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MOOG INC.

Form 10-K

November 13, 2018

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**UNITED STATES SECURITIES AND EXCHANGE COMMISSION**

**Washington, D.C. 20549**

**FORM 10-K**

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended September 29, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from \_\_\_\_ to \_\_\_\_

Commission file number **1-05129**

(Exact Name of Registrant as Specified in its Charter)

**New York**

**16-0757636**

(State or Other Jurisdiction of Incorporation or Organization) (I.R.S. Employer Identification No.)

**East Aurora, New York 14052-0018**

(Address of Principal Executive Offices) (Zip Code)

Registrant's Telephone Number, Including Area Code: **(716) 652-2000**

Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class Name of Each Exchange on Which Registered

Class A Common Stock, \$1.00 Par Value New York Stock Exchange

Class B Common Stock, \$1.00 Par Value New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes  No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes  No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes  No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulations S-T

(§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes  No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

(Check one):

Large accelerated filer  Accelerated filer  Non-accelerated filer  (Do not check if smaller reporting company)

Smaller reporting company  Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for the complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).

Yes  No

The aggregate market value of the common stock outstanding and held by non-affiliates (as defined in Rule 405 under the Securities Act of 1933) of the registrant, based upon the closing sale price of the common stock on the New York Stock Exchange on March 31, 2018, the last business day of the registrant's most recently completed second fiscal quarter, was approximately \$2,718 million.

The number of shares of common stock outstanding as of the close of business on November 6, 2018 was: Class A 32,496,875; Class B 2,300,417.

**DOCUMENTS INCORPORATED BY REFERENCE**

Portions of the Moog Inc. Proxy Statement for the Annual Meeting of Shareholders to be held on February 12, 2019 ("2018 Proxy") are incorporated by reference into Part III of this Form 10-K.



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**Disclosure Regarding Forward-Looking Statements**

Information included or incorporated by reference in this report that does not consist of historical facts, including statements accompanied by or containing words such as “may,” “will,” “should,” “believes,” “expects,” “expected,” “intends,” “plans,” “projects,” “approximate,” “estimates,” “predicts,” “potential,” “outlook,” “forecast,” “anticipates,” “presume” and “assume,” are forward-looking statements. Such forward-looking statements are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements are not guarantees of future performance and are subject to several factors, risks and uncertainties, the impact or occurrence of which could cause actual results to differ materially from the expected results described in the forward-looking statements. Certain of these factors, risks and uncertainties are discussed in the sections of this report entitled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” New factors, risks and uncertainties may emerge from time to time that may affect the forward-looking statements made herein. Given these factors, risks and uncertainties, investors should not place undue reliance on forward-looking statements as predictive of future results. We disclaim any obligation to update the forward-looking statements made in this report.

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**PART I**

The Registrant, Moog Inc., a New York corporation formed in 1951, is referred to in this report as “Moog” or in the nominative “we” or the possessive “our.”

Unless otherwise noted or the context otherwise requires, all references to years in this report are to fiscal years.

**Item 1. Business.**

**Description of the Business.** Moog is a worldwide designer, manufacturer and systems integrator of high performance precision motion and fluid controls and controls systems for a broad range of applications in aerospace and defense and industrial markets. We have three operating segments: Aircraft Controls, Space and Defense Controls and Industrial Systems.

Additional information describing the business and comparative segment revenues, operating profits and related financial information for 2018, 2017 and 2016 are provided in Note 19 of Item 8, Financial Statements and Supplementary Data of this report.

**Distribution.** Our sales and marketing organization consists of individuals possessing highly specialized technical expertise. This expertise is required in order to effectively evaluate a customer’s precision control requirements and to facilitate communication between the customer and our engineering staff. Our sales staff is the primary contact with customers. Manufacturers’ representatives are used to cover certain domestic aerospace markets. Distributors are used selectively to cover certain industrial and medical markets.

**Industry and Competitive Conditions.** We experience considerable competition in our aerospace and defense and industrial markets. We believe that the principal points of competition in our markets are product quality, reliability, price, design and engineering capabilities, product development, conformity to customer specifications, timeliness of delivery, effectiveness of the distribution organization and quality of support after the sale. We believe we compete effectively on all of these bases. Competitors in our three operating segments include:

**Aircraft Controls:** Curtiss-Wright, Liebherr, Nabtesco, Parker Hannifin, UTC and Woodward.

**Space and Defense Controls:** Airbus, ATA Engineering, Bradford Engineering, Chess Dynamics, Cobham, Curtiss-Wright, ESW, EOS, Fulcrum Concepts LLC, General Dynamics, Glenair, Honeywell, Kearfott, Kollmorgan, Kongsberg, LORD, Marotta, Mission Systems, RUAG, Rafael, PVP Advanced, SABCA, Sargent Aerospace & Defense, Schleifring, SEAKR, Silent Sentinel, SL Montevideo, SwRI, UTC, Vacco, Valcor, ValveTech and Woodward.

