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GRAIN LOSS MONITORS

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GENERAL DESCRIPTION

Grain loss monitors are electronic instruments designed to indicate combine grain loss. Sensors, sensitive to seed impacts, are mounted behind the straw walkers and the cleaning shoe. The signal from these sensors is displayed on a meter at the operator's station (FIGURE 1).

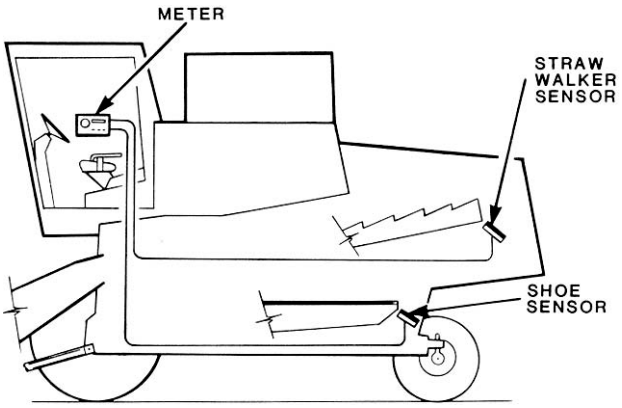

FIGURE 1

Most loss monitors are not designed to measure the actual amount of grain loss but will only warn the operator of increases or decreases in combine lossrate.

Commonly available models can be installed on conventional pull-type or self-propelled combines in about five hours using common tools. They range in price from $325 to $650.

FUNCTIONAL PERFORMANCE

Loss monitors require calibration to suit field conditions and combine loss characteristics to provide meaningful information.

Sensitivity must first be adjusted to discriminate between the particular variety of grain and bits of straw, chaff or weedseeds. This is done by adjusting the sensitivity control to suit the type of grain being harvested. A common method is to drop several grain kernels on the sensors and set the sensitivity control so that the indicator meter responds.

The combine should then be set to field conditions in the normal manner. Once the operator is satisfied with the combine setting, the loss monitor gain control should be set to indicate a reading of about one-third scale, which will represent satisfactory operation.

When this calibration has been accomplished the loss monitor will indicate relative changes in lossrate to the operator. A significant increase in the meter reading is a signal to reduce the feedrate by slowing down. A reduction in the meter reading is a signal that feedrate may be increased to optimize efficiency.

Changes in crop conditions often occur during the day. As a result, occasional loss checks should be made and the loss monitor readjusted, if necessary.

Loss monitors are not designed for use on the new axial threshing combines. Straw and grain, propelled from the back of the combine, strike the sensors at high velocity. When impacted in this way. most loss monitors cannot distinguish grain from straw and they read in error.

The shoe of an axial threshing combine could be fitted with sensors, however, a properly adjusted shoe normally has very low losses even at high feedrates. The use of a loss monitor on the shoe would only be to warn the operator of plugging or of loss increases on sidehills.

It is also suggested that, since the losses from an axial type combine are quite low at normal feedrates, the need of a loss monitor is questionable.

While loss monitors can warn the operator of changes in the lossrate, they do not accurately measure the amount of loss. FIGURE 2 shows a typical grain loss monitor reading compared to the actual grain loss of a combine. At higher feedrates, combine losses increase rapidly in proportion to the loss monitor reading.

Factors which affect monitor performance are the adjustment of the sensitivity control, sensor size and location, and the responsiveness of the meter.

The sensitivity controls of most loss monitors perform well in heavy grains such as wheat and barley, but only a few perform well in light seeds such as flax or rapeseed.

Sensor location is very important to the performance of a loss monitor. Several sensor locations are usually suggested in the operator's manual, however, it is advisable to observe the path of grain loss from the shoe and the straw walkers to determine the best locations.

Sidehill combining can cause significant increases in lossrate at the lower side of the shoe. Full width sensors, or two smaller

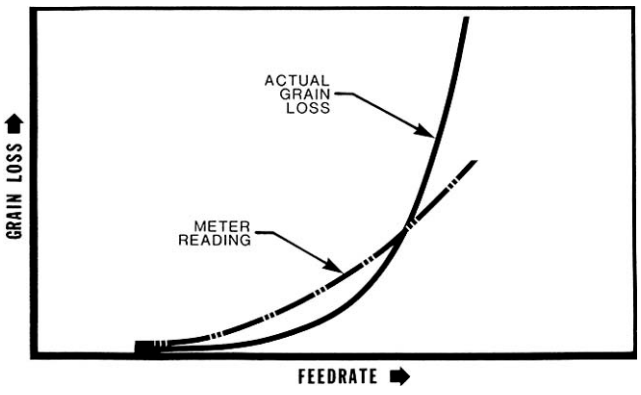

FIGURE 2.

sensors, appropriately placed, are necessary to monitor these losses.

The lossrate from a combine may fluctuate significantly over shorter periods of time. However, these fluctuations are usually too rapid for the operator to control. A responsive meter will fluctuate with these losses and be difficult to read. A dampened meter showing average lossrate is more desirable.

DEPENDABILITY

Loss monitors can give reliable service if installed correctly and handled carefully. Some loss monitors are affected by electrical interference from other components on the combine. This problem is usually identified by erratic meter readings and can be controlled by attaching an electrical noise suppressor to the instrument, or by using a dry cell battery to power the monitor.

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