



TL113019

INSTALLATION MANUAL

FOR TELMA AD50-90 ON

FORD F550 CAB CHASSIS

FROM MODEL YEAR 2011

WITH ROTARY FOOT SWITCH

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SECTION 1 PREPARATION OF THE CHASSIS

1.1 DRIVELINE

Remove the complete drive-shaft assembly after measurements have been taken.

1.2 EXHAUST

An exhaust modification is needed for all wheelbases. Keep all components at least ¼” away from the retarder bracket.

1.3 FUEL TANK

For 189 and 201” WB, an aft-of-axle fuel tank is required for Telma installation with no mid ship fuel tank.

1.4 DIESEL UREA TANK

In some cases depending on wheelbase and tank location, it may be necessary to relocate the urea tank when the Telma is installed. Refer to Ford recommended guidelines for details on proper relocation.

SECTION 2 RETARDER INSTALLATION

2.1 INSTALLATION KIT TIK10682 with rotary foot switch

PART NUMBER	DESCRIPTION	QTY
BB301158	AD50-90 12V 1480/1550/1610	1
JZ100280	SIDE PLATE FASTENERS	1
JZ1007XX-45	Rubber mount kit	1
TIB01017	CONTROL/RELAY BOX BRACKET	2
TIB01034	Pedal Clamp Ford E450 & F550	1
TIB01035	Pedal Bracket Ford & GM	1
TIB01036	Rotary Foot Switch Bracket	1
TIB03100	SPEED SWITCH / TRCM BRACKET	1
TIB03109	OUTSIDE MOUNT RELAY BOX BRACKET	1
TIB05055	Ford F-Series Left Outside Chassis Bracket	1
TIB05056	Ford F-Series Right Outside Chassis Bracket	1
TIB06001	F-Series Right Side Plate Bracket	1
TIB06002	F-Series Left Side Plate Bracket	1
TID15000	Ford F550 harness for AD50-90 3 stages w/rotary switch	1
TIF01064	hex head bolt 1/4 - 28 x 1.25 grade 8 yellow zinc for TRCM mounting	2
TIF01065	hex head Bolt GR8 1/4-28UNFx2 1.125/.857 for pedal clamp and rotary switch	1
TIF01066	nylon insert locknut 1/4-28UNF for pedal clamp and TRCM mounting	4
TIF01067	M4-0.7 x 20mm DIN 933 Class 8.8 Zinc Cap Screw for rotary switch mounting	1
TIF01068	M4 DIN 137 Zinc Wave Washer for rotary switch mounting	1
TIF03001	all metal lock nut 3/8-24UNF	16
TIF03002	HEX BOLT 9/16-12UNC x 2 1/2 G8	8
TIF03003	HEX NUT 9/16-12UNC X 1 1/2"	8
TIF03005	LOCK WASHER 9/16"	8
TIF05004	NUT 1/4-28UNF G8 (USED FOR PEDAL CLAMP)	1
TIF05005	BOLT 1/4-28UNF x 3/4 HEX HEAD G8	1
TIF05010	LOCKWASHER 5/16 SPLIT	4
TIF05011	NUT 5/16	4
TIF05012	BOLT 5/16-18UNC x 1-3/4 HEX HEAD G5	4
TIF05013	BOLT 1/2-13UNC x 1-1/2 HEX HEAD G5	2
TIF05014	LOCKWASHER 1/2 MED SPLIT	2
TIF05031	1/2 - 20 X 1.75 flanged head bolt	2
TIF05032	1/2 - 20 flanged nut	2
TIF05033	1/2 - washer 1-3/8 OD	2
TIG11010	TELMA LIGHT BAR DISPLAY	2
TIG31062	Telma Control Module (TRCM)	1
TIG31066	rotary foot switch	1

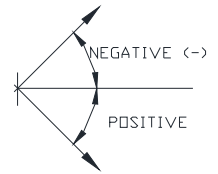
Note:

1480 Flange yokes 2 x Telma part number TIF01086 (158 index) / Spicer part number 3-2-499 must be ordered separately.

2.2 INSTALLATION OF THE CHASSIS BRACKETS

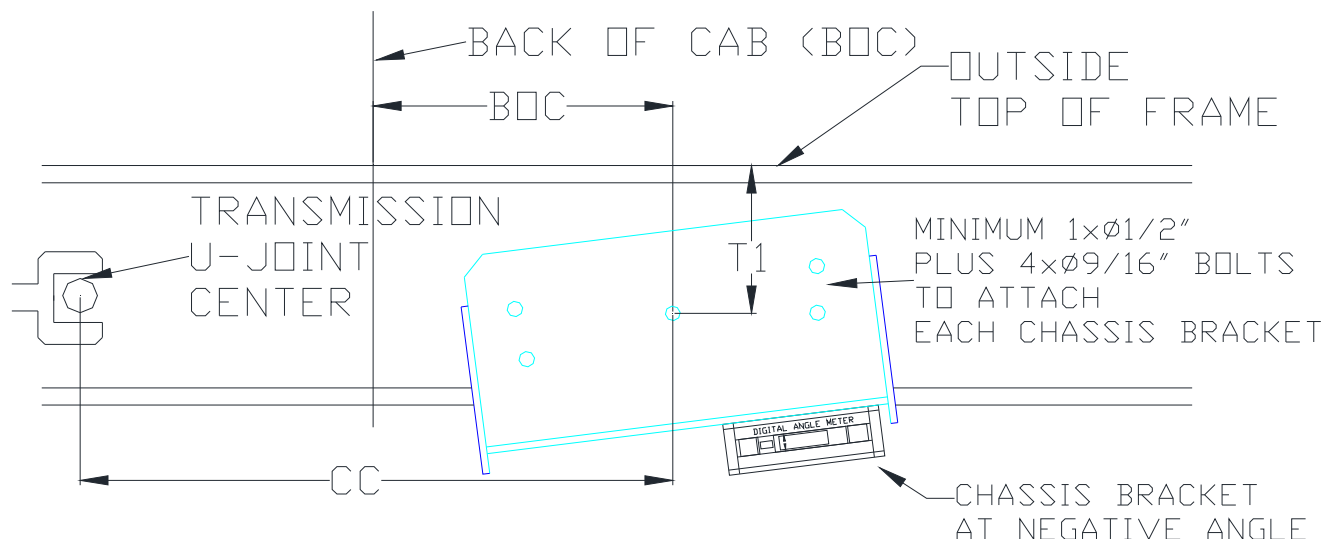
- Remove any bolts that will interfere with the chassis bracket mounting
- Drill a 1/2" reference hole in each frame at dimension T1 from the outside top of each frame rail and dimension CC from the transmission u-joint center or dimension BOC from the back of the cab indicated on the installation drawing.
- Align the reference hole of the chassis bracket (TIB05055 left side bracket / TIB05056 right side bracket) with the reference hole in the frame and assemble using the 1/2"-20UNF x 1.75" flanged bolt (TIF05031) and 1/2"-20UNF flanged nut (TIF05032) included in the kit.
- Rotate the bracket to the angle specified on the installation drawing and tighten the 1/2" reference bolt of each bracket to 100 lb-ft ($\pm 10\%$).

Note: Use an electronic angle meter with 0.1° accuracy (e.g. SPI Pro 360 digital protractor). Calibrate the angle meter using the frame rail to set an alternate reference so that all angles measured are with frame reference of 0°. In order to maintain calibration, do not rotate the angle meter in the horizontal plane after calibration.



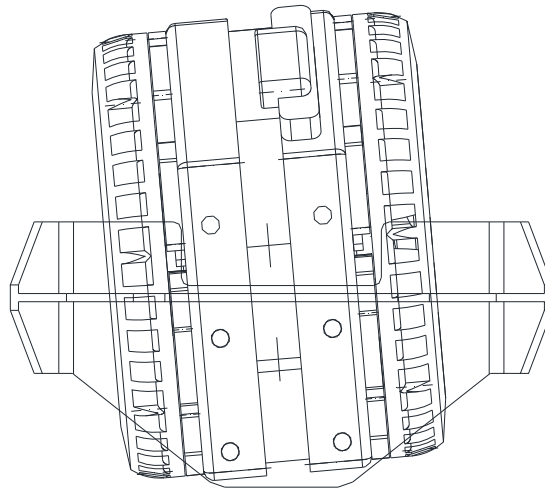
- Drill four 9/16" holes in each chassis bracket and frame rail evenly distributed across the chassis bracket using existing holes when possible. Keep away from fuel and brake lines and secure with the 9/16"-12UNC x 2 1/2" bolts (TIF03002), 9/16"-12UNC nuts (TIF03003), and 9/16" G8 lock washers (TIF03005) included in the kit. Tighten to 150 lb-ft ($\pm 10\%$).
- Drill through the chassis bracket any holes needed for battery box and/or exhaust hanger mounts and reinstall the original bolts that were previously removed. It may be necessary to make a 5/16" spacer to keep the accessory brackets flush on the outside of the frame rail.
 - Install the male parts of the rubber mounts into the 1 5/8" holes in the brackets from the bottom. Place one 2-3/4" diameter 5/8" flat washer on the top and bottom of each mount.

OUTSIDE VIEW DRIVER SIDE FRAME RAIL

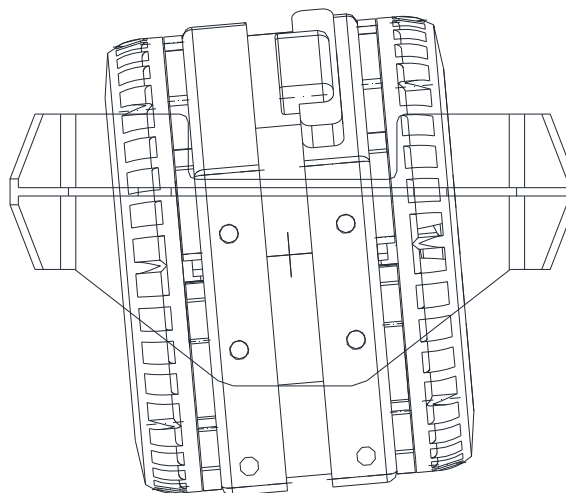


2.3 RETARDER BRACKET INSTALLATION

- Identify the Telma brackets. TIB06001 is for the right or passenger side. TIB06002 is for the left or driver side. The part numbers are stamped into the bracket.
- Identify the driver's side of the Telma from the passenger side. To do so, orient the arrow of the red plate on the Telma towards the axle with the red sticker on the driver's side.
- Attach the retarder brackets to the retarder as shown below according to the position indicated on the installation drawing.
- Use four of the M14x2.0x30mm bolts, and Trep washers provided with the set of fasteners (JZ100280) to fasten each Telma bracket onto the side of the unit. Tighten bolts to 65 lb.-ft. ($\pm 10\%$). Do not use the flat washers included in the kit.