**Industrial Systems:** Atos, Allen-Bradley, Bosch Rexroth, Cardinal Health, Danaher, DEIF Wind Power, E2M Technologies, Eaton, ICU Medical, KEB, MTS Systems Corp., Parker Hannifin, Siemens, Smiths Medical and SSB Wind Systems.

**Government Contracts.** All U.S. Government contracts are subject to termination by the U.S. Government. In 2018, sales under U.S. Government contracts represented 33% of total sales and were primarily within our Aircraft Controls and Space and Defense Controls segments.

**Backlog.** Our twelve-month backlog represents confirmed orders we believe will be recognized as revenue within the next twelve months. As noted in Item 6, Selected Financial Data of this report, as of September 29, 2018, our twelve-month backlog was \$1.5 billion, an increase of 22% compared to September 30, 2017. See Item 7, Management’s Discussion and Analysis of Financial Condition and Results of Operations of this report for a discussion on the various business drivers and conditions contributing to the twelve-month backlog change.

**Raw Materials.** Materials, supplies and components are purchased from numerous suppliers. We believe the loss of any one supplier, although potentially disruptive in the short-term, would not materially affect our operations in the long-term.

**Working Capital.** See the discussion on operating cycle in Note 1 of Item 8, Financial Statements and Supplementary Data of this report.

**Seasonality.** Our business is generally not seasonal; however, certain products and systems, such as those in the energy market of our Industrial Systems segment, do experience seasonal variations in sales levels.

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**Patents.** We maintain a patent portfolio of issued or pending patents and patent applications worldwide that generally includes the U.S., Europe, China, Japan and India. The portfolio includes patents that relate to electrohydraulic, electromechanical, electronics, hydraulics, components and methods of operation and manufacture as related to motion control and actuation systems. The portfolio also includes patents related to wind turbines, robotics, surveillance/security, vibration control and medical devices. We do not consider any one or more of these patents or patent applications to be material in relation to our business as a whole. The patent portfolio related to certain medical devices is significant to our position in this market as several of these products work exclusively together, and provide us future revenue opportunities.

**Research Activities.** Research and development activity has been, and continues to be, significant for us. Research and development expense was at least \$130 million in each of the last three years and represented approximately 5% of sales in 2018.

**Employees.** On September 29, 2018, we employed 11,787 full-time employees.

**Customers.** Our principal customers are Original Equipment Manufacturers, or OEMs, and end users for whom we provide aftermarket support. Aerospace and defense OEM customers collectively represented 53% of 2018 sales. The majority of these sales are to a small number of large companies. Due to the long-term nature of many of the programs, many of our relationships with aerospace and defense OEM customers are based on long-term agreements. Our industrial OEM sales, which represented 34% of 2018 sales, are to a wide range of global customers and are normally based on lead times of 90 days or less. We also provide aftermarket support, consisting of spare and replacement parts and repair and overhaul services, for all of our products. Our major aftermarket customers are the U.S. Government and commercial airlines. In 2018, aftermarket sales accounted for 13% of total sales.

Significant customers in our three operating segments include:

**Aircraft Controls:** Boeing, Airbus, Lockheed Martin, Northrup Grumman, Japan Aerospace, General Dynamics, United Technologies, Honeywell, Bombardier, Embraer and the U.S. Government.

**Space and Defense Controls:** Lockheed Martin, Raytheon, Northrup Grumman, Boeing, General Dynamics, Aerojet Rocketdyne, United Launch Alliance, Rockwell Collins, Airbus, Honeywell and the U.S. Government.

**Industrial Systems:** McKesson, Phillips Healthcare, CAE, Nutricia, Integrated Medical Systems, TurboChef Technologies, Oceaneering, MacArtney, Flight Safety and Arburg.

**International Operations.** Our operations outside the United States are conducted primarily through wholly-owned foreign subsidiaries and are located predominantly in Europe and the Asia-Pacific region. See Note 19 of Item 8, Financial Statements and Supplementary Data of this report for information regarding sales by geographic area and Exhibit 21 of Item 15, Exhibits and Financial Statement Schedules of this report for a list of subsidiaries. Our international operations are subject to the usual risks inherent in international trade, including currency fluctuations, local government contracting regulations, local governmental restrictions on foreign investment and repatriation of profits, exchange controls, regulation of the import and distribution of foreign goods, as well as changing economic and social conditions in countries in which our operations are conducted.

**Environmental Matters.** See the discussion in Note 21 of Item 8, Financial Statements and Supplementary Data of this report.

