TURNER Performance Parts for BMWs
Turner Motorsport Inc, 16 Hunt Road South, Amesbury, MA 01913
978-388-7769 / www.turnermotorsport.com
BTS 3/25/20

E46 REAR SUBFRAME/CHASSIS REINFORCEMENT KIT
TDR4675412

The E46 rear driveline and suspension are very similar to that of the E36. An unfortunate side effect of this is that the E46 also shares some of the same problems as the E36. One of these problems is the rear mounting points for the subframe, which can rip out from their spots in the sheet metal (see figure 1). This happens because the rear differential transmits the torsional load from the engine through the subframe, then into the chassis. This constant loading and unloading weakens the sheet metal and can cause it to fatigue and separate from the chassis. BMW tried to fix this problem in the E46 by placing a cross member on the front two mounting points of the subframe. This cross member keeps the front mounting points from having problems by placing the bushing and the stud in double-sheer, thus reducing the twisting action on the sheet metal. The unfortunate side effect of this is that the load from the front of the subframe now gets transmitted to the left rear of the subframe. This is where we have seen many failures of the chassis on low mileage street cars and race cars.

This product reinforces the chassis sheet metal at the subframe mounting points. We do this by thickening the metal and distributing the load over a larger area. This kit will save time when repairing the chassis, and is also strongly recommended as a preventative maintenance item.

Notes: The rear suspension, rear subframe, and exhaust must be removed to perform this job.

Warning: **Requires Welding.** Only a professional welder should perform this work. The ECU, alternator, and battery should all be disconnected before welding to prevent electrical damage. The welding machine should be directly grounded to the chassis, not to any suspension parts. It is also strongly recommended that the trunk interior, and fuel tank are removed and all fuel lines are capped to reduce the fire hazard while welding.

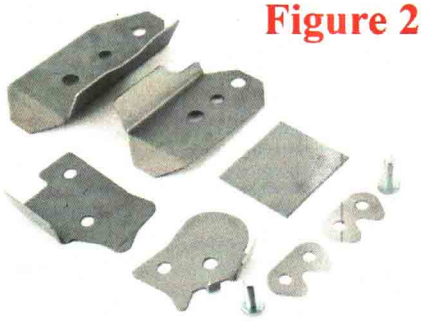
Parts list for kit: (See Figure **2**)

1. Two 12mm x 1.5 bolts
2. Two front subframe mounting point reinforcements
3. Two rear subframe mounting point reinforcements
4. Two cross member spacers
5. Two trunk block off plates

Applications: 1999 - 2005 (E46 3- series and M3)

When would it be a good time to perform this work on my car?

You can save time if you are doing any rear suspension work, exhaust, or doing a differential fluid change.



Directions:

1. Properly lift and support the car to access the rear suspension

2. Remove the rear suspension and fuel system as outlined in a repair manual

3. Place the reinforcements in the proper location. Use a maker to outline the 4 steel reinforcement plates, then remove all the paint and undercoating inside the outline and 1" outside of the outline. (A die grinder with wire wheel or sanding disk works well)

   NOTE: Any paint or undercoating on the welding surface will cause defects in the weld and weaken it.

4. Use the two bolts supplied with the kit and the two threaded studs from the subframe to hold all four plates in place against the chassis. You don't need to tighten the bolts much as they are just there to line up the holes in the plates and chassis, as well as hold everything in place while welding.


Left front reinforcement

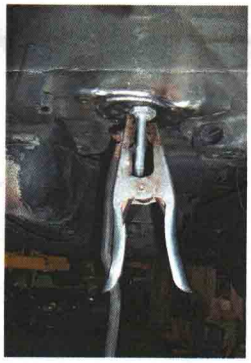

Right front reinforcement


Right rear reinforcement


Left rear reinforcement

5. In each of the reinforcement plates there are ½" holes that do not line up with anything. These holes are for making a rosette weld. The front plates have one hole and the rear two plates have two holes. Use a ½" drill bit to cut through the outer sheet metal of the chassis. Do not drill too deep, as you are just trying to get to the inner sheet metal to tie it all together. The plate can now be welded. **Tip:** Use a factory stud or bolt screwed in the chassis for a good ground point in one of the other mounting points you are not welding around. Fill in the holes with a rosette weld first, then weld around the outer edge of the reinforcement. On the front reinforcements you do not need to weld the entire way around the plate, a stitch weld is sufficient.