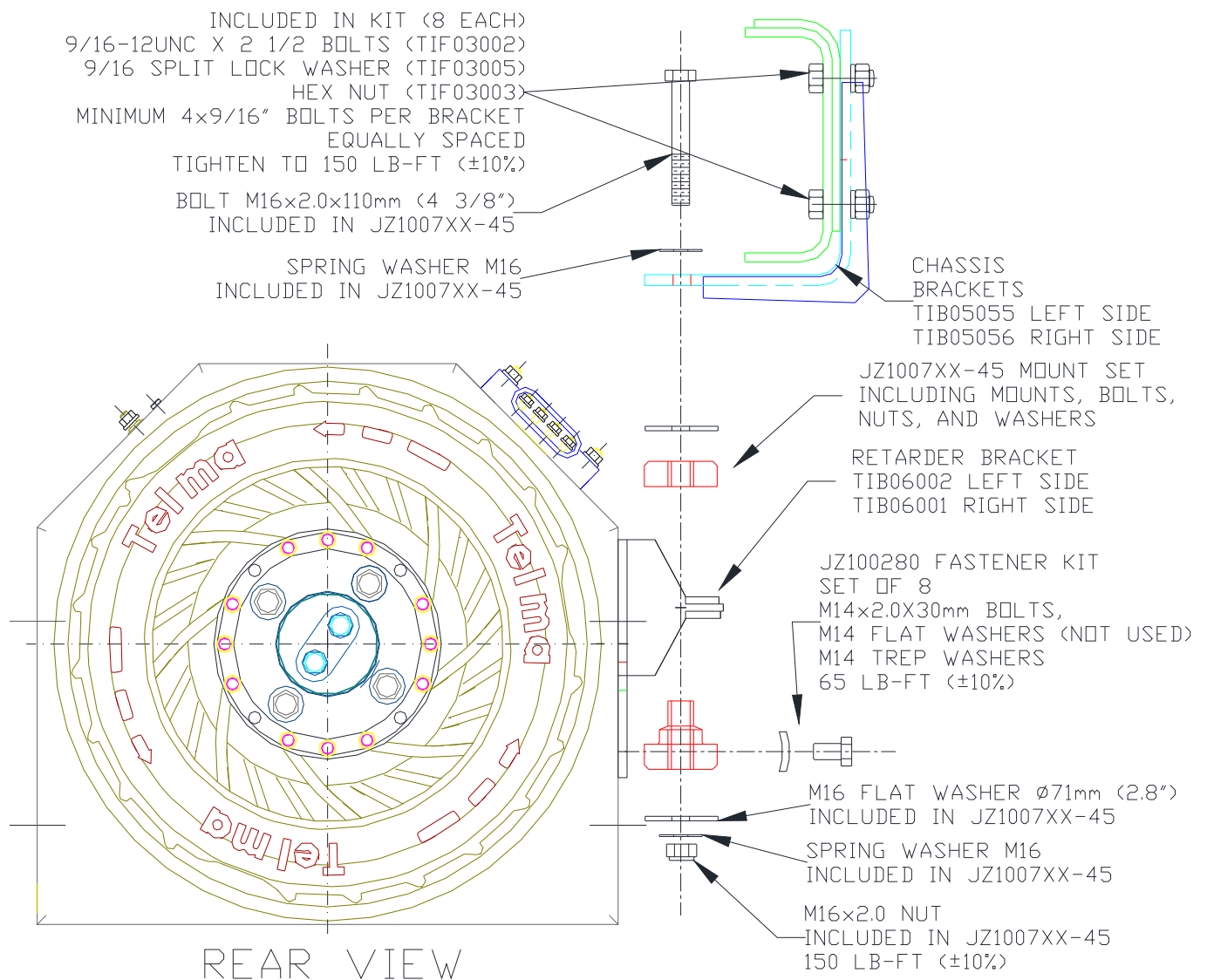
POSITION 2



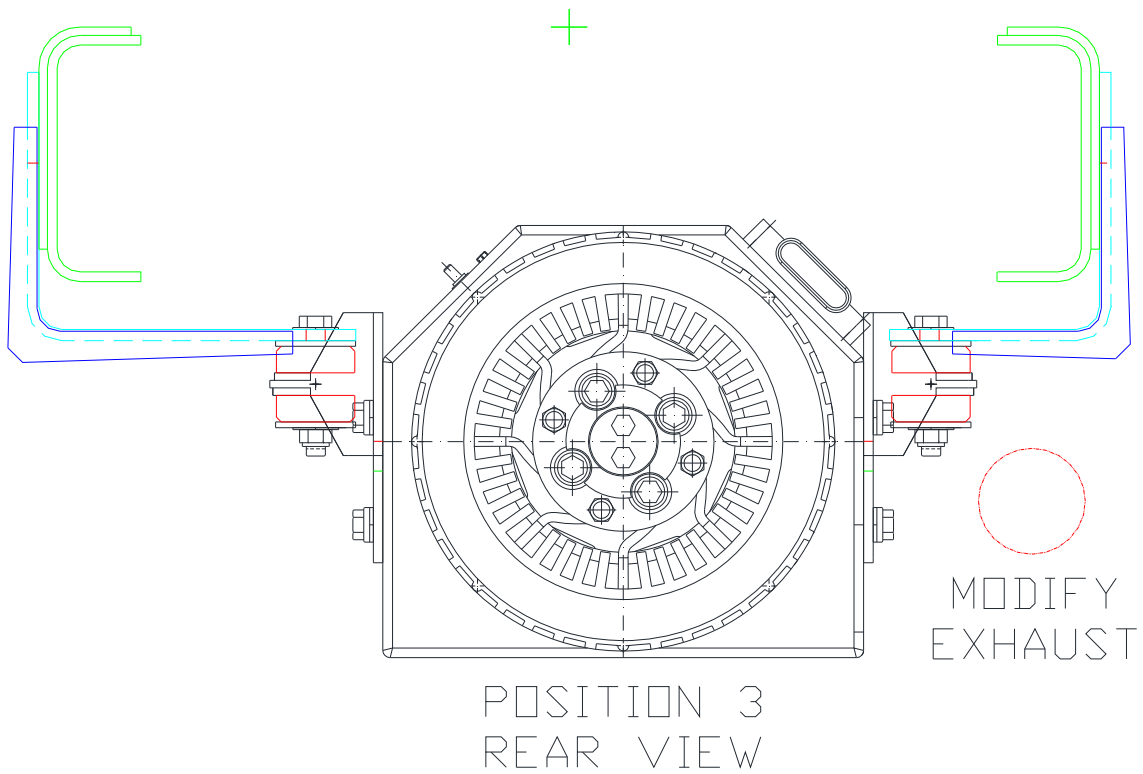
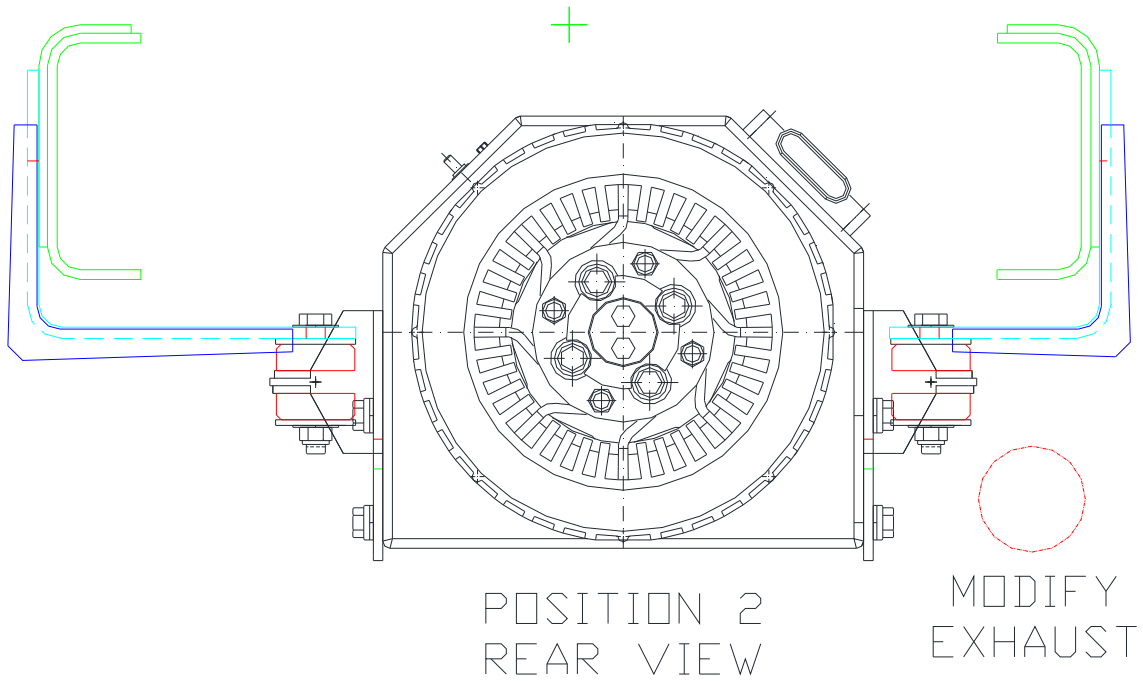
POSITION 3

2.4 INSTALLATION OF THE TELMA IN THE CHASSIS

- Assemble the mounts to the Telma brackets as shown below with the female portion of the mounts on the bottom side of the brackets.
- Use fasteners included in the rubber mount kit JZ1007XX-45 to attach the Telma and bracket assembly to the chassis brackets which were installed previously.
- Install the Telma, equipped with the brackets and rubber mounts to the chassis brackets in the hanging position.
- As shown below, secure the Telma to the chassis bracket using the M16x2.0x110mm long bolts through the holes in the chassis brackets, mounts and retarder brackets. At each mount, install two M16x71mm (2.80") diameter flat washers (one on each end of the rubber mount, one M16 spring washer under the head of the bolt and another between the large diameter flat washer and the M16 all metal lock nut. Tighten to 150 lb.-ft. (±10%).



2.5 END VIEW - TELMA INSTALLED IN CHASSIS

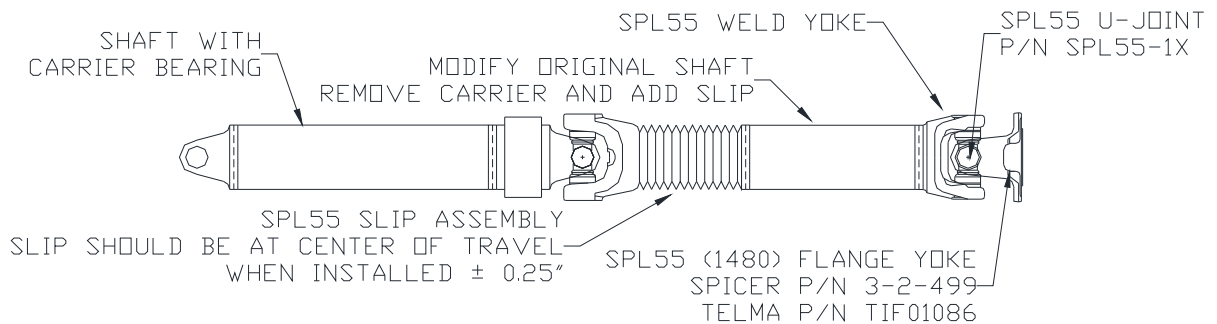


2.6 DRIVE SHAFT MODIFICATION GUIDELINES

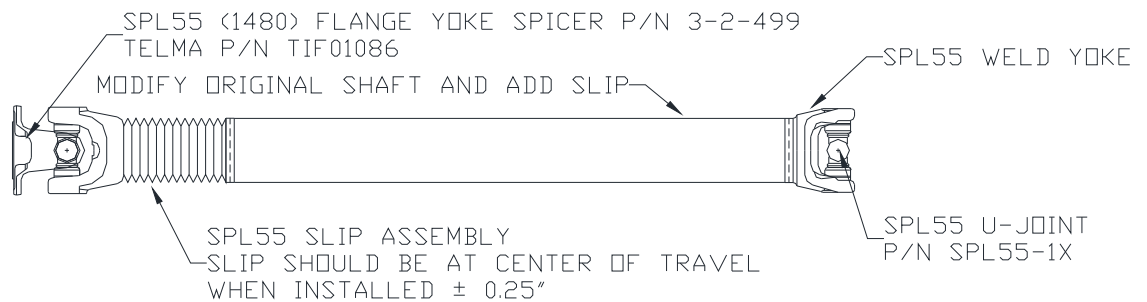
- A slip assembly is required on each side of the Telma. The slip position should be at center of slip travel when the shaft is installed.
- Refer to Ford guidelines for proper drive shaft manufacture, balance, straightness, and critical speed limits.
- Refer to the installation drawings for shaft length guidelines.
- Shaft lengths over 50" should use 4" tubing.
- Always verify proper shaft lengths before modification.
- Connect the flange yoke of each drive shaft to the Telma coupling flange using the supplied locknuts.

Note: Tighten the 3/8"-24UNF flange yoke all metal lock nuts (TIF03001) to 44 lb-ft. ($\pm 10\%$).

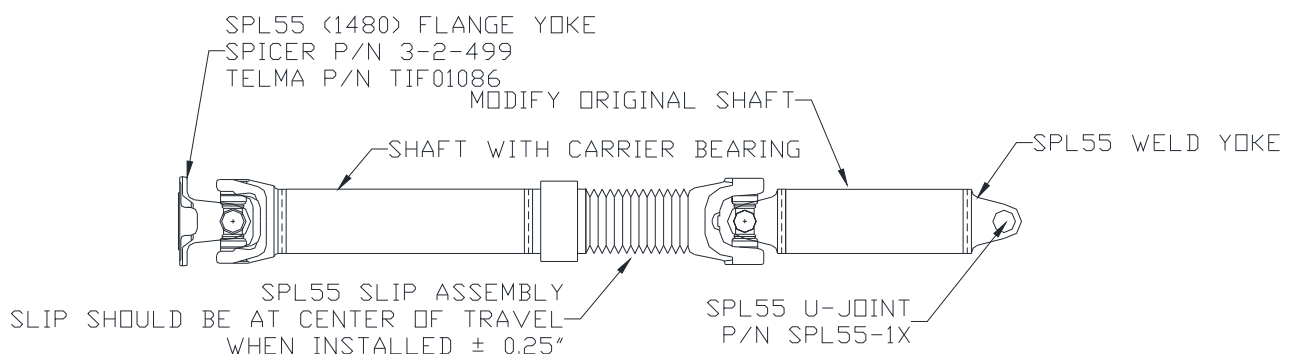
TWO PIECE FRONT SHAFT ASSEMBLY 2-1 / 2-2 CONFIGURATION



REAR SHAFT ASSEMBLY 2-1 CONFIGURATION



TWO PIECE REAR SHAFT ASSEMBLY 2-2 CONFIGURATION



2.7 AXLE SHIM INSTALLATION

Some installations require the addition of shims to adjust the axle angle.

Refer to Ford guidelines for proper shim type and procedure.

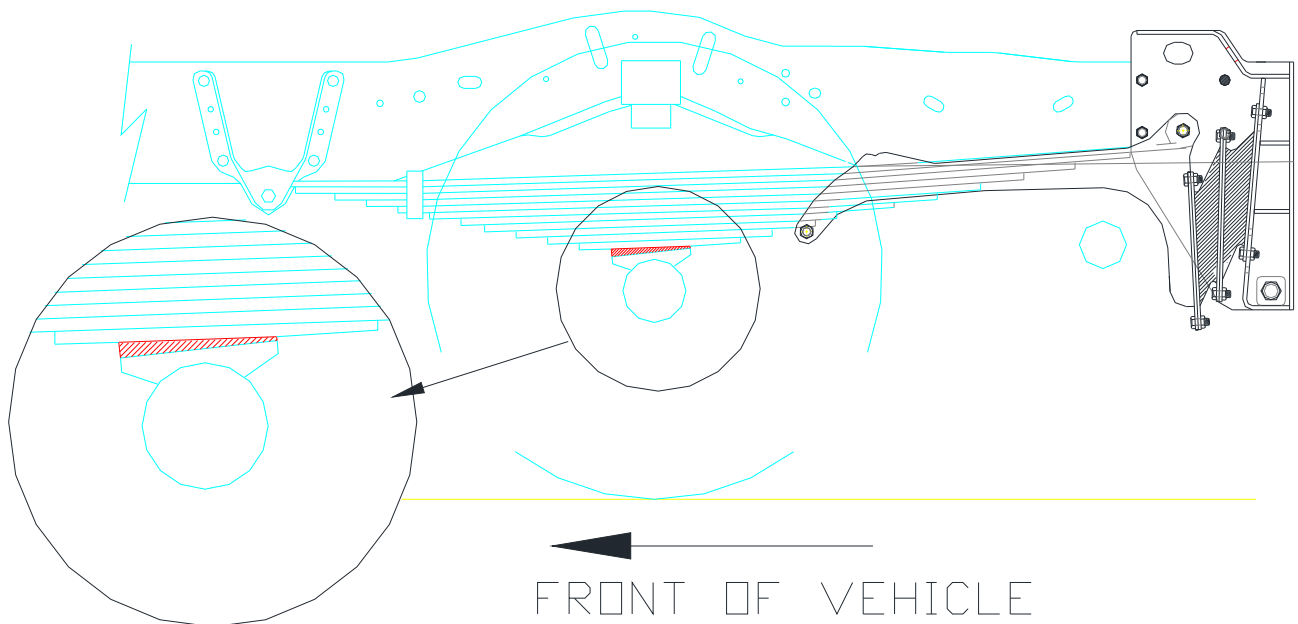
Below are some guidelines.

Axle shims are not included in the kit.

- Loosen the spring U-bolt nuts.
- Lift the chassis by the frame rail until the shim can be slid over the centering pin.
- To lower the axle angle (as shown in the example), the thicker part of the shim should be toward the front of the vehicle. The nose of the axle will go down.
- Lower the chassis and tighten the U-bolt nuts.

