755 Phoenix Drive, Ann Arbor MI, 48108, USA
Phone: 734 668-2930 • Fax: 734 668-2877 • Email: info@carsim.com

Migrating from “Transmission (7 Gears)” to “Transmission (18 Gears)”

This Technical Memo provides instructions for migrating from the deprecated browser screen and library **Powertrain: Transmission (7 Gears)** to its replacement **Powertrain: Transmission (18 Gears)** in CarSim and TruckSim.

> **Note** The library **Powertrain: Transmission (7 Gears)** was removed in version 2021.0. To migrate data from this screen, you will have to work from version 2020.1 or older.

From time to time, the addition of new features or support for more detail in existing features causes the introduction of new library screens with substantially similar function (though most often with new, additional capabilities). The older, less capable screens are retained in the product to ensure backward compatibility and support updates of older databases. However, after a time the older screens are removed.

With the release of Version 2020.0, the **Powertrain: Transmission (7 Gears)** screen and library has been deprecated (i.e., marked for retirement). Normal policy is to retain a deprecated screen for two releases before removal. In other words, this deprecated screen will be carried in the 2020.0 and 2020.1 scheduled releases, and no longer appear in Version 2021.0.

The **Powertrain: Lockup Schedule** and **Powertrain: Unlock Schedule** screens, which describe the lock and unlock schedules for a torque convertor lockup clutch have also been deprecated. Each of these screens only supports the **Powertrain: Transmission (7 Gears)** and has no other use. In the course of following the instructions in this memo, you will transfer all data from these screens to **Powertrain: AT Clutch** Schedule screen

Differences Between the Libraries

Figure 1 shows a **Powertrain: Transmission (18 Gears)** screen and Figure 2 shows the deprecated **Powertrain: Transmission (7 Gears)** screen.

Both screens perform the same function. They define gear ratios, spin inertias and efficiencies in each gear and provide links to shift schedules and optional torque convertor lockup clutch properties.

Several years ago, transmissions with more than seven gear ratios began to become more common in passenger cars, and Truck transmissions often have more than seven. The **Powertrain: Transmission (18 Gears)** was added to support the additional ratios.

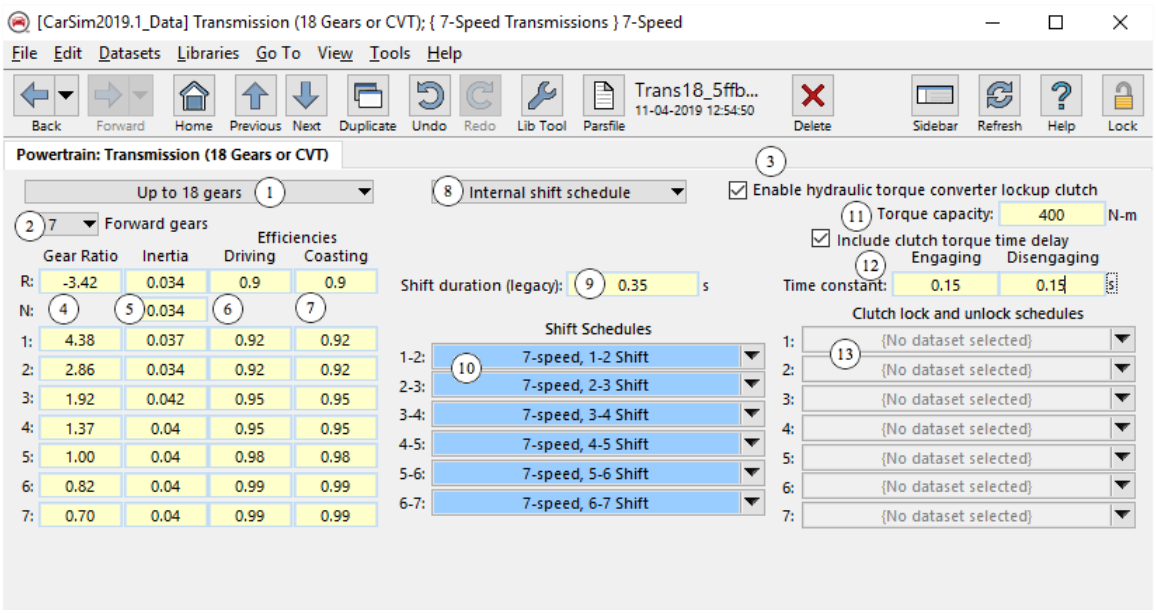

Figure 1.Powertrain: Transmission (18 Gears) screen.

