

Build your own

# McLaren

VODAFONE McLAREN MERCEDES MP4-23

**2008 WORLD CHAMPIONSHIP WINNING CAR**

## Part 4



Build your own  
McLaren

## Contents

### Packs 22-28

#### **3 PACK 22: Building the engine 2**

The engine will really look the part after you have assembled the outside, inner, upper and end blocks onto the base.

#### **5 PACK 23: Assembling the gearbox 1**

The housings supplied with this pack, along with the driveshafts, are assembled onto the engine to give shape to the gearbox of your developing model.

#### **8 PACK 24: Assembling the gearbox 2**

Add the gearbox housing top to the engine/gearbox assembly and see the gearbox starting to take shape, and loosely attach the lower suspension arm stays.

#### **10 PACK 25: Assembling the gearbox cowl 1**

In this first article on putting together the gearbox cowl, you fit the left tension rod diffuser stay to the left gearbox cowl.

#### **13 PACK 26: Assembling the gearbox cowl 2**

This pack's parts allow you to continue working on the left gearbox cowl, assembling the tension rod diffuser and then attaching it to the engine/gearbox assembly.

#### **15 PACK 27: Assembling the gearbox cowl 3**

In this article on putting together the gearbox cowl, you fit the right tension rod diffuser stay to the right gearbox cowl.

#### **18 PACK 28: Assembling the gearbox cowl 4**

This time you'll finish the process of attaching the rear suspension links to the gearbox cowl, and then you can fit the cowl to the gearbox.



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NOT SUITABLE FOR CHILDREN UNDER THE AGE OF 14. THIS PRODUCT IS NOT A TOY AND IS NOT DESIGNED OR INTENDED FOR USE IN PLAY. ITEMS MAY VARY FROM THOSE SHOWN.

# Building the engine 2

pack 22

This pack, your model's engine really comes together. Take care when tightening the self-tapping screws used in the assembly, as overtightening might strip the threads. Stop tightening as soon as the parts are firmly fixed, or when the resistance to the screwdriver suddenly increases.

## PARTS SUPPLIED WITH THIS PACK

1 – Engine block front



3 – Engine block rear



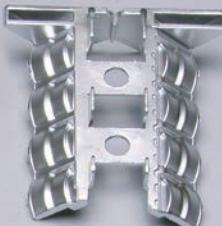
5 – Exhaust ports



6 – Type 'A' screws x 3\*



2 – Engine block outer



4 – Engine block inner



7 – Type 'D' screws x 5\*



\* One spare screw is included

## TOOLS & MATERIALS REQUIRED

Superglue (cyanoacrylate adhesive)

Spatula for applying superglue (a toothpick will do)

Phillips screwdriver (size 0 or 1)

Masking tape

Scissors

## ITEMS TO HAVE READY

Engine base – assembled in Pack 21  
Upper engine block and covers – assembled in Pack 21

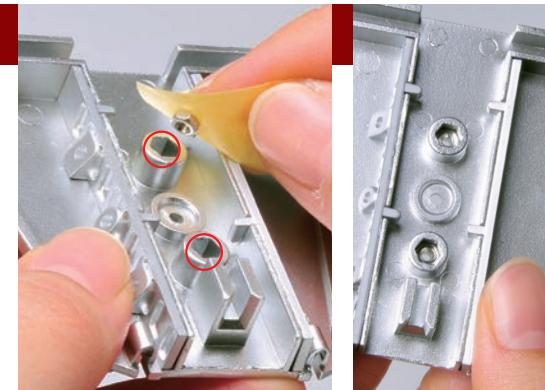
Type 'C' screw – supplied with Pack 21

Type 'A' nuts – supplied with Pack 21

## ASSEMBLING THE BLOCK ON THE BASE

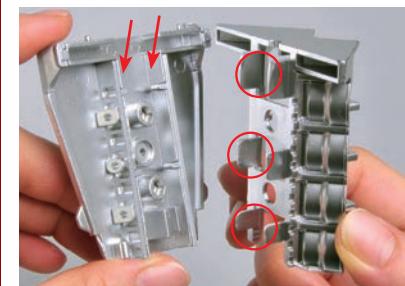
1

Before you assemble the block on the base, insert a type 'A' nut into each of the hexagonal sockets (ringed in red) in the engine base. This can be hard to do, as the nuts are small and hard to grip. To make the job easier, cut a short length of masking tape and stick a nut to it. Then offer up the nut to the hole as shown. Check that both nuts are squarely located in their sockets.



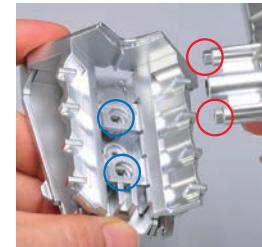
2

With the nuts in place, fit the block outer (part 2) onto the base so that its flanges (circled in red) slot between the walls of the 'channel' (arrowed in red).



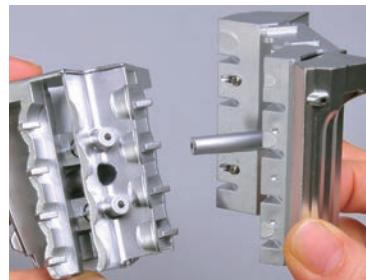
3

Holding the parts together, fit the hexagonal ends (ringed in red) of the two posts on the block inner (part 4) through the holes in the block outer, into the hexagonal holes in the engine base (ringed in blue).



4

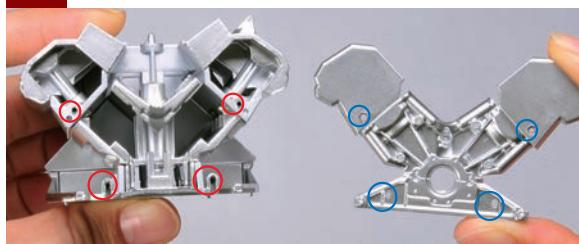
Insert the long post of the upper block assembly into the hole in the top of the inner block and push the parts together. It might need a bit of pressure to fit the two locating pegs beside the post into their corresponding holes so that the upper block seats properly.



## ATTACHING THE FRONT AND REAR

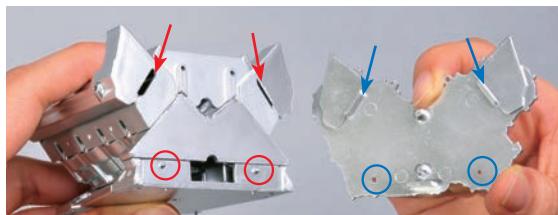
1

The engine block rear (part 3) is attached to the assembly with four type 'D' screws fitted through holes (ringed in blue) in the rear block and into screwholes (ringed in red) in the engine.