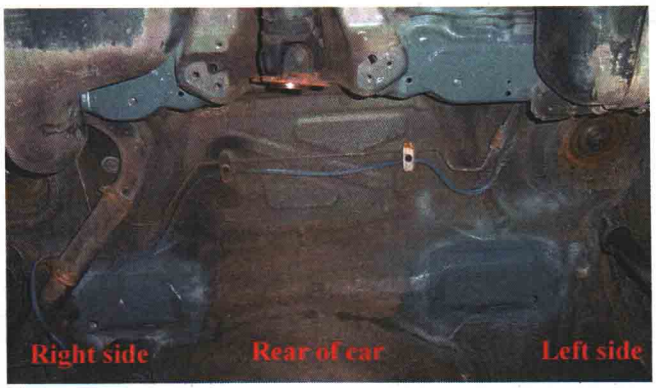

Drill here



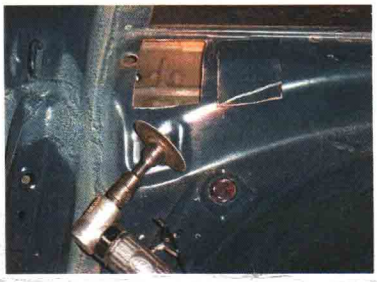

Rosette weld

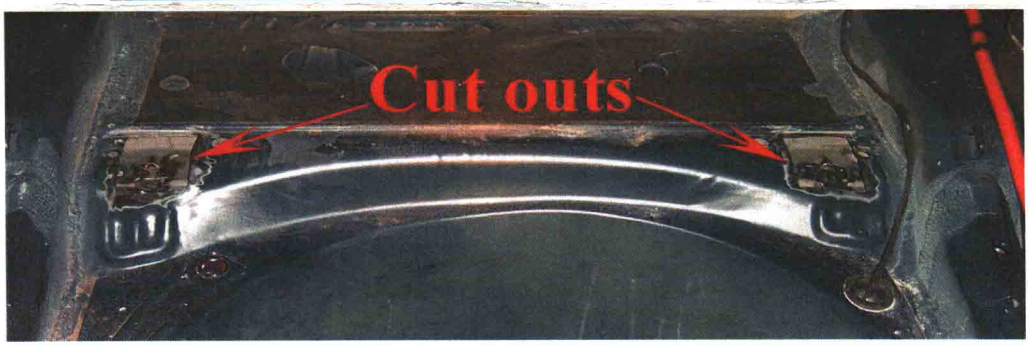
6. After welding all the plates grind the rosettes and any high points so they are flush with the plate.

7. Clean any welding residue and burnt paint off. We suggest using seam sealer where you have stitch welded. Primer and paint all bare metal. We suggest doing this here so it can dry while you work on the next step.



8. Remove the trunk interior to gain access to the top of the rear subframe mounting point. This is where the first crack in the sheet metal starts, in a place that is not clearly visible. Place the two 3"x3.5" sheet metal plates in the trunk as seen below. Draw a line around them, and make another line about ¼" inside the line you just traced. Use a cut off wheel to cut the sheet metal out inside the inner lines. This will make the hole smaller than the sheet metal rectangle supplied with the kit. This will be helpful later.

