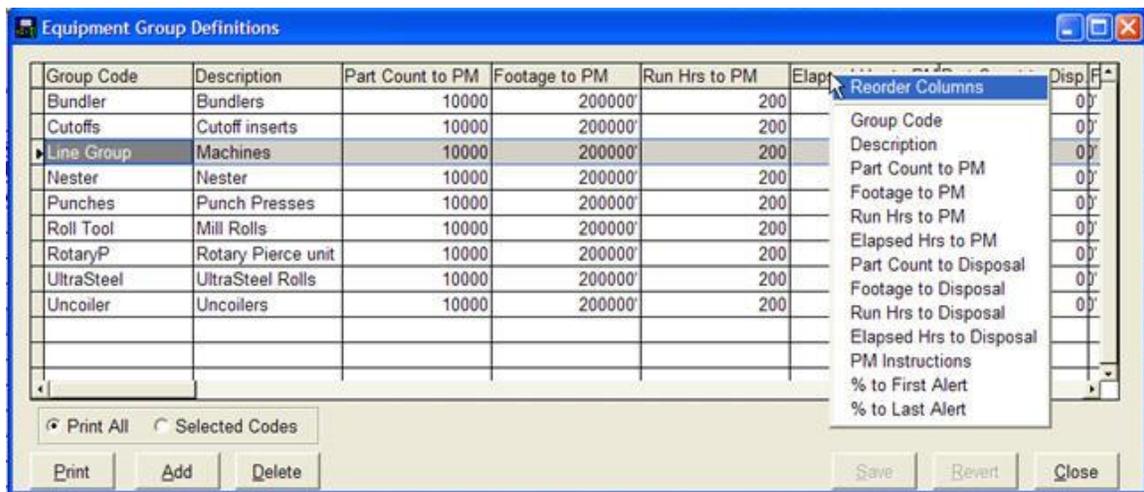


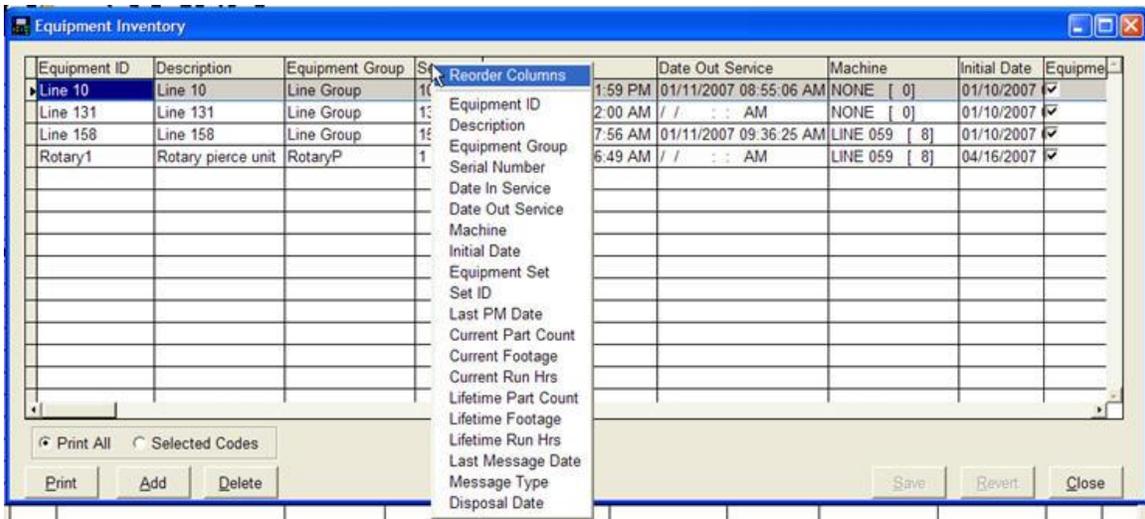
Equipment Tracking in Eclipse for Preventative Maintenance

Eclipse Setup

To configure the system, the user must first define the various types of equipment to be tracked for PM in the Equipment Groups form.

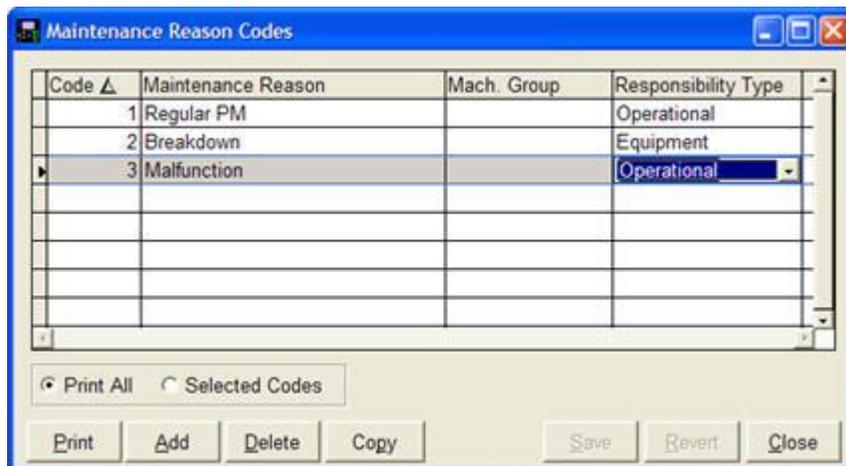


The level of detail is entirely up to the user. Examples of equipment types include: drywall shear die, drywall punch die, drywall rotary punch die, roll former gearbox, and roll tooling. The important consideration when creating equipment types is that the PM schedule is defined per equipment type, not for each specific piece of equipment. Reporting may be another issue that influences how detailed the user should go in defining equipment types. A PM schedule and lifetime criteria will be required for each equipment type and consist of values for part counts, footage and runtime. Trigger percentages will also be required for the first message and for the last message. The user may also establish a set of PM instructions.



Once the equipment types are defined, the user must create the inventory of actual pieces of equipment to be tracked in the Equipment Inventory form. Each copy of a piece of equipment should be assigned a unique ID number. The equipment should be permanently marked with this ID. The user should then estimate and record the appropriate lifetime values to date of part count, footage, runtime, and elapsed time. As the equipment is used in the future, these values will be incremented.