3

The engine block front (part 1) has two flanges (arrowed in blue) that fit into slots (arrowed in red) on the engine and two holes (ringed in blue) that fit over two pins (ringed in red) on the engine.



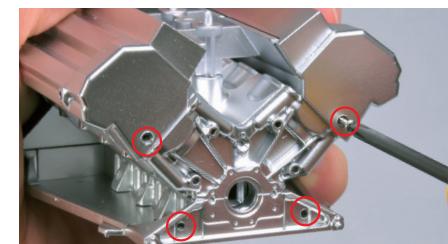
5

Insert a type 'C' screw into the central hole under the engine base. This is self-tapping, so be careful not to overtighten the screw as this may strip the thread that the screw creates.



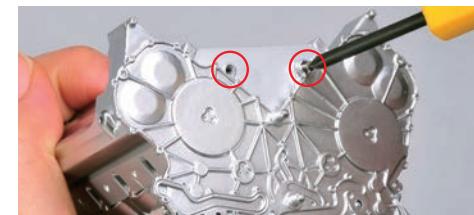
2

Tighten these self-tapping screws carefully – especially the two lower screws, which fit into elongated screwholes.



4

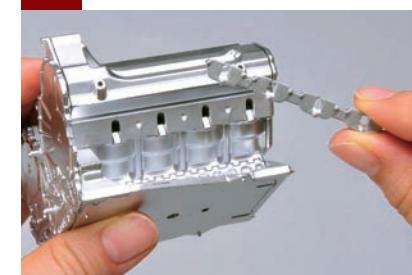
The engine block front is held to the engine by two type 'A' screws inserted through the holes (ringed in red). Do not overtighten these self-tapping screws.



## ADDING THE EXHAUST PORTS

1

The exhaust ports (parts 5) are identical, but make sure you fit them to the engine with the wider sides of the exhaust outlets uppermost.



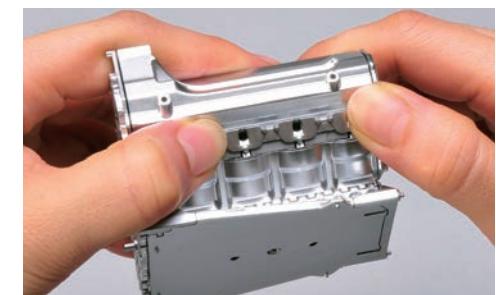
2

Sparingly apply superglue to the side of the molding that has three small pins.



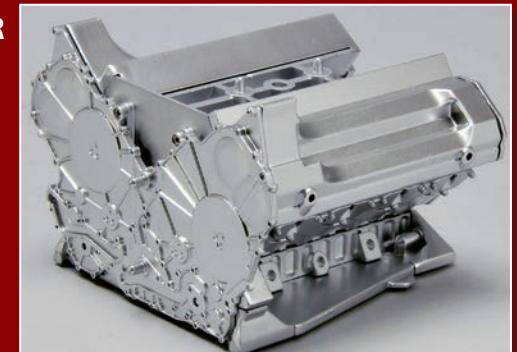
3

Press the glued side of the exhaust ports against the engine block for a couple of minutes until the adhesive bonds. Repeat Steps 1-3 for the other exhaust ports.



## THAT'S IT FOR THIS PACK!

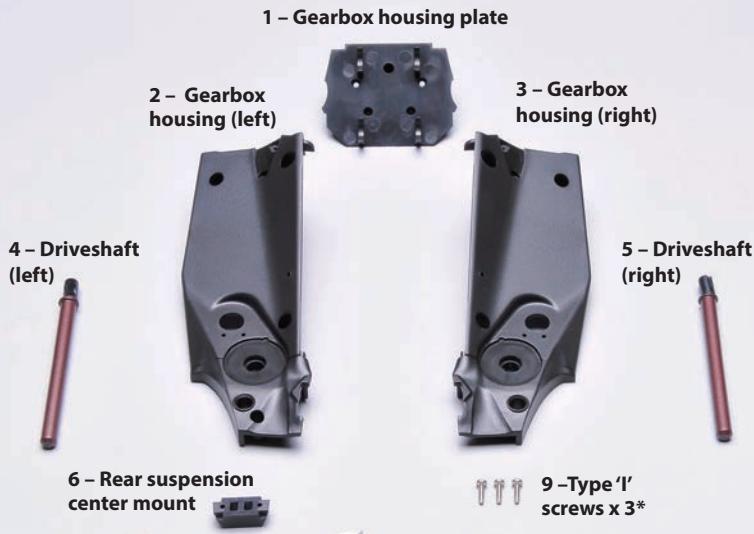
That's most of the engine completed. Put it somewhere safe because in the next pack, you begin assembling the gearbox.



# Assembling the gearbox 1

In this pack, you start to put together the gearbox by attaching the housing plate to the engine, fitting the CV (constant velocity) joints and driveshafts, and then assembling the housings. When screwing the parts together, be careful not to overtighten the self-tapping screws and damage the threads that they cut.

## PARTS SUPPLIED WITH THIS PACK



\* One spare screw is included for each of the three screw types

## TOOLS & MATERIALS REQUIRED

Phillips screwdriver (size 0 or 1 will do)  
Masking tape  
Scissors  
Craft knife

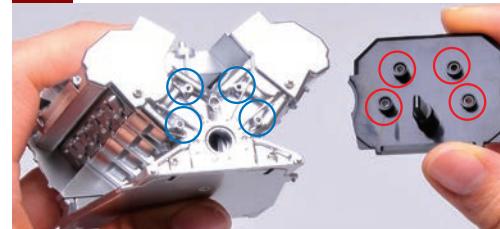
## ITEMS TO HAVE READY

Engine – assembled in Pack 22

## ATTACHING THE GEARBOX HOUSING PLATE TO THE ENGINE

**1**

The gearbox housing plate (part 1) is attached to the engine with four screws. The matching holes and sockets are shown circled in red and blue. Match up the holes and screwholes before assembly.



**2**

Be sure to use the correct screws. The two ringed in red are type 'I' (the shorter silver screws) and the two ringed in blue are type 'F' (the longer silver screws). Tighten until the plate is securely attached, and take care not to strip the screw threads.



## ASSEMBLING THE DRIVE SHAFTS AND GEARBOX HOUSINGS

**1**

The left driveshaft (part 4) and left CV joint (part 7) are both marked with an 'L' (The right ones are marked with an 'R').

