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!**

In addition to this manual there are several file on this jump drive for your use:

- **Sachs tuning guide**
- **Dynamics tuning guide**
- **DTC Error list**
- **Ford Racing wiring diagrams**
- **Aim Configuration File Boss302S FACTORYAIM.cfn (already preloaded on your car)**
- **Aim GPS track coordinates Boss_302_S_GpsMngr_2011_06_13_174017.mpl (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.

FORD RACING WARRANTY DISCLAIMER

FORD RACING PERFORMANCE PARTS AND VEHICLES ARE SOLD “AS IS”, “WITH ALL FAULTS”, “AS THEY STAND” AND WITHOUT ANY EXPRESS WARRANTY WHATSOEVER. TO THE FULLEST EXTENT ALLOWED BY THE STATE AND FEDERAL LAW, FORD MOTOR COMPANY EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, EVEN IF A PARTICULAR PURPOSE IS MENTIONED HEREIN. FORD ALSO EXPRESSLY DISCLAIMS ALL LIABILITY FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO, DAMAGE OR LOSS OF PROPERTY OR EQUIPMENT, LOSS OF PROFITS OR REVENUE, COST OF PURCHASE OR REPLACEMENT OF GOODS, OR CLAIMS OF CUSTOMERS OF THE PURCHASER THAT RESULT FROM THE USE OF ANY AND ALL PARTS OR VEHICLES CONTAINED IN THIS OWNER'S MANUAL. IN NO EVENT SHALL THE LIABILITY OF FORD MOTOR COMPANY, WHETHER IN TORT, CONTRACT OR OTHERWISE, EXCEED THE COST OF THE PART OR VEHICLE. HOWEVER, YOU MAY HAVE LEGAL RIGHTS WHICH VARY FROM STATE TO STATE.

SHOULD ANY PARTS OR VEHICLES CONTAINED WITHIN THIS CATALOG PROVE DEFECTIVE FOLLOWING THEIR PURCHASE, THE BUYER AND NOT THE MANUFACTURER, DISTRIBUTOR OR RETAILER, SHALL ASSUME THE ENTIRE COST OF ALL NECESSARY SERVICING AND/OR REPAIR. THE ENTIRE RISK AS TO THE PERFORMANCE OF SUCH PARTS OR VEHICLES IS WITH THE BUYER.

THIS VEHICLE IS NOT STREET LEGAL OR CERTIFIED UNDER FEDERAL MOTOR VEHICLE SAFETY STANDARDS AND REGULATIONS. THIS VEHICLE IS NEITHER INTENDED NOR CERTIFIED FOR USE ON PUBLIC ROADS. MANY OF THE PARTS IN THIS OWNER'S MANUAL ARE NOT DESIGNED OR TESTED FOR CRASHWORTHINESS OR TO MEET THE SAFETY NEEDS OF THE MOTORING PUBLIC. INSTEAD, THESE PARTS ARE DESIGNED AND INTENDED FOR RACE VEHICLES ON RACE TRACKS WITH ENGINEERS SUPERVISING THE INSTALLATION AND USE OF THE RACE PARTS TO ENSURE THAT THE SAFETY NEEDS OF THE RACE DRIVER ARE MET. THE RACING PARTS COULD CONCEIVABLY BE COMBINED IN AN INFINITE COMBINATION, AND THE USE OF SOME PARTS ON SOME VEHICLES COULD ADVERSELY AFFECT THE PERFORMANCE OF THE VEHICLE OR OTHER RACE PARTS.

TO THE EXTENT THAT A PART CONTAINED WITHIN THIS OWNER'S MANUAL COMES WITH A WARRANTY FROM THE ORIGINAL MANUFACTURER, NOT FORD RACING PERFORMANCE PARTS OR FORD MOTOR COMPANY, THE BUYER SHOULD CONTACT THE ORIGINAL MANUFACTURER FOR ANY AND ALL WARRANTY REPAIR OR REPLACEMENT. TO DETERMINE WHICH PARTS COME WITH A WARRANTY FROM THE ORIGINAL MANUFACTURER, NOT FORD RACING PERFORMANCE PARTS, PLEASE CONTACT THE FORD RACING PERFORMANCE CALL CENTER AT (800) 367-3788 OR:

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 Mustang Boss 302 engine
Ford Racing Oil Pan, M-6675-M50BR
Ford Racing Oil Filter, CM-6731-FL820
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

Driveline
6 speed transmission with Dual Disc Clutch
Torsen T2R Diff
3.73 gears

Chassis
Front: coil over dampers
Front lower control arms with delrin bushing kit
FR adjustable front anti-roll bar
Caster/Camber plates
Rear: coil over dampers
Rear tubular lower control arms with spherical bearings
FR anti-roll bar FR 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
6 point racing harness
Master cut off switch

Exterior
FR front splitter
Rear adjustable CF wing
Unique Carbon hood with air extractors
Hood pins
19X9″ and 19x10" wheels
Boss 302S graphics package
F/R tow hooks

Brakes
Brembo race 4 piston front brake system
2 piece 14″ front rotors
PFC racing pads

Carbon Fiber Brake duct kit
Stainless steel brake lines
FR brake booster assembly
Unique FR ABS calibration

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), internal lateral G sensor, and lap timer.

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.

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 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

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

P_CMP_STAT_E1: Normally 1, other values indicate camshaft issues on Bank #1 exhaust

P_CMP_STAT_I2: Normally 1, other values indicate camshaft issues on Bank #2 intake

P_CMP_STAT_E2: Normally 1, other values indicate camshaft issues on Bank #2 exhaust

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

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

The Boss 302S specific add-on hardware/channels are Oil Temp, 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 displaying the current set point, release the toggle switch. The brake pedal can also be released and is not necessary for the rest of the procedure.

2. The RPM 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 7000 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 8000 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

Prepare ProCal II:

STEP 1: Remove the ProCal II from its plastic bag. Peel back the rubber boot from the lower portion of the ProCal II to expose the MMC socket. Remove the MMC from its plastic case. Insert the MMC into the socket of the ProCal II with the label of the MMC facing the same direction as the ProCal II display screen. Return the rubber boot to its original position to cover the MMC.

STEP 2: Remove the J1962 cable from its plastic packaging. Insert the DB25 connector of the cable into the top of the ProCal II. Finger-tighten the retaining screws of the DB25 so that it is firmly fastened to the ProCal II.

STEP 3: Make sure your vehicle's battery is fully charged (at least 12.0 volts) and all accessories (radio, interior fan, headlights, etc.) are off. If you are unsure if your vehicle's battery is fully charged, connect a battery charger prior to beginning the programming process.
CAUTION: If your ProCal II aborts programming due to low voltage or interrupted programming process, you may be required to have the vehicle towed to an authorized Ford Dealer to reprogram your PCM back to its original stock calibration.

STEP 4: Locate the onboard Diagnostic Link Connector (DLC) at the passenger side air vent.

STEP 5: Connect your OBDII connector of your ProCal II tool to the vehicle DLC.
Note: For the first time the ProCal II is plugged in, you may receive a message indicating BootLoader firmware is updating. The RED error light will be on while the firmware is updating. This is normal for first time power-up. Do not disconnect the ProCal II during this process once it has begun.

STEP 6: Turn the ignition key of your vehicle to the ON position….move to the diagnostic menu

Diagnostics Menu Structure:
Read DTC
Clear DTC
Select Protocol
Select Module
Other Tools

- **Select Protocol**

-HSCAN-ISO14229 (Boss 302S PCM & ABS)

- **Select Module**

-Select PCM
-Select ABS

- **Read DTC(Diagnostic Trouble Codes)**

-Once Module and Protocol are set will return PCM and ABS error codes.

- **Clear DTC**

-Once Module and Protocol are set will clear selected module codes.

- **Other Tools**

-KOEO-Key ON Engine OFF Diagnostic self test, warning fan will activate as part of self test
-KOER-Key ON Engine Running Diagnostic self test, you must press the brake and turn steering wheel once during this test.

