



FORD PERFORMANCE
PARTS



50th Anniversary
COBRA
JET

Official Owner's Manual

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1. INTRODUCTION

ATTENTION!

This is a Racing Vehicle. This vehicle is intended for off-road use ONLY and is not street legal.

Before operating your Cobra Jet please read and understand this owner's manual!

Register your Cobra Jet! Without registration, you may be missing out on critical updates and helpful information!

- The Cobra Jet is a turn-key racing vehicle that requires proper race preparation.
- Beyond component specific maintenance we recommend you regularly perform a “nut and bolt” inspection. This is a process of checking all the nuts, bolts, wiring, belts, hoses, tires, etc. on your vehicle. See the included supplemental Vehicle BOM and Torque Sheet for all torque specifications.
- Check your tire pressures as they will change over time and need to be checked before every run.
- Prior to any runs, it is necessary to, at a minimum, neutralize the rear suspension. See Chassis Setup section for the procedure.
- Change your spark plugs regularly. Fouled plugs can cause your Cobra Jet to run poorly and lead to engine damage. See sections on Engine and Maintenance for full details.
- Ensuring the vehicle is legal for race competition, including SFI certification, is the responsibility of the racer. Familiarize yourself with the vehicle and the rulebook for your sanctioning body.
- Be diligent with the care and maintenance of your vehicle!

ATTENTION!

It is the user's responsibility to understand and properly use all the safety equipment on the vehicle. Check that the safety belts, seat, window net, and roll bar padding are all in good condition and adjusted to fit the driver. Keep in mind that modifications may be required to properly fit certain drivers.



2. START-UP PROCEDURES

2.1 Pre-Start Up

ATTENTION!

Your vehicle is shipped with a water/glycol mix in both cooling systems!

To drain the intercooler system, see Engine section.

To drain the engine coolant system, see Engine section.

2.2 Start-Up Process

ATTENTION!

After start-up, prior to any runs, take the time to properly break-in your brake system by bedding your brake pads. Failure to do so may result in loss of control of your vehicle, potentially causing serious damage as well as injury or death.

Make nine total stops, three from 30 mph, then three from 50 mph, and finally three from 75 mph.

Allow the brakes to cool slightly between each of the three runs, without applying pressure to the brake pedal. After the last stop, allow the brakes to completely cool before making an initial run in your vehicle.

1. Turn on the Cobra Jet's electrical system by pulling out the master power switch located on the passenger side of the rear bumper.





2. Once in the driver seat, locate the switches on the center control panel. On the top row, the first switch is the starter, second is the ignition, the third is the fuel pump, and the fourth is the intercooler pump.



3. First, turn on the ignition switch. You will notice the lights go on above the switches as you turn them on.

4. To ensure the intercooler pump is operating, it is recommended that you turn on the intercooler second. You should hear the intercooler pump running when it is switched on. If not, stop and investigate before proceeding. Serious damage may occur to the engine if the intercooler is not functioning.

5. Turn on the fuel pump switch.

6. Your 50th Anniversary Cobra Jet is equipped with a manually shifted reverse valve body transmission. Make certain that the transmission is in park, in its most rearward position, before starting the engine. The shifter, reverse lock out knob, and gear lock-out lever will all need to be actuated correctly to change gears. See figure below for the gear layout of the shifter.



5. Apply pressure to the brake pedal and push the start engine button, which is located on the top left edge of the center control panel.

ATTENTION!

For your safety, it is necessary to neutralize the rear suspension prior to any runs. See section 9.4.1 for the correct procedure.



3. CALIBRATION & PROCAL3

Your Cobra Jet comes with a baseline calibration loaded on the production PCM. The ProCal3 software has the capability to reflash the PCM with new calibrations and adjust many key engine settings straight from your computer.

New for the 50th Anniversary Cobra Jet are integrated user-selectable Launch Assist tables that are programmable to retard spark timing over a configurable interval. This feature is built into the powertrain control module (PCM) and does not require aftermarket components. This feature allows the user to program four individual Launch Assist tables and select between them prior to making a run.

3.1 ProCal3 Setup

In order to fully utilize ProCal3, you will need to first install the latest ProCal3 software from <https://performanceparts.ford.com/register/>. **You will need to register your Cobra Jet in order to gain access to this software.**

After you have successfully installed ProCal3:

1. Plug the included Vehicle Interface dongle into a USB port. Wait for Windows to install the device drivers.
2. Start the ProCal3 software. Wait for the lights on the Vehicle Interface dongle to blink rapidly, signifying that the software has communication with the dongle.
3. On the Program tab, open the included calibration file into ProCal3
4. Plug the Vehicle Interface dongle into your Cobra Jet's OBD connector.
5. Power on the master power switch on your Cobra Jet, and turn on the ignition switch (but do not start the engine).

The ProCal3 software should now be connected to your Cobra Jet's PCM and is ready for usage. This can be verified by checking that battery voltage and VIN are being displayed in the top left portion of ProCal3.

3.2 ProCal3 Calibrate Tab

The Calibrate tab in the ProCal3 software allows you to make many changes to the engine settings. Once connected to your vehicle, select the Read Data button on the left hand side to retrieve settings currently stored in your Cobra Jet's PCM. To use these functions, select the cell of the value you would like to change, and type in your desired value. Note that you will only be able to send a value between the min and max limits defined in the software. After choosing your values, click the write data button to send the values to the PCM. The progress gauge on the top right will indicate when the process is finished.



ATTENTION!

Ensure that the battery voltage is at least 11.5V before writing to the PCM.
Ensure that the write process is complete before unplugging the Vehicle Interface dongle.

The screenshot shows the Ford Performance software interface. At the top, there are two gauges: a battery voltage gauge on the left showing 13.1 Volts and a 'Complete' progress gauge on the right showing 0.0%. Below the gauges is the Ford logo and 'FORD PERFORMANCE' text. Vehicle information is displayed, including VIN (1FATP8CZ7G52016CJ), PCM Software ID (MY18_CJ_FPDYG_SCJ_X60_FI), PCM Hardware Part Number (BR3A-12B684-CA4), and PCM Part Number (BR3A-12A650-VA). A description reads: '2018 CJ (MY18_CJ_FPDYG_SCJ_X60_Final_190205) as Delivered'. A navigation bar includes buttons for Instructions, Program, Record, Analyze, Diagnose, and Calibrate. A yellow warning banner states: 'WHEN MAKING CHANGES, CLICK "Write Data", DO NOT RE-FLASH THE PCM'. On the left, there are buttons for Write Data, Factory Defaults, Read Data, and Profile Learn (OFF). The main area shows the 'Scalars' tab with a table of parameters and their limits.

Parameter	Value	Unit	Min	Max
Tire Size		704 rev/mile	400.0000	800.0000
Axle Ratio		3.890 :1	2.0000	6.0000
Idle Speed Adder		0 RPM	-200.0000	400.0000
Stoichiometric Air/Fuel Ratio		14.820 :1	12.0000	17.0000
WOT Fuel Adder		0.000 lambda	-0.1000	0.2000
Spark Adder		0.000 deg	-20.0000	20.0000
Closed Loop Fuel Enable		Enabled		
Launch Select		Launch Assist 1		

The min and max values shown are the limits of each adjustment.

Scalars Tab

Tire Size, Axle Ratio

You may adjust the scaling of your vehicle speed data by changing the values of the axle ratio and tire size in the PCM. Do this by typing in the correct values of each in the Calibrate>Scalars tab. The changes will upload to the PCM after you select Write Data.



In order to calculate the Revs/Mile you need to measure the Rollout Distance (in inches) of the rear tires. This is the distance traveled per revolution of the tire; mark a line on the tire sidewall and ground with chalk, then push the vehicle until the mark has moved one revolution. This measured distance is the Rollout Distance.

Revs/Mile = $63360 / \text{Rollout Distance (in inches)}$

Idle Speed Adder

This will adjust your idle RPM. Positive values will result in higher idle speeds and negative values will result in lower idle speeds. The default value is: 0 rpm.

Stoichiometric Air/Fuel Ratio

Stoichiometric air/fuel ratio based on the fuel type. Note that this is a fuel property. It is NOT the air/fuel ratio at wide open throttle. The default value is: 14.82

ATTENTION!

This value should only be matched to the specific fuel used. Changing this value will significantly affect the fueling strategy. Any fuel other than VP C16 may cause severe damage to your engine. Use extreme caution.

WOT Fuel Adder

This will adjust the fuel table at wide open throttle. This is a lambda value; positive values will result in leaner air/fuel ratios and negative values will result in richer air/fuel ratios. The default value is: 0 lambda.

CAUTION!

Use of the WOT Fuel Adder feature may damage your engine.

Spark Adder

This will adjust the timing table in the PCM. Positive values will advance and negative values will retard. The default value is: 0 degrees. Changes to this parameter will impact effectiveness of the launch tables.

CAUTION!

Use of the Spark Adder feature may damage your engine.



Closed Loop Fuel Enable

Changing this will enable/disable the closed loop fuel control feedback for active A/F adjustment. The default setting is: enabled

Launch Select

There are four user-configurable launch assist tables. This tab allows the user to select which of the four tables is currently selected within the PCM. See section 3.2.1 for instructions on the Launch Assist feature.

Limits Tab

Throttle Angle Limit

Set the maximum throttle plate angle. The throttle body is wide open at 82 degrees. The default setting is: 40 degrees.

Engine RPM Limit

Set the engine overall speed limit. The default value is: 8500 RPM.

ATTENTION!

Engine speed limits above 8500 RPM are not tested by Ford Performance and may result in damage to your engine.

2 Step Tab

2 Step Enable, 2 Step RPM

Enable or disable the Launch Control (Two-step) system, and change the set point. The default 2 step value is 2500 RPM. See Section 4 for instructions on the Launch control feature.

ATTENTION!

Using the “Factory Defaults” button in the Calibrate tab will reset the PCM to all of the as-delivered ProCal3 values including all scalars, launch assist tables, etc.



3.2.1 Launch Assist Tables

The Launch Assist Tables may be utilized in low traction situations to prevent wheel spin. Launch assist will retard spark timing by the values entered in the selected table. The timing retard will engage instantly at the set 2 Step RPM, and return to baseline timing values after the last timing point entered in the selected table.

