



Quantum Desktop Playback  
Data Scan Report

Report Date: 10-14-2010  
Locomotive 5023

Data Removed on 10-14-10

SPEED (MPH)	OK
TRACTION MOTOR CURRENT	OK
BRAKE PIPE PRESSURE	OK
INDEPENDENT BRAKE	OK
END-OF-TRAIN PSI	Never above 20.
EP BRAKE REQUESTED	Never ON/ACTIVE
THROTTLE	Stop never reported. Low Idle never reported.
REVERSE	OK
EIE	Never ON/ACTIVE
PCS	OK
HORN	Never ON/ACTIVE
EOT MOVING	Never ON/ACTIVE
EOT MSG. JUST RX	Never ON/ACTIVE
EOT LIGHT	Never ON/ACTIVE
EP OPERATING MODE	Never ON/ACTIVE
EP PENALTY BRAKE	Never ON/ACTIVE
EP ENGINEER EMERGENCY	Never ON/ACTIVE



Quantum Desktop Playback

Manufacturer is QEI    Version # S45E  
Serial Number is 0204100369  
Customer is MMAR

Data was removed on        - 13:50:36 on 10/14/10  
Last Downloaded on        - 06:35:00 on 08/19/10  
Battery was installed on    - 10/14/04  
Locomotive Number is      - 5023

Downloaded by    -        jh  
Location        -        derby  
Train            -        232  
Wheel Size Entry -    39  
Wheel Size used by program:  
Circumference = 122.5    Diameter = 39.0  
No memo present.

Wheel size used for printout is 122.52

QDP Version V

# JSP-010 (BATTERY MAINTENANCE AND QUALIFICATION)

## JOB SPECIFIC PROCESS

Locomotive Type: ALL MODELS

Valid for Road Numbers: (All Models)

Overview: This job process sheet will assist with the maintenance and qualification of batteries.

### SPECIAL TOOLS OR EQUIPMENT:

### SEQUENCE OF JOB STEPS

Please print your name,  
NO signatures

1. Ensure the locomotive is shutdown, discharged, all of the circuit breakers are open and the battery knife switch is open.

J. Martin

### Battery Qualification/Maintenance

2. **NOTE: If batteries are dead, connect the charger until the charge rate falls below 10 amps to determine state of charge. Readings under 20 V are suspect for units with just 2 batteries.**

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3. Insert hose stem into battery cell and squeeze bulb.

J. Martin

4. Release pressure until enough acid solution is drawn into the tube allowing the float to float freely. Be sure float does not touch rubber stopper at the top of the tube.

J. Martin

5. The float reading at the water line is the uncorrected charge level of the battery.

J. Martin

6. Read and record the specific gravity of all 16 pilot cells. "record readings below": acceptable range is 1.225 – 1.300 ( if out of this range notify tech support)

**Note 1:** the sheet below is set up for 2 or 8 batteries as some units have 8 batteries.

**Note 2:** accurate readings cannot be obtained if water has recently been added to cells. Differences of 50 points or more between readings in battery cells may indicate pending battery failure.

J. Martin

7. Based on the above specific gravity readings, do any batteries need replaced? Remember, if the unit came in with already dead batteries, an attempt to charge the batteries must be made before taking the specific gravity readings. YES NO

J. Martin

8. Return acid to cell from which it was drawn.

J. Martin

9. Be sure all vent plugs are replaced and tight.

J. Martin

10. With Unit shut down measure the voltage reading across each battery at the terminals, record readings on the chart below.

J. Martin

11. Make a general check of the battery as to proper blocking, clean and tight connections at all points, and any unusual appearance or condition. If any unusual appearance or conditions exist, like corrosion, clean with scotch-brite buffer or wire br

J. Martin

12. Apply approved protective coating to connections after terminals are cleaned and dried

J. Martin

13. Add water as required (Add water to bottom of filler neck).

J. Martin

### Battery Cranking Voltage Test

14. Close battery knife switch, and circuit breakers.

15. Open the injector toggle switch, on EUI units to prevent unit from starting.

**NOTE: Battery cranking voltage readings do not need to be taken on Air Start Locomotives.**

16. On MUI engines, pull the Governor button and hold back the Lay-shaft while cranking the engine over to prevent unit from starting.

