194	Diesel, semidiesel, and dual-fuel engines for automobiles, highway trucks, and buses	(NA)	(X)	3 165.7	(NA)	(X)	2 744.3
35194 00	Diesel, semidiesel, and dual-fuel engines for automobiles, highway trucks, and buses ⁶	12	(X)	3 165.7	12	(X)	2 744.3
35195	Outboard motors (internal combustion)	(NA)	(X)	(D)	(NA)	(X)	(⁷)
35195 00	Outboard motors (internal combustion)	5	(D)	(D)	4	(D)	(⁷)
35196	Piston-type natural gas engines, including LPG engines (excluding gas turbines)	(NA)	(X)	175.5	(NA)	(X)	66.0
35196 00	Piston-type natural gas engines, including LPG engines (excluding gas turbines) ⁶	6	(X)	175.5	9	(X)	66.0
35197	Tank (except gas turbine) and converted internal combustion engines	(NA)	(X)	(D)	(NA)	(X)	⁷¹ 545.6
35197 21	Tank engines, except gas turbines	1	(D)	(D)	}	(NA)	⁷¹ 545.6
35197 51	Converted engines (basic engines, short blocks purchased or intracompany transfer and converted to marine or other uses)	8	**88.9	612.4			
35197 00	Tank (except gas turbine) and converted internal combustion engines, n.s.k.	(NA)	(X)	—			
35199	Parts and accessories for internal combustion engines, except aircraft and gasoline automotive engines and gas turbines	(NA)	(X)	3 852.3	(NA)	(X)	3 789.9
35199 01	Connecting rods	18	(X)	47.2	11	(X)	42.3
35199 08	Crankshafts, engine	25	(X)	165.0	17	(X)	153.9
35199 09	Camshafts, engine	18	(X)	93.4	11	(X)	65.7
35199 21	Flywheels	15	(X)	29.6	12	(X)	23.3
	Engine bearings (halves):						
35199 24	Main (crankshaft)	4	(X)	(D)	6	(X)	14.7
35199 25	Connecting rod	6	(X)	22.5	4	(X)	2.3
35199 33	Other (camshaft, balance shaft, etc.)	6	(X)	36.7	4	(X)	7.1
	Engine pumps, new:						
35199 27	Oil	12	(X)	19.1	}	(NA)	(X)
35199 31	Fuel	7	(X)	(D)			
35199 32	Water	9	(X)	30.5			
35199 35	Engine blocks	17	(X)	118.2	(NA)	(X)	99.1
35199 39	Cylinder liners (sleeves)	20	(X)	158.6	(NA)	(X)	79.9
35199 49	Cylinder heads	21	(X)	127.7	(NA)	(X)	134.7
35199 63	Intake manifolds and exhaust manifolds	16	(X)	50.9	(NA)	(X)	50.9
35199 67	Valve guides, seats, and tappets	12	(X)	15.4	(NA)	(X)	4.6

See footnotes at end of table.

35A-16 ENGINES, TURBINES; FARM MACHINERY & EQUIP.

MANUFACTURES—INDUSTRY SERIES

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1992 and 1987—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	1992			1987		
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
			Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)
3519—	INTERNAL COMBUSTION ENGINES, N.E.C.—						
	Con.						
35199	Parts and accessories for internal combustion engines, except aircraft and gasoline automotive engines and gas turbines—Con.						
35199 71	Rocker arms and parts	13	(X)	25.0	(NA)	(X)	20.4
35199 75	Fuel injection systems (multipoint)	18	(X)	458.0	(NA)	(X)	376.8
35199 83	Governors, engine speed	12	(X)	65.0	(NA)	(X)	82.2
35199 87	Radiators, stationary engine	7	(X)	30.5	(NA)	(X)	13.6
35199 91	Superchargers, including turbochargers	17	(X)	153.5	(NA)	(X)	352.4
35199 99	Other parts and accessories	81	(X)	1 004.9	(NA)	(X)	870.2
35199 00	Parts and accessories for internal combustion engines, except aircraft and gas automotive engines and turbines, n.s.k.	(NA)	(X)	1 038.5	(NA)	(X)	1 297.2
35190	Internal combustion engines, n.e.c., n.s.k.	(NA)	(X)	182.3	(NA)	(X)	90.3
35190 00	Internal combustion engines, n.e.c., n.s.k. ⁸	(NA)	(X)	147.8	(NA)	(X)	24.7
35190 02	Internal combustion engines, n.e.c., n.s.k. ⁹	(NA)	(X)	34.5	(NA)	(X)	65.6
Product code	Product	1992			1987		
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	
3523—	FARM MACHINERY AND EQUIPMENT						
	Total	(NA)		8 924.6	(NA)		6 384.7
35231	Farm-type (power take off hp) wheel tractors (2- and 4-wheel drive) (sold with or without attachments)	(NA)		(¹⁰)	(NA)		751.2
35231 00	Farm-type (power take off hp) wheel tractors (2- and 4-wheel drive) (sold with or without attachments) ⁵	11		(¹¹)	12		751.2
35232	Farm dairy equipment, sprayers and dusters (except aerial types), farm elevators, and farm blowers	(NA)		382.1	(NA)		263.8
35232 00	Farm dairy equipment, sprayers and dusters (except aerial types), farm elevators, farm blowers, and attachments ⁵	99		382.1	78		263.8
35233	Planting, seeding, and fertilizing machinery, excluding turf machinery ..	(NA)		520.8	(NA)		313.2
35233 00	Planting, seeding, and fertilizing machinery, and attachments ⁵	103		520.8	87		313.2
35235	Harvesting machinery, except hay and straw	(NA)		1 564.5	(NA)		1 014.8
35235 00	Harvesting machinery (except hay and straw) and attachments ⁵	87		1 564.5	58		1 014.8
35236	Haying machinery	(NA)		434.8	(NA)		326.6
35236 00	Haying machinery and attachments ⁵	33		434.8	28		326.6
3523C	Plows, including plowshares (primary tillage), harrows, rollers, pulverizers, and cultivators and weeders	(NA)		267.7	(NA)		189.6
3523C 00	Plows (including plowshares), harrows, rollers, pulverizers, and cultivators and weeders, and attachments ⁵	100		267.7	62		189.6
3523E	All other farm machinery and equipment (excluding parts)	(NA)		¹⁰² 821.1	(NA)		909.9
3523E 00	All other farm machinery and equipment (excluding parts), but including attachments ⁵	307		¹¹² 821.1	217		909.9
35239	Parts for farm machinery, for sale separately	(NA)		1 473.9	(NA)		1 282.5
	Parts for farm machinery (except operator cabs):						
35239 26	Parts for wheel tractors (farm-type) ⁵	38		372.5	24		218.3
35239 31	Parts (except for wheel tractors) ⁵	269		991.5	220		1 019.3
35239 53	Operator cabs for farm equipment ⁶	9		42.0	6		4.5
35239 00	Parts for farm machinery, for sale separately, n.s.k.	(NA)		67.9	(NA)		40.5
3523F	Commercial turf and grounds care equipment	(NA)		834.0	(NA)		516.9
3523F 00	Commercial turf and grounds care equipment, including parts and attachments ⁵	88		834.0	60		516.9
35230	Farm machinery and equipment, n.s.k.	(NA)		625.7	(NA)		816.2
35230 00	Farm machinery and equipment, n.s.k. ¹²	(NA)		396.9	(NA)		340.1
35230 02	Farm machinery and equipment, n.s.k. ¹³	(NA)		228.8	(NA)		476.1
3524—	LAWN AND GARDEN EQUIPMENT						
	Total	(NA)		4 348.6	(NA)		4 061.0
35241	Consumer nonriding lawn, garden, and snow equipment	(NA)		1 946.0	(NA)		1 697.0
35241 00	Consumer nonriding lawn, garden, and snow equipment ⁶	45		1 946.0	49		1 697.0
35244	Consumer riding lawn, garden, and snow equipment	(NA)		1 645.0	(NA)		1 567.4
35244 00	Consumer riding lawn, garden, and snow equipment ⁶	24		1 645.0	23		1 567.4
35246	Parts and attachments for consumer lawn, garden, and snow equipment	(NA)		637.2	(NA)		699.5
35246 00	Parts and attachments for consumer lawn, garden, and snow equipment ⁶	63		637.2	64		699.5
35240	Lawn and garden equipment, n.s.k.	(NA)		120.5	(NA)		97.2
35240 00	Lawn and garden equipment, n.s.k. ¹⁴	(NA)		108.5	(NA)		26.7
35240 02	Lawn and garden equipment, n.s.k. ¹⁵	(NA)		11.9	(NA)		70.5

See footnotes at end of table.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1992 and 1987—Con.

