

# Replenishment Planning Article – Fall 2002

## Joint Orders – Taking Advantage of Price Breaks

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Our vendors gave us deals we couldn't refuse – or could we? In exchange for buying a certain quantity by a certain date they would give us a deal.

### Here are the deals:

1. A wrench manufacturer offers us a 10% discount if we buy more than 1,000 units.
2. A heavy-duty brake manufacturer offers prepaid freight if more than \$2,500 is purchased.
3. Purchase orders to Taiwanese wheel nut manufacturers need to be consolidated for shipping a full container load – 38,000 pounds.

### Should we take the deals?

- What is the cost?
- What are the savings?
- How far out do we pull in replenishment orders to meet the quantity required?
- What replenishment orders do we pull in?

These are some of the daily decisions that had to be made at BATCO, a family owned aftermarket wholesaler of heavy-duty truck parts. No doubt you also need to make similar decisions in your business. For each of the various vendor-marketing programs we wanted to make the right decisions about balancing the offered savings against the extra inventory we would have to hold. The deal may - or may not - be a deal.



(described at the end)

After explaining the real-world issues to E/Step Software, a new feature was added to the Replenishment Planning Module – The JOINT ORDERS REPORT. More of an interactive analysis than a report, this feature lets you simulate various scenarios to evaluate the impact of vendor-marketing programs. We could calculate what replenishment orders would have to be pulled in and the incremental cost to the business in holding the extra inventory. Comparing this cost to the benefit we could receive, the decision became easier.

### How Joint Orders Work

You will have to have some information prepared before beginning:

- Review the deals
- Create a list of those SKUs to be evaluated
- Identify the qualifying target values
- There should be a common weight field among the SKUs
- The cost of carrying inventory in your business
- The expected savings, if known.
- Create some new SKU and REPLORD fields

Regenerate an up-to-date replenishment plan, if necessary.

For the SKUs in your list, FGS will look out one day for planned replenishments that it can pull in a day. It weights the orders by the weighting factor and totals them. It checks if the minimum is achieved. If not, it looks

out a second day for planned orders to pull in two days. It checks the total. Then it pulls the third day three days in. This continues until the minimum is achieved. FGS calculates the inventory carrying cost that changes in the final plan would require and compares the increased carrying costs against the benefits in the deal. If economically feasible, the analyst can request an update of the SKU.FIRMTHRU date to pull up the orders to a close-in SHIPDATE.

**Deal 1 - A 10% discount for an order with the line items totaling up to 1,000 units.**

A heavy-duty wrench manufacturer offered a 10% discount off of their purchase order total if the total combined units purchased was more than 1,000 units. To determine if there were actual savings and the product mix of the purchase order, BATCO utilized the JOINT ORDERS process.

BATCO defined a LIST of 56 SKUS, which represented the heavy-duty wrench manufacturer's part numbers. The weight field was left blank (i.e. unit is the default setting) and the target amount was set at 1,000 units. The cost of funds was set to 20% and the expected savings value was not defined.

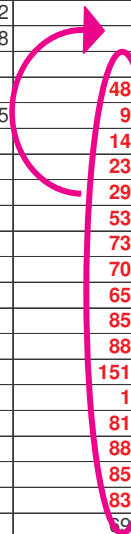
FGS determined that 210 planned orders, of 27 SKUS, covering 1046 units, from now (February 7, 1997) through July 4, 1997 would need to be firmed to meet the 1,000 unit minimum. These orders must be shipped by March 3, 1997 (to meet the present need for some of the items) and the cost for ordering early was \$302.25 dollars. This information is displayed in the Joint Order Summary Report.

| Cost and Benefits |  |
|-------------------|--|
| <b>Cost:</b>      | Pull in Supply Orders with additional inventory costs (at 20% / yr) = \$302.25 |
| <b>Benefit:</b>   | Order value of \$8,268.24 returns 10% (group discount) = \$825.82              |
| <b>Decision:</b>  | Pull in orders, with net cost savings of \$524.57                              |

To confirm the Joint Order Summary Report findings, a Replenishment Summary Plan Report was generated for the 27 SKUS that had selected planned orders from the joint orders process. The total number of units in the planned orders for this group of SKUS for the weekly periods ending July 4, 1997 was 1046 units and is displayed below.