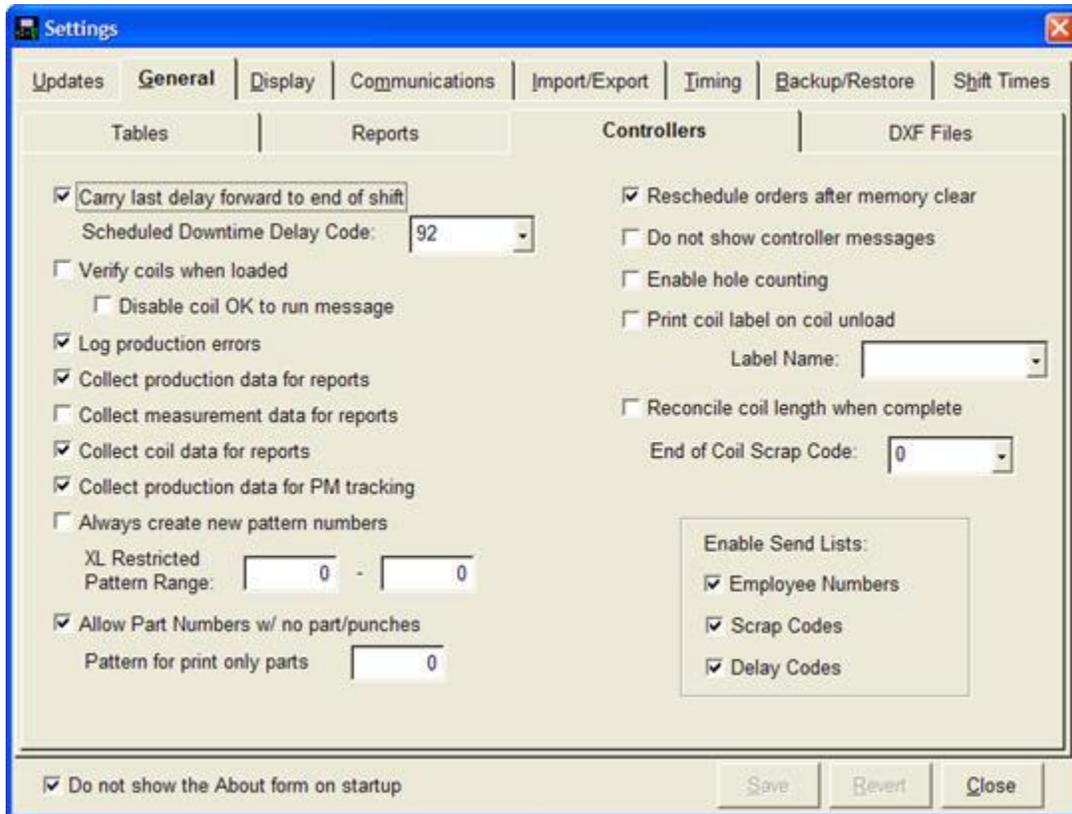
The final required step in configuring the system is to identify in the Equipment Inventory form, the equipment currently in service for each machine.



An optional step in configuring the system is to identify in the Maintenance Reason Codes form, the codes and their meanings to use in specifying why a piece of equipment is taken out of service, and the activity responsible for the action.

Eclipse-COMM Processing of Production Data

When “Collect production data for PM tracking” is turned on, values from the production data returned from the controller will update the inventory record for all equipment shown as “In Service” for the machine.



The quantity values in the production data will be used to update the part count values. Instances of manual shears with no quantity will also update the part count. The footage value in production data will be used to update the footage values. The runtime value in production data will be used to update the runtime values. Both the current and the lifetime values will be updated.

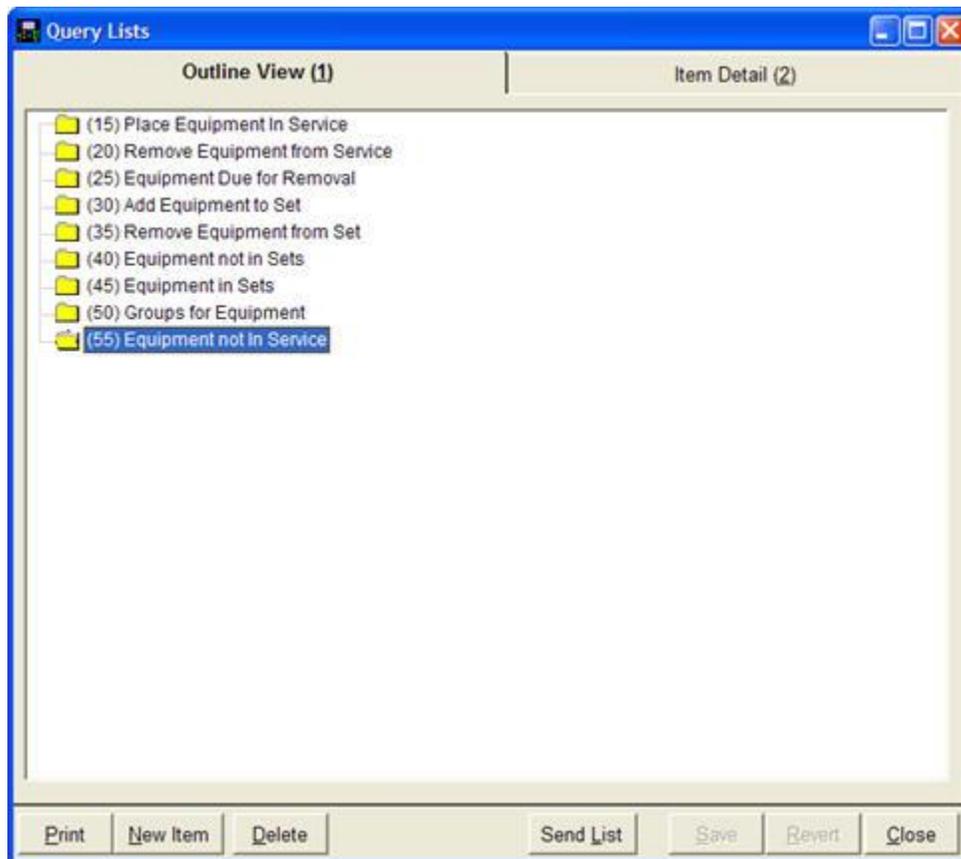
As the part count, footage and runtime values are updated in the equipment inventory, the current and lifetime values will be compared to the current and lifetime PM trigger settings for the associated group the equipment ID is assigned to. Depending on the message timing parameters for the group, the initial warning message will be sent based on the values reaching the indicated percent of the PM trigger values. Interval messages will be sent as the values exceed the initial message percent by increments of the message interval percent. The final message will be sent as the values exceed the final message percent after which no more messages will be sent for that equipment ID. Information pertaining to when messages have been sent will be updated to the equipment inventory.

Equipment Changes Out - In

When a piece of equipment being tracked is removed from a machine and replaced with another copy of the equipment, Eclipse must be updated. This can be accomplished at the XL controllers using Query Lists. It can also be accomplished in Eclipse with the Equipment Inventory form.