¹Data reported by all producers, not just those with shipments of \$100,000 or more.
²For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: *10 to 19 percent estimated; **20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).
³For 1987, product codes 35110 05, 35110 09, 35110 91, and 35110 95 were combined to avoid disclosing data for individual companies.
⁴For 1987, product codes 35110 61, 35110 79, 35110 72, 35110 71, and 35110 83 were combined to avoid disclosing data for individual companies.
⁵There were no administrative-record cases for this industry.
⁶Additional detail is collected for this product in the Current Industrial Reports. For the survey number and title, see appendix C, part 3.
⁷For 1987, product codes 35195 00, 35197 21, and 35197 51 were combined to avoid disclosing data for individual companies.
⁸Typically for establishments with 10 employees or more.
⁹Typically for establishments with less than 10 employees.
¹⁰For 1992, product classes 35231 and 3523E are combined to avoid disclosing data for individual companies.
¹¹For 1992, product codes 35231 00 and 3523E 00 are combined to avoid disclosing data for individual companies.
¹²Typically for establishments with 5 employees or more.
¹³Typically for establishments with less than 5 employees.
¹⁴Typically for establishments with 20 employees or more.
¹⁵Typically for establishments with less than 20 employees.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1992 and 1987

(Million dollars. Product classes shown are those where the data are geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by kind" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1992. For meaning of abbreviations and symbols, see introductory text)

Product class and geographic area	1992 value of product shipments	1987 value of product shipments	Product class and geographic area	1992 value of product shipments	1987 value of product shipments
35191, GASOLINE AND GAS-GASOLINE ENGINES (EXCEPT AIRCRAFT, AUTOMOBILE, HIGHWAY TRUCK, BUS, TANK, AND OUTBOARD MARINE)			35231, FARM-TYPE (POWER TAKE OFF HP) WHEEL TRACTORS (2- AND 4-WHEEL DRIVE) (SOLD WITH OR WITHOUT ATTACHMENTS)		
United States	1 550.4	1 474.3	United States	(D)	751.2
Wisconsin	996.9	1 076.4			
35193, DIESEL, SEMIDIESEL, AND DUAL-FUEL ENGINES (EXCEPT AUTOMOBILE, HIGHWAY TRUCK, BUS, AND TANK)			35232, FARM DAIRY EQUIPMENT, SPRAYERS AND DUSTERS (EXCEPT AERIAL TYPES), FARM ELEVATORS, AND FARM BLOWERS		
United States	1 487.4	1 198.3	United States	382.1	263.8
35194, DIESEL, SEMIDIESEL, AND DUAL-FUEL ENGINES FOR AUTOMOBILES, HIGHWAY TRUCKS, AND BUSES			California	10.0	3.5
United States	3 165.7	2 744.3	Georgia	4.3	(NA)
			Illinois	39.0	21.0
			Indiana	4.1	10.8
			Iowa	40.1	15.4
			Nebraska	8.7	14.8
			North Dakota	27.8	18.8
			Ohio	2.4	2.9
			Texas	4.1	(NA)
			Wisconsin	71.2	34.9
35195, OUTBOARD MOTORS (INTERNAL COMBUSTION)			35233, PLANTING, SEEDING, AND FERTILIZING MACHINERY, EXCLUDING TURF MACHINERY		
United States	(D)	(D)	United States	520.8	313.2
35196, PISTON-TYPE NATURAL GAS ENGINES, INCLUDING LPG ENGINES (EXCLUDING GAS TURBINES)			California	2.3	(NA)
United States	175.5	66.0	Georgia	12.7	(NA)
35197, TANK (EXCEPT GAS TURBINE) AND CONVERTED INTERNAL COMBUSTION ENGINES			Illinois	142.6	104.2
United States	(D)	(D)	Indiana	2.4	11.9
			Iowa	140.3	50.8
			Minnesota	33.4	20.9
			Nebraska	12.9	5.7
			North Dakota	14.7	6.6
			Wisconsin	22.5	11.6
35199, PARTS AND ACCESSORIES FOR INTERNAL COMBUSTION ENGINES, EXCEPT AIRCRAFT AND GASOLINE AUTOMOTIVE ENGINES AND GAS TURBINES			35235, HARVESTING MACHINERY, EXCEPT HAY AND STRAW		
United States	3 852.3	3 789.9	United States	1 564.5	1 014.8
California	143.4	(NA)	California	27.1	17.6
Georgia	13.5	(NA)	Georgia	19.1	(NA)
Illinois	306.4	543.8	Idaho	12.3	(NA)
Iowa	34.0	111.5	Louisiana	16.8	(NA)
Michigan	457.4	372.4	Michigan	5.0	(NA)
Minnesota	20.1	(NA)	North Dakota	8.6	6.4
Missouri	33.9	(NA)	Washington	4.0	(NA)
North Carolina	298.4	233.6	Wisconsin	21.4	17.3
Ohio	227.6	201.0	35236, HAYING MACHINERY		
Oklahoma	38.0	(NA)	United States	434.8	326.6
Pennsylvania	81.6	121.3	California		(NA)
Texas	18.5	31.4	Wisconsin	32.9	2.2
Wisconsin	350.7	482.6			

See footnotes at end of table.

35A-18 ENGINES, TURBINES; FARM MACHINERY & EQUIP.

MANUFACTURES—INDUSTRY SERIES

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1992 and 1987—Con.

[Million dollars. Product classes shown are those where the data are geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by kind" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1992. For meaning of abbreviations and symbols, see introductory text]

Product class and geographic area	1992 value of product shipments	1987 value of product shipments	Product class and geographic area	1992 value of product shipments	1987 value of product shipments
35239, PARTS FOR FARM MACHINERY, FOR SALE SEPARATELY			3523E, ALL OTHER FARM MACHINERY AND EQUIPMENT (EXCLUDING PARTS)—Con.		
United States	1 473.9	1 282.5	Michigan	11.3	(NA)
Arkansas	9.2	10.2	Minnesota	34.3	20.3
California	20.8	15.9	Mississippi	22.8	(NA)
Colorado	18.2	13.1	Missouri	7.9	8.3
Florida	4.7	(NA)	Nebraska	246.4	140.9
Georgia	24.1	7.7	North Carolina	49.0	(NA)
Idaho	10.4	10.2	North Dakota	28.0	3.3
Illinois	323.1	284.2	Ohio	46.8	42.5
Indiana	33.9	53.4	Oregon	7.8	4.5
Iowa	478.1	399.0	Pennsylvania	20.4	12.4
Kansas	22.5	49.7	South Dakota	9.8	(NA)
Michigan	17.0	22.5	Tennessee	32.2	(NA)
Minnesota	30.6	13.4	Texas	30.6	24.8
Mississippi	8.6	(NA)	Washington	9.0	(NA)
Missouri	54.9	63.7	Wisconsin	124.4	87.9
Nebraska	96.9	62.1			
New York	3.1	(NA)	3523F, COMMERCIAL TURF AND GROUNDS CARE EQUIPMENT		
North Dakota	17.0	22.6	United States	834.0	516.9
Ohio	51.4	32.8	California	27.8	8.9
Oklahoma	7.7	(NA)	Georgia	20.3	(NA)
Oregon	18.7	5.3	Illinois	10.4	11.9
South Dakota	4.4	(NA)	Kansas	53.5	52.3
Tennessee	14.2	14.3	Minnesota	27.2	36.1
Texas	15.8	17.7	Nebraska	84.1	47.6
Wisconsin	75.2	72.3	Wisconsin	413.6	256.4
3523C, PLOWS, INCLUDING PLOWSHARES (PRIMARY TILLAGE), HARROWS, ROLLERS, PULVERIZERS, AND CULTIVATORS AND WEEDERS			35241, CONSUMER NONRIDING LAWN, GARDEN, AND SNOW EQUIPMENT		
United States	267.7	189.6	United States	1 946.0	1 697.0
Arkansas	3.8	(NA)	California	32.7	(NA)
California	6.8	(NA)	Illinois	64.3	94.6
Georgia	6.6	(NA)	Indiana	15.7	15.7
Illinois	33.7	36.8	North Carolina	156.0	(NA)
Iowa	91.7	41.9	Pennsylvania	46.3	(NA)
Kansas	34.4	33.1	Tennessee	279.5	(NA)
Mississippi	6.9	(NA)	Wisconsin	54.9	82.4
Nebraska	8.8	(NA)			
North Dakota	10.4	12.8	35244, CONSUMER RIDING LAWN, GARDEN, AND SNOW EQUIPMENT		
Texas	6.6	7.0	United States	1 645.0	1 567.4
Wisconsin	11.1	(NA)	North Carolina	11.6	(NA)
			Tennessee	463.6	(NA)
3523E, ALL OTHER FARM MACHINERY AND EQUIPMENT (EXCLUDING PARTS)			35246, PARTS AND ATTACHMENTS FOR CONSUMER LAWN, GARDEN, AND SNOW EQUIPMENT		
United States	(D)	909.9	United States	637.2	699.5
Arkansas	6.2	(NA)	Illinois	35.3	38.6
California	28.2	85.7	Indiana	29.1	(NA)
Colorado	13.9	6.7	Kansas	29.1	12.5
Florida	8.2	(NA)	Minnesota	16.7	23.2
Georgia	23.6	8.1	North Carolina	23.5	(NA)
Idaho	18.6	17.3	Ohio	53.4	81.8
Illinois	31.3	68.1	Pennsylvania	3.9	(NA)
Indiana	152.9	84.2	Tennessee	80.8	(NA)
Iowa	116.5	90.3	Wisconsin	129.2	182.1
Kansas	64.8	42.5			

Note: For qualifications of data, see footnotes on table 6a.