Section 4 Electrical Information

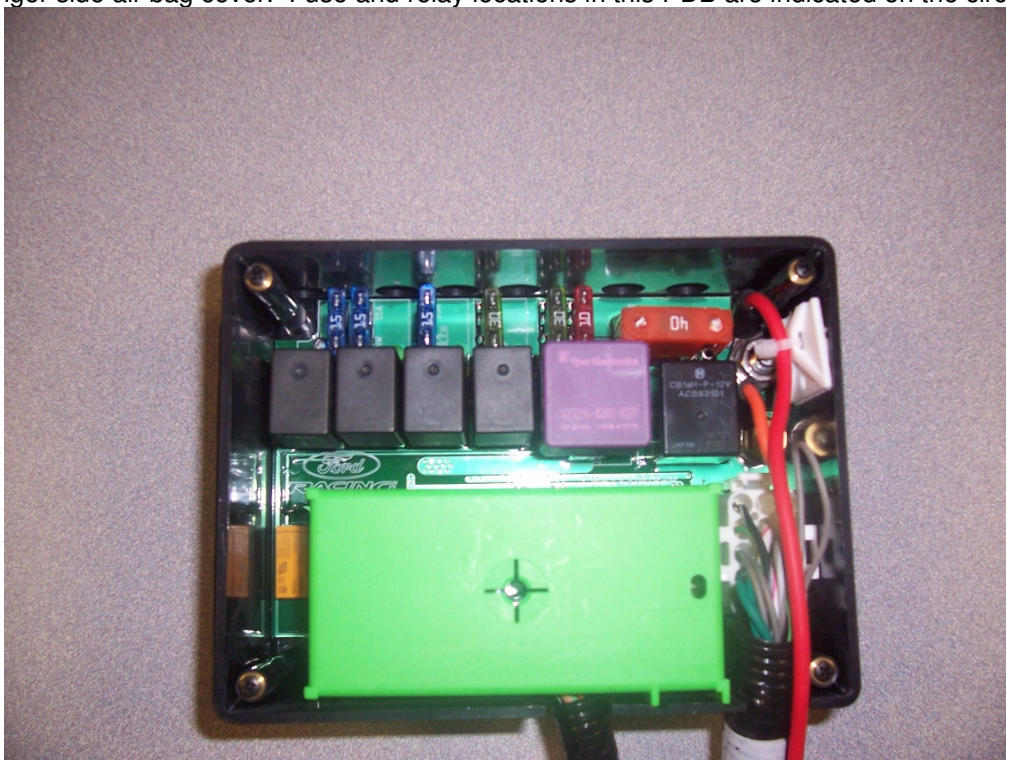
Additional information about the Boss Crate Motor harness used on the 302S can be found on the Ford Racing website at http://www.fordracingparts.com/download/instructionsheets/FordInstShtM-6017-A504V_A54SC.pdf

OBDII Connector

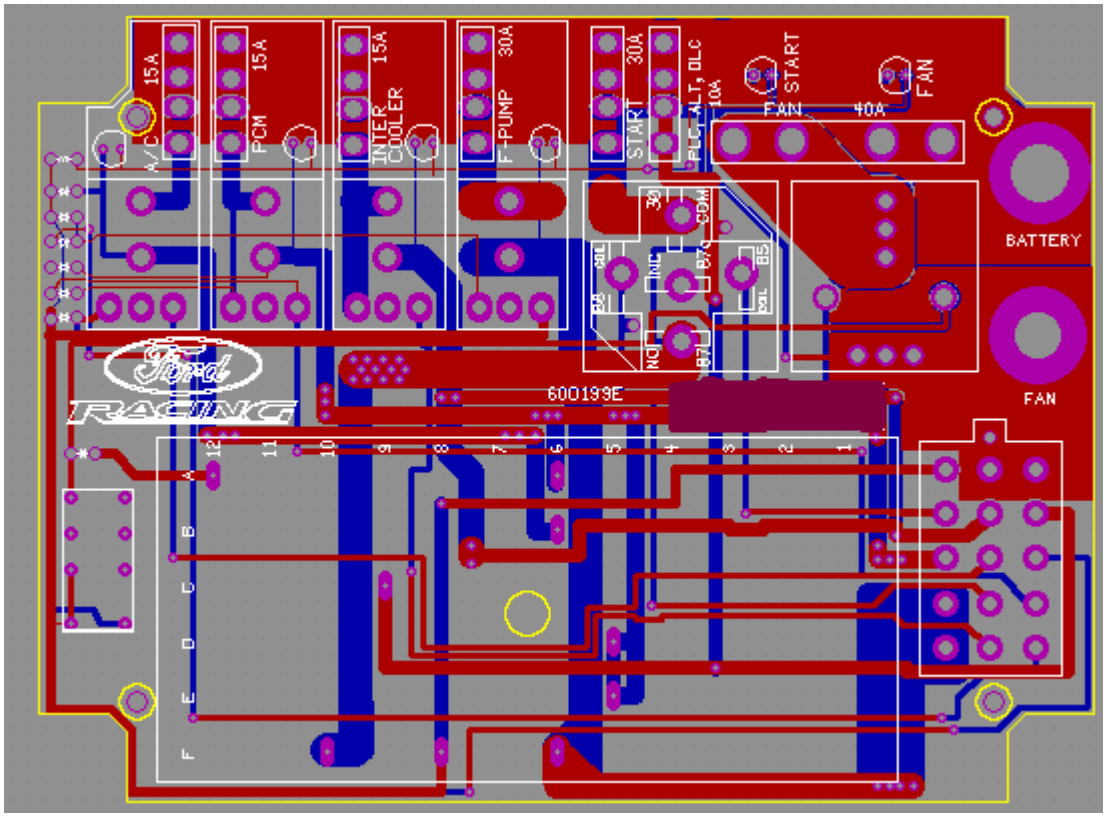
Located on the passenger side air vent.