The following figure shows the entries required to support PM equipment tracking from the XL200 controllers with a UART version 3.15 or greater. More detail is provided later in the PM Query List setup section.

Items 15, 20, 25, 30, and 35, are set up to be PERMANENT query lists which means they will reside in the XL controller's REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button).



Selection of the "Remove Equipment from Service (20)" query list in the XL controller will trigger Eclipse-COMM to provide a list of equipment currently in service on the machine from the equipment inventory. Each line will include a checkbox for selecting the equipment to process. You can select one or more equipment ID's for processing.

In Eclipse-COMM, the equipment ID will be located in the equipment inventory and the out of service for PM time stamp will be updated. A combined image of the equipment inventory for

the equipment ID and its associated equipment group data will be placed in a history file. Then the machine number and the current values for part counts, footage, and runtime will be set to zero.

Selection of the “Place Equipment in Service (15)” query list in the XL controller will trigger Eclipse-COMM to provide a list of available equipment groups. The equipment group that includes the piece of equipment to be placed in service should be selected. This will trigger Eclipse-COMM, to provide a list of the equipment ID’s for the selected equipment group that are not already in service at a machine. The equipment ID being placed in service should be selected from this list. In Eclipse-COMM, the equipment ID will be located in the equipment inventory and the machine number and the in service for PM time stamp will be updated. Then the current values for part count, footage and runtime will be set to zero.

Deleting Equipment IDs

Equipment can only be removed from the equipment inventory using the Equipment Inventory form. When a piece of equipment is removed from the inventory, a combined image of the inventory record for the equipment ID and its associated equipment group record is placed in a history file.

Graphical PM Status

Vis...	Machine	SnapShot	Order	Material	Prod. Code	PM Status	Model	Version	UART	Coil Number
●●	BIG SHEAR [14]						XL100A Dietric	7.24	2.08	
●●	KATZ [15]		3	5/8KASL2358KASL	KASL		XL100A Dietric	7.16	2.04	
●●	LINE 002 [9]		3	5/8USTE2P200623US	USTE		XL200DLP	3.13.00	3.15	08926433
●●	LINE 003 [5]		7/8	FCN2578FCN	FCN		XL100A Dietric	7.24	2.08	04132130
●●	LINE 004 [7]		7/8	FCE20P200311	FCE		XL200DLP	3.09.02	3.13	08917554
●●	LINE 007 [4]		3	5/8USTN2P250623US	USTN		XL200DLP	3.27.00	3.22	08930810
●●	LINE 012 [1]		4	USTE2P200647US	USTE		XL200DLP	3.13.00	3.15	30329147
●●	LINE 014 [12]		4	CSJ318P1807373G40	CSJ3		XL200DLP	3.19.00	3.18	30326453
●●	LINE 054 [6]		2	CAE204P200378	CAE		XL200DLP	3.20.00	3.20	30328029
●●	LINE 059 [8]		2	1/8HRN1P240416	HRN1		XL200DLP	3.13.00	3.15	04126179
●●	LINE 060 [2]		4	TSB186P1806313G40	TSB		XL200CLDLP	3.15.01	3.15	30329302
●●	LINE 080 [3]		2	1/2CSJ51P1606055G40	CSJ5		XL200DLP	3.09.02	3.13	30329126
●●	LINE 095 [11]		1	1/2CHN2P1602055G40	CHN2		XL200DLP	3.13.00	3.15	08912741
●●	LINE 101 [13]		1	1/4CBUN2P2802716	CBU		XL200DLP	3.09.02	3.13	30320500
●●	PRESS BRAKE [16]		1	1/4CBUN2P2802716	CBU		XL100A	7.16	2.04	30188116

Shift Date	02/08/2008	Machine	[1] LINE 012	Model	XL200DLP
Shift:	1	Order	4 USTE206190	Version	3.13.00
Shift Footage	1200	Material	P200647US	Coil Number	30329147
Avg. Rate	19 FPM	Prod. Code	USTE	UART	3.15
Runtime %	7.035 %	Customer Name		Memory	96 %

A graphical representation of a roller in a roll forming machine is displayed in the PM Status column of the main Eclipse form. The color of this picture represents the status of equipment in the equipment inventory that is designated in service at the indicated XL controller.

White	No in service equipment due PM
Yellow	First warning, some in-service equipment due PM
Red	Last warning, some in-service equipment due PM
Red with "D"	Some in-service equipment due disposal

Reports

The screenshot shows a software window titled "Print Equipment Status". The window is divided into two main sections: "Equipment (1)" and "Filter (2)".

The "Equipment (1)" section contains a table with the following data:

Equipment ID	Group Code	Equip Set	Set ID	Date In Service	Machine	Date Out Servic	Date Last Mainten	Due PM	Due Dispc
Line 10	Line Group	✓	Line 10	01/10/2007	NONE [0]	01/11/2007	01/12/2007		
Line 131	Line Group	✓	Line 131	01/11/2007	NONE [0]	/ /	/ /		
Line 158	Line Group	✓	Line 158	01/11/2007	LINE 059 [8]	01/11/2007	/ /	✓	
Rotary1	RotaryP	✓	Rotary1	04/18/2007	LINE 059 [8]	/ /	04/16/2007	✓	