*Replenishment Summary Plan  
for 27 SKUs (in Units)*

| Mfg Days | Period Ending | Forecast OTC | Forecast Sched | Forecast Depend | Service | Target Mfg | Target Change | Replenishments Firm Qty | Replenishments Planned Qty | # Lots | Stock On Hand-- Planned (Ending) | Planned in days |
|----------|---------------|--------------|----------------|-----------------|---------|------------|---------------|-------------------------|----------------------------|--------|----------------------------------|-----------------|
| 56 SKUs  |               |              |                |                 |         |            |               |                         |                            |        | 1,081                            | 48              |
| 52 Weeks | 2/7/1997      |              |                |                 |         |            |               |                         |                            |        |                                  |                 |
| 5        | 2/14/1997     | 100          |                |                 | 355     |            |               | 247                     |                            |        | 1,236                            | 54              |
| 5        | 2/21/1997     | 120          |                |                 | 355     |            |               | 2                       |                            | 1      | 1,141                            | 50              |
| 5        | 2/28/1997     | 102          |                |                 | 355     |            |               | 528                     |                            | 19     | 1,461                            | 65              |
| 5        | 3/7/1997      | 106          |                |                 | 355     |            |               |                         |                            |        | 1,355                            | 60              |
| 5        | 3/14/1997     | 119          |                |                 | 355     |            |               |                         |                            | 7      | 1,282                            | 57              |
| 5        | 3/21/1997     | 116          |                |                 | 355     |            |               | 25                      |                            | 6      | 1,200                            | 54              |
| 5        | 3/28/1997     | 112          |                |                 | 355     |            |               |                         |                            | 5      | 1,102                            | 50              |
| 5        | 4/4/1997      | 111          |                |                 | 355     |            |               |                         |                            | 5      | 1,014                            | 46              |
| 5        | 4/11/1997     | 113          |                |                 | 355     |            |               |                         |                            | 7      | 930                              | 42              |
| 5        | 4/18/1997     | 114          |                |                 | 355     |            |               |                         |                            | 9      | 869                              | 40              |
| 5        | 4/25/1997     | 124          |                |                 | 355     |            |               |                         |                            | 17     | 818                              | 39              |
| 5        | 5/2/1997      | 114          |                |                 | 355     |            |               |                         |                            | 11     | 774                              | 37              |
| 5        | 5/9/1997      | 103          |                |                 | 355     |            |               |                         |                            | 13     | 736                              | 36              |
| 5        | 5/16/1997     | 109          |                |                 | 355     |            |               |                         |                            | 15     | 712                              | 35              |
| 5        | 5/23/1997     | 113          |                |                 | 355     |            |               |                         |                            | 18     | 687                              | 35              |
| 4        | 5/30/1997     | 84           |                |                 | 355     |            |               |                         |                            | 18     | 754                              | 38              |
| 5        | 6/6/1997      | 94           |                |                 | 355     |            |               |                         |                            | 1      | 661                              | 33              |
| 5        | 6/13/1997     | 96           |                |                 | 355     |            |               |                         |                            | 19     | 646                              | 32              |
| 5        | 6/20/1997     | 102          |                |                 | 355     |            |               |                         |                            | 20     | 632                              | 32              |
| 5        | 6/27/1997     | 97           |                |                 | 355     |            |               |                         |                            | 22     | 620                              | 31              |
| 4        | 7/4/1997      | 75           |                |                 | 355     |            |               |                         |                            | 19     | 628                              | 31              |
| 5        | 7/11/1997     | 95           |                |                 | 355     |            |               |                         |                            | 20     | 602                              | 30              |



From the JOINT ORDER process a Suggested Purchase Order Report in an EXCEL format was generated for the selected 27 SKUS and is displayed below. Each planned purchase order line item can be reviewed via a line item's Replenishment Plan Report and edited if required.