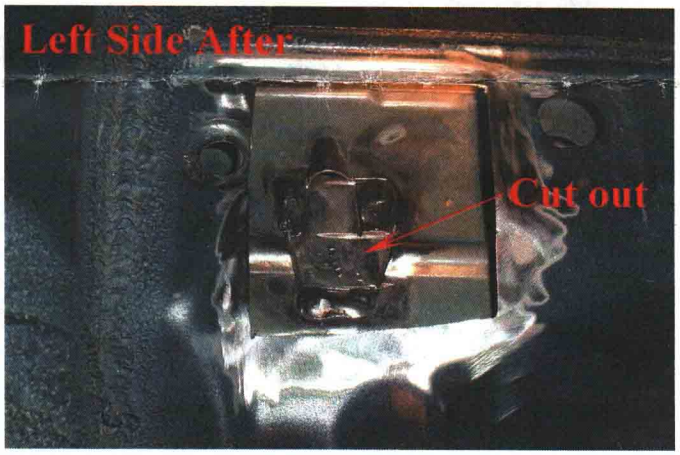




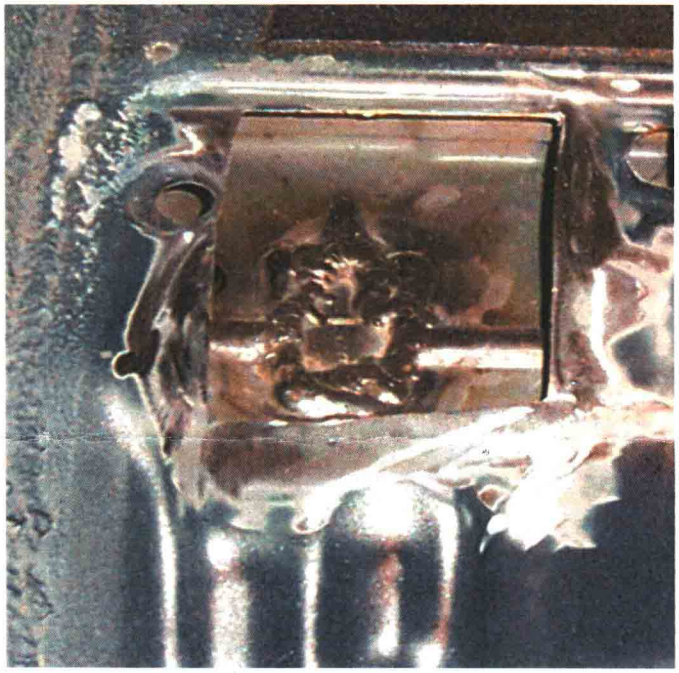
9. Inside each cut out you are going to see three rosette welds. Cut out a section of the sheet metal between the three welds "kind of in a triangle shape" (see after pic below). This is done because the three spot welds are not sufficient surface area to hold the load placed on it, and this will increase the surface area and also fix any cracks that may have started (this is where they begin).

   Tips:

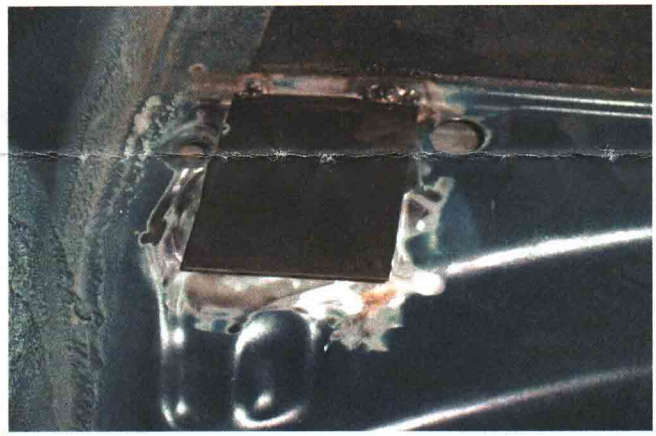
   - Clean the inner sheet metal before cutting. This will help when it is time to weld. This section is sprayed with a factory rust protector that is very flammable.
   - Use a cut off wheel, it helps if you have a used cut off blade that is worn down and is a bit smaller.



10. Weld the upper sheet metal to the lower sheet metal around the area you just cut out. If you have any existing cracks in the sheet metal from fatigue, weld them up at this point. Clean any welding residue and burnt paint off. Primer and paint all bare metal inside the box section.



11. Place the 3" x 3.5" steel plates over the hole. Butt the plate up against the lip in the sheet metal toward the front of the car. Tack weld it in place by the lip. Place two more tack welds about half way down the plate just before factory sheet metal starts to curve down. Bend the rest of the plate to contour the factory sheet metal and spot weld in place. You do not need to weld the entire way around the plate, a stitch weld is sufficient. Clean any welding residue and burnt paint off. We suggest using seam sealer any place you may have stitch welded. Primer and paint all bare metal. We suggest doing this now so it can dry while you work on reinstalling the rear suspension.