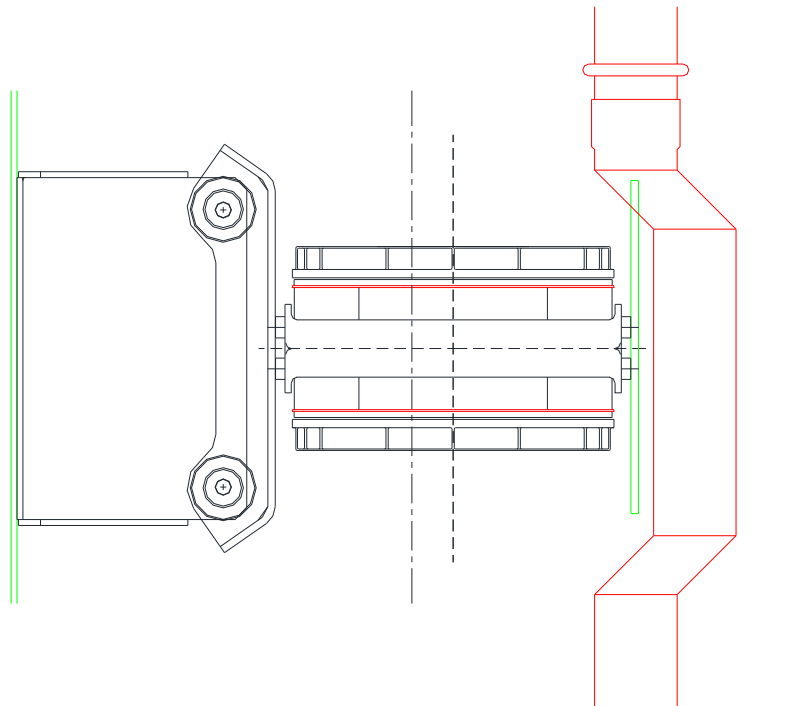
Caution:

- 1) Only steel shims with a hole (not a slot) for the spring pack bolt head should be used to avoid deterioration and breakage over time.
- 2) Make sure the head of the shim pack bolt protrudes above the top of the shim with sufficient height to fit properly into the spring seat hole. In some cases the spring pack bolt will need to be replaced with a taller head or the shim will need to be bolted to the shim pack with the head of the spring pack bolt above the shim. This may require a longer spring pack bolt to be used along with a special shim with a hole the correct size for the spring pack bolt.



2.8 EXHAUST MODIFICATION

Modify the exhaust to go around the Telma (for example four 45° bends).



SECTION 3 CONTROL SYSTEM COMPONENTS INSTALLATION

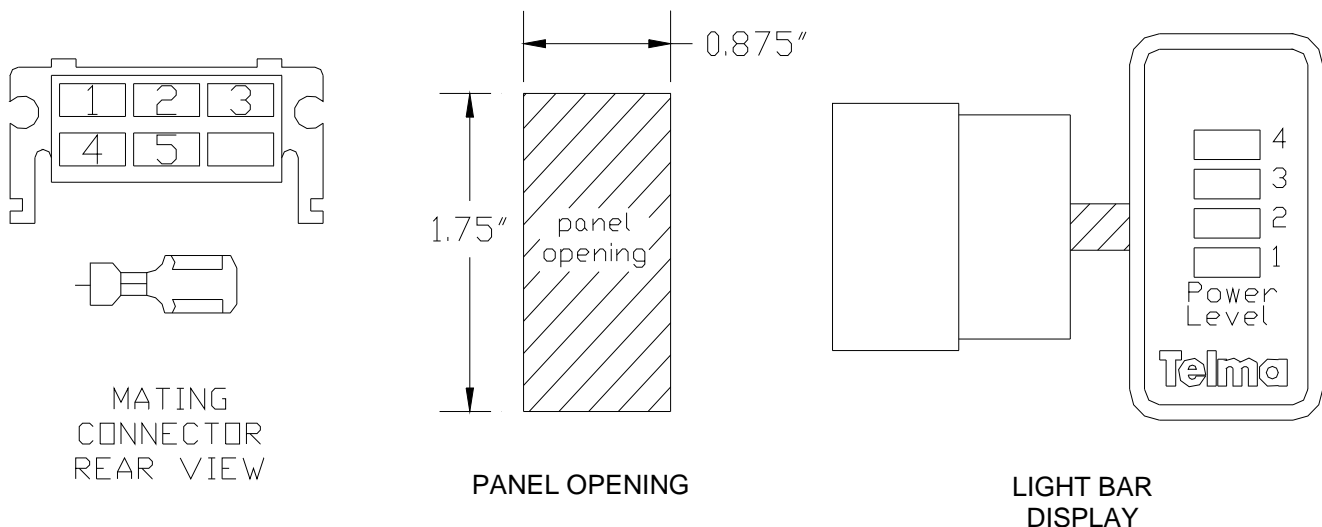
3.1 RELAY BOX MOUNTING

- Install the relay box on the inside of the driver side frame rail forward from the Telma and down approximately 3 1/2", from the top of the frame rail using the relay box mounting brackets TIB01017 x 2 and fasteners supplied in the kit.
- Tighten the four 5/16" bolts to 17 lb-ft ($\pm 10\%$) and the two 1/2" bolts to 75 lb-ft ($\pm 10\%$).



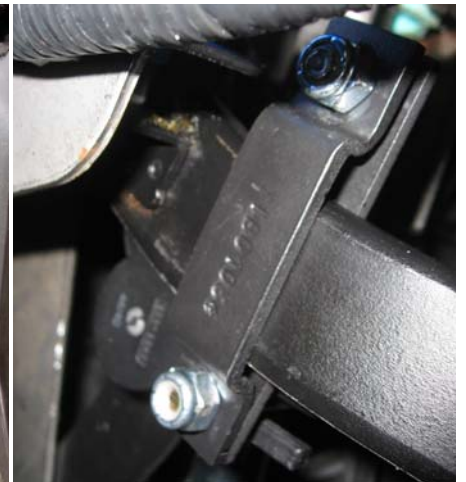
3.2 LIGHT BAR INSTALLATION

- The Light Bar TIG11010 should be mounted so that it is easily visible to the driver.
- Make a rectangular hole, 7/8" wide x 1 3/4" tall.
- Find the white female AMP receptacle and install the org/wht, blu,wht, yel/grn, brn/wht, blk wires in the control harness coming from the relay box harness equipped with the long male blade terminals into positions 1, 2, 3, 4, 5, respectively.
- Feed the harness through the hole in the dash where the light bar TIG11010 will be installed.
- Connect light bar mating connector to the harness and install the light bar into the hole in the dash.



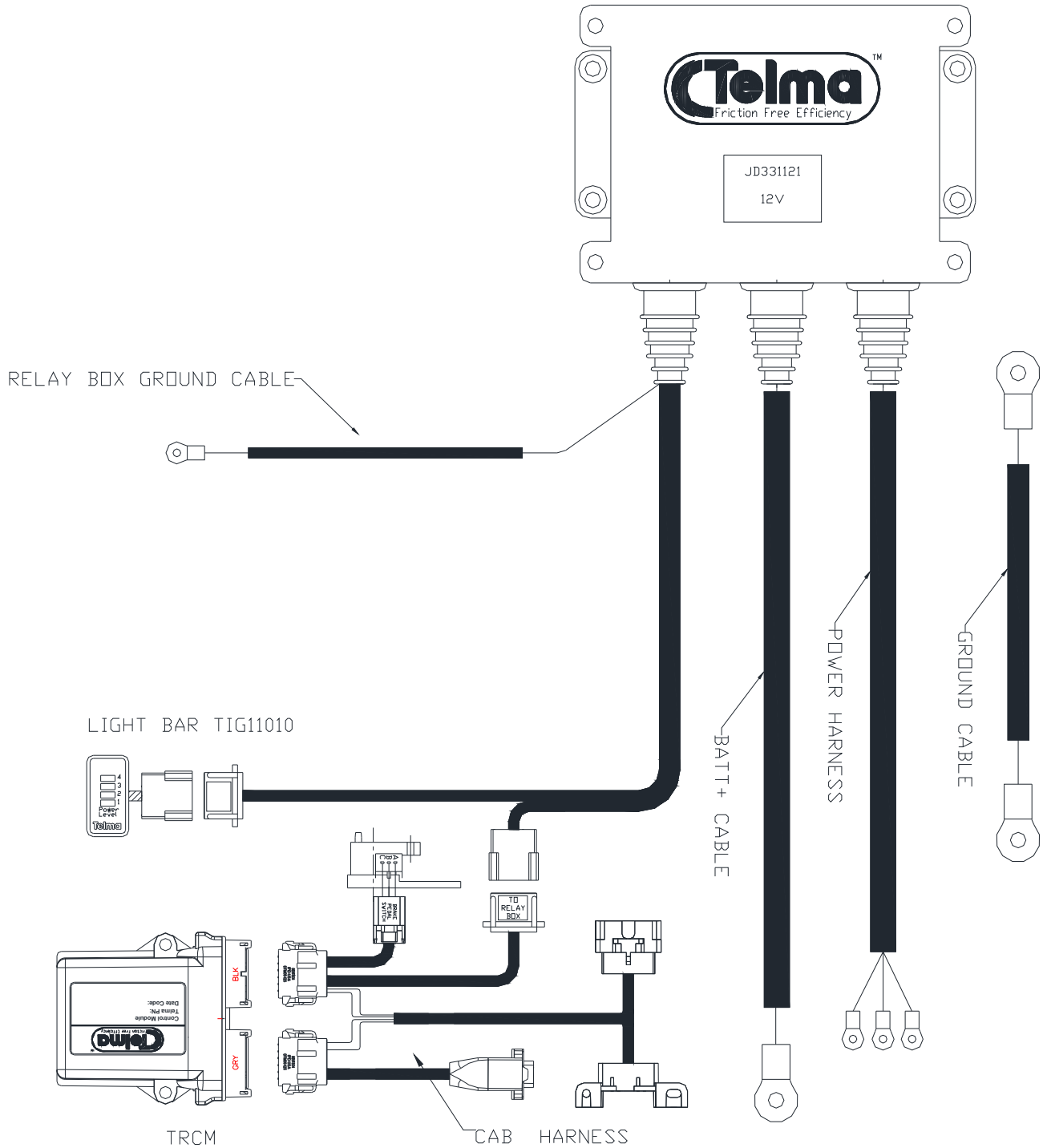
3.3 TRCM & FOOT CONTROL SWITCH INSTALLATION

- Mount the Telma Control Module to the stud mounted to the top of underside of the dash using bracket TIB03100.
- Install the rotary foot switch bracket TIB01036 to the lower right pedal cluster mounting stud as shown below.
- Install the pedal clamp TIB01034 and pedal bracket TIB01035 to the brake pedal as shown below. Use one ¼" x .75" long bolt (TIF05004) and one ¼" x 2" long bolt (TIF01065). The 2" long bolt will be installed closest to the firewall and is used to actuate the foot switch. Engage the switch actuator arm on the bolt as you slide the pedal clamp up. Nylon insert nuts (TIF01066) and one standard nut (TIF05004) are included in the kit. Use the standard nut and one nylon insert nut on the long bolt. Use another nylon insert nut on the short bolt for the pedal clamp and bracket assembly. Tighten the ¼" nuts to 12 lb-ft ±10%. Make sure the actuator arm is not binding on the nut.



SECTION 4 WIRING HARNESS INSTALLATION

4.1 HARNESS ASSEMBLY TID15000





4.1 POWER HARNESS INSTALLATION

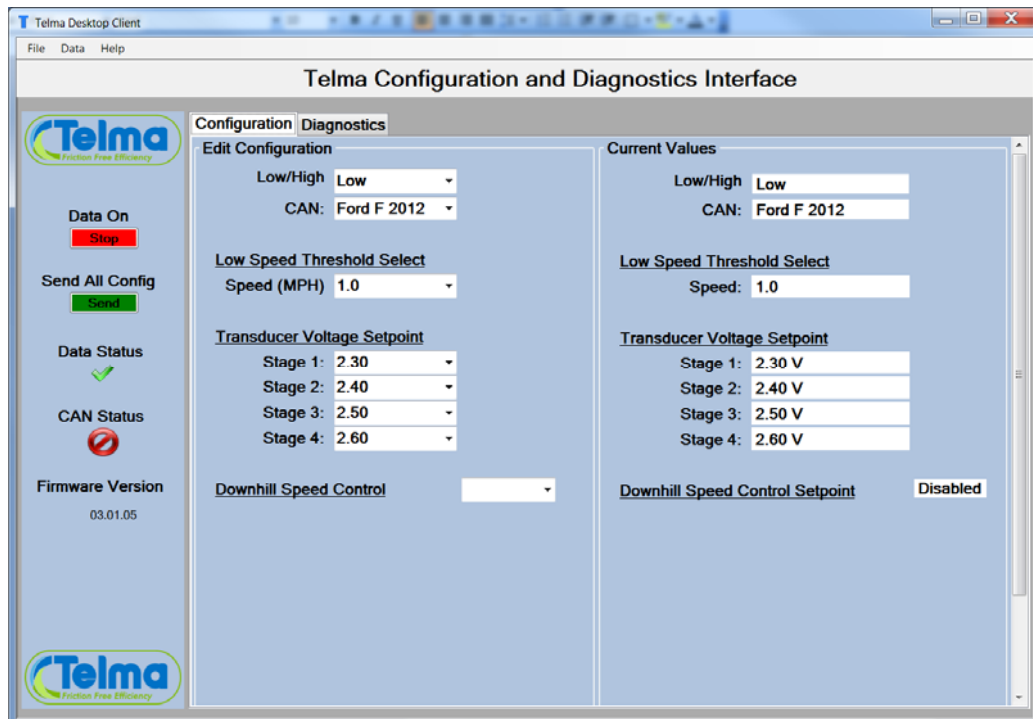
- From the relay box, route the Telma power connection and ground harness along the inside of the frame rail and up over the top along the middle of the Telma.
- Connect the 8G orange, blue, and yellow wires to the connecting block at the top right corner.
- Connect the 8G relay box ground cable and the 2G Telma main ground cable to the insulated ground terminal at the Telma top left corner. Coat the terminals with anti-corrosion paint or body undercoat after the connections are made.
- Secure the harness to the center of the Telma brackets with rubber coated cable clamps. The harness should be secured along the centerline of the Telma and as far away as possible from either rotor to avoid heat damage to the harness. No cables should cross the heat outlets in the periphery of the rotors.
- Connect the black 2G ground cable and to negative terminal of the battery pack or frame mounted battery pack ground point. Secure the cable with rubber coated cable clamps.
- Connect the red 2G power positive cable to the positive terminal of the battery pack or battery disconnect switch. Secure the cable with rubber coated cable clamps.