After review, the individual planned purchase orders were deleted or assigned and released to a vendor.

*Suggested Purchase Order Report in Units  
(Not all line items are displayed)*

| PN   | Qty | Ship Date | Inv Class | Vendor   | Firm Thru | Annusage | Release Date  | Cost | \$ / Line  | Planner | Order Type  |
|------|-----|-----------|-----------|----------|-----------|----------|---|------|--|---------|---|
| 1901 | 4   | 3/3/1997  | A         | 15854610 | 6/30/1997 | 36       | 5/21/1997<br>6/4/1997<br>6/11/1997<br>6/25/1997   | 6.00 | 24.00<br>0.00<br>0.00<br>0.00  | W       | Joint<br>Joint<br>Joint<br>Joint  |
| 1902 | 2   | 3/3/1997  | A         | 15854610 | 6/30/1997 | 57       | 6/26/1997<br>7/2/1997   | 6.81 | 13.62<br>0.00  | W       | Joint<br>Joint  |
| 1904 | 33  | 3/3/1997  | A         | 15854610 | 6/30/1997 | 152      | 4/22/1997<br>4/28/1997<br>5/5/1997<br>5/12/1997<br>5/19/1997<br>5/27/1997<br>6/9/1997<br>6/16/1997<br>6/23/1997<br>6/30/1997              | 6.30 | 207.90<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00         | W       | Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint          |
| 1908 | 9   | 3/3/1997  | A         | 15854610 | 6/30/1997 | 131      | 6/16/1997<br>6/23/1997<br>6/30/1997   | 6.52 | 58.68<br>0.00<br>0.00  | W       | Joint<br>Joint<br>Joint   |
| 1909 | 117 | 3/3/1997  | A         | 15854610 | 6/30/1997 | 732      | 5/9/1997<br>5/12/1997<br>5/19/1997<br>5/27/1997<br>6/9/1997<br>6/16/1997<br>6/23/1997<br>6/30/1997  | 6.42 | 751.14<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00                         | W       | Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint                            |
| 1910 | 92  | 3/3/1997  | A         | 15854610 | 6/30/1997 | 399      | 4/14/1997<br>4/21/1997<br>4/28/1997<br>5/5/1997<br>5/12/1997<br>5/19/1997<br>5/27/1997<br>6/9/1997<br>6/16/1997<br>6/23/1997<br>6/30/1997 | 6.68 | 614.56<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00 | W       | Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint |
| 1912 | 5   | 3/3/1997  | A         | 15854610 | 6/30/1997 | 67       | 6/12/1997<br>6/18/1997<br>6/24/1997<br>7/2/1997   | 7.35 | 36.75<br>0.00<br>0.00<br>0.00  | W       | Joint<br>Joint<br>Joint<br>Joint  |
| 1913 | 25  | 3/3/1997  | A         | 15854610 | 6/30/1997 | 182      | 5/20/1997<br>5/27/1997<br>6/9/1997<br>6/16/1997<br>6/23/1997<br>6/30/1997   | 7.27 | 181.75<br>0.00<br>0.00<br>0.00<br>0.00<br>0.00   | W       | Joint<br>Joint<br>Joint<br>Joint<br>Joint<br>Joint  |

To confirm the Suggested Purchase Order Report findings an Individual Replenishment Plan Report was generated in units for each of the 27 SKUS selected by the joint orders process. A sample report for PN 1904 is displayed below.

For part number 1904 the planned order quantities through the weekly period of July 4, 1997 matched the total quantity of 33 stated in the Suggested Purchase Order Report.

