Ford Racing Boss 302S

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

The Boss 302S is a turn-key, or in this case a push button, racing vehicle and requires proper race preparation. Please read and understand the owner's guide and the detailed instructions for the various components supplied with your Boss 302S. Beyond component specific maintenance we recommend that you regularly "nut and bolt" your Boss 302S. This is a process of checking all the nuts, bolts, wiring, belts, hoses, tires, etc…on your vehicle. **Your race car should be checked before every session of use…it is also equally important to inspect your vehicle after each use: this includes checking all mechanical components as well as checking for codes using your Ford Pro-Cal tool. In addition you should also review the data in your AIM data acquisition system outlined later in this manual. Please be diligent with the care of your vehicle!**

Contents

In addition to this manual there are several files on the included jump drive or at http://www.fordracingparts.com/parts/part_details.asp?PartKeyField=11687

- **Dynamics tuning guide**
- **DTC error list**
- **Ford Racing wiring diagrams**
- **AIM configuration file Boss302S#14 FACTORY.cfn (already preloaded on your car)**

Only after reviewing Pro-Cal tool DTC codes and AIM data should further support be required. Please call the Ford Racing Tech Line at 800-FORD788.

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FORD RACING PERFORMANCE PARTS
P.O. BOX 490
DEARBORN, MI 48121

Section 1 **Ford Racing Boss 302S Specifications**

Engine
5.0L Ford Racing Motorsport Engine, based on 2012-2013 Mustang Boss 302
Unique Ford Racing PCM software and Calibration
Ford Racing Oil Pan, M-6675-M50BR
Oil Filter, Wix Racing 51268R
Engine Oil: Motorcraft 5W50 full synthetic or equivalent
Setrab ProLine Engine oil cooler
Upgraded electrical connectors
FR intake badge
Boss 302 fuel system
Upgraded cooling system, Dewitt Radiator

Driveline
Six speed transmission with Exedy clutch (integral cooler pump)
Torsen T2R Diff
3.73 gears

Chassis
Front: coil over dampers
Front lower control arms with delrin bushing kit
Ford Racing adjustable front anti-roll bar
Caster/camber plates
Rear: coil over dampers
Rear tubular lower control arms with spherical bearings
Ford Racing anti-roll bar
Ford Racing adjustable panhard bar
EPAS with unique Ford Racing calibration
FIA Spec 6 point roll cage
FR1 Muffler

Electrical
Lightened FR wiring harness
AMB transponder
Switch plate – start/ignition, aux switches

Interior
AIM MXL data acquisition system with GPS
Recaro HANS Pro Racer seat
Fire system with 2 nozzles
Quick release racing steering wheel
Window net
Safety system triangle nets
Six point racing harness
Master cut off switch
Drives side floor heat shield

Exterior
Ford Racing front splitter
Rear adjustable CF wing
Unique carbon hood with air extractors
Hood pins
19X9″ and 19x10" wheels (optional BBS)
Boss 302S graphics package
Front/rear tow hooks

Brakes
Brembo race 4 piston front brake system
2 piece 15″ front rotors
PFC racing pads
Carbon fiber brake duct kit
Stainless steel brake lines
Ford Racing brake booster assembly
Unique Ford Racing ABS calibration M-2353-CA

Section 2 **Driver Information/ AIM System**

Your Boss 302S includes a MXL Pista which is a digital dash, gauge, and race data acquisition system featuring a tachometer, 8 analog inputs, 1 speed input, CAN/serial ECU connector, gear position indicator (From ECU) and internal lateral G sensor.

With standard features including a wide, fully configurable display, six configurable alarm LED's, backlight, and USB connector; the MXL is a stylish, powerful unit that re-defines the state of the art in data acquisition for performance vehicles.

These are the factory settings for the alarm lights:

It is very important that the AIM data is reviewed and retained….the software allows you to save information such as date, driver and track. Also use the notes function after every download as this will help you to recall information at a later time.

The MXL Pista is interfaced with the Boss 302S PCM and allows you to monitor:

Lateral Acceleration: From the head unit's accelerometer (use this to compare setups, conditions or driving technique)

Battery Voltage: Recommended alarm for this channel is less than 13.5 Volts

P_RPM (Engine RPM): From the Boss PCM

P_ACT : Inlet air charge temperature

P_VSPD (Vehicle speed): Averaged vehicle speed between four wheels

P_PEDAL: Throttle pedal position in percentage

P_GEAR: Manual transmission gear position

P_CMP_FAIL_FLAG: Normally zero, non-zero value indicates a camshaft error (see camshaft status codes)

P_EPOS_STATUS: Normally zero, non-zero value indicates a crankshaft position error

P_COIL_ERROR_FLG: Normally zero…non-zero value indicates a issue

P_HSF: 0=Cooling fan off 1= cooling fan on

P_FUELUSED: Fuel totalizer, when used with the Channel Report, the signal range will return liters of fuel used per lap

A_WS_FL: The individual wheel speed of the front left wheel

A_WS_FR: The individual wheel speed of the front right wheel

A_WS_RL: The individual wheel speed of the rear left wheel

A_WS_RR: The individual wheel speed of the rear right wheel

P_CMP_STAT_I1: Normally 1, other values indicate camshaft issues on Bank #1 intake (passenger's side)

P_CMP_STAT_E1: Normally 1, other values indicate camshaft issues on Bank #1 exhaust (passenger's side)

P_CMP_STAT_I2: Normally 1, other values indicate camshaft issues on Bank #2 intake (driver's side)

P_CMP_STAT_E2: Normally 1, other values indicate camshaft issues on Bank #2 exhaust (driver's side)

P_LAMBDA_1: The air fuel ratio of bank #1 (a static value of 1 indicates missing or problematic O2 sensors, passenger's side)

P_LAMBDA_2: The air fuel ratio of bank #2 (a static value of 1 indicates missing or problematic O2 sensors, driver's side)

The Boss 302S specific add-on hardware/channels are oil temperature, oil pressure and a GPS module.