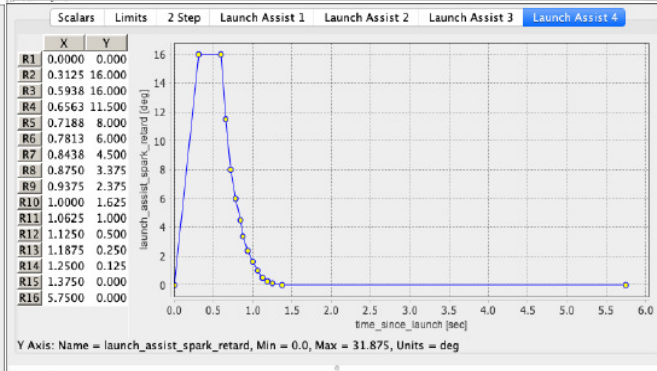
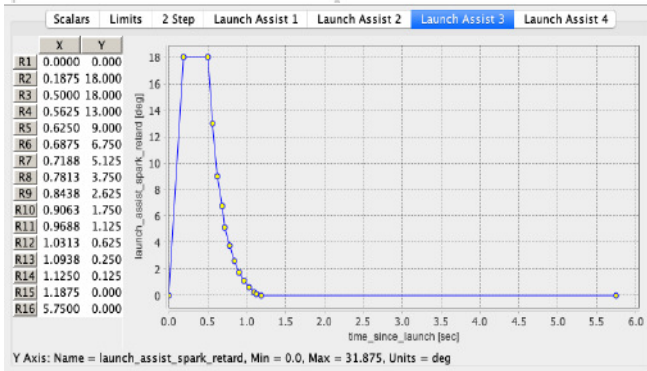
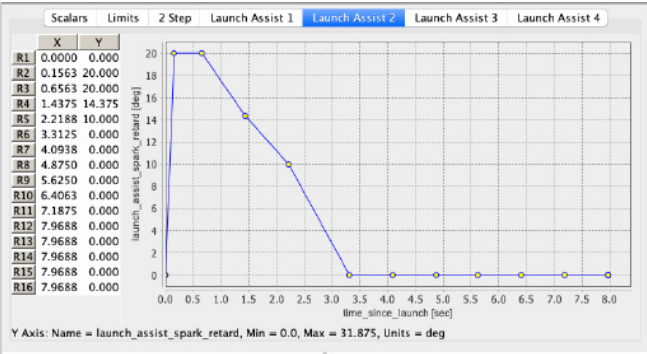
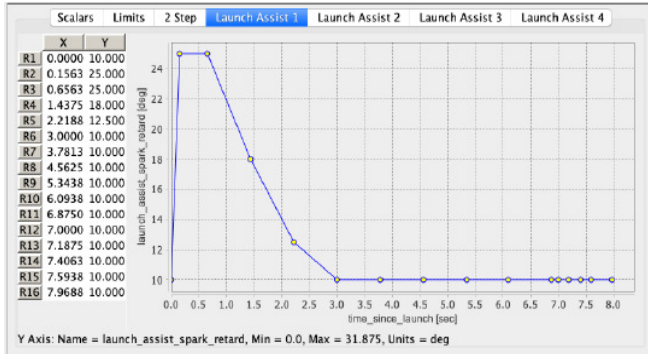
There are 4 user-configurable tables that can be selected either via ProCal or through the RacePak display. To select the tables via ProCal, Read Data currently stored in the PCM, and choose the desired table "Launch Assist X" in the Launch Select row. If modifying a table, select "Write Data" to store changes in the PCM. To select tables via RacePak follow the process outlined below:

1. While depressing the brake pedal and hold the L/C RPM toggle switch down for 3 seconds.
2. The tachometer will sweep to 6000 RPM and hold while in Launch Assist selection mode.
3. Release the L/C RPM rocker switch. The brake pedal can now be released.
4. Toggle the L/C RPM toggle switch up and down to change tables. The currently selected table number will display in the center of the RacePak unit.
5. Accept the selected table by holding the L/C Set switch up for 3 seconds.





The 4 predefined Launch Assist tables are designed to prevent wheelspin in varying traction conditions. Launch aggressiveness increases from Table 1 (least aggressive) -> Table 4 (most aggressive).



Note that the Launch Assist feature is separate from Launch Control, which will hold the engine RPM at a certain speed at the starting line. See Section 4 for more information.

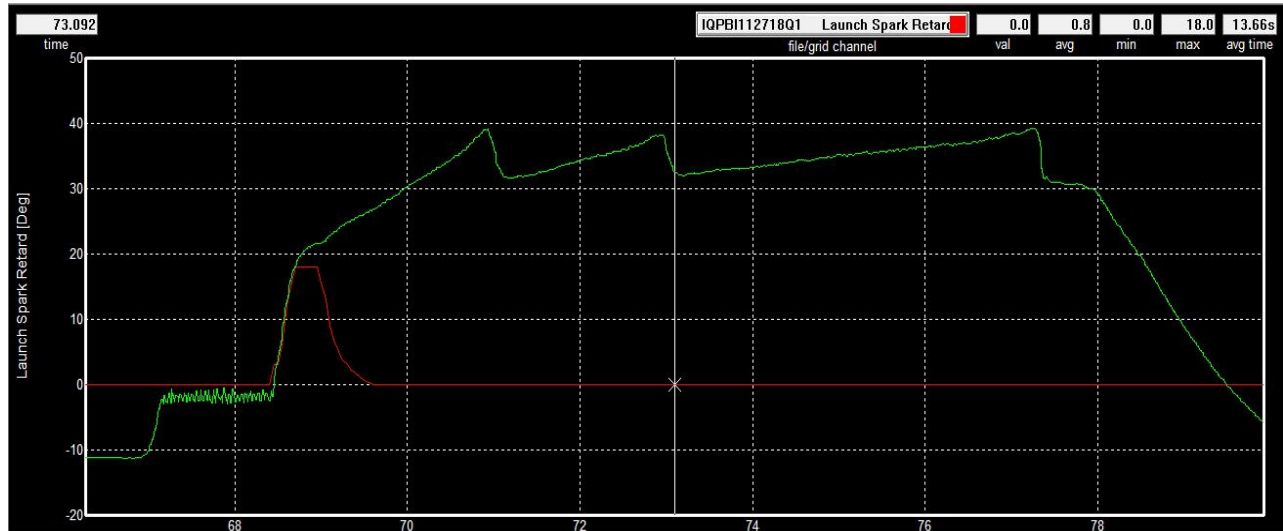


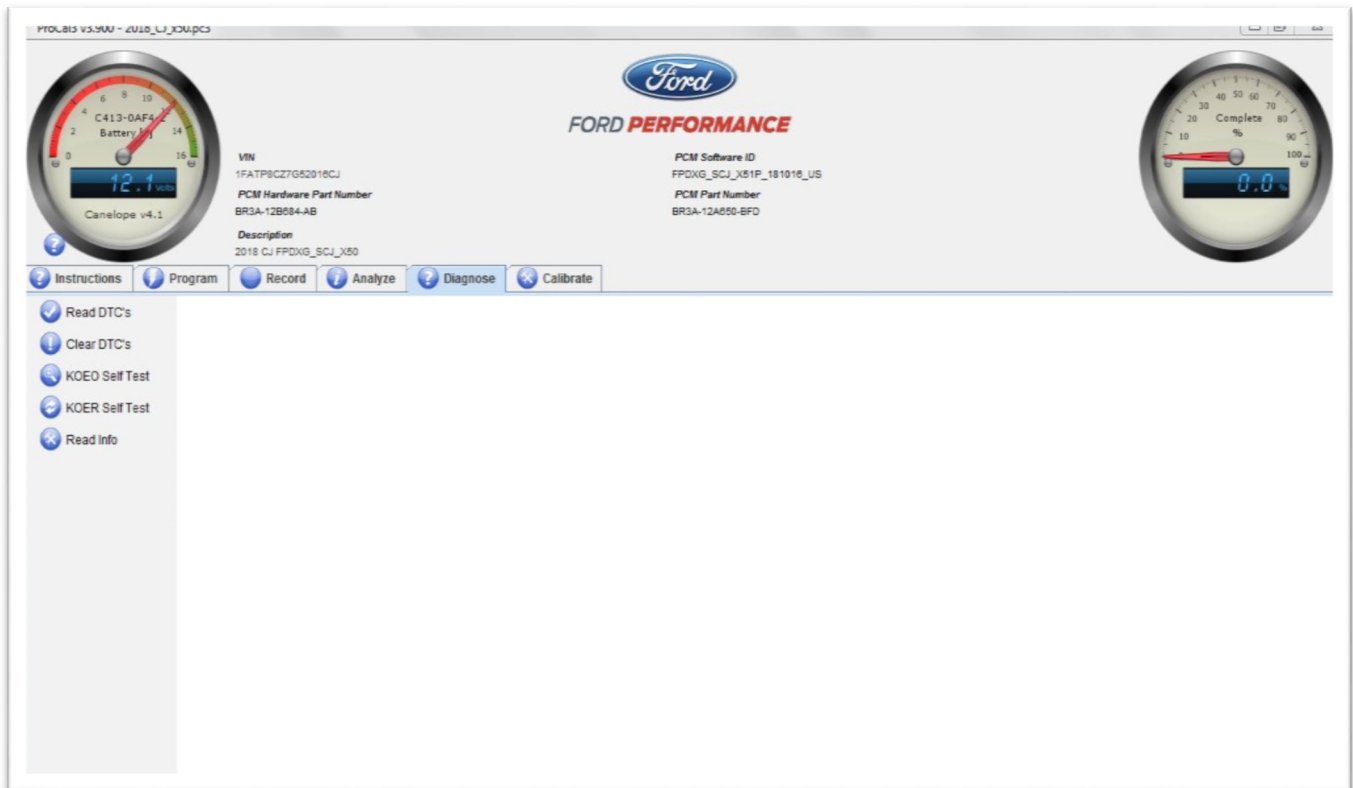
Figure shows launch spark retard (red) vs engine rpm (green). Launch Assist is active right after 2 step.

NOTE:

Launch assist is not a smart traction control device. It is a closed loop spark modifier with no active feedback.

3.3 ProCal3 Diagnose Tab

The ProCal3 tool may also be used to read any diagnostic trouble codes (DTCs) on your Cobra Jet. Go to the Diagnose tab and use the buttons to read or clear any codes. Click on the Key On Engine Off (KOEO) and Key On Engine Running (KOER) self tests to run these in order to find all codes. Note that the engine needs to be on for the KOER test.



3.4 ProCal3 Downloader Tab

The ProCal3 tool may also be used to download calibration updates to the PCM, if available. Instructions will be provided with any updates.



4. Launch Control (Two-Step)

The 50th Anniversary Cobra Jet has an integrated launch control that will maintain a set engine speed (two-step limiter) while the accelerator pedal is depressed. This feature is built into the powertrain control module (PCM) and does not require aftermarket components. There are three aspects of the launch control:

1. Launch control indicator
2. Setting of the desired launch engine speed
3. Activating the launch control at the starting line – done by depressing the brake pedal

Note that the Launch Control is a separate feature from Launch Assist, which can reduce power at the launch in low traction situations. See Section 3.2.1 for more information.

4.1 Setup

Launch Control RPM Indicator

The current RPM set point will be displayed on the dash after a PCM power up. When the ignition switch is turned "ON", the in-dash tachometer sweeps to the current launch control RPM setting for approximately 2 seconds. The tachometer will then return to normal function.





Launch Control RPM Setting

The launch control is set using the L/C Set and the L/C +/- switches on the center console. This may be done whether the engine is running or not. To adjust the launch control RPM set point in the vehicle, a simple 3 step process is required:

1. Depress the brake pedal, hold the L/C +/- switch up for approximately 3 seconds. The tachometer will sweep to 8000 RPM and back to the current launch control set point.
2. Release the brake pedal and L/C +/- switch.
3. Use the L/C +/- switch to increase or decrease until the desired setting is reached.



4. Hold the L/C Set switch up for approximately 3 seconds to save the new setting to the PCM.

Note that the launch control set point may also be changed via the ProCal3 software.

4.2 Operation

The launch control system activates when the brake pedal is depressed. No buttons need to be pressed. At the starting line, the driver will apply firm pressure on the brake with the left foot and apply full throttle with the right. The launch control will hold the engine RPM at the preset speed. Once the driver releases the brakes to launch, the launch control deactivates and allows the engine to rev freely.



5. ELECTRICAL SYSTEM

5.1 OBDII

The OBDII connector is located on the passenger side above the glove box.



5.2 Vehicle PDB (Fuse Box)

The Vehicle Power Distribution Block (PDB) shown in the figure below contains all the fuses and relays for every electrical component on the vehicle. The PDB is located in the passenger side front of the engine bay. Refer to schematics in the included wiring diagram for fuse/relay locations within the PDB.





5.3 Center Control Panel

Multiple switches are located throughout the control panel for control of starter motor, ignition, fuel pump, intercooler pump, and launch control RPM. The light above each switch will illuminate when the switch is placed in the ON position.

