



*State of West Virginia*  
**Joe Manchin III, Governor**

**WV Office of Miners' Health, Safety & Training**  
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To: West Virginia Underground Operations  
From: Ronald L. Wooten, Director   
Date: June 8, 2010  
Re: Mine Safety Information Notice **0608-2010**

The WV Office of Miners Health Safety and Training in conjunction with MSHA and Joy have developed a resolution on the issue of portable hand-held radios use in conjunction with the Joy TX-3 remote control unit.

As an interim measure, until upgrades to the TX-3 can be implemented a satisfactory distance requirement must be maintained of no less than 18 inches between the portable hand-held radio being actively (keyed) used for communication and a TX3 radio remote control is required.

This Mine Safety Information Notice supersedes our previous recommendation that all portable hand-held radios be kept at least 200 feet outby where a TX-3 remote is being operated. This closer proximity allows mine operators to fulfill communications and tracking requirements mandated by W.Va. rules and the 2006 Miner Act.

The Joy Safety Notices provided to OMHS&T are attached.

Testing has determined that the TX3 radio remote Hall Effect devices can be affected by the portable hand-held radios with a power rating of 1 watt to 5 watts. We have not seen any communication or tracking device that has a transmitting power less than 1 watt affect a TX3 radio remote. The Hall Effect devices that can be affected are located between and include the START and the TRAM SPEED devices. These devices are not affected beyond 4 inches. The 18 inch requirement provides a satisfactory safety margin for use of a portable hand-held radio in proximity to a TX3 radio remote control.

There are two stipulations to this distance requirement. The first stipulation is that the TX3 operator cannot wear a remote (lapel) microphone. The remote microphone would allow the portable hand-held radio to be keyed closer than 18 inches from the TX3, when the portable hand-held radio is worn on the operator's belt. The operator must remove the portable hand-held radio from his/her belt and use it at face level for communication.

The second stipulation is that the portable hand-held radio cannot be worn so that it will come into physical contact with the TX3 radio remote. Our testing has shown that a portable hand-held radio may activate a Hall Effect sensor without being keyed when the speaker is oriented correctly and in physical contact with the TX3 radio remote case along the edge and corner where the affected devices noted above are located. We have only seen this event once and it only activated one Hall Effect device, but it must be taken into account.

The Structured Mining Model TXCM100 and the Forced Potato Type U-XXX/L0KA01 have not been demonstrated to be susceptible to the type of interference found in the TX-3; therefore, Mine Safety Information Notice 0125-2010 with recommendations relating to the use of handheld radios in proximity to them is rescinded.

If there is any report of interference between any other communication and tracking device and any other device, please report it to Randall Harris at OMHS&T (304) 558-1425 [randall.j.harris@verizon.net](mailto:randall.j.harris@verizon.net) or Richard O'Hanlon at MSHA (304) 547-2316 [ohanlon.richard@dol.gov](mailto:ohanlon.richard@dol.gov).

RLW/ks

Attachments (2)



# JOY GLOBAL SERVICE BULLETIN

Bulletin No.: **GSB0023**  
Page 1 of 4  
Date Issued: **14 DECEMBER 2005**  
Product: **CONTINUOUS MINERS**  
Type: **ALL REMOTE CONTROL MACHINES**  
Approval: **MS/CCV/COH/RWW/RLB/LJL**

## REMOTE CONTROL OPERATION OF JOY CONTINUOUS MINERS

(Replaces U.S. Service Bulletin 00FG-0176)

The concept of operating mining equipment by remote control provides increased operator safety and comfort while achieving maximum productivity from the machine. However, as with any piece of equipment this increased safety aspect can be realized only if safe operating practices are followed. **WARNING! Failure to follow the proper operating procedures could result in serious injury or death.** This bulletin provides some general guidelines. These guidelines apply to all Continuous Miner remotes, except where noted.