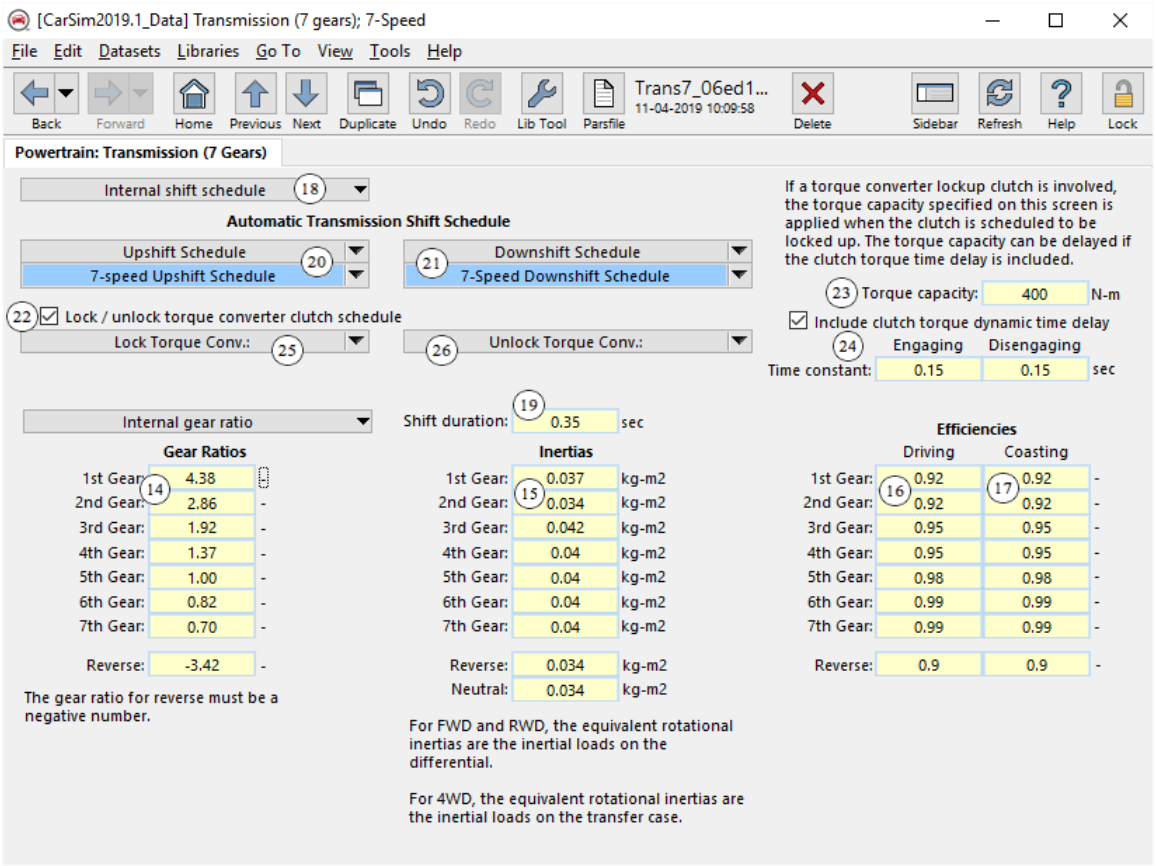

Figure 2. Powertrain: Transmission (7 Gears) screen.

The **Powertrain: Transmission (7 Gears)** screen always displayed data fields for 7 ratios, and for those with fewer gears it was typical to enter the information for the highest actual gear into the fields for the unused (higher number) ratios. The **Powertrain: Transmission (18 Gears)** screen has a pulldown control to set the number of gears.

The shorter names **7 Gears** and **18 Gears** will be used for brevity in most of the remainder of this document.

Migrating the Data – Preparing a Screen

To assist you in moving to the newer screen, it's a good idea to first navigate to the **7 Gears** screen for the dataset you want to replace. Use the **View** menu item and select "Additional Window (Read-Only)". This opens a copy of the screen you can refer to while building its replacement in **18 Gears.** Note that in the read-only copy you can navigate among screens and copy data to the clipboard, but you cannot change the contents of any screen.