Table 6c. Historical Statistics for Product Classes—Value Shipped by All Producers: 1992 and Earlier Years

[Million dollars. For meaning of abbreviations and symbols, see introductory text]

Product code	Product class	1992	1991 ¹	1990 ¹	1989 ¹	1988 ¹	1987	1982	1977
3511-35110	Turbines, turbine generators, and turbine generator sets ----- Turbine generator sets, turbines, turbine generators, and parts ----	5 998.5 5 998.5	5 568.4 5 568.4	4 412.1 4 412.1	4 053.0 4 053.0	3 690.8 3 690.8	3 196.0 3 196.0	3 662.3 3 662.3	2 813.1 2 813.1
3519-35193	Internal combustion engines, n.e.c. ----- Gasoline and gas-gasoline engines (except aircraft, automobile, highway truck, bus, tank, and outboard marine) -----	11 633.8 1 550.4	11 182.6 1 396.5	11 717.6 1 579.8	12 428.0 1 517.3	12 444.0 1 599.4	10 908.7 1 474.3	8 972.4 1 001.8	7 548.0 892.9
35193	Diesel, semidiesel, and dual-fuel engines (except automobile, highway truck, bus, and tank) -----	1 487.4	1 487.4	1 548.0	1 557.3	1 552.6	1 198.3	1 548.2	1 587.4
35194	Diesel, semidiesel, and dual-fuel engines for automobiles, highway trucks, and buses -----	3 165.7	2 453.3	2 757.9	3 173.1	2 987.8	2 744.3	1 715.6	1 322.2
35195	Outboard motors (internal combustion) -----	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35196	Piston-type natural gas engines, including LPG engines (excluding gas turbines) -----	175.5	152.7	114.7	112.9	103.4	66.0	99.6	31.9
35197	Tank (except gas turbine) and converted internal combustion engines -----	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
35199	Parts and accessories for internal combustion engines, except aircraft and gasoline automotive engines and gas turbines -----	3 852.3	(D)	4 678.5	4 645.4	4 640.7	3 789.9	3 405.7	2 846.9
35190	Internal combustion engines, n.e.c., n.s.k. -----	182.3	87.0	96.2	91.8	86.5	90.3	58.2	52.9
3523-35231	Farm machinery and equipment ----- Farm-type (power take off hp) wheel tractors (2- and 4-wheel drive) (sold with or without attachments) -----	8 924.6 (D)	9 723.7 (D)	10 871.4 (D)	9 577.6 (D)	7 902.0 (D)	6 384.7 751.2	10 370.0 2 321.9	9 548.9 2 637.0
35232	Farm dairy equipment, sprayers and dusters (except aerial types), farm elevators, and farm blowers -----	382.1	334.0	352.8	350.9	261.1	263.8	382.2	306.4
35233	Planting, seeding, and fertilizing machinery, excluding turf machinery -----	520.8	485.9	585.0	549.6	387.1	313.2	566.5	466.5
35235	Harvesting machinery, except hay and straw -----	1 564.5	1 844.3	1 969.5	1 563.7	1 175.4	1 014.8	1 854.1	1 463.3
35236	Haying machinery -----	434.8	532.8	730.7	628.3	457.3	326.6	444.8	414.9
3523C	Plows, including plowshares (primary tillage), harrows, rollers, pulverizers, and cultivators and weeders -----	267.7	344.9	462.8	419.2	331.0	189.6	424.6	591.2
3523E	All other farm machinery and equipment (excluding parts) -----	(D)	1 237.5	(D)	(D)	(D)	909.9	1 156.3	1 228.0
35239	Parts for farm machinery, for sale separately -----	1 473.9	(D)	1 652.8	1 488.0	1 557.1	1 282.5	2 327.6	1 609.5
3523F	Commercial turf and grounds care equipment -----	834.0	723.0	726.0	653.4	553.7	516.9	238.2	280.3
35230	Farm machinery and equipment, n.s.k. -----	625.7	882.0	917.3	825.3	819.1	816.2	653.7	551.8
3524-35241	Lawn and garden equipment ----- Consumer nonriding lawn, garden, and snow equipment -----	4 348.6 1 946.0	4 267.3 1 848.6	4 342.9 1 864.0	4 043.5 1 831.6	4 174.6 1 795.1	4 061.0 1 697.0	2 385.2 1 167.5	1 747.2 841.2
35244	Consumer riding lawn, garden, and snow equipment -----	1 645.0	1 675.4	1 746.5	1 514.5	1 552.9	1 567.4	765.2	577.4
35246	Parts and attachments for consumer lawn, garden, and snow equipment -----	637.2	609.3	599.8	571.5	715.1	699.5	399.3	302.5
35240	Lawn and garden equipment, n.s.k. -----	120.5	134.0	132.6	125.9	111.5	97.2	53.3	26.1

¹Figures are estimates derived from a representative sample of manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures publications for this period.

Table 7. Materials Consumed by Kind: 1992 and 1987

[Includes cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992 delivered cost (million dollars)	1987 delivered cost (million dollars)
INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS			
Materials, ingredients, containers, and supplies -----		2 464.3	1 495.0
Fluid power products (hydraulic and pneumatic):			
359412	Pumps, motors, and hydrostatic transmissions -----	(D)	(D)
359301	Cylinders and rotary actuators -----	2.3	(¹)
356921	Filters -----	(D)	(¹)
349261	Hose or tube fittings and assemblies -----	(D)	(¹)
349271	Valves -----	30.7	(¹)
Fabricated metal products (except forgings):			
345001	Bolts, nuts, screws, washers, rivets, and screw machine products -----	41.9	6.7
346901	Metal stampings -----	(D)	(D)
344301	Metal tanks, heat exchangers, steam condensers, and other boiler products, fabricated steel plate, and weldments -----	(D)	(D)
344001	Fabricated structural metal products -----	(D)	79.6
340089	All other fabricated metal products -----	161.2	(¹)
Forgings:			
346200	Iron and steel -----	(D)	(D)
346300	Nonferrous -----	(D)	(¹)
Castings (rough and semifinished):			
332001	Iron and steel -----	330.6	(D)
336005	Aluminum and aluminum-base alloy -----	1.7	(D)
336003	Other nonferrous -----	(D)	(D)
Shapes and forms (except castings, forgings, and fabricated metal products):			
Steel:			
331007	Bars, bar shapes, and plates -----	70.9	164.9
331022	Sheet and strip -----	24.7	
331034	All other steel shapes and forms -----	19.4	
336002	Nonferrous -----	34.0	(D)
359225	Pistons, piston rings, carburetors, valves (intake and exhaust only) -----	(D)	(D)
369401	Engine electrical equipment (spark plugs, magnetos, generators, starters, etc.) -----	(D)	(D)
362120	Integral horsepower motors and generators (1 hp or more) -----	(D)	130.2
Bearings (mounted or unmounted):			
356218	Ball -----	4.5	(D)
356201	Roller -----	(D)	(D)
356810	Plain bearings and bushings -----	12.6	11.1

See footnotes at end of table.

35A-20 ENGINES, TURBINES; FARM MACHINERY & EQUIP.

MANUFACTURES—INDUSTRY SERIES

Table 7. Materials Consumed by Kind: 1992 and 1987—Con.

