

Section 5

Train Inspections Hot Box Detector and WILD Instructions

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TRAIN INSPECTIONS

1.0 Inspecting SPECIAL Dangerous Commodities

- 1.1 A train or transfer carrying one or more full carloads, containerloads or trailerloads of SPECIAL dangerous commodities MUST, within one mile of the mileage shown by subdivision footnote at which this instruction applies,
- perform a pull-by or a standing inspection,
 - from the front of the train to and including 8 axles behind the last full carload, containerload, or trailerload of a SPECIAL dangerous commodity.

2.0 Use of Portable Radios when Making Train Inspection

When portable radios are available they must be carried by crew members when making train inspections.

3.0 Mechanical Safety Inspections

- 3.1 Mechanical Safety Inspections will be performed by Certified Car Inspectors at those locations designated for that train, as specified in the Train Service Schedule CM422A.

At locations other than designated Safety Inspection Locations, where trains originate or cars are added to a train, the train crew or other qualified person must make a Pre-departure Inspection for those conditions listed in item 4.1.

3.2 Cars Lifted at Other than Safety Inspection Locations

The CST must arrange to notify Mechanical Services when trains lift cars at other than designated Safety Inspection Locations.

4.0 Pre-Departure Inspection Procedures (by other than a certified car inspector)

4.1 Hazardous Conditions

At each location where a freight car is placed in a train and a Certified Car Inspector is not on duty for the purpose of inspecting freight cars, the freight car must, as a minimum requirement, be inspected for these hazardous conditions:

- Car body leaning or listing to the side,
- Car body sagging downward,
- Car body positioned improperly on the truck,
- Object dragging below the car body,
- Object extending from the side of the car body,
- Plug door open or any door out of guide,
- Broken or missing safety appliance (e.g. handhold, ladder, sill step),
- Insecure coupling,
- Brake that fails to release,
- Missing “end cap bolt” on a roller bearing,
- Overheated wheel or journal,
- Broken or cracked wheel,
- Any other apparent safety hazard likely to cause an accident or casualty before the train arrives at its destination,
- Lading leaking from a placarded dangerous goods car,
- Suspicious or dangerous objects, including Improvised Explosive Devices (IED’s),
- Obvious leakage or spillage from grain cars.

On passenger trains, see also Section 9, Item 10.0 – Safety Inspections.

If carrying cars with dangerous goods, see Section 8, Dangerous Goods, item 1.1.

4.2 Performing the Pre-departure Inspection

- Inspect both sides of each car.
- Perform a standing inspection on both sides, or a standing inspection on one side, then a roll-by inspection on the other.
- The roll-by inspection must not exceed 5 MPH.

Note: A pre-departure inspection may be made before or after the car(s) is added to the train.

4.3 Hazardous Condition Found

If any hazardous condition is found during the pre-departure inspection, then:

- report it to the proper authority and if safe to do so:
- correct the condition, or
- remove the defective car from the train, or
- move the car to another location, taking whatever actions necessary to ensure the safe operation of the train and the safety of the employees (e.g., reduce speed).

Note: Before entering the USA, defective cars must be set off at a location capable of making repairs.

5.0 Train Inspection Intervals

5.1 No train may be operated in excess of 60 miles, or move past 2 consecutive non-operational hot box detectors without having been inspected on each side of the entire train. These inspections must be performed by:

- (i) hot box detectors; or
- (ii) pull-by inspection by crew members of the train; or
- (iii) passing train inspection by:
 - wayside employees, or
 - crew members of other trains.

Note: Passing train inspections must be conducted by 2 employees on opposite sides of the train, within 1 train length of each other.

The inspection results must be conveyed to the train crew to be considered an inspection.

6.0 Locomotive Engineers Inspecting Passing Trains

In the application of CROR Rule 110 (a) the Locomotive Engineer must complete a full service brake pipe reduction before vacating the cab of the locomotive.

7.0 Crew Change Pull-by Inspections

7.1 Trains operating WITHOUT a caboose must perform a crew change pull-by inspection (as per item 8.0) if the train meets ANY of the following three conditions:

a) train consist documents state:

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*****
PULL BY INSPECTION REQUIRED AT CREW
CHANGE POINTS AS PER GOI SECTION 5
ITEM 7.1 APPLIES
IN CANADA ONLY
*****

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b) it is known or suspected that the train contains loads prone to shifting.

- Loads prone to shifting include: lengthwise loads of pipe, timber, poles, metal rods or other similar material, that are not protected by end bulkhead to top of lading.

Note: Loads NOT prone to shifting include:

- flat cars loaded with steel plates or machinery, and
- bulkhead flats loaded with banded or packaged lumber which does not extend above the bulkhead by more than 50 percent.

c) the train contains one or more cars containing dangerous goods (including residue cars) for which an Emergency Response Assistance Plan (ERAP) is required as identified by consist header (a).

Note: For cars lifted enroute, Compressed Waybill and/or Shipping Document will indicate a ERAP/ERP number if applicable.

7.2 Notification of Crew Change Pull-by Inspection

If a pull-by inspection will be needed, but the train consist documents do NOT contain the warning described in item 7.1 a), then the incoming conductor must advise the:

- RTC,
- Responsible manager, (if applicable)
- outgoing crew (when a personal transfer occurs)

The need for a crew change pull-by inspection must be reported on the **Crew to Crew Form**.

