source to automatically identify and retrieve missing transactions. This option is set using a `CHANGE REPLICATION SOURCE TO` statement (from MySQL 8.0.23) or `CHANGE MASTER TO` statement (before MySQL 8.0.23). If the replica has multiple replication channels, you need to set this option for each channel individually. For details of how GTID auto-positioning works, see Section 17.1.3.3, "GTID Auto-Positioning". When file position based replication is in use, `SOURCE_AUTO_POSITION=1` | `MASTER_AUTO_POSITION=1` is not used, and instead the binary log position or relay log position is used to control where replication starts.

- Set `sync_relay_log=1`, which instructs the replication I/O thread to synchronize the relay log to disk after each received transaction is written to it. This means the replica's record of the current position read from the source's binary log (in the applier metadata repository) is never ahead of the record of transactions saved in the relay log. Note that although this setting is the safest, it is also the slowest due to the number of disk writes involved. With `sync_relay_log > 1`, or `sync_relay_log=0` (where synchronization is handled by the operating system), in the event of an unexpected halt of a replica there might be committed transactions that have not been synchronized to disk. Such transactions can cause the recovery process to fail if the recovering replica, based on the information it has in the relay log as last synchronized to disk, tries to retrieve and apply the transactions again instead of skipping them. Setting `sync_relay_log=1` is particularly important for a multi-threaded replica, where the recovery process fails if gaps in the sequence of transactions cannot be filled using the information in the relay log. For a single-threaded replica, the recovery process only needs to use the relay log if the relevant information is not available in the applier metadata repository.

- Set `innodb_flush_log_at_trx_commit=1`, which synchronizes the `InnoDB` logs to disk before each transaction is committed. This setting, which is the default, ensures that `InnoDB` tables and the `InnoDB` logs are saved on disk so that there is no longer a requirement for the information in the relay log regarding the transaction. Combined with the setting `sync_relay_log=1`, this setting further ensures that the content of the `InnoDB` tables and the `InnoDB` logs is consistent with the content of the relay log at all times, so that purging the relay log files cannot cause unfillable gaps in the replica's history of transactions in the event of an unexpected halt.

- Set `relay_log_info_repository = TABLE`, which stores the replication SQL thread position in the `InnoDB` table `mysql.slave_relay_log_info`, and updates it together with the transaction commit to ensure a record that is always accurate. This setting is the default from MySQL 8.0, and the `FILE` setting is deprecated. From MySQL 8.0.23, the use of the system variable itself is deprecated, so omit it and allow it to default. If the `FILE` setting is used, which was the default in earlier releases, the information is stored in a file in the data directory that is updated after the transaction has been applied. This creates a risk of losing synchrony with the source depending at which stage of processing a transaction the replica halts at, or even corruption of the file itself. With the setting `relay_log_info_repository = FILE`, recovery is not guaranteed.

- Set `relay_log_recovery = ON`, which enables automatic relay log recovery immediately following server startup. This global variable defaults to `OFF` and is read-only at runtime, but you can set it to `ON` with the `--relay-log-recovery` option at replica startup following an unexpected halt of a replica. Note that this setting ignores the existing relay log files, in case they are corrupted or inconsistent. The relay log recovery process starts a new relay log file and fetches transactions from the source beginning at the replication SQL thread position recorded in the applier metadata repository. The previous relay log files are removed over time by the replica's normal purge mechanism.

For a multithreaded replica, setting `relay_log_recovery = ON` automatically handles any inconsistencies and gaps in the sequence of transactions that have been executed from the relay log. These gaps can occur when file position based replication is in use. (For more details, see Section 17.5.1.34, "Replication and Transaction Inconsistencies".) The relay log recovery process deals with gaps using the same method as the `START REPLICA | SLAVE UNTIL SQL_AFTER_MTS_GAPS` statement would. When the replica reaches a consistent gap-free state, the relay log recovery process goes on to fetch further transactions from the source beginning at the replication SQL thread position.