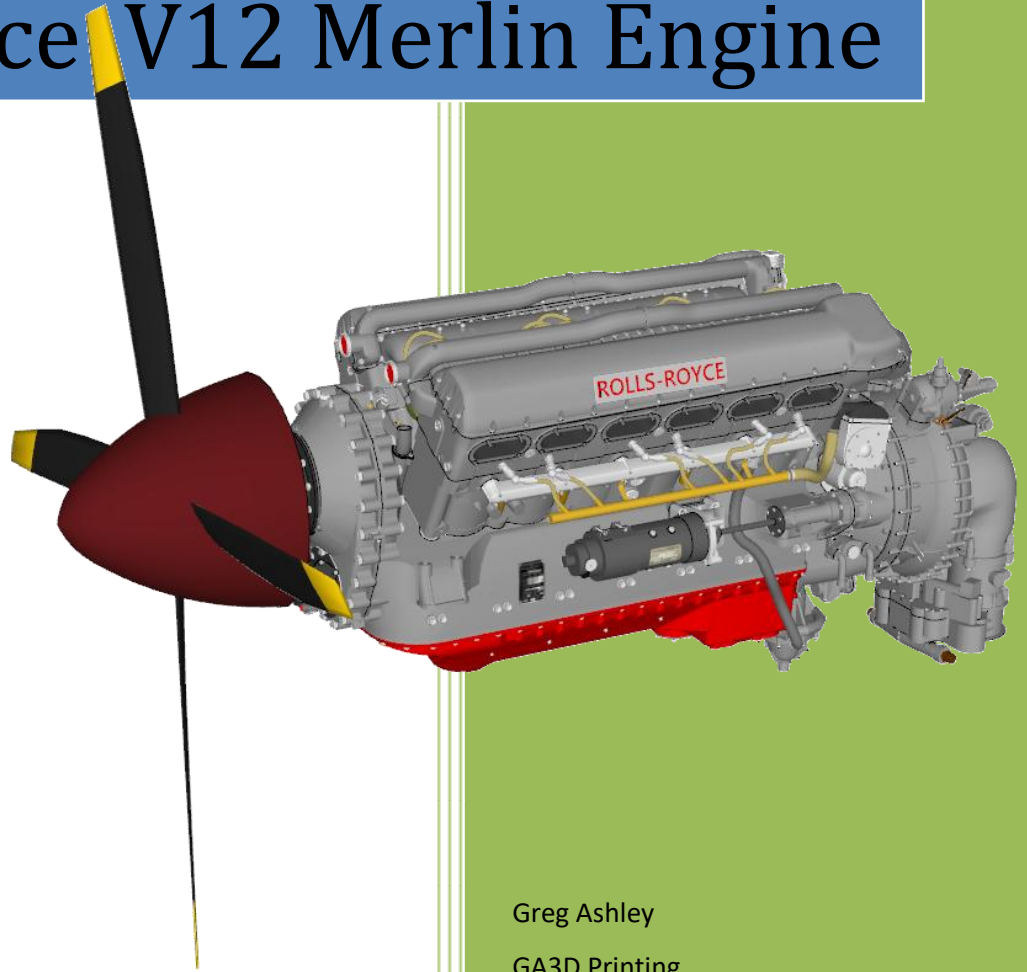


# 2021

## Rolls Royce V12 Merlin Engine



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GA3D Printing

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# Rolls Royce V12 Merlin 3D Printed Merlin Engine Introduction

Disclosure: - This model was downloaded from the 3D Warehouse, the engineer that uploaded the model was PM3D we did not design or make the original sketch/model. This version of the Rolls Royce Merlin first produced in July 1940, just in time for the Battle of Britain. Two speed supercharger and 1480 hp @ 3000 rpm at 6000ft. Used on Hurricane II, Beaufighter II, Halifax II & Lancaster I.

The printed parts are all in PLA+ filament and printed on Creality Ender-3 V2 FDM printers. Some parts are 0.12mm layer heights and others are 0.08mm layer height, to achieve the best resolution for the end model. The model has been scaled to 12% of the downloaded model. Most parts required support and this has been noted in the items parts listing.

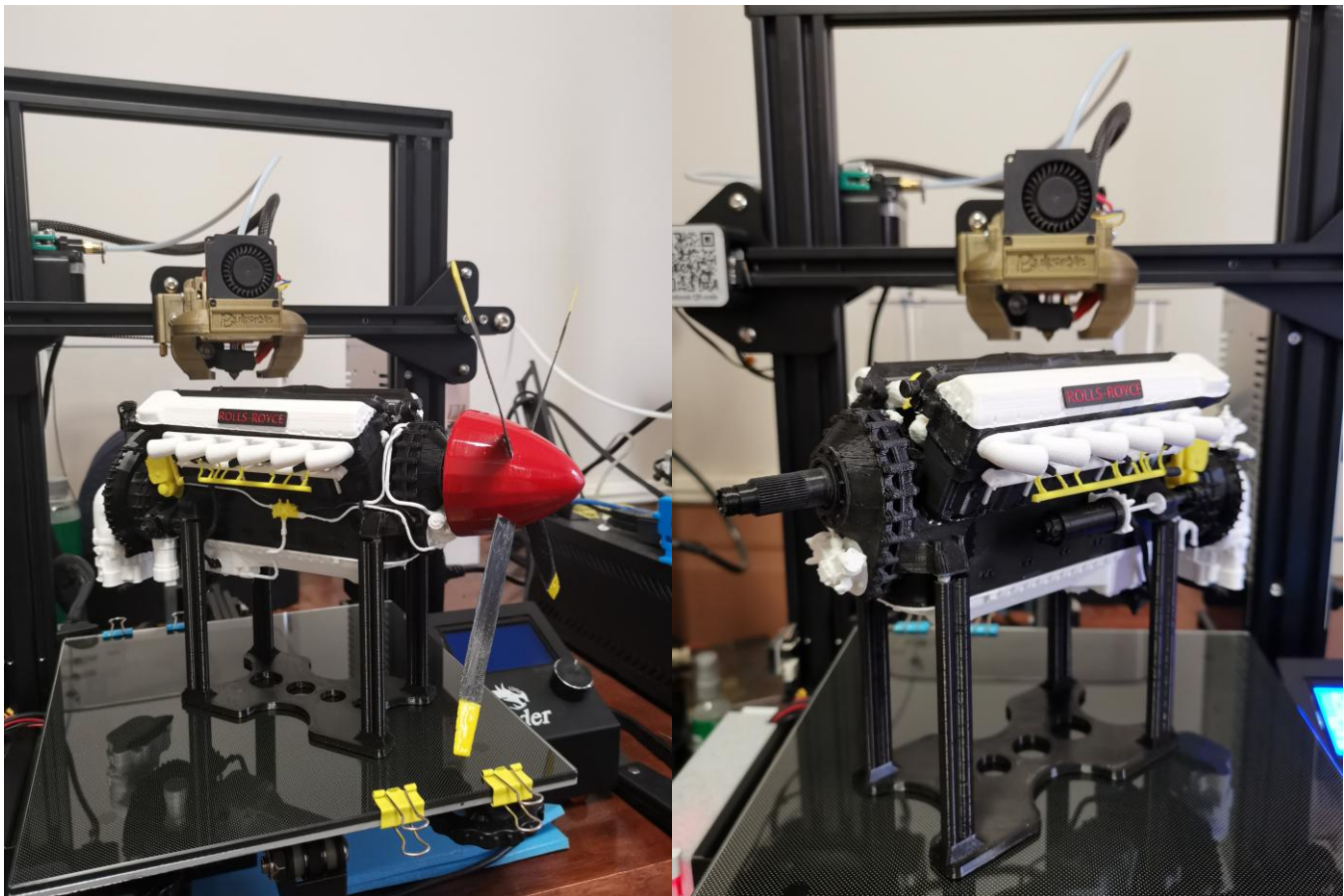
As mentioned, we did not design the 3D model but we have spent many hours in splitting up the model into 57 individual parts. All parts required repairing, as many manifolds existed, and parts where not assembled correctly, so as to correctly and successfully 3D Print. We have also separated all parts so as to make it easier to assemble and paint the model as you wish.

All STL files can be downloaded from [GA3DPrinting.com](http://GA3DPrinting.com) any questions or concerns maybe emailed through to [admin@ga3dprinting.com](mailto:admin@ga3dprinting.com) We have made some notes to customers that may have purchased the printed parts from us and that may not have seen or used parts that have been FDM 3D Printed before. These printed parts are as they come from the printer, no attempt has been made to clean the parts. This will reflect in our notes below.

## Notes on 3D Printed Parts:-

- 1.) Most parts are printed with supports and brims. All supports and brims need to be removed carefully as to not break the plastic parts. Remember all FDM 3D Printed parts have layers lines, these lines are produced during the FDM process. The layer lines are also the weak point of all 3D Printing parts, so with this knowledge handle the removal of all supports and brims with the layer lines in mind.
- 2.) Brims are the single layer at the bottom of prints; they are used to help with bed adhesion during printing. They are best removed with either a sharp scalpel or file. I also use a ceramic blade to scrape of the brim as it does give a better finish by using this method.
- 3.) While we are still at the first layer of a print, if no brim has been used or even with the aid of a brim, prints will still come off the printer with a slight elephant's foot. This is where the plastic bulges out at the bottom first few layers. All parts should have this elephants foot scraped off, to get a nice sharp corner for mating parts. Just a side note here, all bottom surfaces can be identified by the very smooth glass like surface, as I print directly on glass!
- 4.) All supports can be removed by using a small precision flat bladed screw driver, to leverage the support off. Again be careful not the damage the parent part of the print. I have included an image of all the parts in the manual, so to better give you an idea of how the part should look without the supports. When the supports are removed there may be a small amount of plastics remain, this can be scrapped off the print.

- 5.) Very small thin strands of plastic, called spider webs maybe seen on the print. These can be best removed with the aid of a heat source, like a butane torch. Be very careful as the part will melt if too much heat is applied. Webs are best removed placing the heat source at the under the part, and allow the heat to rise up to the part and melt the webs away. This gives you a better feel on how close to bring the flame and part together, without damage. The webs should just disappear if done correctly.
- 6.) Try not to use any power tools like a Dremel tool to remove excess and unwanted plastic from the part. As we have found that using these types of tools, just melts the plastic and damages the lower layers around where the excess piece of plastic was. Just scrap or cut off the excess plastic, works the best for the finished model.
- 7.) We had found the best adhesive to use with the PLA+ filament is ZAP-A-Gap Medium CA+ some assembly can be made easy by using the ZAP product called ZIP Kicker CA Accelerator. Remember once the parts have been stuck together, it is basically impossible to detach them from one another. So please be careful with the assembly process and ensure all parts are aligned as per the supplied images.
- 8.) The parts are not numbered, so ensure that you have the correct part as per the images. There are Left and Right hand parts, so ensure you check that you have the correct side before gluing.
- 9.) Below we have included some images of the finished product. We did not paint the model and only used coloured filament to product the model. These images may assist with your assembly of the model.



