

LifeCheck Technical Note

ID: TN016
Created: 13.March.2024
Updated: 02.September.2024
By: Chris Drew
Description: Run Sheets

The purpose of this document is to detail the process of working with Run Sheets; how to create; make changes and then import them back into LifeCheck to update chassis builds and sessions.

What is a Run Sheet?

Run sheets are created initially by LifeCheck within the Chassis Builder and can subsequently be read back into the system to allow changes to a car build to be imported and applied to the build.

Like Build Sheets, Run Sheets are simply Microsoft Excel documents and as such may be maintained and edited off-line without the need for LifeCheck to be available. In this way a Run Sheet is ideal for team members to record changes made to the chassis build while at the track, hotel or on a flight where they do not have an Internet connection and as such cannot access the live LifeCheck system.

While a run sheet is typically created by LifeCheck itself, functionality is included to handle run / allocation sheets which have been created externally but which conform to a few basic rules which allow LifeCheck to process the sheet and identify where changes to the build have been made.

A Run Sheet may also be a mixture of the two of these - initially created by LifeCheck and then modified to perhaps remove components which are not required (usually those which are not replaceable at an event such as engine and gearbox internals) or perhaps to create a Template from which future Run Sheets will be based. The following sections will detail how each of the different Run Sheet types are created and processed.

Run Sheet Templates

When creating a Run Sheet it is possible to specify that a Microsoft Excel file should be used as the template. This allows for instance, a corporate logo to be included in the run sheet and other imagery and formatting applied to the Run Sheet.

Note that in this mode, the template **MUST NOT** include the chassis build elements – in this case, templates are only used for formatting purposes and there should be no content following the row number specified in the Run Sheet Options to be the sessions start row.

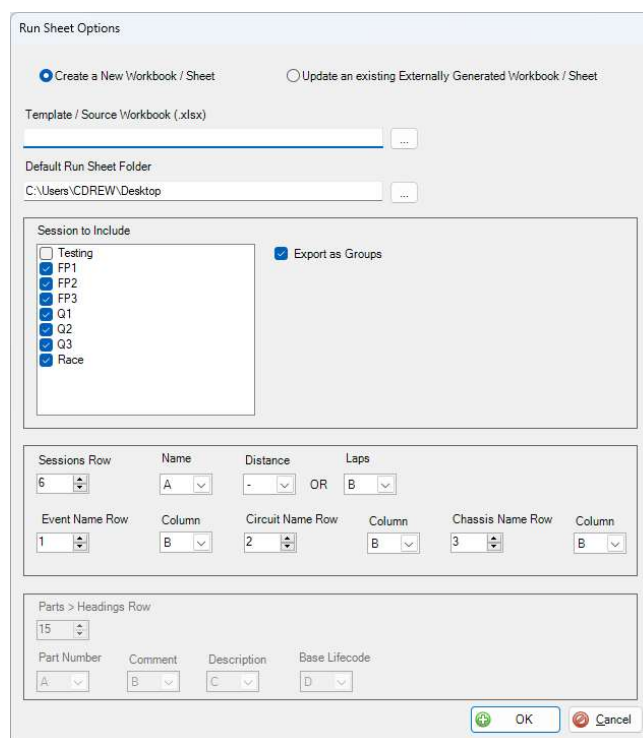
If a template is to be used it is important that the following options are set correctly to ensure the run sheet information is output to the correct rows and columns. The template is specified within the Run Sheet options window which in turn can be displayed by clicking the 'Options' button when creating a run-sheet.

It is however possible to produce an initial run sheet using LifeCheck and use this run sheet as the template to create run sheets for future events. This process is explained in more detail later in this section.

Run Sheet Options

The run sheet options may be accessed by clicking the **Run Sheet Settings** button on the **Administration>Global Settings** window. The settings displayed differ depending on whether LifeCheck is to create the run sheet or is to read an externally generated sheet. As such some options will be disabled depending on the current setting.

The Run Sheet is comprised of 3 distinct sections, the first is the heading section which defines the Event, Chassis and Circuit Names. The second is the Sessions section which lists the names of the sessions to be included in the run sheet and adds a placeholder where the distance (or laps) run in each session can be entered and the third is the Chassis Build section which details the components on the chassis and allows for any changes to be recorded.



