IFS Aviation Maintenance

CMS API Guide

ICAM 26.2



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Introduction

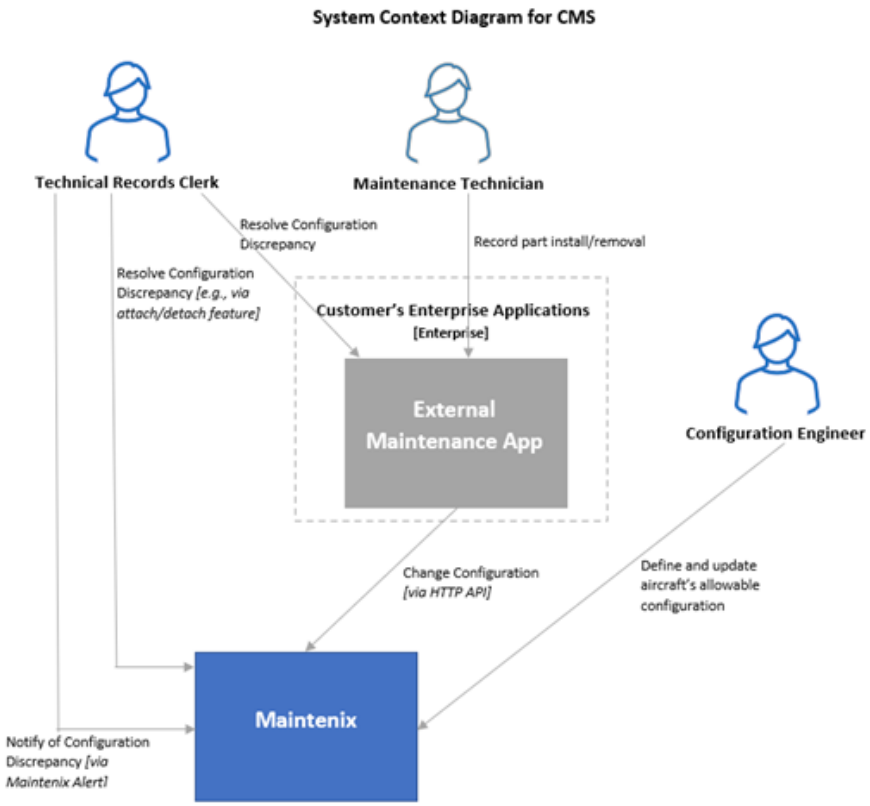
Introduction

The Configuration Management Service (CMS) API enables an external maintenance application to install, remove, or replace (remove and install) parts from an aircraft/assembly in Maintenix to ensure that aircraft maintenance operations leave the aircraft in a compliant, airworthy state.

There are four aspects to the CMS functionality:

- **External Application Interaction:** The external maintenance application initiates the change configuration process by sending configuration changes made to CMS.
- **Independent Message Processing:** These messages are processed independently, not tied down to a specific task or work package. The originating task for the configuration change may still exist in Maintenix.
- **Task-based Configuration Changes:** Any task-based configuration changes originating from the external maintenance application send their data to CMS after task closure and sign-off.
- **CMS Processing:**Once CMS receives the messages, it either processes them or reports them to Tech Records for correction. The sending application will have moved on by this point.

The following diagram shows how personas and systems interact in CMS.



Persona / System	Description
Maintenance Technician	A technician that performs maintenance activities on an aircraft
Configuration Engineer	A person responsible for ensuring the aircraft's configuration complies with all OEM and regulatory rules and specifications.
Technical Records Clerk	A person responsible for the entry and maintenance, i.e.: resolution of discrepancies, of aircraft technical records.
External Maintenance App	A customer owned application where aircraft maintenance is executed.
Maintenix	Maintenix is the system of record for Current and Allowable Aircraft Configuration. Customers may also leverage other capabilities in Maintenix, e.g.: Maintenance Execution, Maintenance Planning, Supply Chain. **Note** Current Aircraft Configuration refers to what's currently installed on an aircraft. Allowable Aircraft Configuration refers to what could be installed on an aircraft.

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CMS API scenarios

CMS API scenarios

This section describes the scenarios that are supported by the API

Each of the supported scenarios contains the following sections:

- **Goal**: A short statement that defines the purpose of the scenario.
- **Pre-conditions**: A list of conditions that must be met before the scenario can be implemented.
- **Messaging**: A basic description of the messaging required for the scenario.
- **Result:** The outcome of the successful execution of the scenario.

Part on an airframe

A part on an airframe can be found by searching for its Serial Number, Part Number or Manufacturer Code.

Remove

Remove a part

Goal: To remove a part from an airframe in Maintenix.

Pre-conditions:

- Aircraft configurations are updated in Maintenix.

Messaging: The message/payload is an array of configuration changes. Refer section *Remove part for airframe* for the message sample.

Result: The part is removed from the airframe in Maintenix.

Remove multiple parts with the same request

Goal: To remove multiple parts from an airframe in Maintenix.

Pre-conditions:

- Aircraft configurations are updated in Maintenix.

Messaging: The message/payload is an array of configuration changes. Refer section *Remove part for airframe* for the message sample.

Result: The parts are removed from the airframe in Maintenix.

Install

Install a part

Goal: To install a part to an airframe in Maintenix.

Pre-conditions:

- If the supply system is Maintenix, usually the part would have already been issued as serviceable by the time the change configuration message is received by CMS.
- If the supply system is not Maintenix, item location and status in supply are not a concern.

Messaging: The message/payload is an array of configuration changes. Refer section *Install part for airframe* for the message sample.

Result: The part is installed in the airframe in Maintenix.

Install multiple parts with the same request

Goal: To install multiple parts to an airframe in Maintenix.