7.3 OTHER than Regular Crew-Change Points

When a crew change pull-by inspection is required under the provisions of item 7.1:

- If the relieving crew takes over control of the train directly from the relieved train crew, then no inspection is required.
- If the relieving crew does NOT take over control of the train directly from the relieved train crew, then a pull-by inspection (or combination standing pull-by inspection) is required.

7.4 Trains entering Canada from the USA

All trains entering Canada from the United States must receive a pull-by inspection at the first crew change location encountered in Canada.

Note: Trains that receive a pull-by inspection at border locations comply with this instruction.

8.0 Pull-by Inspection Procedure

8.1 Performing pull-by inspection (for other than meeting the purposes of the Section 13: *Air Brake Tests and Procedures*)

Both sides of the train must be inspected.

Position a crew member (or other qualified person) on each side of the track close to the moving train.

If only one crew member is available, then a standing inspection, or combination standing/pull-by inspection is permitted.

Movement must not exceed 15 MPH.

Inspect for defects and dangerous conditions.

Positioned employees must inspect for defects and dangerous conditions, including indications of.

- sticking brakes,
- skidded wheels,
- damaged or derailed equipment, and
- any apparent condition deemed unsafe for continued movement.

Inspection results at crew change points.

At crew changes, the outbound crew must be given the results of the pull-by inspection:

- verbally (in person, or by radio), or
- by the Crew to Crew Form (when the outbound crew does not take over control directly from the inbound crew).

If the outbound crew does not receive the inspection results, then an outbound pull-by inspection must be performed.

Note: All defects noted during a pull-by inspection must be reported on **Form 1225** and faxed to the **NMC Car Planning Specialist: (403) 205-9127**

9.0 Inspection When Equipment is Stopped on a Bridge.

- a) On a bridge without catwalks, where types of railway equipment permit, or where the bridge structure itself permits:
 - crews may use these to gain access to the trouble area or traverse the bridge;
 - employees must not put their personal safety in jeopardy;
 - employees must not walk on tops of cars with running boards removed.
- b) Car(s) stopped on a bridge requiring replacement of air hoses or knuckles may be pulled off the bridge with brakes applied provided:
 - sufficient brakes on the remaining cars on the train can be released to permit movement without the use of excessive force.
- c) Where car(s) stopped on a bridge have more serious defects, or where the train cannot be moved account insufficient brakes released;
 - the RTC or Operating department must be contacted for assistance.

10.0 Defect Suspected - IMPORTANT

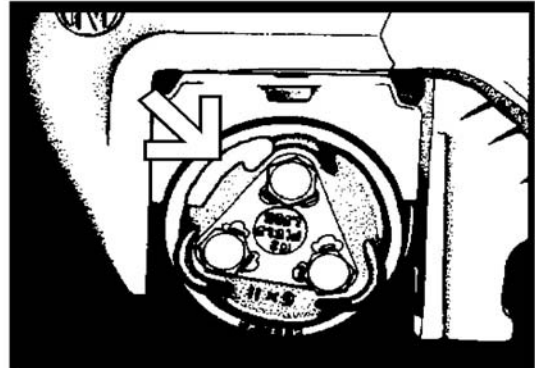
When, an overheated bearing or other defect is suspected by other than an HBD inspection, item 22.0:

- stop the train immediately, and
- make a close inspection.

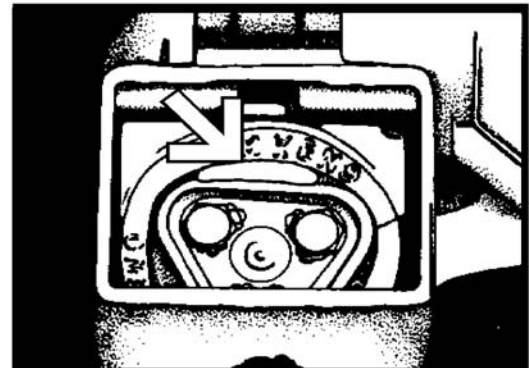
11.0 Overheated Bearings

11.1 Testing for Overheated Bearings

- a) Roller bearings - apply a temperature indicating crayon to the face or side of the outer ring (cup) of the roller bearing.

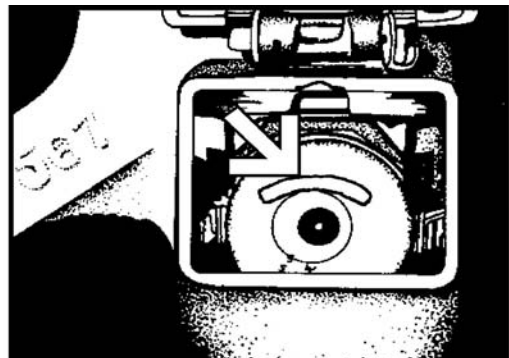


Roller Bearing



Roller Bearings Inserted in Friction Bearing Truck Side Frames

- b) Plain bearing - open the journal box cover and apply a temperature indicating crayon to the end of the journal.



Plain Bearing

- c) Check heat indicators if so equipped.

11.2 Bearing Inspection using the Back of the Bare Hand and Temperature Indicating Crayons (200°F):

CAUTION: When using the back of the hand, **do not** physically touch the bearing housing if excessive heat is felt as your hand approaches the bearing housing or axle.