[Includes cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992 delivered cost (million dollars)	1987 delivered cost (million dollars)
INDUSTRY 3511, TURBINES AND TURBINE GENERATOR SETS—Con.			
356601	Speed changers, gears, and industrial high-speed drives	30.1	7.9
351101	Turbines purchased for incorporation into turbine generator sets	(D)	(¹)
351102	Generators purchased for incorporation into turbine generator sets	10.4	(¹)
305300	Gaskets (all types) and asbestos packing	3.3	1.6
308006	Fabricated plastics products, except gaskets	1.7	(D)
305201	Rubber and plastics hose and belting6	.4
354501	Cutting tools for machine tools	8.6	24.8
970099	All other materials and components, parts, containers, and supplies	449.6	1164.4
971000	Materials, ingredients, containers, and supplies, n.s.k. ²	184.9	481.2
INDUSTRY 3519, INTERNAL COMBUSTION ENGINES, N.E.C.			
Materials, ingredients, containers, and supplies		6 478.4	5 547.1
Fluid power products (hydraulic and pneumatic):			
359412	Hydraulic and pneumatic fluid power pumps, motors, and hydrostatic transmissions	164.1	78.4
359301	Cylinders and rotary actuators	26.7	(¹)
356921	Filters	32.2	(¹)
349261	Hose or tube fittings and assemblies	25.5	(¹)
349271	Valves	(D)	(¹)
Fabricated metal products (except forgings):			
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	183.7	122.9
346901	Metal stampings	111.7	110.1
344301	Metal tanks, heat exchangers, steam condensers, and other boiler products, fabricated steel plate, and weldments	49.7	38.0
344001	Fabricated structural metal products	(D)	6.9
340089	Other fabricated metal products	307.0	(¹)
Forgings:			
346200	Iron and steel	494.9	303.6
346300	Nonferrous	(D)	(¹)
Castings (rough and semifinished):			
332001	Iron and steel	987.5	903.7
336005	Aluminum and aluminum-base alloy	572.8	531.2
336003	Other nonferrous	21.3	(D)
Shapes and forms (except castings, forgings, and fabricated metal products):			
Steel:			
331007	Bars, bar shapes, and plates	70.6	110.1
331022	Sheet and strip	39.5	
331034	Other steel shapes and forms	23.4	
336002	Nonferrous shapes and forms	18.7	14.1
359225	Pistons, piston rings, carburetors, valves (intake and exhaust only)	570.1	313.5
369401	Engine electrical equipment including spark plugs, magnetos, generators, starters, etc.	236.4	175.7
362120	Integral horsepower motors and generators (1 hp or more)	(D)	(D)
Bearings, including both mounted and unmounted:			
356218	Ball bearings	16.9	19.6
356201	Roller bearings	15.2	29.5
356810	Plain bearings and bushings	45.1	44.3
356601	Speed changers, gears, and industrial high-speed drives	70.8	59.0
351101	Turbines purchased for incorporation into turbine generator sets	—	(¹)
351102	Generators purchased for incorporation into turbine generator sets	(D)	(¹)
305300	Gaskets (all types) and asbestos packing	86.7	62.8
308006	Fabricated plastics products, except gaskets	47.7	44.0
305201	Rubber and plastics hose and belting	43.3	35.0
354501	Cutting tools for machine tools	38.1	32.3
970099	All other materials and components, parts, containers, and supplies	1 802.4	¹² 072.2
971000	Materials, ingredients, containers, and supplies, n.s.k. ²	70.8	372.5
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT			
Materials, ingredients, containers, and supplies		3 975.4	2 872.5
Fluid power products (hydraulic and pneumatic):			
359412	Pumps, motors, and hydrostatic transmissions	132.9	42.6
359301	Cylinders and rotary actuators	46.4	18.2
356921	Filters	5.3	(¹)
349261	Hose or tube fittings and assemblies	40.4	15.4
349271	Valves	36.3	17.8
Fabricated metal products, except forgings:			
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	89.5	52.5
346901	Metal stampings	79.9	31.9
340067	All other fabricated metal products	174.8	6.2
Forgings:			
346200	Iron and steel	69.2	49.2
346300	Nonferrous	1.5	(¹)
Castings (rough and semifinished):			
332001	Iron and steel	177.1	113.9
336005	Aluminum and aluminum-base alloy	22.8	11.5
336003	Other nonferrous	6.8	9.2
Shapes and forms (except castings, forgings, and fabricated metal products):			
Steel:			
331007	Bars, bar shapes, and plates	210.1	520.0
331022	Sheet and strip	360.3	
331023	Structural shapes and sheet piling	53.2	
331091	All other	71.9	
336002	Nonferrous	3.3	16.4

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1992 and 1987—Con.

[Includes cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992 delivered cost (million dollars)	1987 delivered cost (million dollars)
INDUSTRY 3523, FARM MACHINERY AND EQUIPMENT—Con.			
339915	Metal powders.....	8.5	1.9
Engines:			
351920	Diesel and semidiesel engines	202.9	86.2
351905	Gasoline and other carburetor.....	47.9	69.5
369401	Engine electrical equipment (spark plugs, magnetos, generators, starters, etc.)	63.2	32.5
362100	Electric motors and generators	30.9	18.6
Bearings (mounted or unmounted):			
356218	Ball	53.9	33.8
356201	Roller.....	36.3	17.8
356601	Speed changers, gears, and industrial high-speed drives	116.4	66.4
301100	Tires and inner tubes.....	135.0	70.5
305201	Rubber and plastics hose and belting	61.5	29.4
308006	Fabricated plastics products, except gaskets.....	95.2	43.0
285101	Paints, varnishes, lacquers, stains, shellacs, japans, enamels, and allied products	45.1	23.1
352390	Cabs purchased for installation on farm machinery	(³)	(¹)
970099	All other materials and components, parts, containers, and supplies	³ 853.9	¹ 744.9
971000	Materials, ingredients, containers, and supplies, n.s.k. ²	643.0	730.1
INDUSTRY 3524, LAWN AND GARDEN EQUIPMENT			
Materials, ingredients, containers, and supplies		2 889.8	2 493.4
Fluid power products (hydraulic and pneumatic):			
359412	Pumps, motors, and hydrostatic transmissions	44.3	22.9
359301	Cylinders and rotary actuators	2.4	2.9
356921	Filters	(D)	(¹)
349261	Hose or tube fittings and assemblies.....	2.6	2.4
349271	Valves	(D)	(D)
Fabricated metal products, except forgings:			
345001	Bolts, nuts, screws, washers, rivets, and screw machine products.....	76.9	64.9
346901	Metal stampings	137.3	134.5
340067	All other fabricated metal products	116.9	(D)
Forgings:			
346200	Iron and steel	(D)	4.8
346300	Nonferrous	(D)	(¹)
Castings (rough and semifinished):			
332001	Iron and steel	11.9	32.3
336005	Aluminum and aluminum-base alloy	86.6	45.5
336003	Other nonferrous	(D)	(D)
Shapes and forms (except castings, forgings, and fabricated metal products):			
Steel:			
331007	Bars, bar shapes, and plates.....	42.0	(D)
331022	Sheet and strip	150.4	
331023	Structural shapes and sheet piling	3.7	
331091	All other	19.1	(D)
336002	Nonferrous	(D)	
339915	Metal powders.....	16.3	17.5
Engines:			
351920	Diesel and semidiesel engines	(D)	(D)
351905	Gasoline and other carburetor.....	914.7	721.8
369401	Engine electrical equipment (spark plugs, magnetos, generators, starters, etc.)	59.6	43.7
362100	Electric motors and generators	17.5	(D)
Bearings (mounted or unmounted):			
356218	Ball	28.0	13.4
356201	Roller.....	4.2	10.3
356601	Speed changers, gears, and industrial high-speed drives	106.1	78.8
301100	Tires and inner tubes.....	136.0	86.7
305201	Rubber and plastics hose and belting	37.6	18.1
308006	Fabricated plastics products, except gaskets.....	132.1	113.2
285101	Paints, varnishes, lacquers, stains, shellacs, japans, enamels, and allied products	40.5	13.6
352390	Cabs purchased for installation on farm machinery	(D)	(¹)
970099	All other materials and components, parts, containers, and supplies	426.8	¹ 427.2
971000	Materials, ingredients, containers, and supplies, n.s.k. ²	241.8	355.6

¹For 1987, data for these material codes were not collected separately, but included with material code 970099.

²Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

³For 1992, material code 352390 is included with material code 970099 to avoid disclosing data for individual companies.

Appendix A.

Explanation of Terms

This appendix is in two sections. Section 1 includes items requested of all establishments mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) not included on the report forms but derived from information collected on the forms. Section 2 covers supplementary items requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3c of this report.

SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

Number of establishments and companies. A separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical locations, even if the individual locations were producing the same line of goods, a separate report was requested for each location. If the company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the *General Summary* subject report.

Employment and related items. The report forms requested separate information on production workers for a specific payroll period within each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees. This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave,

paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production workers. This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

All other employees. This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truckdrivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development

laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual industries shown in this report. They are included in the *General Summary* and geographic area reports as a separate category.

Payroll. This item includes the gross earnings of all employees on the payrolls of operating manufacturing establishments paid in the calendar year 1992. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payrolls of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

Production-worker hours. This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

Cost of materials. This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by

others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Specific materials consumed. In addition to the total cost of materials, which every establishment was required to report, information also was collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the establishments consuming less than a specified amount (usually \$25,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See Census of Manufactures for the importance of administrative records in the industry.)

Value of shipments. This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Individual products. As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. In the 1992 census program, information was collected on the output of almost 11,000 individual product items. The term "product," as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases, it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 terms; whereas, "motor gasoline" was reported as a single item.

Approximately 6,300 of the product items were listed separately on the 1992 census report forms. Data for

about 4,500 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1992 for these items, as derived from the commodity surveys, are shown in the "products shipped" table.

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1987 information is presented for most products.