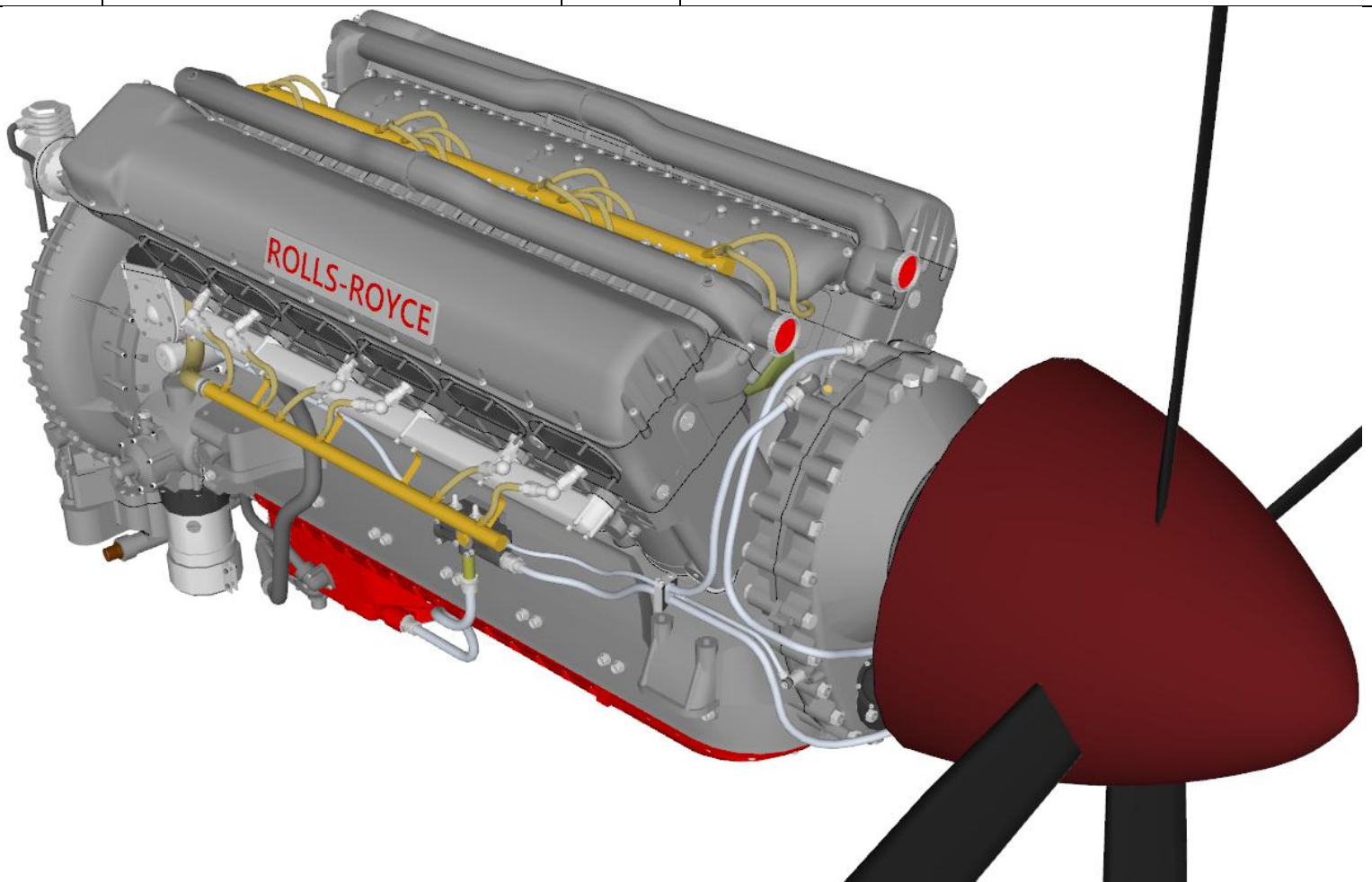
Have fun assembling this model.

## Rolls Royce Assembly Parts List

<u>Item No</u>	<u>Part Name</u>	<u>Image No</u>	<u>Assembly Description</u>
001	Merlin Engine Block LH	1	Supports used so check image, removal see Item No1
002	Merlin Engine Block RH	2	Supports used so check image, removal see Item No2
003	Merlin Engine Barrel LH	3	Supports used so check image, removal see Item No3
004	Merlin Engine Barrel RH	4	Supports used so check image, removal see Item No4
005	Merlin Cylinder Head LH	4	Supports used so check image, removal see Item No5
006	Merlin Cylinder Head RH	3	Supports used so check image, removal see Item No6
007	Merlin Valve Cover LH	2	Supports used so check image, removal see Item No7
008	Merlin Valve Cover RH	2	Supports used so check image, removal see Item No8
009	Merlin Super Charger Front	1	Supports used so check image, removal see Item No9
010	Merlin Super Charger Mid	1	Supports used so check image, removal see Item No10
011	Merlin Super Charger Rear	1	No Supports used, see Item No11
012	Merlin SU Carburettor	1	Supports used so check image, removal see Item No12
013	Merlin Top Coolant Pipe LH	2	Supports used so check image, removal see Item No13
014	Merlin Top Coolant Pipe RH	2	Supports used so check image, removal see Item No14
015	Merlin Intake Manifold LH	4	Supports used so check image, removal see Item No15
016	Merlin Intake Manifold RH	3	Supports used so check image, removal see Item No16
017	Merlin Induction Tube	5	Supports used so check image, removal see Item No17
018	Merlin Ignition Loom Inner	2 & 5	Supports used so check image, removal see Item No18
019	Merlin Coolant Manifold LH	3 & 7	Supports used so check image, removal see Item No19
020	Merlin Coolant Manifold RH	4 & 7	Supports used so check image, removal see Item No20
021	Merlin Ignition Loom Outer LH	5 & 8	Supports used so check image, removal see Item No21

022	Merlin Ignition Loom Outer RH	5 & 8	Supports used so check image, removal see Item No22
023	Merlin Exhaust Pipes Zoff		Supports used so check image, removal see Item No23
024	Merlin Generator Housing	3 & 8	Supports used so check image, removal see Item No24
025	Merlin Generator Mounting	7 & 9	Supports used so check image, removal see Item No25
026	Merlin Generator Connector	3	Supports used so check image, removal see Item No26
027	Merlin Magneto LH	6	Supports used so check image, removal see Item No27
028	Merlin Magneto RH	6	Supports used so check image, removal see Item No28
029	Merlin Magneto Balance Pipe	6	Supports used so check image, removal see Item No29
030	Merlin Magneto Connector Pipe	6	Supports used so check image, removal see Item No30
031	Merlin LH Magneto Outer Ignition Loom Connector Pipe	6	Supports used so check image, removal see Item No31
032	Merlin RH Magneto Outer Ignition Loom Connector Pipe	6	Supports used so check image, removal see Item No32
033	Merlin Starter Motor	2 & 8	Supports used so check image, removal see Item No33
034	Merlin Speed Clutch Pump	8 & 9	Supports used so check image, removal see Item No34
035	Merlin SU Carburettor Lower Pipe	9	Supports used so check image, removal see Item No35
036	Merlin 2 Speed Control	1 & 6	Supports used so check image, removal see Item No36
037	Merlin Control Linkage Bar	10	Supports used so check image, removal see Item No37 Glue on as shown in a Horizontal Position
038	Merlin Fuel Pump	8 & 9	Supports used so check image, removal see Item No38
039	Merlin Pressure Regulator	2	Supports used so check image, removal see Item No39
040	Merlin Heywood Compressor	1 & 8	Supports used so check image, removal see Item No40
041	Merlin Cam Drive and Shafts	6	No Supports used, see Item No41
042	Merlin Rolls Royce Name Plate Zoff	3	Supports used so check image, removal see Item No42
043	Merlin CSU Pitch Controller	4	Supports used so check image, removal see Item No43
044	Merlin Hydraulic Pipe 1	7 & 9	Supports used so check image, removal see Item No44 To be cut at the Engine Block Hydraulic Mounting Block
045	Merlin Hydraulic Pipe 2	10	Supports used so check image, removal see Item No45