**Website Access to Information.** Our internet address is [www.moog.com](http://www.moog.com). We make our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and, if applicable, amendments to those reports, available on the investor relations portion of our website. The reports are free of charge and are available as soon as reasonably practicable after they are filed with the Securities and Exchange Commission. We have posted our corporate governance guidelines, Board committee charters and code of ethics to the investor relations portion of our website. This information is available in print to any shareholder upon request. All requests for these documents should be made to Moog's Manager of Investor Relations by calling 716-687-4225.



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**Executive Officers of the Registrant.** Other than the changes noted below, the principal occupations of our executive officers for the past five years have been their employment with us in the same positions they currently hold.

On January 5, 2018, Jennifer Walter was named Vice President - Finance. She will continue as Controller and Principal Accounting Officer.

On December 1, 2017, Paul Wilkinson was named Vice President and Chief HR Officer. Previously, he was a Group Vice President and Global HR Director, Aircraft Group.

On August 11, 2015, Maureen M. Athoe was named Vice President and President, Space and Defense Group. Previously, she was a Group Vice President, Group General Manager and Site Manager.

On August 11, 2015, R. Eric Burghardt was named Vice President and President, Aircraft Group. Previously, he was a Group Vice President and Financial Director.

On August 11, 2015, Mark J. Trabert was named Vice President and President, Aircraft Group. Previously, he was a Group Vice President and Deputy General Manager.

<b>Executive Officers</b>	<b>Age</b>	<b>Year First Elected Officer</b>
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John R. Scannell Chairman of the Board; Chief Executive Officer Director	55	2006
Richard A. Aubrecht Vice President - Strategy and Technology	74	1980
Donald R. Fishback Director; Vice President; Chief Financial Officer	62	1985
Paul Wilkinson Vice President	38	2017
Patrick J. Roche Vice President	55	2012
Maureen M. Athoe Vice President	60	2015
R. Eric Burghardt Vice President	59	2015
Mark J. Trabert Vice President	59	2015
Jennifer Walter Vice President - Finance; Principal Accounting Officer	47	2008
Timothy P. Balkin Treasurer; Assistant Secretary	59	2000

In addition to the executive officers noted above, Robert J. Olivieri, 68, was elected Secretary in 2014. Mr. Olivieri's principal occupation is partner in the law firm of Hodgson Russ LLP.

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**The markets we serve are cyclical and sensitive to domestic and foreign economic conditions and events, which may cause our operating results to fluctuate.** The markets we serve are sensitive to fluctuations in general business cycles, domestic and foreign governmental tariff and trade policies, and economic conditions and events. For example, our defense programs are largely contingent on U.S. Department of Defense funding. In addition, our space programs rely on the same governmental funding as well as investment for commercial and exploration activities. Our aerospace programs are dependent on the highly cyclical commercial airline industry, driven by fuel price increases, demand for travel and economic conditions. Demand for our industrial products is dependent upon several factors, including capital investment, product innovations, economic growth, the price of oil and natural gas, cost-reduction efforts and technology upgrades. Our sales and operating profit have been affected by the continued moderate rates of recovery in the economies in which we conduct business. If global economic uncertainties continue or economic conditions deteriorate, our operations could be negatively impacted through declines in our sales, profitability and cash flows due to lower orders, payment delays and price pressures for our products.

**We operate in highly competitive markets with competitors who may have greater resources than we possess.** Many of our products are sold in highly competitive markets. Some of our competitors, especially in our industrial markets and medical markets, are larger, more diversified and have greater financial, marketing, production and research and development resources. Within the aerospace industry, suppliers have consolidated to widen their product offerings and secure long-term sole-source positions. As a result, these competitors may be better able to withstand the effects of periodic economic downturns, and their program wins could reduce the total number of viable suppliers and increase their competitiveness. Our sales and operating margins will be negatively impacted if our competitors:

- develop products that are superior to our products,
- develop products of comparable quality and performance that are more competitively priced than our products,
- develop methods of more efficiently and effectively providing products and services, or
- adapt more quickly than we do to new technologies or evolving customer requirements.

We believe that the principal points of competition in our markets are product quality, reliability, design and engineering capabilities, price, innovation, conformity to customers' specifications, timeliness of delivery, effectiveness of the distribution organization and quality of support after the sale. Maintaining or improving our competitive position requires continued investment in manufacturing, engineering, quality standards, marketing, customer service and support and our distribution networks. If we do not maintain sufficient resources to make these investments, are not successful in meeting our quality or delivery standards or are not successful in maintaining our competitive position, we could face pricing pressures or loss in market share, causing our operations and financial performance to suffer.