Typically, both quantity and value of shipments information were collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers also was collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production also was collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

Classes of products. To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Census of Manufactures, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1992 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, etc. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

Duplication in cost of materials and value of shipments. The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication since the products of some industries are used as materials by others. This duplication results, in part, from the addition of related industries representing successive stages

in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the food group and the addition of pulp mills to paper mills in the paper and allied products group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the annual survey.

Duplication of products within individual industries is significant within a number of industry groups, e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the U.S. level and beginning in 1964, for all geographic levels.

Value added by manufacture. This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1a), value added is adjusted only for the change in work-in-process inventories between the beginning and end of year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures. For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to

manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases. New facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations are excluded. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b.

End-of-year inventories. Respondents were asked to report their 1991 and 1992 end-of-year inventories at cost or market. Effective with the 1982 Economic Census, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

The following items were collected only from establishments included in the ASM sample:

Supplemental labor costs. Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not specifically required by legislation whether they

Because of this change in reporting instructions, the 1982 through 1992 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing", which are aggregates of figures reported by establishments in specified industries.

Specialization and coverage ratios. These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

An establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans. They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees.

While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records generally do not provide reliable figures on net employee benefits of these types.

Retirements of depreciable assets. Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1992. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.

Depreciation charges for fixed assets. This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.

Rental payments. Total rental payments is collected on all census forms. However, the breakdown between rental payments for buildings and other structures and rental payments for machinery and equipment is collected only on the ASM forms. This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

Depreciable assets. Total value of gross depreciable assets is collected on all census forms. However, the detail for depreciable assets is collected only on the ASM forms. The data encompass all fixed depreciable assets on the books of establishments at the beginning and end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all

buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

New and used capital expenditures. The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)

Quantity of electric energy consumed for heat and power. Data on the cost of purchased electric energy are collected on all census forms. However, data on the quantity of purchased electric energy are collected only on the ASM forms. In addition, information is collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.

Breakdown of new capital expenditures for machinery and equipment. ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement. Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

Foreign content of cost of materials. Establishments included in the ASM sample panel were requested to provide information on foreign-made materials purchased or transferred from foreign sources. This includes materials acquired from a central warehouse or other domestic establishment of the same company but made in an operation outside of the 50 States, District of Columbia, Puerto Rico, or U.S. territories.

Cost of purchased services. ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, communication services, legal services, accounting and bookkeeping services, advertising, software and other data processing services, and refuse removal. Each of these items reflect the costs paid directly by the establishment, and exclude salaries paid to employees of the establishment for these services.

Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property also are included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force also are excluded.

Included in the cost of purchased advertising services are payments for printing, media coverage, and other advertising services and materials.

Included in the cost of purchased software and other data processing services are all purchases by the establishment from other companies. Excluded are services provided by other establishments of the same company (such as by a separate data processing unit).

Included in the cost of purchased refuse removal services are all costs of refuse removal services paid by the establishment, including costs for hazardous waste removal or treatment. Excluded are all costs included in rental payments or as capital expenditures.

Three basic approaches were utilized to produce these statistics.

1. For items 1 through 6, data were estimated (imputed) for all non-ASM establishments using the available data in the establishment record and industry-based parameters. The statistics were then generated by simply tabulating all census records including the imputed value for non-ASM establishments and the unweighted value for ASM establishments. Separate imputation rates were developed and are shown in the table. For quantity of purchased electricity for heat and power (item 7), a similar procedure was used; however, the imputation parameters were geographically-based instead of industry-based. For quantities of generated less sold electricity, no imputation was performed for non-ASM establishments. The estimates for these items are simply tabulations of unweighted ASM values.

Since the published statistics for these items were developed from the complete census universe and not just the ASM establishments, there are no sampling variances associated with these statistics. However, there is an unknown level of bias for each of the items due to the imputation of the non-ASM establishments. This bias is felt to be small due to the strong correlation between the items being imputed and the collected items that were used to generate the impute values.

2. For items 8 and 9, the estimates were developed using a ratio estimation methodology. For item 8, an estimate of the breakout of new capital expenditures for machinery and equipment into the three categories was made from ASM establishments reporting these categories. The estimated proportions were then applied to the corresponding census value for new capital expenditures for machinery and equipment to produce the estimates.

The estimates for item 9, foreign content of cost of materials, were developed in a similar manner based on costs of parts, supplies, and components (item 5a) as the control total for the three categories.

For items 8 and 9, an adjustment ratio of the following form was computed:

$$R_j = \frac{NMc}{TMEasm}$$

where:

NMc = the census value of new capital expenditures for machinery and equipment

TMEasm = the weighted ASM value of new capital expenditures for machinery and equipment from reporters of the detailed breakout data

3. For item 10, cost of purchased services, the estimates were made by simply tabulating weighted data for all the ASM records that reported the item. A response coverage ratio (a measure of the extent to which respondents reported for each item) is shown in table 3c for the types of services. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

Appendix B.

Annual Survey of Manufactures Sampling and Estimating Methodologies

DESCRIPTION OF SURVEY SAMPLE

The annual survey of manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 64,000 manufacturing establishments selected from a total of about 216,000 establishments. These 216,000 establishments represent all manufacturing establishments of multiunit companies and all single-establishment companies mailed schedules in the 1987 Census of Manufactures. This mail portion is supplemented annually by a Social Security Administration list of new manufacturing establishments opened after 1987 and a list of new multiunit manufacturing establishments identified from the Census Bureau's Company Organization Survey.

For the current panel, all establishments of companies with 1987 shipments in manufacturing in excess of \$500 million were included in the survey panel with certainty. There are approximately 500 such companies collectively accounting for approximately 18,000 establishments. For the remaining portion of the mail survey, the establishment was defined as the sampling unit. For this portion, all establishments with 250 employees or more and establishments with a very large value of shipments also were included in the survey panel with certainty. A total of 12,100 establishments were selected from this portion of the universe with certainty. Therefore, of the 64,000 manufacturing establishments included in the ASM panel, approximately 31,000 are selected with certainty. These certainty establishments collectively account for approximately 80 percent of the total value of shipments in the 1987 census.

Smaller establishments in the remaining portion of the mail survey were sampled with probabilities ranging from 0.999 to 0.005 in accordance with mathematical theory for optimum allocation of a sample. The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. The measures of size depend directly upon each establishment's 1987 product class values and the historic variability of the year-to-year shipments of each product class. Product classes displaying more volatile year-to-year change in shipments at the establishment level were sampled at a heavier rate.

This method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight differences in employment, value added, and other

general statistics, since these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of small establishments out of a given sample panel without introducing a bias into the survey estimates.

The nonmail portion of the survey includes all single-establishment companies that were tabulated as administrative records in the 1987 Census of Manufactures. Although this portion contained approximately 134,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of the Internal Revenue Service and the Social Security Administration. This administrative-records information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under conditions which safeguard the confidentiality of both tax and census records. Estimates of data other than payroll and employment for these small establishments were developed from industry averages.

The corresponding estimates for the mail and nonmail establishments were added together, along with the base-year differences, as defined in the Description of Estimating Procedure section, to produce the figures shown in this publication.

DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1988-1991 were computed using a difference estimation procedure. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1987 census published number for an item total and the linear ASM estimate of the total for 1987. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

These base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail

establishments, to produce the estimates for the years 1983-1991. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.

However, the 1992 sample estimates for the purchased service items, shown in table 3c, are strictly ASM linear estimates developed only from ASM establishments that reported the specific item.

The remaining estimates in table 3c, showing the breakdown of expenditures for new machinery and equipment and costs of parts (separated into purchases from foreign sources and purchases from domestic sources), were computed as ratio estimates. To do this, linear estimates of the new machinery detail items were developed from the ASM establishments and were ratio adjusted to the corresponding census total for new machinery. In a similar fashion, the ASM linear estimates of the detailed purchased materials items were ratio adjusted to the corresponding census total for cost of parts.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors (the standard errors divided by the estimated values to which they refer).