Pre-conditions:

- If the supply system is Maintenix, usually the part would have already been issued as serviceable by the time the change configuration message is received by CMS.
- If the supply system is not Maintenix, item location and status in supply are not a concern.

Messaging: The message/payload is an array of configuration changes. Refer section *Install part for airframe* for the message sample.

Result: The parts are installed in the airframe in Maintenix.

Replace

Remove part and install using the same request for same position

Goal: To replace parts of an airframe in Maintenix.

Pre-conditions:

- If the supply system is Maintenix, usually the part would have already been issued as serviceable by the time the change configuration message is received by CMS.
- If the supply system is not Maintenix, item location and status in supply are not a concern.

Messaging: The message/payload is an array of configuration changes. Refer section *Replace part for airfram*e for the message sample.

Result: The parts are replaced in the airframe in Maintenix.

Part on an engine

A part on an engine can be found by searching for its Serial Number, or Part Number.

Remove

Remove a part

Goal: To remove a part from an engine in Maintenix.

Pre-conditions:

- Aircraft configurations are updated in Maintenix.

Messaging: The message/payload is an array of configuration changes. Refer section *Remove part for engine* for the message sample.

Result: The part is removed from the engine in Maintenix.

Remove multiple parts with the same request

Goal: To remove multiple parts from an engine in Maintenix.

Pre-conditions:

- Aircraft configurations are updated in Maintenix.

Messaging: The message/payload is an array of configuration changes. Refer section *Remove part for engine* for the message sample.

Result: The parts are removed from the engine in Maintenix.

Install

Install a part

Goal: To install a part to an engine in Maintenix.

Pre-conditions:

- If the supply system is Maintenix, usually the part would have already been issued as serviceable by the time the change configuration message is received by CMS.
- If the supply system is not Maintenix, item location and status in supply are not a concern.

Messaging: The message/payload is an array of configuration changes. Refer section *Install part for engine* for the message sample.

Result: The part is installed in the engine in Maintenix.

Install multiple parts with the same request

Goal: To install multiple parts to an engine in Maintenix.

Pre-conditions:

- If the supply system is Maintenix, usually the part would have already been issued as serviceable by the time the change configuration message is received by CMS.
- If the supply system is not Maintenix, item location and status in supply are not a concern.

Messaging: The message/payload is an array of configuration changes. Refer section *Install part for engine* for the message sample.

Result: The parts are installed in the engine in Maintenix.

Replace

Remove part and install using the same request for same position

Goal: To replace parts of an engine in Maintenix.

Pre-conditions:

- If the supply system is Maintenix, usually the part would have already been issued as serviceable by the time the change configuration message is received by CMS.
- If the supply system is not Maintenix, item location and status in supply are not a concern.

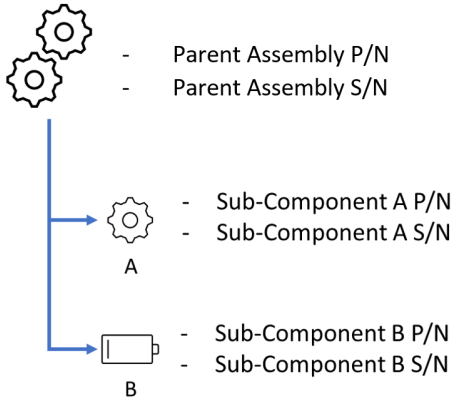
Messaging: The message/payload is an array of configuration changes. Refer section *Replace part for engine* for the message sample.

Result: The parts are replaced in the engine in Maintenix.

Configuration change reporting on loose assembly

The CMS API validates and reports configuration changes linked to loose assemblies - components that are independent of an aircraft. Technicians utilize this function during in-shop repairs or external MRO shops.

The loose assembly functions as the parent assembly in this process.



Data used in this process are as follows:

Mandatory Data	Optional Data
• Parent assembly part number (loose component) • Parent assembly serial number • Sub-component part number (child) • Sub-component serial number	• Manufacturer ID • Configuration Position Code of child assembly

Note While the data required for configuration change reporting for parts on airframes and engines are similar to above, the mandatory data set required for validation may differ based on the presented CMS API scenario. Refer *Inbound message samples* section for message structure used in each scenario.

3

Setting up CMS API

Setting up CMS API

The following sections provide setup and configuration information for the CMS APIs.

Licensing and subscription

A Maintenix license feature has been added to protect the new API.

To use the CMS API, your organization must hold a valid license for it. Therefore, the CMS_API feature has been added to your Maintenix `license.xml`. If your current license does not include this feature, contact your Maintenix representative.

> **Note** `license.xml` resides in the `<install-dir>/domain/config/maintenix` folder, on the Maintenix application server host.

Granting Security Permission

About this task

Only Maintenix users that have the CMS_API_CHANGE_CONFIGURATION permission can invoke the CMS API.

Steps

1. Log in as a user with the ADMIN role.
2. Go to **Administrator**, click **Role Search.**
3. Search for the role that you want to grant permission to, then select it from the list.
4. On the **Role Details** page, click the **Permissions** tab.

5. Search for the **CMS_API_CHANGE_CONFIGURATION**.
6. Select the parameter from the list and click **Enable.**
7. Click **OK.**

CMS authentication

Authentication is handled in two different ways depending on whether CMS is deployed in a standalone Maintenix context (basic authentication) or within IFS Cloud (IAM/OIDC).

The CMS API is restricted to users with the CMS_API_CHANGE_CONFIGURATION permission, and the API can be invoked if the license is valid.

System initialization

New customers initializing Maintenix for the first time need to migrate the allowable and current configuration data into the system.

For customers with an existing Maintenix installation, no special data migration is required to enable CMS.

Activate alerts

To notify a role when CMS errors or warnings occur, the below configuration steps need to be followed:

Steps:

1. Go to the **Alerts Setup** page.
2. Click the **Category** drop-down list and select "CMS".
3. Select the check box beside the alert.
4. Click **Activate Alert**.