A	<p>Required Equipment:</p> <ul style="list-style-type: none"> All crew members, other than locomotive engineers, of each movement must be in possession of a temperature indicating crayon (200°F).
B	<p>Crayon Application:</p> <ul style="list-style-type: none"> Use crayon as per illustrations in item 11.1 Crayon may not melt at or below freezing.
C	<p>Crayon Results:</p> <ul style="list-style-type: none"> Wax-like, shiny smear indicates overheated bearing. Thin, coloured line indicates the metal is not overheated (i.e., metal is below the temperature indicated on the crayon).
D	<p>Inspection Procedure:</p> <ul style="list-style-type: none"> Inspection for suspected overheating must include feeling the roller bearing housing using the back of the bare hand and use of the temperature indicating crayon. When using the temperature crayon, the employee performing the duties must mark the bearing housing and end bolt(s) with sufficient force with the crayon to make an identifiable mark to indicate that it has been checked. (see second bullet 11.2 (c)). In all cases, inspection must be as instructed by Section 5, item 24.0, which requires an inspection of 8 axles in both directions, both sides from a defect that is found and 16 axles in both direction, both sides if no defect is found.

11.3 Overheated Bearing Confirmed

If a bearing has overheated, then:

- set-out the car at the first available location, or location designated by the Time Table,
- complete **Form 1225**, and notify the RTC.

12.0 Overheated, Hot, Skidded, and Shelled Wheel Defects

12.1 Overheated Wheels (Pre-departure Inspection/En route)

This applies to trains detecting hot wheels en route, or at any location where a freight car is to be placed in a train and a certified car inspector is not on duty to conduct inspections.

- a) Safety Defect:
 - Heat discoloration on any type of wheel which extends more than 4 inches from the rim into the plate, on both the front face and back face.
- b) Actions to be taken:
 - Set off car with safety defect at first available location;
 - Do not place a car with a safety defect in the train;
 - Complete **Form 1225**, and notify RTC.

12.2 Hot Wheels (En route)

- a) Detection/Description:
 - Trains required to stop and inspect for a hot wheel condition (i.e. stopped at hot box detectors);
 - Usually caused by sticking brakes or set hand brakes.
- b) Safety Defect:
 - Brakes that cannot be released.
- c) Actions to be taken:

1	Check for sticking air brakes and set hand brakes. (Refer to item 13.0, Sticking Brakes, for cause and release of sticking brakes.)
2	If the brakes are successfully released, then perform a pull-by inspection of the car to ensure: <ul style="list-style-type: none"> wheels are turning freely, and all skids and shells are detected.
3	If the brakes cannot be released, then the car must be set off at the first available location.
4	Complete Form 1225 , and notify RTC.

12.3 Skidded and Shelled Wheels

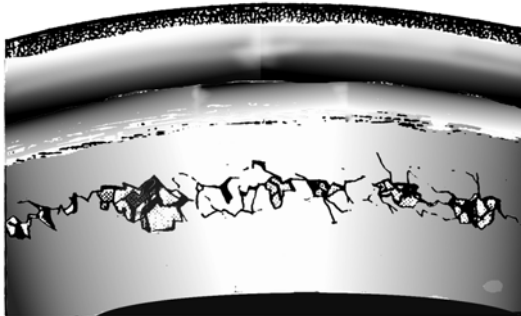
a) Detection/Description:

- Detected by observing or being advised of pounding wheels.
- Skidded wheel - a wheel that has flat spots.



Skidded Wheel

- Shelled wheel - a wheel tread defect where portions of the tread surface are missing.



Shelled Wheel

b) Safety Defects:

- A skid measuring more than 2 ½ inches in length.
- Two adjoining skids each measuring more than 2 inches in length.
- A shell spot that is more than 1 ¼ inches in width and 1 ½ inches in length.

c) Actions to be taken:

1	If other than a UTO mandated inspection, proceed at SLOW SPEED to the first location where an inspection for skidded and shelled wheels can be made.
2	Closely inspect for skids and shell spots, measuring to determine if safety defects exist.
3	Check for sticking air brakes and set hand brakes. (Refer to item 13.0, Sticking Brakes, for cause and release of sticking brakes.)
4	If the brakes are released, then perform a pull-by inspection of the car to ensure: <ul style="list-style-type: none"> • wheels are turning freely, and • all skids and shells are detected.
5	If any safety defects exist, then the car must be set off at the first available location.
6	Complete Form 1225 , and notify RTC.

12.4 Wheel Impact Load Detector (WILD) Sites

When wheels with excessive impact are measured by a WILD site, crews are governed by advice received from the RTC, rather than item 12.3 c) above.

13.0 Sticking Brakes

Sticking brakes refers to brake shoes that are against the wheel (applied position) when they should be clear of the wheel (released position).

13.1 Indications of sticking brakes:

- a) A defect indicated by a Hot Box Detector System.
- b) Brake cylinder piston in applied position.
- c) Hand brake chain tight.
- d) Noise of brake shoes against rotating wheels.
- e) Odour of hot metal or burning oil.
- f) Smoke, sparks or fire around wheels and brake shoes.
- g) Sliding wheels.

13.2 Causes of sticking brakes:

- a) An insufficient brake pipe reduction to ensure proper release.
- b) Hand brake not fully released.
- c) Retaining valve not in direct exhaust position.
- d) Defective automatic slack adjuster.
- e) Binding or fouled brake rigging.
- f) Overcharged air brake systems.
- g) Excessive brake pipe leakage.
- h) Defective control valve.