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.



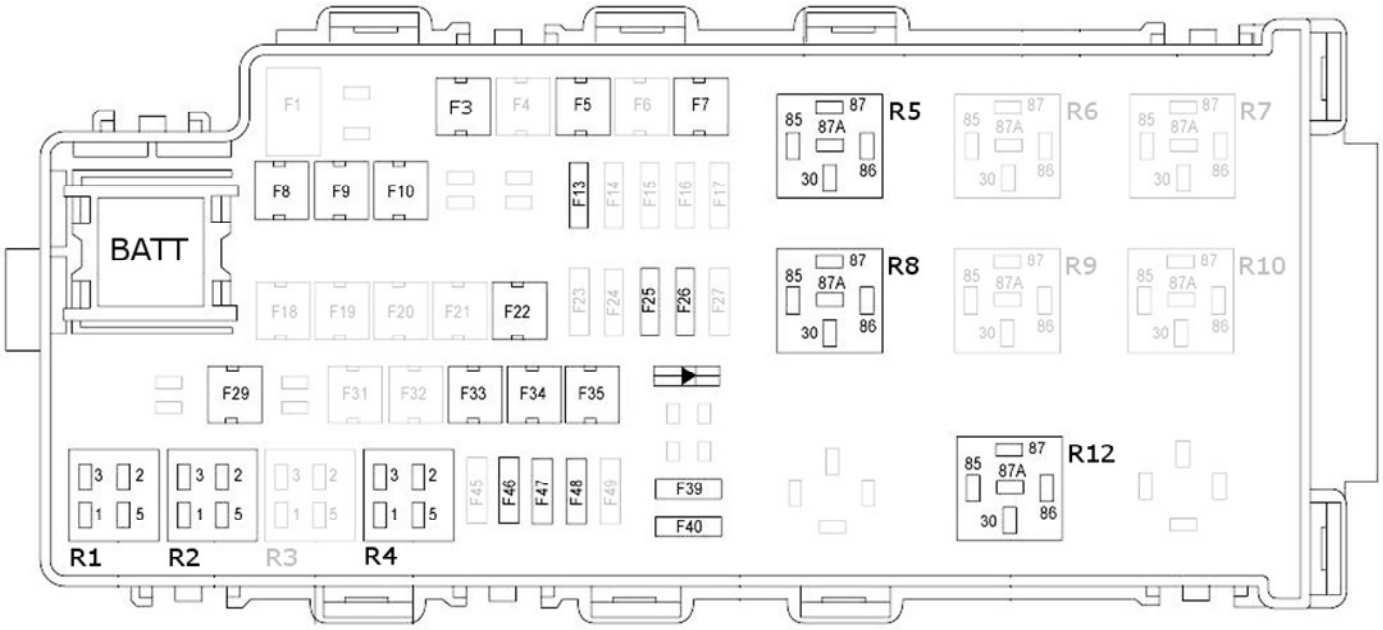
Refer to the circuit board picture below for clarification of fuse/relay locations in the Controls Pack PDB.



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 FR 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	109.0	80.4
Driveshaft Mid-Bearing to Body	Bolt	47.5	35.0
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 base 2-way dampers are manufactured by SACH. These were originally used on the FR500S and were retuned for the Boss 302S.