The 'Run Sheet Options' dialog box contains the following sections:

- Options:** Two radio buttons: 'Create a New Workbook / Sheet' (selected) and 'Update an existing Externally Generated Workbook / Sheet'.
- Template / Source Workbook (.xlsx):** A text field with a browse button ('...').
- Default Run Sheet Folder:** A text field showing 'C:\Users\CDREW\Desktop' with a browse button ('...').
- Session to Include:** A list box containing 'Testing', 'FP1', 'FP2', 'FP3', 'Q1', 'Q2', 'Q3', and 'Race'. All items are checked. To the right is a checked checkbox labeled 'Export as Groups'.
- Sessions Row:** A section with dropdowns for 'Name' (A), 'Distance' (-), 'OR' (B), and 'Laps'.
- Event Name Row:** A section with dropdowns for 'Column' (B), 'Circuit Name Row' (2), 'Column' (B), 'Chassis Name Row' (3), and 'Column' (B).
- Parts > Headings Row:** A section with a dropdown for 'Parts' (15) and a table with columns 'Part Number', 'Comment', 'Description', and 'Base Lifecode', each with a dropdown (A, B, C, D respectively).
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.

Template File (New Workbook/Sheet Only)

If specified, LifeCheck will read this file and use it as the template for the Run Sheet. An example of a run sheet template is held in the \templates sub-folder within the LifeCheck installation folder.

Default Run Sheet Folder

This is the folder into which generated run sheets will be saved, Either browse or manually enter a valid folder name here

Sessions to Include

Check those sessions which are to be included in the Run Sheet.

Export as Groups

If this box is checked, LifeCheck will create an Excel structured (grouped) document with the components defined within each assembly grouped beneath the assembly. In this way, users can hide

the complexity of an assembly seeing only the top level, major assemblies unless they choose to expand upon one of them.

Sessions Row

This field defines the index of the first row to which the Session Distances section will start. Note row numbers are 1 based throughout these settings.

Name

This defines the column letter into which the name of the session (selected above) will be displayed.

Distance

This defines the column letter selected to hold the session distance (mileage or kilometres), which is to be entered by the user and subsequently read by LifeCheck. Select '-' to require laps instead.

Laps

This defines the column letter selected to hold the number of laps run, which is to be entered by the user and subsequently read by LifeCheck. Select '-' to require distance instead.

Note you cannot specify a column for both of Distance and Laps!

Event Name Row / Columns

Define the row number and column name to identify the cell into which LifeCheck will write (any) Event Name selected. Set the column to the first '-' entry to disable event name inclusion in the run sheet.

Circuit Name Row / Columns

Define the row number and column name to identify the cell into which LifeCheck will write the name of the Circuit selected. Set the column to the first '-' entry to disable circuit name inclusion in the run sheet.

Chassis Name Row / Columns

Define the row number and column name to identify the cell into which LifeCheck will write the name of the Chassis selected. Set the column to the first '-' entry to disable chassis name inclusion in the run sheet.

Parts > Headings Row (Existing Workbook / Sheet Only)

This defines the row number where the headings for the Chassis Build section which details the components on the chassis can be found in an existing workbook / sheet. The headings must include 'Part Number', 'Comment', 'Life Code' and columns for individual sessions. The session names must correspond with a session defined with LifeCheck – for example 'FP1'. Data rows for components in the build should follow the headings however blank rows are permitted and will be skipped.

Part Number

This defines the column letter where the Part Number for the component in the build will be found.

Comment

The comment column allows LifeCheck to more accurately identify a component in the run sheet and is especially useful when the base life code has not been specified – perhaps the component was not included in the base build. Any comment specified **MUST** match any comment specified for a component within the chassis build. Note that where a life code has been specified, it will over-ride any comment as it provides greater accuracy when identifying a specific component in the build.