13.3 To release a suspected sticking brake:

1	Ensure the hand brake is fully released.
2	Ensure the retainer is set to direct exhaust.
3	<p>If the brake cylinder is in the applied position, then request the locomotive engineer to make a full service brake application and then release.</p> <ul style="list-style-type: none"> • If the brakes release on the affected car, then do NOT cut out the car brakes. Proceed. • If the brakes do not release on the affected car, then cut out the car brakes and bleed the air system.
4	<p>If the brake cylinder is in the release position, and the brake rigging indicates the brake is applied, then attempt to release by applying the hand brake fully and releasing several times.</p> <ul style="list-style-type: none"> • If sticking continues the car must be set out at the nearest available point.

14.0 Cutting Out Car Air Brakes

Car air brakes must NOT be cut out except when:

- a) Any portion of the rigging has failed.
- b) There is a continual blow at the control valve exhaust or at the pressure retaining valve.
- c) When pipes are broken beyond the branch pipe cut out cock.

Note: When a brake is cut out at the branch pipe, the combined auxiliary and emergency reservoirs must be completely drained.

15.0 Inspection Required Following an Emergency Brake Application While Moving

15.1 Passenger Trains Stopped by an Emergency Brake Application

Before the movement resumes:

- each car must be inspected to ensure all brakes are released,
- a pull-by inspection of the train must also be made - **without exception**.

15.2 All Other Trains Stopped by an Emergency Brake Application

a)	<p>Complete a pull-by inspection (on at least one side of the train), watching in particular for:</p> <ul style="list-style-type: none"> • skidded wheels, • applied brakes, and • evidence of derailment. <p>If a pull-by inspection cannot be made due to terrain, proceed at SLOW speed to the first location where a pull-by inspection can be made.</p>
b)	<p>If there is evidence of derailed equipment or unusual train action, then stop the train immediately and determine the cause.</p>
c)	<p>Record, on the Crew to Crew Form, the:</p> <ul style="list-style-type: none"> • location the emergency brake application occurred, and • results of the pull-by inspection.

Exception: A pull-by inspection of the entire train is NOT required if ALL of the following conditions are met:

- 1) a pull-by inspection was performed for a previous emergency brake application and documented on the **Crew to Crew Form**;

- 2) Train tonnage is:
 - less than 6,000 tons; or
 - 6,000 tons or more, and each car (except a caboose marshalled as the last car) exceeds 100 gross tons.
- 3) speed at time of the emergency brake application was greater than 25 MPH;
- 4) the emergency brake application occurred within 15 seconds of initiating a service brake application;
- 5) no unusual slack action was noted during the stop;
- 6) when the brakes are released, the air flow indicator and rear car brake pipe pressure readings indicate no loss of air pressure; and
- 7) the train is NOT carrying SPECIAL dangerous commodities.
 - If conditions 1 through 6 have been met, **but** the train is carrying SPECIAL dangerous commodities, then complete a pull-by inspection from the leading locomotive to the last car containing SPECIAL dangerous commodities.

15.3 Employees Performing Emergency Brake Application Pull-by Inspection

This pull-by inspection may be made by:

- crew members of the train itself;
- crew members of a stopped train;
- other wayside employees.

The person making the inspection must have a portable radio and be informed of the situation.

16.0 Reporting Detention or Defects

16.1 Form 1225: “Report of Detention to Trains, Repairs to Cars En route, Air Brake Cut OUT, Disabled Cars Set Out and Hot Box Detector Report”

16.2 The conductor must complete **Form 1225** when:

- a train is stopped for unscheduled inspection,
- a train crew makes repairs en route to any car (e.g. replacing knuckles, air hoses, etc.),
- brakes are cut out,
- any hot box detector information is provided, except “No Alarms,”
- a hot box detector appears to be inoperative.

16.3 The conductor must complete all applicable parts of **Form 1225**, including “Other Particulars.”

- “Other Particulars” should include:
 - the specific location of the defect (e.g., B end, or A end),
 - reservoirs drained or brakes cut out at the branch pipe, and
 - details of inspection (e.g., whether a temperature indicating crayon was used).

16.4 Form 1225 Information.

a) **Conductor** must:

- Transmit **Form 1225** information to the RTC verbally, at first opportunity:
 - car or engine number of the defective or suspected defective equipment;
 - condition found;
 - type of defective bearing (e.g., plain or roller);
 - action taken.
- Leave a copy on the train (for the relieving conductor at run-through terminals, the Mechanical Officer at final destination).
- Fax the original copy of Form 1225 to the NMC – Network Manager Car: **(403) 205-9127**

b) RTC must advise the mechanical department of all details of defective equipment, including:

- set off location,
- nature of temporary repairs, and
- other actions taken (e.g., brakes cut out).

17.0 Crew to Crew Form

The **Crew to Crew Form** provides each relieving crew with information regarding the condition of the train, including:

- hot box detector information and details of inspections, including whether a defect was found;
- emergency brake application inspection report;
- results of inbound train inspection;
- location of all hand brakes applied;
- details of any brakes cut out (including reservoirs drained);
- details of any defective cars being moved in the train (including actions taken to move them safely); and
- locomotive defects.

Note: Locomotive defects must also be reported to the Central Locomotive Specialist (1-800-308-6426).

The Crew to Crew Form remains on the train for the information of train crew members until destination. It is not collected by mechanical services.

HOT BOX DETECTOR and WILD INSTRUCTIONS

18.0 General

18.1 CROR Rules 110 and 111

These instructions are in addition to the requirements of CROR Rules 110 and 111.

18.2 Definition – “Train”

Where the term “train” appears herein, it also applies to a transfer and/or engine.