**We depend heavily on government contracts that may not be fully funded or may be terminated, and the failure to receive funding or the termination of one or more of these contracts could reduce our sales and increase our costs.** Sales to the U.S. Government and its prime contractors and subcontractors represent a significant portion of our business. In 2018, sales under U.S. Government contracts represented 33% of our total sales, primarily within Aircraft Controls and Space and Defense Controls. Sales to foreign governments represented 5% of our total sales. Funding for government programs can be structured into a series of individual contracts and depend on annual congressional appropriations, which are subject to change. Additionally, the 2011 Budget Control Act reduced the Department of Defense spending (or sequestration) by approximately \$500 billion. The Bipartisan Budget Act of 2013 and the Bipartisan Budget Act of 2015 provided stability and modest growth in the Department of Defense spending through 2017. After operating under continuing resolutions, which restrict new program starts, the U.S. Government signed the 2019 defense appropriations budget in September 2018, with moderate growth in defense spending. However, future budgeted levels of defense spending beyond



2019 are uncertain and subject to debate. As a result of this uncertainty, we expect discretionary government spending levels will face pressure, and potentially lead to procurement reductions. Any reduction in future Department of Defense spending levels could adversely impact our sales, operating profit and our cash flow. We have resources applied to specific government contracts and if any of those contracts are rescheduled or terminated, we may incur substantial costs redeploying those resources.

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**We make estimates in accounting for long-term contracts, and changes in these estimates may have significant impacts on our earnings.** We have long-term contracts with some of our customers. These contracts are predominantly within Aircraft Controls and Space and Defense Controls. Revenue representing 39% of 2018 sales was accounted for using the percentage of completion, cost-to-cost method of accounting. Under this method, we recognize revenue as work progresses toward completion as determined by the ratio of cumulative costs incurred to date to estimated total contract costs at completion, multiplied by the total estimated contract revenue, less cumulative revenue recognized in prior periods. Changes in these required estimates could have a material adverse effect on sales and profits. Any adjustments are recognized in the period in which the change becomes known using the cumulative catch-up method of accounting. For contracts with anticipated losses at completion, we establish a provision for the entire amount of the estimated remaining loss and charge it against income in the period in which the loss becomes known. Amounts representing performance incentives, penalties, contract claims or impacts of scope change negotiations are considered in estimating revenues, costs and profits when they can be reliably estimated and realization is considered probable. Due to the substantial judgments involved with this process, our actual results could differ materially or could be settled unfavorably from our estimates.

**We enter into fixed-price contracts, which could subject us to losses if we have cost overruns.** In 2018, fixed-price contracts represented 88% of our sales that were accounted for using the percentage of completion, cost-to-cost method of accounting. On fixed-price contracts, we agree to perform the scope of work specified in the contract for a predetermined price. Depending on the fixed price negotiated, these contracts may provide us with an opportunity to achieve higher profits based on the relationship between our total contract costs and the contract's fixed price. However, we bear the risk that increased or unexpected costs may reduce our profit or cause us to incur a loss on the contract, which would reduce our net earnings. Loss reserves are most commonly associated with fixed-price contracts that involve the design and development of new and unique controls or control systems to meet the customer's specifications.

**We may not realize the full amounts reflected in our backlog as revenue, which could adversely affect our future revenue and growth prospects.** As of September 29, 2018, our twelve-month backlog was \$1.5 billion, which represents confirmed orders we believe will be recognized as revenue within the next twelve months. There is no assurance that our customers will purchase all the orders represented in our backlog, due in part to the U.S. Government's ability not to exercise contract options or to modify, curtail or terminate major programs. Due to the uncertain nature of our contracts with the U.S. Government, we may never realize revenue from some of the orders that are included in our backlog. A portion of our backlog also relates to commercial aircraft programs, and if there are entry into service delays or lower than anticipated deliveries due to production issues, we may never realize the full amounts included in our backlog. If this occurs, our future revenue and growth prospects may be adversely affected.

**If our subcontractors or suppliers fail to perform their contractual obligations, our prime contract performance and our ability to obtain future business could be materially and adversely impacted.** We rely on subcontracts with other companies to perform a portion of the service we provide to our customers on many of our contracts. There is a risk that we may have disputes with our subcontractors, including disputes regarding the quality and timeliness of work performed by the subcontractor, customer concerns about the subcontractor, our failure to extend existing task orders or issue new task orders under a subcontract or our hiring of personnel of a subcontractor. Failure by our subcontractors to satisfactorily provide on a timely basis the agreed-upon supplies, or perform the agreed-upon services, may materially and adversely impact our ability to perform our obligations as the prime contractor. Subcontractor performance deficiencies could result in a customer terminating our contract for default. A default termination could expose us to liability and substantially impair our ability to compete for future contracts and orders. In addition, a delay or failure in our ability to obtain components and equipment parts from our suppliers may adversely affect our ability to perform our obligations to our customers.