*Individual Replenishment Plan Report  
For PN 1904 (in Units)*

| Mfg Days        | Period Ending | -----Forecast----- |          |          | -----Target----- |            |         | -----Replenishment Planned----- |                 |           | -----Stock On Hand----- |          |
|-----------------|---------------|--------------------|----------|----------|------------------|------------|---------|---------------------------------|-----------------|-----------|-------------------------|----------|
|                 |               | OTC                | Sched    | Depend   | ervice           | Mfg Change | Firm    | Planned (Ending)                | Planned in days | Available | ove ServTgt             |          |
| PartNur         | Descript      | Loc Nam            | LeadTime | PlanRule | RLQ              | leplFreq   | MinLotQ | ot Incr                         | Start Dt        | hWkDay    | Plan To                 | ShipDays |
| 1904            | 1904          | MASTER             | 20       | NTHWKDA  | 110              | 1.4        | 1       | 1                               | 123451          | SHIPDAT   |                         | 5        |
| Total OH        | Alloc OH      | On Hand            | On Order |          |                  |            |         |                                 |                 |           |                         |          |
| 11              | 0             | 11                 | 34       |          |                  |            |         |                                 |                 |           |                         |          |
| As of           | 2/5/1997      |                    |          |          | 13               |            | 13      | 11                              |                 | 11        | 16                      | -2       |
|                 | 2/14/1997     | 3                  |          |          | 13               |            | 34      |                                 |                 | 42        | 66                      | 29       |
|                 | 2/21/1997     | 4                  |          |          | 13               |            |         |                                 |                 | 38        | 61                      | 25       |
|                 | 2/28/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 35        | 56                      | 22       |
|                 | 3/7/1997      | 3                  |          |          | 13               |            |         |                                 |                 | 32        | 51                      | 19       |
| <b>LEADTIME</b> |               | <b>LEADTIME</b>    |          |          | <b>LEADTIME</b>  |            |         | <b>LEADTIME</b>                 |                 |           |                         |          |
|                 | 3/14/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 29        | 46                      | 16       |
|                 | 3/21/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 26        | 41                      | 13       |
|                 | 3/28/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 23        | 36                      | 10       |
|                 | 4/4/1997      | 3                  |          |          | 13               |            |         |                                 |                 | 20        | 31                      | 7        |
|                 | 4/11/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 17        | 26                      | 4        |
|                 | 4/18/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 14        | 21                      | 1        |
|                 | 4/25/1997     | 4                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 21       |
|                 | 5/2/1997      | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 20       |
|                 | 5/9/1997      | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 20       |
|                 | 5/16/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 20       |
|                 | 5/23/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 20       |
| 4               | 5/30/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 6         | 16                      | 27       |
|                 | 6/6/1997      | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 22       |
|                 | 6/13/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 22       |
|                 | 6/20/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 22       |
|                 | 6/27/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 22       |
| 4               | 7/4/1997      | 2                  |          |          | 13               |            |         |                                 |                 | 3         | 14                      | 23       |
|                 | 7/11/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 2         | 13                      | 21       |
|                 | 7/18/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 21       |
|                 | 7/25/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 21       |
|                 | 8/1/1997      | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 22       |
|                 | 8/8/1997      | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 22       |
|                 | 8/15/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 21       |
|                 | 8/22/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 20       |
|                 | 8/29/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 20       |
| 4               | 9/5/1997      | 2                  |          |          | 13               |            |         |                                 |                 | 5         | 16                      | 25       |
|                 | 9/12/1997     | 3                  |          |          | 13               |            |         |                                 |                 |           | 13                      | 20       |
|                 | 9/19/1997     | 4                  |          |          | 13               |            |         |                                 |                 | 4         | 13                      | 21       |
|                 | 9/26/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 21       |
|                 | 10/3/1997     | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 21       |
|                 | 10/10/1997    | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 22       |
|                 | 10/17/1997    | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 23       |
|                 | 10/24/1997    | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 23       |
|                 | 10/31/1997    | 3                  |          |          | 13               |            |         |                                 |                 | 3         | 13                      | 23       |