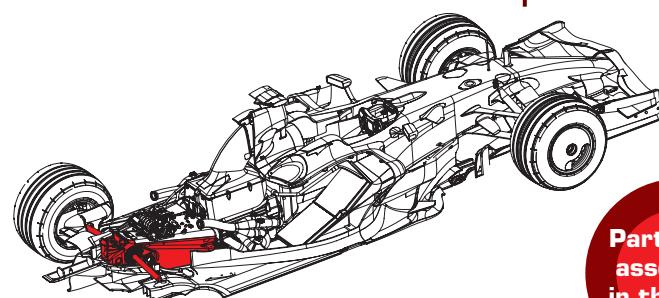


**2**

The left CV joint and shaft fit into the left gearbox housing (part 2) so that the groove in the shaft lines up with a spline in the housing (both ringed in yellow) and the tab in the CV joint fits into a notch in the housing (both ringed in red).



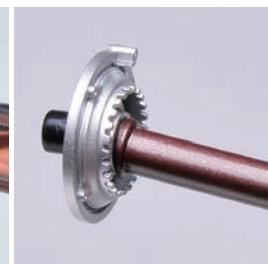
- pack 23



Parts to be assembled in this pack

3

Fit the end of the shaft through the hole in the CV joint. If it is a tight fit, gently scrape the end of the shaft with a craft knife to remove any lumps or bumps in the molding.



4

Fit the shaft into the housing as shown so the spline slots into the groove. Now rotate the CV joint around the shaft until the tab fits into the notch.

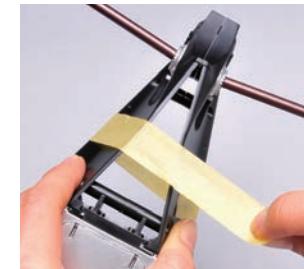


5

Turn the housing over and press the shaft into the housing. Screw a type 'H' screw through the hole in the housing (ringed in red) into the hole in the end of the shaft. Make sure the shaft is secure, but be careful not to overtighten the screw. Now repeat Steps 1 to 5 for the right housing, driveshaft and CV joint (parts 3, 5 and 8).



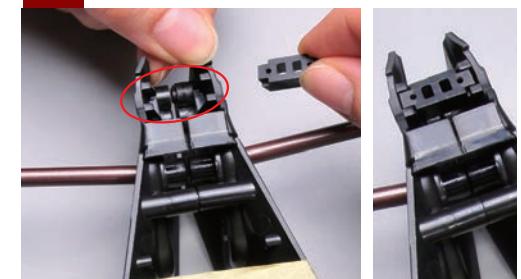
3



Fit the right housing onto the housing plate in a similar way, and hold the two together with the masking tape as shown.

4

Gently pry apart the ends of the two housings and insert the rear suspension center mount (part 6) into its place (ringed in red). Be sure to get the narrower side at the front.



5

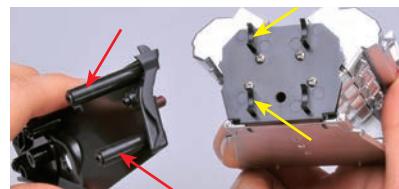
Join the housings permanently by screwing four type 'H' screws through the holes (ringed in red) in the left housing.



## ATTACHING THE GEARBOX HOUSINGS TO THE HOUSING PLATE

1

Cut off about 6 inches of masking tape and keep it at hand. Then look for the long posts projecting from the left housing (arrowed in red). These fit into semi-circular mountings (arrowed in yellow) on the housing plate.



2

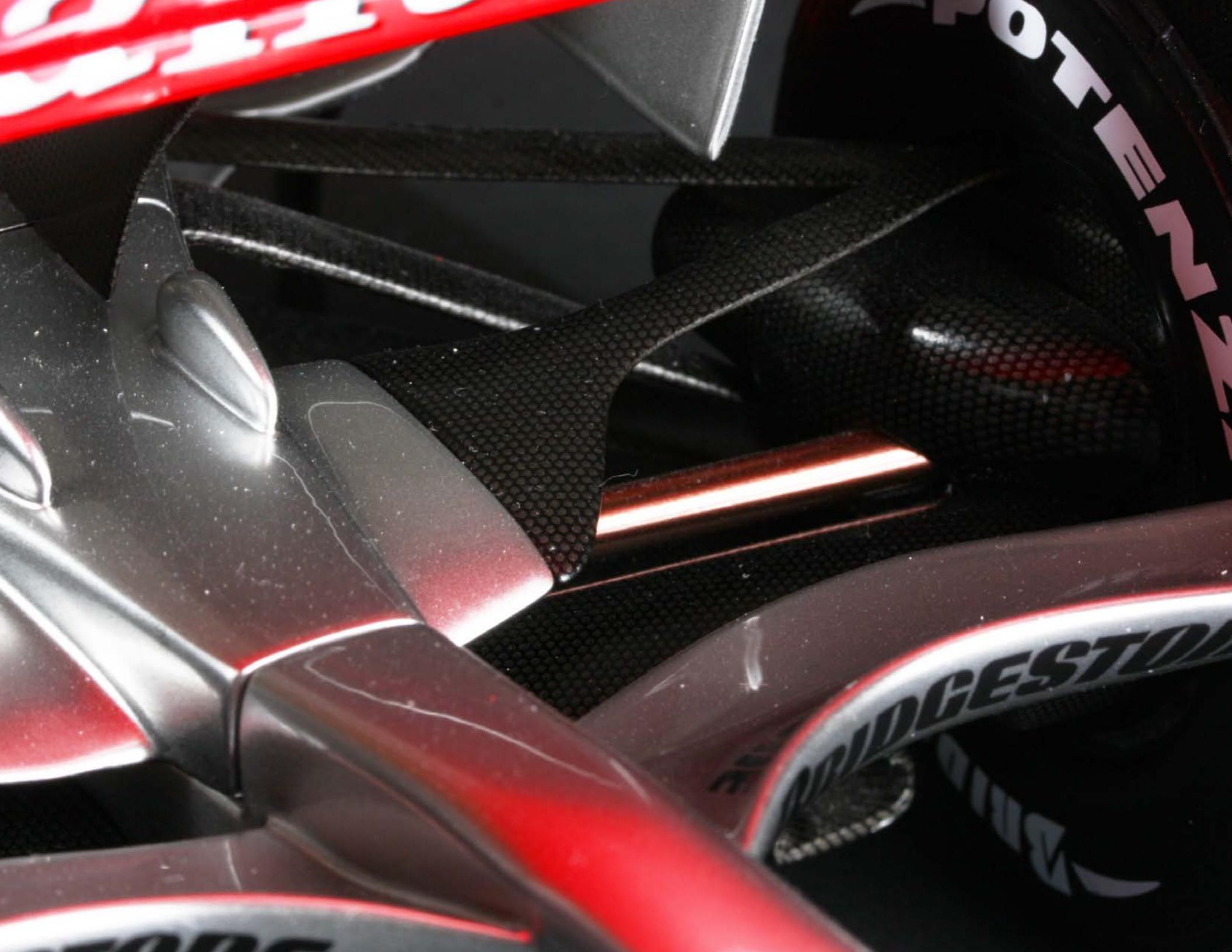


Slide the two posts into the mountings so that the groove along the back of the housing (arrowed in red) slots onto the edge of the housing plate.