Tip: You can edit the roles assigned to alerts by selecting the check box beside the alert and clicking **Edit Role Assignments**. From this page, you can select or clear roles as required.

For more details, refer to *Errors and warnings.*

4

CMS API

Open API specification

You can obtain the CMS Open API specification from a running Maintenix instance at the URL: `http://<host:port>/cmsApi/openapi.json`. The Maintenix user that is used to log in requires the API_VIEW_REQUEST permission.

Inbound message samples

This section contains sample requests/responses. Refer to the Open API Specification for more details.

Configuration management endpoint: `http://<host:port>/cmsApi/currentConfiguration/v1/changeConfiguration/batch/`

Missing components endpoint:

`http://<host:port>/cmsApi/currentConfiguration/v1/missingAircraftMandatoryComponents/{aircraftRegistrationCode}`

Part on an airframe

Remove part for airframe

This message is used to remove parts from an airframe.

This POST method requires a list of the parts to be removed. Each part must contain the serial number and the reason for removal.

Request

```
{
```

```
  "metaData": {
    "correlationId": "60.1.1234567",
    "messageId": "88888",
    "system": "CMS",
    "timestamp": "2022-05-10T11:55:18.602835000Z"
  },
  "configurationChanges": [
    {
      "airframeFunctionPositionKey": {
        "aircraftKey": {
           "registrationCode": "LRP-15A"
        },
         "airframeFunctionPositionCode": "26-00-02-01:1"
      },
      "remove": {
          "partKey":{
          "partNumber": "KIDDE - 473955-1",
            "serialNumber" : "KIDDE-473955-1-9",
            "manufacturer" : "AIA"
          },
        "reason": "remove broken part"
      },
      "dateTime": "2022-06-10T11:55:18.602835000Z"
    }
  ]
}
```

For multiple parts, the following section needs to be repeated in the above response for every part to be removed, with the corresponding details:

```
    {
      "airframeFunctionPositionKey": {
        "aircraftKey": {
           "registrationCode": "LRP-15A"
        },
         "airframeFunctionPositionCode": "26-00-02-01:1"
      },
      "remove": {
          "partKey":{
          "partNumber": "KIDDE - 473955-1",
            "serialNumber" : "KIDDE-473955-1-9",
            "manufacturer" : "AIA"
          },
        "reason": "remove broken part"
      },
      "dateTime": "2022-06-10T11:55:18.602835000Z"
    }
```

Response

```
{
```

```
    "metaData": {
        "correlationId": "60.1.1234567",
        "messageId": "8cf89448-c0ea-4ba2-9dee-1825057d72a5",
        "system": "CMS",
        "timestamp": "2022-09-21T06:32:03Z"
    },
    "responses": [
        {
            "status": "200",
            "warnings": [
                {
                    "code": "CMS-3001",
                    "detail": "The given part was found but a matching
inventory was not found. A new inventory was created with the given
part number. "
                },
                {
                    "code": "CMS-3019",
                    "detail": "The given part was found but a matching
inventory was not found and a part was found in the requested
remove position. A new inventory was created with the given part
number. N/A: You are removing CARGO SMOKE DETECTION/FIRE SUPPRESSION
MODULE, part no KIDDE - 473955-1, serial no KIDDE-473955-1-9.
According to Maintenix records, this item does not exist and the
currently installed item should have part no 473955-1, serial no
KIDDE-473955-1-9. Are the numbers entered for the removed part
correct?"
                },
                {
                    "code": "CMS-3004",
                    "detail": "A new part is created and assigned to
the part group as unapproved."
                },
                {
                    "code": "CMS-3025",
                    "detail": "There is currently a different
installed inventory in the position, the current inventory was
removed and the given part was attached and removed. N/A: You are
removing CARGO SMOKE DETECTION/FIRE SUPPRESSION MODULE, part no
KIDDE - 473955-1, serial no KIDDE-473955-1-9. According to Maintenix
records, this item is loose and the currently installed item should
have part no 473955-1, serial no KIDDE-473955-1-9. Please confirm
that the part number and serial number of the removed inventory are
correct."
                },
                {
                    "code": "CMS-3010",
                    "detail": "To be removed inventory is not
installed on the config slot, it will be attached then removed.
\nThe inventory KIDDE-473955-1-9 that you have selected with OEM Part
No: KIDDE - 473955-1 has status BUILD (Unapproved Part) and is not
approved.\nYou are attaching CARGO SMOKE DETECTION/FIRE SUPPRESSION
MODULE, part no KIDDE - 473955-1.  According to Maintenix records,
this part is not approved in part group 26-00-02-01-Cargo Smoke
```

```
 Detection/Fire Suppression Module. Please confirm that the part
 number and serial number of the inventory are correct.\n"
                }
            ]
        }
    ]
}
```

Install part for airframe

This message is used to install parts to an airframe.

This POST method requires a list of the parts to be installed. Each part must contain the part number and the manufacturer code.