## Deal 2 – Prepaid freight for more than \$2,500 purchased.

A heavy-duty brake manufacturer offered prepaid freight to BATCO if the total combined units of a purchase order was more than 2,500 dollars. To determine if there were actual savings and, if so, the product mix of the purchase order BATCO defined a LIST of 90 SKUS, which represented the part numbers supplied by the heavy-duty brake manufacturer. The weight field was set to “dollars” and the target amount was set at 2,500 dollars. The cost of funds was set to 20% and the expected savings from the prepaid freight was \$305.

FGS determined that 44 planned orders, of 44 SKUS, totaled \$3,049.75, from now through March 28, 1997 would need to be firming to meet the 2,500-dollar minimum. These orders must be shipped by February 10, 1997 and the cost for ordering early was \$4.00 dollars. By taking advantage of the vendor’s program a savings of \$301 was realized. The Joint Order Summary Report displays this information.

| Cost and Benefits  |        |
|--|--------|
| <b>Cost:</b> Pull in a couple of supply orders with additional inventory costs (at 20% / yr) = | \$4.00 |
| <b>Benefit:</b> Free prepaid freight =   | \$305  |
| <b>Decision:</b> Pull in orders, with net cost savings of                                      | \$301  |

## Deal 3 – Consolidate a single container from Taiwan

Purchase orders to several Taiwanese wheel nut manufactures were cut with common ship dates so that they could be consolidated into a single container for import to BATCO. Once again we utilized the JOINT ORDERS process.

|   |             |
|---|-------------|
| Firming up <b>113</b> planned orders for <b>26</b> SKUs from now through <b>6/06/97</b> , |             |
| for a weight total of <b>41,442</b> , meets the <b>38,000</b> minimum.                    |             |
| These orders must be shipped by 2/14/97.  |             |
|   |             |
| Expected savings from ordering jointly  | ?????????   |
| <b>Less cost to carry stock ordered early (at 0.2/yr)</b>                                 | <b>-394</b> |
| Net savings   | ?????????   |

BATCO defined a group of 26 SKUS, which represented the Taiwanese wheel nut manufacturers. The weight field in FGS was set to “weight” and the target amount was set at 38,000 pounds. The cost of funds was set to 20% and the expected savings value was not defined.

FGS determined that 113 planned orders, of the 26 SKUS, totaled to 41,442 pounds, from now through June 6, 1997 would need to be firming to meet the 38,000-pound minimum. These orders must be shipped by February 14, 1997 and the cost for ordering early was \$394.00 dollars. The Joint Order Summary Report above displays this information. The inventory carrying cost by consolidating the orders was significantly less than the expense of individual LTL’s from three different international vendors.

| Cost and Benefits   |       |
|---|-------|
| <b>Cost:</b> Pull in a supply orders to meet 38K lb container minimum is extra inv cost = | \$394 |
| <b>Benefit:</b> LTL’s from 3 international vendors are unthinkable                        |       |
| <b>Decision:</b> Pull in orders to fill container – increases inventory expense by        | \$394 |

Any given week, Batco was evaluating 20 to 30 joint order deals. FGS’s Replenishment Planning Module, the Joint Orders Report, and automated commands made it easy and profitable for us to intelligently exploit the vendors’ deals.

## Additional Required Fields to run Joint Orders

If you have Replenishment Planning Module and wish to use Joint Orders, you will need the following new fields in your database:

- REPLORD.SHIPDATE (If not already defined – email [Tech Support](#) to request a command create this new field)
- SKU.FIRMTHRU (Run a command: FIRMTHRU.CMD)
- SKU.SHIPBY (Run a command: SHIPBY.CMD)

[Link to E/Step Software Website](#)