12. Install the rear Suspension as outlined in the repair manual with one exception: When installing the aluminum cross member on 3 series or the steel cross member on M3 you will need to use the two spacers supplied with the kit. **Warning:** if you do not use the spacers you may crack the cross member. Place a small dab of RTV silicone between the cross member and the spacer. This will help keep the spacers from getting lost if the cross member is removed in the future.

13. Install trunk interior and any other components that you removed. Have an alignment done to assure proper adjustment. Test drive the vehicle.

PART NO. 67110 **Instruction Sheet**

SPC PERFORMANCE®

BMW REAR CAMBER ARM

This part should only be installed by personnel who have the necessary skill, training and tools to do the job correctly and safely. Incorrect installation can result in personal injury, vehicle damage and / or loss of vehicle control.

1. Before beginning any alignment always check for loose or worn parts, tire pressure and odd tire wear patterns. Determine amount of rear camber needed. Raise rear of vehicle and support body on jack stands.
2. Remove the inner and outer lower control arm mounting bolts and remove the arm from the vehicle.

   Note: It may be necessary to lower the rear member to fully remove the inner bolt.
3. Install the 67110 adjustable arm using the OE bolts. Lower the vehicle and torque both bolts to manufacturer's specifications.

   Note: Tightening the bolts with the vehicle in the raised position may cause premature bushing wear due to preloading the bushings.
4. Adjust camber by loosening jam nuts and turning the center piece to desired camber specification.

   Note: The maximum length of the arm is reached when the flat on one rod is visible at the end of the turnbuckle adjuster. Do NOT lengthen the arm beyond this point.

   Always check for proper clearance between suspension components and other components of the vehicle.
5. Tighten the jam nuts, set rear toe to specifications, complete alignment and road test the vehicle.

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REVSHIFT
PERFORMANCE ENGINEERING

BMW E46 Subframe Bushings
PSB-E46M
Installation Instructions

Remove the old bushings from the subframe using a press or alternative methods.

Clean the subframe bushing bore to remove rubber and debris..

Separate the bushings from the aluminum sleeves using a press or by firmly twisting and pulling the halves apart by hand.

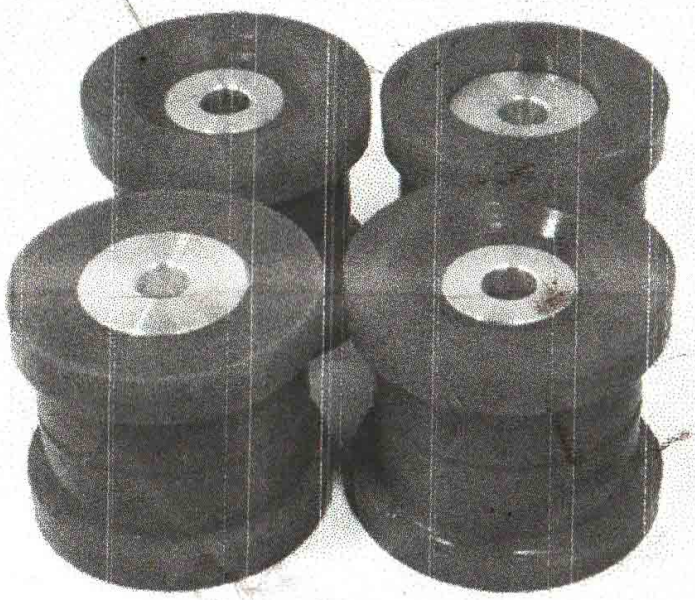
Apply a moderate amount of the supplied lube to the outside of the bushings and to the subframe bore.

Press the bushing halves into the subframe making sure to align the relief in the front upper bushing with the subframe weld.

Press the aluminum sleeve into the bushings while supporting the opposite side bushing so it doesn't come out of the subframe.

Install the subframe using the oem bottom plates and hardware.

Torque the bolts to factory specs.