4.2 CONTROL HARNESS INSTALLATION

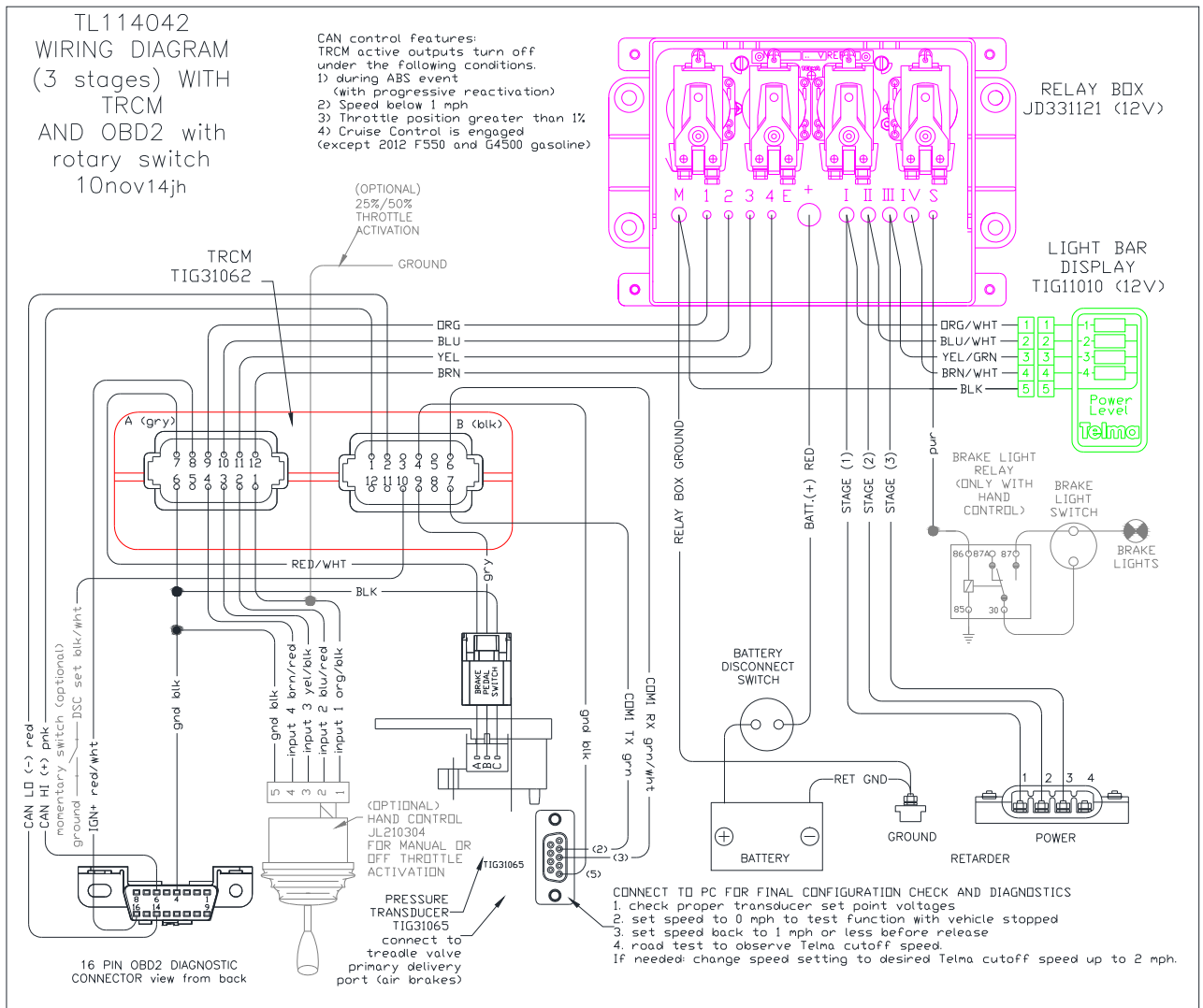
- Follow the OEM harness and route the control harness along the inside of the left frame through the firewall and into the cab on the left side. Connect the main harness to the cab harness at the connector labeled “TO RELAY BOX”.
- Find the Telma Control Module cab harness and plug the two connectors into the Telma Control Module.
- Plug the foot switch connector onto the rotary foot switch.
- Remove the OEM OBD2 diagnostics connector from its attachment points under the dash and plug the mating OBD2 connector of the Telma harness into the OEM OBD2 connector. Secure together with a wire tie. Attach the OBD2 connector of the Telma harness to the OEM attaching points where the OEM OBD2 diagnostics connector was installed.
- Attach the mating connector to the four wires (org, blu, yel, brn) found in the relay box control harness and plug into the cab harness receptacle labeled “to relay box”.
- Install the five wires (org/wht, blu/wht, yel/grn, brn/wht, blk) found in the relay box control harness into the Light Bar mating connector positions 1-5 respectively.
- Feed the harness equipped with the light bar mating connector through the light bar hole and plug in the Light Bar.
- Plug the light bar into the hole.
- After final installation of the wiring, connect the PC to configure the Telma Control Module (TRCM) and check proper function. Unplug the gray connector from the module and reconnect in order to power cycle after a configuration change has been made.

Configuration Settings	Ford F550 shuttle with rotary foot switch
Low/High	Low
CAN	Ford F 2012*
Speed	1.0mph
Set point Stage 1	2.30
Set point Stage 2	2.40
Set point Stage 3	2.50
Set point Stage 4	2.60

* For Ford F Super Duty from model year 2012



4.3 WIRING DIAGRAM



SECTION 5 RECOMMENDED TOOLS

- Transmission Jack
- Heavy duty drill motor
- Standard assortment of mechanics hand tools
- Vehicle hoist, pit, or floor jack with stands
- Electrical connector crimping pliers for use with non-insulated connectors
- Electronic angle meter with 0.1° accuracy (e.g. SPI Pro360 digital protractor)
- Laptop or desktop Windows computer with DB9 serial port or USB-to-serial port adapter TIG01027.
- Straight through DB9 serial cable (male/female)



SECTION 6 INSTALLATION CHECKLIST

- Use checklist TIL05001 to check that correct installation was performed and file in the vehicle records
- Connect the PC to configure the Telma Control Module (TRCM) and check proper function. Unplug the gray connector from the module and reconnect in order to power cycle after a configuration change has been made.

TL105001
REVISED: 13apr12jh
TELMA INSTALLATION CHECKLIST
INSTALLATION REPORT
OBD2 AD50-90 3 stages



CHASSIS # (last 8)	
Telma serial #	
INSPECTION DATE:	
INSPECTION LOCATION:	
INSPECTED BY:	
Customer:	
Body Manufacturer:	
chassis Make / Model:	
engine:	
Wheelbase:	
Telma installed by:	

PHYSICAL CHECKS

The following checks should be made after the installation is completed. A copy of the completed inspection report should be kept in the vehicle file.

INSPECTION COMMENTS

CHECKS	DESCRIPTION	INSPECTION COMMENTS																														
Batteries	The battery pack must consist of 2 batteries connected in parallel equivalent to diesel OEM capacity.																															
Telma Batt "-" and "+" cables	The Telma battery cables (2AWG) must be connected to the terminal of the battery pack or to a remote mounted post connected directly to the post of the battery pack with at least a 2AWG cable. Protect the connection with anti-corrosion paint or body undercoating.																															
Relay Box	The relay box should be mounted in a vertical position. The relay box should be away from heat sources and moving components to prevent damage. The relay box placement should allow easy removal of the cover for inspection. All harnesses should exit from the bottom of the relay box and be secured with a drip loop.																															
Telma	The power connecting block should be at the top right rear corner of the Telma. The Telma ground terminal should be at the top left front corner of the Telma. Heat sensitive chassis components should be no closer than 4 inches from the Telma rotors. All connections should be protected with anti-corrosion paint or coating. Vent tube or vent valve should be installed before brackets are installed on the Telma																															
Control Module	The Telma Control Module (TRCM) should be located on the Telma bracket under the driver side dash. Connect to the PC to configure and check operation before release. Unplug the gray connector from the module and reconnect in order to power cycle after a configuration change has been made. Refer to TL105087 and TL105088 for product details.																															
Foot Switch	When the brake pedal is in the highest position, the Telma foot switch should be adjusted so that there is a 1/8" gap between the fully compressed foot switch plunger and the pedal bracket. There should be a return spring installed between the foot switch bracket and the pedal bracket in order to maintain the brake pedal in the highest position when released. The Telma foot switch should be oriented so that the wiring connector points up and away from the driver's foot.																															
Indicator Lights	The Telma Light Bar Display should be mounted where it is easily visible to the driver.																															
General Wiring	The control harness and battery connection cables should be secured with cable clamps and routed along the inside of the frame rail wherever possible. All harnesses should be positioned at least 6 inches from exhaust system components or protected with high temperature insulation and heat shields. Avoid sharp edges that could cause damage. At least 3 inches clearance should be maintained from moving or rotating components. Install grommets in holes through sheet metal.																															
Control Harness	The Telma control harness should be routed along the inside of the driver side frame rail from the relay box toward the front of the chassis. It should enter the cab through an existing hole under the driver side stepwell and be routed behind the left kick panel and up under the dash toward the steering column area. Make sure the harness does not interfere with the parking brake mechanism and cannot be damaged when the parking brake is applied.																															
Power Harness	Harnesses connected to the retarder should be positioned along the center of the retarder frame as far away as possible from either retarder rotor and secured to the retarder bracket with rubber-coated metal cable clamps.																															
Drive Shafts	Drive shafts must be equipped with universal joints of the same type as supplied by the OEM. The front drive shaft must be equipped with a slip yoke. When the shaft is installed, the 3" slip should be extended approximately 1 1/2". The rear drive shaft must be equipped with the same type of slip yoke as supplied by the OEM and installed toward the front at the rear of the retarder. When the shaft is installed, the slip should be extended approximately 1 1/2". Front and rear Telma yokes should be in the same plane.																															
Installation drawing Post install Check	Drive shaft lengths and angles should conform to the installation drawing. An electronic anglemeter with 0.1 degree accuracy must be used. Contact Telma for recommendations. all angle measurements are with chassis reference of 0 degrees (zero meter on frame) Check and record measurements and compare to the installation drawing used. Place a copy of this checklist and the install drawing used in the vehicle file	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">TRANSMISSION ANGLE</th> <th style="width: 20%;">ANGLE</th> <th style="width: 20%;">LENGTH</th> </tr> </thead> <tbody> <tr><td>(FRONT SHAFT INSTALLED LENGTH AND ANGLE) L1</td><td></td><td></td></tr> <tr><td>(REAR OR SECOND SHAFT INSTALLED LENGTH AND ANGLE) L2</td><td></td><td></td></tr> <tr><td>(REAR SHAFT IN A THREE SHAFT SYSTEM INSTALLED LENGTH AND ANGLE) L3</td><td></td><td></td></tr> <tr><td>TELMA ANGLE</td><td></td><td></td></tr> <tr><td>(outside top of frame to lower chassis bracket hole) T1</td><td></td><td></td></tr> <tr><td>BOC</td><td></td><td></td></tr> <tr><td>AXLE ANGLE</td><td></td><td></td></tr> <tr><td>Mor-Ryde Suspension (yes/no)</td><td></td><td></td></tr> <tr><td>axle shims installed (yes/no)</td><td></td><td></td></tr> </tbody> </table>	TRANSMISSION ANGLE	ANGLE	LENGTH	(FRONT SHAFT INSTALLED LENGTH AND ANGLE) L1			(REAR OR SECOND SHAFT INSTALLED LENGTH AND ANGLE) L2			(REAR SHAFT IN A THREE SHAFT SYSTEM INSTALLED LENGTH AND ANGLE) L3			TELMA ANGLE			(outside top of frame to lower chassis bracket hole) T1			BOC			AXLE ANGLE			Mor-Ryde Suspension (yes/no)			axle shims installed (yes/no)		
TRANSMISSION ANGLE	ANGLE	LENGTH																														
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OPERATIONAL CHECKS																																
Road Test	The four dash lights illuminate progressively when the brake pedal is applied and vehicle is moving. Telma turns off when the brake pedal is released and vehicle is moving. Telma turns off when the vehicle comes to a stop and the brakes are still applied Telma does not activate if the accelerator is pressed Telma does not activate if the cruise control is engaged The four dash lights do not illuminate if the brakes are not applied No vibrations noticed during road test up to speed limit																															

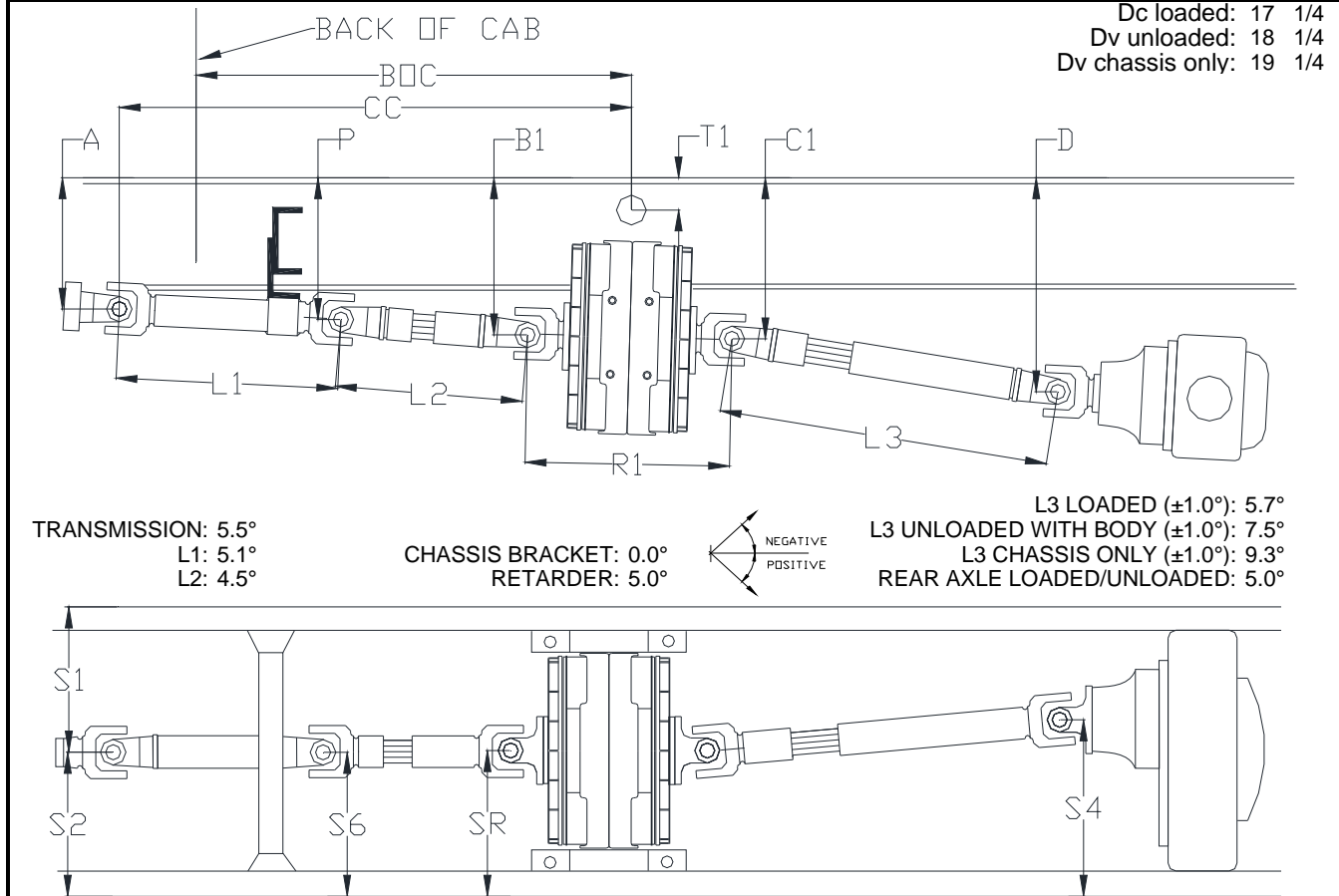


APPENDIX

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	189.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.8L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	5R110	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.