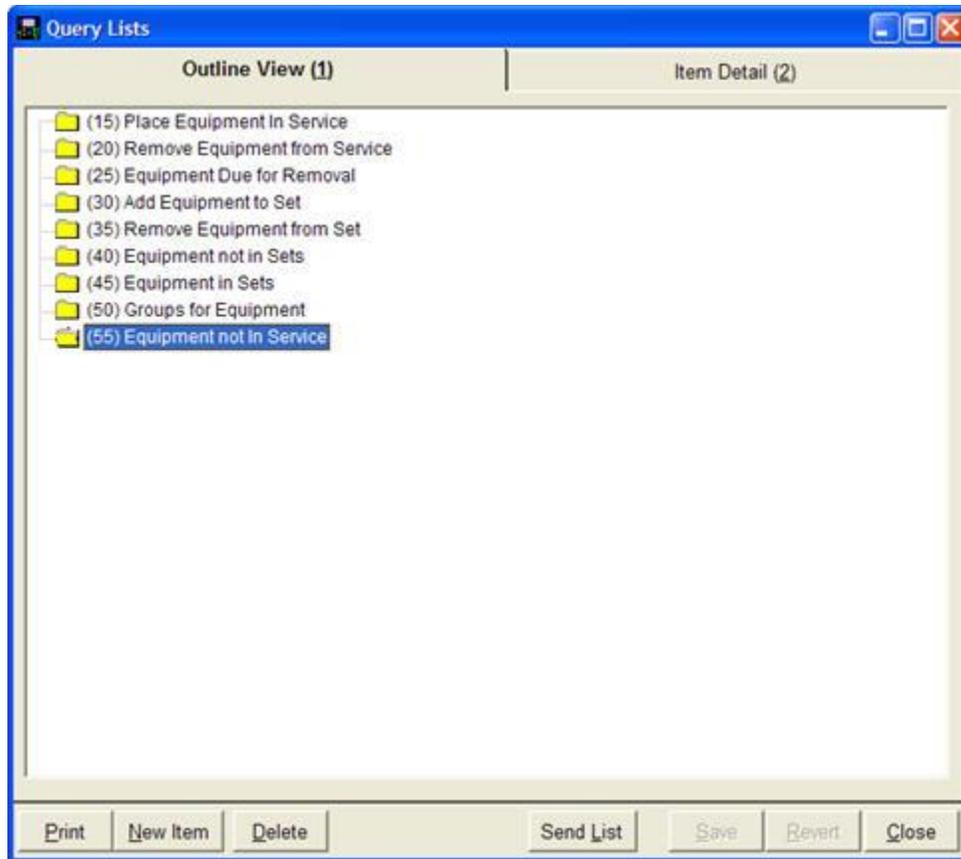
The "Filter (2)" section is currently empty, showing "Filter: NO FILTER".

Below the table, there are several controls:

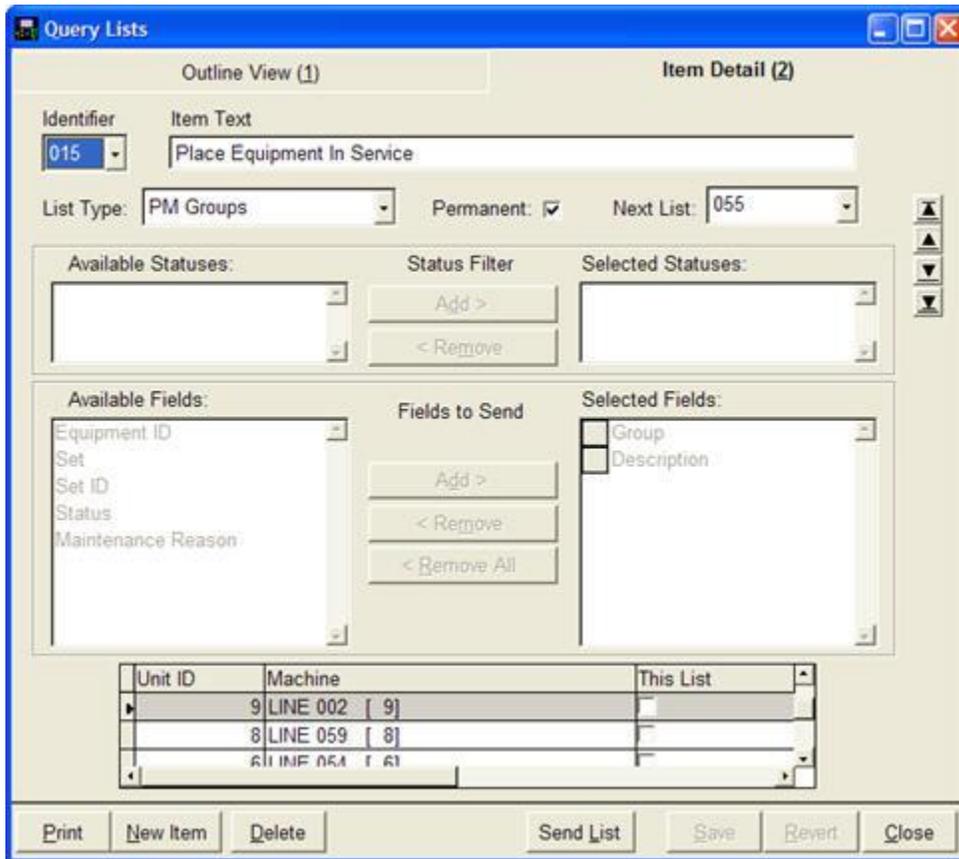
- Sequence: (3) Descending
- Report: Print All Selected Equipment
- A dropdown menu for report selection, currently showing "EQUIPMENT ID". The dropdown is open, showing the following options: "DUE MAINTENANCE", "IN SERVICE", "DUE MAINTENANCE", "DUE DISPOSAL", "AVAILABLE", "PERFORMANCE", and "USAGE DETAILS".
- Buttons for "Print" and "Close".

There are several reports available to support Preventative Maintenance activities. You can see the selection in the figure above.

PM Query List setup



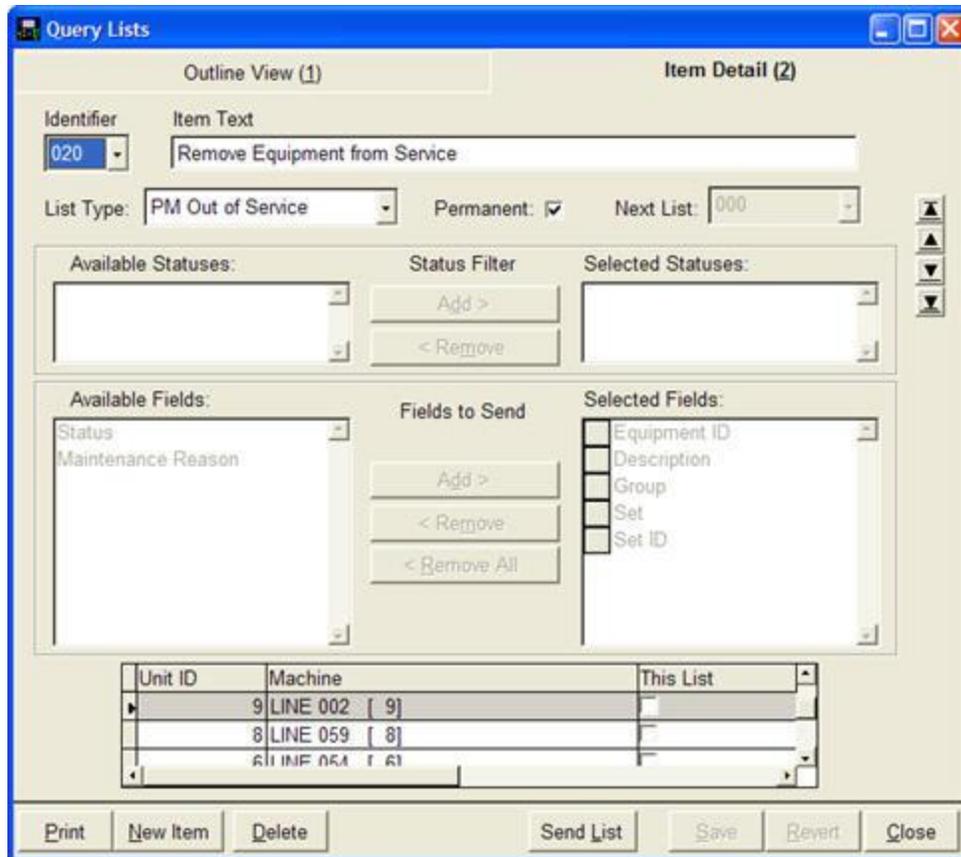
The above screen sample shows the entries required to support PM equipment tracking from the XL200 controllers with a UART version 3.15 or greater.