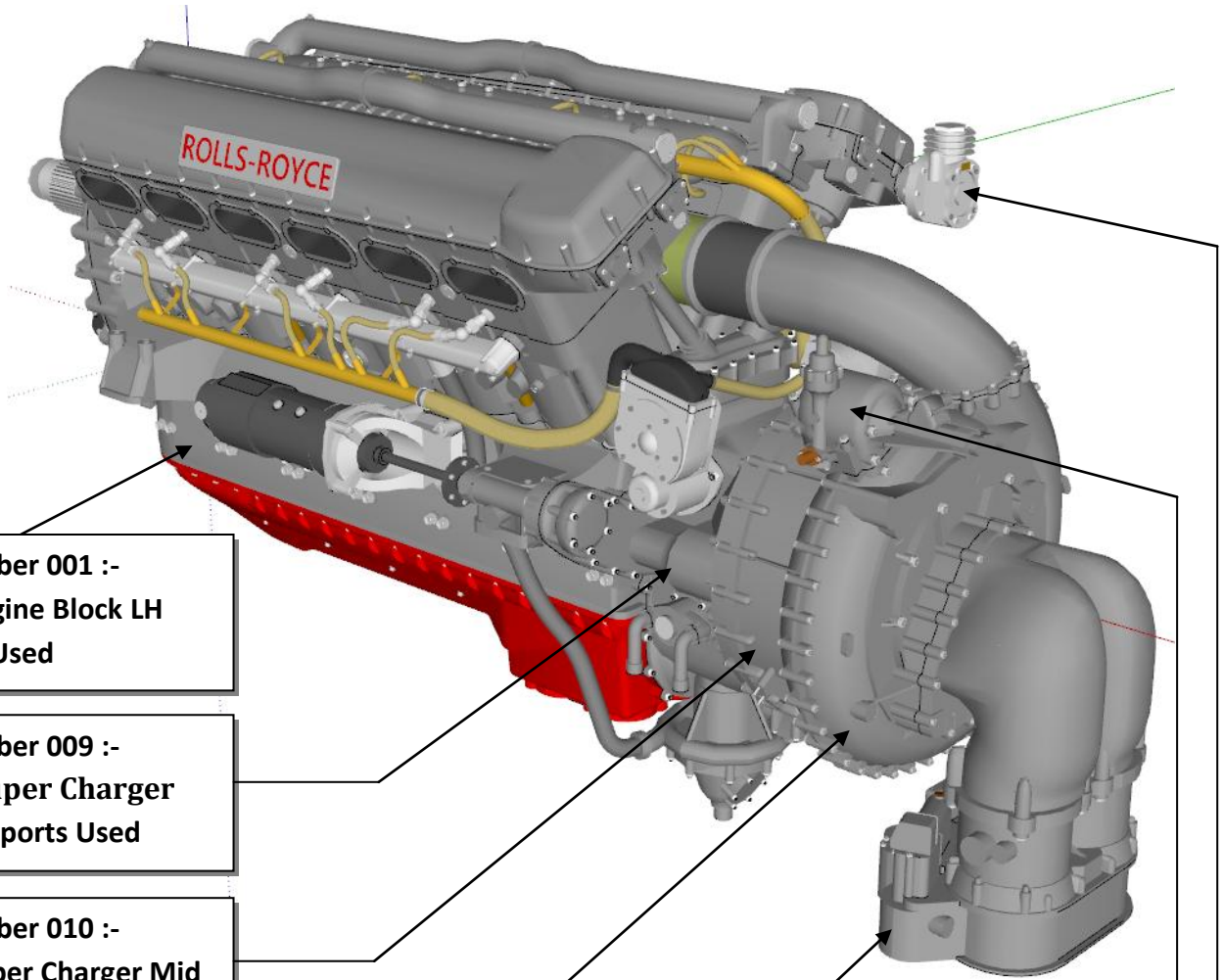
046	Merlin Hydraulic Pipe 3	7 & 10	Supports used so check image, removal see Item No46
047	Merlin Hydraulic Pipe 4	7 & 10	Supports used so check image, removal see Item No47
048	Merlin Hydraulic Pipe 5	10	Supports used so check image, removal see Item No48 To be cut at the Engine Block Hydraulic Mounting Block
049	Merlin Hydraulic Pipe 6	10	Supports used so check image, removal see Item No49
050	Merlin Coolant Pump RH Hose	7,9&10	Supports used so check image, removal see Item No50
051	Merlin Coolant Pump LH Hose	7 & 9	Supports used so check image, removal see Item No51
052	Merlin Sump Speed Clutch Hose	9 & 10	Supports used so check image, removal see Item No52
053	Merlin 4 Blade Propeller		Supports used so check image, removal see Item No53
054	Merlin Stand with 8 Magnets		No Supports used, see Item No54
055	Merlin Propeller Drive Shaft	3 & 5	No Supports used, see Item No55
056	Merlin Sump	4	No Supports used, see Item No56
057	Merlin Coolant Pump	8	Supports used so check image, removal see Item No57



# Rolls Royce V12 Merlin Engine Parts Schematic

All Parts are 12% of the Original Model Size

Image Number 1



**Item Number 001 :-  
Merlin Engine Block LH  
Supports Used**

**Item Number 009 :-  
Merlin Super Charger  
Front Supports Used**

**Item Number 010 :-  
Merlin Super Charger Mid  
Supports Used**

**Item Number 011 :-  
Merlin Super Charger Rear  
No Supports Used**

**Item Number 012 :-  
Merlin SU Carburettor  
Supports Used**

**Item Number 036 :-  
Merlin 2 Speed Control  
Supports Used**

**Item Number 040 :-  
Merlin Heywood  
Compressor Supports**

**Image Number 2**

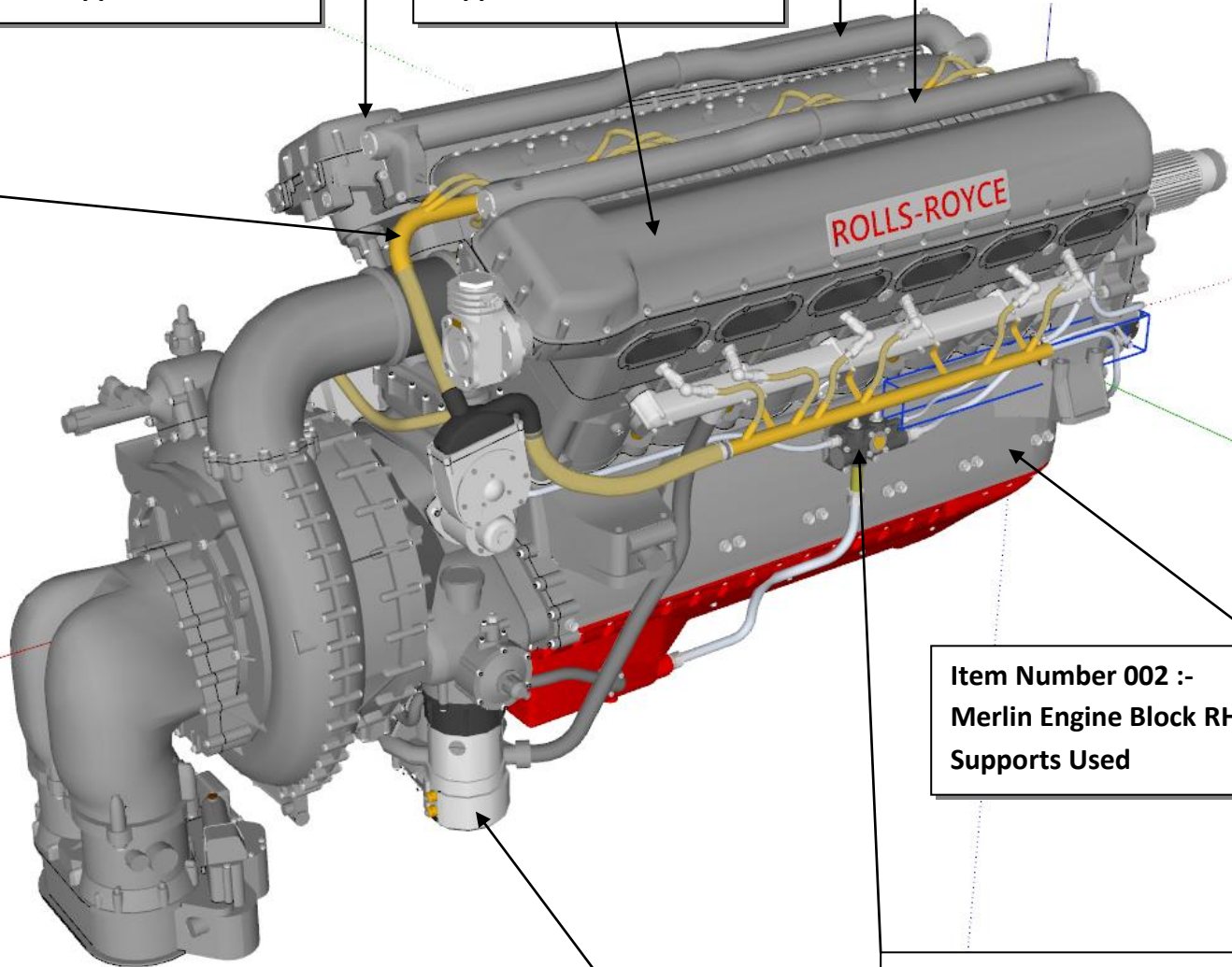
**Item Number 007 :-  
Merlin Valve Cover LH  
Supports Used**

**Item Number 013 :-  
Merlin Top Coolant Pipe  
LH Supports Used**

**Item Number 014 :-  
Merlin Top Coolant Pipe  
RH Supports Used**

**Item Number 018 :-  
Merlin Ignition Loom  
Inner Supports Used**

**Item Number 008 :-  
Merlin Valve Cover RH  
Supports Used**



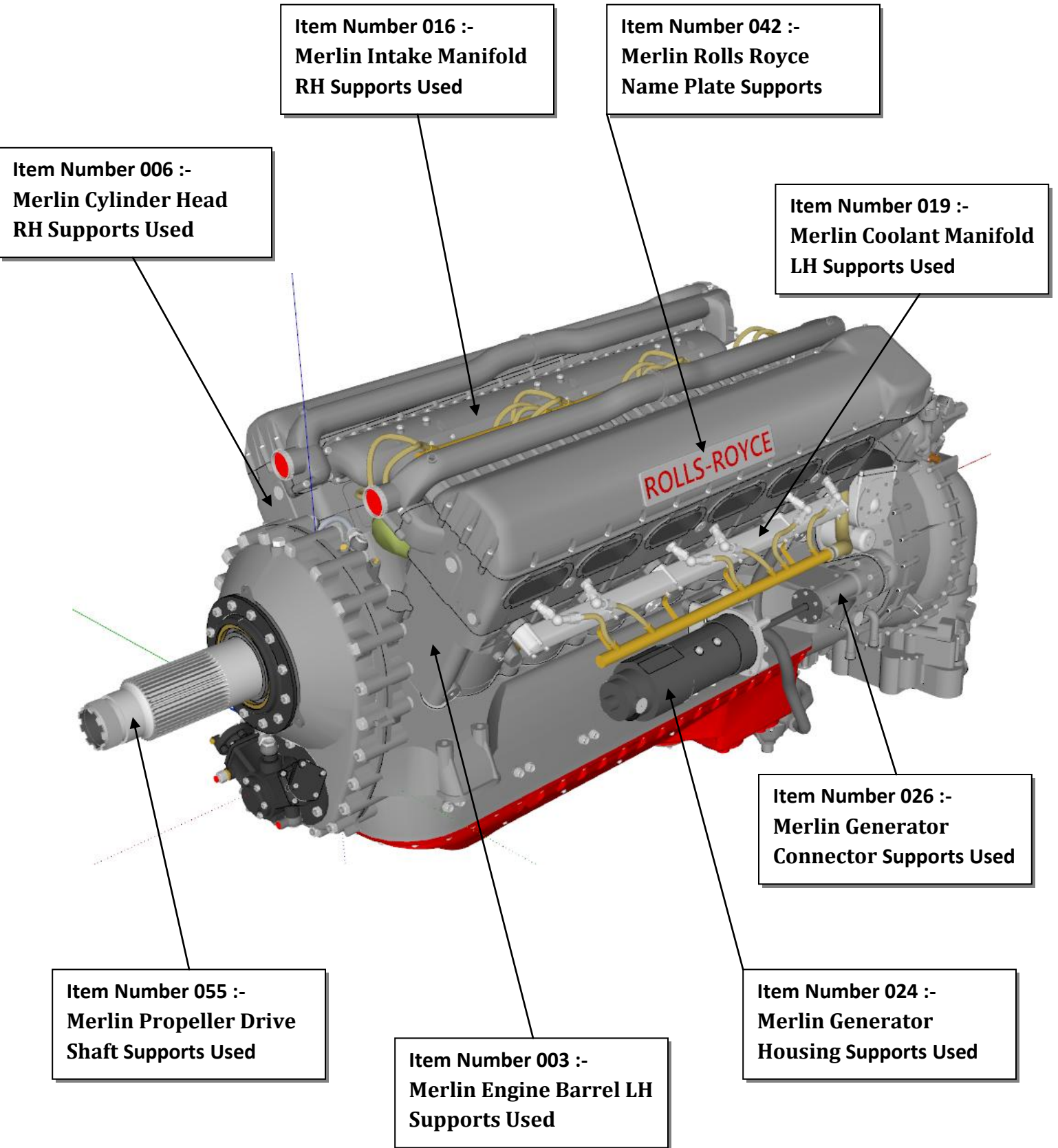
**Item Number 002 :-  
Merlin Engine Block RH  
Supports Used**