NOTE!

None of the electrical systems will function unless the master power switch is turned on. See Section 2.2 for more information.



1. Start Switch – Depressing the Start switch will engage the starter for fixed interval of time. The shifter must be in park or neutral to allow a start attempt or the starter will be prevented from engaging.
2. Ignition Switch – The ignition switch is the master start/run control. It must be on before any vehicle run operation will be allowed.
3. Fuel Pump Switch – Engage the fuel pump switch to allow the engine to start. The high flow pump will produce a noticeable tone from the rear of the vehicle, and is part of normal operation.
4. Intercooler Pump Switch – Engage the intercooler pump prior to starting the vehicle to cool the intake air. You may also engage the intercooler pump to pre-cool the intake heat exchanger between runs with the engine off.
5. RacePak 1 and 2 – Buttons used to navigate through the different screens on the display. They may also be used to program and customize each display screen by



holding down the buttons for various lengths of time. Please refer to the RacePak manual available at the following link for further instructions:

https://documents.holley.com/techlibrary_iq3_dsp_manual_v5.pdf

6. Launch Control Switch – Up/Down momentary switch to change launch control RPM. See Section 4.1 - Launch Control Setup for detailed operation.
7. Lights – Toggles the vehicle lights on (up position) and off (down position). The display settings may also be configured to dim the dash when lights are activated.

WARNING!

The intercooler pump will not turn on unless the switch has manually been flipped to the “on” position. Engine damage will occur when operating the vehicle when the intercooler pump is not on.

5.4 Power Windows

The power window control includes a feature to move the window down slightly if the door is opened with the window in the fully raised position. After extended periods of time with the master switch in the off position, the window may need to be operated through one complete up/down cycle to recalibrate the window position controller for full up/down position. After one complete cycle, the power windows will function normally until the master power is turned off again.

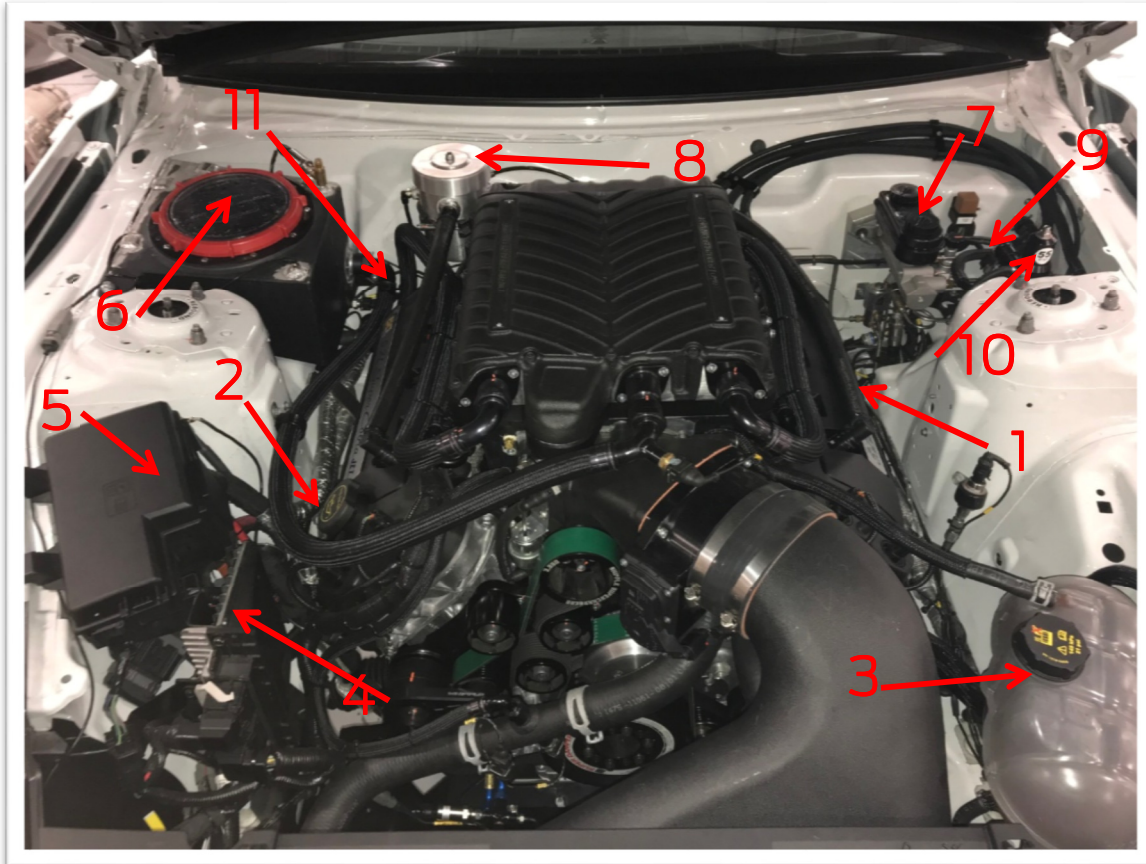
NOTE!

Opening or closing the doors with the master power switch off will cause the window glass to catch on the door seal, due to the automatic window drop feature not being active. It is recommended to turn on the master power switch before operating any of the doors.



6. ENGINE

Your 50th Anniversary Cobra Jet is equipped with a hand built Ford Performance 5.2L supercharged V8 engine. This is an extreme performance racing engine that requires diligent care and maintenance to ensure optimum performance over time.



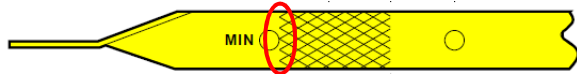
1	Engine oil dipstick
2	Engine oil fill cap
3	Engine coolant reservoir
4	Vehicle PCM
5	Vehicle PDB
6	Intercooler reservoir
7	Brake master cylinder/fluid reservoir
8	Oil catch can
9	Brake bias adjuster
10	Fuel pressure regulator & test port
11	Transmission dipstick/fill tube



6.1 Maintenance

Drag racing puts extreme loads on engine components that will require unique maintenance performed on a regular basis. Ford Performance recommends the following:

1. Fill oil to the bottom of crosshatch on the dipstick. Capacity: 7.0-7.5 qt. w/ filter change.



2. Change engine oil and filter after every two events, cut open filter and inspect for foreign material.
3. Monitor engine oil pressure over time to understand engine bearing wear by picking a consistent RPM and temperature to look for deviations.
4. Check cylinder compression and leakage after every two events to monitor engine condition.
5. Full engine teardown, check, and rebuild is recommended after 50 runs.

6. FPP highly recommends the replacement of the following parts:

- **Pistons and rings**
- **Main and rod bearings**
- **Valves, valve springs, valve seals, spring retainers, and lash caps**
- **Supercharger belt**

In addition, the following parts should be checked for excess wear and/or cracks:

- Block
- Crank
- Heads
- Supercharger
- Chain guides (primary and secondary)

After 1 season of usage, the cylinder block should be evaluated for replacement.

7. O2 sensors are recommended to be replaced after 50 runs.
8. Spark plugs have a limited life expectancy and should be checked every 10 passes. Upon any misfire, plugs should be changed immediately. Look for missing platinum pucks on the ground strap. It is recommended to replace all spark plugs after every 20 runs.



For rebuild and service see the complete engine Bill of Material (BOM) for the 5.2L engine in the included supplemental document.

Compression and leak down tests should be performed periodically on the motor to verify its health. These tests should be done with the engine warm.

- Compression with the blower belt attached should be 140-150psi.
- Leak down should be less than 15%.

If the engine does not pass these tests, further inspection is required. Contact Tech Line or your engine builder with any questions.

6.2 Intercooler Drain, Flush, and Fill

Your 50th Anniversary Cobra Jet is equipped with an intercooling/charge air cooling system that consists of three main components: a heat exchanger (within intake manifold), an electric pump, and a water tank. This system cools the intake charge by circulating fluid from the water tank to a heat exchanger installed downstream of the supercharger.

ATTENTION!

Your vehicle is shipped with a water/glycol mix in both cooling systems!

The intercooler system is not equipped with a drain valve. In order to drain the system, you must use a pump with a hose to pump the water out of the reservoir. It is recommended to use a 12V bilge pump as shown in the figure below. You may use the voltage outputs in the vehicle PDB in the engine bay to power the pump.



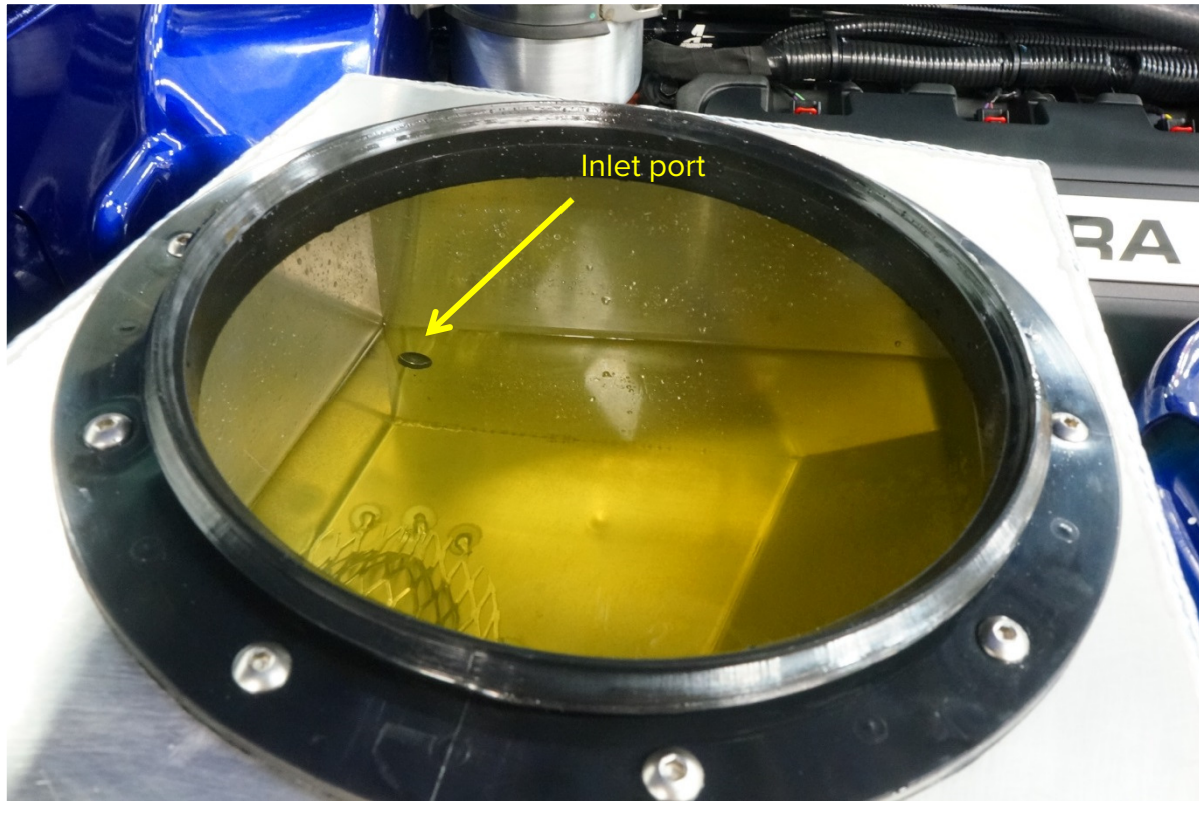


To drain and fill the system:

- Open the intercooler reservoir lid and pump out all the coolant, as shown below.