A	B1	C1	P	R1	T1	CC
6 3/8	12 13/16	14	9	14 7/16	4 1/4	85
S1	S2	S4	S6	SR	BOC	
15 3/4	19 1/4	18 3/4	19 1/4	19 1/4	55	

	L1	L2	L3
SHAFT LENGTH	30 1/2	47 9/16	32
SHAFT MIN TUBE DIA	3.00	3.00	3.00
SHAFT MIN TUBE THICKNESS	0.095	0.095	0.095

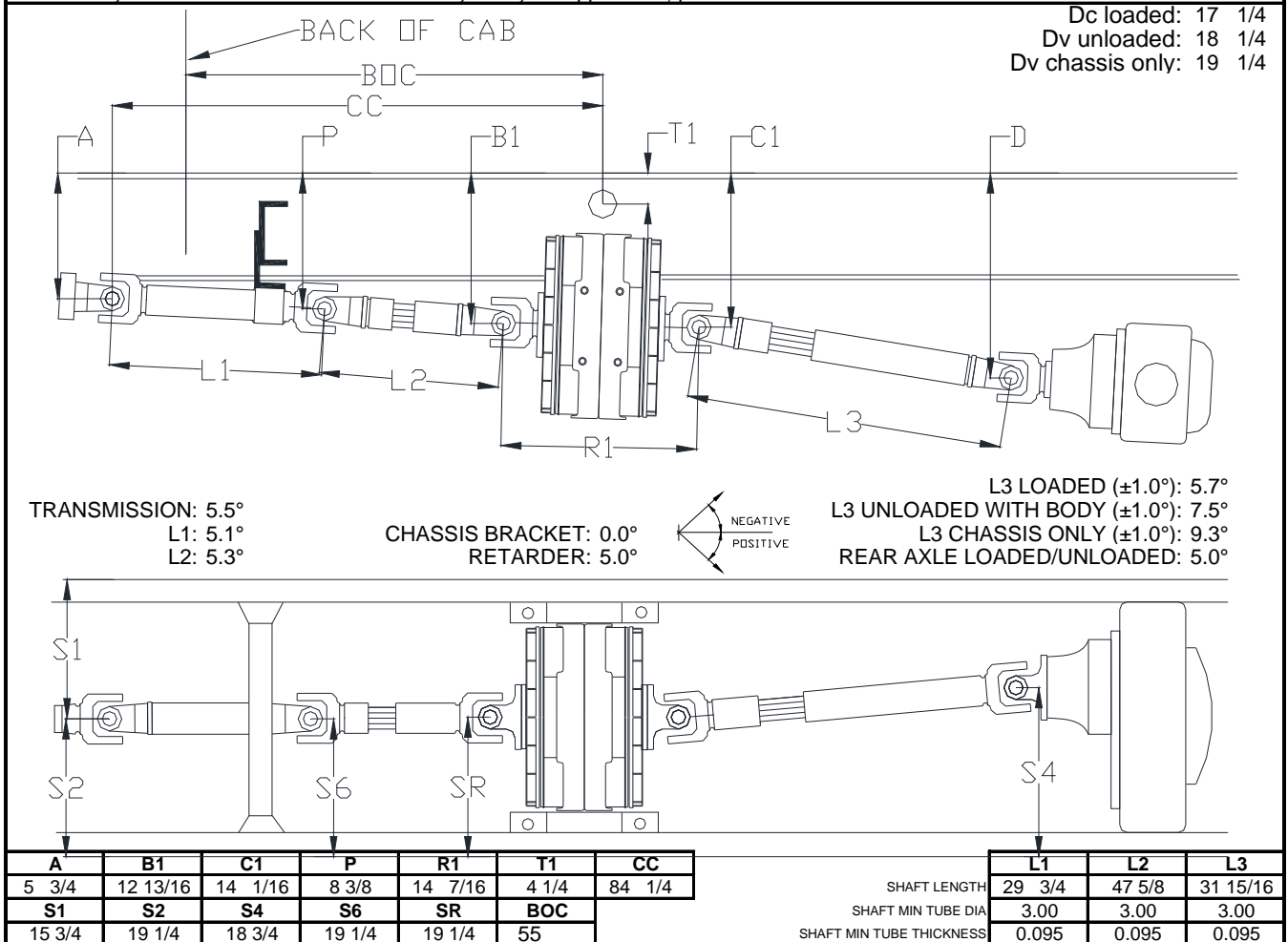
CAUTION:

- back of cab to retarder centerline
- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
- NOTE 2: All drive shafts must be dynamically balanced after modification.
- NOTE 3: Always verify proper shaft lengths before modification
- NOTE 4: When not specified, the front & the rear drive shafts, on each retarder side, must have at least the same slip as the original drive shaft
- NOTE 5: When not specified, the flange yoke on each retarder side must have the maximum working angle capacity available in the driveline series concerned.
- NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**
- NOTE 7: **After installation is completed, measure drive shaft angles and compare to the angles on the installation drawing. Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing**
- NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 9: **USE BRACKET POSITION 3**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 4.5° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 5.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD F550	CUSTOMER:	
WHEELBASE	189.0"	VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD 6.7L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD 6R140	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2	BRAKES	HYD
RETARDER MODEL	AD50-90	ABS	TRW
RETARDER PART NUMBER	BB301158	AXLE RATIO	4.88
RETARDER SERIAL NUMBER		DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT	FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL		SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL		VOCATION	SHUTTLE

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.



CAUTION: back of cab to retarder centerline

NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"

NOTE 2: All drive shafts must be dynamically balanced after modification.

NOTE 3: Always verify proper shaft lengths before modification

NOTE 4: When not specified, the front & the rear drive shafts, on each retarder side, must have at least the same slip as the original drive shaft

NOTE 5: When not specified, the flange yoke on each retarder side must have the maximum working angle capacity available in the driveline series concerned.

NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**

NOTE 7: **After installation is completed, measure drive shaft angles and compare to the angles on the installation drawing. Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing**

NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**

NOTE 9: **USE BRACKET POSITION 3**

NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 5.3° WITH CHASSIS REFERENCE OF 0°**

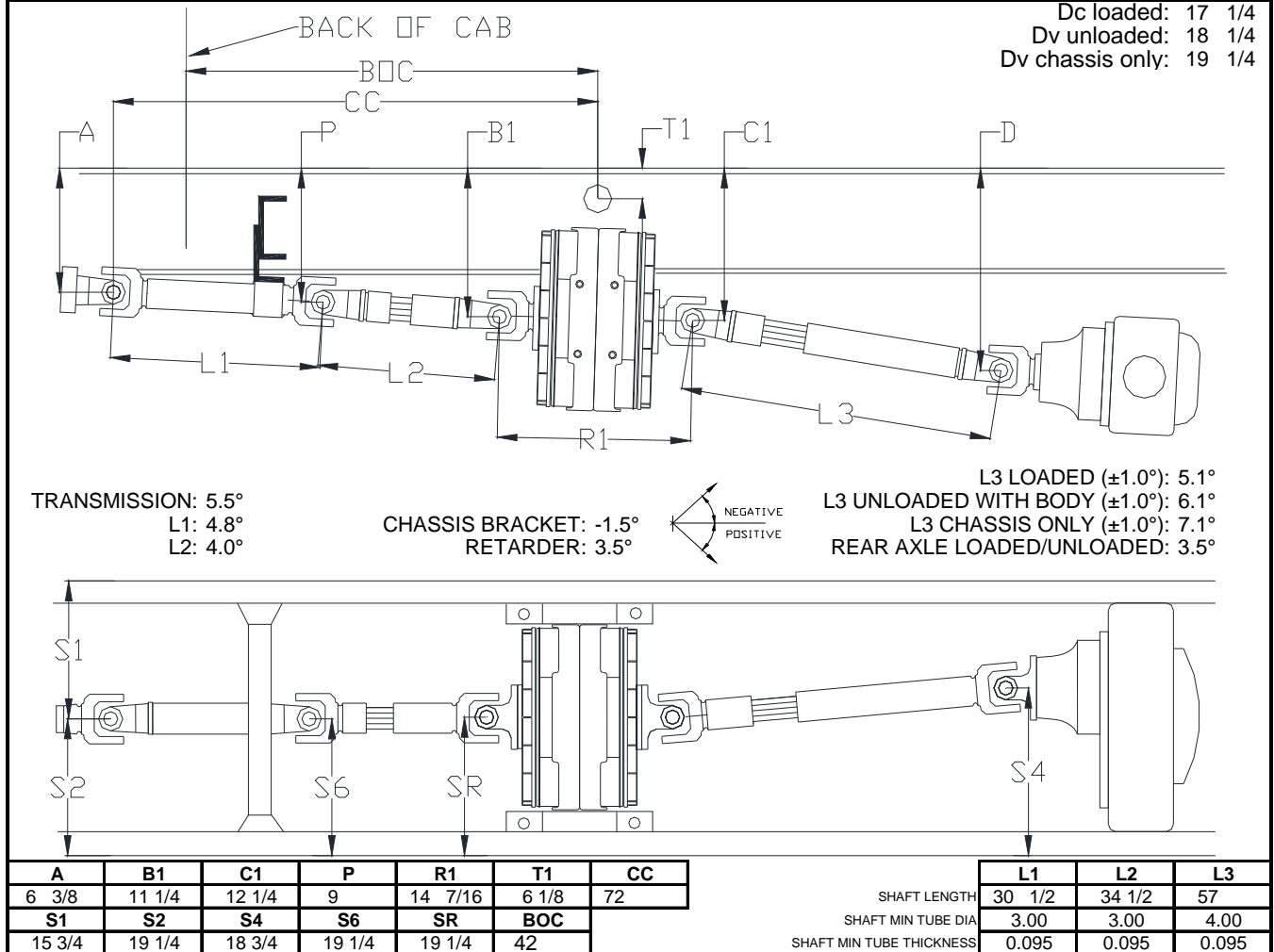
NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**

NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 5.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	201.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.8L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	5R110	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.

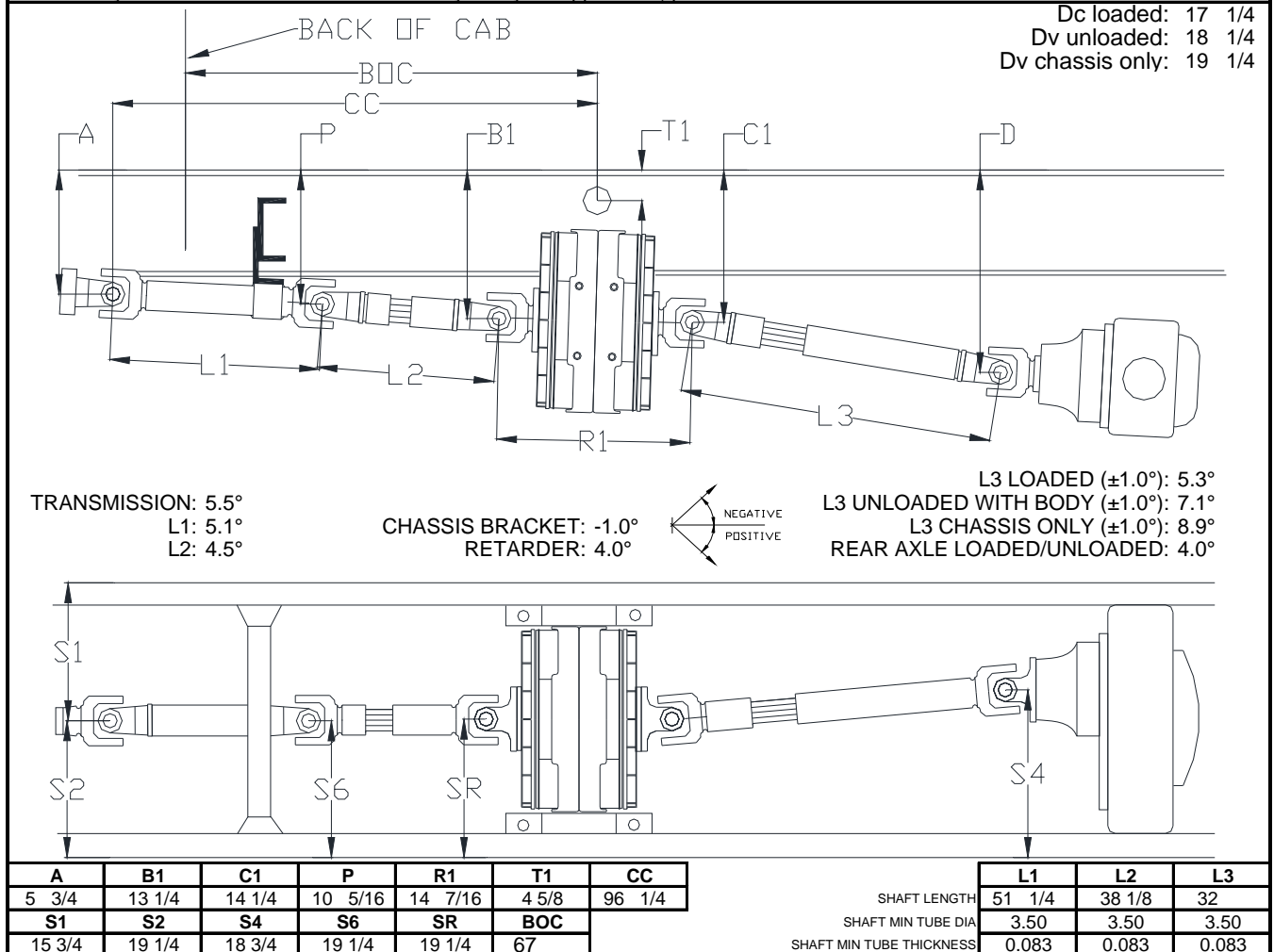

CAUTION:

- back of cab to retarder centerline
- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
- NOTE 2: All drive shafts must be dynamically balanced after modification.
- NOTE 3: Always verify proper shaft lengths before modification
- NOTE 4: When not specified, the front & the rear drive shafts, on each retarder side, must have at least the same slip as the original drive shaft
- NOTE 5: When not specified, the flange yoke on each retarder side must have the maximum working angle capacity available in the driveline series concerned.
- NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**
- NOTE 7: **After installation is completed, measure drive shaft angles and compare to the angles on the installation drawing.**
Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing
- NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 9: **USE BRACKET POSITION 2**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 4.0° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 3.5° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	201.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.7L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	6R140	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.