**Item Number 033 :-  
Merlin Starter Motor  
Supports Used**

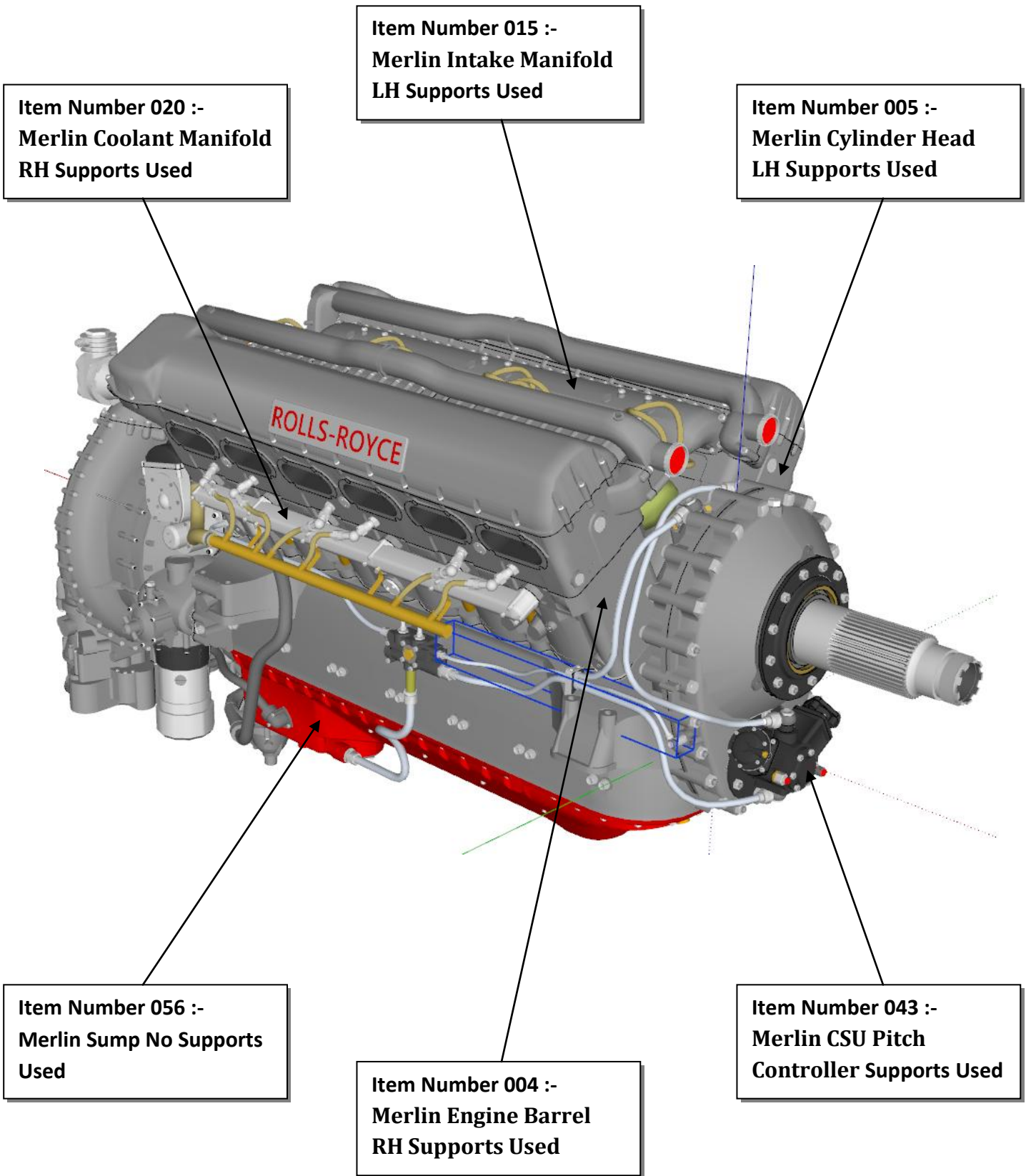
**Item Number 039 :-  
Merlin Pressure  
Regulator Supports Used**