- Re-fill with straight water
- Cycle the intercooler pump for 2-3 minutes
- Flush the system by repeating the steps above.
- While cycling the pump, for the second time, check for any leaks in the system
- Ensure the intercooler water level is at an inch above the inlet port. See figure below
- Close the intercooler water tank lid securely

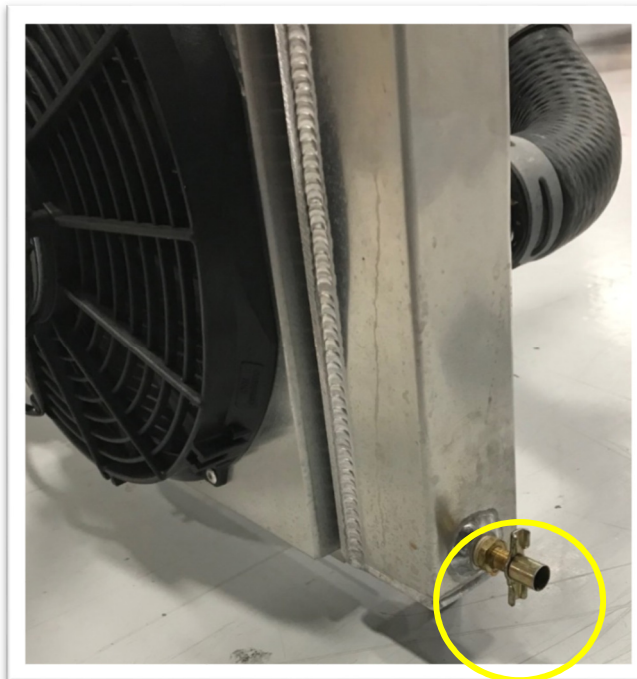


ATTENTION!

For maximum performance and longevity of your Cobra Jet engine, the intercooler water tank should be filled with ice before every run. See Section 9.3 for more details.

6.3 Engine Coolant Drain, Flush, and Fill

- Remove engine coolant reservoir cap
- Remove belly pan from below radiator
- Loosen drain petcock on the driver's side of the radiator as shown below to drain coolant into a vessel



- When coolant has finished draining, tighten drain petcock and fill system with distilled water at engine coolant reservoir
- Run engine for 2-3 minutes
- Drain and refill the system with distilled water again to flush the system, by repeating the above steps
- After running the engine again for 2-3 minutes, check for leaks and ensure that the coolant reservoir is filled to the MAX line

ATTENTION!

Any time the vehicle will be stored in a climate under freezing (32° F) the system needs to be drained and appropriate glycol/water mix filled.



7. TRANSMISSION

Your 50th Anniversary Cobra Jet is equipped with a T4 3-speed manually shifted reverse pattern valve body automatic transmission, supplied by Joel's on Joy. The transmission is shifted using a Precision Performance Products shifter.

7.1 Maintenance

Change transmission fluid and filter every 50 runs.

To change the fluid and clean the filter:

- Drain transmission fluid out of drain plug
- Remove the transmission pan
- Remove filter, replace with new
- Reinstall the transmission pan with a new gasket. Torque pan bolts to 130 in-lb
- Reinstall and torque drain plug to 115 in-lb
- Fill transmission with 4 qts of fluid, through the dipstick hole
- Check the fluid level and keep filling until the fluid reaches the fill line on the dipstick.

The only oil recommended for your transmission is XT-10-QLVC Motorcraft Mercon LV. The recommended filter is SPX A34010B. The filter and pan gasket are available from Joel's on Joy. For an oil change, approximately 4-6 quarts of oil is needed. A dry fill is approx. 10-11 quarts.

If the vehicle is campaigned on a regular basis, the transmission should be torn down by a professional racing transmission rebuilder (Joel's on Joy, (248) 446-6024) once per year.

ATTENTION!

Chassis dynamometer testing of your Ford Mustang Cobra Jet with this transmission is not recommended, and may result in damage to your drivetrain.



8. CHASSIS

8.1 Brakes

Your 50th Anniversary Cobra Jet comes equipped with 4 wheel manual disc brakes, specially engineered and built for the Cobra Jet by Strange Engineering. Ford Performance recommends using Motorcraft PM-1-C brake fluid. The brake fluid should be bled every 25 runs or every half a year, whichever comes first.

ATTENTION!

The Strange Engineering brake kit on the Cobra Jet is designed for Drag Racing only!
www.strangeengineering.net

8.1.1 Break-in Procedure

After start-up, prior to any runs, take the time to properly break-in your brake system by bedding your brake pads. Failure to do so may result in loss of control of your vehicle, potentially causing serious damage as well as injury or death.

Make nine total stops, three from 30 mph, then three from 50 mph, and finally three from 75 mph.

Allow the brakes to cool slightly between each of the three runs, without applying pressure to the brake pedal. After the last stop, allow the brakes to completely cool before making an initial run in your vehicle.

8.1.2 Proportioning Valve

With the valve rotated clockwise until fully seated, the rear calipers will have full pressure. With the valve rotated counterclockwise fully out, the rear caliper pressure will be reduced to 43%. The vehicle is delivered with a setting of 3.5 rotations counterclockwise from fully seated.



8.1.3 Line Lock

The line lock feature allows the driver to hold the front brakes while leaving the rear brakes disengaged. This enables the driver to perform a burnout. To use, apply pressure to the brake pedal, then hold the red button on the shifter. This will engage the line lock and maintain the front brake pressure that the pedal was applied to. Releasing the LL button will release the brake pressure.

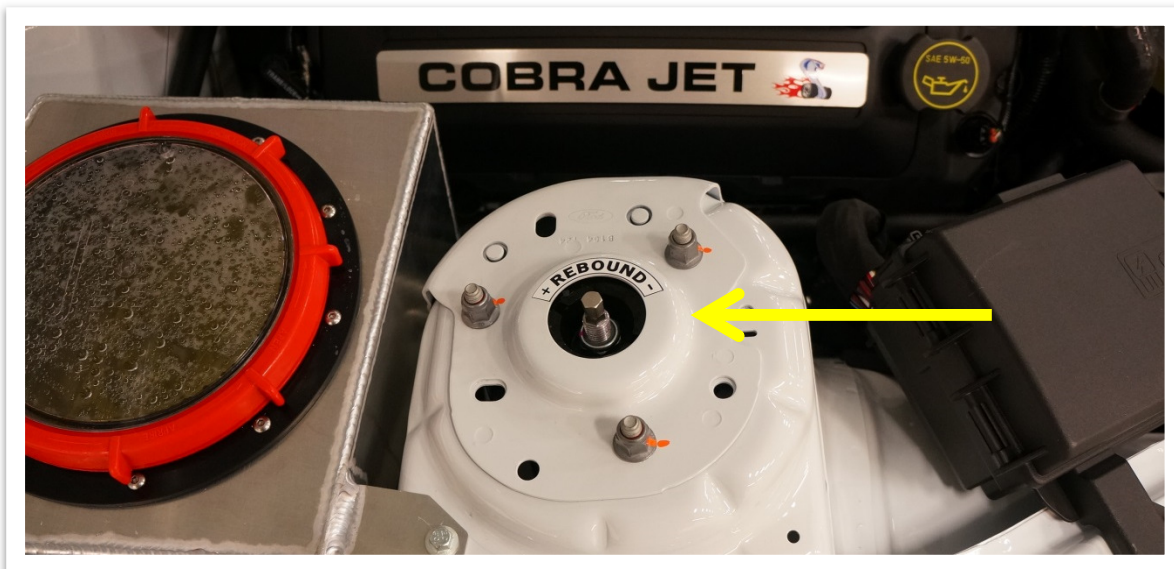




8.2 Dampers

The front and rear dampers are manufactured by Strange Engineering specifically for the Cobra Jet. There are adjustment knobs for both compression and rebound for each damper. The front dampers are adjusted using a 3/8" wrench and the rears with a 4mm hex key. Do not force adjusters beyond initial contact with stop, damage to the seats will occur.

Front Rebound Adjustment (Clockwise = Less Damping)



Front Compression Adjustment (Clockwise = More Damping)





Rear Rebound Adjustment (Clockwise = More Damping)



Rear Compression Adjustment (Clockwise = More Damping)

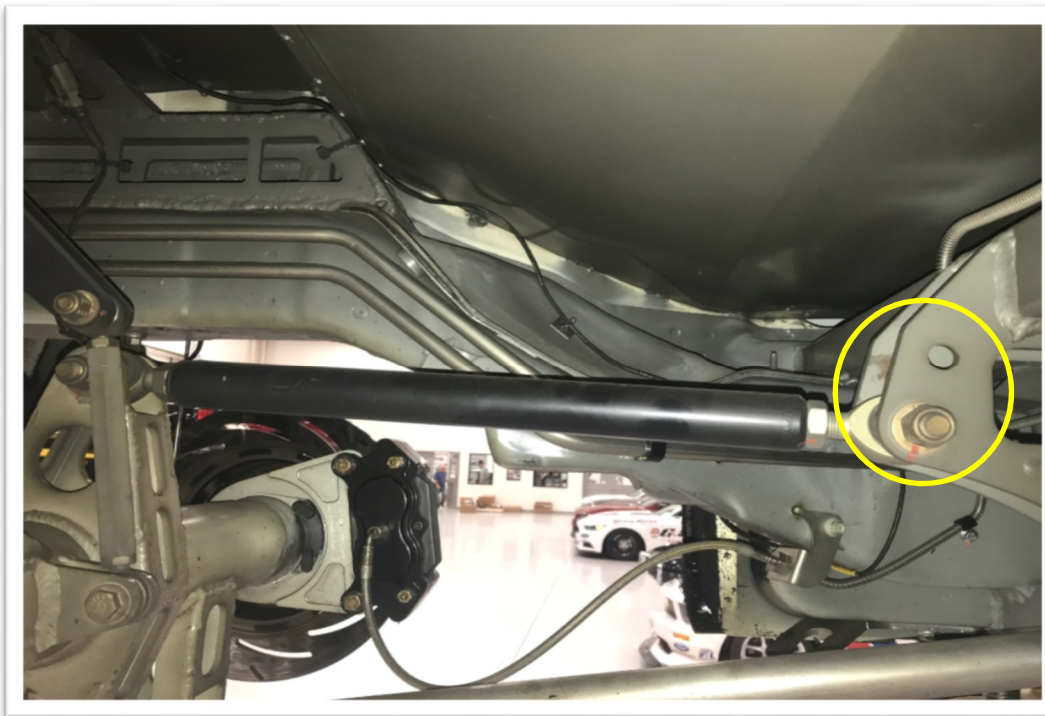




See section 9.4 for the chassis setup guide, including guidelines for setting the dampers. See the included damper curve file for the measured force curves for the supplied dampers.

8.3 Anti-Squat

Your 50th Anniversary Cobra Jet comes designed with two different rear upper control arm positions. Adjustment between these two positions will cause the anti-squat geometry to change. See Section 9.4 for the guide on choosing an anti-squat value.



ATTENTION!

If you choose to adjust the upper control arm position, you will need to follow the procedures to re-set pinion angle and re-neutralize the rear suspension. Failure to do so may result in loss of control of your vehicle, potentially causing serious damage as well as injury or death.

Any adjustment to the rear suspension must be followed by a re-neutralization of suspension. See section 9.4.1 for the correct setup procedure.