The oil pressure should not drop below 30 PSI during normal operating conditions (except hot idle). Oil Temperature should not exceed 300 degrees Fahrenheit. The GPS module is included for lap timing without requiring a conventional beacon; it also provides the following channels:

GPS_SPEED: Absolute vehicle speed (useful when comparing individual speed during abs events)

GPS_NSAT: Number of satellites in range

GPS LAT_ACC: Calculated lateral acceleration

GPS LONG_ACC: Calculated longitudinal acceleration

Your AIM system will come preloaded with most tracks in North America, you can add additional tracks using GPSMANAGER available on AIM's web site.

RPM 2-STEP / PIT LANE SPEED CONTROL (PLSC)

The Boss 302S has a RPM 2-STEP feature that will maintain a set engine speed while the accelerator pedal is depressed. This feature is built into the powertrain control module (PCM) and does not require aftermarket components.

1) RPM Indicator

When the ignition switch is turned "ON", the tachometer will momentarily display the current set point.

2)RPM Setting

The system utilizes a toggle switch in the center console to set the desired launch engine speed. Proper precautions have been made to ensure the setting mode cannot be entered unless the vehicle is stopped. To set the 2-STEP RPM, a simple 3 step process is required:

1. Depress the brake pedal with the engine running and simultaneously hold the toggle switch up for approximately 2 seconds. The AIM tachometer will display the current 2 STEP set point. After the tachometer sweeps and is displays the current set point, release the toggle switch, the brake pedal can then be released and is not necessary for the rest of the procedure.

2. The RPM set point is adjusted by moving the toggle switch up or down. The RPM will change in 100 RPM increments. The user range for the launch control is 2000 rpm to 7750 rpm and the PCM will not allow any settings beyond these limits.

3. Once the desired launch control set point is achieved, press the "PLSC" button. The AIM tachometer will again sweep to 9000 rpm, then back to the desired set point, and finally back to the current engine speed. The system set point is now stored in the PCM's memory and will maintain this value until it is changed again even if the power is removed from the PCM.

PIT LANE SPEED CONTROL (PLSC)

The Pit Lane Speed Control is adjusted identically to the 2-STEP, however instead of holding the toggle switch up, hold the toggle switch down to set the PLSC. The information will be displayed on the speed readout of the MXL. After setting the desired speed once again, store the setting by depressing the PLSC button on the steering wheel.

Section 3 **Ford Pro-Cal Instructions**

The calibrations contained on the memory card are designed for Sunoco 260 GTX (98 octane) and pump premium (91 octane or higher) fuel. Be sure to select the proper calibration for the fuel you are running or severe engine damage can occur.

PROGRAMMING

Please read through all the steps before starting the programming process. Only perform process if battery is fully charged! If possible, connect to a battery charger prior to beginning programming process.

1) Turn on the vehicle master power and ignition switches. Be sure all other switches are off (fuel pump, differential cooler, driver radio, driver cool-suit, etc). The programming process is highly dependent on good battery voltage, so anything that takes power can cause the process to fail which can cause the PCM (Powertrain Control Module) to be non-functional unless sent back to Ford Racing for repair.

2) Insert the supplied memory card into the Procal tool (card slot is located on the bottom of the tool underneath the rubber boot) before plugging the tool into vehicle's OBD-II port (located behind the passenger side airbag cover).

3) The tool may update new bootloader firmware and perform an integrity check of the data on the memory card the first time a new card is inserted. If this occurs, please be patient and wait until menu appears with "**Programming**" highlighted. This can take up to a minute and will not occur again unless the memory card is changed**. Do NOT disconnect the tool from the vehicle or turn off vehicle master power switch while this update is in progress.**

4) Press "**Enter**" to select the "**Programming**" option and **"Enter"** again to acknowledge the warning about connecting a battery charger.

5) Press "**Enter**" to select the "**Auto Selection**" option.

6) Use scroll arrows to select desired calibration. The text that will be displayed on the Procal screen is in bold and the parenthesis contain the description of each file.

260GTX	(Sunoco 260 GTX fuel calibration)
91+ OCT	(91+ octane fuel calibration)
91+ OCT 2500	(91+ octane fuel calibration with 2500 rpm rev limit)

7) A message saying "**An updated software version is available. Press enter to proceed**" will appear. Press "**Enter**" to proceed.

8) Turn the ignition switch off, then press "**Enter**", and turn the ignition switch on.

9) The desired calibration will be programmed into the vehicle. **Do NOT, under any circumstances, unplug the tool or switch the ignition switch or master power switches off during the programming process. Failure to follow this warning may result in having to send the PCM back to Ford Racing for repair at the owner's expense.**

10) "**Update Complete Cycle key and press <Enter>**" will appear when programming is complete. Turn ignition switch off then on and press "**Enter**".

11) "**Process finished <enter> = exit**" will appear. Press "**Enter"** to continue.

12) "**ENT = clear DTCs ESC = finish**" will appear. Press "**Enter**" to clear Diagnostic Trouble Codes (DTCs)

13) "**Process complete**" will appear. Press "**Enter**" then press "**ESC**" twice to return to main menu.

14) Disconnect tool from OBD-II port. Reprogramming process is now complete. Turn fuel pump switch on and start engine to verify that programming was successful.