Description Column

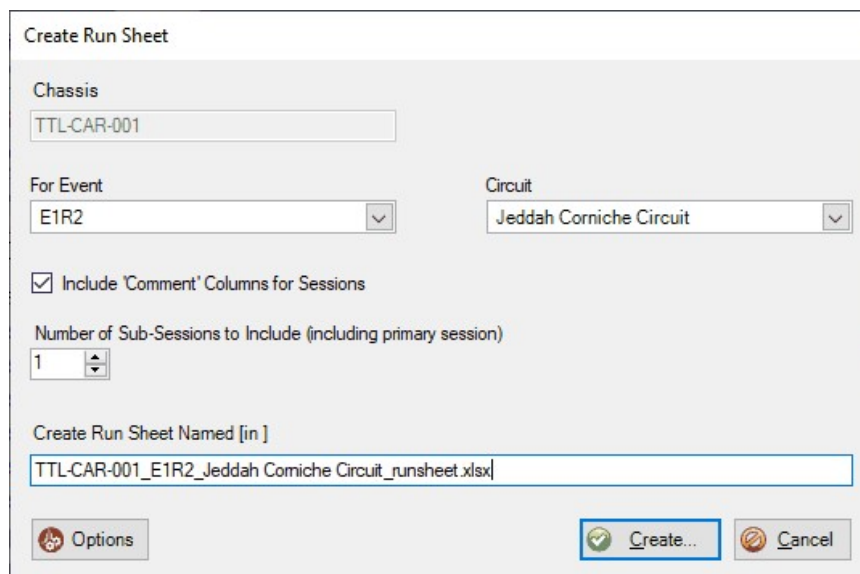
While this column is not strictly necessary it does allow LifeCheck to update the description specified for the part if the 'Update Run Sheet' option is selected.

Base Life Code Column

An alternative to the comment is to define the column containing 'initial' life code for the chassis build. As per the LifeCheck generated run sheet, this allows a specific component to be identified in the build and changed if required.

Creating a Run Sheet

As mentioned previously, a Run Sheet can be created from the Chassis Builder screen by right-clicking in the left pane of that window and selecting Create Run Sheet from the menu displayed. The following window will be shown:-



Here the name of the chassis for which the run sheet is to be created is shown and you are able to select the Event (if required) and Circuit for the run sheet. The values specified will be substituted into the appropriate cells in the generated work sheet.

For Event

This is the event for which the run sheet is to be created. It is optional

Circuit

This is the circuit for which the event sheet is to be created.

Include 'Comment' Columns for Sessions

This should be checked to create additional columns in the generated run sheet where comments for each session can be entered. These comments will be added as 'notes' to the component being swapped-off the chassis.

Number of Sub-Sessions to Include

When generating the Run Sheet, LifeCheck will by default add a row in the 'headings' section for each session selected and also columns for each session selected. In many cases, a session may well consist of multiple sub-sessions. Setting the value here will add additional rows and columns to the generated sheet to allow changes made within these sub-sessions to be recorded. By default, only the primary session is added to the sheet (for example 'Qualifying'). If a value > 1 is specified the sessions will be added as 'Qualifying (1)', 'Qualifying (2)' and so on. It is recommended that the number of sub-sessions specified is 3 or less to keep the width of the generated sheet to a manageable size!

It is of course always possible to insert additional sub-session columns as required, this simply saves time by defining a set number for you! If additional sub-session are manually added, it is important to add them to both the initial list of sessions and also as additional columns. These must also be in run order.

Create Run Sheet Named

This is the name of the run sheet which will be generated. The folder in to which the file will be saved is specified within the Options. The default name will include the chassis name, any event selected and the circuit name but this can be over-ridden if required.

Options

Click to display the Run Sheet options (see above).

Example Run Sheet

The following screen shot shows a simple run sheet generated using a template and specifying 2 sessions, the main session and a single sub-session.