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REVSHIFT
PERFORMANCE ENGINEERING

BMW E46 M3 Differential Bushings
PDB-E46M
Installation Instructions

Remove the old bushings from the differential and subframe using a press or alternative methods.

Clean the subframe and differential bushing bore.

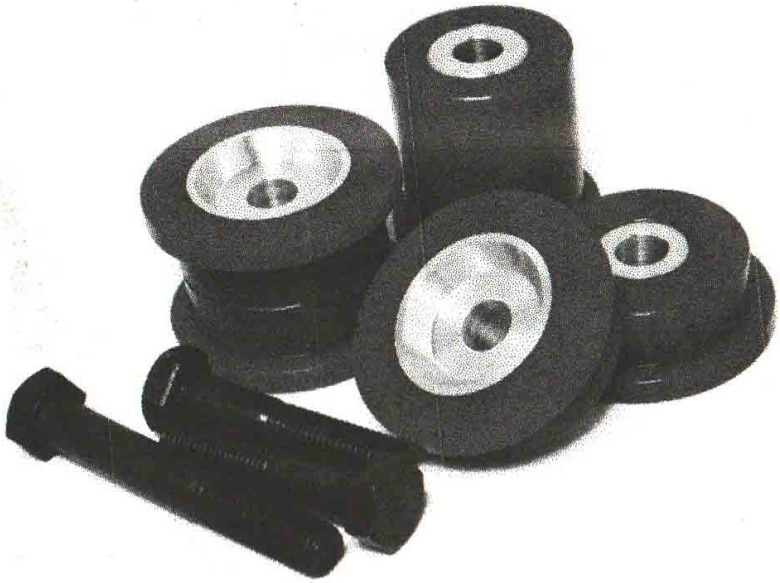
Apply a moderate amount of the supplied lube to the outside of the bushings and to the diff and subframe bore.

Press the single front bushing into the subframe with the wider bushing shoulder toward the passenger side of the car.

Press the four rearward bushings into both sides of the differential cover on the frontside and backside.

Install the differential to the subframe using the supplied class 10.9 bolts.

Torque to 85 ft-lbs.



BILLY BOAT EXHAUST INSTALLATION INSTRUCTIONS

General Installation

Your Billy Boat Exhaust system was designed to be a direct replacement exhaust system, while offering the best performance, finish and value available from a stainless steel exhaust system. Proper installation will ensure a lifetime of quality and performance from this product.

Please follow these instructions carefully to get the most from your Billy Boat Exhaust system.

1) Disconnect the NEG (-) battery terminal. Disconnecting power from your vehicle may allow the computer to "clear" its memory during installation.

2) With the engine cool, remove the factory exhaust system, starting from the first connection after the catalytic converter, and working back. In some cases, where the factory exhaust system is one piece, it may be necessary to cut it in sections for easy removal (the *Billy Boat Exhaust* system, in most cases, comes in sections for simple installation).

3) Be sure to inspect all gaskets and rubber hangers before installation and replace as necessary. The use of high temperature silicone between each connection may further improve the exhaust seal.

4) Starting at the catalyst, secure the first pipe of your new exhaust system-using factory mounting locations.

5) Secure the next component/pipe in the system and work back one section at a time.
HINT: secure the exhaust system with all hardware finger tight.

6) With the Billy Boat Exhaust system in a hanging loose position, each pipe where it has the best center point and begin tightening all hardware as you work back. Do not force the exhaust system to fit! If seems to not fit properly, please call the Billy Boat Exhaust toll free tech line at (888) 228.7435.

7) Reconnect the battery NEG (-) terminal.

8) Start vehicle.

9) With the vehicle running at an idle, check for exhaust leaks at each connection. If there is a leak check that the mounting hardware is tight. If so, check the gasket for wear and replace as necessary.

10) Enjoy this fine product for the life of your vehicle!

23045 N 15th Ave, Phoenix AZ 85027 • 623-581-7600 • 888-228-7435 • 623-581-5640 fax
Hear The Sound of Performance at **www.BBExhaust.com**

Billy Boat Exhaust Safety, Installation and Liability Statements

SAFETY: Appropriate disassembly, assembly methods and procedures are essential to ensure the personal safety of the individual performing the kit installation. Improper installation due to the failure to correctly follow these instructions could cause personal injury or death. Read each step of the installation manual carefully before starting the installation.