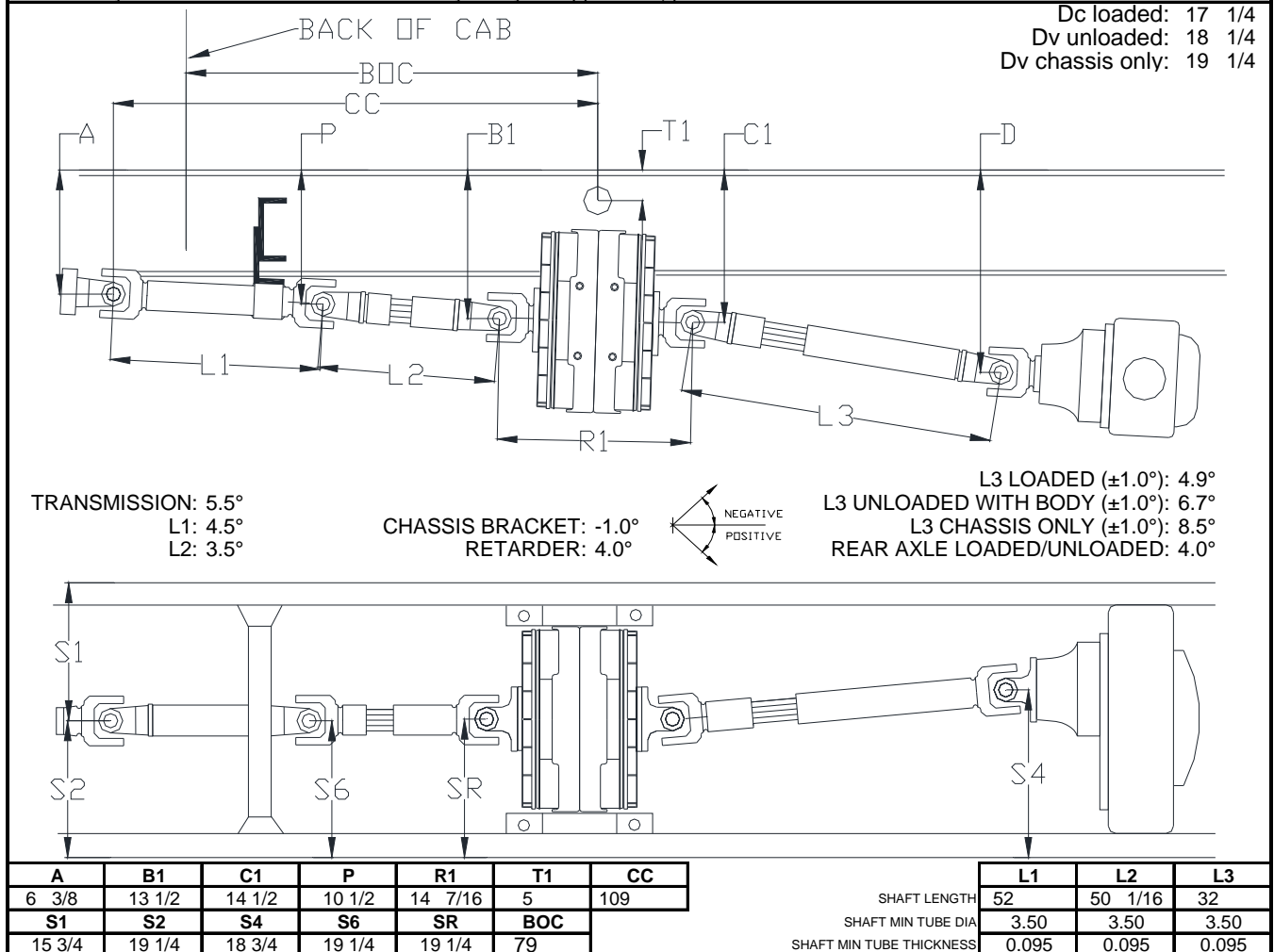

CAUTION:

- back of cab to retarder centerline
- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
- NOTE 2: All drive shafts must be dynamically balanced after modification.
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- NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**
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- NOTE 9: **USE BRACKET POSITION 3**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 4.5° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 4.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	213.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.8L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	5R110	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.

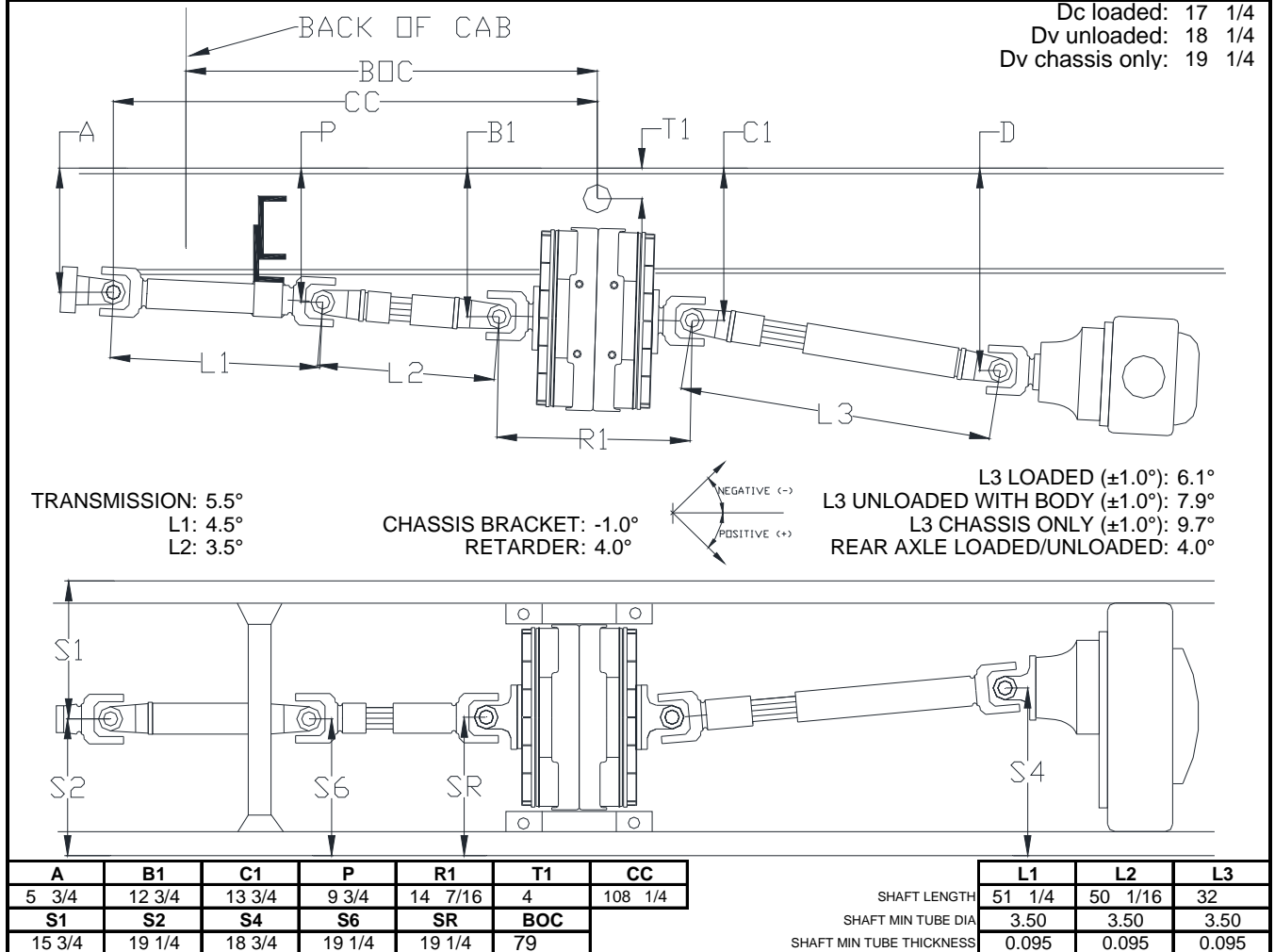

CAUTION:

- back of cab to retarder centerline
- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
- NOTE 2: All drive shafts must be dynamically balanced after modification.
- NOTE 3: Always verify proper shaft lengths before modification
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- NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**
- NOTE 7: **After installation is completed, measure drive shaft angles and compare to the angles on the installation drawing.**
Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing
- NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 9: **USE BRACKET POSITION 3**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 3.5° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 4.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	213.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.7L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	6R140	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.



Dc loaded: 17 1/4
Dv unloaded: 18 1/4
Dv chassis only: 19 1/4

TRANSMISSION: 5.5°
L1: 4.5°
L2: 3.5°

CHASSIS BRACKET: -1.0°
RETARDER: 4.0°

L3 LOADED (±1.0°): 6.1°
 L3 UNLOADED WITH BODY (±1.0°): 7.9°
 L3 CHASSIS ONLY (±1.0°): 9.7°
 REAR AXLE LOADED/UNLOADED: 4.0°

A	B1	C1	P	R1	T1	CC	L1	L2	L3
5 3/4	12 3/4	13 3/4	9 3/4	14 7/16	4	108 1/4	51 1/4	50 1/16	32
S1	S2	S4	S6	SR	BOC		SHAFT LENGTH		
15 3/4	19 1/4	18 3/4	19 1/4	19 1/4	79		SHAFT MIN TUBE DIA	3.50	3.50
							SHAFT MIN TUBE THICKNESS	0.095	0.095

CAUTION: back of cab to retarder centerline

NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"

NOTE 2: All drive shafts must be dynamically balanced after modification.

NOTE 3: Always verify proper shaft lengths before modification

NOTE 4: When not specified, the front & the rear drive shafts, on each retarder side, must have at least the same slip as the original drive shaft

NOTE 5: When not specified, the flange yoke on each retarder side must have the maximum working angle capacity available in the driveline series concerned.

NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**

NOTE 7: **After installation is completed, measure drive shaft angles and compare to the angles on the installation drawing. Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing**

NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**

NOTE 9: **USE BRACKET POSITION 3**

NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 3.5° WITH CHASSIS REFERENCE OF 0°**

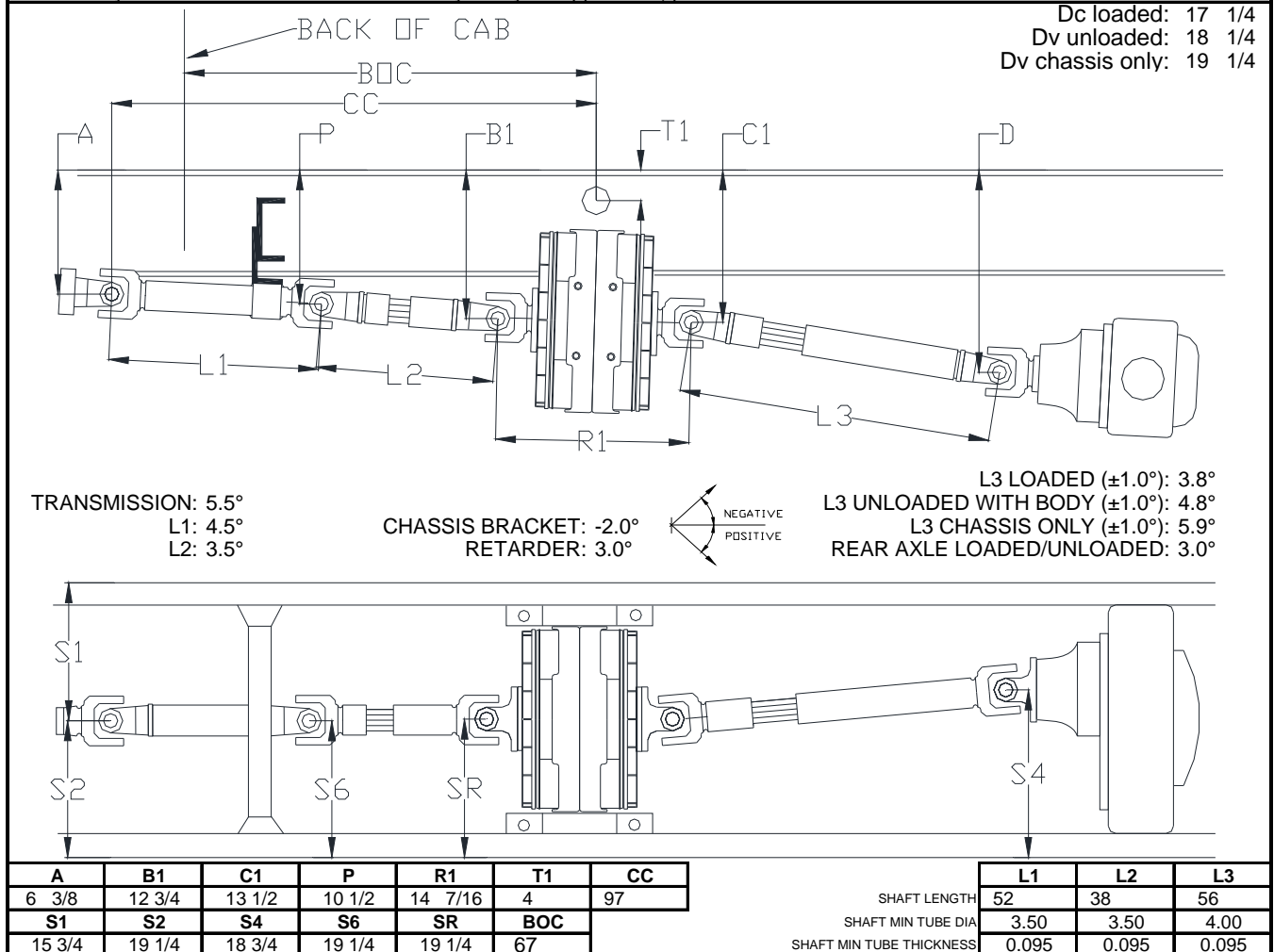
NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**

NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 4.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	225.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.8L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	5R110	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.