AutoSave TTL-CAR-001_E1R2_Jeddah Corniche Circuit_runsheet.xlsx Chris Drew								
File Home Insert Page Layout Formulas Data Review View Add-ins Help QuickBooks Team Comments Share								
F13								
	A	B	C	D	E	F	G	H
1								
2	Run Sheet For Event E1R2							
3	Chassis:	TTL-CAR-001	Circuit:	Jeddah Corniche Circuit				
4								
5								
6	Session Name	Laps						
7	FP1 (1)	21						
8	FP1 (2)	22						
9	FP2 (1)							
10	FP2 (2)							
11	FP3 (1)							
12	FP3 (2)							
13	Q1 (1)							
14	Q1 (2)							
15	Q2 (1)							
16	Q2 (2)							
17	Q3 (1)							
18	Q3 (2)							
19	Race (1)							
20	Race (2)							
21								
22	Part Number	Comment	Description	Life Code	Life Left (Race)	FP1 (1)	FP1 (2)	FP2 (1)
23	01 - DRIVETRAIN		DRIVETRAIN	2011-001				
24	TTL-G3000\2011		DRIVESHAFT AND JOINTS ASS	1109	131.84			
25	TTL-G3015\1		DRIVESHAFT XTRAC ASSY 104	1111	2413.08			
26	TTL-G3017\2		JOINT CV OUTER ASSY 27 TOO	1113B ADST	486.92			
27	TTL-X-G2035		JOINT TRIPOD SK96	1109	131.84			
28	02 - BODYWORK		BODYWORK	L01	2037.65			
29	TTL-N0-SIDEPOD		SIDEPOD FRONT PANEL LH AS	L01				
30	TTL-N0-26001		SIDEPOD PANEL LH	L01	482.35			
31	03 - BRAKING		BRAKES	2011-001				
32	031 - BRAKING FRONT		BRAKES FRONT	L01				
33	TTL-AP-001		FRONT BRAKE CALIPER - LH	L12	2969.13	L13	L12	
34	TTL-AP-002		FRONT BRAKE CALIPER - RH	L12	4969.13	L13	L12	
35	TTL-AP-DISC001		FRONT ROTOR - ROAD COURSE	L08	486.92			
36	TTL-AP-DISC001		FRONT ROTOR - ROAD COURSE	L11	1404.65			

Updating a LifeCheck Generated Run Sheet

Typically you will generate a separate Run Sheet for each Chassis for a specific event / circuit and provide this run sheet to the Race Mechanics or other person responsible for recording changes made to the car build. The Run Sheet will have columns where the life codes for replacements made prior to the specified session. For example, in the screen shot below, the Left Hand and Right Hand front brake calipers have been replaced for FP1 (2) and again for FP2 (1).

	Part Number	Comment	Description	Life Code	Life Left (Race)	FP1 (1)	FP1 (2)	FP2 (1)
23	01 - DRIVETRAIN		DRIVETRAIN	2011-001				
24	TTL-G3000\2011		DRIVESHAFT AND JOINTS ASSY	1109	131.84			
25	TTL-G3015\1		DRIVESHAFT XTRAC ASSY 1046	1111	2413.08			
26	TTL-G3017\2		JOINT CV OUTER ASSY 27 TOOTH	1113B ADST	486.92			
27	TTL-X-G2035		JOINT TRIPOD SK96	1109	131.84			
28	02 - BODYWORK		BODYWORK	L01	2037.65			
29	TTL-N0-SIDEPOD		SIDEPOD FRONT PANEL LH ASSY	L01				
30	TTL-N0-26001		SIDEPOD PANEL LH	L01	482.35			
31	03 - BRAKING		BRAKES	2011-001				
32	031 - BRAKING FRONT		BRAKES FRONT	L01				
33	TTL-AP-001		FRONT BRAKE CALIPER - LH	L12	2969.13		L13	L14
34	TTL-AP-002		FRONT BRAKE CALIPER - RH	L12	4969.13		L13	L14
35	TTL-AP-DISC001		FRONT ROTOR - ROAD COURSE	L08	486.92			
36	TTL-AP-DISC001		FRONT ROTOR - ROAD COURSE	L11	1404.65			

Note that the Life Code column denotes the build of the car prior to it going out on track (for FP1 (1)). It is down to the user to select whether the changes specified should be applied to the chassis build prior to the session being recorded or relate to changes made after the session!

In addition to recording changes made to the Chassis Build, the run sheet will also support setting the distance (or laps) run for the session in the run sheet as shown in the previous screen shot. There you can see that 21 laps were run in FP1 (1) and 22 laps run in FP1 (2). LifeCheck can read these values from the run sheet and apply them within the Record Session window.

Part Classes

There may be instances in the chassis build where a Part Class has been selected and the replacement component is actually a different part to that originally fitted. Perhaps a different rate anti-roll bar has been fitted which has a different part number but is in the same part class as that originally fitted.

LifeCheck allows this case to be handled in the run sheet by the changed component being identified by both its part number and life code. For example, if the original ant-roll bar had a part number of 'TTL-FRB-01234' but the replacement had a part number of 'TTL-FRB-04567' and a life code of 'L0010' the run sheet cell for the session in which the change was made should have a value of 'TTL-FRB-04567>L0010'.