- Always wear safety glasses for eye protection.
- Place the ignition switch in the OFF position.
- Always apply the parking brake when working on the vehicle.
- Block the front and rear tire surfaces to prevent unexpected vehicle movement.
- Operate the engine only in well-ventilated areas to avoid exposure to carbon monoxide.
- Do not smoke or use flammable items near or around the fuel system.
- Use chemicals and cleaners only in well-ventilated areas.
- Batteries can produce explosive hydrogen gas which can cause personal injury. Do not allow flames, sparks or flammable sources to come near the battery.
- Keep hands and any other objects away from the radiator fan blades.
- Keep yourself and your clothing away from moving parts when the engine is running.
- Do not wear loose clothing or jewelry that can be caught in rotating or moving parts.

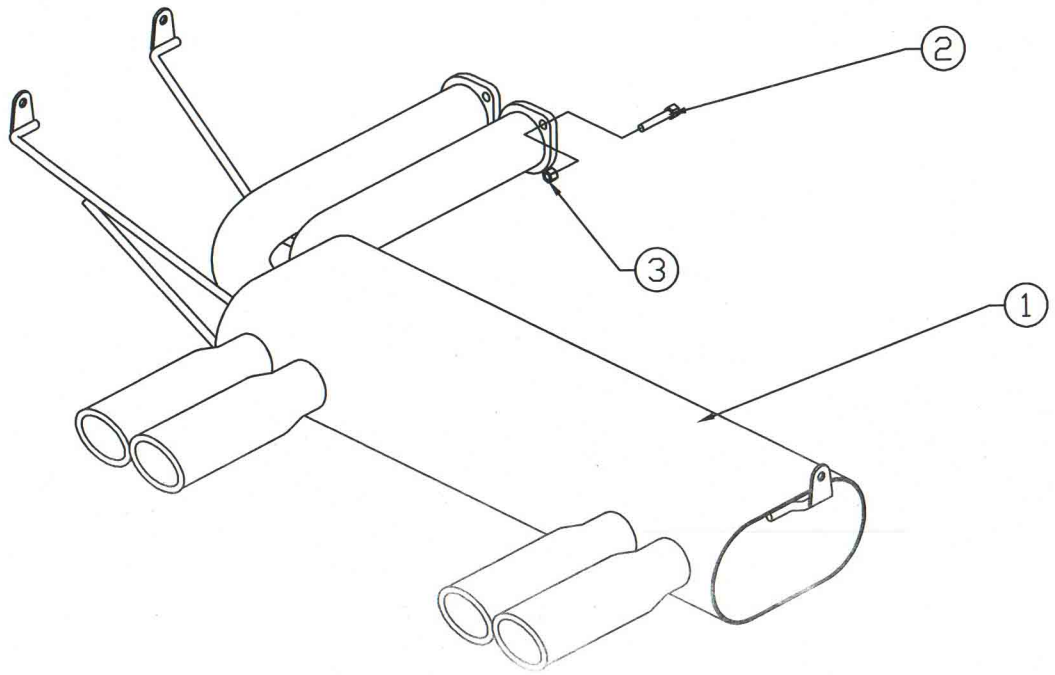
VEHICLE SUPPORT WARNING: Should the purchaser decide to install this exhaust product at home, be warned that car or light duty truck/van "bumper" jacks are intended for emergency use only. The use of frame contact jack stands in conjunction with a floor jack as main support is highly recommended to minimize accidental dropping of a vehicle while the installation proceeds. We recommend the use of a shop hoist if possible. Please use caution!

GENERAL STATEMENT OF LIABILITY: While we provide information for do-it-yourself installation of exhaust systems and related items, these operations are not without risk. Injury may occur during an installation or exhaust systems and their components may be damaged in the process. We are not responsible or liable for damages that may be sustained to persons or property during an installation. For this reason, we recommend professional installation as the best option when at all possible. While care has been taken in the preparation of the information contained in this web site, Billy Boat Exhaust and BillyBoatExhaust.com does not and cannot guarantee its accuracy. Anyone accessing this information does so at their own risk. It will be assumed that access indemnifies Billy Boat Exhaust and BillyBoatExhaust.com from any and all injury or damage arising from such use.