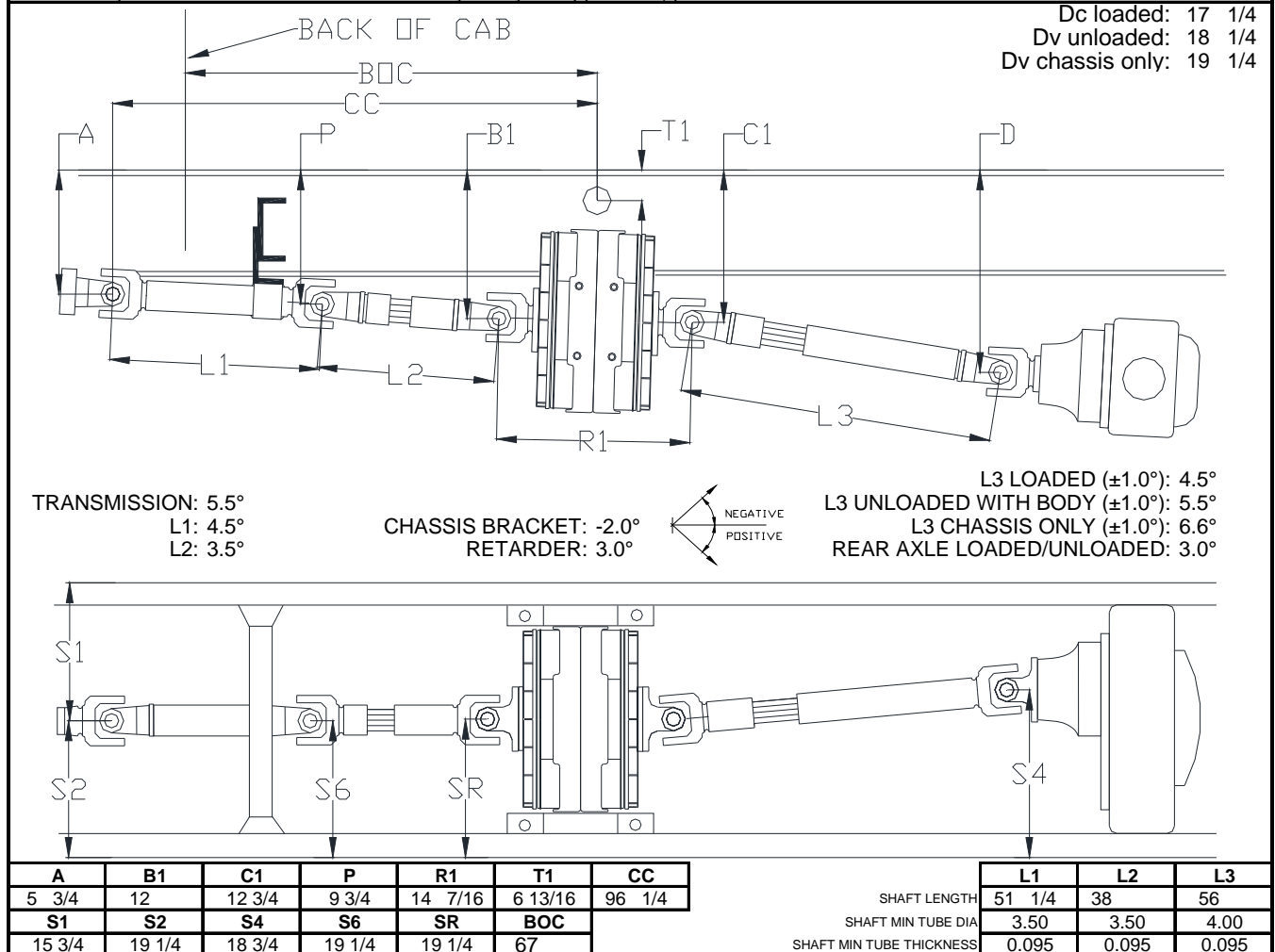

CAUTION:

- back of cab to retarder centerline
- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
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- NOTE 5: When not specified, the flange yoke on each retarder side must have the maximum working angle capacity available in the driveline series concerned.
- NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**
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Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing
- NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 9: **USE BRACKET POSITION 3**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 3.5° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 3.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	225.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.7L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	6R140	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

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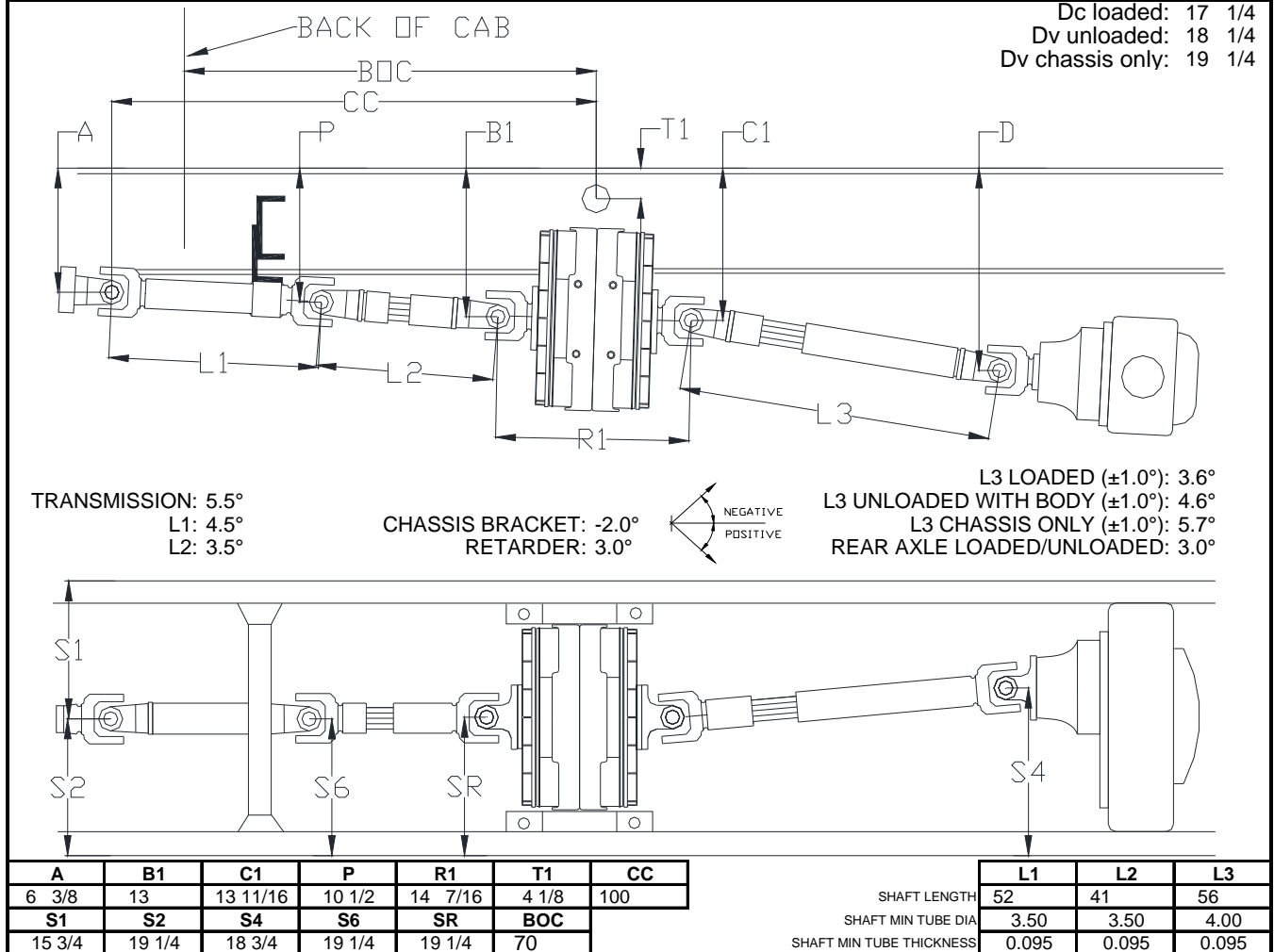

CAUTION:

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- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
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- NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**
- NOTE 7: **After installation is completed, measure drive shaft angles and compare to the angles on the installation drawing.**
Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing
- NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 9: **USE BRACKET POSITION 2**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 3.5° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 3.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	228.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.8L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	5R110	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.

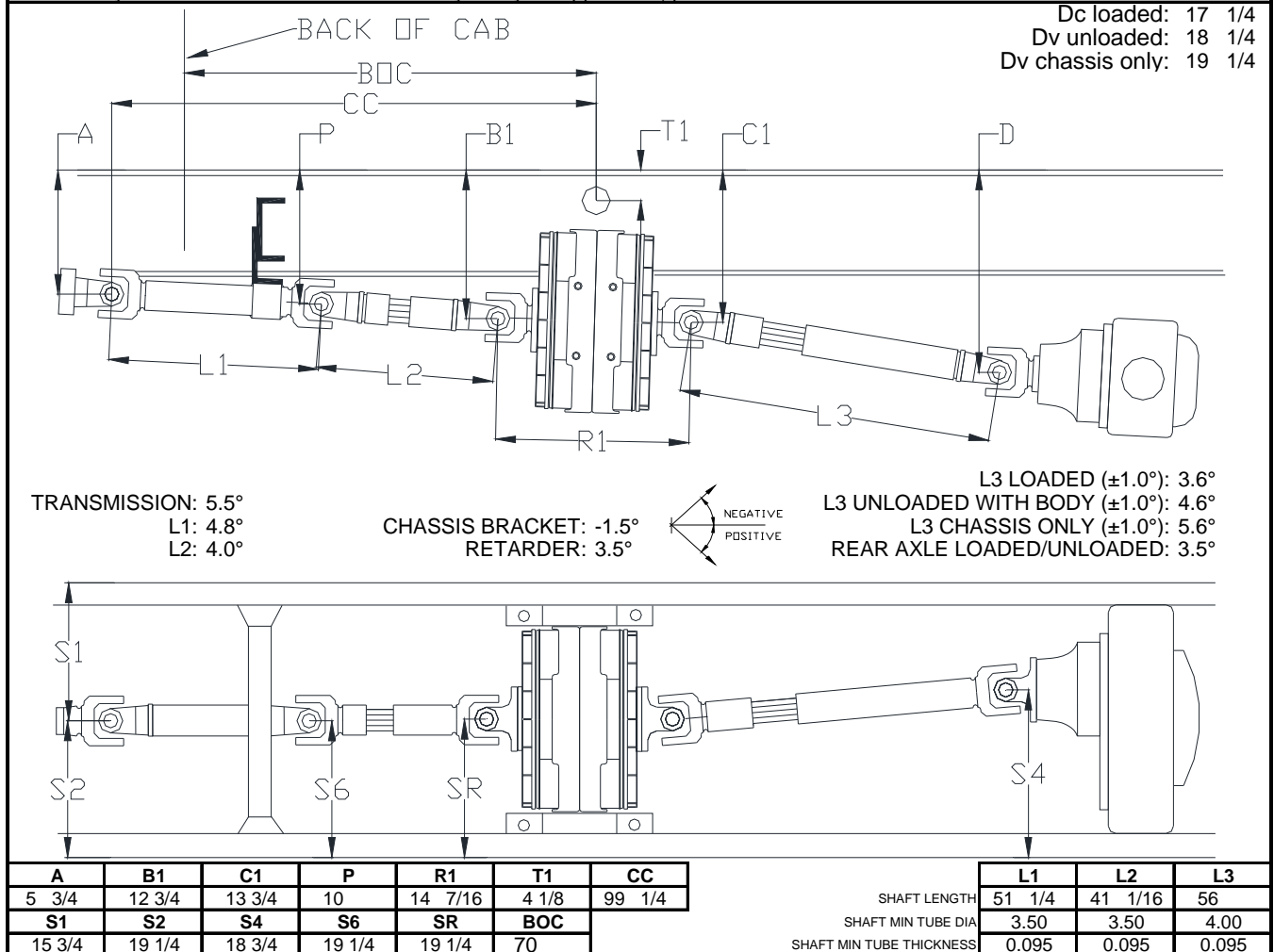

CAUTION:

- back of cab to retarder centerline
- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
- NOTE 2: All drive shafts must be dynamically balanced after modification.
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- NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 9: **USE BRACKET POSITION 3**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 3.5° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 3.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	228.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.7L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	6R140	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

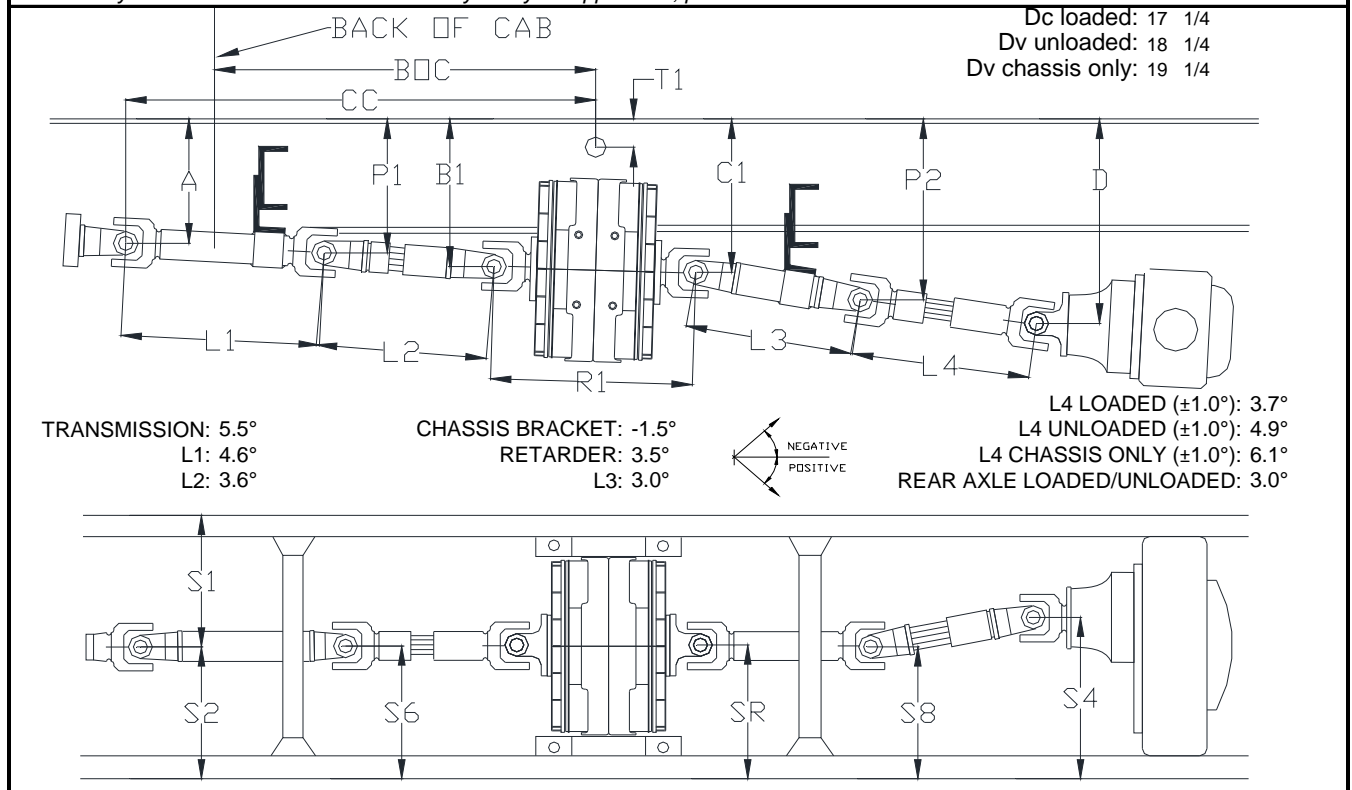
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CAUTION:

- back of cab to retarder centerline
- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
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Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing
- NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 9: **USE BRACKET POSITION 3**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 4.0° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **IF NECESSARY ADJUST AXLE ANGLE TO 3.5° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA				
CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	233.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.8L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	5R110	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4x2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-479
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	shuttle

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.