The entry shown in this screen sample is set up to be a PERMANENT query list which means it will reside in the XL controller's REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) once it has been assigned to a machine (check the "This List" box) and sent to the controller (Send List button). You must save (Save button) any pending changes before sending the list setup data to the controller.

When this entry is selected from the entries available at the controller and Eclipse-COMM gets the request, it will respond with a list of equipment groups. Only one equipment group may be selected for further processing.

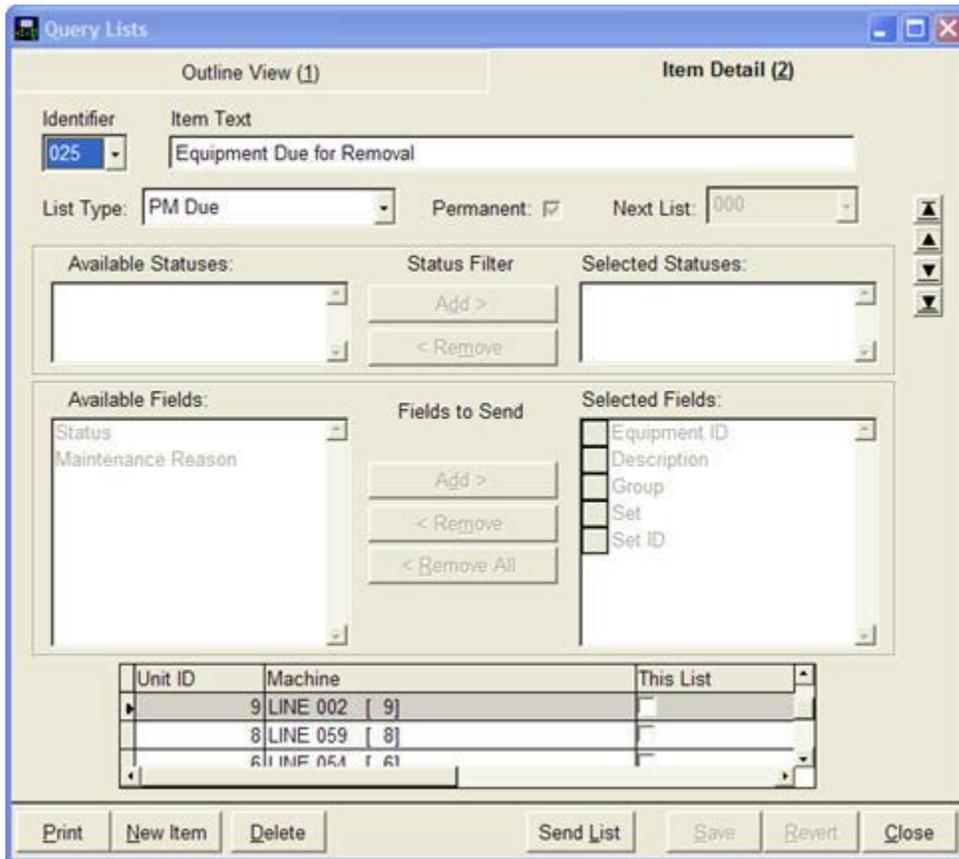
Once the equipment group request is received, Eclipse-COMM will respond with the list defined in item 055 (see Next List above). Item 55 in this example generates a list of equipment ID's assigned to the selected equipment group that are not currently in service (have no machine number assigned).



The entry shown in this screen sample is also set up to be a PERMANENT query list which means it will reside in the XL controller's REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) once it has been assigned to a machine (check the "This List" box) and sent to the controller (Send List button). You must save (Save button) any pending changes before sending the list setup data to the controller.

When this entry is selected from the entries available at the controller and Eclipse-COMM gets the request, it will respond with a list of equipment ID's, their description, group and set ID if applicable, for equipment that is currently in service at the XL controller. Each line will include a checkbox for selecting the equipment ID(s) to process. You can select one or more equipment ID's for further processing.

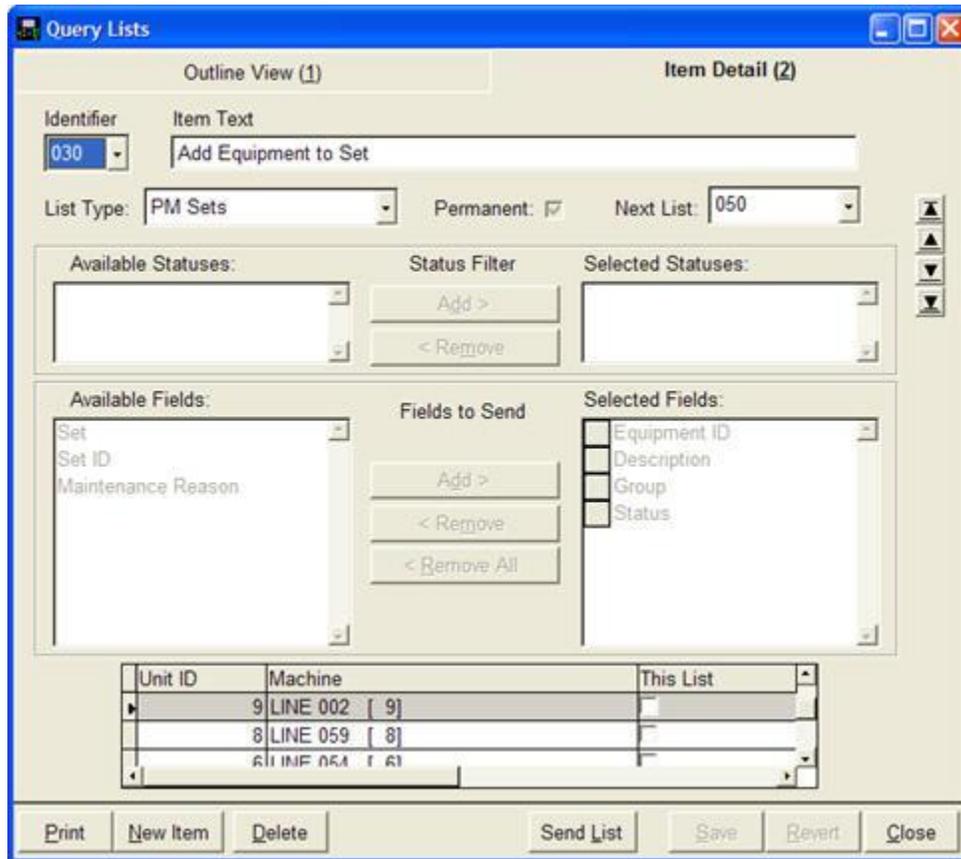
In Eclipse-COMM, the equipment ID will be located in the equipment inventory and the out of service for PM time stamp will be updated. A combined image of the equipment inventory for the equipment ID and its associated equipment group data will be placed in a history file. Then the machine number and the current values for part counts, footage and runtime will be set to zero.