LOCAL LAWS & LIMITATION OF LIABILITY/DISCLAIMERS: Local Laws & Limitation of Liability/Disclaimers: The regulation of emissions production, noise levels and safety standards is undertaken by the federal government, each of the fifty state legislatures, and by many local municipalities, towns and counties. The manufacturer makes no warranties of merchantability, of fitness for a particular purpose, or that its products are approved for general use, or that its products comply with laws, regulations or ordinances in the states where they may be sold to the ultimate purchaser, the consumer. The entire risk as to the conformity of this product in any such state and as to repair, should the product prove to be defective or non-conforming, is on the retail purchaser, the buyer, the ultimate consumer of such product and it is not upon the seller, distributor, or manufacturer. In this connection, retail purchaser, the buyer, the ultimate consumer assumes the burden of the entire cost of any and all necessary service, alterations, and or repair. The foregoing statement limits the liability of the manufacturer.

BILL OF MATERIALS

ITEM	QTY.	U/M	PACKING ISP INT	DESCRIPTION
1	1	EA		MUFFLER SECTION
2	4	EA		BOLT- 8MM -1.25 x 50
3	4	EA		NUT- 8MM -1.25 STOVER LOCK
4				
5				
6				
7				
8				



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BILLY BOAT PERFORMANCE EXHAUST | INCH | FBMW1250

THE WORLD'S BEST AIR FILTER

HORSEPOWER GUARANTEED

THIS KIT IS GUARANTEED TO INCREASE HORSEPOWER

Every Intake Kit we sell has been tested on a Dynamometer and proven to increase horsepower. We measure horsepower at the wheels. The horsepower rating that may have been on the window sticker when your car was new is a measurement of horsepower at the engine and there is often a loss of horsepower through the drive train by the time it reaches the wheels.

K&N hereby warrants and guaranties to the original retail purchaser of any K&N air intake kit that the vehicle on which the air intake system is installed will gain an increase in horsepower, or K&N will refund the purchase price, including sales tax, to the retail purchaser, subject to the following terms and conditions:

The K&N air intake system must have been properly installed on the vehicle in accordance with the included K&N instructions. The system must be the correct part number for the vehicle upon which it was installed. The vehicle must be in good running condition. The vehicle must undergo a dynamometer test both before and after the installation of the system, with no changes to the vehicle, except for the installation of the kit. The dyno tests must be performed by the same testing facility and must be performed within 30 days of one another and within 60 days of the date of purchase. The test results or work order for each test must reflect the name and address of the vehicle owner or operator having the test performed; the year, make, model, and mileage of the vehicle being tested; and the horsepower results from both tests.

If the dyno tests show that the vehicle did not gain an increase in horsepower, then the retail purchaser must return the complete air intake system to K&N in its original packaging, together with his or her proof of purchase, the ORIGINALS of the two dyno tests statement requesting a refund in accordance with our Horsepower Guarantee. Upon receipt of all of the foregoing, K&N will refund the full purchase price, including sales tax, to the original retail purchaser. This guaranty does not apply to any other costs incurred by the purchase, including, but not limited to, the dyno tests, parts and labor for the installation and removal of the air intake system, shipping costs, rental car, loss of use or incidental damages, if any, and K&N expressly disclaims any and all liability for same.