8.4 Seat Belts

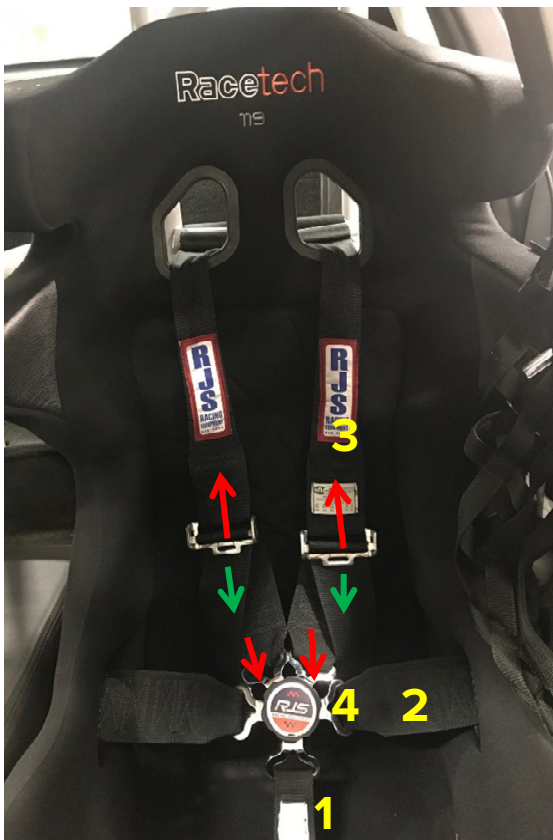
ATTENTION!

The seat belts in the Cobra Jet are NOT PRE SET. Before driving the vehicle, set belt lengths. They will need to be adjusted for each individual that operates this vehicle. Belts are date stamped and will need to be replaced with your sanctioning body's rules and regulations.

ATTENTION!


No passenger seat belt is provided. The passenger seat is provided for compliance to NHRA Stock class rules, and is not intended for use.


The seat belt adjustment procedure is outlined here:



To adjust seat belt:

- Adjust seat position
- Adjust anti-sub strap **(1)** to place the camlock **(4)** at waist height when the belt is snug (adjustment is under seat)
- Clip lap belts **(2)** into buckle **(4)**
- Adjust lap belts **(2)**
- Clip shoulder belts **(3)** into buckle **(4)**
- Adjust shoulder belts **(3)**

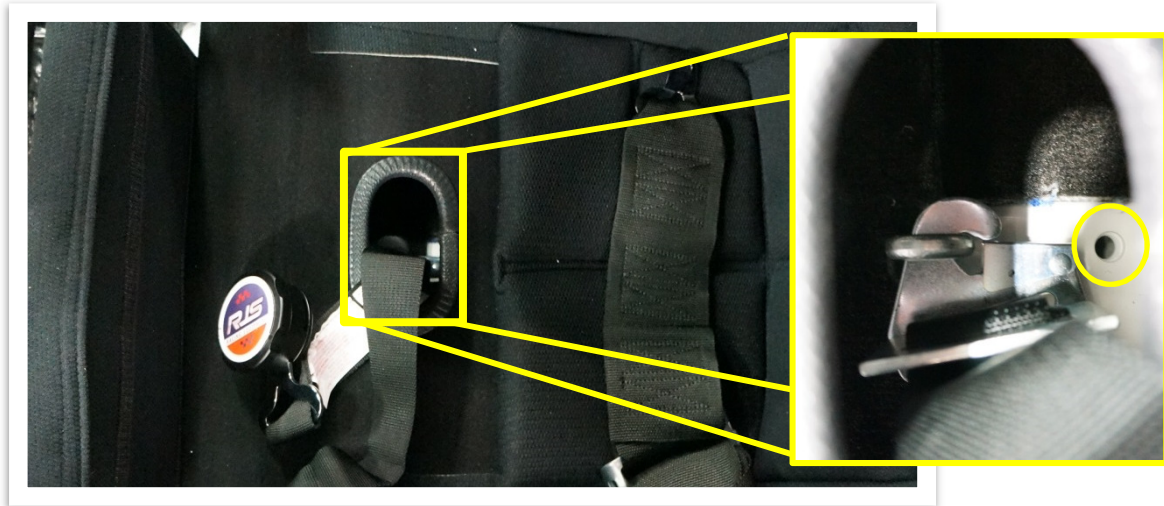
To tighten belts pull down on the end of the strap webbing (as shown on shoulder belts) 

To loosen belts pull up on the metal adjuster and pull down on the belt buckles (as shown on the shoulder belts) 



ATTENTION!

Depending on seating position, the alternate anti-sub strap eye bolt position may be needed.



8.5 Tire Care

To ensure optimum safety and performance of your Cobra Jet, care should be taken in storage of the equipped racing tires. Mickey Thompson racing tires should not be stored in extreme high or low temperatures, in direct sunlight, around welding areas, in overhead garage areas or around high-voltage electric motors.

Mickey Thompson Tire Storage Tips:

1. Remove the tires from the vehicle.
2. Deflate the tires to roughly 5 psi, and store them on their side in a cool/dark/dry environment.
3. Do not use chemicals on the tires, and clean them with a mild detergent/water mixture.
4. Independent of tire wear, M/T recommends removing tires from service after 4 years of storage.

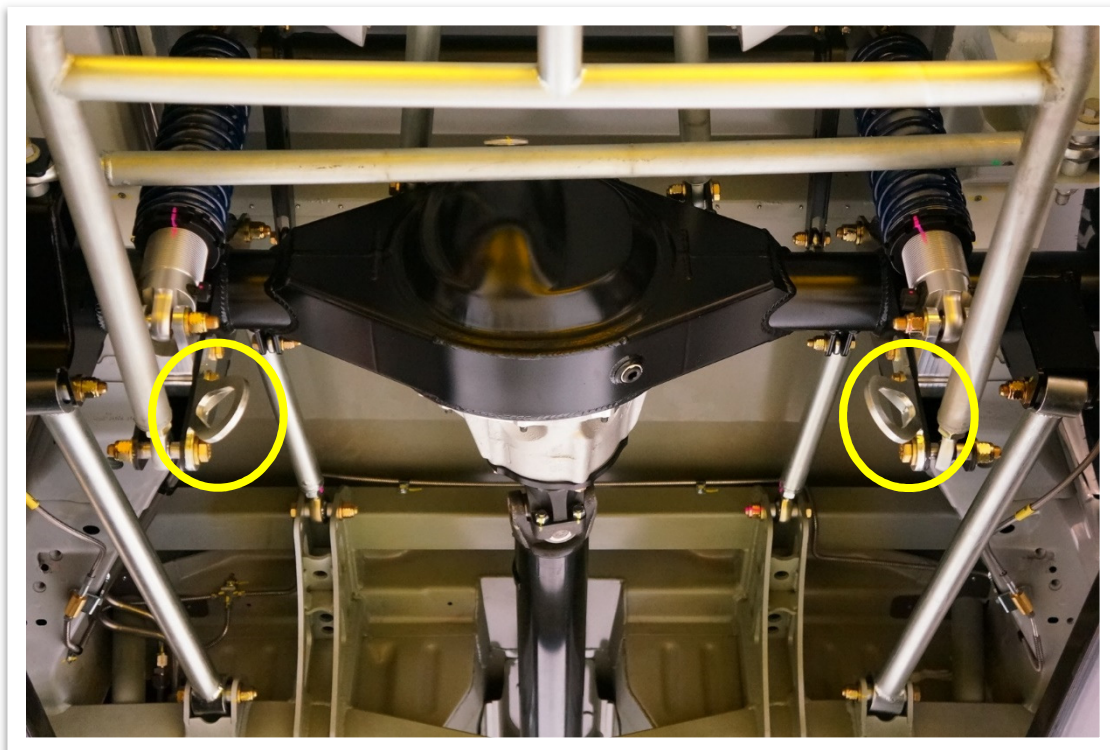
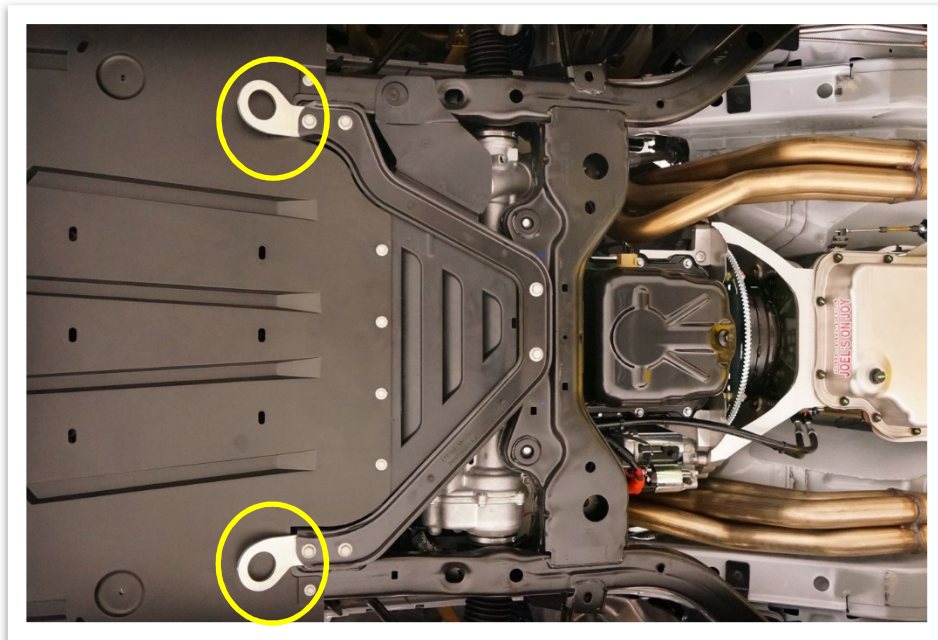
For additional information visit <http://www.mickeythompson tires.com/tech-bulletins/>

Always check over your tires for proper pressure, cracking and uneven wear. Ensure that there is sufficient tread depth before making a run in your Cobra Jet.



8.6 Vehicle Tie-downs

This vehicle is equipped with both front and rear tie down locations.





9. COMPETITION AND RECOMMENDED SETUP

As delivered, your Cobra Jet is legal for NHRA Stock and Super Stock Competition. Because horsepower ratings change over time, the class that your Cobra Jet is legal for may change. Please consult NHRAracer.com or contact NHRA Tech for the latest classification updates.

9.1 Fuel Sample Port

The fuel sample port and fuel pressure regulator are mounted to the driver's side shock tower.



Taking a sample will require a length of 5/32" fuel-compatible rubber hose to reach whatever vessel being used to hold the sample.

- After installing the sample hose, with the vehicle master power switch and ignition switch on, turn on the fuel pump.
- Turn the red valve to the **ON** position and depress it for flow. Once the required amount of fuel is obtained, release the red valve, rotate it to the **OFF** position.
- Turn off the fuel pump, ignition, and master power switch.
- Remove the sample hose.



9.2 Fueling

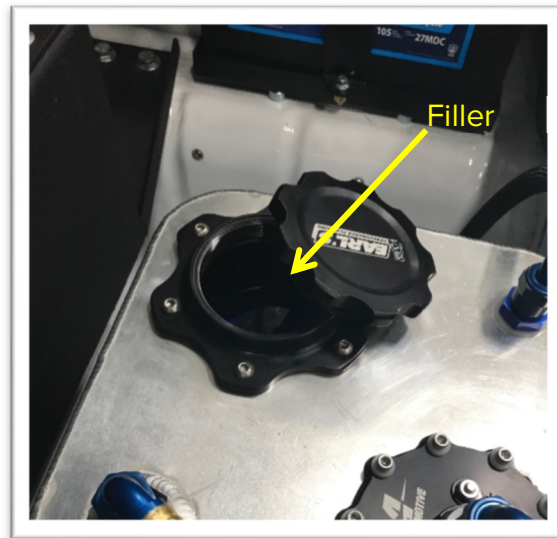
Your 50th Anniversary Cobra Jet is equipped with a 4.25 gallon (approx.) fuel tank mounted in the trunk. To fill the tank, open the trunk to access the tank. Lift up the latch of the fuel tank cap and turn counterclockwise until it hits the stop, then lift up to remove the cap. Set the cap aside.