DIAGNOSTICS

To check continuous PCM diagnostic codes (for instance, if the check engine light on the AIM illuminates or the engine exhibits unusual behavior), turn the ignition switch ON, then select the "**Diagnostics**" option from the main menu, hit "**Enter**", then scroll down to "**Read DTCs**" and hit "**Enter**" again. If the vehicle has any diagnostic trouble codes stored in memory, they will be displayed here as a number with a "P" before it, for example P0102, along with a scrolling text description which summarizes what the code means. Write down these code numbers and descriptions to assist in diagnosing the issue. Please have these codes handy if you call the Ford Racing technical hotline for assistance. AIM data will also be useful in assisting with problem diagnosis, so please have that available as well. Note that any stored diagnostic codes will be cleared when the master power switch is turned off so we recommend the switch only be turned to off when the
vehicle is in transit, under-going repairs, or stored over-night.

To run a Key On Engine Off (KOEO) test, turn the ignition switch ON (with engine OFF), select the "**Diagnostics**" option from the main menu, hit "**Enter**", then scroll down to "**KOEO Self Test**" and hit "**Enter**" again. Note that the cooling fan will activate for a few seconds during this test. If it does not, there is an issue with the cooling fan, wiring, or fuse that will need to be resolved prior to running the vehicle.

To run a Key On Engine Running (KOER) test, start the engine and let it reach operating temperature, then select the "**Diagnostics**" option from the main menu, hit "**Enter**", then scroll down to "**KOER Self Test**" and hit "**Enter**" again. Note that engine speed will increase while the test is running. Do not touch the accelerator pedal or attempt to move the vehicle until the test has completed and engine speed has returned to normal. At any point during the test, press the brake pedal at least once or a brake switch code will be returned.

To check continuous diagnostic codes in other modules, select the **"Vehicle"** option from the main menu, hit **"Enter"**, then highlight **"Get Veh DTCs"** and hit **"Enter"** again. Codes for all active modules will be displayed. Note that it is normal for the EPAS module to return U0155 and U0140 codes.

NOTE: All powertrain software and calibrations contained in the provided MMC's and in the vehicle at time of delivery are copyrighted works of Ford Motor Company and are protected under US copyright law. They may <u>not</u> be uploaded or copied for <u>any</u> purpose including, but not limited to, calibration modification and/or distribution.

If you have any questions, concerns, or issues, call the Ford Racing technical hotline at 1-800-FORD788 any time between 8:30 am and 5:00 pm Eastern, Monday through Friday, excluding holidays.

Section 4 **Electrical Information**

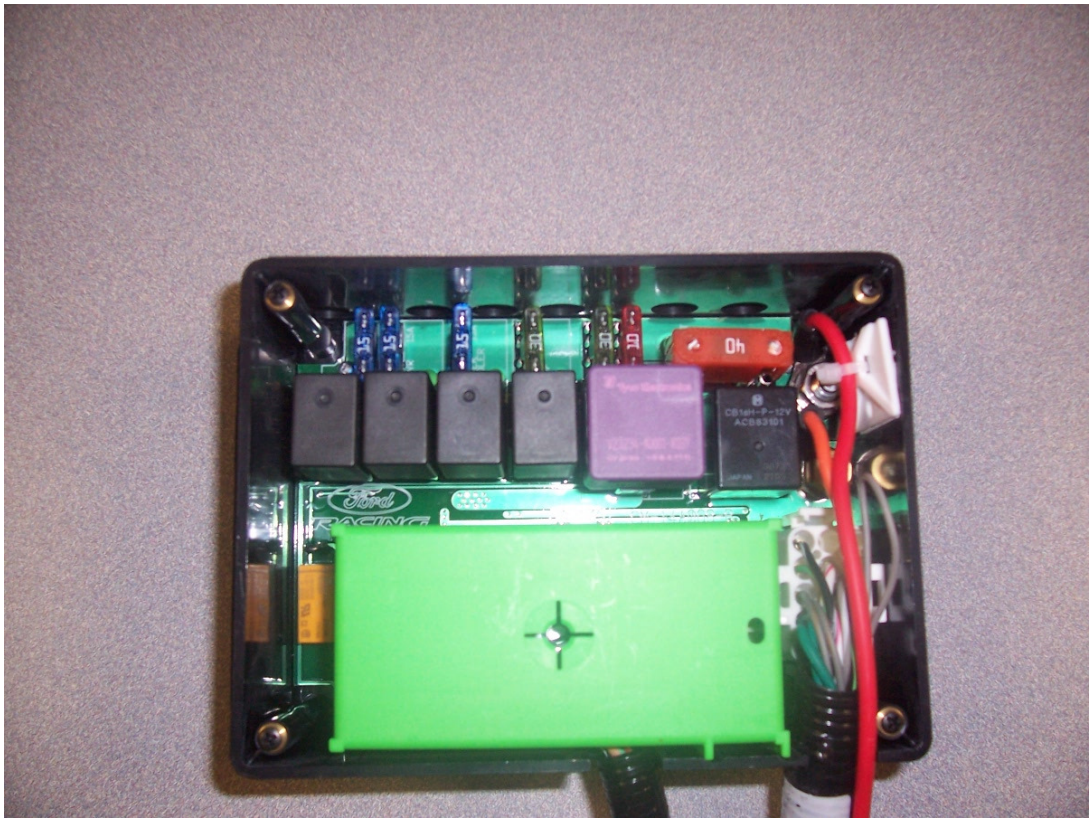
Additional information about the Boss Crate Motor harness used on the 302S can be found on the Ford Racing website at http://www.fordracingparts.com/parts/part_details.asp?PartKeyField=11687