18. Based on the cranking voltages, is any battery suspect of needing replaced? YES NO

2 Battery Units	Specific Gravity				Water Added			Battery Replaced-Reason
	Cell 1	Cell 2	Cell 3	Cell 4	Yes	No	Yes	
Battery 1								o
Section A	1222	1222	1222	1222	✓			
Section B	1222	1222	1222	1222	✓			
Section C	1222	1222	1222	1222	✓			
Section D	1222	1222	1222	1222	✓			

2 Battery Units	Specific Gravity				Water Added			Battery Replaced-Reason
	Cell 1	Cell 2	Cell 3	Cell 4	Yes	No	Yes	
Battery 2								o
Section A	1222	1222	1222	1222	✓			
Section B	1222	1222	1222	1222	✓			
Section C	1222	1222	1222	1222	✓			
Section D	1222	1222	1222	1222	✓			

8 Battery Units	Specific Gravity				Water Added			Battery Replaced-Reason
	Cell 1	Cell 2	Cell 3	Cell 4	Yes	No	Yes	
Battery 1								
Battery 2								
Battery 3								
Battery 4								
Battery 5								
Battery 6								
Battery 7								
Battery 8								

**BATTERY CRANKING VOLTAGE CHART**

	Battery 1	Battery 2	Battery 3	Battery 4	Battery 5	Battery 6	Battery 7	Battery 8
Battery Voltage	32.8	32.9						
	Battery 1	Battery 2	Battery 3	Battery 4	Battery 5	Battery 6	Battery 7	Battery 8
Battery Voltage								

	Battery 1	Battery 2	Battery 3	Battery 4	Battery 5	Battery 6	Battery 7	Battery 8
Cranking Battery Voltage								
Battery Voltage								

	Battery 1	Battery 2	Battery 3	Battery 4	Battery 5	Battery 6	Battery 7	Battery 8
Cranking Battery Voltage								

LOCOMOTIVE											DATE			
5023											10-13-10			
Start Readings					Has Shims		END READING					Has Shims		OLD GAUGE
	Flange Height	Flange Thickness	Rim Thickness	Witness Groove	YES	NO		Flange Height	Flange Thickness	Rim Thickness	Witness Groove	YES	NO	FLANGE THICKNESS MEASUREMENT
L#1	0-18	0-0	2				L#1							
L#2	0-19	2-0	3 3/16				L#2							
L#3	0-21	0-0	2				L#3							
L#4	0-20	0-0	2 1/4				L#4							
L#5	0-19	0-0	2 3/16				L#5	0-18	0-0	2.00				turn wheel
L#6	0-20	0-0	2 1/4				L#6							
R#1	0-21	0-0	2 3/16				R#1							
R#2	0-19	0-0	3 3/16				R#2							
R#3	2-22	0-0	1 3/16				R#3	0-20	0-0	1 3/16				
R#4	0-22	2-0	2 3/16				R#4							
R#5	0-18	4-0	2				R#5	0-18	0-0	2.00				turn wheel
R#6	0-21	3-0	2 1/4				R#6							

WEAR LIMITS FOR ROAD & SWITCH LOCOMOTIVES - MINIMUM DAILY REQUIREMENTS

FRA 1 1/2" MMA 1 7/16" Flange Height  
 FRA 7/8" MMA 15/16" Flange Thickness  
 FRA 1" MMA 1 1/16" Rim Thickness  
 FRA 5/16" MMA 1/4" Tread Wear