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete-coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total and almost certain confidence that the interval 47,000 to 53,000 includes the complete-coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors also would occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Census Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

Appendix C. Product Code Reference Tables

Part 1. Comparability of Product Classes and Product Codes That Changed: 1992 to 1987

1992	1987	1992	1987	1992	1987	1992	1987
35110	35111	35337 28	35337 24	35464	35461	35521 57	35521 54
		35337 28	35337 25	35464 01	35461 22	35521 57	35521 56
35110	35112	35337 32	35337 26	35464 05	35461 35	35521 67	35521 68
		35337 32	35337 27	35464 09	35461 01	35521 67	35521 69
35110 05	35111 01			35464 09	35461 03	35521 86	35521 84
35110 09	35111 02			35464 09	35461 04	35521 86	35521 85
35110 11	35112 03	35353 41	35353 45	35464 09	35461 05		
35110 11	35112 13	35353 47	35353 45	35464 09	35461 07		
35110 21	35112 21			35464 09	35461 09	35533 34	35533 39
35110 22	35112 22	35363 39	35363 37	35464 15	35461 01	35533 38	35533 31
35110 23	35112 23	35363 39	35363 38	35464 15	35461 03	35533 38	35533 39
35110 24	35112 24						
35110 61	35112 61			35464 15	35461 04	35534 12	35534 01
35110 71	35112 71	35373 04	35373 05	35464 15	35461 05	35534 12	35534 02
35110 72	35112 72	35373 07	35373 05	35464 15	35461 07	35534 12	35534 03
		35373 09	35373 05	35464 15	35461 09	35534 13	35534 04
		35373 11	35373 05	35464 19	35461 12	35534 13	35534 05
35110 75	35112 74			35464 19	35461 15	35534 13	35534 06
35110 75	35112 76			35464 19	35461 16	35534 13	35534 07
35110 79	35112 79	35374 18	35374 17	35464 19	35461 17	35534 13	35534 08
35110 81	35112 81	35374 18	35374 19	35464 19	35461 18	35534 13	35534 09
35110 83	35112 83			35464 19	35461 19		
35110 91	35111 01						
35110 95	35111 02	35419 41	35419 21	35464 19	35461 21	35551 01	35551 02
		35419 41	35419 22	35464 19	35461 22	35551 03	35551 02
		35419 41	35419 23	35464 19	35461 23		
35199 35	35199 41	35419 41	35419 24	35464 19	35461 25		
35199 35	35199 42	35419 41	35419 25	35464 19	35461 26	35552 03	35552 38
35199 39	35199 43	35419 41	35419 26	35464 19	35461 28	35552 05	35552 38
35199 39	35199 44			35464 19	35461 29	35552 09	35552 01
35199 49	35199 45			35464 19	35461 31	35552 09	35552 37
35199 49	35199 46	35424 11	35424 01	35464 19	35461 32	35552 09	35552 41
35199 63	35199 47	35424 11	35424 02	35464 19	35461 33		
35199 63	35199 48	35424 75	35424 03	35464 19	35461 34	35553 00	35553 03
35199 67	35199 51	35424 75	35424 04	35464 19	35461 35	35553 00	35553 05
35199 67	35199 52	35424 75	35424 05	35464 19	35461 37	35553 00	35553 08
35199 71	35199 53			35464 21	35461 36	35553 00	35553 09
35199 71	35199 54	35442 03	35442 11				
35199 75	35199 55	35442 05	35442 11			35556 71	35556 65
35199 75	35199 56	35442 07	35442 13	35465	35461	35556 73	35556 65
35199 83	35199 57	35442 09	35442 13	35465 02	35461 01	35556 79	35556 65
35199 83	35199 58	35442 14	35442 15	35465 02	35461 03		
35199 87	35199 59	35442 14	35442 16	35465 02	35461 04		
35199 87	35199 60	35442 21	35442 17	35465 05	35461 05		
35199 91	35199 61	35442 21	35442 18	35465 07	35461 07	35558 01	35558 02
35199 91	35199 62	35442 25	35442 19	35465 09	35461 09	35558 01	35558 09
35199 99	35199 91	35442 25	35442 23	35465 11	35461 18	35558 03	35558 02
35199 99	35199 92			35465 12	35461 12	35558 03	35558 09
				35465 13	35461 19	35558 11	35558 02
				35465 14	35461 18	35558 11	35558 09
3531M 08	3531M 09	35451 15	35451 16			35558 91	35558 89
3531M 21	3531M 09	35451 15	35451 18			35558 93	35558 89
3531M 21	3531M 15	35451 21	35451 17				
		35451 21	35451 19	35465 14	35461 19		
3531N	3531H	35451 62	35451 58	35465 15	35461 15		
3531N 00	3531H 00	35451 62	35451 59	35465 16	35461 16	35561 18	35561 02
		35451 62	35451 61	35465 17	35461 17	35561 18	35561 07
		35451 64	35451 58	35465 21	35461 21	35561 18	35561 08
3531P	3531H	35451 64	35451 59	35465 22	35461 22	35561 18	35561 11
		35451 64	35451 63	35465 23	35461 23		
3531P	3531K	35451 67	35451 65	35465 24	35461 26		
3531P 06	3531K 06			35465 25	35461 25	35562 73	35562 71
3531P 07	3531K 07			35465 27	35461 26	35562 73	35562 75
3531P 11	3531K 11	35451 67	35451 66			35562 89	35562 85
3531P 20	3531K 20	35451 67	35451 68	35465 28	35461 28	35562 89	35562 91
3531P 21	3531K 21	35451 74	35451 70	35465 29	35461 29		
3531P 22	3531K 22	35451 74	35451 71	35465 31	35461 31		
3531P 24	3531K 24	35451 74	35451 77	35465 33	35461 33	35563 19	35563 01
3531P 25	3531K 25	35451 79	35451 91	35465 36	35461 36	35563 19	35563 02
3531P 27	3531K 27	35451 79	35451 93	35465 37	35461 37	35563 19	35563 03
3531P 53	3531K 53	35451 81	35451 82	35465 38	35461 34	35563 19	35563 06
		35451 81	35451 84	35465 38	35461 35	35563 19	35563 07
				35465 39	35461 35	35563 19	35563 08
3531P 55	3531K 55			35465 41	35461 32	35563 19	35563 09
3531P 61	3531K 61			35465 43	35461 32	35563 19	35563 14
3531P 70	3531K 70	35455 73	35455 94				
3531P 74	3531K 74	35455 73	35455 95				
3531P 77	3531K 77	35455 77	35455 81				
3531P 82	3531K 82	35455 77	35455 91	35473 41	35473 48		
3531P 85	3531H 00	35455 77	35455 92	35473 43	35473 48	35592 04	35592 03
3531P 90	3531K 90	35455 77	35455 97	35473 49	35473 48	35592 04	35592 05
3531P 97	3531K 97	35455 79	35455 83				
		35455 79	35455 93	35481 14	35481 01		
		35455 79	35455 96	35481 14	35481 02	35593 41	35593 27
35329 31	35329 33	35455 79	35455 98	35481 15	35481 05	35593 41	35593 28
35329 31	35329 34			35481 15	35481 06	35593 41	35593 29
35329 35	35329 37						
35329 35	35329 38	35462 45	35462 47				
35329 42	35329 41	35462 48	35462 47	35482 09	35482 01	35594 16	35594 09
35329 42	35329 43	35462 49	35462 47	35482 09	35482 02	35594 16	35594 13
35329 72	35329 71			35482 17	35482 07	35594 16	35594 15
35329 72	35329 72			35482 17	35482 08	35594 25	35594 17
35329 72	35329 73	35463 19	35463 12	35482 18	35482 15	35594 25	35594 19
35329 72	35329 75	35463 19	35463 14	35482 18	35482 16	35594 25	35594 21