HBD EQUIPMENT DESCRIPTIONS

19.0 Hot Box Detectors (HBD) Description

HBD's operate for trains in either direction on the track in which they are installed.	
HBD's detect the following:	
Dragging Equipment:	Detects equipment dragging between or near the rails.
Hot Box:	Detects overheated journals by measuring the temperature of the heat radiated from the journal box. Hot Box alarms can also be caused by overheated traction motor suspension bearings and sticking brakes.
Hot Wheel:	Detects sticking or dragging brakes, and set hand brakes by measuring the temperature of the heat radiated from the wheel rim.
Temperature:	Measure outside temperature and report it after the entire train passes the HBD. Temperature is used in the application of Hot and Cold Weather Temperature Speed Zones. Note: Temperatures will be given in degrees C in Canada and degrees F in USA.
Some HBD's also detect:	
Dimensional Shipment:	Detect shipments exceeding acceptable dimensions. A dimensional shipment may be loaded or empty, i.e. leaning car body, sagging car body, improper positioning on trucks or shifted load, etc. When the train is passing, a tone is transmitted without an announcement. The final results message specifies dimensional equipment. Time table footnotes indicate locations equipped with dimensional shipment detectors.

5

20.0 HBD Talker Description

HBD's have a "talker" that transmits, by train radio, a recorded voice message of alarm data. Alarms are announced as the train passes, and are repeated after the entire train passes the HBD location. There are two models of HBD's in use on CP, the older systems will repeat the results message twice while the new model only announces the result message once, a DTMF code must be entered to have the HBD repeat the message. DTMF codes for each HBD will be indicated in the Time Table or by Special Instruction.

Hot box detectors equipped with a bilingual talker transmit a message in French and repeat the message in English.

No Alarms – Final Results Messages

If there are no alarms the talker transmits one of the following messages immediately after the rear of the train passes the HBD.

Older Model HBD: After a two second pause, the message is repeated once, followed by "Message complete; detector out."

New model HBD: No automatic repeat and no post message. DTMF code may be used to repeat last message. Repeated message is preceded by the word "Repeat". ("Message complete; detector out" will not be announced on the repeat.)

No Alarms			
Situation	Older Model HBD Results Message	New model HBD Results Message	Repeat
System working – no alarms	"CP detector, Mile (number), (subdivision), (track), Temperature (temperature) degrees, total axles (number), no alarms."	"CP detector, Mile (number), (subdivision), (track), (temperature) degrees, axles (number), no alarms."	DTMF
System NOT working – no alarms	"CP detector, Mile (number), (subdivision), (track), Temperature (temperature) degrees, total axles (number), system not repeat not working."	"CP detector, Mile (number), (subdivision), (track), (temperature) degrees, axles (number), system not working."	DTMF
		Note: DTMF code to repeat last message preceded by the word "Repeat".	

Alarm Announcements While Passing HBD

As the train passes the HBD, the talker transmits a one second alert tone and announcement for each alarm. The following table summarizes the announcements.

Alarm Announcements while Passing HBD			
Situation	Older Model HBD Announcement	New model HBD Announcement	Repeat
Dragging Equipment	Tone + "dragging equipment"	Tone + "dragging equipment"	None
Hot Box	Tone + "hot box"	Tone + "hot box"	None
Hot Wheel	Tone + "hot wheel"	Tone + "hot wheel"	None
Dimensional Shipment	Tone only	Tone + "Dimensional Shipment"	None

Alarms - Final Results Message

If there are alarms, the talker transmits a two-second tone followed by a final results message. This message is in addition to the alarm announcements and tones while a defect passes the HBD.

The final results message lists defects sequentially, starting with the defect nearest the head-end. Location is given by axle number from the front of the train, including locomotive axles.

Older Model HBD: After a two second pause, the message is repeated once, followed by “Message complete; detector out.”

New model HBD: No automatic repeat and no post message. DTMF code may be used to repeat last message. Repeated message is preceded by the word “Repeat”. (“Message complete; detector out” will not be announced on the repeat.)

Examples of messages are summarized in the following table.

Alarms After Passing HBD			
Situation	Older Model HBD Results Message	New model HBD Results Message	Repeat
Single Alarm	“CP detector, Mile (number), (subdivision), (track), Temperature (temperature) degrees, total axles (number), (number) alarms, (number) alarms.”	“CP detector, Mile (number), (subdivision), (track), (temperature) degrees, axles (number), (alarm type), (rail), axle (number)	DTMF
Six or less alarms (Lists up to six alarms)	“CP detector, Mile (number), (subdivision), (track), Temperature (temperature) degrees, total axles (number), (number) alarms, (number) alarms.” First alarm, hot box, (rail), axle (number) Second alarm hot wheel, near axle (number) Third alarm, dragging equipment, near axle (number) Fourth alarm,... Fifth alarm, ... Sixth alarm, ...”	“CP detector, Mile (number), (subdivision), (track), (temperature) degrees, axles (number), (number) alarms.” First alarm, hot box, (rail), axle (number) Second alarm hot wheel, near axle (number) Third alarm, dragging equipment, near axle (number) Fourth alarm,... Fifth alarm, ... Sixth alarm, ...”	DTMF
More than six alarms (lists first alarm plus instruction)	“CP detector, Mile (number), (subdivision), (track), , Temperature (temperature) degrees, total axles (number). More than six alarms. First alarm, axle (number). Inspect entire train, both sides from first alarm to rear of train, or as instructed.”	“CP detector, Mile (number), (subdivision), (track), (temperature) degrees, axles (number). More than six alarms. First alarm, axle (number). Inspect entire train, both sides from first alarm to rear of train, or as instructed.”	DTMF
System NOT working – with alarms		“CP detector, Mile (number), (subdivision), (track), (Temperature) degrees, axles (number), (One of the above alarm formats), system not working.”	DTMF
		Note: DTMF code to repeat last message preceded by the word “Repeat”.	