The entry shown in this screen sample is also set up to be a PERMANENT query list which means it will reside in the XL controller’s REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) once it has been assigned to a machine (check the “This List” box) and sent to the controller (Send List button). You must save (Save button) any pending changes before sending the list setup data to the controller.

When this entry is selected from the entries available at the controller and Eclipse-COMM gets the request, it will respond with a list of equipment ID’s, their description, group and set ID if applicable, for equipment that is currently in service at the XL controller and a PM due message has been sent to the controller (result of one or more of the elements tracked exceeding the limits for the associated equipment group). Each line will include a checkbox for selecting the equipment ID(s) to process. You can select one or more equipment ID’s for further processing.

In Eclipse-COMM, the equipment ID will be located in the equipment inventory and the out of service for PM time stamp will be updated. A combined image of the equipment inventory for the equipment ID and its associated equipment group data will be placed in a history file. Then the machine number and the current values for part counts, footage and runtime will be set to zero.

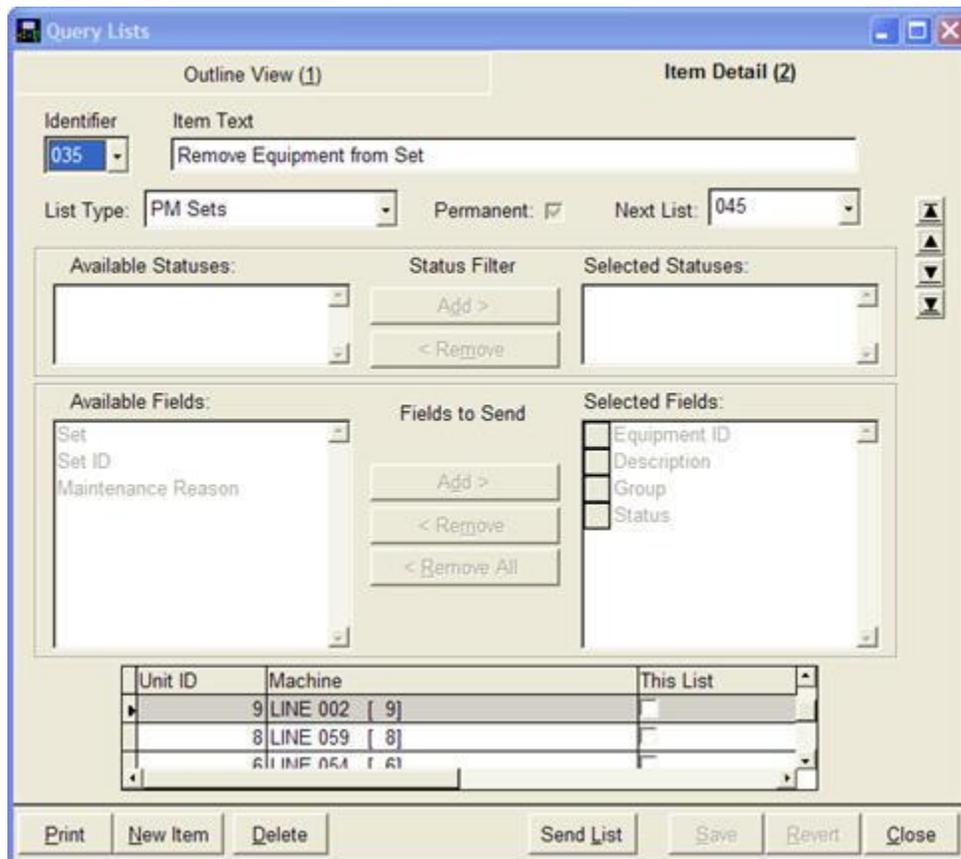


Sets provide a means of managing multiple pieces of equipment as a single unit.

The entry shown in this screen sample is also set up to be a PERMANENT query list which means it will reside in the XL controller's REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) once it has been assigned to a machine (check the "This List" box) and sent to the controller (Send List button). You must save (Save button) any pending changes before sending the list setup data to the controller.

When this entry is selected from the entries available at the controller and Eclipse-COMM gets the request, it will respond with a list of equipment set ID's, their description, group and set ID if applicable that have been defined in the Equipment Inventory form and are designated in service at the XL controller or not in service at any other XL controller. Only one equipment set may be selected for further processing.