Request

```
{
  "metaData": {
    "correlationId": "60.1.1234567",
    "messageId": "88888",
    "system": "CMS",
    "timestamp": "2022-05-10T11:55:18.602835000Z"
  },
  "configurationChanges": [
    {
      "airframeFunctionPositionKey": {
        "aircraftKey": {
            "registrationCode": "LRP-15A"
        },
        "airframeFunctionPositionCode": "26-00-02-01:1"
      },
      "install": {
        "partKey": {

            "partNumber": "KIDDE - 473955-1",
            "serialNumber" : "KIDDE-473955-1-9",
            "manufacturer" : "AIA"
        }
      },
      "dateTime": "2022-06-10T11:55:18.602835000Z"
    }
  ]
}
```

For multiple parts, the following section needs to be repeated in the above response for every part to be installed, with the corresponding details:

```
    {
      "airframeFunctionPositionKey": {
        "aircraftKey": {
```

```
            "registrationCode": "LRP-15A"
        },
        "airframeFunctionPositionCode": "26-00-02-01:1"
      },
      "install": {
        "partKey": {

            "partNumber": "KIDDE - 473955-1",
            "serialNumber" : "KIDDE-473955-1-9",
            "manufacturer" : "AIA"
        }
      },
      "dateTime": "2022-06-10T11:55:18.602835000Z"
    }
```

Response

```
{
    "metaData": {
        "correlationId": "60.1.1234567",
        "messageId": "72ef2a71-3a4f-40a1-85ca-ae2b134611b6",
        "system": "CMS",
        "timestamp": "2022-09-21T06:34:06Z"
    },
    "responses": [
        {
            "status": "200",
            "warnings": [
                {
                    "code": "CMS-3011",
                    "detail": "To be installed part is in BUILD or
 OBSLT status. N/A: You have identified that you installed part no
 KIDDE - 473955-1 with status BUILD.  According to Maintenix records,
 this part is not approved.  Please confirm that the part number and
 serial number of the installed inventory are correct."
                },
                {
                    "code": "CMS-3014",
                    "detail": "To be installed inventory is loose and
 its condition is not ready for issue (RFI)."
                },
                {
                    "code": "CMS-3015",
                    "detail": "Following warnings were found to
 install this inventory. \nThe inventory KIDDE-473955-1-9 that
 you have selected with OEM Part No: KIDDE - 473955-1 has status
 BUILD (Unapproved Part) and is not approved.\nYou are attaching
 CARGO SMOKE DETECTION/FIRE SUPPRESSION MODULE, part no KIDDE -
 473955-1.  According to Maintenix records, this part is not approved
 in part group 26-00-02-01-Cargo Smoke Detection/Fire Suppression
 Module. Please confirm that the part number and serial number of the
 inventory are correct.\n"
                }
            ]
```

```
        }
    ]
}
```

Replace part for airframe

This message is used to replace parts of an airframe.

This POST method requires details of the parts to be removed and the parts to be installed. Each part to be removed must contain the serial number and the reason for removal. Each part to be installed must contain the part number and the manufacturer code.

Request

```
{
  "metaData": {
    "correlationId": "60.1.1234567",
    "messageId": "88888",
    "system": "CMS",
    "timestamp": "2022-05-10T11:55:18.602835000Z"
  },
  "configurationChanges": [
    {
      "airframeFunctionPositionKey": {
        "aircraftKey": {
           "registrationCode": "LRP-15A"
        },
         "airframeFunctionPositionCode": "26-00-02-01:1"
      },
      "remove": {
          "partKey":{
          "partNumber": "KIDDE - 473955-1",
            "serialNumber" : "KIDDE-473955-1-9",
            "manufacturer" : "AIA"
          },
        "reason": "remove broken part"
      },
      "dateTime": "2022-06-10T11:55:18.602835000Z"
    }
    {
      "airframeFunctionPositionKey": {
        "aircraftKey": {
            "registrationCode": "LRP-15A"
        },
        "airframeFunctionPositionCode": "26-00-02-01:1"
      },
      "install": {
        "partKey": {

            "partNumber": "KIDDE - 473955-2",
            "serialNumber" : "KIDDE-473955-2-0",
            "manufacturer" : "AIA"
        }
```

```
      },
      "dateTime": "2022-06-10T11:55:18.602835000Z"
    }
  ]
}
```

For multiple parts, the following sections need to be repeated in the above response for every part to be removed and/or installed, with the corresponding details:

Part to be removed:

```
    {
      "airframeFunctionPositionKey": {
        "aircraftKey": {
           "registrationCode": "LRP-15A"
        },
         "airframeFunctionPositionCode": "26-00-02-01:1"
      },
      "remove": {
          "partKey":{
          "partNumber": "KIDDE - 473955-1",
            "serialNumber" : "KIDDE-473955-1-9",
            "manufacturer" : "AIA"
          },
        "reason": "remove broken part"
      },
      "dateTime": "2022-06-10T11:55:18.602835000Z"
    }
```

Part to be installed:

```
    {
      "airframeFunctionPositionKey": {
        "aircraftKey": {
            "registrationCode": "LRP-15A"
        },
        "airframeFunctionPositionCode": "26-00-02-01:1"
      },
      "install": {
        "partKey": {

            "partNumber": "KIDDE - 473955-2",
            "serialNumber" : "KIDDE-473955-2-0",
            "manufacturer" : "AIA"
        }
      },
      "dateTime": "2022-06-10T11:55:18.602835000Z"
    }
```

Retrieve list of missing mandatory components

This is the response payload when retrieving the list of missing components.