21.0 Procedures – Approaching and Passing Over HBDs

21.1 Approaching HBDs

When approaching a HBD...		
Step	Responsible Employee(s)	Action
1	Locomotive Engineer	Brakes – Avoid prolonged use of train brakes where practicable, until the entire train passes the HBD. (This prevents false hot wheel and hot box alarms.)
2	Crew members	Radio - Ensure the train radio is on the correct train standby channel.

21.2 Passing over HBDs

When the train reaches the HBD...		
Step	Responsible Employee(s)	Action
1	Locomotive Engineer	DMD (Distance Measuring Device) – Set the DMD as soon as the train reaches the HBD location. (Distance helps identify defect location and identify when to expect the final results message. Axle count is unavailable until the rear of the train passes over the HBD.)
2	Crew members	Radio – Avoid using the radio system until after the final results message has been transmitted. (This prevents talking over a tone or announcement.)
3	Crew members	Verbal Communication – Confirm, while passing the HBD, any defects announced.

22.0 HBD Alarms and Procedures Summary

No Alarms: If the final results message reports “no alarms,” then **proceed** without an inspection.

Note: If there was an announcement indicating “Hot box”, but the final results report “no alarms”, then resume speed and proceed without an inspection.

Use this table to identify the appropriate HBD procedure for various events.

	Events	Procedure
A	Defect: Dragging equipment announced while passing HBD.	See item 23.1.
B	Defect: Hot box announced while passing HBD.	See item 23.2.
C	Defect: Hot wheel announced while passing HBD.	See item 23.3.
D	Defect: alert tone only while passing HBD.	If this is a dimensional shipment detector, then see item 23.4.
E	Final results message reports “ system not working. ”	a) If any announcement and/or alert tones were heard, then inspect the entire train following the procedures in items 23.1, 23.2, 23.3 and 23.4 as applicable. b) If no announcement and/or alert tones are heard, then inspect the train only if carrying SPECIAL dangerous and the HBD is noted by ** in the time table. See item 27.0.
F	Speed is 8 MPH or less passing an operating HBD and final results message reports a defect.	Inspect the entire train following the procedures in items 23.1, 23.2, 23.3 and 23.4 as applicable.
G	Speed is 8 MPH or less passing an operating HBD and final results message reports NO defect.	Inspect the train only if carrying SPECIAL dangerous and the HBD is noted by ** in the time table. See item 27.0.
H	Defect announced while passing the HBD, but message unclear or in doubt.	Reduce to Slow Speed and listen carefully to the final announcement.
I	Final results message reports defect, but the location is not heard or is in doubt.	Inspect the entire train following the procedures in items 23.1, 23.2, 23.3 and 23.4 as applicable.
J	No final results message received.	a) If any announcement and/or alert tones were heard, then inspect the entire train following the procedures in items 23.1, 23.2, 23.3 and 23.4 as applicable. b) If no announcement and/or alert tones are heard, then inspect the train only if carrying SPECIAL dangerous and the HBD is noted by ** in the time table. See item 27.0.
K	HBD withdrawn from service by GBO/DOB or by Operating Bulletin.	No inspection unless the train is carrying SPECIAL dangerous and the HBD is noted by ** in the time table. See item 27.0.
L	Incorrect axle count and the final results message reports No defects.	<ul style="list-style-type: none"> • No inspection unless the train is carrying SPECIAL dangerous and the HBD is noted by ** in the time table. See item 27.0. • See item 25.0, Incorrect Axle Count.

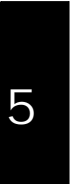
23.0 Alarm Procedures

23.1 Dragging Equipment

When an alert tone is followed by the announcement “dragging equipment”...	
Step	Action
1	Note the DMD reading.
2	Stop the train immediately using good train handling practices.
3	Perform a stationary train inspection. a) If the entire train passes the HBD location before stopping , then locate the defect using the axle count as per item 24.1. b) If the train is stopped before the entire movement passes the HBD , then locate the defect using the noted DMD distance as per item 24.2.
Note	Do not pull ahead to a crew member to perform the inspection, unless it is unsafe to walk back. If it is unsafe to walk back, then pull ahead not exceeding 10 MPH to inspect for defect. If the train must be pulled ahead over a facing point switch , do not exceed 5 MPH .

23.2 Hot Box

When an alert tone is followed by the announcement “hot box”...	
Step	Action
1	Note the DMD reading.
2	Immediately reduce to Slow Speed using throttle modulation and dynamic brake, and without using the air brakes, if possible. <ul style="list-style-type: none"> If a subsequent announcement states “dragging equipment,” then stop immediately and follow the procedure for dragging equipment.
3	Observe the train for defects. If the defect is visible from the cab of the locomotive, then stop the train immediately and inspect. (See item 24.2, Locating Defects using Measured Distance.)
4	When the rear of the train has passed the HBD and the final results messages have been reported, stop the train, making every reasonable effort to stop before a facing point switch. <ul style="list-style-type: none"> Note: If an inspection point is designated, then proceed at Slow Speed (without stopping) to the inspection point. Exception: if the final results message reports more than six alarms, stop the train immediately to perform the inspection.
Note	If the final results message reports “No Alarms” then resume speed and proceed without an inspection. (The final message corrects for inaccurate readings of converted plain bearing journals).
5	Perform a stationary train inspection. a) Locate the defect using the axle count as per item 24.1. b) See item 11.0, to test for overheated bearings.
Note	Do not pull ahead to a crew member to perform the inspection, unless it is unsafe to walk back. If it is unsafe to walk back, then pull ahead not exceeding 10 MPH to inspect for defect. If the train must be pulled ahead over a facing point switch , do not exceed 5 MPH .