## THAT'S IT FOR THIS PACK!

The transmission is really taking shape. In the next pack you get close to completing the gearbox by adding its upper housing and the lower suspension arms stays.



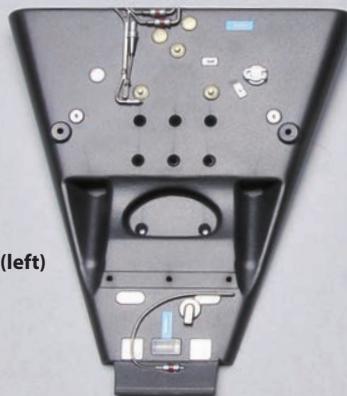


# Assembling the gearbox 2

This pack, you continue to assemble the gearbox, using the new set of components supplied, which include the top of the gearbox housing. This is glued in place using ABS adhesive, while other small parts are screwed together. As usual, do not overtighten the screws, which might damage the threads.

## PARTS SUPPLIED WITH THIS PACK

1 – Gearbox housing top



2 – Rear lower suspension arm stay (left)



4 – Gearbox oil filter (left)

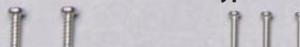


3 – Rear lower suspension arm stay (right)



5 – Gearbox oil filter (right)

6 – Type 'C' screws x 2\*      7 – Type 'D' screws x 3\*



\* A spare screw is included for each of the two screw types

## TOOLS & MATERIALS REQUIRED

Phillips screwdriver (size 00) – supplied with Pack 1

Phillips screwdriver (size 0)

ABS adhesive

Masking tape

Scissors

Craft knife

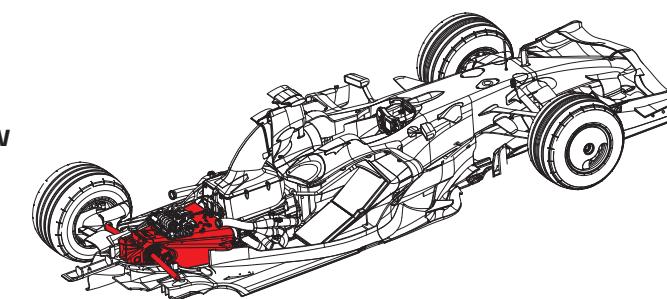
## OPTIONAL EXTRAS

Screwdriver adapter – supplied with Pack 8

## ITEMS TO HAVE READY

Engine and gearbox – assembled in Pack 23

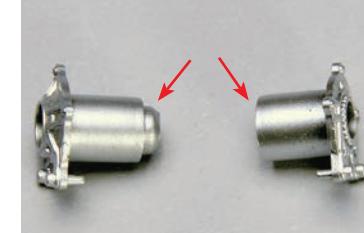
Parts to be assembled in this pack



## INSTALLING THE GEARBOX OIL FILTERS

1

The two filter castings are slightly different. The left half (part 4, on the left below) has a projection that fits inside the right half (part 5, on the right below).



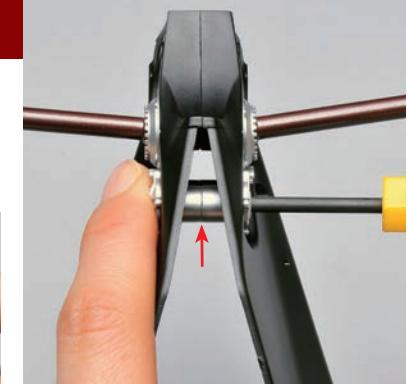
2

Both the castings have pins (circled in red) that fit into holes (circled in yellow) close to the CV joints. Insert the left half (shown above) followed by the right one on the other side, ensuring that the pins fit into the holes and that the center of part 4 fits inside part 5.



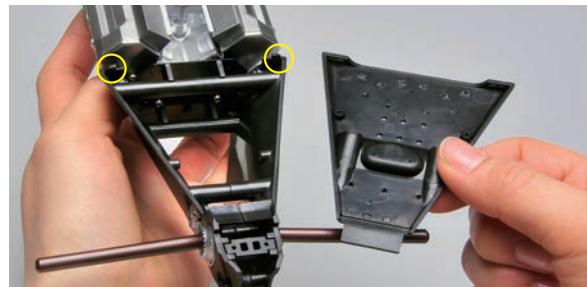
3

When both filters are in position, insert a type 'C' screw through the right casting and screw it into the central hole in the left casting. Tighten the self-tapping screw carefully using a size 0 screwdriver, taking care not to overtighten it. Stop when the resistance increases and the join between the two lids (arrowed in red) has closed.

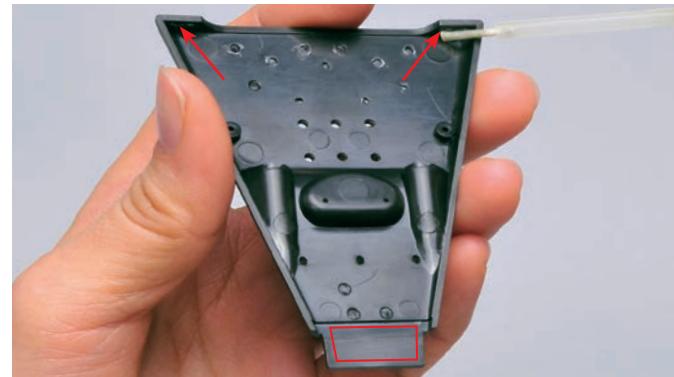


## ATTACHING THE GEARBOX HOUSING TOP

**1** Test-fit the gearbox housing top (part 1) onto the gearbox/engine assembly to check the contact points for gluing. Note how the wide end fits over two tabs on the gearbox housing, which are shaped like quarter circles (ringed in yellow).



**2** Apply a little ABS adhesive to the points where the housing top touches these two tabs (arrowed in red). Also spread a little ABS adhesive over the flat area within the red rectangle.



**3** Apply ABS adhesive to the top edges of the housing sides (outlined in red), the area inside the red rectangle, and where the two tabs touch the housing top.