HIGH-FLOW INTAKE KITS

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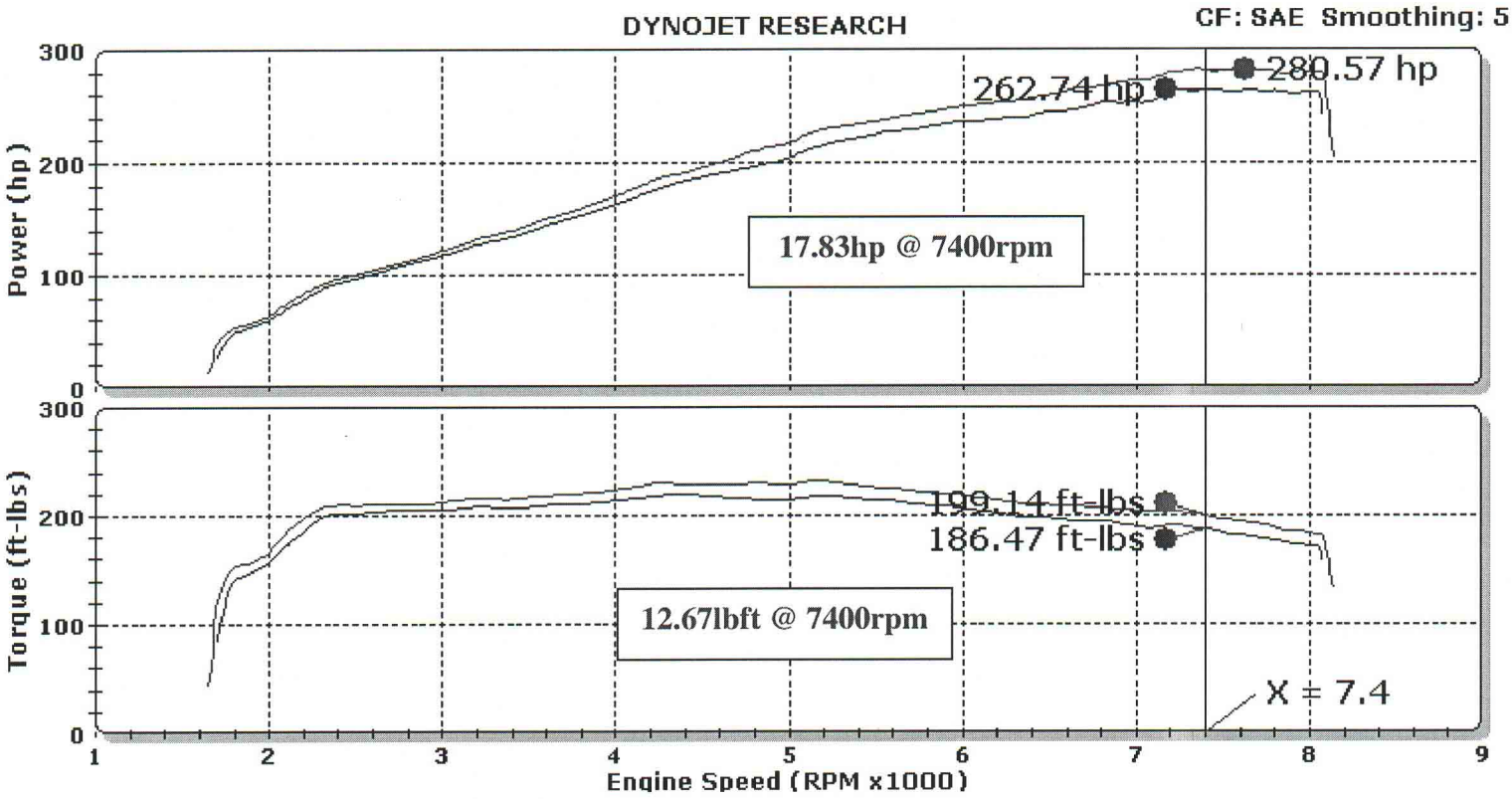

Run Title: Stock 03 BMW M3
Run Notes: Baseline stock run. 17659 miles. 3rd gear run.
Run Date: 9/21/2004 10:28:03 AM
Stock.001: 81.10 °F, 29.20 in-Hg, SAE: 1.01

Run Title: FIPK 03 BMW M3
Run Notes: 57-1003 installed. 17662 miles. 3rd gear run.
Run Date: 9/21/2004 1:05:27 PM
FIPK.002: 88.24 °F, 29.08 in-Hg, SAE: 1.02

Horsepower gains based on specific or similar vehicle dynamometer test. Results will vary. For more information, lookup vehicle and/or testing protocols at KNFilters.com

391003

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DO NOT RETURN

THIS PRODUCT TO THE STORE

If you have questions regarding your purchase please contact K&N directly

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orders@knfilters.com

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8/21