**Contracting on government programs is subject to significant regulation, including rules related to bidding, billing and accounting kickbacks and false claims, and any non-compliance could subject us to fines and penalties or possible debarment.** Like all government contractors, we are subject to risks associated with this contracting, including substantial civil and criminal fines and penalties. These fines and penalties could be imposed for failing to follow procurement integrity and bidding rules, employing improper billing practices or otherwise failing to follow cost accounting standards, receiving or paying kickbacks or filing false claims. We have been, and expect to continue to be, subjected to audits and investigations by U.S. and foreign government agencies and authorities. The failure to comply with the terms of our government contracts could harm our business reputation. It could also result in our progress payments being withheld or our suspension or debarment from future government contracts, which could have a material affect on our operational and financial results.

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**The loss of The Boeing Company as a customer or a significant reduction in sales to The Boeing Company could adversely impact our operating results.** We provide The Boeing Company, or Boeing, with controls for both military and commercial applications, which, in total, were 14% of our 2018 sales. Sales to Boeing's commercial airplane group are generally made under a long-term supply agreement through 2021 for the Boeing 787 and through 2019 for other commercial airplanes. Boeing operates in a competitive environment and continues to evaluate the size, scope and cost of their supplier base. Any detrimental impact to Boeing's production rates or a reduction in our awarded content could reduce our orders from Boeing. A reduction in sales or the loss of Boeing as a customer could reduce our sales and earnings.

**Our new product research and development efforts may not be successful which could reduce our sales and earnings.** Technologies related to our products have undergone, and in the future may undergo, significant changes. We have incurred, and we expect to continue to incur, expenses associated with lengthy research and development activities and the introduction of new products in order to succeed in the future. Our technology has been developed through customer-funded and internally-funded research and development, as well as through business acquisitions. If we fail to predict customers' preferences or fail to provide viable technological solutions, we may experience difficulties that could delay or prevent the acceptance of new products or product enhancements. Also, the research and development expenses we incur may exceed our cost estimates and new products we develop may not generate sales sufficient to offset our costs. Additionally, our competitors may develop technologies and products that have more competitive advantages than ours and render our technology uncompetitive or obsolete.

**Our inability to adequately enforce and protect our intellectual property or defend against assertions of infringement could prevent or restrict our ability to compete.** Protecting our intellectual property is critical in order to maintain a competitive advantage. We therefore rely on internally developed and acquired patents, trademarks and proprietary knowledge and technologies. Our inability to defend against the unauthorized use of these rights and assets could have an adverse effect on our competitive position and on our results of operations and financial condition. Litigation may be necessary to protect our intellectual property rights or defend against claims of infringement. This litigation could result in significant costs and divert management's focus away from operations.

**Our business operations may be adversely affected by information systems interruptions, intrusions or new software implementations.** We are dependent on various information technologies throughout our company and third parties to administer, store and support multiple business activities. In addition, we store sensitive data including proprietary business information, intellectual property and confidential employee data on our servers and databases. Furthermore, we may have access to sensitive, confidential or personal information that may be subject to privacy and security laws and controls. Although we continue to review and enhance our computer systems and cybersecurity controls, information system disruptions, equipment failures or cybersecurity attacks, such as unauthorized access, malicious software and other intrusions, could still occur and may lead to potential data corruption and exposure of proprietary and confidential information. Any intrusion may cause operational stoppages, fines, penalties, diminished competitive advantages through reputational damages and increased operational costs. Additionally, we may incur additional costs to comply with our customers', including the U.S. Government's, increased cybersecurity protections and standards in our products. Prior cyberattacks directed at us have not had a material impact on our financial results. In addition, we are in the early stages of a multi-year business information system transformation and standardization project. This endeavor will occupy additional resources, diverting attention from other operational activities, may cause our information systems to perform unexpectedly and may increase our exposure to cyber risks. While we expect to invest significant resources throughout the planning and project management process, unanticipated delays could occur and would adversely affect our financial results.

**Our indebtedness and restrictive covenants under our credit facilities could limit our operational and financial flexibility.** We have incurred significant indebtedness, and may incur additional debt for

acquisitions, operations, research and development and capital expenditures. Our ability to make interest and scheduled principal payments and meet restrictive covenants could be adversely impacted by changes in the availability, terms and cost of capital, changes in interest rates or changes in our credit ratings or our outlook. These changes could increase our cost of business, limiting our ability to pursue acquisition opportunities, react to market conditions and meet operational and capital needs, thereby placing us at a competitive disadvantage.

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**Significant changes in discount rates, rates of return on pension assets, mortality tables and other factors could adversely affect our earnings and equity and increase our pension funding requirements.**

Pension costs and obligations are determined using actual results as well as actuarial valuations that involve several assumptions. The most critical assumptions are the discount rate, the long-term expected return on assets and mortality tables. Other assumptions include salary increases and retirement age. Some of these assumptions, such as the discount rate and return on pension assets, are reflective of economic conditions and largely out of our control. Despite fully funding our largest pension plan, changes in the pension assumptions could adversely affect our earnings, equity and funding requirements.