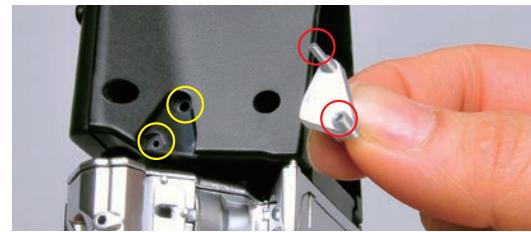


**4** Fit the top, and hold the housing together for about three minutes until the glue bonds. Then tape the parts together with masking tape for about an hour to allow the join to gain full strength. Remove the tape before the next step.

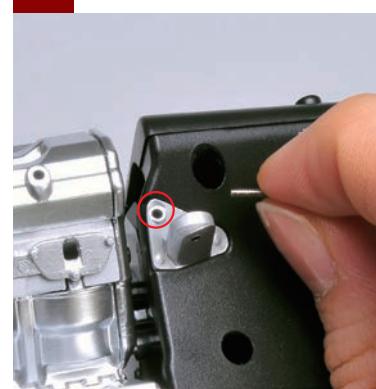


## ADDING THE LOWER SUSPENSION ARM STAYS

**1** Fit the left rear lower suspension arm stay (part 2) into the left gearbox housing so that the two pins (circled in red) fit into the holes (ringed in yellow).



**2** Insert a type 'D' screw into the hole in the stay (ringed in red).



**3** Tighten the screw using a size 00 screwdriver. Do not tighten it all the way – stop when the screw is about halfway in. Repeat Steps 1-3 for the right rear lower suspension arm stay (part 3), again being sure to tighten the screw to only halfway in.



### THAT'S IT FOR THIS PACK!

Your engine and gearbox assembly is taking shape. Next time, you will assemble the left side gearbox cowl and tension rod diffuser stay.



# Assembling the gearbox cowl 1

In this pack you begin assembling the rear suspension links, starting with the left gearbox cowl and the left tension rod diffuser stay. As usual when tightening self-tapping screws, be careful not to overdo it, as you can easily strip the thread that the screws cut in the ABS moldings.

## PARTS SUPPLIED WITH THIS PACK



1 – Gearbox cowl (left)

2 – Tension rod diffuser stay (left)



3 – Type 'A' screws x 4\*

4 – Type 'E' screws x 5\*

\* A spare screw is included for each of the two screw types

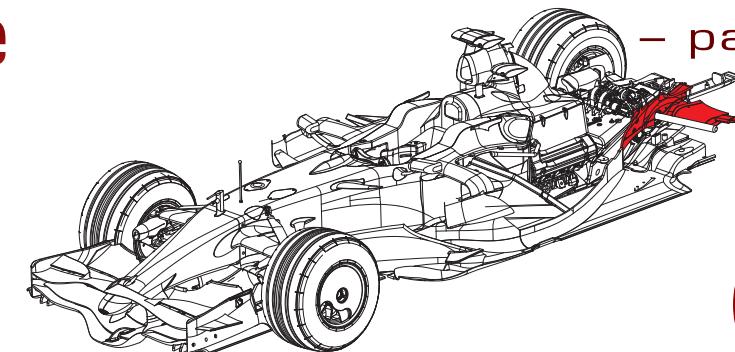
## TOOLS & MATERIALS REQUIRED

Phillips screwdriver (size 00) – supplied with Pack 1

## OPTIONAL EXTRAS

Screwdriver adapter – supplied with Pack 8

– pack 25

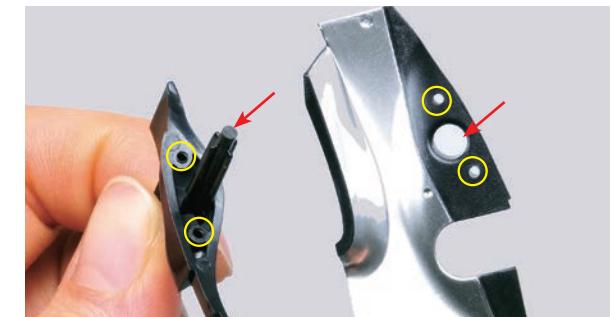


Parts to be assembled in this pack

## ATTACHING THE LEFT TENSION ROD DIFFUSER STAY

1

Fit the projecting shaft on the diffuser stay (arrowed in red) into the large hole on the silver painted side of the gearbox cowl. Make sure that the two screwholes (circled in yellow) line up.



2

Press the stay into place until it fits flush with the cowl, and the screwholes align.



3

Fit a silver type 'A' screw into one of the holes (ringed in yellow).



**4**

Holding the parts together, carefully tighten the screw using the size 00 Phillips screwdriver. Take care not to overtighten it.

**5**

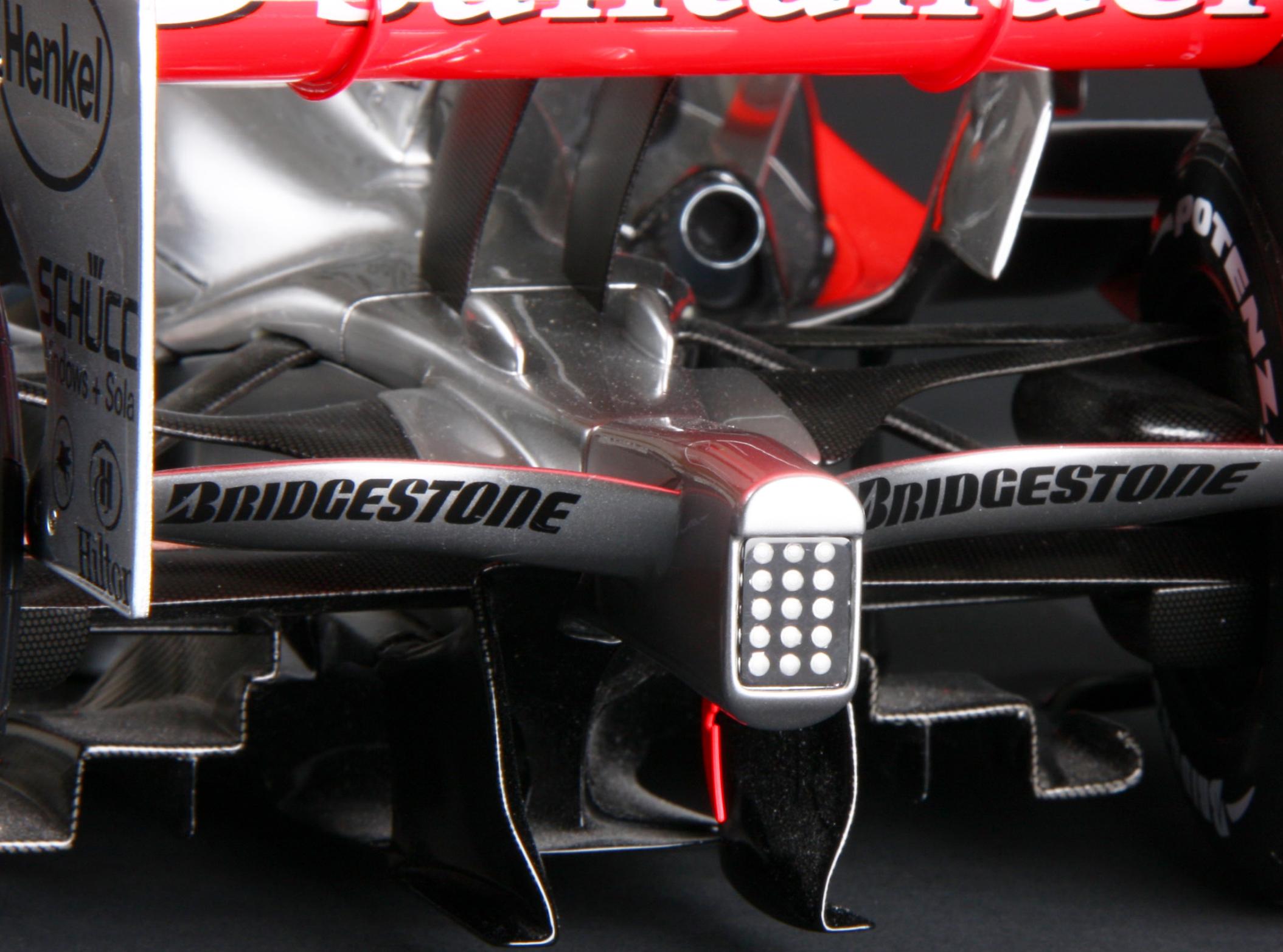
Insert a screw into the other hole. When both screws have been screwed in, check that the stay is firmly fixed flush with the cowl.