OBDII Connector

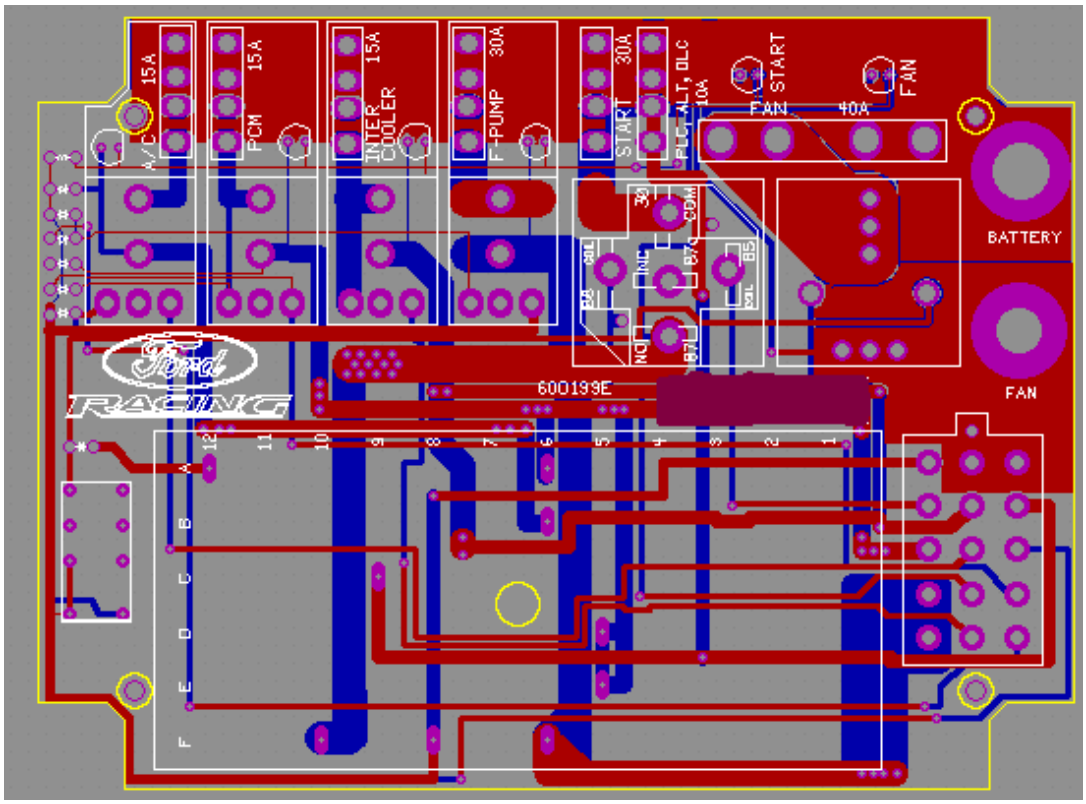
Located on the passenger side air vent.

Controls Pack Power Distribution Box

The Controls Pack Power Distribution Box (PDB) is responsible for base engine electrical functions and is located under the passenger side air bag cover. Fuse and relay locations in this PDB are indicated on the circuit board.



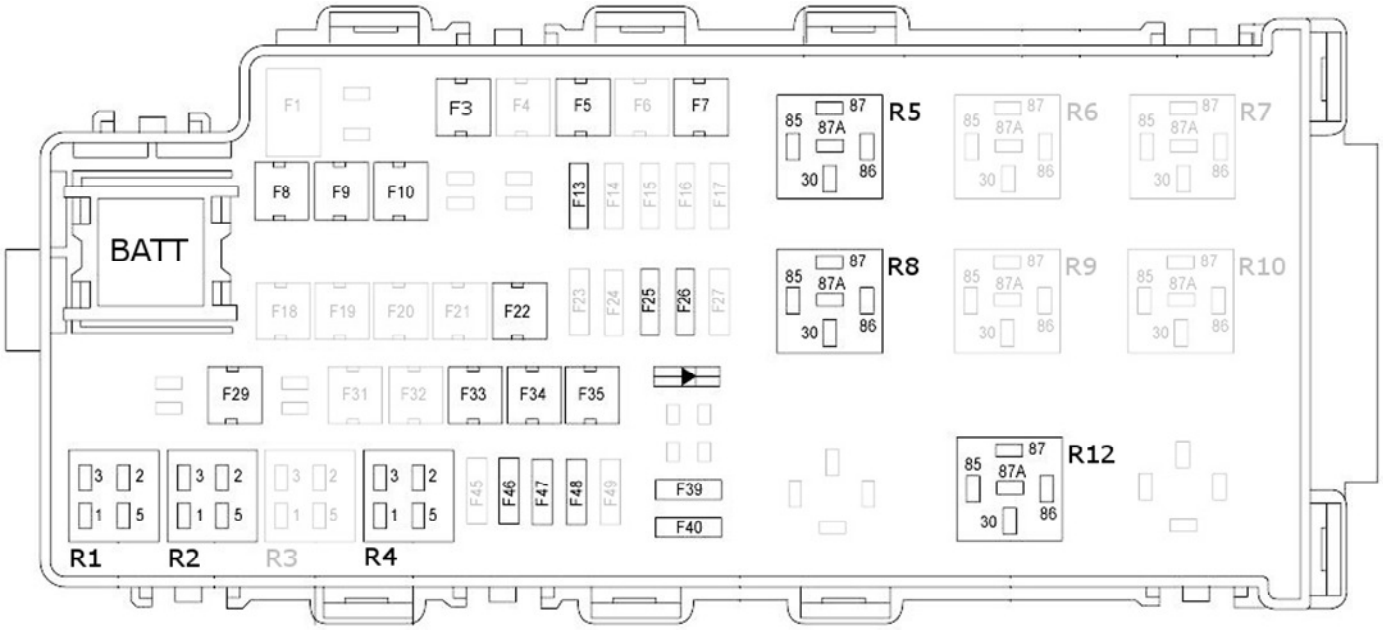
Refer to the circuit board picture below for clarification of fuse/relay locations in the Controls Pack PDB.