In the read-write copy that you have open, use the **Libraries** menu item to navigate to **Powertrain: Transmission (18 Gears).** You will create a dataset in this library for each dataset you need to transfer from the **Powertrain: Transmission (7 Gears).** To do this, Use the **File** menu item and select "New Dataset (Empty)". In the dialog that opens, type in the category name and title from the read-only copy. (Remember you are creating a replacement in a different library, so the same category and title is a good idea). Note that all the fields in the new screen are empty.

Migrating the Data

Follow these steps:

Set up basic configuration:

1) On the **18 Gears** set the pulldown (1) to "Up to 18 Gears".
2) On the **18 Gears** screen set the pulldown (2) to the number of gears in the transmission. The number of rows in the data columns will be set to correspond to the number of gears, plus reverse and neutral.
3) On the **18 Gears** set the pulldown (8) to the same setting as pulldown (18) on the **7 Gears** screen. This will reveal or hide the links for shift schedule information.
4) Set the checkbox item (3) on the **18 Gears** screen to the same setting as item (22) on the **7 Gears** screen. This will reveal or hide links and fields for torque convertor lockup clutch information.

Individual gear ratios:

5) For each gear, copy and paste the gear ratio (14) from the **7 Gears** screen to the corresponding field (4) on the **18 Gears** screen.
6) For each gear, copy and paste the transmission inertia (15) from the **7 Gears** screen to the corresponding field (5) on the **18 Gears** screen.
7) For each gear, copy and paste the transmission efficiency in the driving direction (16) from the **7 Gears** screen to the corresponding field (6) on the **18 Gears** screen.

8) For each gear, copy and paste the transmission efficiency in the coasting direction (17) from the **7 Gears** screen to the corresponding field (7) on the **18 Gears** screen.

Shifting:

9) On the **18 Gears** screen you will see that space for a link (10) is displayed for a Shift Schedule for each pair of gears (1-2, 2-3, etc.). Use the pulldown to create a **Powertrain: Shift Schedule** dataset for each pair and give each one an appropriate descriptive category and title. The **18 Gears** shift schedules display upshift and downshift information for each pair of gears together in one chart, helping to avoid errors of conflicting data.

10) Return to the **7 Gears** screen and navigate to the linked Upshift Schedule screen (20). One by one, copy and paste the data for upshifting each gear to the corresponding table for a linked shift schedule (10) on the **18 Gears** screen.

11) Return to the **7 Gears** screen and navigate to the linked Downshift Schedule screen (21). One by one, copy and paste the data for upshifting each gear to the corresponding table for a linked shift schedule (10) on the **18 Gears** screen.

12) Copy the value in the Shift Duration Field (19) on the **7 Gears** screen to the corresponding field (9) on the **18 Gears** screen. Note that this field is labeled "legacy" on the 18 Gears screen because the individual upshift/downshift screen has fields to enter the shift duration for upshifting downshifting in each gear, giving you much more control. It is strongly recommended that you use these instead of the single value allowed on the **18 Gears** screen.

Torque converter lockup clutch:

13) If the checkbox (22) on the 7 Gears screen is checked, you should also have checked (3) on the **18 Gears** screen. In that case, copy and paste the clutch Torque Capacity (11) to (23).

14) For the clutch lockup and unlock schedules, a link is shown for a dataset describing the lock and unlock behavior of the clutch in each gear. Use the pulldown (13) to create a **Powertrain: AT Clutch** dataset for each gear and give each one an appropriate descriptive category and title. Then, in similar fashion to the gear shifting information, navigate to the Lock Torque Converter dataset from the **7 Gears** screen, and copy the data for each gear to the corresponding dataset you just created and linked on the **18 Gears** screen, and repeat this process for data from the Unlock Torque Converter dataset under the **7 Gears** screen to provide the clutch unlock schedule.

Finishing Up

After creating the new datasets in **Powertrain: Transmission (18 Gears)**, close the read-only window and navigate to the **Powertrain: Transmission (7 Gears)** library again. For each dataset, use **Tools** from the menu and choose **Find All References to This Dataset** to find the places that linked to it. One by one, double-click the listed items to go to the screen where the **7 Gears** dataset is linked, and change that link to the new **18 Gears** dataset just created.

Complete the above steps for each dataset in the **Powertrain: Transmission (7 Gears)** library. Once you are sure the data has been transferred correctly and is linked to the datasets that use it,

it’s a good idea to delete the **Powertrain: Transmission (7 Gears)** datasets so you won’t use them in the future. Remember, when the screen is retired any data still there will be lost.