### THAT'S IT FOR THIS PACK!

The assembly you completed this time is the first step in the process of fitting the rear suspension mountings to the gearbox cowl. Next time, you fit the left tension rod diffuser to its stay, so keep the assembly and the screws ready for use.

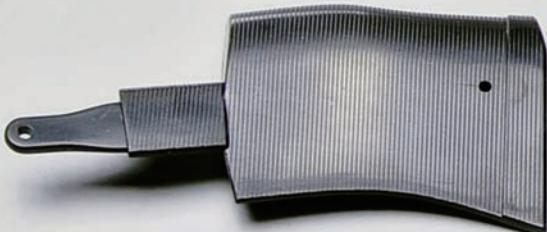




# Assembling the gearbox cowl 2

In this pack you continue the process of attaching the rear suspension links. First, you fit the upper and lower parts of the left tension rod diffuser onto the stay you attached to the left gearbox cowl in Pack 25. Then you can attach the cowl to the rear end of the gearbox.

## PARTS SUPPLIED WITH THIS PACK



1 – Tension rod diffuser upper (left)



2 – Tension rod diffuser lower (left)

### TOOLS & MATERIALS REQUIRED

Phillips screwdriver (size 00) – supplied with Pack 1

Masking tape  
ABS adhesive

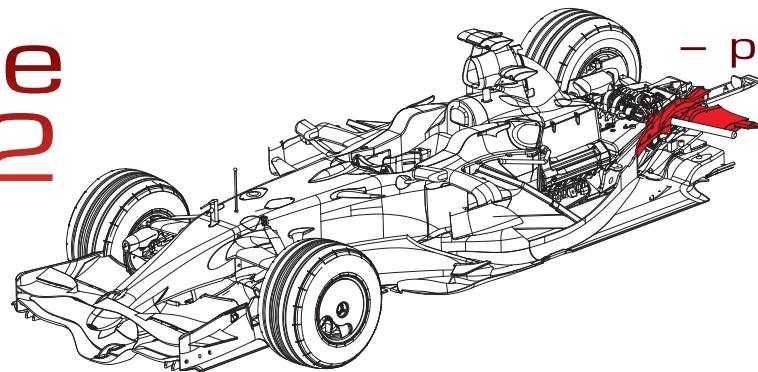
Scissors

### OPTIONAL EXTRAS

Screwdriver adapter – supplied with Pack 8

### ITEMS TO HAVE READY

Left gearbox cowl and left tension rod diffuser stay – assembled in Pack 25  
Engine and gearbox – assembled in Pack 24



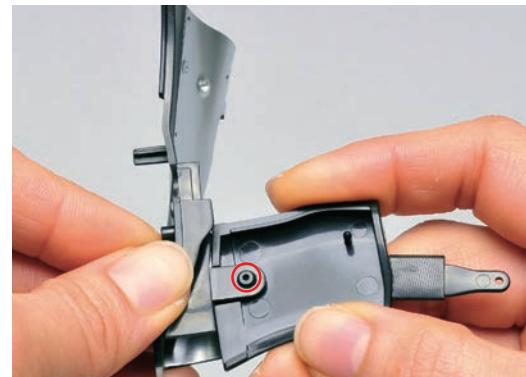
– pack 26

Parts to be assembled in this pack

## FITTING THE TENSION ROD DIFFUSER TO THE GEARBOX COWL

1

Test-fit the tension rod diffuser parts to the gearbox cowl to check how they fit and see where to apply adhesive. Start with the upper half of the tension rod diffuser (part 1). Making sure you have the gearbox cowl the right way up, fit the short post (ringed in red) through the hole (ringed in red) in the tension rod diffuser stay.



2

Now take the lower half (part 2). The screwhole (ringed in red) fits over the post you just fitted in place. The hollow post (ringed in yellow) fits over the pin hole (ringed in yellow) on part 1. The groove arrowed in blue fits over the ridge also indicated in blue.

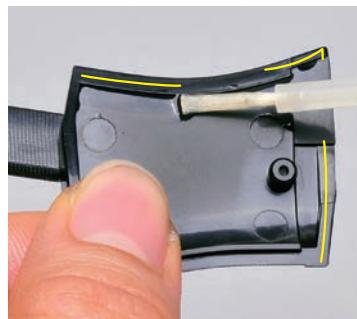


3



The assembly should look like this. The hole on the underside (ringed in yellow) takes a screw that holds the parts together.

4



Separate the components and apply ABS adhesive to the inner edge of part 1, where it is marked in yellow. Also apply adhesive sparingly to the ridge (arrowed in red) on the front edge.