**Image Number 3**



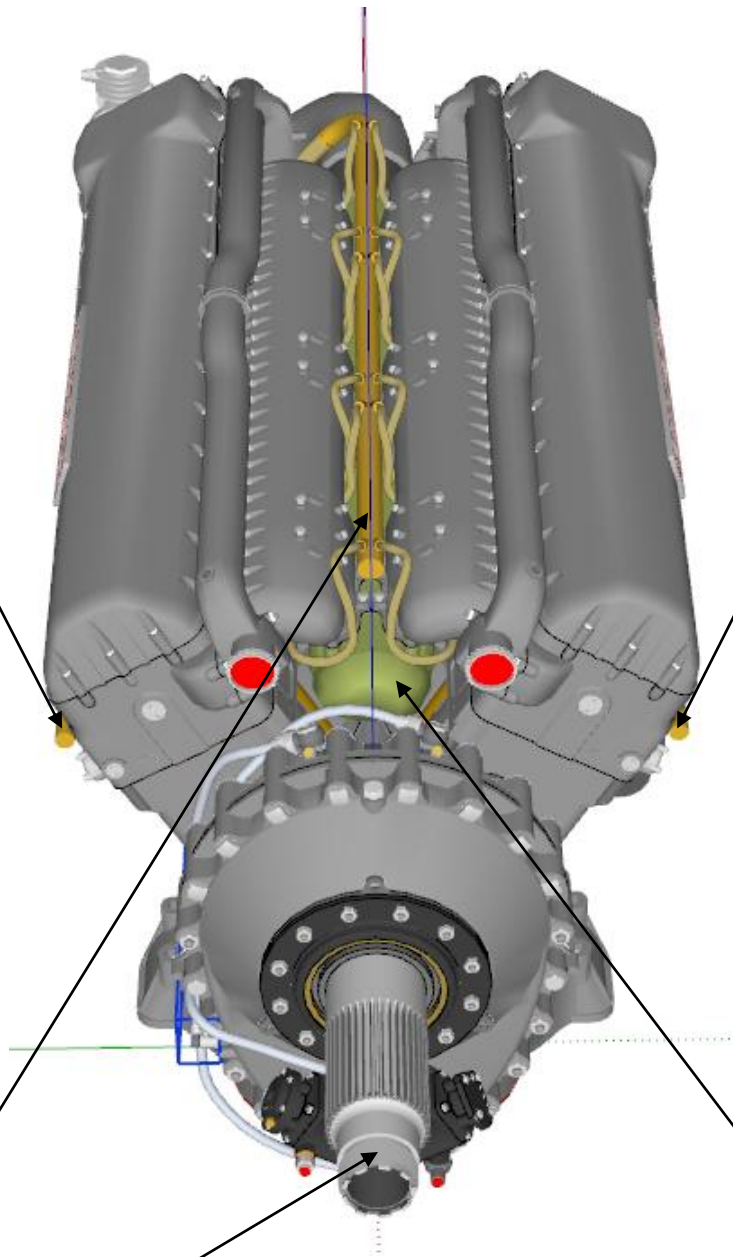
**Image Number 4**



**Image Number 5**

**Item Number 022 :-  
Merlin Ignition Loom  
Outer RH Supports Used**

**Item Number 021 :-  
Merlin Ignition Loom  
Outer LH Supports Used**



**Item Number 018 :-  
Merlin Ignition Loom  
Inner Supports Used**

**Item Number 055 :-  
Merlin Propeller Drive  
Shaft Supports Used**

**Item Number 017 :-  
Merlin Induction Tube  
Supports Used**

**Image Number 6**

**Item Number 030 :-  
Merlin Magneto  
Connector Supports  
Used**

**Item Number 032 :-  
Merlin RH Magneto  
Outer Ignition Loom  
Connector Pipe Supports  
Used**

**Item Number 031 :-  
Merlin LH Magneto  
Outer Ignition Loom  
Connector Pipe Supports  
Used**

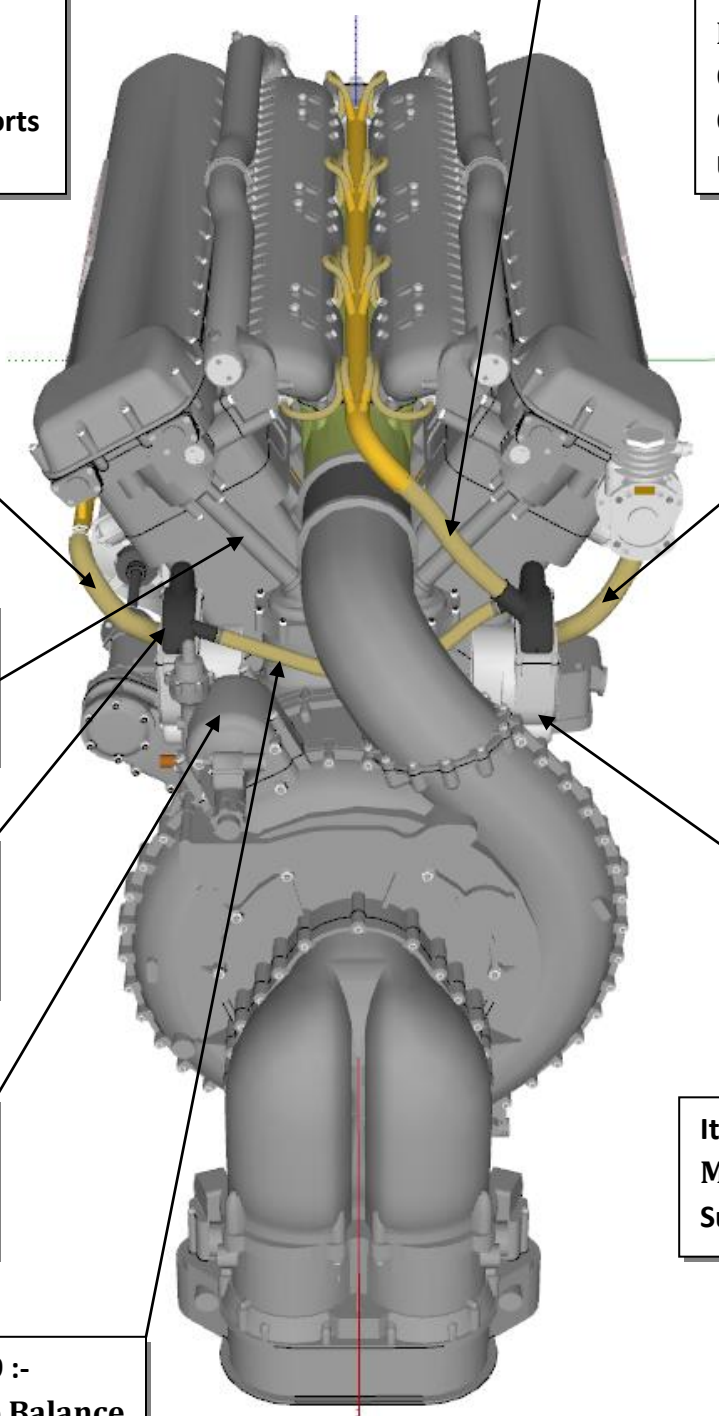
**Item Number 041 :-  
Merlin Cam Drive and  
Shafts Supports Used**

**Item Number 027 :-  
Merlin Magneto LH  
Supports Used**

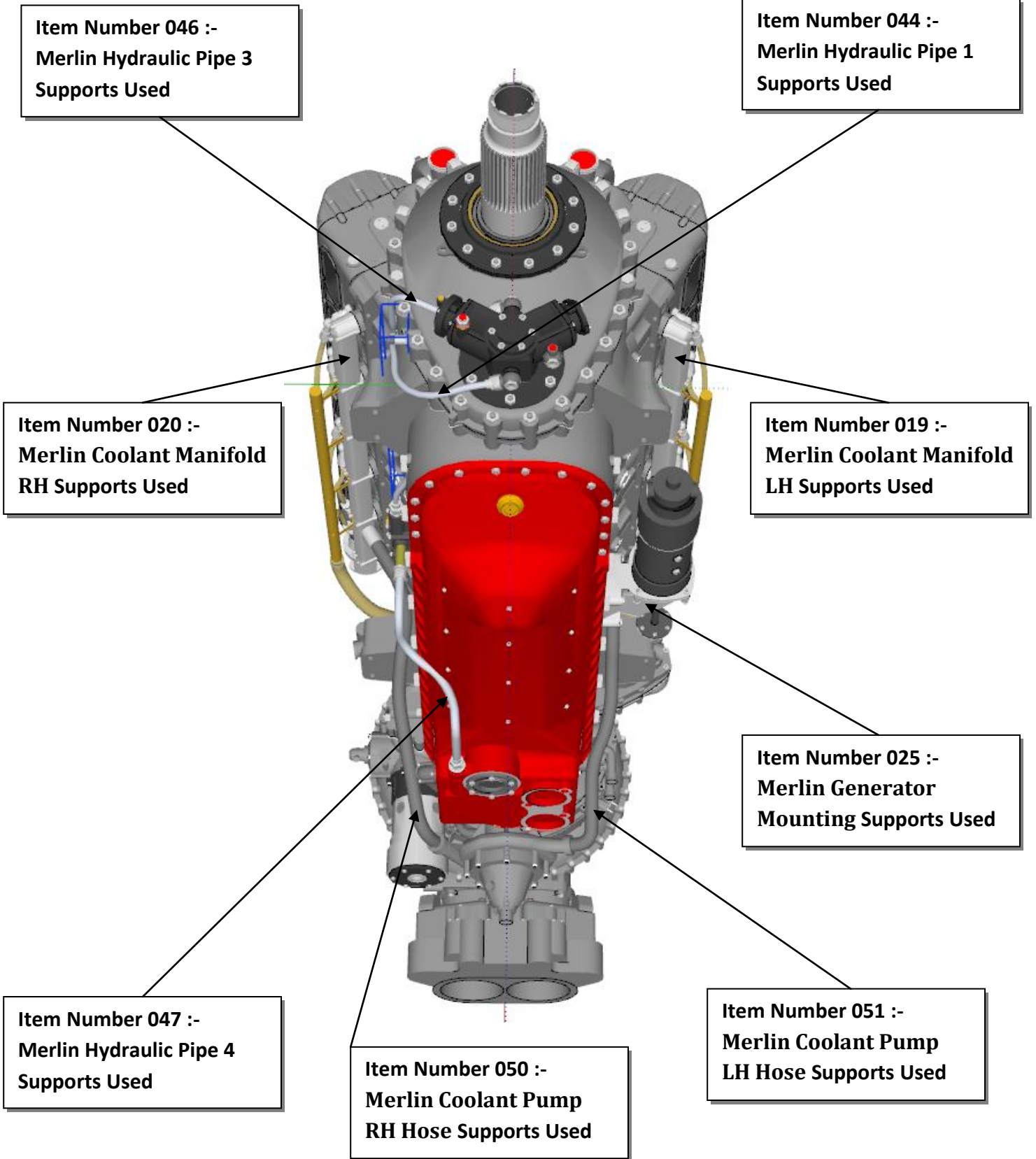
**Item Number 036 :-  
Merlin 2 Speed Control  
Supports Used**

**Item Number 029 :-  
Merlin Magneto Balance  
Pipe Supports Used**

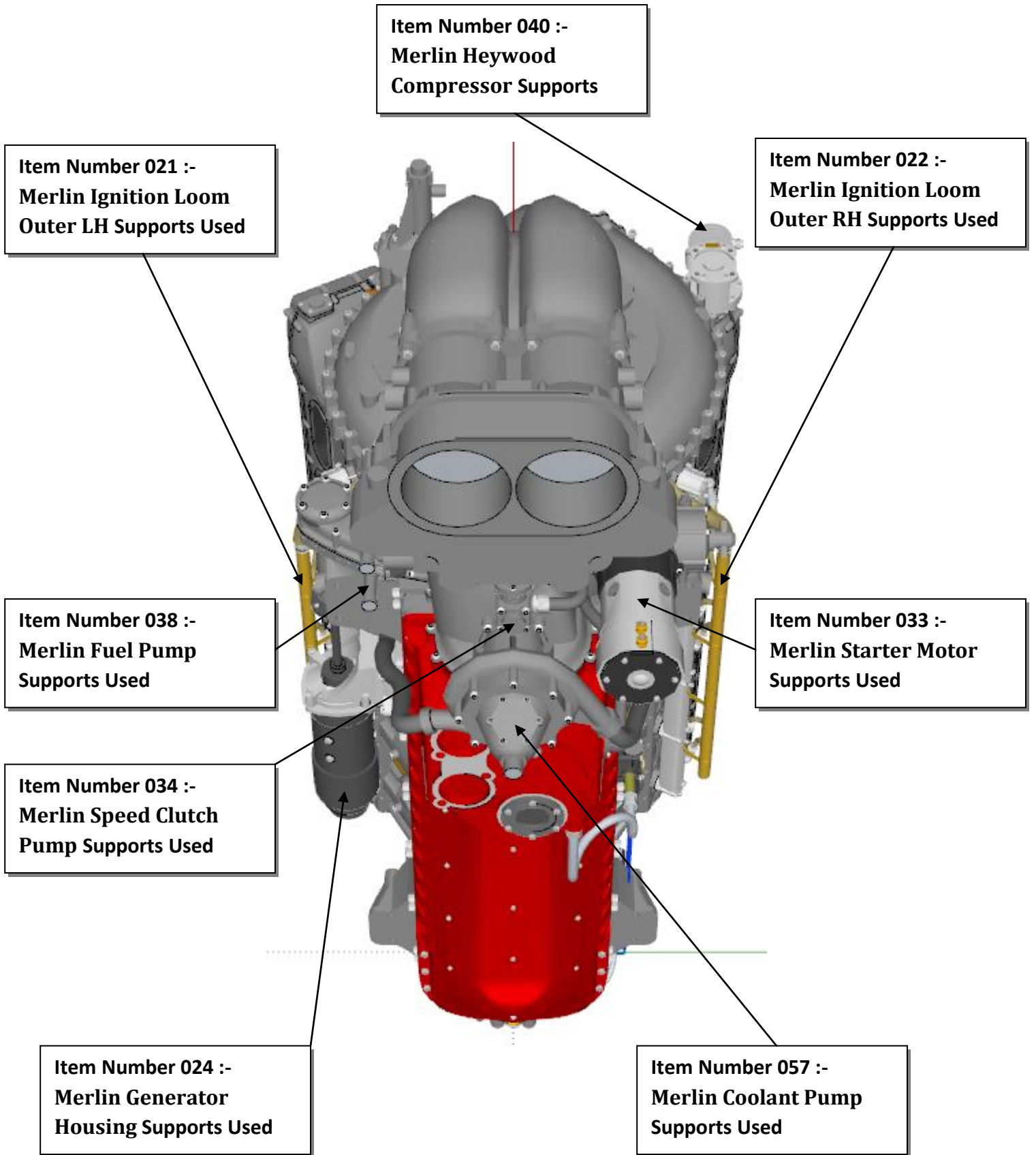
**Item Number 028 :-  
Merlin Magneto RH  
Supports Used**