**A write-off of all or part of our goodwill or other intangible assets could adversely affect our operating results and net worth.** Goodwill and other intangible assets are a substantial portion of our assets. At September 29, 2018, goodwill was \$797 million and other intangible assets were \$96 million of our total assets of \$3.0 billion. Our goodwill and other intangible assets may increase in the future since our growth strategy includes acquisitions. However, we may have to write off all or part of our goodwill or other intangible assets if their value becomes impaired. Although this write-off would be a non-cash charge, it could reduce our earnings and our financial condition significantly.

**Our sales and earnings may be affected if we cannot identify, acquire or integrate strategic acquisitions, or if we engage in divesting activities.** Acquisitions are a key part of our growth strategy. Our historical growth has depended, and our future growth is likely to depend, in part, on our ability to successfully identify, acquire and integrate acquired businesses. We intend to continue to seek additional acquisition opportunities, both to expand into new markets and to enhance our position in existing markets throughout the world. Growth by acquisition involves risk that could adversely affect our financial condition and operating results. We may not know the potential exposure to unanticipated liabilities. Additionally, the expected benefits or synergies might not be fully realized, integrating operations and personnel may be slowed and key employees, suppliers or customers of the acquired business may depart. We may also continue to engage in divesting activities if we deem the operations as non-strategic or underperforming. Divestitures could adversely affect our profitability and, under certain circumstances, require us to record impairment charges or a loss as a result of a transaction. In pursuing acquisition opportunities, integrating acquired businesses, or divesting business operations, management's time and attention may be diverted from our core business, while consuming resources and incurring expenses for these activities.

**Our operations in foreign countries expose us to political and currency risks and adverse changes in local legal and regulatory environments.** We have significant manufacturing and sales operations in foreign countries. In addition, our domestic operations sell to foreign customers. In 2018, 41% of our net sales were to customers outside of the United States. Our financial results may be adversely affected by fluctuations in foreign currencies and by the translation of the financial statements of our foreign subsidiaries from local currencies into U.S. dollars. We expect international operations and export sales to contribute to our earnings for the foreseeable future. Both the sales from international operations and export sales are subject in varying degrees to risks inherent in doing business outside of the United States. Such risks include the possibility of unfavorable circumstances arising from host country laws or regulations including privacy laws protecting personal data, changes in tariff and trade barriers and import or export licensing requirements. In addition, any local or global health issue or uncertain political climates, international hostilities, natural disasters, or any other terrorist activities could adversely affect customer demand, our operations and our ability to source and deliver products and services to our customers.

**Unforeseen exposure to additional income tax liabilities may affect our operating results.** Our distribution of taxable income is subject to domestic and, as a result of our significant manufacturing and sales presence in foreign countries, foreign tax jurisdictions. Our effective tax rate and earnings may be affected by shifts in our mix of earnings in countries with varying statutory tax rates, changes in the valuation of deferred tax assets and outcomes of any audits performed on previous tax returns. Additionally, any alterations to tax regulations or interpretations could have significant impacts on our

effective tax rates and on our deferred tax assets and liabilities. Specifically, with the enactment of the Tax Cuts and Jobs Act of 2017, we have made a reasonable estimate of the effects of the one-time transition tax based on our current interpretation. This estimate could differ materially from the resulting actual liability due to changes in our calculations and interpretation, as well as additional guidance yet to be issued through U.S. Treasury regulations.

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**Government regulations could limit our ability to sell our products outside the United States and otherwise adversely affect our business.** In 2018, approximately 18% of our sales were subject to compliance with the United States export regulations. Our failure to obtain, or fully adhere to the limitations contained in the requisite licenses, meet registration standards or comply with other government export regulations would hinder our ability to generate revenues from the sale of our products outside the United States. In addition, the U.S. Government has established, and from time to time, revises, sanctions that restrict or prohibit U.S. companies and their subsidiaries from doing business with certain foreign countries, entities and individuals. The absence of comparable restrictions on competitors in other countries may adversely affect our competitive position. In order to sell our products in European Union countries, we must satisfy certain technical requirements. If we are unable to comply with those requirements with respect to a significant quantity of our products, our sales in Europe would be restricted. Doing business internationally also subjects us to numerous U.S. and foreign laws and regulations, including regulations relating to import-export control, technology transfer restrictions, foreign corrupt practices, privacy regulations and anti-boycott provisions. From time to time, we may file voluntary disclosure reports with the U.S. Department of State and the Department of Commerce regarding certain violations of U.S. export laws and regulations discovered by us in the course of our business activities, employee training or internal reviews and audits. To date, our voluntary disclosures have not resulted in a fine, penalty, or export privilege denial or restriction that has had a material adverse impact on our financial condition or ability to export. Our failure, or failure by an authorized agent or representative that is attributable to us, to comply with these laws and regulations could result in administrative, civil or criminal liabilities. In the extreme case, these failures could result in financial penalties, suspension or debarment from government contracts or suspension of our export privileges, which could have a material adverse effect on us.