**Please distribute copies of this bulletin to all personnel who work with or around remote-controlled equipment. In addition, we recommend that you review these guidelines with all personnel during your regular safety meetings.**

The guidelines are as follows:

### A. POSITION OF PERSONNEL

The relative position of the operator and all other personnel to the machine is most important. ***One of the most significant potential hazards is being pinched between the machine and the rib. Therefore, all personnel must remain a safe distance from any remote controlled machine.*** Generally, personnel should avoid placing themselves between the machine and the rib unless there is sufficient clearance. Personnel must remain under an adequately supported roof and away from any hazards created by the machine or haulage equipment. Keep in mind that the conveyor boom swings from side to side, and therefore all personnel should stay clear of the arc of the boom. In addition, the operator must always be positioned so that he can determine the status of the methane monitor warning light on the machine being operated.

Under some situations it may be necessary for the operator to be positioned alongside the conveyor where the conveyor swing is a potential hazard. In these situations a variety of devices to disable the conveyor swing are available and should be considered. Depending upon conditions, it may be safe for personnel to position themselves next to the machine provided that all of the following conditions are met:

- personnel are under an adequately supported roof;
- personnel are a safe distance from the side of the machine;
- personnel are outside the arc of the conveyor boom;
- personnel are not located directly in front or behind the machine;
- personnel are not in the path of an oncoming shuttle car or other haulage vehicle.

Continued . . .

B. OPERATION IN CONJUNCTION WITH OTHER EQUIPMENT AND PERSONNEL

If the machine is being operated in conjunction with another machine that has an operator, such as a continuous haulage system or a shuttle car, the operator of the remote controlled continuous miner should position himself so that he can clearly see the operator of the other machine. If shuttle cars or other mobile haulage systems are being used in conjunction with the continuous miner, the operator must be careful not to position himself in the path of travel of these machines. In this situation, the best position for the operator may be alongside the continuous miner provided that he is a safe distance from the side of the machine, and that there is sufficient clearance between the operator and the rib. ***It is important to remember that since the continuous miner is a tracked vehicle, it can pivot. There must be sufficient clearance so that neither the operator nor any other personnel would be pinched between the machine and rib, in the event that the machine pivots.*** Likewise, the operator of a continuous miner should have a clear line of sight at all times to the miner helper and to anyone else assisting in the operation of the machine.

C. RADIO REMOTE CONTROL OPERATION

Radio remote control enables mine personnel to operate continuous miners and other equipment (e.g., longwall shearers, FCT's) unencumbered by a cable. However, because the machine may accept a "signal" from any transmitter of the same frequency as the receiver on the machine, certain precautions must be taken to insure against inadvertent operation.

Recommended precautions are as follows:

1. ***Prior to operating two miners in the same underground section, always verify that they are using separate frequencies for the transmitter/receiver set.*** The remote controls sold by Joy have multiple frequencies available. By using separate frequencies, two miners can safely operate in the same section. In addition, when operating JOY miners in the same section with other radio remote controlled equipment made by Joy or by other manufacturers, always verify that each piece of equipment is operating on a different frequency.
2. ***When two or more pieces of equipment are being operated in the same coal mine on the same frequency, it is essential to verify that the machines are separated by a sufficient distance so that there will not be interference to reduce downtime.***

A minimum distance of 1,000 feet between machines is recommended (measured using the shortest distance through crosscuts, entries, or other air openings). Do not operate spare transmitters, since a machine's receiver on pre-July of 2000 units cannot distinguish between an intended transmitter versus another identical transmitter.

Current "One Way" remote systems (units provided on Joy machines built since July of 2000) have a feature called Teach/Learn. Remotes with teach/learn capability are able to distinguish between two transmitters on the same frequency. When connected by cable to the receiver's teach/learn port, the transmitter exchanges serial number information with the receiver and sets its frequency to match that of the receiver. Once disconnected from the teach/learn port and activated in the normal operating mode, the receiver will only accept commands from the transmitter that is broadcasting the matching set of serial numbers on its frequency. If another transmitter is broadcasting on the same frequency, the receiver will "hear" it but will not obey the commands from this non-matching transmitter. If the non-matched transmitter is closer to the receiver such that its signal is stronger than the signal from the "matched" transmitter, then the receiver will cause the miner to shut down its pump, thus defaulting to a safe condition. As a "belt and suspenders" approach when there are two miners in the same section, it is recommended that they

have separate frequency receivers. This will eliminate the occurrence of “nuisance drop-outs” caused by same frequency interference.