Updating an Externally Generated Run Sheet

We have previously discussed the possibility of creating a run sheet using LifeCheck and then customising the generated Excel spreadsheet to include such things as company logos, colour schemes and perhaps removing parts from the run sheet which cannot or should not be changed while at the track. For example, the engine and gearbox may be sealed components which may only be swapped in their entirety with no sub-assemblies being possible to change.

Once the template has been modified to be independent of any specific chassis / race it can then be updated for a specific chassis / race and saved as a new file. To facilitate this, the Run Sheet options should be switched to specify that an externally generated run sheet is to be used after generating the run sheet from within LifeCheck and making any required changes.

Once this has been done, select the right-click option 'Update Run Sheet' from within **Chassis Builder**. LifeCheck will prompt for the run sheet to be updated, select the template previously created the following window will be displayed to allow the update process to be configured :-

First select the worksheet which is to be read. You can then select whether to save to a new file or to update the current file – as this is a template it is recommended that a new file is requested. The file name will be based on the chassis, event and circuit select although you can of course over-ride the suggested filename. By default, the new file will be saved into the folder specified as the default run sheet folder in the options window.

Updating the Run Sheet

The process of updating the run sheet is a fairly complex process as LifeCheck must step through the current chassis build, find any matching part in the run sheet and update the sheet as required.

Identification of the part to be updated is of course, central to this process. The first step is to identify if the component in the chassis build is a member of a part class. If it is then it could be replacing a part in the run sheet which is also a member of the same part class. For example, if replacing a suspension spring, the chassis build may specify a different part number for the suspension spring if a different rate is required.

To handle this, LifeCheck will create a list of possible parts which could be being replaced by the component in the chassis build and will iterate through the run sheet attempting to find a suitable match. If a comment has been specified in the Chassis Template for that component, it should also match a comment in the run sheet for match to be found.

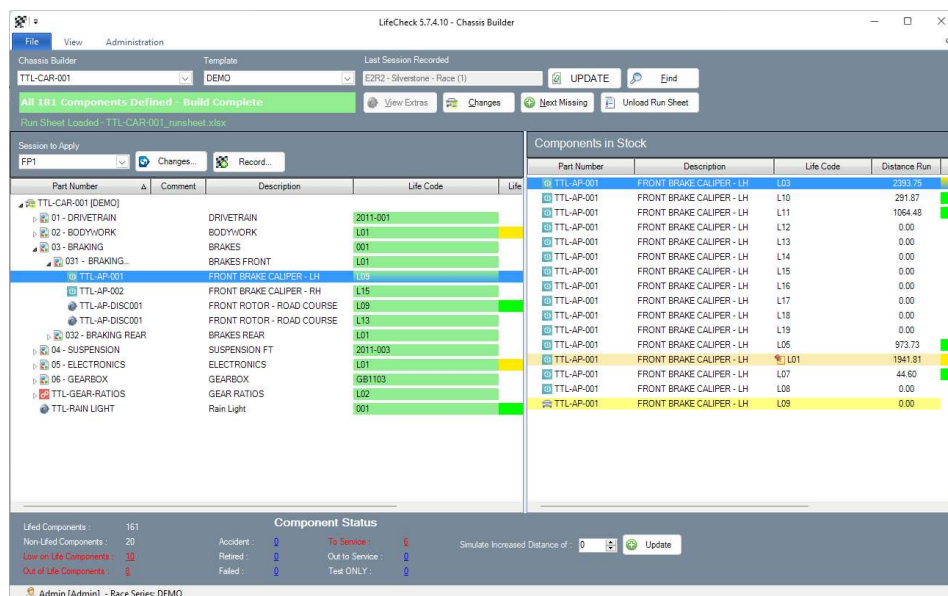
If no match is found in the run sheet, LifeCheck will continue on to the next item in the chassis build – it is perfectly valid for entries to be deleted from the run sheet and as such not all components in the chassis build may exist in the run sheet.

If a match is found, LifeCheck will check to see if the part number and/or description fields in the run sheet should be updated (as may be the case with a part class) and, if necessary, will update them with the appropriate value from the chassis build. The life code for the chassis build component will also be updated as well as any value specified for the 'Life Left (Race)' column. Note that no other columns, whether added externally or by life check will be updated.