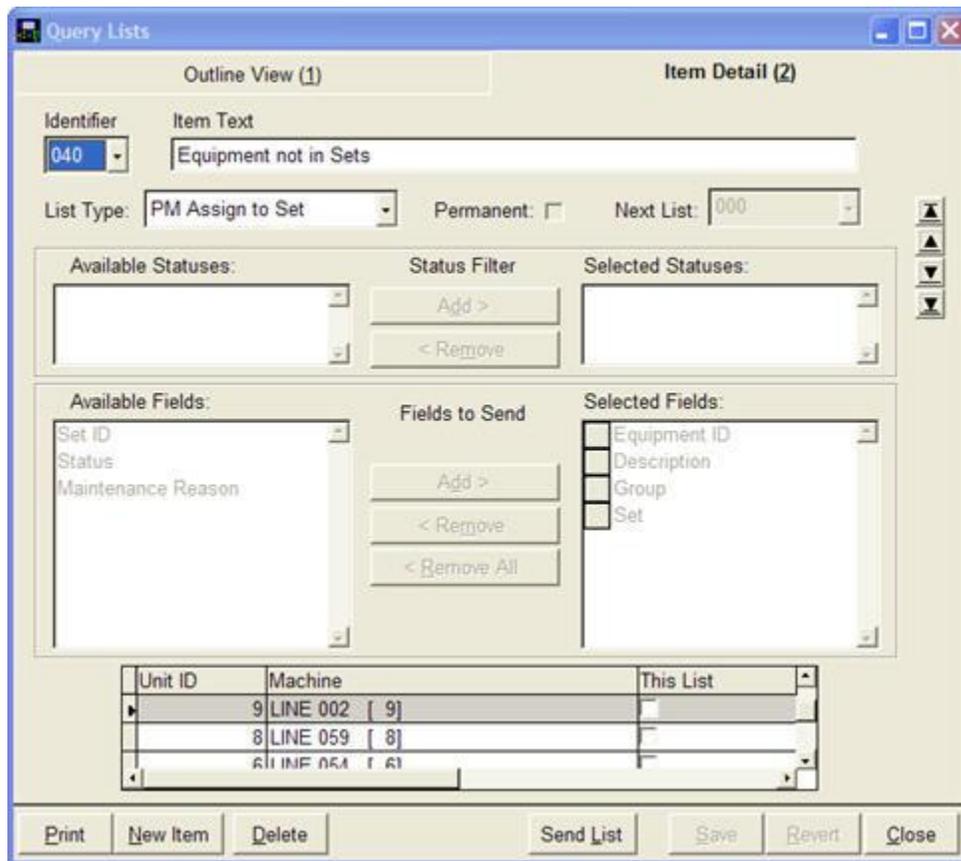
Once the equipment set request is received, the equipment set ID will be saved and Eclipse-COMM will respond with the list defined in item 050 (see Next List above). Item 50 in this example generates a list of equipment groups that is used to select equipment ID's to be assigned to the saved equipment set ID.



The entry shown in this screen sample is also set up to be a PERMANENT query list which means it will reside in the XL controller's REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) once it has been assigned to a machine (check the "This List" box) and sent to the controller (Send List button). You must save (Save button) any pending changes before sending the list setup data to the controller.

When this entry is selected from the entries available at the controller and Eclipse-COMM gets the request, it will respond with a list of equipment set ID's, their description, group and set ID if applicable, that have been defined in the Equipment Inventory form that are designated in service at the XL controller or not in service at any other XL controller. Only one equipment set may be selected for further processing

Once the equipment set request is received, Eclipse-COMM will respond with the list defined in item 045 (see Next List above). Item 45 in this example generates a list of equipment ID's assigned to the selected equipment set ID.

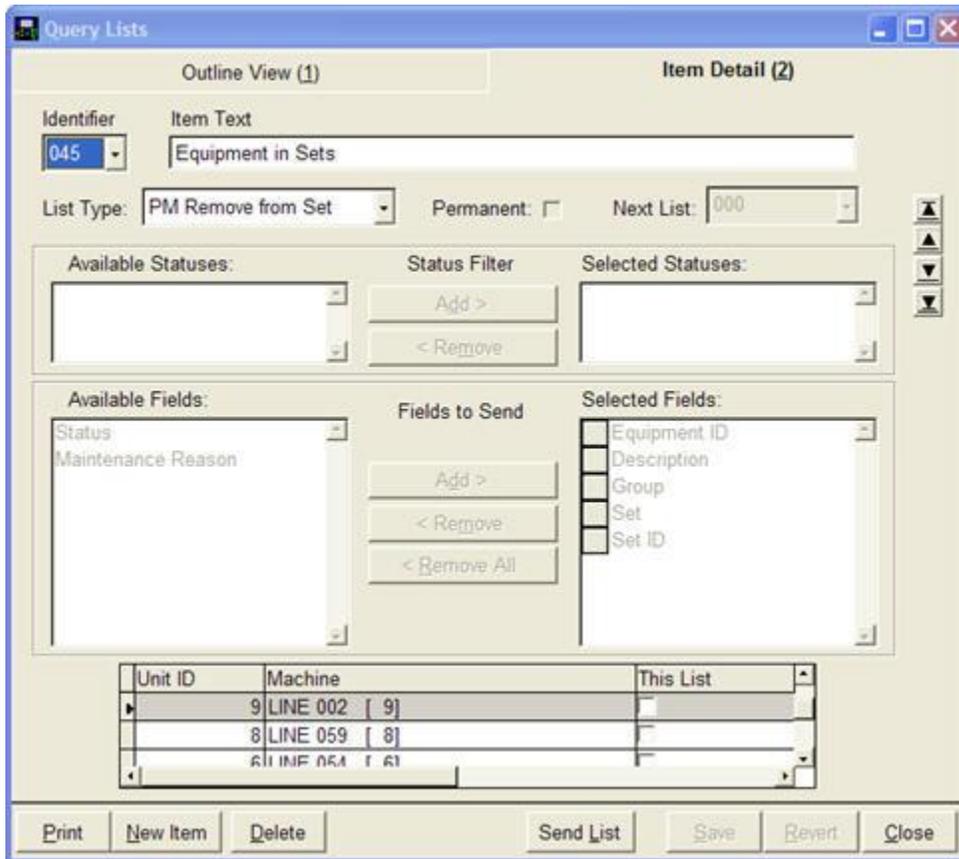


The entry shown in this screen sample will not reside in the XL controller’s REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) as it is not designated as PERMANENT.

When Eclipse-COMM gets a request that references this item in its “Next List”, it will respond with a list of equipment ID’s, their description, group and set ID if applicable, that belong to the equipment group from the request and that are not in service and not already assigned to a set.

In the XL controller, the results of this query will appear in a list of equipment ID’s. Each line will include a checkbox for selecting the equipment ID(s) to process. You can select one or more equipment ID’s for further processing.

Once the equipment ID’s request is received, Eclipse-COMM will respond by assigning the saved equipment set ID (see item 50) to the equipment inventory records for the selected equipment ID’s as no “Next List” is indicated.