This GET method requires the aircraftRegistrationCode in the endpoint.


```
{
    "metadata": {
        "correlationId": "297e18ee-7815-46cd-b43b-b8bf6a55469e",
        "messageId": "a97d593a-cc1f-49e7-bfd6-a8bdd2805ee3",
        "system": "CMS",
        "user": "mxi",
        "timestamp": "2023-11-13T16:58:23.442Z"
    },
    "status": "200",
    "hasMissingMandatoryComponent": "true"
    "missingComponents": [
        {
            "standardPart": {
                "partNumber": "321002519ALT-UNK",
                "name": "ANTI SKID CONT"
            },
            "airframeFunctionPositionCode": "321002519ALT:1.2.2"
        },
        {
            "standardPart": {
                "partNumber": "721907710",
                "name": "HPT MODULE"
            },
            "assembly": "CF6-80",
            "airframeFunctionPositionCode": "CF6-80:1.RT",
            "assemblyFunctionPositionCode": "8054:1.1"
        },
        {
            "standardPart": {
                "partNumber": "273T4520-9-1",
                "name": "MLG DOOR"
            },
            "airframeFunctionPositionCode": "321002790:1.2"
        },
        {
            "standardPart": {
                "partNumber": "2-7460-3",
                "name": "ANTI SKID"
            },
            "airframeFunctionPositionCode": "321002761:1.2"
        },
        {
            "standardPart": {
                "partNumber": "721907748",
                "name": "HOTSEC MODULE"
            },
            "assembly": "CF6-80",
            "airframeFunctionPositionCode": "CF6-80:1.LT",
            "assemblyFunctionPositionCode": "8053:1.1"
```

```
        },
        {
            "standardPart": {
                "partNumber": "3800298-1-5",
                "name": "G20 757/767 APU"
            },
            "airframeFunctionPositionCode": "APU G20:1.1"
        },
        {
            "standardPart": {
                "partNumber": "162T1111-1",
                "name": "OUTER CYLINDER"
            },
            "airframeFunctionPositionCode": "702:1.1"
        }
    ],
    "code": null,
    "detail": null,
    "warnings": []
}
```


Part on an engine

Remove part for engine

This message is used to remove parts from an engine.

This POST method requires a list of the parts to be removed. Each part must contain the serial number and the reason for removal.

Request


```
{
  "metaData": {
    "correlationId": "60.1.1234567",
    "messageId": "88888",
    "system": "CMS",
    "timestamp": "2022-05-10T11:55:18.602835000Z"
  },
  "configurationChanges": [
    {
      "subAssemblyFunctionPositionKey": {
        "aircraftKey": {
          "registrationCode": "LRP-15A"
        },
      "airframeFunctionPositionCode": "72-00-00:1",
      "assemblyFunctionPositionCode": "71-11-11:1"
      },
     "remove": {
        "partKey": {
            "partNumber": "MI585161",
            "serialNumber": "MI585161"
```

```
        },
       "reason": "broken part"
      },
      "dateTime": "2022-05-10T11:55:18.602Z"
    }
  ]
}
```

For multiple parts, the following section needs to be repeated in the above response for every part to be removed, with the corresponding details:

```
    {
      "subAssemblyFunctionPositionKey": {
        "aircraftKey": {
          "registrationCode": "LRP-15A"
        },
       "airframeFunctionPositionCode": "72-00-00:1",
       "assemblyFunctionPositionCode": "71-11-11:1"
      },
     "remove": {
        "partKey": {
            "partNumber": "MI585161",
            "serialNumber": "MI585161"
        },
       "reason": "broken part"
      },
      "dateTime": "2022-05-10T11:55:18.602Z"
    }
```

Reponse

```
{
    "metaData": {
        "correlationId": "60.1.1234567",
        "messageId": "d0badc41-43fc-4025-a78d-3c35e7e30204",
        "system": "CMS",
        "timestamp": "2022-09-21T07:15:01Z"
    },
    "responses": [
        {
            "status": "200",
            "warnings": [
                {
                    "code": "CMS-3005",
                    "detail": "A part is found and assigned to the
 part group as unapproved."
                },
                {
                    "code": "CMS-3017",
                    "detail": "There is currently a different
 installed inventory in the position, the current inventory was
 removed, and the given part was attached and removed. N/A: You are
```

```
 removing RECEIVER-TRANSMITTER, part no MI585161, serial no MI585161.
 According to Maintenix records, this item is already installed on
 aircraft LRP-15A and the currently installed item should have part
 no 65-73774-823, serial no ENG221322. Please confirm that the part
 number and serial number of the removed inventory are correct."
                },
                {
                    "code": "CMS-3010",
                    "detail": "To be removed inventory is not
 installed on the config slot, it will be attached then removed. \nYou
 are attaching RECEIVER-TRANSMITTER, part no MI585161.  According to
 Maintenix records, this part is not approved in part group 71-11-11-
Cowling Doors. Please confirm that the part number and serial number
 of the inventory are correct.\n"
                }
            ]
        }
    ]
}
```

Install part for engine

This message is used to install parts to an engine.

This POST method requires a list of the parts to be installed. Each part must contain the part number and the manufacturer code.

Note For serialized (SER) parts, a serial number is always mandatory for tracking and identification.For batch (BATCH) parts, the serial number is optional.

Request

```
{
  "metaData": {
    "correlationId": "60.1.1234567",
    "messageId": "88888",
    "system": "CMS",
    "timestamp": "2022-05-10T11:55:18.602835000Z"
  },
  "configurationChanges": [
    {
      "subAssemblyFunctionPositionKey": {
        "aircraftKey": {
           "registrationCode": "LRP-15A"
        },
      "airframeFunctionPositionCode": "72-00-00:1",
      "assemblyFunctionPositionCode": "71-11-11:1"
      },
     "install": {
        "partKey": {
            "partNumber": "MI585161",
```

```
            "serialNumber": "MI585161"
        },
     },
    "dateTime": "2022-05-10T11:55:18.602Z"
    }
  ]
}
```

For multiple parts, the following section needs to be repeated in the above response for every part to be installed, with the corresponding details:

```
    {
      "subAssemblyFunctionPositionKey": {
        "aircraftKey": {
           "registrationCode": "LRP-15A"
        },
      "airframeFunctionPositionCode": "72-00-00:1",
      "assemblyFunctionPositionCode": "71-11-11:1"
      },
     "install": {
        "partKey": {
            "partNumber": "MI585161",
            "serialNumber": "MI585161"
        },
     },
    "dateTime": "2022-05-10T11:55:18.602Z"
    }
```

Response

```
{
    "metaData": {
        "correlationId": "60.1.1234567",
        "messageId": "4bb9f4ea-f276-4b55-b281-bece97563482",
        "system": "CMS",
        "timestamp": "2022-09-21T07:16:08Z"
    },
    "responses": [
        {
            "status": "200",
            "warnings": [
                {
                    "code": "CMS-3014",
                    "detail": "To be installed inventory is loose and
 its condition is not ready for issue (RFI)."
                },
                {
                    "code": "CMS-3015",
                    "detail": "Following warnings were found to
 install this inventory. \nYou are attaching RECEIVER-TRANSMITTER,
 part no MI585161.  According to Maintenix records, this part is not
```

```
 approved in part group 71-11-11-Cowling Doors. Please confirm that
 the part number and serial number of the inventory are correct.\n"
                }
            ]
        }
    ]
}
```

Replace part for engine

This message is used to replace parts of an engine.