Listing Run Sheet Changes and Applying them

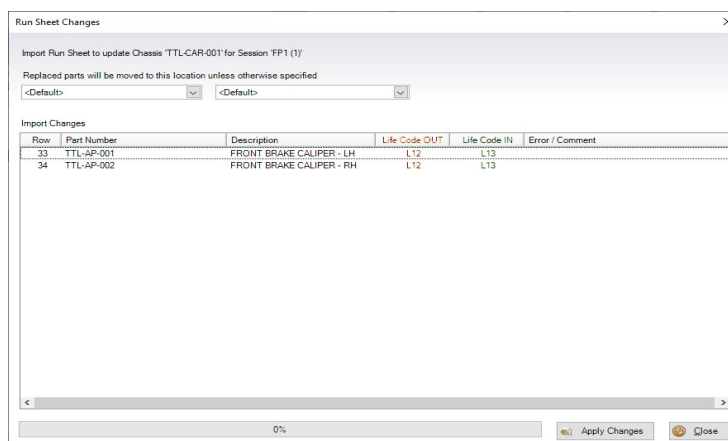
Once the event has been completed, the run sheet can be recovered from the race engineers and read back into LifeCheck. This is done by right-clicking in the left hand pane of Chassis Builder and selecting Load Run Sheet from the menu displayed. You may then browse to and select the run sheet to be loaded. It is recommended that the run sheet is not also open within any other program prior to reading it into LifeCheck.

If all was validated successfully, the run sheet will be loaded, its name displayed below the 'Build progress' bar and a new panel displayed above the left pane. This lists the sessions read from the run sheet and allows Changes to be applied or the session to be recorded.



To Unload the run sheet (perhaps a change has been made and you want to read the changed file), select **Un-load Run Sheet** from the right-click menu or by clicking the appropriate button.

To apply changes to the current chassis build, first select the required session from the drop down list of sessions defined in the run sheet and then click **Changes**. This will cause LifeCheck to read the run sheet and identify any changes defined therein. Again using the previous run sheet as an example, the following window will be displayed.



This shows that for car **TTL-CAR-001** and session **FP1 (1)**, 2 changes have been detected - changing the **FRONT BRAKE CALIPER-LH** and **FRONT BRAKE CALIPER-LH** from **L12** to **L13**. The row number is also specified as well as the part number and description just in case there are any errors in the data read. If you are happy with the changes, click **Apply Changes** to update the Chassis Build.

By default, components removed from the chassis are moved to the location from which the new component was pulled (Quick Swap). You may however specify an alternate location into which the swapped off components are moved - perhaps they need to go to inspection? If 'Comments' were enabled in the Build Sheet and a comment was specified for a component being changed, this will be added as a note to the component.

To remove a component from the chassis build, without replacing it, as may be the case for an optional sensor which may or may not be fitted, specify the life code as '-'. In a similar fashion, the base life code may be set to '-' by LifeCheck if the component was not specified in the build. If a valid life code is specified for a run, the component will be selected on to the chassis.

Once the relevant changes have been applied, you can continue on to record the session for the chassis. To do this simply ensure the required session is selected and click the **Record...** button.

Recording Sessions from a Run Sheet

The Record Session function for Run Sheets works in exactly the same way as when invoked from the main menu other than LifeCheck will pre-select the event, circuit and chassis and will also set the number of laps or race distance as appropriate.

This technique can also be used without a run sheet as such. LifeCheck can read a spreadsheet which ONLY contains the Sessions Run table and from that import the session distances.

Customisations

Although LifeCheck will generate the Run Sheet for you and add the necessary columns the generated sheet may be edited to remove any rows which are not required, perhaps you can only swap the gearbox as a whole and as such exporting all of the Gearbox components is not supported. In this case you may delete the rows for parts within the Gearbox.

You may also find that additional columns are required for runs for which space was not previously allocated. For example, you may not have requested sub-sessions but find that you now need one. Simply add a column with the appropriate name to the right of the preceding run column. As long as the Column Heading starts with a valid Session Name, LifeCheck will be able to access the data for that run. Note however it is the users responsibility to ensure the runs are recorded in sequence and that any changes made are loaded at the appropriate point.

There is also flexibility as to what each run column actually means and this is left up to the user and procedures in place at each individual team. For example, the **Life Code** column may actually define the build of the car as of the end of the last session run and NOT the required build for the first session of the next event. In this case the first entry in the Run Sheet (e.g. **FP1 (1)**) may inform the Race Engineers of the changes to be made prior to the each session.