Use a funnel to fill the tank, being careful not to spill fuel on any painted surfaces. Ford Performance recommends VP C16 fuel only. Do not overfill. Maximum fill level is an inch below the filler flange. Overfilling may cause fuel to spill out via the vent tube.

ATTENTION!

Attempting to run any fuel other than VP C16 may cause severe detonation and damage to your engine. If you choose to run a different fuel, ensure that the Stoichiometric air/fuel ratio in ProCal3 is changed accordingly. See Section 3.2 for more information.



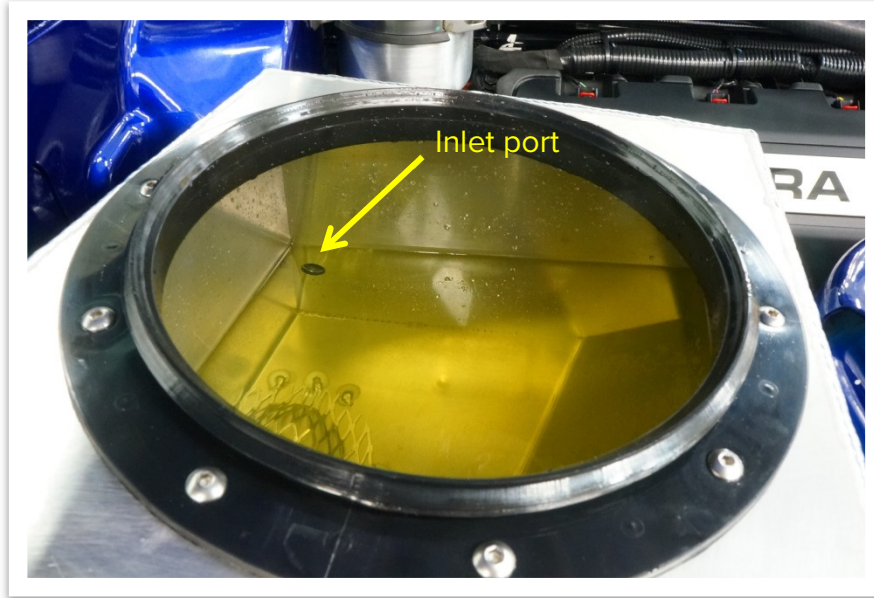
After filling the tank, replace the cap and turn clockwise to lock it in. Ensure the cap is secure, then close the latch on the cap. Make sure to close the trunk lid securely.

9.3 Intercooler Operation

The intercooler system cools the intake charge by circulating fluid from the water tank to a heat exchanger installed downstream of the supercharger.

Prior to every run:

- Ensure that the level of intercooler water is at its recommended fill level: one inch above the inlet port (see figure below)
 - If the level is higher, use a pump to drain water from the system until the correct level is reached. Do not allow the water level in the tank to drop below the inlet port while draining, to prevent air pockets in the system. See Section 6.2 on more information on draining the system.



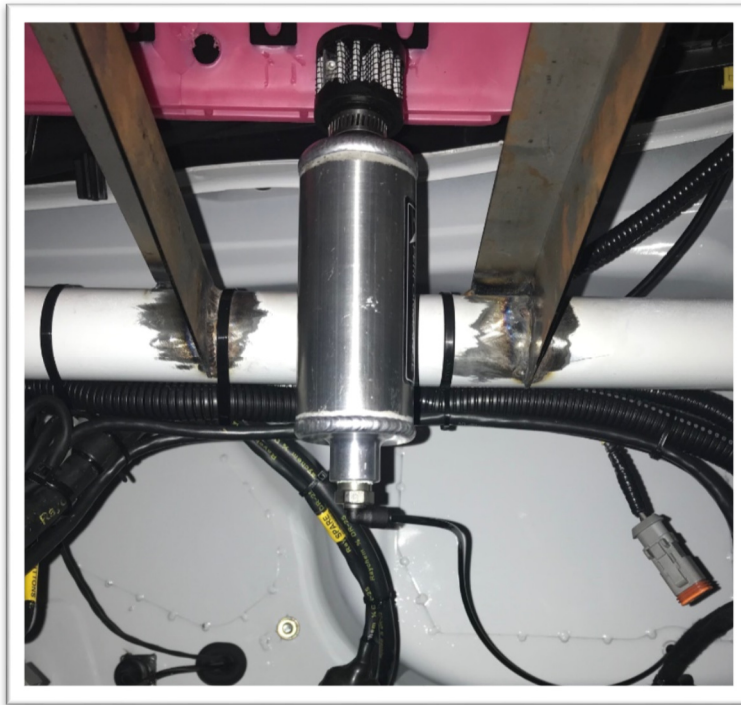
- Fill the intercooler reservoir up to the top with ice.
- For best performance, cycle the intercooler pump for a few minutes before the run in order to pre-chill the heat exchanger.

Reduced engine power will result if water tank and intake air temperatures are allowed to rise. Do not allow the water level in the tank to drop below the inlet port while draining.

ATTENTION!

The intercooling system relies on ice being added to the water tank to properly cool the intake charge. Dangerous intake air temperatures will occur if ice is not added periodically between runs. Failure to add ice as necessary can cause damage to the engine.

Periodically check intercooler reservoir overflow canister, located on the passenger side behind the glove box panel (see figure below), and empty as necessary.



9.4 Chassis Setup

ATTENTION!

It is necessary to properly set up your Cobra Jet chassis prior to making any runs. Failure to do so may result in loss of control of your vehicle, potentially causing serious damage as well as injury or death.

The rear suspension **must** be neutralized with driver to promote straight vehicle tracking. It is highly recommended that a full baseline chassis setup is performed before running your Cobra Jet. Additionally, there are many adjustments that can be made to the chassis to optimize performance under varying track conditions.

9.4.1 Neutralizing Rear Suspension

Neutralizing the rear suspension involves adjusting the lengths of the rear passenger side upper control arm and the anti-roll bar drop link.

- The passenger side control arm will be made slightly shorter than the neutralized position
- The passenger side anti-roll bar drop link will be made slightly longer than the neutralized position



This procedure **must** be done with the driver in full gear in the driver's seat, and any ballast in place, as intended to be run.

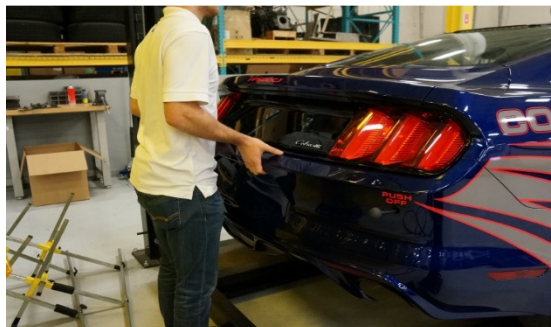
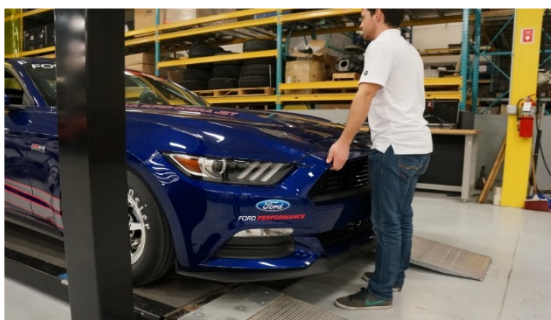
1. Park vehicle on an elevated level surface, such as the drive-on hoist shown below.



2. Set tire pressures.

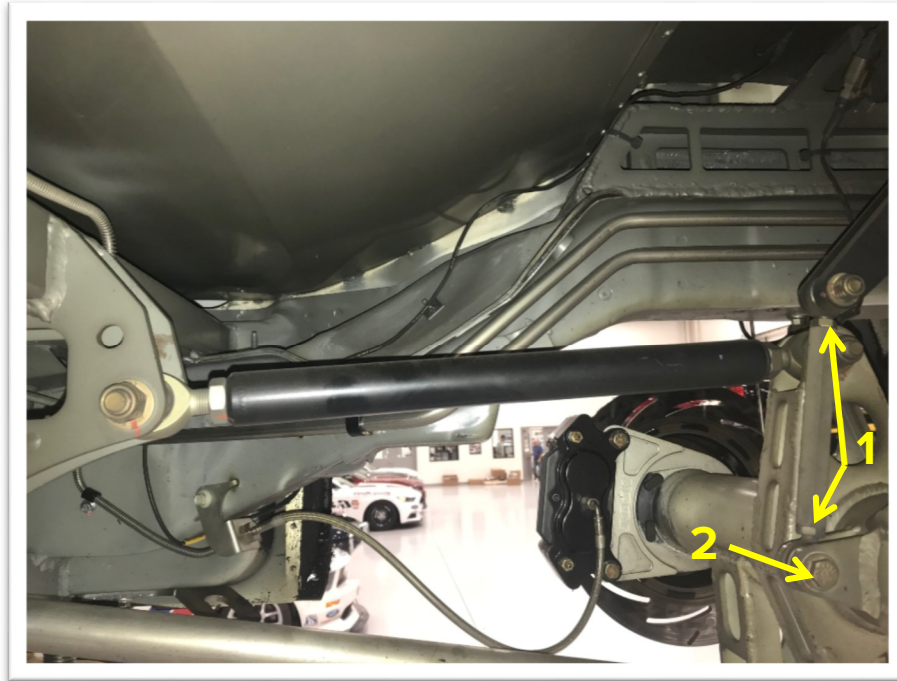
Front Tire Pressure	40 psi
Rear Tire Pressure	20-24 psi, even left to right

3. Settle the vehicle by lifting up and then pressing down by hand on the front of the vehicle, then lift up and press down on the rear.

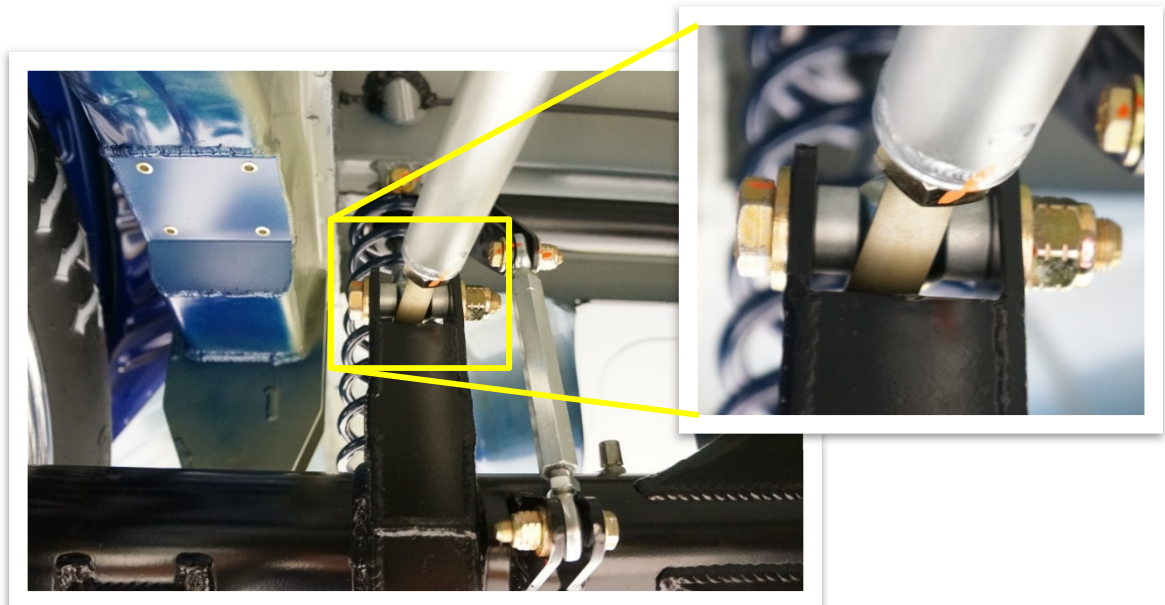




4. Loosen the jam nuts on both ends of the passenger side anti-roll bar drop link **(1)**. Note that the upper rod end has a left-handed thread. Remove the lower bolt and set the hardware aside **(2)**.