WEAR LIMITS - ROAD & SWITCH LOCOS - MIN 92 DAY REQ

WEAR LIMITS - PASSENGER LOCOS - MIN 92 DAY REQ

FLANGE Height	FLANGE THICKNESS	Rim THICKNESS	Tread WEAR	FLANGE HEIGHT	FLANGE THICKNESS	Rim THICKNESS	Tread WEAR
FRA 1 1/2"	FRA 7/8"	FRA 1"	FRA 5/16"	FRA 1 1/2"	FRA 7/8"	FRA 1"	FRA 5/16"
MMA 1 7/16"	MMA 1 1/32"	MMA 1 1/8"	MMA 1/4"	MMA 1 7/16"	MMA 1"	MMA 1 1/4"	MMA 1/4"

CONVERSION CHART FOR WHEEL DIAMETER

8= 37"	15= 37 7/8"	22= 38 1/2"	29= 39 5/8"	36= 40 1/2"
9= 37 1/8"	16= 38"	23= 38 7/8"	30= 39 3/4"	37= 40 5/8"
10= 37 1/4"	17= 38 1/8"	24= 39"	31= 39 7/8"	38= 40 3/4"
11= 37 3/8"	18= 38 1/4"	25= 39 1/8"	32= 40"	39= 40 7/8"
12= 37 1/2"	19= 38 3/8"	26= 39 1/4"	33= 40 1/8"	40= 41"
13= 37 5/8"	20= 38 1/2"	27= 39 3/8"	34= 40 1/4"	41= 41 1/8"
14= 37 3/4"	21= 38 5/8"	28= 39 1/2"	35= 40 3/8"	42= 41 1/4"

LOCOMOTIVE RAIL CLEARANCE

COUPLER HEIGHT		PILOT HEIGHT		HEIGHT OF HORIZONTAL END HANDHOLD OR UNCOUPLING LEVER IF USED AS HORIZONTAL HANDHOLD		LOCO RAIL CLEARANCE	
FRA	MAX 34 1/2" MIN 31 1/2"	FRONT 33 1/2" REAR 33	MAX 5" MIN 3"	FRONT 43 1/4" REAR 5	FRA MIN 30" MMA MIN 30" FRA MAX 50" MMA MAX 50"	FRA MIN 2 1/2" MMA MIN 3"	

WHEEL DIAMETER MEASUREMENTS ARE TAKEN FROM THE TOP OF THE WITNESS GROOVE. 40" DIAMETER WHEELS WITNESS GROOVE = 36"  
 42" DIAMETER WHEEL WITNESS GROOVE = 38"

WHEEL MATCHING STANDARDS FOR 6 AXLE LOCOMOTIVES (FRA & MMA STANDARDS ARE THE SAME)

- 1" IS THE MAXIMUM VARIATION ALLOWED IN WHEEL DIAMETER BETWEEN ANY 2 WHEELS IN THE SAME TRUCK WITHOUT SHIMS
- 1 1/2" IS THE MAXIMUM VARIATION ALLOWED IN WHEEL DIAMETER BETWEEN ALL 2 WHEELS IN THE SAME TRUCK WITH SHIMS
- 1 1/4" IS THE MAXIMUM VARIATION ALLOWED IN WHEEL DIAMETER BETWEEN WHEELS ON DIFFERENT TRUCKS

REMEMBER THIS RULE

IF A WHEEL DIAMETER VARIATION IS FOUND AT ANY POINT, THE WHEEL DIAMETER DIFFERENCE BETWEEN ANY 2 WHEELS IN THE SAME TRUCK MUST BE WITHIN THE TOLERANCE SPECIFIED IN THE WHEEL DIAMETER STANDARDS. NOTE: IN ORDER TO MAINTAIN THE MAXIMUM VARIATION ALLOWED IN WHEEL DIAMETER BETWEEN WHEELS ON DIFFERENT TRUCKS, THE WHEEL DIAMETER DIFFERENCE BETWEEN ANY 2 WHEELS ON DIFFERENT TRUCKS MUST BE WITHIN THE TOLERANCE SPECIFIED IN THE WHEEL DIAMETER STANDARDS.

EMPLOYEES SIGNATURE

*M. Carter*

SUPERVISORS SIGNATURE