**Image Number 7**



**Image Number 8**



**Image Number 9**

**Item Number 044 :-  
Merlin Hydraulic Pipe 1  
Supports Used**

**Item Number 008 :-  
RR Merlin Heywood Comp  
Supports Used**

**Item Number 050 :-  
Merlin Coolant Pump  
RH Hose Supports Used**

**Item Number 025 :-  
Merlin Generator  
Mounting Supports Used**

**Item Number 052 :-  
Merlin Sump Speed  
Clutch Hose Supports  
Used**

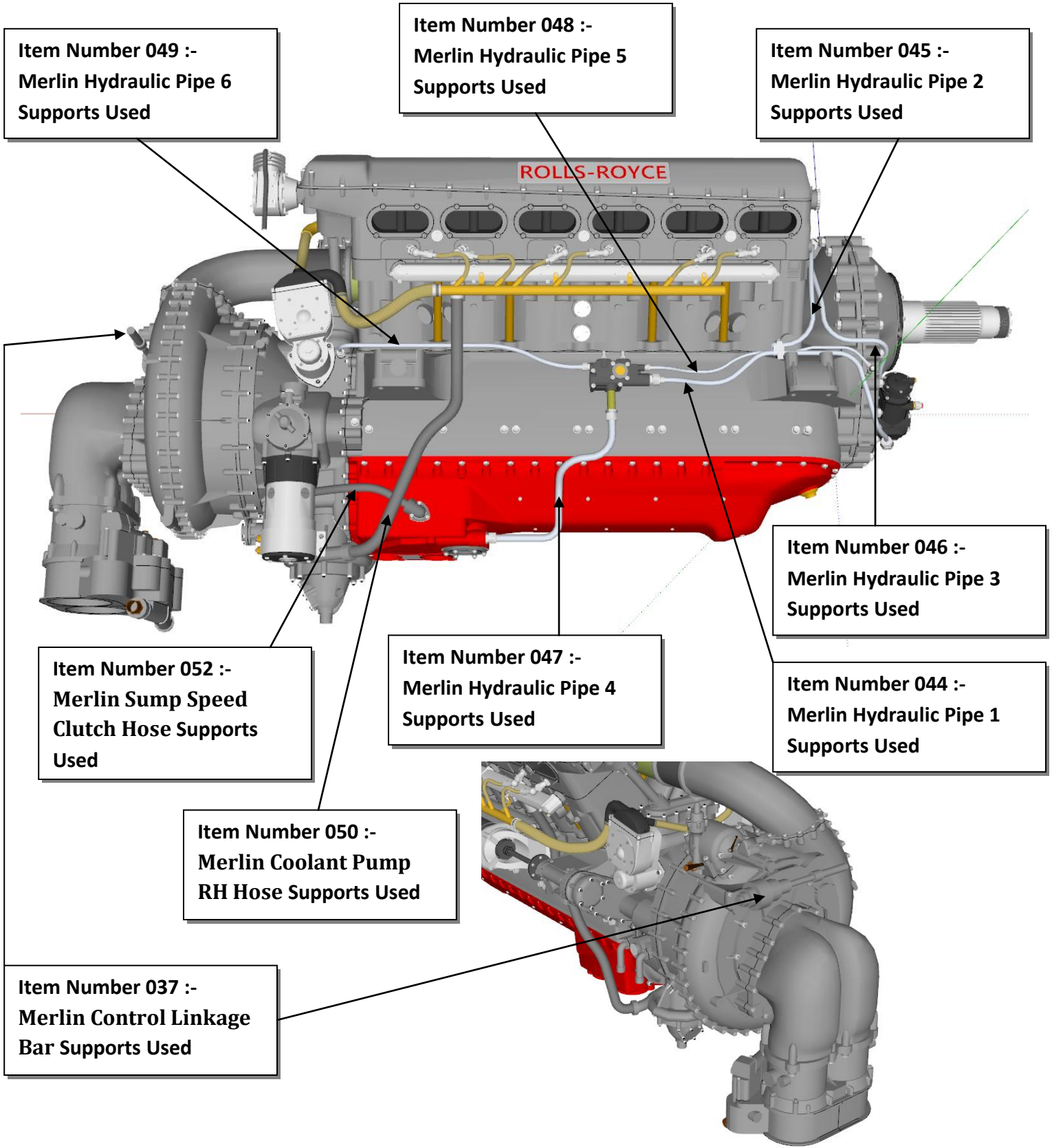
**Item Number 051 :-  
Merlin Coolant Pump  
LH Hose Supports Used**

**Item Number 034 :-  
Merlin Speed Clutch  
Pump Supports Used**

**Item Number 035 :-  
Merlin SU Carburettor  
Lower Pipe Supports**

**Item Number 038 :-  
Merlin Fuel Pump  
Supports Used**

**Image Number 10**



**Item Number 049 :-  
Merlin Hydraulic Pipe 6  
Supports Used**

**Item Number 048 :-  
Merlin Hydraulic Pipe 5  
Supports Used**

**Item Number 045 :-  
Merlin Hydraulic Pipe 2  
Supports Used**

**Item Number 046 :-  
Merlin Hydraulic Pipe 3  
Supports Used**

**Item Number 044 :-  
Merlin Hydraulic Pipe 1  
Supports Used**

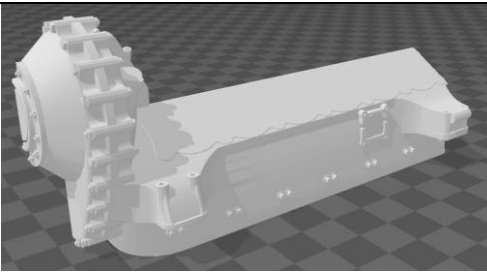
**Item Number 052 :-  
Merlin Sump Speed  
Clutch Hose Supports  
Used**

**Item Number 047 :-  
Merlin Hydraulic Pipe 4  
Supports Used**

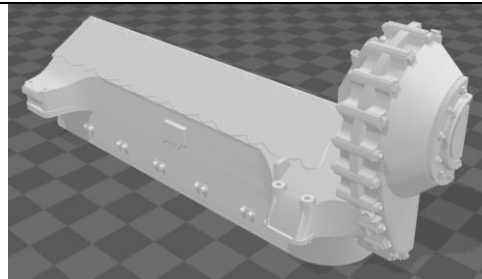
**Item Number 050 :-  
Merlin Coolant Pump  
RH Hose Supports Used**

**Item Number 037 :-  
Merlin Control Linkage  
Bar Supports Used**

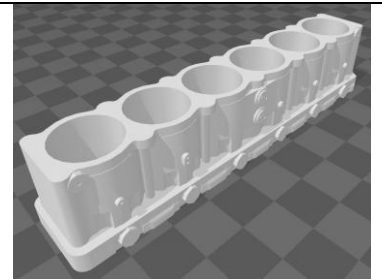




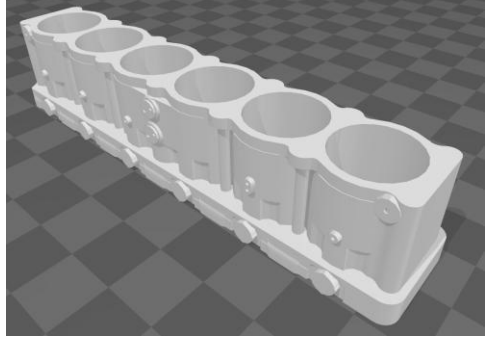
**Item No 1.**



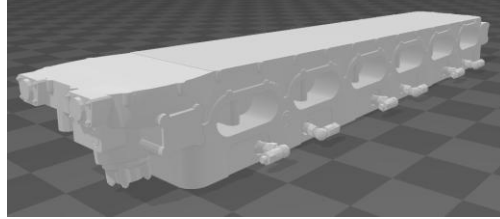
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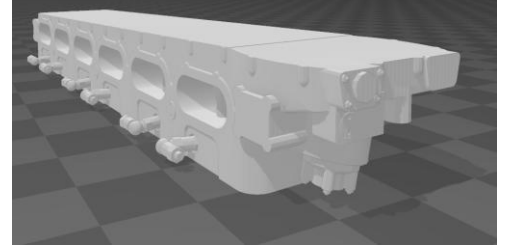
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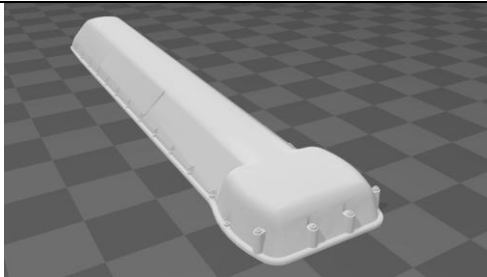
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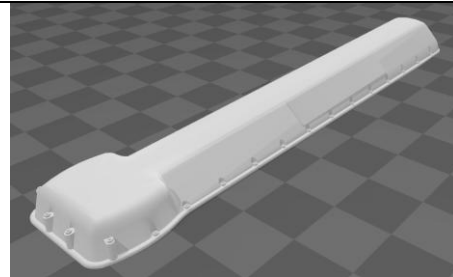
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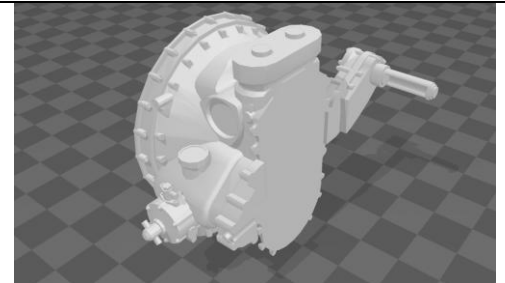
**Item No 6.**



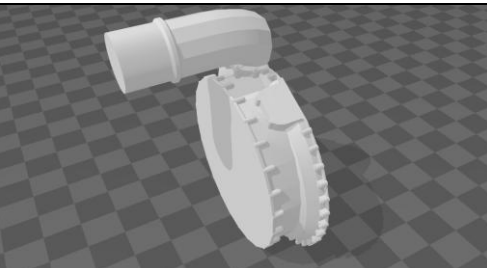
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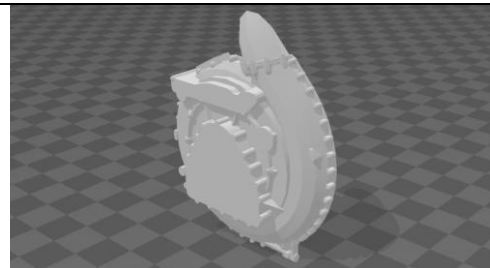
**Item No 8.**