A	B1	C1	P1	P2	R1	T1	CC					
6 3/8	11 3/4	12 3/8	8 13/16	14 1/8	14 7/16	6 3/8	82	SHAFT LENGTH	L1	L2	L3	L4
S1	S2	S4	S6	S8	SR	BOC		SHAFT MIN TUBE DIA	30 1/2	44 1/2	31	48
15 3/4	19 1/4	18 3/4	19 1/4	19 1/4	19 1/4	52		SHAFT MIN TUBE THICKNESS	3.00	3.50	3.00	3.50
									0.095	0.095	0.095	0.095

CAUTION:

NOTE 1: L1, L2 and L3 are measured from center of U-joint and are installed lengths. back of cab to retarder centerline angle tolerance=±0.2° dimension tolerance=±1/16"

NOTE 2: All drive shafts must be dynamically balanced after modification.

NOTE 3: When not specified, the front & the rear drive shafts, on each retarder side, must have at least the same slip as the original driveshaft.

NOTE 4: When not specified, the flange yoke on each retarder side must have the maximum working angle capacity available in the driveline series concerned.

NOTE 5: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**

NOTE 6: **USE RETARDER BRACKET POSITION 2**

NOTE 7: **ADJUST FIRST SHAFT (L1) TO 4.6° WITH CHASSIS REFERENCE OF 0°**

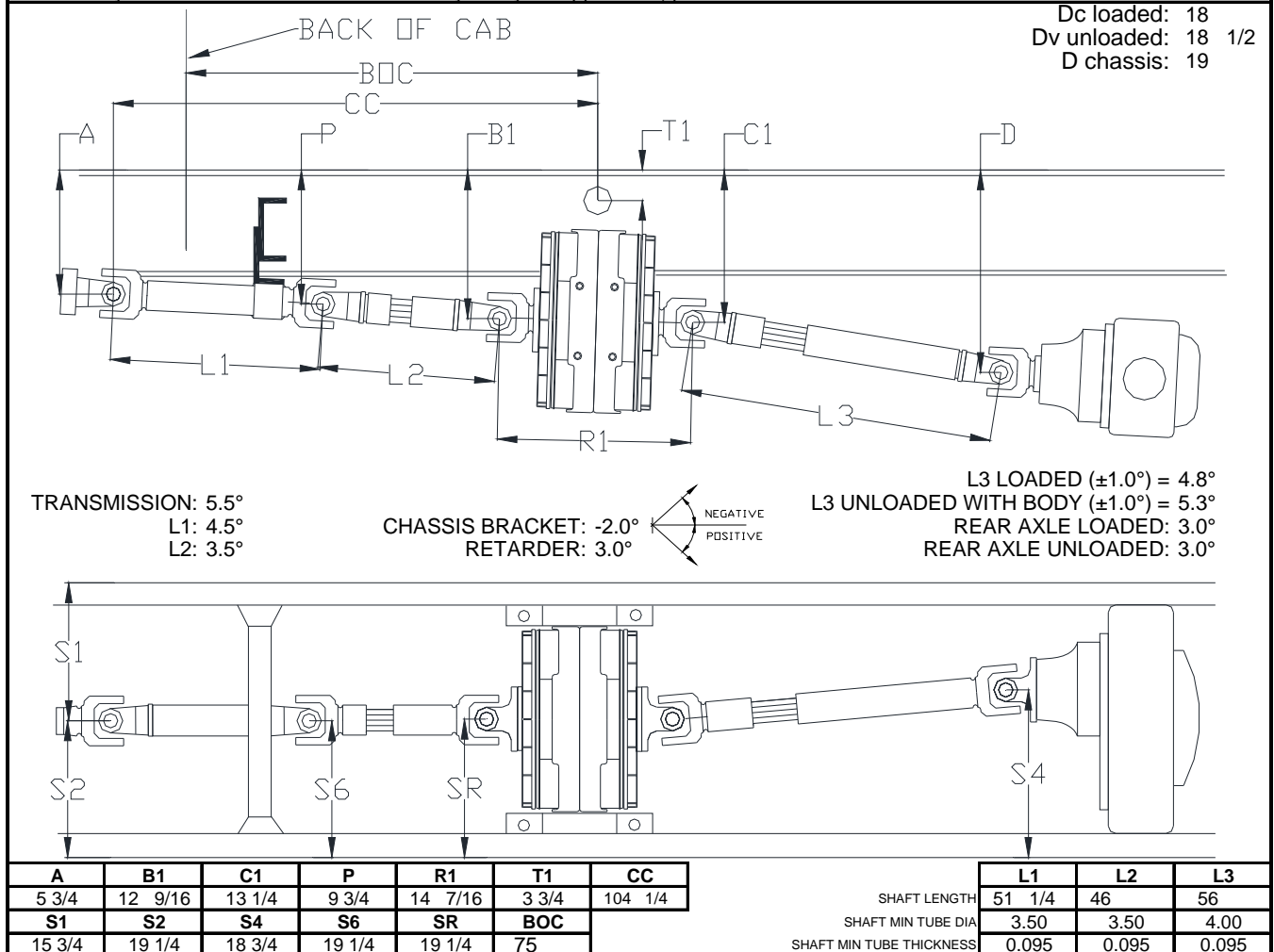
NOTE 8: **ADJUST THIRD SHAFT (L3) TO 3.0° WITH CHASSIS REFERENCE OF 0°**

NOTE 9: **IF NECESSARY ADJUST AXLE ANGLE TO 3.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA

CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	233.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.7L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	6R140	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4X2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-499
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	SHUTTLE

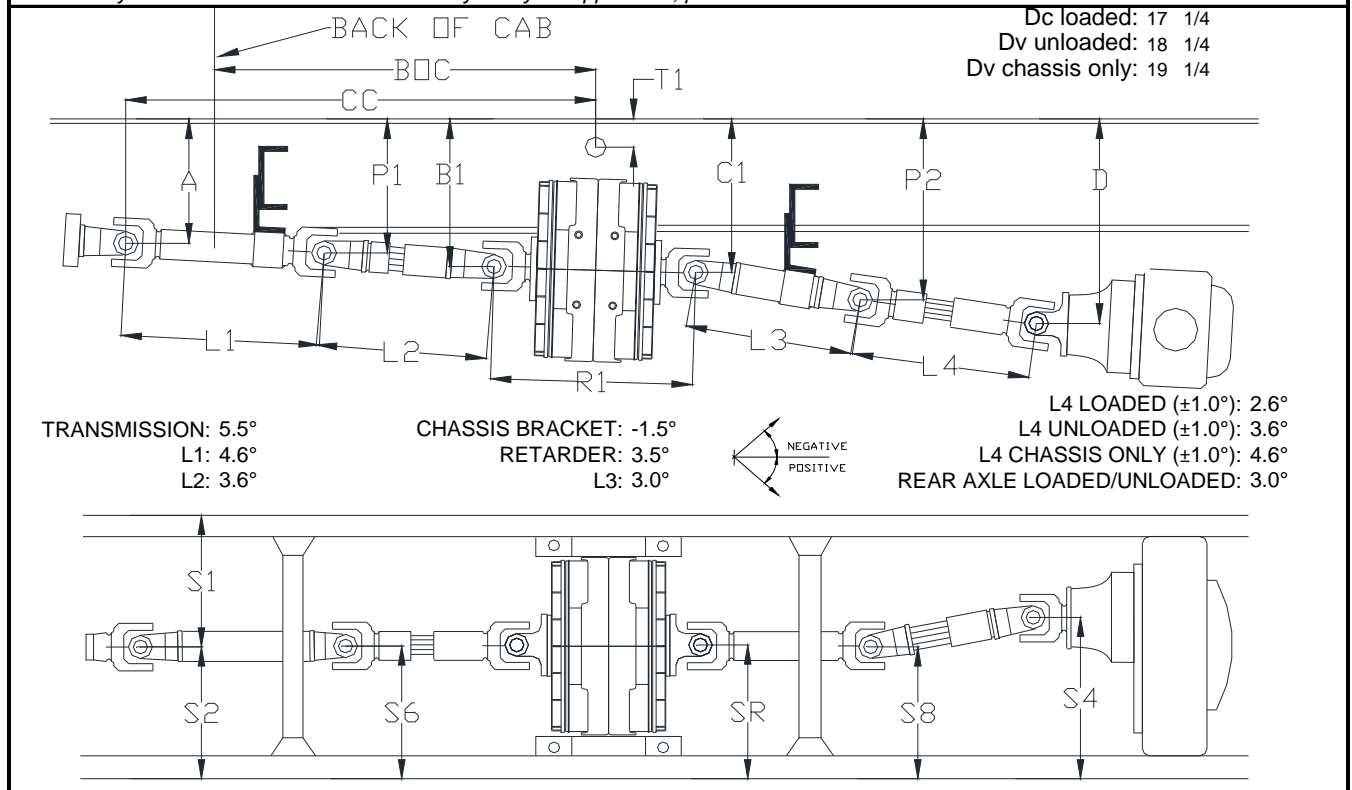
Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.


CAUTION:

- back of cab to retarder centerline
- NOTE 1: Drive shaft lengths are measured from center of U-joint and are installed lengths. angle tolerance=±0.2°
dimension tolerance=±1/16"
- NOTE 2: All drive shafts must be dynamically balanced after modification.
- NOTE 3: Always verify proper shaft lengths before modification
- NOTE 4: When not specified, the front & the rear drive shafts, on each retarder side, must have at least the same slip as the original drive shaft
- NOTE 5: When not specified, the flange yoke on each retarder side must have the maximum working angle capacity available in the driveline series concerned.
- NOTE 6: **Adjust Telma angle to angle indicated by rotating chassis bracket**
- NOTE 7: **After installation is completed, measure drive shaft angles and compare to the angles on the installation drawing.**
Contact TELMA Customer Support Engineering if the angles measured do not conform to the drawing
- NOTE 8: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 9: **USE BRACKET POSITION 3**
- NOTE 10: **ADJUST CARRIER BEARING SO THAT SECOND SHAFT (L2) IS 3.5° WITH CHASSIS REFERENCE OF 0°**
- NOTE 11: **ADJUST CARRIER BEARING SO THAT SECOND U-JOINT OFFSET IS 1 3/4"**
- NOTE 12: **CHECK AFTER BODY IS INSTALLED AND IF NECESSARY ADJUST AXLE ANGLE TO 3.0° WITH CHASSIS REFERENCE OF 0°**

VEHICLE TECHNICAL DATA				
CHASSIS MAKE / MODEL	FORD	F550	CUSTOMER:	
WHEELBASE	252.0"		VEHICLE NUMBER	
ENGINE MAKE / MODEL	FORD	6.8L	SPEED SWITCH / INTERFACE	
TRANSMISSION MAKE / MODEL	FORD	5R110	TIRE SIZE	225/70R-19.5
AXLE MAKE / MODEL	DANA	S130	GVW / GCW	19500 lbs
DRIVE TYPE	4x2		BRAKES	HYD
RETARDER MODEL	AD50-90		ABS	TRW
RETARDER PART NUMBER	BB301158		AXLE RATIO	4.88
RETARDER SERIAL NUMBER			DRIVE LINE SERIES	1480
RETARDER CONTROL SYSTEM	FOOT		FLANGE YOKE	3-2-479
MILEAGE AT TIME OF INSTALL			SUSPENSION TYPE	SPRING
HOURS AT TIME OF INSTALL			VOCATION	shuttle

Note: If any of the above mentioned factors vary with your application, please call our TECHNICAL DEPARTMENT.



A	B1	C1	P1	P2	R1	T1	CC					
6 3/8	11 3/4	12 3/8	8 13/16	14 9/16	14 7/16	6 3/8	82	SHAFT LENGTH	L1	L2	L3	L4
S1	S2	S4	S6	S8	SR	BOC		SHAFT MIN TUBE DIA	30 1/2	44 7/16	40	58
15 3/4	19 1/4	18 3/4	19 1/4	19 1/4	19 1/4	52		SHAFT MIN TUBE THICKNESS	3.00	3.50	3.50	4.00
									0.095	0.095	0.095	0.095

CAUTION: back of cab to retarder centerline angle tolerance=±0.2°
dimension tolerance=±1/16"

- NOTE 1: L1, L2 and L3 are measured from center of U-joint and are installed lengths.
- NOTE 2: All drive shafts must be dynamically balanced after modification.
- NOTE 3: When not specified, the front & the rear drive shafts, on each retarder side, must have at least the same slip as the original driveshaft.
- NOTE 4: When not specified, the flange yoke on each retarder side must have the maximum working angle capacity available in the driveline series concerned.
- NOTE 5: **USE MOUNTING BRACKETS TIB05055, TIB05056, TIB06001, TIB06002**
- NOTE 6: **USE RETARDER BRACKET POSITION 2**
- NOTE 7: **ADJUST FIRST SHAFT (L1) TO 4.6° WITH CHASSIS REFERENCE OF 0°**
- NOTE 8: **ADJUST THIRD SHAFT (L3) TO 3.0° WITH CHASSIS REFERENCE OF 0°**
- NOTE 9: **IF NECESSARY ADJUST AXLE ANGLE TO 3.0° WITH CHASSIS REFERENCE OF 0°**