Finally, in order to avoid accidental interfering with another radio remote controlled machine, ***do not energize the radio transmitter or electrically connect the receiver on a machine when above ground.*** Radio waves can travel much farther above ground than below ground. Due to the wide variations in conditions, it is not possible to place specific values for an operational distance. Therefore, always utilize the cable or on-board controls for aboveground operation.

**D. OPERATION FROM WITHIN THE MACHINE**

Some continuous miners may still have both remote control and on-board controls (i.e., inside the operator's platform). While it may be possible to operate a continuous miner that has on-board controls from inside the operator's platform using the remote station, Joy strongly recommends against this practice. Instead, if the machine is to be operated from inside the operator's platform, the remote control should be disconnected or de-energized, and the on-board controls utilized. Of course, when on-board controls are utilized they must be used in a manner consistent with applicable government regulations, e.g., the operator must be under a supported roof.

**E. POWER SOURCE FOR REMOTE CONTROL UNITS**

Some continuous miner models of JOY radio remote control units are designed so that the operator's cap lamp battery can energize the control. The unit is not designed to be operated by a separate battery attached to the remote, and Joy strongly recommends against this practice for several reasons. The primary reason is that when the operator moves away from the remote control, the only safe practice is for him to de-energize it by disconnecting it from its battery source, and leaving it on a firm surface. This will prevent another person from activating it while the operator is away. Having a separate battery attached to the remote control, permits the miner operator to walk away from the remote while it is still energized. In addition, when the remote is being operated with the umbilical cable, when the operator moves away from the remote, he should make certain that it is de-energized and on a firm surface. When the machine is not in use, remove power to avoid the possibility of unintentional operation.

Some continuous miner models of JOY radio remote control units are designed with their own internal battery. Once again, Joy strongly recommends that the operator not move away from the remote control. The only safe practice is for the operator to de-energize the unit before leaving it on a firm surface. Although this will not prevent another person from activating it while the operator is away, it will prevent the machine from immediate movement. In addition, when the remote is being operated with the umbilical cable, if the operator moves away from the remote he should ensure that it is de-energized and on a firm surface. When the machine is not in use, de-energize to avoid the possibility for unintentional operation.

**F. USE OF MAGNETS NEAR REMOTE CONTROL OPERATED EQUIPMENT**

MSHA (US regulatory agency) has recently published a Program Information Bulletin No. P05-05 regarding “Use of Magnets near Remote Control Operated Equipment”. The information described within that document lists three types of remote control units built by Matric, which are utilized on Joy Continuous Mining Machines. Two of the types indicate that the use of permanent magnets in proximity to them had no effect. One additional model should have been listed,

namely model TX2, which is also unaffected by the use of permanent magnets in proximity. Only one model used by Joy, Model TX3, was listed as being affected by a permanent magnet in proximity to the unit.

While tests show that a strong permanent magnet can have effect on the TX3 unit, Joy reiterates MSHA's results that state "When spaced 1 inch or more from the surface of the enclosure of any of the tested remote control units, the magnets had little or no effect on any Hall-effect switch". Strong permanent magnets can be used safely in the same operating section as machines equipped with Joy's TX3 remote control unit **provided that precaution of keeping strong magnets at least 6 inches away from the TX3 is followed.**

As stated in our previous Safety Notice dated 19 December 2003 concerning this subject, Joy strongly recommends that extreme caution be exercised when using magnets around the Lightweight Remote Control Station and reiterates that normal safe practices be used when operating with remote control. This includes observing the safe operating zones around the machine and not placing a powered remote station on a piece of energized equipment.

This information was taken from Joy Global Safety Notice GSN0004 was issued 24 March 2005 addressing this same subject.

