

## CASE PARTS EMPORIUM

It is June 6, Sue McCaskey's first day in the newly created position of materials manager for Parts Emporium. A recent graduate of a prominent business school, McCaskey is eagerly awaiting her first real-world problem. At approximately 8:30 A.M. it arrives in the form of status reports on inventory and orders shipped. At the top of an extensive computer printout is a handwritten note from Joe Donnell, the purchasing manager: "Attached you will find the inventory and customer service performance data. Rest assured that the individual inventory levels are accurate because we took a complete physical inventory count at the end of last week. Unfortunately, we don't keep compiled records in some of the areas as you requested. However, you're welcome to do so yourself. Welcome aboard!"

A little upset that aggregate information is not available, McCaskey decides to randomly select a small sample of approximately 100 items and compile inventory and customer service characteristics to get a feel for the "total picture." The results of this experiment reveal to her why Parts Emporium decided to create the position she now fills. It seems that the inventory is in all the wrong places. Although there is an *average* of approximately 60 days of inventory, customer service is inadequate. Parts Emporium tries to backorder the customer orders not immediately filled from stock, but some 10 percent of demand is being lost to competing distributorships. Because stockouts are costly relative to inventory holding costs, McCaskey believes that a cycle-service level of at least 95 percent should be achieved.

Parts Emporium, Inc., was formed in 1973 as a wholesale distributor of automobile parts by two disenchanted auto mechanics, Dan Block and Ed Spriggs. Originally located in Block's garage, the firm showed slow but steady growth until 1976, when it relocated to an old, abandoned meat-packing warehouse on Chicago's South Side. With increased space for inventory storage, the company was able to begin offering an expanded line of auto parts. This increased selection, combined with the trend toward longer car ownership, led to an explosive growth of the business. By 1998, Parts Emporium was the largest independent distributor of auto parts in the North Central region.

In 2000, Parts Emporium relocated in a sparkling new office and warehouse complex off Interstate 55 in suburban Chicago. The warehouse space alone occupied more than 100,000 square feet. Although only a handful of new products have been added since the warehouse was constructed, its utilization has increased from 65 percent to more than 90 percent of capacity. During this same period, however, sales growth has stagnated. These conditions motivated Block and Spriggs to hire the first manager from outside the company in the firm's history.

Sue McCaskey knows that although her influence to initiate changes will be limited, she must produce positive results immediately. Thus, she decides to concentrate on two products from the extensive product line: the EG151 exhaust gasket and the DB032 drive belt. If she can demonstrate significant gains from proper inventory management for just two products, perhaps Block and Spriggs will give her the backing needed to change the total inventory management system.

The EG151 exhaust gasket is purchased from an overseas supplier, Haipei, Inc. Actual demand for the first 21 weeks of 2001 is shown in the following table:

WEEK	ACTUAL DEMAND	WEEK	ACTUAL DEMAND
1	104	12	97
2	103	13	99
3	107	14	102
4	105	15	99
5	102	16	103
6	102	17	101
7	101	18	101
8	104	19	104
9	100	20	108
10	100	21	97
11	103		

A quick review of past orders, shown in another document, indicates that a lot size of 150 units is being used and that the lead time from Haipei is fairly constant at two weeks. Currently, at the end of week 21, no inventory is on hand; 11 units are backordered, and there is a scheduled receipt of 150 units.

The DB032 drive belt is purchased from the Bendox Corporation of Grand Rapids, Michigan. Actual demand so far in 2001 is shown in the following table:

WEEK	ACTUAL DEMAND	WEEK	ACTUAL DEMAND
11	18	17	50
12	33	18	53
13	53	19	54
14	54	20	49
15	51	21	52
16	53		

Because this product is new, data are available only since its introduction in week 11. Currently, 324 units are on hand; there are no backorders and no scheduled receipts. A lot size of 1,000 units is being used, with the lead time fairly constant at three weeks.

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The wholesale prices that Parts Emporium charges its customers are \$12.99 for the EG151 exhaust gasket and \$8.89 for the DB032 drive belt. Because no quantity discounts are offered on these two highly profitable items, gross margins based on current purchasing practices are 32 percent of the wholesale price for the exhaust gasket and 48 percent of the wholesale price for the drive belt.

Parts Emporium estimates its cost to hold inventory at 21 percent of its inventory investment. This percent recognizes the opportunity cost of tying money up in inventory and the variable costs of taxes, insurance, and shrinkage. The annual report notes other warehousing expenditures for utilities and maintenance and debt service on the 100,000-square-foot warehouse, which was built for \$1.5 million. However, McCaskey reasons that these warehousing costs can be ignored because they will not change for the range of inventory policies that she is considering.

Out-of-pocket costs for Parts Emporium to place an order with suppliers are estimated to be \$20 per order for exhaust gaskets and \$10 per order for drive belts. On the outbound side, there can be delivery charges. Although

most customers pick up their parts at Parts Emporium, some orders are delivered to customers. To provide this service, Parts Emporium contracts with a local company for a flat fee of \$21.40 per order, which is added to the customer's bill. McCaskey is unsure whether to increase the ordering costs for Parts Emporium to include delivery charges.

### **Questions**

1. Put yourself in Sue McCaskey's position and prepare a detailed report to Dan Block and Ed Spriggs on managing the inventory of the EG151 exhaust gasket and the DB032 drive belt. Be sure to present a proper inventory system and recognize all relevant costs.
2. By how much do your recommendations for these two items reduce annual cycle inventory, stockout, and ordering costs?

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*Source:* This case was provided by Professor Robert Bregman, University of Houston.