This POST method requires details of the parts to be removed and the parts to be installed. Each part to be removed must contain the serial number and the reason for removal. Each part to be installed must contain the part number and the manufacturer code.

Request

```
{
  "metaData": {
    "correlationId": "60.1.1234567",
    "messageId": "88888",
    "system": "CMS",
    "timestamp": "2022-05-10T11:55:18.602835000Z"
  },
  "configurationChanges": [
    {
      "subAssemblyFunctionPositionKey": {
        "aircraftKey": {
          "registrationCode": "LRP-15A"
        },
      "airframeFunctionPositionCode": "72-00-00:1",
      "assemblyFunctionPositionCode": "71-11-11:1"
      },
     "remove": {
        "partKey": {
            "partNumber": "MI585161",
            "serialNumber": "MI585161"
        },
      "reason": "broken part"
     },
     "dateTime": "2022-05-10T11:55:18.602Z"
    }
    {
      "subAssemblyFunctionPositionKey": {
        "aircraftKey": {
           "registrationCode": "LRP-15A"
        },
      "airframeFunctionPositionCode": "72-00-00:1",
      "assemblyFunctionPositionCode": "71-11-11:1"
      },
     "install": {
        "partKey": {
```

```
            "partNumber": "MI585162",
            "serialNumber": "MI585162"
        },
     },
    "dateTime": "2022-05-10T11:55:18.602Z"
    }
  ]
}
```

For multiple parts, the following sections need to be repeated in the above response for every part to be removed and/or installed, with the corresponding details:

Part to be removed:

```
    {
      "subAssemblyFunctionPositionKey": {
        "aircraftKey": {
          "registrationCode": "LRP-15A"
        },
      "airframeFunctionPositionCode": "72-00-00:1",
      "assemblyFunctionPositionCode": "71-11-11:1"
      },
     "remove": {
        "partKey": {
            "partNumber": "MI585161",
            "serialNumber": "MI585161"
        },
      "reason": "broken part"
     },
     "dateTime": "2022-05-10T11:55:18.602Z"
    }
```

Part to be installed:

```
    {
      "subAssemblyFunctionPositionKey": {
        "aircraftKey": {
           "registrationCode": "LRP-15A"
        },
      "airframeFunctionPositionCode": "72-00-00:1",
      "assemblyFunctionPositionCode": "71-11-11:1"
      },
     "install": {
        "partKey": {
            "partNumber": "MI585162",
            "serialNumber": "MI585162"
        },
     },
    "dateTime": "2022-05-10T11:55:18.602Z"
    }
```

Configuration change validation for loose assembly

This section shows sample payloads related to parent assembly and child components that are loose equipment, during shop repair.

Scenario 1:

Parent assembly is a loose engine with multiple TRK parts installed. One TRK part must be replaced.

The replacement part is not found in the Maintenix database. Therefore the CMS automatically creates a new TRK part.

Parent Assembly Details	Sub-component Details
Loose Engine: • **P/N:** CF34-10E • **S/N:**994648	TRK to be removed: • **P/N:** CF34QEC • **S/N:**994397QEC • **Sub-assembly Position Code:** 71-00-99-01:1
	TRK to be installed: • **P/N:** CF34QEC • **S/N:** 424489

Payload:

```
{
  "metaData": {
    "correlationId": "60.1.1234567",
    "messageId": "88888",
    "system": "FLM",
    "timestamp": "2022-05-10T11:55:18.602835000Z",
    "user":"mxi"
  },
  "configurationChanges": [
    {
      "assemblyFunctionPositionKey": {
        "assemblyPartKey": {
          "partNumber": "CF34-10E",
          "serialNumber":"994648"
        },
        "assemblyFunctionPositionCode": "71-00-99-01:1"
      },
      "remove": {
        "partKey": {
          "partNumber": "CF34QEC",
          "manufacturerCode": "99207",
          "serialNumber": "994397QEC"
```

```
        }
      },
      "install": {
        "partKey": {
          "partNumber": "CF34QEC",
          "manufacturerCode": "99207",
          "serialNumber": "424489"
        }
      },
      "dateTime": "2022-05-10T11:55:18.602Z"
    }
  ]
}
```

Scenario 2:

Parent assembly is a loose TRK part with a part installed. One TRK part must be removed.

Parent Assembly Details	Sub-component Details
Loose TRK: • **P/N:** 21425-01 • **S/N:** 09113032	TRK to be removed: • **P/N:** 21598-01 • **S/N:** 1346 • **Sub-assembly Position Code:** 21-31-03-01:1

Payload:

```
{
  "metaData": {
    "correlationId": "60.1.1234567",
    "messageId": "88888",
    "system": "FLM",
    "timestamp": "2022-05-10T11:55:18.602835000Z",
    "user":"mxi"
  },
  "configurationChanges": [
    {
      "assemblyFunctionPositionKey": {
        "assemblyPartKey": {
          "partNumber": "21425-01",
          "serialNumber":"09113032"
        },
        "assemblyFunctionPositionCode": "21-31-03-01:1"
      },
      "remove": {
        "partKey": {
          "partNumber": "21598-01",
          "serialNumber": "1346"
        }
```

```
      },
      "dateTime": "2022-05-10T11:55:18.602Z"
    }
  ]
}
```

5

Errors and warnings

Errors and warnings

When the CMS API processes messages that cannot result in a successful response, error messages or warnings are displayed as follows.