#### G. MAINTAIN ONGOING FAMILIARITY WITH CONTROLS

*It is important for the machine operator to familiarize himself with the machine's controls each time the operator initially uses the machine.* This familiarization should be done with the machine and personnel in a safe operating area. This familiarization is necessary because of the following factors:

1. Directional movement may differ from machine to machine.
2. Location or sequence of handles may differ.
3. The same remote station may function differently on different machines, because of solenoid or wiring differences between machines.
4. Maintenance may have been performed on the machine that inadvertently changed control station lever response.

As you are aware, mining conditions vary greatly. Therefore, it is not possible to cover every conceivable situation. A general safety alertness among all personnel is essential.

Again, the remote control is a useful device, and as with any piece of equipment it must be used properly. Proper use of a remote control will greatly increase the safety and comfort of your personnel, while at the same time permitting you to achieve maximum productivity from your equipment.

END



Date: 04 June 2010

## **SAFETY NOTICE**

### **(UNITED STATES CUSTOMERS ONLY)**

**RE: Interference Between Hand-Held Portable Radio Units Operating at 1 Watt or Higher and Joy Mining Machinery's TX3 Remote Control Unit (used only in the United States)**

#### **Introduction:**

This Safety Notice is to advise the appropriate equipment owners of a potential safety hazard that may lead to the injury of mine personnel. This hazard is applicable to all Joy Mining Machinery TX3 remote control units.

**Please distribute and review this Safety Notice and Global Service Bulletin GSB0023 with all personnel who work with or around remotely operated equipment.**

#### **Description:**

Recently, Joy has been advised that various hand-held portable radio units operated at 1 watt and higher can cause electromagnetic interference when used in close proximity to the TX3 remote control unit. An initial investigation into this indicated that these radio units can cause the magnetic hall-effect switches contained on the top row of switches on the TX3 to possibly activate when the hand-held radio unit is "keyed" within four (4) inches of the rear side of the TX3 unit. This can cause the unintended start up of certain components of the continuous miner, such as the cutter head. Joy has agreed with MSHA to notify users of this possible interference and the recommended measures to protect against it.

As a possible long term solution, MSHA is currently investigating test methods to determine the acceptable level of immunity required for devices used in locations where hand-held portable radio units operated at 1 watt and higher are used. Once those new test methods and criteria are established, Joy will investigate possible upgrades to meet the immunity requirements. If a suitable upgrade is developed and approved by MSHA, it will be installed when existing units are returned for repair or exchange, as well as in new units.

#### **Joy Mining Machinery strongly recommends that you do the following:**

Until such time that an upgrade is available, Joy recommends the following Administrative Controls be used for mine operations that utilize hand-held portable radio units operated at 1 watt and higher:

- Maintain separation distance of 457mm (18 in) between hand-held portable radio units and the Joy TX3 units.
- Instruct the TX3 operator with a hand-held portable radio unit that the TX3 should be off before the radio is used. The operator should also be reminded to keep the radio at least 457mm (18 in) from the TX3.
- Remove the use of a remote keyed microphone/speaker; the radio operator must hold the handheld unit near his mouth and away from the TX3 unit when talking into the radio.

Please note that hand-held portable radio units operated at 1 watt and higher can be used safely in the same operating section as machines equipped with Joy's TX3 remote control unit provided that hand-held portable radio units are kept **at least 457mm (18 in) away from the TX3.**

Joy strongly recommends that extreme caution be exercised when using any communication devices around the TX3 Lightweight Remote Control Station and reiterates that normal safe practices must be used when operating with the remote control. This includes observing the safe operating zones around the machine and not placing a powered remote station on a piece of energized equipment. Please refer to Global Service Bulletin GSB0023 for additional information regarding remote control operation of Joy equipment (a copy of the bulletin accompanies this notice).

**FAILURE TO DO THE PRECEDING RECOMMENDED ACTIONS COULD RESULT IN SERIOUS INJURY OR DEATH.**

Please contact your Joy representative with any questions regarding the content of this Safety Notice or the recommendations contained in it.

END