The Optional 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

Both the Sachs and Dynamics tuning guides are on this FR thumb drive.

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.

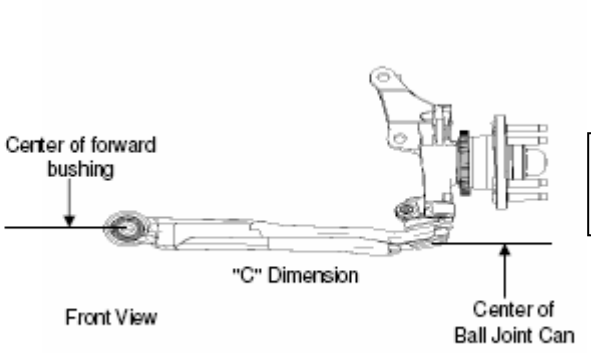
- Changes to ride heights, corner weights, and alignment will have effects on each other. Getting these settings correct is an iterative process. If you are making a major change or a new installation/re-installation, make a rough setup of height and alignment before starting with fine adjustments

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.

"C" Dimension Measurement:

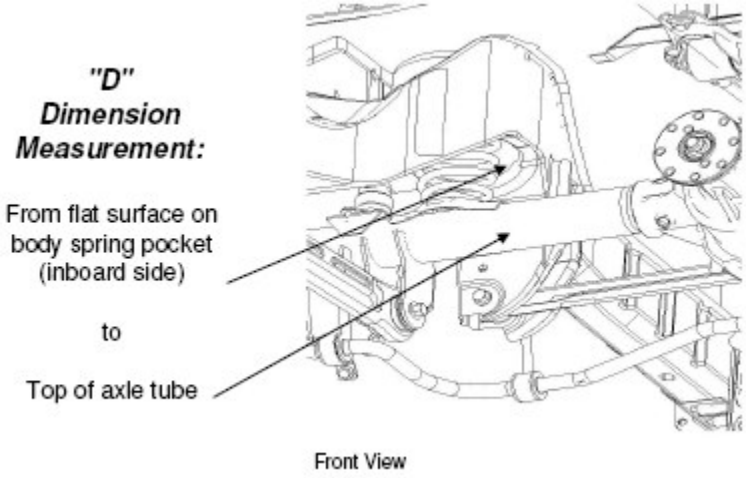
Center of bolt of lower arm forward bushing is higher than center of bottom surface / end cap of ball joint can



Front "C" Dimension = 11mm (Inner pivot higher than balljoint)

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.



Front View

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 2012 Boss 302 engine with the exception of the oil pan and engine harness…all service information and parts pertaining to a production 2012 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 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
Ford Racing M-6731-FL1A (case of 12) or CM6731-FL820 (individual)
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.
Capacity: 13 Quarts

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

Transmission Fluid
XT-2-QDX Mercon ATF
Replace every 4 hours on-track usage
Capacity: 3.46L

Clutch: CR3V-7B546-AA 2012 GT500 Dual Disc
Note refer to factory service manual when servicing.

Differential Oil
75W140 Synthetic Gear Lube Motorcraft XY-75W140-QL
Replace every 4 hours on-track usage
Capacity: Fill to bottom of filler hole.

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: 95 ft-lbs

For World Challenge competition the following wheel and tires are required….
Wheels 18x10" Ford Racing M-1007-R1810 **(requires unique lug nuts)**

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

Tires: Pirelli 305/645-18 P Zero Race Slick

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

Part description	Part number
Button, Start Engine	M-11572-GT
Shock Mount, Rear	M-18197-A
Booster, Race Brake	M-2005-R
Pad, Rear Brake Kit	M-2200-R
Differential	M-4204-T31H
Kit, Ring & Pinion Install	M-4210-B1
Crossbrace, Trans Cooler Air Scoop	M-5025-MBR
Muffler, SVT Kit	M-5230-MGTCA1
Bar, Front Anti Roll	M-5490-A
Bar, Rear Anti Roll	M-5490-A
Adaptor, Remote Oil Filter (On Engine Block)	M-6881-M50
Shifter Assembly	M-7210-B
Lever, Shift	M-7213-J
Radiator Assembly	M-8005-MGT

GT500 Transmission AR3V-7003-BC