23.3 Hot Wheel

When an alert tone is followed by the announcement “hot wheel”...	
Step	Action
1	Note the DMD reading.
2	Immediately reduce to Slow Speed using throttle modulation and dynamic brake, and without using the air brakes, if possible. <ul style="list-style-type: none"> • If a subsequent announcement states “dragging equipment” or “hot box,” then follow the procedure for that alarm.
3	Observe the train for defects. If the defect is visible from the cab of the locomotive, then stop the train immediately and inspect. (See item 24.2, Locating Defects using Measured Distance.)
4	When the rear of the train has passed the HBD and the final results messages have been reported: <ul style="list-style-type: none"> • allow a crew member to detrain, and • pull the train ahead, not exceeding 10 MPH, to the hot wheel defect. <p>Exception: If an inspection point is designated, then proceed to the inspection point, not exceeding Slow Speed and perform the inspection.</p> <p>Note: If the final results message reports more than six alarms, stop the train immediately and perform a stationary inspection. It is not acceptable to pull the train ahead to the defects.</p>
5	Perform an inspection . <ol style="list-style-type: none"> a) Locate the defect using the axle count as per item 24.1. b) To inspect for the hot wheels, see item 12.2, Hot Wheels (En route).

23.4 Dimensional Shipment

This instruction applies only to **HBDs equipped with dimensional shipment detectors**, as listed in the time table subdivision footnotes.

When an alert tone is heard <u>without</u> an announcement...	
Step	Action
1	Note the DMD reading.
2	Immediately reduce to Slow Speed using throttle modulation and dynamic brake, and without using the air brakes, if possible. <ul style="list-style-type: none"> • If a subsequent announcement states “dragging equipment” or “hot box,” then follow the procedure for that alarm.
3	Observe the train for defects. If the defect is visible from the cab of the locomotive, then stop the train immediately and inspect. (See item 24.2, Locating Defects using Measured Distance.)
4	When the rear of the train has passed the HBD and the final results messages have been reported: <ul style="list-style-type: none"> • allow a crew member to detrain, and • pull the train ahead, not exceeding 10 MPH, to the dimensional shipment. <p>Exception: If an inspection point is designated, then proceed to the inspection point, not exceeding Slow Speed and perform the inspection.</p>
5	Perform an inspection , using axle count to locate the defect as per item 24.1.

24.0 Procedures for Locating Defects

24.1 Locating Defects using Axle Count

When available, use axle count to locate defects (rather than distance measured using the DMD).

Step	Action
1	Note the location of the defects stated in the final results message.
2	Locate the defects by counting the actual axles from the front of the train, beginning with the lead locomotive. Ensure cars and locomotives with other than four axles are not counted as having four axles.
3	Inspect the train in the specified location. <ul style="list-style-type: none"> If a defect is found at or near the indicated location, then inspect both sides of the train for 8 axles in each direction from the suspected defect. (This helps verify that the defect has been correctly identified.) If a defect is not found at the indicated location, then inspect both sides of the train for 16 axles in each direction from the indicated location.
4	If any part of the train passed the HBD at 8 mph or less , then inspect the entire train for additional defects.
5	Notify the RTC of the inspection results and take appropriate action (e.g., make repairs, set off car, etc.).
6	Complete the reporting requirements . See: <ul style="list-style-type: none"> item 16.0, Reporting Detention or Defects, and item 17.0, Crew to Crew Form.
7	If the defect was a suspected hot box and no defect was found , see item 26.0, No Defect Found - Hot Box.
Note	Alarms from hot wheel detectors and dragging equipment detectors can only indicate the general vicinity of the alarm, rather than an exact location.

24.2 Locating Defects using Measured Distance

When axle count is unavailable, locate defects using DMD distance measured.

Step	Action
1	Determine the approximate location of the defect by using the: <ul style="list-style-type: none"> noted DMD distance, and train consist information (e.g., train length 2000 foot indicators, etc.)
2	Inspect the train at the measured location. <ul style="list-style-type: none"> If a defect is found at or near the indicated location, then inspect both sides of the train for 8 axles in each direction from the suspected defect. (This helps verify that the defect has been correctly identified.) If a defect is not found at the indicated location, then inspect both sides of the train for 16 axles in each direction from the indicated location.
3	Inspect the entire train for additional defects.
4	Notify the RTC of the inspection results and take appropriate action (e.g., make repairs, set off car, etc.).
5	Complete the reporting requirements . See: <ul style="list-style-type: none"> item 16.0, Reporting Detention or Defects, and item 17.0, Crew to Crew Form.
6	If the defect was a suspected hot box and no defect was found , see item 26.0, No Defect Found - Hot Box.