Error Messages

Scenario	Area	Type	Message	Status code	Alert ID	Notes
The registrationCode in AircraftKey cannot be found in Maintenix	Reference Errors	Error	Aircraft could not be found for registration code	CMS-4000	4000	
The configuration slot code in airframeFunctionPosition Code cannot be found in Maintenix	Reference Errors	Error	Config slot with code <> could not be found	CMS-4003	4003	
The position code in airframeFunctionPositionCode cannot be found in Maintenix	Reference Errors	Error	Position <> could not be found on config slot with code <>	CMS-4005	4005	

Scenario	Area	Type	Message	Status code	Alert ID	Notes
The position code is not provided in airframeFunctionPositionCode and there are multiple positions in the configuration slot code, and therefore unable to determine the exact airframe function position	Reference Errors	Error	Config slot with code <> has multiple positions and a position was not provided	CMS-4004	4004	
Loose inventory specified under assemblyPartKey cannot be found in Maintenix	Reference Errors	Error	The loose part inventory we are installing or removing from was not found	CMS-4018	4018	
Loose inventory specified under assemblyPartKey has multiple parts in Maintenix	Reference Errors	Error	There were multiple possible loose part inventories found	CMS-4019	4019	
Loose inventory specified under assemblyPartKey and assemblyFunctionPositionCode is currently installed or is assigned to another location	Reference Errors	Error / Warning	The Loose Part is currently installed in an aircraft or another part, it is replaced by a duplicated part in the parent inventory	CMS-3026	3026	Controlled by config parameter

Scenario	Area	Type	Message	Status code	Alert ID	Notes
Loose inventory specified under assemblyPartKey is locked or scrapped	Reference Errors	Error	The loose part inventory we are installing or removing from is locked or quarantined or scrapped	CMS-4021	4021	
Loose inventory specified under assemblyPartKey is not sub-assembly or TRK	Reference Errors	Error	The loose part inventory provided is not TRK or ASSY	CMS-4022	4022	
Position of the loose TRK inventory specified under assemblyFunctionPositionCode is not provided, or cannot be found	Reference Errors	Error	Loose Part Config slot with code <> could not be found	CMS-4023	4023	
Part number of the loose inventory child component cannot be found in the validation request	Reference Errors	Error	Part number was not found in the loose part request	CMS-4024	4024	
Position of the loose inventory child component is not provided or cannot be found under assemblyFunctionPositionCode	Reference Errors	Error	Loose Part Function Position not provided and CMS not able to find config slot by provided part number	CMS-4025	4025	
Registration code not provided	Schema Error	Error				
Configuration slot code not provided	Schema Error	Error				

Scenario	Area	Type	Message	Status code	Alert ID	Notes
Unauthorized	Authorization	Error				When not enabled
Both the partNumber and the manufacturerCode are provided in the partKey, mxPartNumber found, but not on the part group and not the same inv class	Remove, Install	Error	Part number in the request is of a different inv class			
mxPartNumber found serialNumber found, part is either quarantined or scrapped	Remove, Install	Error	The requested part to be installed, is either quarantined or scrapped	CMS-4009	4009	
Reason not provided	Remove, Install	Error	Unexpected error occurred while processing the configuration change	CMS-4002	4002	
If removed partNumber in the partKey is provided, serialNumber must be provided as well	Remove	Error	The removed part's serial number is required if the removed part's part number is provided	CMS-4006	4006	

Scenario	Area	Type	Message	Status code	Alert ID	Notes
If removed partKey, both part number and manufacturer are not provided, look for the default "mx part no" in the provided functional position, but no 'part no' found in the provided functional position	Remove	Error	The remove part number and manufacturer code were not provided, and a standard part does not exist for the part group associated with the provided function position code	CMS-4007	4007	
Full partKey is provided - Part is found but serialNumber is XXX	Remove	Error	The given part's serial number is XXX or UNK and is not valid	CMS-4008	4008	
serialNumber of the installed part not provided on the request	Install	Error	Serial number of the installed part is not provided			
partNumber of the installed part not provided on the request	Install	Error	Part number of the installed part is not provided			
The location in which the inventory item has to be installed is not a hole (inventory installed already)	Install	Error	There is a part installed on the requested location			

Scenario	Area	Type	Message	Status code	Alert ID	Notes
Install partKey provided without partNumber or serialNumber	Install	Error	Install part key was provided without a part number or serial number	CMS-4001	4001	

Warnings

Scenario	Area	Type	Message	Status code	Alert ID	Notes
All the following scenarios where a new part is installed and added to the part group: 1. Full partKey provided --> mxPartNumber not found, manufacturerCode not found 2. Full partKey provided --> mxPartNumber not found, but the manufacturer was found 3. Manufacturer not provided in partKey --> mxPartNumber not found in the part group and in all parts	Remove, Install	Warning	A new part is created and assigned to the part group as unapproved	CMS-3004	3004	

Scenario	Area	Type	Message	Status code	Alert ID	Notes
All the following scenarios where an existing part is added to the part group as unapproved: 1. Full partKey provided --> mxPartNumber found, but not inside the part group, but same inventory class 2. Manufacturer not provided in partKey --> mxPartNumber found in the part group, single result 3. Manufacturer not provided in partKey --> mxPartNumber not found in the part group, but in all parts, single result	Remove, Install	Warning	A part is found and assigned to the part group as unapproved	CMS-3005	3005	
All the following scenarios where CMS has to pick one, due to inadequate information provided: 1. Manufacturer not provided in partKey --> mxPartNumber found in the part group, but multiple results 2. Manufacturer not provided in partKey --> mxPartNumber not found in the part group, but in all parts and has multiple results	Remove, Install	Warning	Insufficient information on the part number hence the default part is picked	CMS-3006	3006	
All the following scenarios where a new inventory item has to be created: 1. Serial number doesn't exist	Remove, Install	Warning	A new inventory item is created	CMS-3001	3001	