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1992	1987	1992	1987	1992	1987	1992	1987
35595	35599	35651 28	35651 08	35699 31	35698 31	35820 11	35820 21
35595 01	35599 86	35651 31	35651 09	35699 41	35698 07	35820 12	35820 13
35595 03	35599 86	35651 31	35651 21	35699 42	35698 07	35820 12	35820 14
35595 05	35599 86	35651 33	35651 11	35699 43	35698 07	35820 29	35820 22
35595 09	35599 87	35651 33	35651 14	35699 44	35698 07	35820 29	35820 26
		35651 35	35651 12	35699 47	35698 35	35820 29	35820 28
35598	35599	35651 35	35651 13	35699 47	35698 48	35820 31	35820 25
35598 01	35599 01	35651 37	35651 15	35699 51	35698 02	35820 31	35820 35
35598 03	35599 03	35651 41	35651 15	35699 51	35698 04	35820 31	35820 36
35598 05	35599 05	35651 43	35651 16	35699 51	35698 06	35820 39	35820 34
35598 07	35599 07					35820 39	35820 41
35598 09	35599 09	35651 45	35651 17	35699 51	35698 08	35820 39	35820 43
35598 11	35599 11	35651 49	35651 19	35699 51	35698 12	35820 39	35820 81
35598 13	35599 13	35651 51	35651 21	35699 51	35698 14		
35598 15	35599 15	35651 52	35651 21	35699 51	35698 16	35853 32	35853 31
35598 17	35599 17	35651 53	35651 21	35699 51	35698 18	35853 32	35853 33
35598 19	35599 19	35651 59	35651 19	35699 51	35698 22	35853 37	35853 36
		35651 59	35651 21	35699 51	35698 24	35853 37	35853 38
				35699 51	35698 26	35853 98	35853 73
35598 22	35599 22			35699 51	35698 28	35853 98	35853 97
35598 25	35599 25	35660 34	35660 31	35699 51	35698 28		
35598 27	35599 27	35660 34	35660 32	35699 51	35698 32		
35598 29	35599 29	35660 37	35660 35	35699 51	35698 36	35859 06	35859 04
35598 31	35599 31	35660 37	35660 36	35699 51	35698 49	35859 06	35859 05
35598 35	35599 35	35660 47	35660 33			35859 06	35859 07
35598 36	35599 33	35660 47	35660 40	35713	35711		
35598 36	35599 37	35660 49	35660 38				
35598 39	35599 39	35660 49	35660 39	35713	35712	35892 01	35892 05
35598 41	35599 41					35892 01	35892 06
		35676 09	35676 03	35713 00	35711 00	35892 01	35892 07
35598 43	35599 43	35676 09	35676 04	35713 00	35712 00	35892 02	35892 03
35598 45	35599 45	35676 15	35676 05			35892 02	35892 04
35598 48	35599 47	35676 15	35676 06	35714	35711	35892 02	35892 07
35598 48	35599 49	35676 21	35676 17			35892 46	35892 35
35598 51	35599 51	35676 21	35676 19			35892 46	35892 44
35598 53	35599 53			35714	35712	35892 84	35892 77
35598 55	35599 55					35892 84	35892 78
35598 58	35599 57	35681 12	35681 11	35714 00	35711 00	35892 84	35892 79
35598 58	35599 59	35681 12	35681 13	35714 00	35712 00		
35598 61	35599 61					35892 86	35892 85
		35683 20	35683 21			35892 86	35892 87
35598 63	35599 63	35683 20	35683 24	35715	35711	35892 86	35892 88
35598 65	35599 65	35683 23	35683 22			35892 96	35892 98
35598 67	35599 67	35683 23	35683 24	35715	35712	35892 97	35892 80
35598 69	35599 69	35683 33	35683 32			35892 97	35892 91
35598 71	35599 71	35683 33	35683 34			35892 97	35892 99
35598 74	35599 73	35683 44	35683 43	35715 00	35711 00		
35598 74	35599 75	35683 44	35683 45	35715 00	35712 00		
35598 78	35599 77	35683 89	35683 27			35893 07	35893 08
35598 78	35599 79	35683 89	35683 29	35716	35711	35893 07	35893 09
35598 84	35599 82	35683 89	35683 92				
		35683 89	35683 97	35716	35712	35934	35931
35598 84	35599 85	35683 89	35683 97			35934 00	35931 00
35598 88	35599 88	35683 89	35683 98				
35598 89	35599 89	35683 91	35683 95	35716 00	35711 00	35935	35931
35598 90	35599 90	35683 99	35683 93	35716 00	35712 00	35935 00	35931 00
35598 91	35599 94						
35598 91	35599 95			35717	35711	35939	35933
35598 96	35599 96	35694	35692			35939 00	35933 00
35598 97	35599 97	35694 00	35692 00	35717	35712	35943	35941
35598 98	35599 80					35943 00	35941 10
35598 98	35599 81						
		35695	35692	35717 00	35711 00	35944	35941
35598 98	35599 83	35695 00	35692 00	35717 00	35712 00	35944 00	35941 10
35598 98	35599 85						
35598 98	35599 85	35696	35692				
35598 98	35599 92	35696 00	35692 00	35718	35711	35945	35941
35598 98	35599 93					35945 00	35941 10
35598 98	35599 99			35718	35712	35945 00	35941 20
		35699	35697				
35643 39	35643 23			35718 00	35711 00	35946	35941
35643 39	35643 28	35699	35698	35718 00	35712 00	35946 00	35941 10
		35699 01	35698 01			35946 00	35941 20
		35699 03	35698 03				
35646 11	35646 10	35699 05	35698 05				
35646 21	35646 20	35699 09	35697 00	35784	35781	35949	35942
		35699 11	35698 11			35949 00	35942 10
		35699 13	35698 13	35784	35782	35949 00	35942 20
35651 23	35651 01						
35651 23	35651 15						
35651 25	35651 02	35699 15	35698 15				
35651 25	35651 21	35699 17	35698 17	35784 00	35781 00	35962 12	35962 09
35651 27	35651 06	35699 21	35698 21	35784 00	35782 00	35962 12	35962 11
35651 28	35651 06	35699 23	35698 23			35962 14	35962 13
35651 28	35651 06	35699 25	35698 25			35962 14	35962 15
35651 28	35651 07	35699 27	35698 27	35789	35783	35962 21	35962 17
				35789 00	35783 00	35962 21	35962 19

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1987		1992		1987		1992		1987		1992	
35651 15	35651 23	35692 00	35694 00	35711 00	35713 00	35859 04	35859 06				
35651 15	35651 37	35692 00	35695 00	35711 00	35714 00	35859 05	35859 06				
35651 15	35651 41	35692 00	35696 00	35711 00	35715 00	35859 07	35859 06				
35651 16	35651 43			35711 00	35716 00						
35651 17	35651 45			35711 00	35717 00	35892 03	35892 02				
35651 19	35651 49	35697	35699	35711 00	35718 00	35892 04	35892 02				
35651 19	35651 59	35697 00	35699 09			35892 05	35892 01				
35651 21	35651 25					35892 06	35892 01				
35651 21	35651 31			35712	35713	35892 07	35892 01				
35651 21	35651 51	35698	35699			35892 07	35892 02				
35651 21	35651 52	35698 01	35699 01			35892 35	35892 46				
35651 21	35651 53	35698 02	35699 51	35712	35714	35892 44	35892 46				
35651 21	35651 59	35698 03	35699 03			35892 77	35892 84				
		35698 04	35699 51			35892 78	35892 84				
		35698 05	35699 05	35712	35715	35892 79	35892 84				
		35698 06	35699 51								
35660 31	35660 34	35698 07	35699 41			35892 80	35892 97				
35660 32	35660 34	35698 07	35699 42	35712	35716	35892 85	35892 86				
35660 33	35660 47	35698 07	35699 43			35892 87	35892 86				
35660 35	35660 37	35698 07	35699 43			35892 88	35892 86				
35660 36	35660 37	35698 07	35699 44	35712	35717	35892 91	35892 97				
35660 38	35660 49					35892 98	35892 96				
35660 39	35660 49					35892 99	35892 97				
35660 40	35660 47										
		35698 08	35699 51	35712	35718						
		35698 11	35699 11								
		35698 12	35699 51	35712 00	35713 00						
35676 03	35676 09	35698 13	35699 13	35712 00	35714 00	35893 08	35893 07				
35676 04	35676 09	35698 14	35699 51	35712 00	35715 00	35893 09	35893 07				
35676 05	35676 15	35698 15	35699 15	35712 00	35716 00						
35676 06	35676 15	35698 16	35699 51	35712 00	35717 00	35931	35934				
35676 17	35676 21	35698 17	35699 17	35712 00	35718 00						
35676 19	35676 21	35698 18	35699 51			35931	35935				
		35698 21	35699 21								
				35781	35784	35931 00	35934 00				
35681 11	35681 12			35781 00	35784 00	35931 00	35935 00				
35681 13	35681 12										
		35698 22	35699 51								
		35698 23	35699 23								
		35698 24	35699 51	35782	35784	35933	35939				
		35698 25	35699 25	35782 00	35784 00	35933 00	35939 00				
35683 21	35683 20	35698 26	35699 51								
35683 22	35683 23	35698 27	35699 27	35783	35789	35941	35943				
35683 24	35683 20	35698 28	35699 51	35783 00	35789 00						
35683 24	35683 23	35698 31	35699 31			35941	35944				
35683 27	35683 89	35698 32	35699 51								
35683 29	35683 89	35698 35	35699 47	35820 13	35820 12	35941	35945				
35683 32	35683 33	35698 36	35699 51	35820 14	35820 12						
35683 34	35683 33	35698 36	35699 51	35820 21	35820 11	35941	35946				
35683 36	35683 99	35698 48	35699 47	35820 22	35820 29						
35683 43	35683 44	35698 49	35699 51	35820 25	35820 31	35941 10	35943 00				
35683 45	35683 44			35820 26	35820 29	35941 10	35944 00				
				35820 28	35820 29	35941 10	35945 00				
		35711	35713	35820 34	35820 39	35941 10	35946 00				
35683 92	35683 89			35820 35	35820 31	35941 20	35945 00				
35683 93	35683 99	35711	35714	35820 36	35820 31	35941 20	35946 00				
35683 95	35683 91			35820 41	35820 39						
35683 97	35683 89			35820 43	35820 39	35942	35949				
35683 98	35683 89	35711	35715	35820 81	35820 39	35942 10	35949 00				
						35942 20	35949 00				
35692	35694	35711	35716	35853 31	35853 32	35962 09	35962 12				
				35853 33	35853 32	35962 11	35962 12				
35692	35695	35711	35717	35853 36	35853 37	35962 13	35962 14				
				35853 38	35853 37	35962 15	35962 14				
				35853 73	35853 98	35962 17	35962 21				
35692	35696	35711	35718	35853 97	35853 98	35962 19	35962 21				