25.0 Incorrect Axle Count

When a HBD reports an incorrect Axle Count...	
Step	Action
1	Advise the RTC of the incorrect axle count and arrange to verify train consist information. <ul style="list-style-type: none"> • If the train is carrying an additional car or cars and any of these are dangerous goods cars, then arrange for a radio waybill (Section 8, item 3.7). • If any of these additional cars are SPECIAL dangerous, then the inspection requirements at HBDs indicated by a double asterisk (**) in the time table apply (item 27.0).
2	Use Form 125 (or any other appropriate form) to record the correct information.
3	If the train has placarded cars , then update the train consist to show the correct position of all placarded cars. (See Section 8, item 4.0.)
4	If the train has SPECIAL dangerous, then see item 27.0.
5	Communicate the correct information to the outbound conductor, and MYPM or Terminal Supervisor

26.0 No Defect Found - Hot Box

Whenever a car or engine is identified by an alarm for the defect “hot box” at the same axle location twice within 75 miles, and there is no apparent reason for the alarms, that car or engine must be set off at the designated set-off point.

Important: At crew-change points, leave the relieving crew a copy of **Form 1225** and **Crew to Crew Form** for any car or engine remaining on the train that was identified by a “hot box” alarm within 75 miles of the crew change point.

26.1 Passing Occupied Service Equipment cars

In the event that a car or engine is identified by an “hot box” alarm and no defect is found. Such train or engine is restricted to a maximum of 10 MPH while passing occupied service equipment cars as identified by GBO as per GOI Section 7, item 19.4, until passing the next operational detector with no “hot box” alarm.

27.0 SPECIAL Dangerous at Double Asterisk () HBD – Mandatory Inspection**

HBD identified in the time table by a double asterisk (**) indicate mandatory inspection points for trains carrying SPECIAL dangerous commodities. **Note:** the HBD must report a complete and accurate inspection.

- a) If a train carrying SPECIAL dangerous commodities passes a HBD identified with a double asterisk and:
 - the HBD is withdrawn from service,
 - the HBD reports "System Not Repeat Not Working" or is otherwise known to be inoperative,
 - any part of the movement passes the HBD at 8 MPH or less,
 - no message is received, or
 - the HBD reports incorrect axle count and system reports No alarms

then inspect the train **within one mile** of the mileage shown in the subdivision footnotes.
- b) Perform the inspection:
 - on both sides,
 - from the front of the train to and including eight axles behind the last full carload, containerload, or trailerload of a SPECIAL dangerous commodity,
 - at a speed not exceeding 5 MPH.
- c) The inspection can be performed by:
 - Mechanical department inspectors,
 - Crews of standing trains or transfer movements,
 - A pull-by inspection by crew members, or
 - A standing inspection.

28.0 Reporting Defective HBDs

- a) Notify the RTC when a HBD:
 - transmits a message to “inspect the entire train;”
 - does not transmit any messages;
 - transmits an improper message;
 - transmits a message difficult to hear or understand;
 - transmits the message “system not repeat not working;”
 - total axle count does not appear to be correct; or
 - reports a defect, but upon train inspection there is no defect found.
- b) Include appropriate details such as:
 - HBD location,
 - defect axle number,
 - suspect car number,
 - train direction,
 - side of train, and
 - type of defect reported by the HBD.
- c) The RTC must report this information to the appropriate S&C Support DESK.

29.0 Hot and Cold Weather Temperature Speed Zones

Note: Cold Weather Temperature Speeds do not apply to passenger trains.

- a) During extreme hot and cold weather, trains are governed by specific speed restrictions. The speed restrictions / zones, and specific hot & cold temperature ranges are specified by GBO and/or Summary Bulletin (SB).
 - When specific whole miles are indicated in the GBO/SB, the speed restrictions only apply between the mileages stated.
 - The HBD temperature announcement prior to the mileages stated, or as determined by thermometer, will govern speed until the next HBD transmission.
 - When no specific mileages are indicated in the GBO/SB, the speed restriction applies to the entire subdivision, unless or until otherwise indicated.
- b) The conductor must:
 1. Record the temperature on the Crew to Crew form (Other important information to subsequent crews section).
 2. Advise the RTC when a Hot or Cold weather speed restriction goes into effect and when it is terminated.

- 3. Transfer this information to the relieving crew, when applicable.
- c) When leaving an initial station or crew change point while extreme Hot or Cold weather temperature is suspected, determine the outside ambient temperature:
 - using an outside thermometer, or
 - as indicated on the Crew to Crew form.

If in doubt as to the outside ambient temperature, the speed restriction applies.

30.0 Steam Locomotive CP 2816

When a hot box detector broadcasts a hot box or hot wheel alarm(s) for any of the 7 axles of CP 2816, the alarm(s) may be disregarded providing that the locomotive is operating (under steam).

Exception: If more than **6 alarms** occur, then inspect the entire train as per item 23.2, Hot Box and item 23.3, Hot Wheel.

31.0 Wheel Impact Load Detectors (WILD)

31.1 Wheel Impact Load Detectors (WILD) measure excessive wheel impact on rail and identify defective cars using AEI car tag IDs.

The WILD transmits the information to a central location. Train crews do **not** hear a tone or a message. When a defective car is identified, the RTC relays instructions to the crew (e.g., speed restriction, set off location).

It is important to set off the car specified by the RTC, because serious defects may not be heard, visible, or otherwise identifiable by train crews. (e.g., A wheel out of round, with no associated sound, may create a greater rail impact than a skidded wheel that is audible.)

WILD detectors are installed at HBDs and other stand alone sites as follows.

<u>Subdivision</u>	<u>Mileage</u>
Mountain	47.80
Red Deer	22.80
Brooks	147.47
Swift Current	30.90
Indian Head	103.40
Carberry	43.05
Kaministiquia	59.37
Cartier	88.10
MacTier	25.46
Galt	42.72
Lacolle	18.74