Scenario	Area	Type	Message	Status code	Alert ID	Notes
All the following scenarios where the existing inventory item has to be duplicated as it cannot be used: 1. Inventory is marked as "in a shop" (install only) 2. Inventory is installed on a locked parent	Remove, Install	Warning	A duplicate inventory item is created	CMS-3002, CMS-3003	3002, 3003	
Removed partKey not provided, but currently nothing installed at provided position in Maintenix	Remove	Warning	No configuration change was applied. The remove part key was not provided and a part was not currently installed in the provided function position			
In removed partKey, manufacturer is provided without partNumber, the manufacturer is ignored	Remove	Warning	Remove part key was provided with a manufacturer code but without a part number, the manufacturer code has been ignored	CMS-3000	3000	
No partKey provided and no installed parts on the requested location	Remove	Warning	Nothing to remove from the functional position	CMS-3007	3007	

Scenario	Area	Type	Message	Status code	Alert ID	Notes
No partKey is provided and there is an installed part on the requested location	Remove	Warning	Remove part details are missing in the request. The currently installed part is removed			

Configuring warning parameters

The CMS displays warning messages depending on the data issues detected, and configuration parameters set.

About this task

When the CMS detects data issues or lack of information that prevent operations, a warning message is displayed.

The system administrator must configure the warning parameters in the **utl_config_parm** table.

Scenario	Configuration parameter, CMS warnings
The requested remove position is empty, the given remove part is installed in a different position, the given part was detached from it's current position, attached and removed; Or the given remove part is loose, the given part was attached and removed.	HOLE_TOBE_RMVD_EXISTS, CurrentlyHoleToBeRemovedWarningValidator

Scenario	Configuration parameter, CMS warnings
No remove part was given but there is currently an installed inventory in the requested position, the current inventory was removed. Or to be removed part is provided but there is currently a different installed inventory in the position, the current inventory was removed and the given part was attached and removed.	TOBE_RMVD_NOTMATCH, CurrentlyInstalledInventoryRemovedWarningValidator
The installed part status is not approved or the installed part is not approved in the part group, part incompatibility or the part is not interchangeable.	*This warning is not configurable,* InstallAttachingInventoryWarningValidator
The installed part is not approved in the part group.	TOBE_INST_NOTAPPROVED_FOR_GROUP, InstalledPartNotApprovedInGroupWarningValidator
The part to be installed does not belong to the inventory owners organization.	TOBE_INST_PART_USER_NOT_BELONG_TO_INV_OWNER_ORG, InstalledPartUserNotBelongToInventoryOwnerOrgWarningValidator
The installed part is locked or in repair, a duplicated part was created.	CMS_DUP_INV_CREATED, InstallInventoryDuplicatedWarningValidator
The part to be installed had incompatibility warnings.	TOBE_INST_NOT_TASK_COMPATIBLE, TOBE_INST_NOT_PART_COMPATIBL, InstallPartIncompatibleWarningValidator

Scenario	Configuration parameter, CMS warnings
The part to be installed is in BUILD or OBSLT status.	TOBE_INST_NOTAPPROVED, InstallPartNotApprovedWarningValidator
The given part was found but matching inventory was not found and there is a hole in the requested remove position or there is a part that was found in the requested remove position. A new inventory was created with the given part number.	TOBE_INST_NOTFOUND, TOBE_RMVD_NOTFOUND, HOLE_TOBE_RMVD_NOTFOUND, InventoryCreatedWarningValidator
There is no currently installed inventory in the position, nothing was removed.	*This warning is not configurable,* NoInventoryRemovedWarningValidator
A part is found and assigned to the part group as unapproved.	CMS_PART_NO_ASSIGNED_TO_PART_GROUP, PartNumberAddedToPartGroupWarningValidator
A new part is created and assigned to the part group as unapproved.	CMS_NEW_PART_NO_CREATED, PartNumberCreatedWarningValidator
Multiple matching part numbers were found, a part was selected by the CMS API.	CMS_NEW_PART_NO_CREATED, PartNumberCreatedWarningValidator
The removed part is locked, a duplicate part was created.	CMS_DUP_INV_CREATED, RemoveInventoryDuplicatedWarningValidator

Scenario	Configuration parameter, CMS warnings
Remove part key was provided with a manufacturer code but without a part number, the manufacturer code has been ignored.	*This warning is not configurable,* RemoveManufacturerIgnoredWarningValidator
The inventory be installed is loose and its condition is not ready for issue (RFI).	TOBE_INST_NOT_RFI, ToBeInstalledLooseAndNotRFIWarningValidator
The part to be installed is not interchangeable.	TOBE_INST_NOT_PART_INTERCHANGEABLE, ToBeInstalledNotInterchangeableWarningValidator
The inventory to be installed is attached.	TOBE_INST_ATTACHED, ToBeInstallNotLooseWarningValidator
The inventory be removed is not installed on the config slot, it will be attached and then removed.	TOBE_RMVD_NOTMATCH, ToBeRmvdInvNotInstalledOnSlotWarningValidator
The given remove position has inventory currently installed with serial number XXX or UNK and is updated with the provided part number and serial number.	*This warning is not configurable,* ToBeRmvdNotMatchXXXAttachedPartWarningValidator

Note Error configuration parameters are not configurable

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