Part 3. Current Industrial Reports by Product Code

[Current Industrial Reports (CIR) data are contained in the publication *Manufacturing Profiles: 1992* [MP-1(92)] issued August 1994 and available through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. To access the most current CIR data electronically, dial the Census-BEA Electronic Forum at 301-457-2310. Your communications modem should be set as follows: Baud rate: 1200, 2400, 9600; Parity: None; Data bits: 8; Stop bits: 1; Duplex: full. Before making your first call, decide on a password and be prepared to provide the following regarding your computer: PC brand name, monitor screen dimensions (e.g., 80 columns by 24 lines), monitor color support, modem baud rate, and PC communications software package. Call the voice number, 301-457-1242, for further bulletin board assistance]

Product code	Current Industrial Report	Product code	Current Industrial Report
3519100	MA35L, Internal Combustion Engines	3561510	MA35P, Pumps and Compressors
3519300	MA35L, Internal Combustion Engines	3561520	MA35P, Pumps and Compressors
3519400	MA35L, Internal Combustion Engines	3561530	MA35P, Pumps and Compressors
3519600	MA35L, Internal Combustion Engines	3562100	MA35Q, Antifriction Bearings
3523100	MA35A, Farm Machinery and Lawn and Garden Equipment	3562200	MA35Q, Antifriction Bearings
3523200	MA35A, Farm Machinery and Lawn and Garden Equipment	3562300	MA35Q, Antifriction Bearings
3523300	MA35A, Farm Machinery and Lawn and Garden Equipment	3562400	MA35Q, Antifriction Bearings
3523500	MA35A, Farm Machinery and Lawn and Garden Equipment	3562900	MA35Q, Antifriction Bearings
3523600	MA35A, Farm Machinery and Lawn and Garden Equipment	3563100	MA35P, Pumps and Compressors
3523926	MA35A, Farm Machinery and Lawn and Garden Equipment	3563120	MA35P, Pumps and Compressors
3523931	MA35A, Farm Machinery and Lawn and Garden Equipment	3569400	MA35N, Fluid Power Products, Including Aerospace
3523953	MA35A, Farm Machinery and Lawn and Garden Equipment	3569500	MA35N, Fluid Power Products, Including Aerospace
3523C00	MA35A, Farm Machinery and Lawn and Garden Equipment	3569600	MA35N, Fluid Power Products, Including Aerospace
3523E00	MA35A, Farm Machinery and Lawn and Garden Equipment	3571300	MA35R, Computers and Office and Accounting Machines
3523F00	MA35A, Farm Machinery and Lawn and Garden Equipment	3571400	MA35R, Computers and Office and Accounting Machines
3524100	MA35A, Farm Machinery and Lawn and Garden Equipment	3571500	MA35R, Computers and Office and Accounting Machines
3524400	MA35A, Farm Machinery and Lawn and Garden Equipment	3571600	MA35R, Computers and Office and Accounting Machines
3524600	MA35A, Farm Machinery and Lawn and Garden Equipment	3571700	MA35R, Computers and Office and Accounting Machines
3531A00	MA35D, Construction Machinery	3571800	MA35R, Computers and Office and Accounting Machines
3531B00	MA35D, Construction Machinery	3572100	MA35R, Computers and Office and Accounting Machines
3531C00	MA35D, Construction Machinery	3572200	MA35R, Computers and Office and Accounting Machines
3531E00	MA35D, Construction Machinery	3575100	MA35R, Computers and Office and Accounting Machines
3531F00	MA35D, Construction Machinery	3575200	MA35R, Computers and Office and Accounting Machines
3531G00	MA35D, Construction Machinery	3577100	MA35R, Computers and Office and Accounting Machines
3531N00	MA35D, Construction Machinery	3577200	MA35R, Computers and Office and Accounting Machines
3531P20	MA35D, Construction Machinery	3578400	MA35R, Computers and Office and Accounting Machines
3531P70	MA35F, Mining Machinery, and Mineral Processing Equipment	3578900	MA35R, Computers and Office and Accounting Machines
3531P90	MA35D, Construction Machinery	3579200	MA35R, Computers and Office and Accounting Machines
3532500	MA35F, Mining Machinery, and Mineral Processing Equipment	3579300	MA35R, Computers and Office and Accounting Machines
3532600	MA35F, Mining Machinery, and Mineral Processing Equipment	3579500	MA35R, Computers and Office and Accounting Machines
3532700	MA35F, Mining Machinery, and Mineral Processing Equipment	3579900	MA35R, Computers and Office and Accounting Machines
3532800	MA35F, Mining Machinery, and Mineral Processing Equipment	3579A00	MA35R, Computers and Office and Accounting Machines
3533A00	MA35F, Mining Machinery, and Mineral Processing Equipment	3581100	MA35U, Vending Machines
3536315	MA35F, Mining Machinery, and Mineral Processing Equipment	3585100	MA35M, Air-Conditioning and Refrigeration Equipment
3539500	MA35N, Fluid Power Products, Including Aerospace	3585200	MA35M, Air-Conditioning and Refrigeration Equipment
3541300	MQ35W, Metalworking Machinery	3585343	MA35M, Air-Conditioning and Refrigeration Equipment
3541400	MQ35W, Metalworking Machinery	3585400	MA35M, Air-Conditioning and Refrigeration Equipment
3541500	MQ35W, Metalworking Machinery	3585500	MA35M, Air-Conditioning and Refrigeration Equipment
3541600	MQ35W, Metalworking Machinery	3585600	MA35M, Air-Conditioning and Refrigeration Equipment
3541A00	MQ35W, Metalworking Machinery	3585C00	MA35M, Air-Conditioning and Refrigeration Equipment
3541B00	MQ35W, Metalworking Machinery	3593200	MA35N, Fluid Power Products, Including Aerospace
3541C00	MQ35W, Metalworking Machinery	3593400	MA35N, Fluid Power Products, Including Aerospace
3541D00	MQ35W, Metalworking Machinery	3593900	MA35N, Fluid Power Products, Including Aerospace
3542100	MQ35W, Metalworking Machinery	3594300	MA35N, Fluid Power Products, Including Aerospace
3542200	MQ35W, Metalworking Machinery	3594400	MA35N, Fluid Power Products, Including Aerospace
3542300	MQ35W, Metalworking Machinery	3594500	MA35N, Fluid Power Products, Including Aerospace
3561100	MA35P, Pumps and Compressors	3594600	MA35N, Fluid Power Products, Including Aerospace
3561300	MA35P, Pumps and Compressors	3594900	MA35N, Fluid Power Products, Including Aerospace

Publication Program

1992 CENSUS OF MANUFACTURES

Publications of the 1992 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.

Preliminary Reports

Industry series—83 reports (MC92-I-20A(P) to -39D(P))

Preliminary industry data are issued in 83 separate reports covering 459 industries. Preliminary summary data for the United States and States are released in one report.

Final Reports

Industry series—83 reports (MC92-1-20A to -39D)

Each of the 83 reports provides information for a group of related industries ("dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 459 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment, State, and degree of primary product specialization.

Geographic area series—51 reports (MC92-A-1 to -51)

A separate report is being published for each State and the District of Columbia. Each report presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, MA's, counties, and selected places. Comparative statistics for earlier census years are shown for the State and large MA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics (including inventories, assets, rents, and energy costs) are presented only in statewide totals.

Subject series—3 reports (MC92-S-1 to -3)

Each of the three reports contains detailed statistics for an individual subject, such as concentration ratios in manufacturing, manufacturers' shipments to the Federal Government, and a general national-level summary.

Reference series—1 report (MC92-R-1)

The *Numerical List of Manufactured and Mineral Products* includes a description of the principal products and services published in the 1992 Censuses of Manufactures and Mineral Industries.

Location of Manufacturing Plants—1 report (MC92-LM)

This report includes data for number of establishments by four-digit SIC industry and by employment-size class for counties, incorporated places of 2,500 inhabitants or more, and Zip Codes for each State. This report is available only on compact disc-read only memory (CD-ROM).

Analytical Reports—2 reports (AR92-1 and -2)

Exports From Manufacturing Establishments (AR92-1)

This report presents data on exports by two- and three-digit SIC industry groups for the United States and States. Information is presented on value of direct report shipments and estimates of the employment required to manufacture these products. Included are estimates of employment in manufacturing and nonmanufacturing establishments that supply parts, materials, and services for production of manufactured exports.

Selected Characteristics of Manufacturing Establishments That Export (AR92-2)

This report presents data on the number of manufacturing companies and establishments that export by major group, State, employment size, and ratios of exports to shipments.

Electronic Media

All data included in the printed reports are available on CD-ROM. The CD-ROM's provide the same information found in the reports as well as additional information not published in the final reports, such as location of manufacturing plants. Electronic media products are available for users who wish to summarize, rearrange, or process large amounts of data. These products, with corresponding technical documentation, are sold by Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.

OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, financial, insurance, real estate, service industries, construction industries, mineral industries, transportation, communications, utilities, enterprise statistics, minority-owned businesses, and women-owned businesses also are available from the 1992 Economic Census. A separate series of reports covers the census of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Commonwealth of the Northern Mariana Islands. Separate announcements describing these reports are available free of charge from Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.