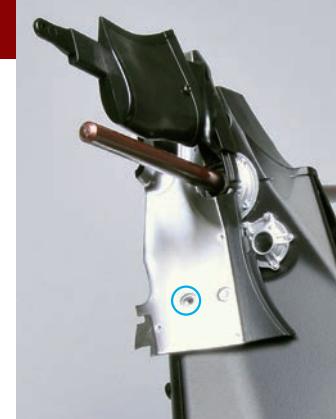
5

Working quickly before the adhesive dries, fit part 1 onto the stay, as you did in Step 1, then add part 2, as shown in Step 3. Holding the upper and lower halves of the diffuser together, insert a black type 'E' screw (supplied with Pack 25) through the hole in the lower tension rod and tighten it carefully as it cuts a thread in the screwhole. It doesn't matter if the tension rod assembly is slightly loose on the tension rod stay at this point.



2

With the cowl in place, locate the small hole (ringed in blue) that takes the screw which holds the parts together. To make it easier to fit the screw into the hole in the gearbox, remove the cowl and very gently twist the tip of the size 00 Phillips screwdriver in the screwhole. This will widen the opening a little and help to guide the screw into place.



3

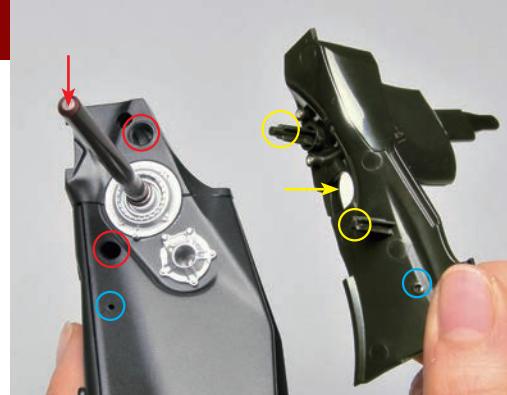
Fit the cowl back in place. To avoid damaging its silver finish, stick masking tape over the hole you identified in Step 2. Then poke a toothpick through the tape to reopen the hole. Insert a silver type 'A' screw (supplied with Pack 25) through the hole and into the gearbox. Tighten it carefully, then remove the tape.



## ATTACHING THE LEFT GEARBOX COOL TO THE GEARBOX

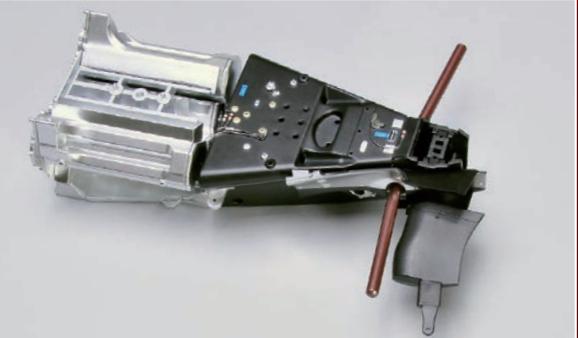
1

Test-fit the cowl onto the gearbox. The shaft (arrowed in red) goes through the hole (arrowed in yellow) in the cowl and the two cross-shaped pins (ringed in yellow) on the cowl fit into sockets (ringed in red) in the gearbox. This will also align the two screwholes ringed in blue.



### THAT'S IT FOR THIS PACK!

The left tension rod diffuser is now attached to the rear of the gearbox. As usual, store your newly assembled parts carefully and look after any spare screws.



# Assembling the gearbox cowl 3

In this pack you continue assembling the rear suspension links, moving on to the right-hand gearbox cowl and the right tension rod diffuser stay. The whole assembly is a mirror image of the one you built in Pack 25.

## PARTS SUPPLIED WITH THIS PACK



1 – Gearbox cowl (right)



2 – Tension rod diffuser stay (right)

3 – Type 'A' screws x 4\*



4 – Type 'E' screws x 5\*



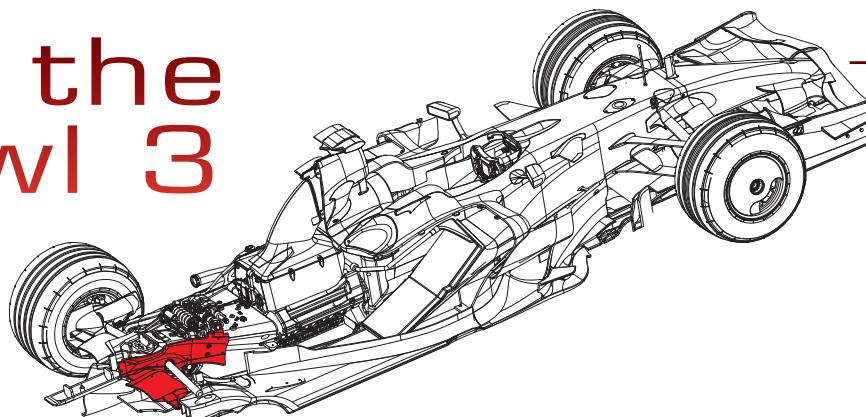
\* A spare screw is included for each of the two screw types

## TOOLS & MATERIALS REQUIRED

Phillips screwdriver (size 00) – supplied with Pack 1

## OPTIONAL EXTRAS

Screwdriver adapter – supplied with Pack 8



– pack 27

Parts to be assembled in this pack

## ATTACHING THE RIGHT TENSION ROD DIFFUSER STAY

1

Fit the projecting shaft on the diffuser stay into the large hole (arrowed in red) on the silver-painted side of the gearbox cowl. Make sure that the two screwholes (circled in yellow) line up with each other.



2

Press the stay into place until it fits flush with the cowl, and the screwholes align.



3

Fit a silver type 'A' screw into one of the holes ringed in yellow.



4

Holding the parts together, tighten the screw using the size 00 Phillips screwdriver. Take care not to overtighten it.



5

Insert a screw into the other hole. When both screws have been tightened, check that the stay is firmly fixed flush with the cowl.



### THAT'S IT FOR THIS PACK!

This assembly is the first part of fitting the right rear suspension mountings to the gearbox cowl. Next time, you'll fit the right tension rod diffuser to its stay, so keep the assembly and the screws ready for use.



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# Assembling the gearbox cowl 4

In this pack, you complete the process of attaching the rear suspension links to the gearbox cowl. First, fit the upper and lower parts of the right tension rod diffuser onto the stay that you attached to the right gearbox cowl in Pack 27. Then you can attach the cowl to the gearbox.