**The failure or misuse of our products may damage our reputation, necessitate a product recall or result in claims against us that exceed our insurance coverage, thereby requiring us to pay significant damages.** Defects in the design and manufacture of our products may necessitate a product recall. We include complex system designs and components in our products that could contain errors or defects, particularly when we incorporate new technologies into our products. If any of our products are defective, we could be required to redesign or recall those products, pay substantial damages or warranty claims and face actions by regulatory bodies and government authorities. Such an event could result in significant expenses, disrupt sales, affect our reputation and that of our products and cause us to withdraw from certain markets. We are also exposed to product liability claims. Many of our products are used in applications where their failure or misuse could result in significant property loss and serious personal injury or death. We carry product liability insurance consistent with industry norms. However, these insurance coverages may not be sufficient to fully cover the payment of any potential claim. A product recall or a product liability claim not covered by insurance could have a material adverse effect on our business, financial condition and results of operations.

**We are involved in various legal proceedings, the outcome of which may be unfavorable to us.** Our business may be adversely impacted by the outcome of legal proceedings and other contingencies that cannot be predicted with certainty. We estimate loss contingencies and establish reserves based on our assessment where liability is deemed probable and reasonably estimable given the facts and circumstances known to us at a particular point in time. Subsequent developments may affect our assessment and estimates of the loss contingencies recorded as liabilities.

**Future terror attacks, war, natural disasters or other catastrophic events beyond our control could negatively impact our business.** Terror attacks, war or other civil disturbances, natural disasters and other catastrophic events could lead to economic instability and decreased demand for commercial products, which could negatively impact our business, financial condition, results of operations and cash flows. From time to time, terrorist attacks worldwide have caused instability in global financial markets and the aviation industry. In 2018, 24% of our net sales were in the commercial aircraft market. Also, our facilities and suppliers are located throughout the world and could be subject to damage from fires, floods,



earthquakes or other natural or man-made disasters. Although we carry third party property insurance covering these and other risks, our inability to meet customers' schedules as a result of a catastrophe may result in the loss of customers or significantly increase costs, including penalty claims under customer contracts.

**Our operations are subject to environmental laws, and complying with those laws may cause us to incur significant costs.** Our operations and facilities are subject to numerous stringent environmental laws and regulations. Although we believe that we are in material compliance with these laws and regulations, future changes in these laws, regulations or interpretations of them, or changes in the nature of our operations may require us to make significant capital expenditures to ensure compliance. We have been and are currently involved in environmental remediation activities. The cost of these activities may become significant depending on the discovery of additional environmental exposures at sites that we currently own or operate, at sites that we formerly owned or operated, or at sites to which we have sent hazardous substances or wastes for treatment, recycling or disposal.

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None.

**Item 2. Properties.**

On September 29, 2018, we occupied 5,143,000 square feet of space, distributed by segment as follows:

	Square Feet		
	Owned	Leased	Total
Aircraft Controls	1,468,000	396,000	1,864,000
Space and Defense Controls	828,000	312,000	1,140,000
Industrial Systems	1,588,000	529,000	2,117,000
Corporate Headquarters	20,000	2,000	22,000
Total	3,904,000	1,239,000	5,143,000

We have principal manufacturing facilities in the United States and countries throughout the world in the following locations:

• Aircraft Controls - U.S., Philippines and United Kingdom.

• Space and Defense Controls - U.S., United Kingdom and Ireland.

• Industrial Systems - U.S., Germany, Czech Republic, Italy, Costa Rica, China, United Kingdom, Netherlands, Luxembourg, Philippines, Japan, Canada, India and Lithuania.

Our corporate headquarters is located in East Aurora, New York.

We believe that our properties have been adequately maintained and are generally in good condition.

Operating leases for our properties expire at various times from 2019 through 2036. Upon the expiration of our current leases, we believe that we will be able to either secure renewal terms or enter into leases for alternative locations at market terms.

**Item 3. Legal Proceedings.**

From time to time, we are involved in legal proceedings. We are not a party to any pending legal proceedings that management believes will result in a material adverse effect on our financial condition, results of operations or cash flows.

**Item 4. Mine Safety Disclosures.**

Not applicable.

Table of Contents**PART II****Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.**

Our two classes of common shares, Class A common stock and Class B common stock, are traded on the New York Stock Exchange ("NYSE") under the ticker symbols MOG.A and MOG.B. The following chart sets forth, for the periods indicated, the high and low sales prices of the Class A common stock and Class B common stock on the NYSE.