Vehicle Power Distribution Box

The Vehicle PDB shown in the following picture contains the fuses/relays used for headlights, taillights and other vehicle functions. This PDB is located in the passenger side kick panel.

Fuse and relay locations for this PDB are shown below.



Relay	Pin	Circuit #	To	Pin	Description
R1	1	300B	C1200	35	Ground
R1	2	21B	C1200	14	High Beam Switch
R1	3	22	C1200	6	High Beam Feed
R1	5	20B	S20		12V HAAT 30A (F22)
R2	1	24A	S24		Low Beam Coil
R2	2	26	R8	30	Low Beam Coil Ground
R2	3	23	C1200	7	Low Beam Feed
R2	5	20C	S20		12V HAAT 30A (F22)
R4	1	300C	C1200	36	Ground
R4	2	25A	S25		Parking Lamps Coil
R4	3	27A	C1200	31	Parking Lamps Feed
R4	5	20D	S20		12V HAAT 30A (F22)
R5	30	530	F7	2	12V HAAT 40A (F7)
R5	85	300D	C1200	37	Ground
R5	86	201A	C1200	16	Ignition On
R5	87	1600A	S1600		R/S Feed to PDB
R8	30	26	R2	2	Low Beam Coil Ground
R8	85	21C	C1200	15	High Beam Switch
R8	86	300E	C1200	38	Ground
R8	87A	300H	C1200	39	Ground
R12	30	1230	F33	2	12V HAAT 30A (F33)
R12	85	300J	C1200	40	Ground
R12	86	1286C	C1200	30	Intercooler Trigger
R12	87	555	C1200	42	Intercooler Feed

Fuse	Type	Source	Amps	Circuit #	To	Pin	Description
F3	HAAT	BATT	20	200	C1200	3	T1 - 12V HAAT
F5	HAAT	BATT	20	80	C1200	5	Power Point / Line Lock
F7	HAAT	BATT	40	530	R5	30	12V to 'Key-On Power' Fuses
F8	HAAT	BATT	40	110	C1200	9	ABS Power
F9	HAAT	BATT	30	70	C1200	34	Wiper Motor
F10	HAAT	BATT	30	120	C1200	1	ABS Power
F13	HAAT	BATT	15	270	C1200	13	Mirrors
F22	HAAT	BATT	30	20A	S20		Headlamps
F25	HAAT	BATT	20	180A	C1200	25	Brake Lamps / Flashers / Turn
F26	HAAT	BATT	10	220A	C1200	26	Cluster / Light Switch Feed
F29	HAAT	BATT	30	50	C1200	29	Power Window Motor LT
F33	HAAT	BATT	30	1230	R12	30	Intercooler Pump
F34	HAAT	BATT	30	40	C1200	8	Power Window Motor RT
F35	HAAT	BATT	10	230	C1200	17	T4 - Aux 1
F39	R/S	S1600	10	250	C1200	20	T5 - Aux 2
F40	R/S	S1600	10	260	C1200	24	T6 - Aux 3
F46	R/S	S1600	15	140A	C1200	4	Window Switch
F47	R/S	S1600	15	240A	S240		RCM/ABS/SPS Feed
F48	R/S	S1600	10	170A	S170		Cluster/Wiper/MFS Feed

Splice	Circuit #	To	Pin	Description
S20	20A	F22	2	12V HAAT 30A (F22)
S20	20B	R1	5	High Beam Feed
S20	20C	R2	5	Low Beam Feed
S20	20D	R4	5	Parking Lamps Feed
S24	24A	R2	1	Low Beam Coil
S24	24B	D1	1	Diode to Parking Lamps
S24	24C	C1200	2	Low Beam Signal
S25	25A	R4	2	Parking Lamps Coil
S25	25B	D1	2	Diode from Low Beam
S25	25C	C1200	11	Parking Lamps Signal
S1600	1600A	R5	87	R/S Power Feed
S1600	1600B	F39	1	R/S Power Feed
S1600	1600C	F40	1	R/S Power Feed
S1600	1600D	F46	1	R/S Power Feed
S1600	1600E	F47	1	R/S Power Feed
S1600	1600F	F48	1	R/S Power Feed
S240	240A	F47	2	12V R/S 15A (F47)
S240	240B	C1200	22	12V R/S 15A (F47)
S240	240C	C1200	23	12V R/S 15A (F47)
S170	170A	F48	2	12V R/S 10A (F48)
S170	170B	C1200	18	12V R/S 10A (F48)
S170	170C	C1200	19	12V R/S 10A (F48)

Future Expansion

Three fused 10Amp circuits are available on the center console for addition of customer accessories such as data loggers, radios, etc. These circuits can be accessed by removing the center console and adding the circuit to the output side of the desired switch. One of the circuits uses 12V Hot At All Times (HAAT) power while the other two circuits interface to Run/Start (R/S) Power and will only provide power when the ignition switch is in the ON position.

Please find the individual wiring diagrams on the included Ford Racing thumb drive.