5. Loosen the jam nuts on both sides of the passenger side rear upper control arm. Note that the rear rod end has a left-handed thread. After loosening the jam nuts, rotate the bottom of each rod end towards the outboard side of the vehicle, as shown below.





6. Neutralize the control arm by rotating the arm until no friction is felt. If rotating one direction increases the friction, try rotating in the opposite direction.
7. Remove the lash from the control arm by shortening it. Facing towards the rear of the vehicle, turn the control arm clockwise until friction is felt, typically around 30 degrees. Then turn another 3-5 degrees.
8. Tighten the jam nuts on the control arm, ensuring that the control arm does not move while tightening.
9. Re-connect anti-roll bar drop link at zero preload. To do this, adjust the length of the drop link until the lower bolt is easily installed. Then, reinstall and torque down the drop link lower bolt.
10. Remove the lash from the anti-roll bar drop link. Facing upwards, turn the link clockwise until some friction is felt, then turn an additional 5 degrees.
11. Tighten the drop link jam nuts, ensuring that the link does not rotate while tightening.

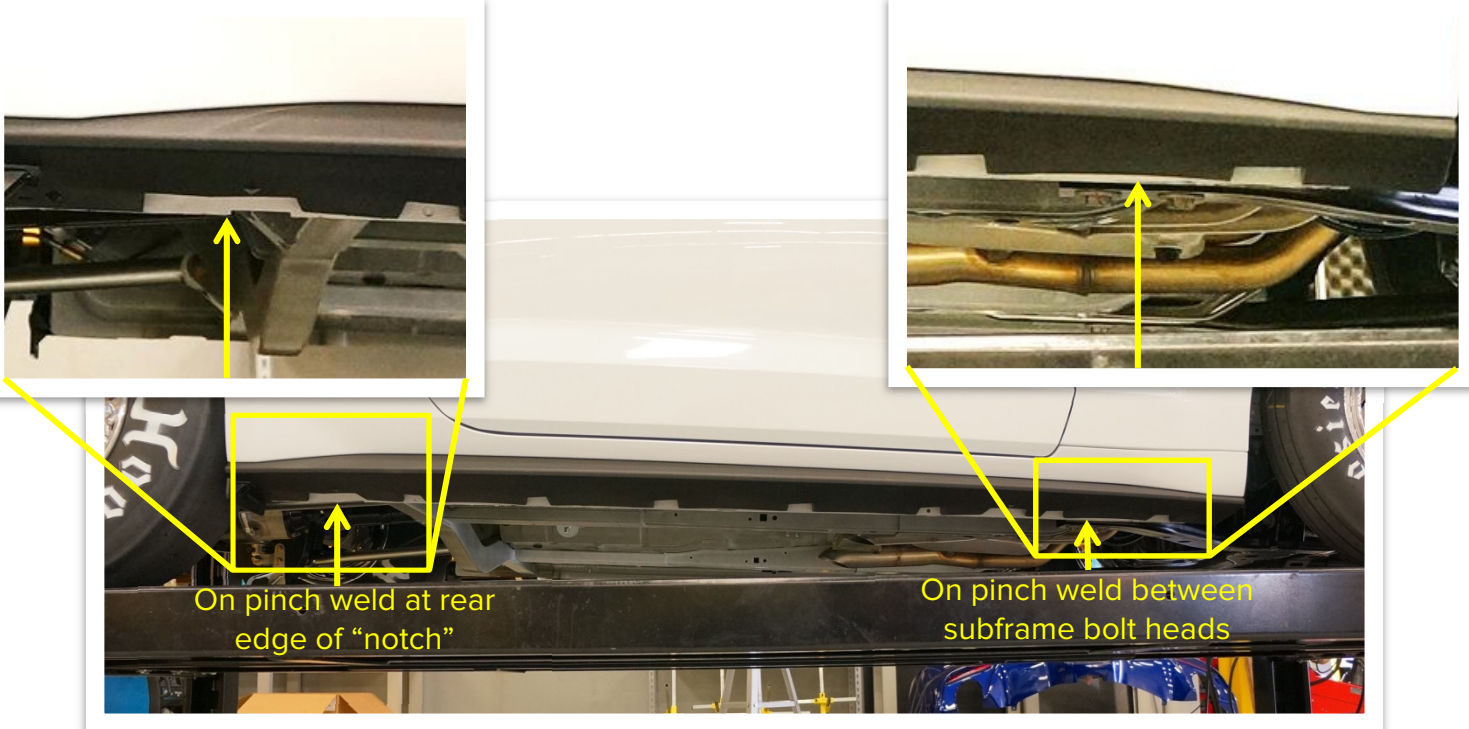
9.4.2 Baseline Setup

For optimum performance of your Cobra Jet, a full chassis setup should be performed. It is recommended that this setup be done at an experienced race shop with proper equipment. The procedure for a full chassis setup is detailed here.

Tools required:

- Level drive-on vehicle lift or scale platform
- Wrenches
- Sockets/Socket Wrench
- SmartStrings or equivalent toe alignment system
- Camber gauge
- Digital inclinometer

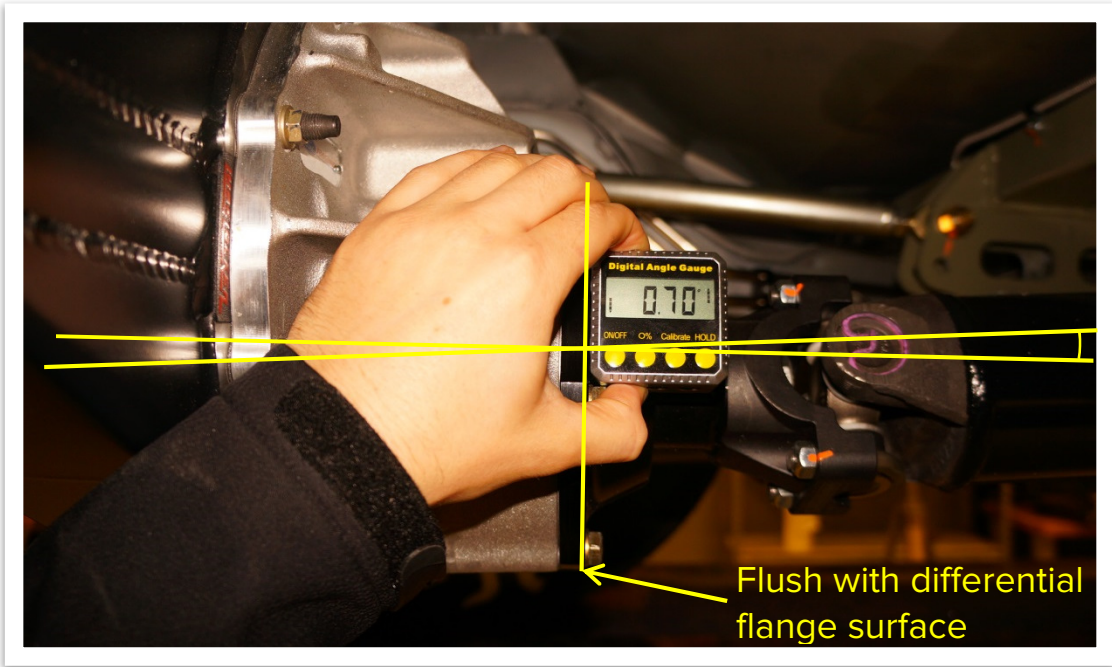
1. Park vehicle on an elevated level surface, such as the drive-on hoist. Any ballast used should be in place, but the driver should **NOT** be in the vehicle.
2. Set tire pressures.
3. Remove passenger side upper 4 link bar & disconnect anti-roll bar (remove passenger side drop link)
4. Adjust all dampers to full soft for compression and rebound.
5. Loosen coil over lower spring seat collars and using the spring perches, set ride heights on the pinch weld at the locations shown below. See chart on page 45 for nominal specifications.



6. Settle the car, by following step 3 in Section 9.4.1. Repeat steps 5 and 6 until the target ride heights are achieved. Then tighten all coilover lower spring seat collars.
7. Using a camber gauge, set front camber as desired. Nominal spec is -0.75 (degrees).
8. Using SmartStrings or equivalent alignment tool set front toe angles. Nominal spec is 1/8-1/4 inches total toe in.
9. Verify that the axle is positioned correctly in the vehicle, by measuring from the frame rail to the upper control arm mounting bracket on both sides. The bracket should be 1/16" closer to the frame rail on the driver's side than the passenger side. Loosen the jam nuts and adjust the panhard bar accordingly.



10. Using the driver side upper control arm, set pinion angle as desired. The nominal specification is 2.5 degrees. The pinion angle is measured as the difference between the driveshaft and the differential flange angles as shown. Use a digital inclinometer to find the angles and add/subtract them to find the pinion angle. The pinion angle shown is: (3.20 counter-clockwise – 0.70 counter-clockwise = 2.50 degrees). To increase the angle, loosen the jam nuts and shorten the control arm; to decrease the angle, lengthen the arm. See figures below for measuring the angle.





11. Torque driver side rear upper control arm jam nuts to spec and verify pinion angle.
12. Reinstall the passenger side upper control arm and torque to spec.
13. Neutralize the rear suspension by following steps 5 through 11 in Section 9.4.1.
14. Set front and rear damper compression and rebound settings. Nominal damper settings are shown in the table below. See the included damper curve file for all the damper force curves.



9.4.3 Setup Guide

The suspension of your Cobra Jet is extremely adjustable. There are two rear suspension upper link mounting hole positions offered. The vehicle is delivered with the links installed in the upper position. This is the baseline setting and should perform well in most situations. If more anti-squat is desired, the lower position may be used. The recommended chassis settings for these two positions are provided here. See the included damper curve file for all the damper force curves.

***ATTENTION!**
Start front rebound at full stiff until you understand track conditions and vehicle response.

ATTENTION!
If you choose to adjust the upper control arm position, you will need to follow the procedures to re-set pinion angle and re-neutralize the rear suspension. Failure to do so may result in loss of control of your vehicle, potentially causing serious damage as well as injury or death.

Adjustment	Reduced Anti-Squat (upper position) Setting	Baseline Anti-Squat (lower position) Setting
Front Rebound*	1/2 turn from full stiff	1/2 turn from full stiff
Front Compression	4 clicks from full stiff	4 clicks from full stiff
Rear Rebound	20 clicks from full stiff	16 clicks from full stiff
Rear Compression	20 clicks from full stiff	20 clicks from full stiff
Front Tire Pressure	40 psi	
Rear Tire Pressure	22 psi	
Front Rocker Pinch Weld	4 1/2 ± 1/4 inches	
Rear Rocker Pinch Weld	6 1/8 ± 1/8 inches	
Front Camber	-.75 ± .25 degrees	
Front Toe	1/8 inch toe in @ rim lip (per side)	
Recommended Rear Upper Control Arm Position	Lower Hole	
2 Step RPM Starting point	2500 RPM	
2 Step RPM Range	2200-4000 RPM	
Wheelie Bar Spring Rate	200 lb/in	
Wheelie Bar Spring Preload	No preload	
Wheelie Bar Height	5-5 1/4 inches	
Pinion Angle	2.5 +/- 0.5 degrees	



NOTE:

It is important to run nonzero pinon angle to avoid premature wear.
Also, avoid excessive pinon angles.