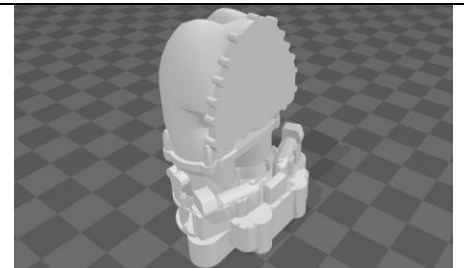
**Item No 9. Shown with Item No 26**



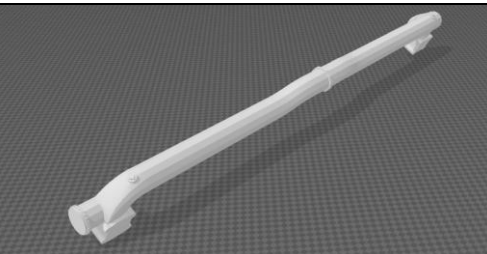
**Item No 10.**



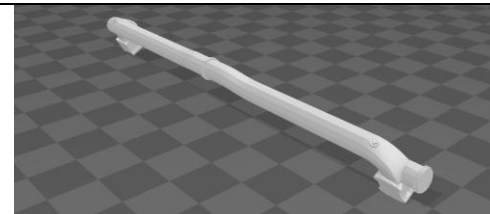
**Item No 11.**



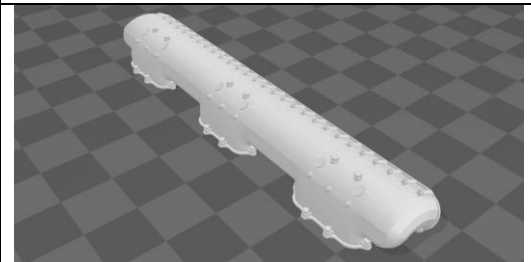
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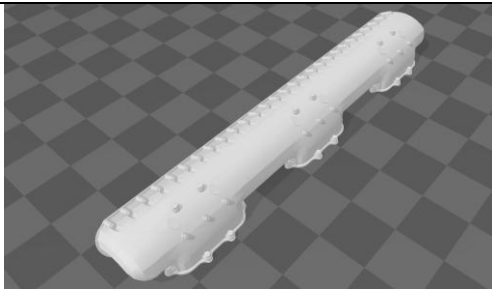
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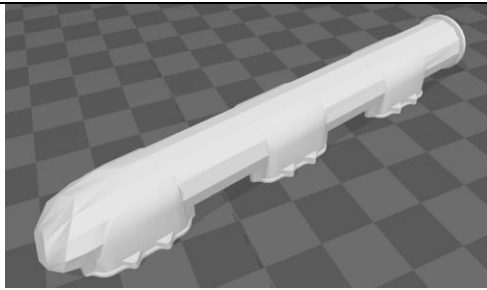
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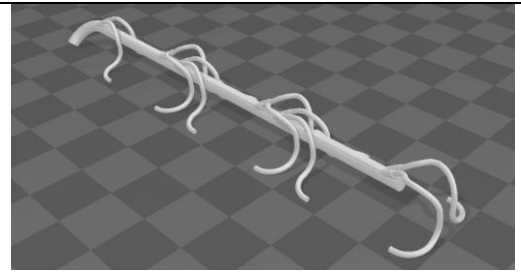
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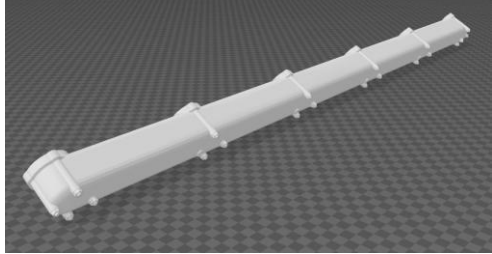
**Item no 16.**



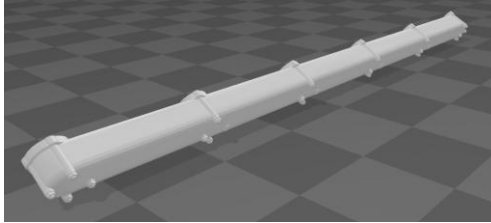
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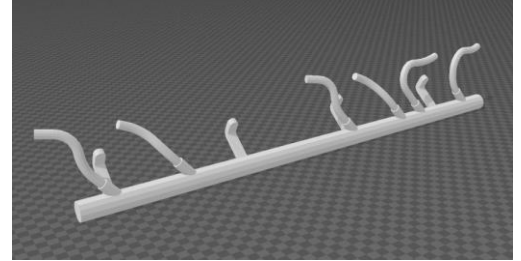
**Item No 18.**



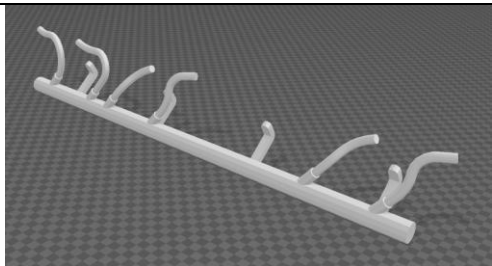
**Item No 19.**



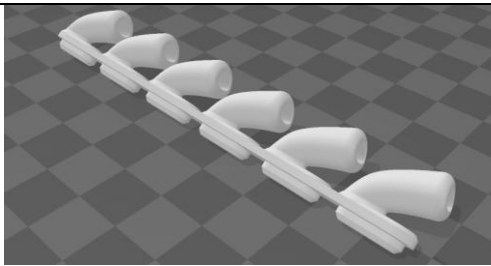
**Item No 20.**



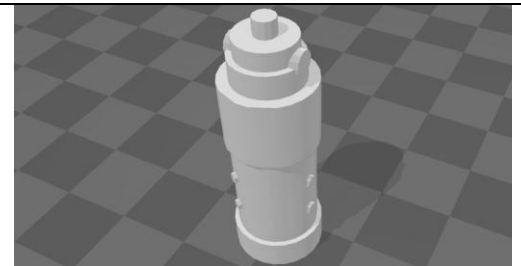
**Item No 21.**



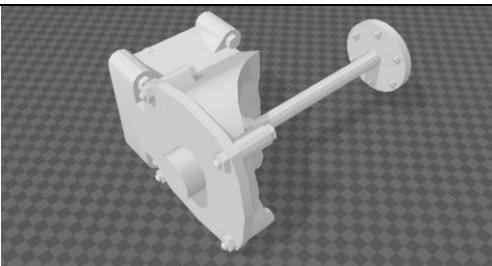
**Item no 22.**



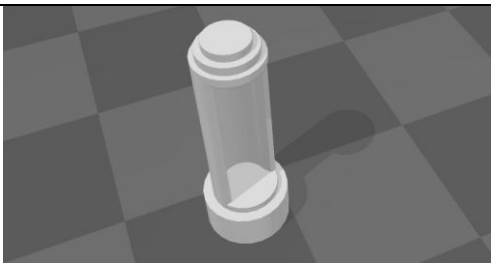
**Item No 23. 2off Required**



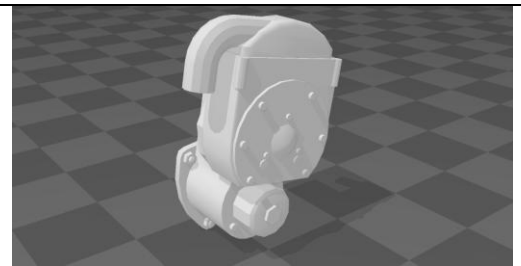
**Item No 24.**



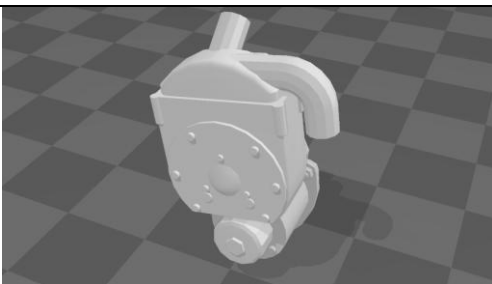
**Item No 25.**



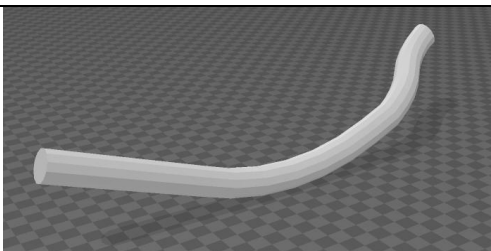
**Item No 26. This part is on Item No 9.**



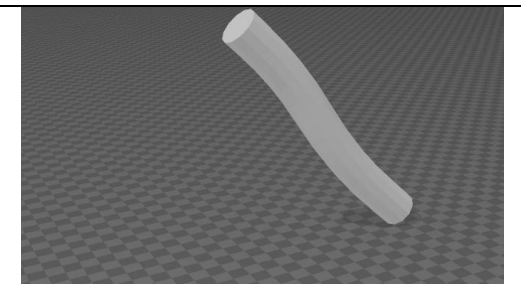
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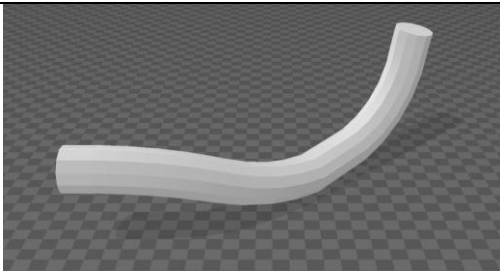
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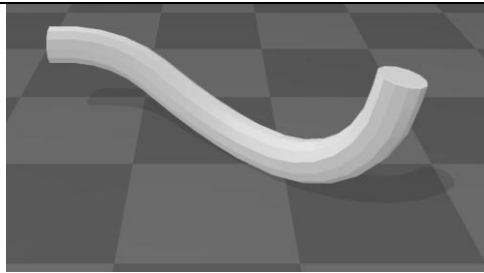
**Item No 29.**