Section 5 **Torque Sheets**

Bolt Torque Spec. Sheet

Location:	Type of Fastener	Torque in Nm	Torque in Ft Lbs
Engine Mount to Crossmember	Bolt	55.0	40.5
Engine Mount to Engine Block Bracket	Nut	62.5	46.1
Engine Block Bracket to Engine Block	Bolt	55.0	40.5
Flywheel to Crank	Bolt	20.0 + 60 degrees	10 + 60 degrees
Pressure Plate to Flywheel	Bolt	62.5 + 60 degrees	46.1 + 60 degrees
Transmission Bellhousing to Engine	Bolt	47.5	35.0
Starter Motor to Transmission Bellhousing	Bolt	25.0	18.0
Transmission Mount to Transmission	Bolt	47.5	35.0
Transmission Mount to Body	Bolt	62.5	46.1
Transmission Lever to Transmission	Bolt	40.0	29.5
Shift Lever Mount to Body	Nut	10.5	7.8
Driveshaft to Transmission	Bolt	55.0	40.5
Driveshaft to Rear Axle	Bolt	55.0	40.5
H-Pipe Flange to Manifold	Bolt & Nut	40.0	29.5
H-Pipe to Tail Pipe Clamp	Nut	47.5	35.0
Tailpipe to Muffler Clamp	Nut	30.0	22.1
Steering Rack to Crossmember	Bolt	115.0	84.8
Jam Nut, Outer to Inner Tie Rod	Nut	55.0	40.5
Outer Tie Rod to Spindle	Nut	80.0	59.0
Caliper Bracket to Spindle	Bolt	115.0	84.8
Caliper to Caliper Bracket (Front)	Stud	47.5	35.0
Spindle to Coilover	Bolt	225.0	165.9
Coilover to Camber Plate	Nut	103.0	75.9
Camber Plate to Body	Bolt & Nut	35.0	25.8
Wheel Hub to Spindle	Nut	340.0	251.0
Lower Control Arm to Crossmember PT3 (Front)	Bolt	210.0	154.8
Lower Control Arm to Crossmember PT4 (Front)	Bolt & Nut	185.0	136.4
Lower Control Arm to Spindle PT6	Bolt & Nut	103.0	75.9
Sway Bar Link to Coilover	Nut	115.0	84.8
Sway Bar Link to Sway Bar	Nut	115.0	84.8
Sway Bar Mount to Crossmember	Nut	70.0	51.6
Crossmember to Body	Bolt & Nut	115.0	84.8
Pencil Brace to Crossmember	Nut	47.5	35.0
Drop Bracket to Axle	Bolt & Nut	115.0	84.8
Drop Bracket to Coilover	Bolt & Nut	115.0	84.8
Coilover to Top Clevis Bracket	Bolt & Nut	115.0	84.8
Top Clevis Bracket to Body	Nut	40.0	29.5
Axle to 3rd Link	Bolt & Nut	175.0	129.0
3rd Link to Body Bracket	Bolt & Nut	175.0	129.0
3rd Link Body Bracket to Body Forward	Bolt	440.0	325.0
3rd Link Body Bracket to Body Rearward	Bolt	115.0	85.0
Cailper to Axle (Rear)	Bolt	103.0	75.9
ABS Sensor to Hub	Bolt	15.0	11.0
Lug Nut	Nut	135.0	100.0

Section 6 **Brake/Chassis/Setup Information**

Brakes

Your Boss 302S comes equipped with Brembo road race brakes, a Ford Racing brake booster, PFC racing pads and a TRW Race ABS system that is uniquely tuned to the car. Changing any of these components from the intended design will degrade brake system performance. This could result in increased stopping distances or degraded pedal feel.

Dampers

The 3 way dampers are Dynamics manufactured by Multimatic, these are uniquely tuned to the Boss 302S.

These are serviced by:

Carl Haas Automobile Imports, Inc
Contact Alan O'Leary
500 Tower Parkway
Lincolnshire, IL 60069

Phone: (847) 634-8200
Fax: (847) 634-8208

The Damper tuning guide is on the included Ford Racing thumb drive and web site.

Chassis Setup Specifications and Procedures

The following setup specifications and procedures are recommended starting points for the BOSS 302S. Optimal ride height and alignment will vary by track.

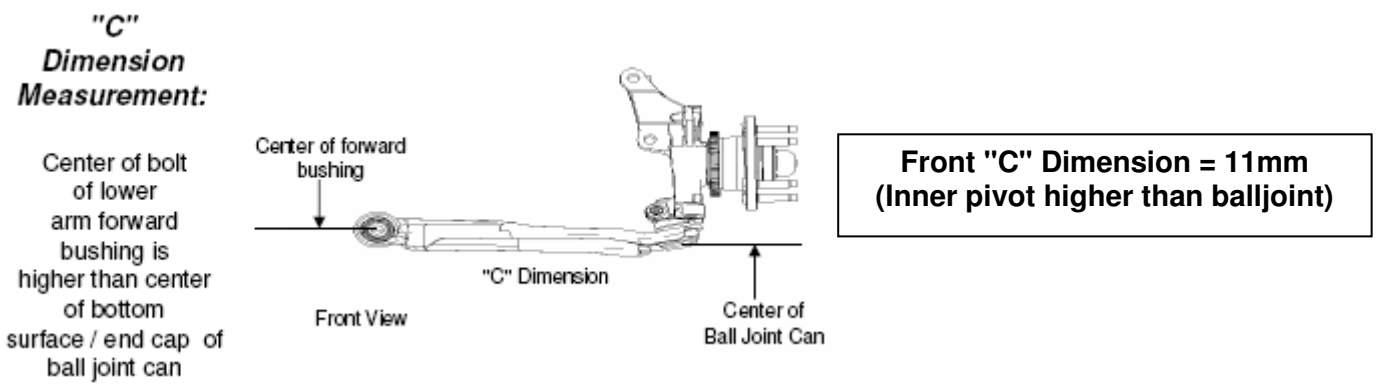
Preparing the vehicle for setup:

- Fill the vehicle with fuel. The saddle type fuel tank in this vehicle does not maintain even fuel levels between the two sides, so the only way to ensure consistent left/right balance and setup is to fill the tank.
- Make sure that the vehicle is setup in as-raced conditions, with all extra equipment and ballast installed.
- Install an unused (or clean, lightly used) set of tires if possible; the variation in diameter and stuck-on rubber bits typical of used tires can affect corner weights. Set tire pressures to 30psi, or another nominal setting that is the same on both axles.
- Ballast the driver's seat to simulate the driver's weight, or use the actual driver (if you have a very patient driver with nothing better to do)
- Optional - setting the shocks to full soft in compression and rebound will help the car to settle more consistently and will result in a more accurate setup.
- Make sure that the vehicle has been rolled forward in a straight line and bounced up and down to settle the suspension before making any measurements.
- Changes to ride heights, corner weights, and alignment will have effects on each other. Getting these settings correct is an iterative process. If you are making a major change or a new

installation/re-installation, make a rough setup of height and alignment before starting with fine adjustments

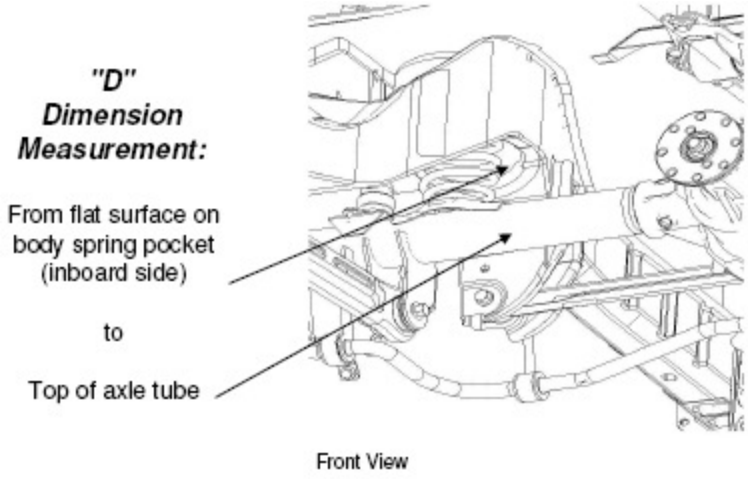
Measuring and setting front ride height:

- Front ride height is defined by the "C" dimension, which is the difference in height between the inner pivot of the front lower control arm and the bottom of the balljoint can. This measurement is used because it is a consistent measure of suspension position, independent of wheels, tires, bodywork, etc.
- Measuring the height of the center of the balljoint can be difficult because it is inside the wheel. One method is to use a dial indicator base with a pointer, setting the base on a ground reference and setting the pointer on the center of the can; with the pointer locked in, remove the base/pointer and set it on a flat surface and measure the height. This measurement is independent of ride height, and will not change as long as the same wheel/tire/pressure is used, so it only needs to be measured once per setup session.
- The inner pivot height can be measured with a tape measure from the ground to the center of the bolt.
- Before adjusting ride height, jack up the corner to relieve the spring pressure and use the threaded perches on the struts to adjust ride height. Each full turn of the perch is a change of approximately 1.5mm.



Measuring and setting rear ride height:

- Rear ride height is defined by the "D" dimension, which is the distance between the top of the axle tube and the flat surface on the inboard side of the spring pocket. This measurement is used because it is a consistent measure of suspension position, independent of wheels, tires, bodywork, etc.
- A tool can be easily made to help make this measurement, such as two flat pieces of metal with a bolt and wingnut to lock them together at a given setting. This can be used to measure the current height (setting it on the vehicle, then removing and measuring the length), or it can be set to the desired height and used as a "go/no-go" gauge.
- Before adjusting ride height, jack up the corner to relieve the spring pressure and use the threaded perches on the struts to adjust ride height. Each full turn of the perch is a change of approximately 1.5mm.



Rear "D" Dimension = 90mm

Each ride height adjustment can have an effect on the other three, so it may take several iterations to get all 4 corners set.

Adjusting corner weights:

- Once initial ride heights are set, use corner scales to measure and adjust corner weights so that the diagonal (RF+LR and LF+RR) weights are 50% (OR AS CLOSE TO 50% AS POSSIBLE). The "Cross Weight %" (shown on many scales) is the RF+LR Percentage
- It is recommended that all corner weight adjustments be made at the rear of the car, raising or lowering the appropriate side as needed (see chart)
- Note that the process of setting corner weights will change the ride heights and they will no longer be equal side-to-side

To **RAISE** Cross Weight % (RF+LR)	
LF LOWER	RF RAISE
LR RAISE	RR LOWER

To **LOWER** Cross Weight % (RF+LR)	
LF RAISE	RF LOWER
LR LOWER	RR RAISE

Adjusting alignment (in this order):

- Set caster. Recommended setting is typically 7° - 7.5°, but equal on both sides
- Set camber on both sides to -3.0°

Set toe to 0 degrees or 1/8" total toe out on 30" toe plates

Section 7 Safety Equipment/Maintenance/Part Numbers

General Safety Items

The seat belts and window nets in the Boss 302S are NOT PRE SET. Before driving the vehicle, set belt lengths. They will need to be adjusted for each individual that races this vehicle.

Roll cage – Roll bar padding (not included) should be added to any areas the driver could come in contact with.

Fire system – pin should be pulled before each time out on track and replaced when vehicle comes in.

Maintenance

Engine: M-6007-M50BR
The engine is a production Boss 302 engine with the exception of the oil pan and engine harness, all service information and parts pertaining to a production Boss 302 engine applies.

Oil pan: M-6675-M50BR

Engine Wiring harness
This harness is a production 5.0L Boss harness that is modified by Precision Race Services (PRS). The four camshaft VCT phasers (cam covers, front of engine), 4 camshaft position sensors (cylinder head, rear of engine) and the crankshaft position sensor (RH rear of engine) connection are modified by Precision Race Services.