9.5 Parachute Usage

Ensure your parachute deployment system is functioning properly prior to the start of each run. It is recommended to deploy the parachute when trap speeds exceed 150mph and at least once per event.

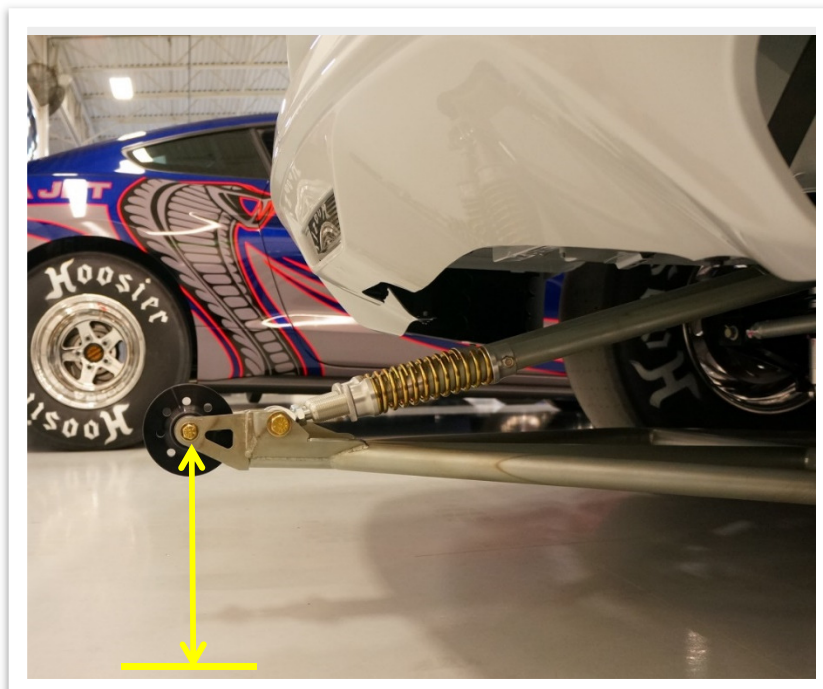
9.6 Wheelie Bar Alignment

Ford Performance offers a specially developed wheelie bar for the Cobra Jet.

WARNING!

Ford Performance recommends a wheelie bar be used while operating this vehicle. Ford Performance offers the Cobra Jet specific wheelie bar developed for your vehicle.

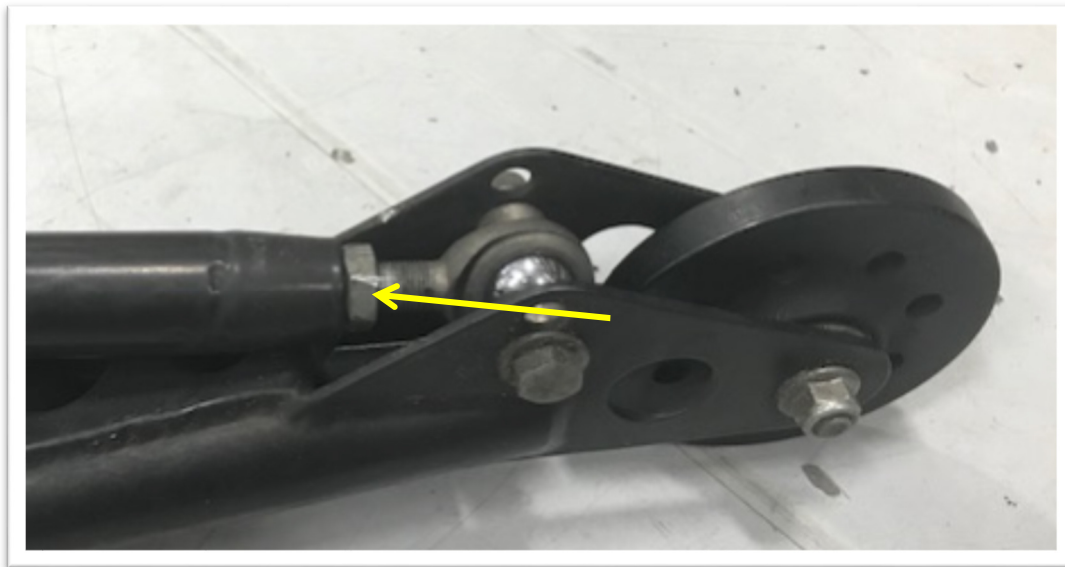
The wheelie bar 200lb/in spring, and the lower bar may be adjusted to raise or lower the wheelie bar. Wheelie bar height is measured from the ground to the center of the wheelie bar wheel.



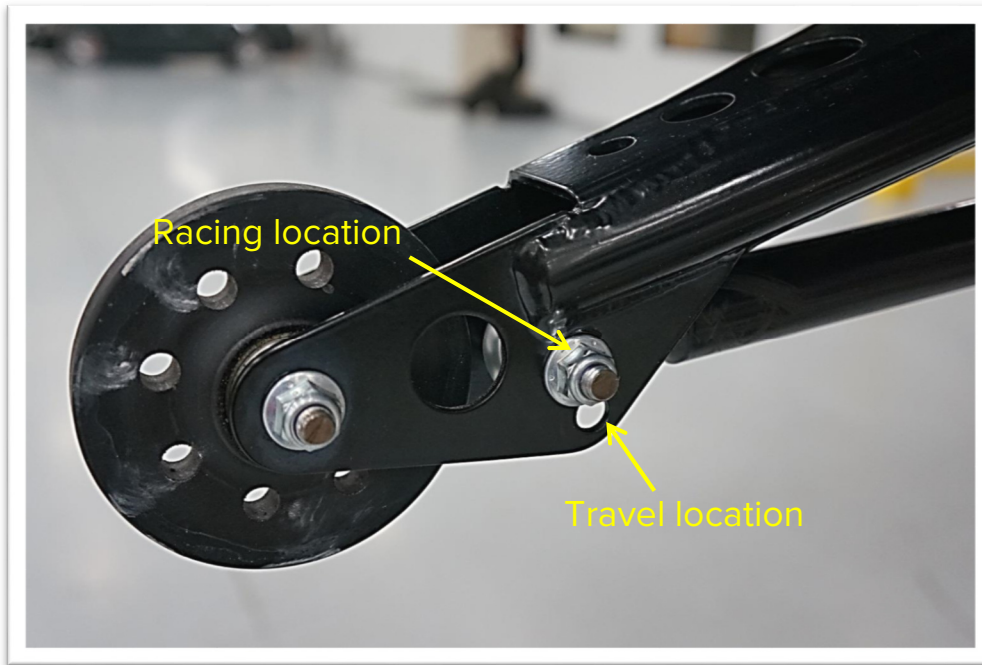


Before setting the wheelie bar height, make sure your vehicle's suspension is properly set up. Refer to Section 9.4 Chassis Setup for suspension setup instructions. Set your front and rear tire pressure and make sure the vehicle is settled.

Once the vehicle is properly setup, set the wheelie bar height to 5-5 ¼ inches to the center of the wheelie bar wheel by loosening the jam nuts and turning the lower bar to either raise or lower the bar. Once the height is achieved, snug the jam nuts on both ends of the lower bar.



The lower and upper bars have two attachment locations. The upper hole location is used for racing the lower location raises the bar for loading and trailering the vehicle. In this position, however, there is still the possibility of damage. Please evaluate your particular situation as removal of the wheelie bar assembly may be required. The wheelie bar wheel requires no lubrication.





10. RacePak Display and Datalink II Software

The 50th Anniversary Cobra Jet is equipped with a RacePak IQ3 Cobra Jet display and data logging system. Up to 4 display screens may be customized to display current values of the desired logged parameters. There are two buttons located in the center dash panel labeled RacePak 1 and RacePak 2. These buttons allow you to cycle through the screens as well as set time/date, start/stop data logging, etc. The detailed IQ3 user guide is available online at the following link:

https://documents.holley.com/techlibrary_iq3_dsp_manual_v5.pdf

This guide in the above link goes into detail of the RacePak button functions, how to log data, set warning lights, and much more.

The Datalink II software, which is used to modify display settings, recording parameters, and view live data is available from RacePak's website at the following link:

https://www.holley.com/support/data_acquisition/



11. KEY CONTACTS

ATTENTION!

If you haven't already registered your Cobra Jet it is critical you contact the Competition Manager to ensure we have up-to-date contact information. This allows us to contact you in the event of any Cobra Jet updates, special deals and promotions.

Phone

Ford Performance Tech Line

800-367-3788

Websites

<https://performanceparts.ford.com/>

<https://performanceparts.ford.com/cobra-jet/>

All Ford Performance Parts

Your Source for all Cobra Jet Information

Contacts

Contingency

fcntgcy@ford.com

Facebook

Fast News

[Official Ford Performance Drag Racing Fan Group](#)

<https://performanceparts.ford.com/register/>

Other Drag Racing Key Contacts

Racing Body Tech Departments

NHRA Tech – Pat Cvengros

NMRA/NMCA Tech – Lonnie Grim

pcvengros@nhra.com

nmrarules@promediapub.com

Cobra Jet Parts Suppliers

Watson Racing

Joel's on Joy - Transmissions

Whipple – Supercharger

Mickey Thompson – Tires

RC Components – Wheels

Strange Engineering – Axle/Brakes/Shocks

Dynotech Engineering – Driveshaft

www.watsonracing.com

joelsonjoy@yahoo.com

tech@whipplesuperchargers.com

tech@mickeythompson tires.com

tech@rccomponents.com

jb@strangeengineering.net

sraymond@dynotecheng.com

Helpful Links

www.NHRARACER.com



A. SERVICE SPECIFICATIONS

Engine Oil

Motorcraft 5W-50 Full Synthetic XO-5W50-QGT

Fill oil to the bottom hatch mark on the dipstick

Capacity: 7.0-7.5 qt w/ oil change

Oil Filter

Ford Performance M-6731-FL820 (case of 12)

O₂ Sensor

Ford P/N: 8F9Z-9F472-D

Engine & Intercooler Coolant

Motorcraft Premium Gold with Bittering Agent WSS-M97B51-A1

Engine Coolant Capacity: 3.5 Gal

Intercooler Coolant Capacity: 2.5 Gal

**ALL COBRA JETS ARE SHIPPED WITH COOLANT
CONSULT YOUR RULEBOOK TO SEE IF WATER IS REQUIRED**

Accessory Drive Belt

Supercharger: NAPA (Gates Green) K100665RPM

Alternator: NAPA 25-060427

Transmission Fluid

XT-10-QLVC Motorcraft Mercon LV

Filter: SPX A34010B

Capacity: Oil change, 4-6qt. Dry fill, 10-11qt.

Differential Oil

Lucas High Performance Heavy Duty SAE 85W-140 Gear Oil

Capacity: 3 qt

Gear ratios: 3.89:1

Brake Fluid

Motorcraft High Performance PM-1-C

Tires

Front: Mickey Thompson (26.0x4.0-15) 30071

Rear: Mickey Thompson (30.0x9.0-15) Radial, R1 Compound 3066R

Wheels

Front: 15"x3.5", RC Components

Rear 15"x10", RC Components

Fuel

VP C16

Fuel Pressure: 55±2 psi gage, fuel pump on and engine off

Fuel Filter

Aeromotive TM 10 micron #12321

Spark Plugs

Motorcraft CYFS-092-YPT gapped to .027" - .031" (.7-.8mm)