## PARTS SUPPLIED WITH THIS PACK



1 – Tension rod diffuser upper (right)



2 – Tension rod diffuser lower (right)

## TOOLS & MATERIALS REQUIRED

Phillips screwdriver (size 00) – supplied with Pack 1

Masking tape

ABS adhesive

Scissors

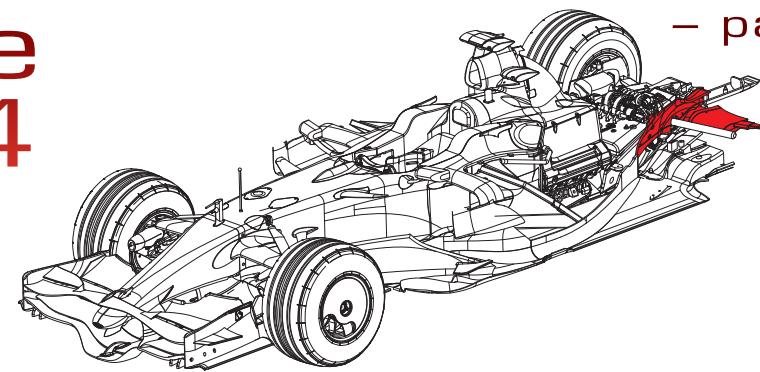
## OPTIONAL EXTRAS

Screwdriver adapter – supplied with Pack 8

## ITEMS TO HAVE READY

Right gearbox cowl and right tension rod diffuser stay – assembled in Pack 27  
Engine and gearbox – assembled in Pack 24

– pack 28

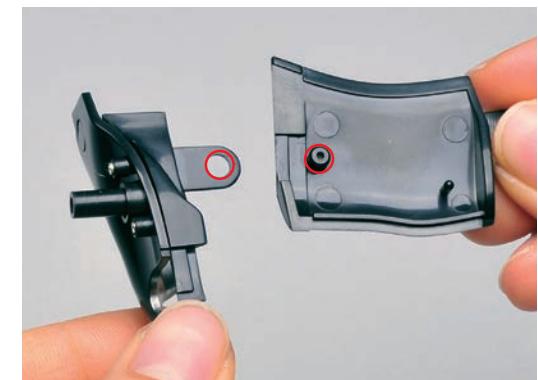


Parts to be assembled in this pack

## FITTING THE TENSION ROD DIFFUSER TO THE GEARBOX COWL

1

Test-fit the tension rod diffuser parts to the gearbox cowl to check how they fit and see where to apply adhesive. Start with the upper half of the tension rod diffuser (part 1). Making sure you have the gearbox cowl the right way up, fit the short post (ringed in red) through the hole (ringed in red) in the tension rod diffuser stay.



2



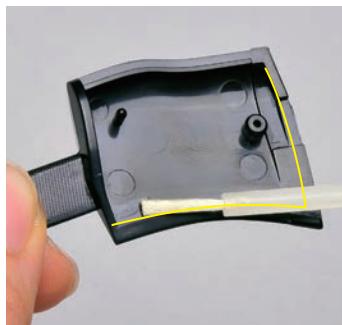
3



Now take the lower half (part 2). The screwhole (ringed in red) fits over the post in Step 1. The hollow post (ringed in yellow) fits over the pin (ringed in yellow) on part 1, and the grooves around the edges should interlock.

The assembly should look like this. The hole on the underside (ringed in yellow) is for a screw that holds the parts together.

4



Separate the components and apply ABS adhesive to the inner edge of part 1, following the line marked in yellow. Also apply adhesive sparingly to the ridge (arrowed in red) on the front edge.

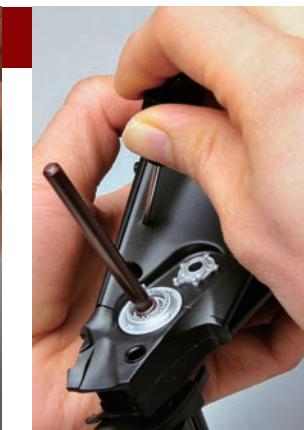
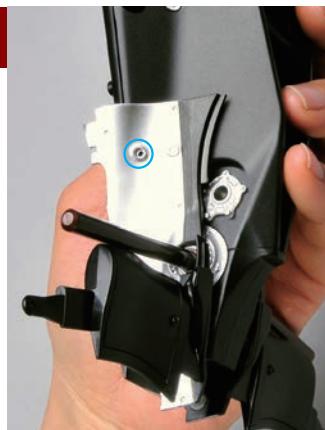
5

Working quickly before the ABS adhesive dries, fit part 1 onto the stay, as you did in Step 1, then add part 2, as you did in Step 3. Holding the upper and lower halves of the diffuser together, insert a black type 'E' screw (supplied with Pack 27) through the hole in the lower tension rod and tighten it carefully as it cuts a thread in the screwhole. It doesn't matter if the tension rod assembly is slightly loose on the tension rod stay at this point.



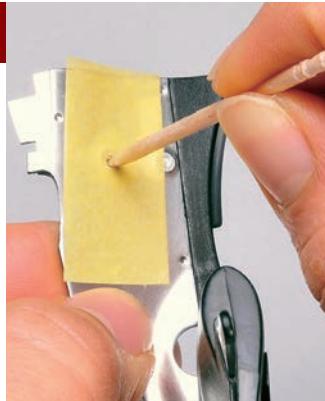
2

With the cowl in place, locate the small hole (ringed in blue) that takes the screw which holds the parts together. To make it easier to fit the screw into the hole in the gearbox, remove the cowl and very gently twist the tip of the size 00 Phillips screwdriver in the screwhole. This will widen the opening a little and help to guide the screw into place.



3

Fit the cowl back in place. To avoid damaging its silver finish, stick masking tape over the hole you identified in Step 2. Then poke a cocktail stick through the tape to reopen the hole. Insert a silver type 'A' screw (supplied with Pack 27) through the hole and into the gearbox. Tighten it carefully, then remove the tape.



## ATTACHING THE COWL TO THE GEARBOX

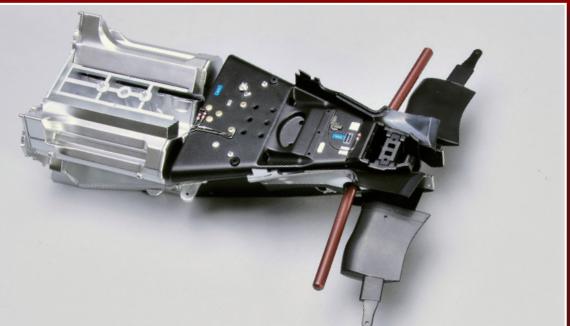
1

Test-fit the cowl onto the gearbox. The shaft (arrowed in red) goes through the hole (arrowed in yellow) in the cowl and the two cross-shaped pins (ringed in yellow) on the cowl fit into sockets (ringed in red) in the gearbox. This will also align the two screwholes ringed in blue.



### THAT'S IT FOR THIS PACK!

Both sides of the gearbox cowls and tension rod diffusers are now attached to the rear of the gearbox. Store this assembly carefully and retain any spare screws.



## Coming in Part 5

Complete the assembly of the rear suspension, assemble the left rear wheel and tyre, and begin assembly of the engine cover.