**Item No 30.**



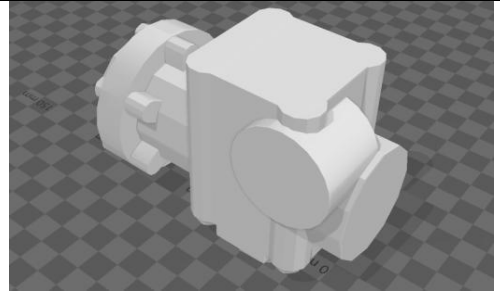
**Item No 31.**



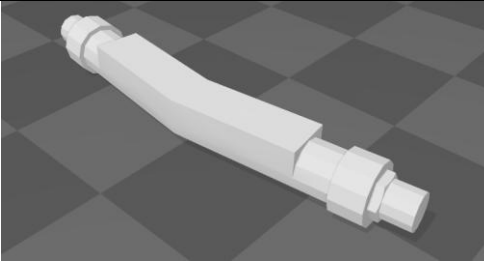
**Item No 32.**



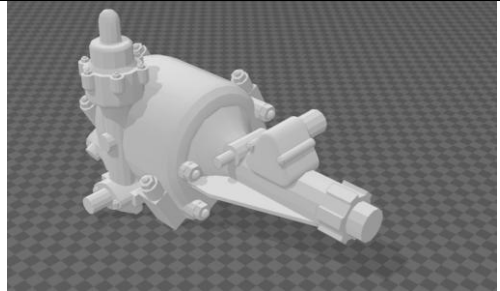
**Item No 33.**



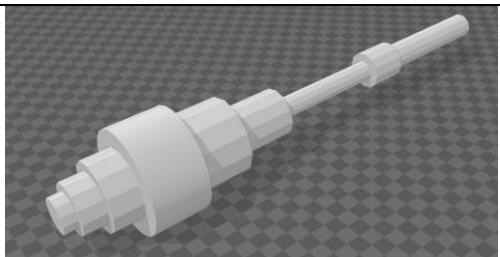
**Item No 34.**



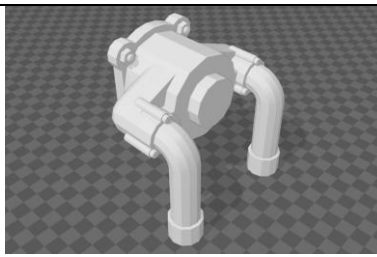
**Item No 35.**



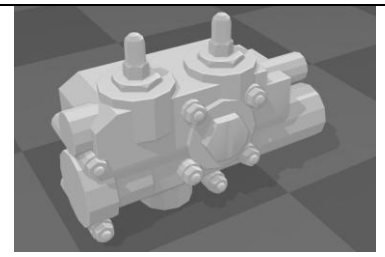
**Item No 36.**



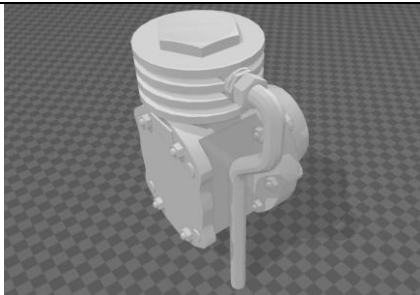
**Item No 37.**



**Item No 38.**



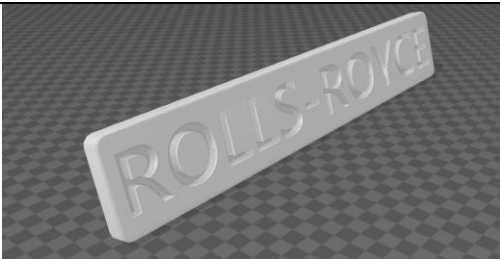
**Item no 39.**



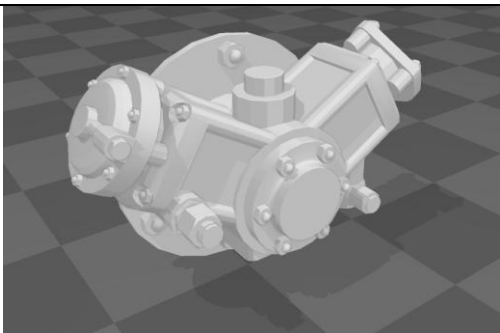
**Item No 40.**



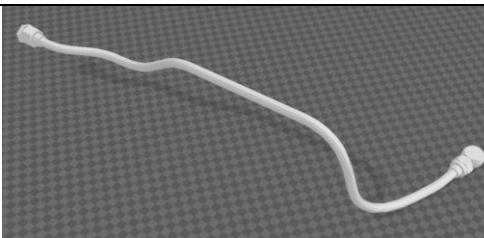
**Item No 41.**



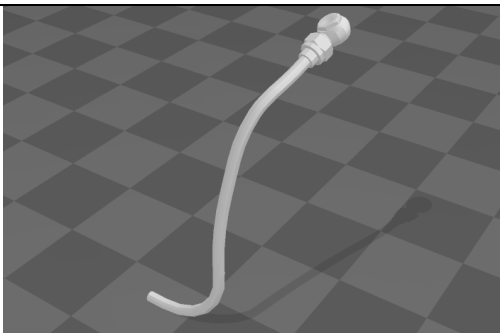
**Item No 42. 2off Required**



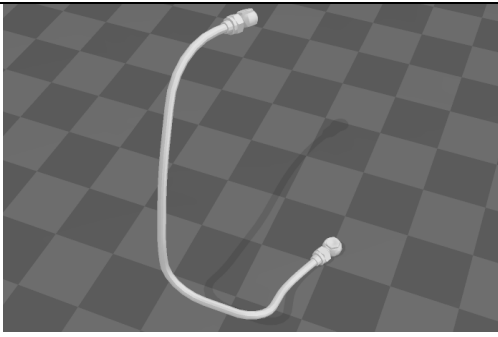
**Item No 43.**



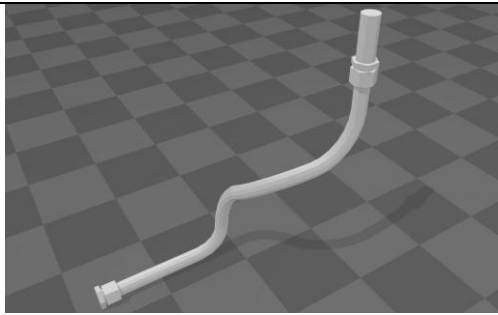
**Item No 44.**



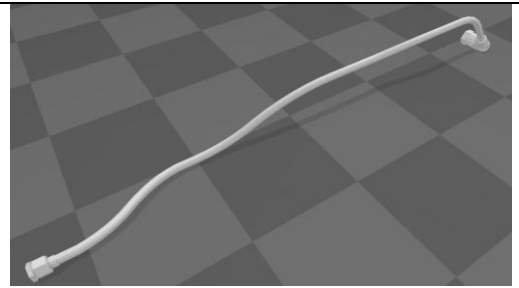
**Item No 45.**



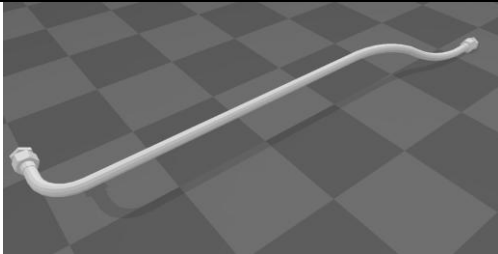
**Item No 46.**



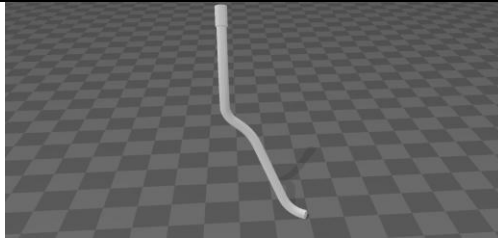
**Item No 47.**



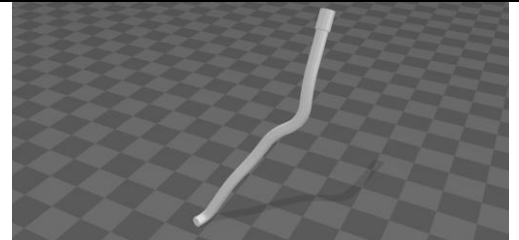
**Item No 48.**



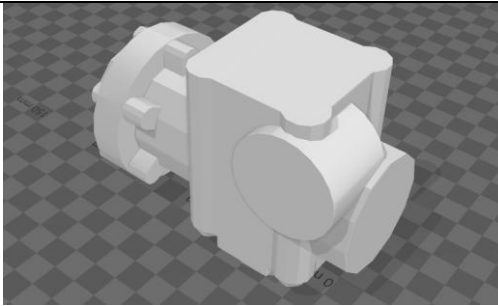
**Item No 49.**



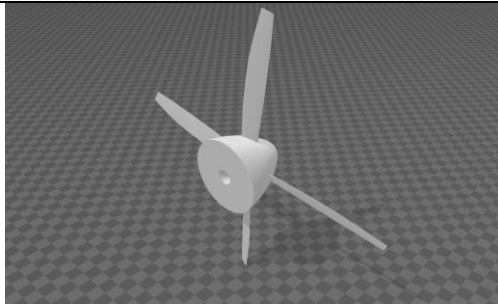
**Item No 50.**



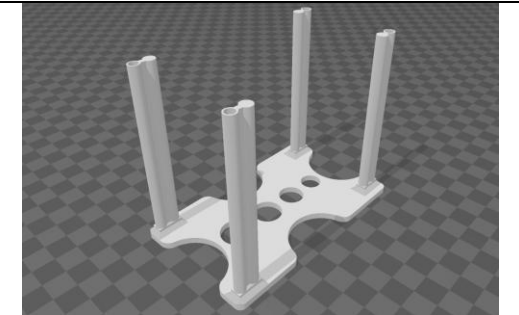
**Item No 51.**



**Item No 52.**



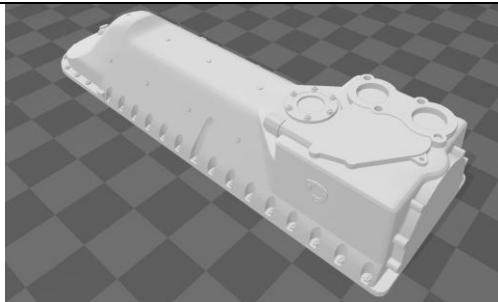
**Item No 53.**



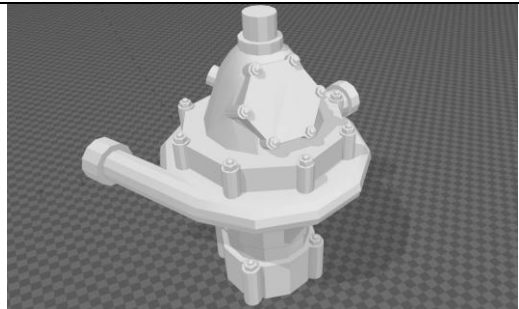
**Item No 54. 8off 4 x 2mm Magnets**



**Item No 55.**



**Item No 56.**



**Item No 57.**