Alternatively, the Run Sheet **Life Code** column may reflect the base build for the first session and therefore the first entry in the run sheet (e.g. **FP1 (1)**) will define the changes made after the session has run.

In addition it is possible to create the Run Sheet from scratch if preferred. All that is required is to have the first column as Part Number and have other columns with a heading of 'Life Code' and for the sessions for which changes are to be recorded. In a similar way, session run distances can be manually added to the top of the file so long as their position marries up to that specified in the Run Sheet options.

Run Sheet Mechanisms

It is important to fully understand the mechanisms by which LifeCheck will process a run sheet and how changes are identified to ensure the correct data is entered in to the run sheet. This is of specific importance where part classes are involved or where an assembly may be switched in its entirety or component parts of the assembly may be changed individually.

Part Classes

Take as an example the case where we have 3 different makes of front brake caliper within LifeCheck made by AP, Brembo or Wilwood. These parts are all assigned to the Part Class 'FRONT BRAKE CALIPER' but of course have different part numbers. Our chassis template simply defines 2 instances of the brake caliper class and adds a comment of 'LEFT' to the first and 'RIGHT' for the second. The part numbers are as follows :-

TTL_AP_001 AP Brake Caliper

TTL_BB_001 Brembo Brake Caliper

TTL_WW_001 Wilwood Brake Caliper

The initial chassis build includes 2 AP Brake Calipers (A001 & A002).

Part Number	Comment	Description	Life Code	Life Left (Race)	FP1	FP2
031 - BRAKING FRONT		BRAKES FRONT	L01			
TTL_AP_001	LEFT	Front Brake Caliper (AP)	A001	5000	A003	TTL-AP-00099981>L01
TTL_AP_001	RIGHT	Front Brake Caliper (AP)	A002	5000	A004	TTL-AP-00099981>L02

After 'the 'FP1' session the calipers were switched for new AP calipers with life codes of A003 and A004. When processing the run sheet for the changes made in FP1, LifeCheck will identify the new life code – A003 and the original part number, TTL_AP_001.

Note however that the replacement component could in fact be ANY brake caliper with the same part class as the currently fitted caliper. In this case however, LifeCheck will scan the current chassis build for a component which matches both the part number and any comment specified. If found, this will be the component being replaced.

It should also be noted that LifeCheck will scan the current chassis build and not the run sheet to identify the component to replace. This is necessary as the chassis build may have been altered by a previously applied session – this is detailed further in the next section. In addition, as the replacement component is a member of a part class, ANY component within that part class and having the comment (if specified) may be selected. In this way, LifeCheck can change 1 caliper for a different make of caliper and be able to handle this change in subsequent sessions.

Changing Assemblies

Changing assemblies in a run sheet also can cause confusion when identifying changes in subsequent sessions. For example, if for example a front subframe is changed as a built assembly in FP1 and then an individual component such as a Camber Arm within the assembly is changed in FP2 there is a problem as the Camber Arm as known in the run sheet is not the one which will be in the LifeCheck Chassis Build as it was changed when the front subframe was changed. This is the primary reason why LifeCheck checks the current chassis build when identifying the component to be swapped off the chassis. By doing this, the current Camber Arm will be swapped for the replacement.

It is however important to note that LifeCheck is therefore not able to completely validate the change specified in the run sheet as the component being swapped out is always assumed to be that already on the chassis – this could be incorrect if the sessions are not added in the correct order!

Duplicate Component Handling

Another potential source of errors is when there are 2 components on the chassis with the same part number and a comment has not been added to the chassis template to uniquely identify each instance. In the above brake caliper example, it can be seen that if the comments had not been specified, LifeCheck would scan the chassis build for the component being removed and would simply find the first brake caliper as no details other than the Part Number are known. That would then be added to the list of changes.

When processing the second brake caliper change, LifeCheck would again scan the chassis build and initially would pickup the same caliper as above as it encountered it first. At this point, LifeCheck will scan its list of changes already identified and will determine that this specific caliper has already been changed in this session and would try to find the next matching component. Ideally, the second brake caliper would be identified and the change added to the list. If however a second match was not found, LifeCheck would add another change for the same component.

While this process will work correctly in most circumstances as the run sheet should be in the same order as the chassis build, it is recommended that comments are always added to the chassis template where multiple components have the same part number.