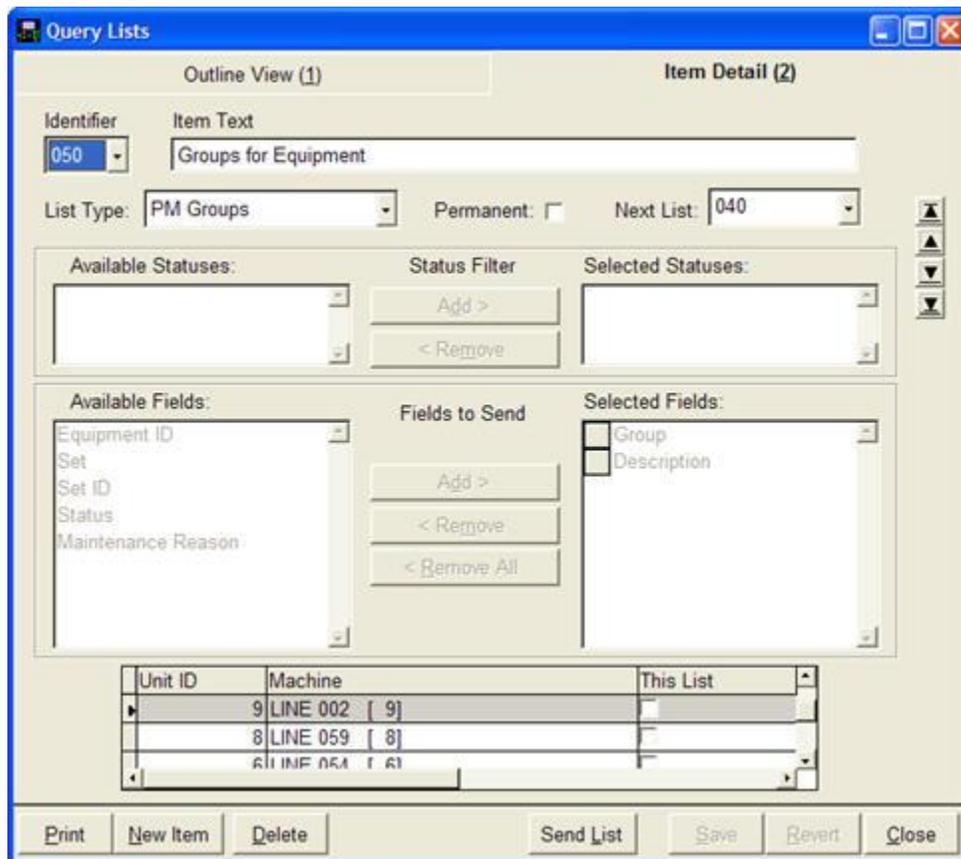


The entry shown in this screen sample will not reside in the XL controller’s REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) as it is not designated as PERMANENT.

When Eclipse-COMM gets a request that references this item in its “Next List”, it will respond with a list of equipment ID’s, their description, group and set ID if applicable, that belong to the equipment set ID from the request and that are not in service and not a set master record.

In the XL controller, the results of this query will appear in a list of equipment ID’s. Each line will include a checkbox for selecting the equipment ID(s) to process. You can select one or more equipment ID’s for further processing.

Once the equipment ID’s request is received, Eclipse-COMM will respond by removing the equipment set ID from the equipment inventory records for the selected equipment ID’s as no “Next List” is indicated.

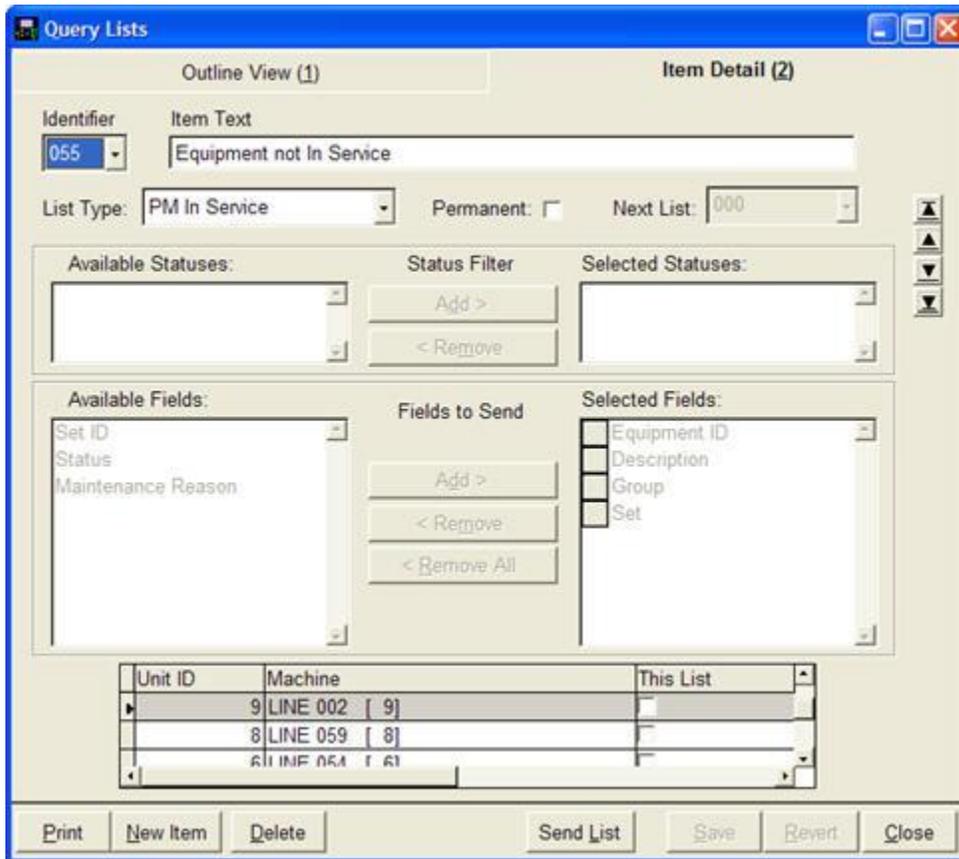


The entry shown in this screen sample will not reside in the XL controller’s REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) as it is not designated as PERMANENT.

When Eclipse-COMM gets a request that references this item in its “Next List”, it will respond with a list of equipment groups.

In the XL controller, the results of this query will appear in a list of available equipment groups. Only one equipment group may be selected for further processing.

Once the equipment groups request is received, Eclipse-COMM will respond with the list defined in item 040 (see Next List above). Item 40 in this example generates a list of equipment ID’s that is used to select equipment ID’s to be assigned to the saved equipment set ID (see item 30).



The entry shown in this screen sample will not reside in the XL controller’s REQUEST ECLIPSE DATA section of the PRODUCTION MENU (Production Data button) as it is not designated as PERMANENT.

When Eclipse-COMM gets a request that references this item in its “Next List”, it will respond with a list of equipment ID’s for equipment that is not designated in service.

In the XL controller, the results of this query will appear in a list of available equipment ID’s. Each line will include a checkbox for selecting the equipment ID(s) to process. You can select one or more equipment ID’s for further processing.

In Eclipse-COMM, the equipment ID will be located in the equipment inventory and the in service time stamp will be updated.