**Quarterly Stock Prices**

Fiscal Year Ended	Class A		Class B	
	High	Low	High	Low
<b>September 29, 2018</b>				
<b>1st Quarter</b>	<b>\$89.97</b>	<b>\$78.27</b>	<b>\$88.97</b>	<b>\$78.89</b>
<b>2nd Quarter</b>	<b>93.93</b>	<b>79.58</b>	<b>91.71</b>	<b>79.95</b>
<b>3rd Quarter</b>	<b>88.31</b>	<b>75.62</b>	<b>85.84</b>	<b>77.67</b>
<b>4th Quarter</b>	<b>87.85</b>	<b>71.56</b>	<b>84.00</b>	<b>72.60</b>

## September 30, 2017

1st Quarter	\$73.05	\$55.35	\$71.81	\$56.44
2nd Quarter	69.80	60.29	68.49	63.00
3rd Quarter	74.50	64.82	73.23	64.87
4th Quarter	85.30	70.47	83.16	72.70

The number of shareholders of record of Class A common stock and Class B common stock was 641 and 299, respectively, as of November 6, 2018.

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The following table summarizes our purchases of our common stock for the quarter ended September 29, 2018.

**Issuer Purchases of Equity Securities**

Period	(a) Total Number of Shares Purchased (1)(2)	(b) Average Price Paid Per Share	(c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs (3)	(d) Maximum Number (or Approx. Dollar Value) of Shares that May Yet Be Purchased Under Plans or Programs (3)
July 1, 2018 - July 31, 2018	31,728	\$ 78.24	—	3,349,491
August 1, 2018 - August 31, 2018	1,012,369	75.78	—	3,349,491
September 1, 2018 - September 29, 2018	8,602	83.62	—	3,349,491
Total	1,052,699	\$ 75.92	—	3,349,491

Reflects purchases by the Moog Inc. Stock Employee Compensation Trust Agreement ("SECT") of shares of Class B common stock from the Moog Inc. Retirement Savings Plan ("RSP") as follows: 7,106 shares at \$79.23 per share during August; and 6,471 shares at \$82.44 per share during September.

Also reflects purchases by the SECT of shares of Class B common stock from the Moog Inc. Employee (1) Retirement Plan ("ERP") as follows: 274,864 shares at \$75.74 per share during August and purchases by the Moog Inc. Supplemental Retirement Plan Trust ("SERP") of shares of Class B common stock from the ERP as follows: 726,170 shares at \$75.74 per share during August. In connection with the issuance of shares to the Employee Stock Purchase Plan ("ESPP"), we purchased 31,716 Class B shares at \$78.24 per share from the SECT.

In connection with the exercise of equity-based compensation awards, we accept delivery of shares to pay for the exercise price and withhold shares for tax withholding obligations. In July, we accepted (2) delivery of 12 shares at \$82.17 per share, in August, we accepted delivery of 4,229 shares at \$80.31 per share and in September, we accepted delivery of 2,131 shares at \$87.20 per share, in connection with the exercise of equity-based awards.

The Board of Directors has authorized a share repurchase program. This program has been amended from time to time to authorize additional repurchases up to an aggregate 13 million common shares. The (3) program permits the purchase of shares of Class A or Class B common stock in open market or privately negotiated transactions at the discretion of management. The purchases identified in column (a) are not included in this program.

Table of Contents**Performance Graph**

The following graph and tables show the performance of the Company's Class A common stock compared to the NYSE Composite-Total Return Index and the S&P Aerospace & Defense Index for a \$100 investment made on September 30, 2013, including reinvestment of any dividends.

	9/13	9/14	9/15	9/16	9/17	9/18
Moog Inc. - Class A Common Stock	\$100.00	\$116.58	\$92.16	\$101.48	\$142.20	\$147.44
NYSE Composite - Total Return Index	100.00	113.92	106.88	120.08	140.19	153.94
S&P Aerospace & Defense Index	100.00	118.18	122.62	144.53	207.46	256.64

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For a more detailed discussion of 2016 through 2018, refer to Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations of this report and Item 8, Financial Statements and Supplementary Data of this report.

(dollars in thousands, except per share data) **2018(1)(3)** 2017(1)(3) 2016(1)(2)(3) 2015(1) 2014(1)

**RESULTS FROM OPERATIONS**

Net sales	<b>\$2,709,468</b>	\$2,497,524	\$2,411,937	\$2,525,532	\$2,648,385
Net earnings (4)	<b>96,507</b>	141,280	126,745	131,883	158,198
Net earnings per share (4)					
Basic	<b>\$2.71</b>	\$3.94	\$3.49	\$3.39	\$3.57
Diluted	<b>\$2.68</b>	\$3.90	\$3.47	\$3.35	\$3.52
Dividends declared per share	<b>\$0.50</b>	\$—	\$—	\$—	\$—
Weighted-average shares outstanding					