Please contact PRS for spares or service parts:

Precision Race Services
16749 Dixie Highway Suite 9
Davisburg, MI 48350
(248) 634-4010 office
(248) 634-4014 fax

Fuel
Sunoco GT 260 GTX 98 (R+M)/2 www.sunocoinc.com/Site/Consumer/RaceFuels/UnleadedFuels/Sunoco260GT.htm
(WARNING! USING A LOWER OCTANE FUEL WILL CAUSE PERMANENT DAMAGE TO THE ENGINE)

Fuel Filter
The Fuel filter is integral to the fuel tank and non-serviceable.

Engine Oil
Motorcraft 5W-50 Full Synthetic XO-5W50-QGT
Replace every 4 hours on-track usage
The recommended oil level is the bottom of the crosshatching of the dipstick (approximately 14 quarts)

Oil Filter
Oil Filter, Wix Racing 51268R
Replace every 4 hours of on-track usage
Regularly check the catch can for oil located on the passenger side rear of the engine compartment.

Engine Coolant
Motorcraft Premium Gold VC-7B
50/50 Mix Ratio
Change annually and follow guidelines on container for freeze protection

Transmission Fluid
Dexron III ATF
Replace every 4 hours on-track usage
Capacity: 3.46L + cooling system

Clutch: Exedy Single disk EH04SD1

Differential Oil
75W140 Synthetic Gear Lube Motorcraft XY-75W140-QL
Replace every 4 hours on-track usage
Capacity: fill to bottom of filler hole
Regularly check the catch can for fluid located in the passenger side trunk compartment.

Brake Fluid
Use only High Performance DOT3 PM-1-C
Bleed brakes after each session. Replace fluid after each event

Wheel/Tires
Front; Pirelli P Zero 255/40ZR19
Rear; Pirelli P Zero 285/35ZR19
Wheel torque: 100 ft-lbs

For World Challenge competition the following wheel and tires are required….
Wheels 18x10.5" Ford Racing M-1007-R18105 **(requires unique lug nuts)**
Tires: Front Pirelli 305/660-18 P Zero Race Slick
Tires: Rear Pirelli 305/680-18 P Zero Race Slick

Part Number:	Allstar-ALL44102
Product Photo:	
Description:	LUG NUTS 1/2-20 STEEL 10PK

Air Filter
FA1897-Motorcraft
Replace after every 12 hours of usage

Spark Plugs
BR3E-12405-DA (Heat Range 1) or M-12405-M50 (Heat range 0)
SP519-Motorcraft
GAP= 0.04 (1.0 mm)
Replace after every 6 hours of usage

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

Part Number Listing

M-1012-G	WHEEL NUT (5 PACK)
M-1104-A	WHEEL HUB FRONT W/STUDS FR500S
M-1107-B	REAR WHEEL STUDS FR500S (10 PACK)
M-1225-B	8.8" AXLE BEARING AND SEAL KIT (PAIR)
M-12405-M50	5.0L 4V HEAT RANGE 0 PLUG SET
M-12655-E	PROCAL WITH SD CARD
M-12A227-CJ13	PULSE RING 5.0L4V HIGH RPM COMPETITION
M-14A006-M302A	CNTRLS PACK HARNESS FOR MUSTANG ROAD RACE CAR
M-17954-A	TOW HOOK LOOP KIT
M-18197-A	REAR SHOCK MOUNT KIT
M-1820-M	WINDSHIELD BANNER MUSTANG FORD RACING
M-2005-R	BRAKE BOOSTER BOSS 302R/302S
M-2353-CA	ABS MODULE MUSTANG 2010-12
M-2454-A	FR500S DEAD PEDAL
M-3075-RA	CONTROL ARM KIT EXT BALL JOINT MUSTANG 2011-14
M-3130-R4	2005-14 MUSTANG BUMP STEER KIT
M-4033-KA	DIFF COVER 8.8 ALUM FINNED WITH TAPPED HOLES
M-4204-T31H	FR500/BOSS R/S DIFFERENTIAL (T2R)
M-4210-C3	DIFF INSTALL KIT INC BRNGS AND SEAL 8.8"
M-4216-A300	8.8" RING GEAR BOLT SET OF TEN
M-4264-A	PANHARD BAR MUSTANG 2005-14
M-5230-MGTCA1	MUFFLER KIT MGT/MSVT 2011-14
M-5478-CJ	CJ DRIVESHAFT LOOP
M-5490-A	ANTI -ROLL BARS MGT 2005-14
M-5638-C	BUSHING KIT BOSS 302S FRONT REPLACEMENT
M-5649-S	BOSS S CONTROL ARM KIT, REAR LOWER MUSTANG
M-5650-A	BOSS S MUSTANG REAR LWR CTRL ARM RELOC BKT
M-6675-M50BR	OIL PAN 5.0L B302R
M-6P067-M50B	COIL COVERS 5.0L4V POWERED BY FORD BLUE
M-7210-B	SHORT THROW SHIFTER MSVT 2007-09
M-7213-J	2007-09 SVT BLACK SHIFT KNOB AND HANDLE
M-7512-A	HOSE, HYD CLUTCH 2005-14 MUSTANG
M-8200-MBRA	MODIFIED 2013 BOSS 302S GRILLE
M-8600-M50BALT	ALTERNATOR KIT BOSS 5.0L4V
M-9424-M50BR	INTAKE MANIFOLD BOSS302R
M-9444-M50B	INSTALLATION KIT - BOSS 302 INTAKE MANIFOLD

AMB Transponder

The AMB transponder number can be found on the driver's side shock tower as shown in the attached picture