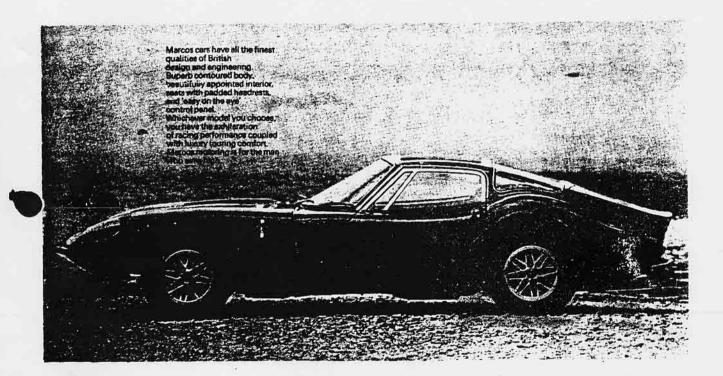


## MARCOS CARS OF AMERICA

## PRE 1971



## MANUAL

55 OAK STREET • ROSWELL, GEORGIA 30075 • (404) 993-7653

## "MARCOS", A LITTLE HISTORY

To anyone who has seen the original "Wooden Wonder" Marcos, it can be difficult to imagine that from such an ungainly vehicle should evolve the sleek and beautiful shape that most people now equate with the name. The story begins in 1959 when Jem Marsh and Frank Costin first met and between them conceived the idea of a car built on a wooden chassis. The result was the strange little car that was raced by a youthful Jackie Stewart in various events, and which interestinly enough still races to this day. In fact the Jackie Stewart car, driven by Jem Marsh himself, has recently won the Historic Group Two Championship, and would seem to be in excellent shape after twenty odd years.

Nevertheless, this car had styling that is best described as unusual, and it had such novelties as a four piece windshield and a great deal of plywood in its construction. By the end of 1960 Frank Costin had left the company, although by this time Dennis and Peter Adams had joined Marsh, Dennis being responsible for styling, and Peter being involved with the intricacies of the wooden chassis that was to become a Marcos hallmark. A move to new premises at Bradford-on-Avon in Wiltshire enabled the company to step up development of the 'Unly Duckling'; gradually the familiar Marcos shape grew out of this, its shapely fiberglass bodywork being designed by Dennis Adams and based on a wooden monocoque chassis. The car continued in this form until 1969 when the wooden chassis was replaced by a tubular steel unit, and then in 1971 production ceased altogether.

The Marcos is a rewarding car to own and drive, although now I must interject a few words on the motive power units and the model range, which are possibly the most confusing aspects of the car. The very first models, from 1964 to 1966, were fitted with the 1800c.c. Volvo engine, and then from 66 to 67 a FORD engine either 1500 or 1650cc was available. Then from 1967 to 1971 a FORD Cortina 1600 GT crossflow engine was used, although it was at about this time that power was increased quite dramatically with the FORD V engines and so on. In fact, between 68 and 71 the 3-litre Ford V-5 was available on the wooden chassis, from 69 to 70

the car was available with the Ford V-4 (although only 40 examples were made), and from 1969 to 1971 the car was available with the 3 litre straight six engine from the Volvo 164.

Bob Boston

This manual is to assist purchasers of Marcos body/chassis units in the completion of their vehicles. We must emphasise that this is only to help you build your vehicle and there are many other parts and ways of fitting the body/chassis units up to road going standards.

Set out below are parts which can be purchased either used and overhauled, or in some cases purchased new through the normal trade channels.

<u>Front suspensions</u> from a Tr Spitfire or GT-6 models. This includes the wish-bone uprights, steering arms, brake discs, calipers and hubs. The shock absorbers and springs cannot be used.

Steering column Triumph Spitfire or GT-6. Preferably the later type which has the 3 position light switch. This must be complete with the top mounting brackets and all clamps and fittings, right down to the rack and pinion on the vehicle concerned.

Rack and Pinion these can be taken off of any Spitfire or GT-6. Preferably the later type which has a rubber seal between the brackets and the rack. The earlier models had aluminum brackets and are not so desirable.

Checks to be made on the used parts. Obviously, if you are using used parts you must check every item very carefully and insure that everything is cleaned and oiled, and repacked with grease in the case of the front hubs.

Front Suspension Bottom trunnions are very often worn, due entirely to lack of maintenance. These are shown on figure D. The calibers should be carefully checked for leaks. New rubber seals for these are easily obtained if need be. Wishbone bushings are normally satisfactory but should be checked also.

The brake discs should not be too badly corroded. The vertical link on the front suspension, in conjunction with the trunnion, should also be checked for any undue wear.

Rack and Pinion The rack and pinion should be carefully checked for any tight spots. These normally give very little trouble but would be advisable to strip the rack and clean it out and repack with the appropriate grease. The ball joints on the end of the rack should be checked and replaced if necessary.

Rear Axle if using rear axle other than supplied by Marcos, You should check for bearing and oil seal leakage which could leak onto brake shoes. In the rear of this manual is a diagram of the Marcos rear suspension set up. The brackets must be attached correctly and by electric welding other than gas welding which might cause axle shaft heat distoration. You would also have to change rear brake drum bolt pattern to match the front as in figure A.

The front suspension fits right onto the Marcos frame using the nuts and bolts as listed in our nut and bolt sheet in the rear of this manual. The spring and shock should be fitted with the adjusting screw at the bottom, using the correct bolts.

The rack and pinion steering should be bolted on the chassis using the standard Triumph brackets and rubbers.

The rear axle should be fitted with the 4 radius rods. The adjustable radius rod to be fitted last and adjusted to suit the correct length between the axle bracket and the chassis. The panhard rod can then be fitted. (Refer to figure H) Fit it to the chassis first then onto the axle. The panhard rod must be adjusted to insure that the back plates of the axle, on both sides, are the same distance away from the main chassis tubes. The spring/shock units are fitted with the adjusting screw on the bottom.

**c**nsure that the lock nuts on the adjustable radius rod and Panhard rod are done up really tight.

Having fitted the front and rear suspension and modified the axle halfshafts in regard to the bolt pattern for the rear wheels, you can now fit your wheels.

Fit master cylinders, these are Girling 3/4 inch bore with an adjustable rod and vertical reservoirs, to pedal carriage. Fit flexible hoses to suit onto cylinders and to steel brake lines, via a suitable bracket in order to support them, see drawing (B). The brakes can now be bled. It is best to bleed them once then let them set overnight, and then you can bleed them again to ensure there is no air in the lines.

Having already your handbrake (from Cortina), cut a hole in the floor to accept the moving part of the brake and bolt onto the support bracket underneath(as in Marcos chassis drawing). Fit the Marcos handbrake cable to the moving part of the handbrake, using the cable and clevis pin supplied. The other end of the cable fits to the compensating mechanism of the rear axle.

It is very often better to hear the engine you have chosen running before you buy it. If possible drive the car to ensure it has good oil pressure and does not smoke from the oil filler cap. Thouroughly check and clean all engine accessaries (starter, alternator, etc.) to minimize any chance of failure at future dates.

The engine can be installed in the Marcos with all the accessories mounted with the exception of the exhaust manifolds which should be left off until later.

Exhaust manifolds for the 2800cc V-6 Ford engine are special and can be supplied from Marcos. The 1600 cc Cortina and 1500cc Cortina are also special and can be supplied by Marcos. The Triumph TR-6 and the Volvo 6 cylinder engine both use their standard manifolds. The exhaust system can be custom made or supplied by Marcos.

Connect the fuel line to pump using a suitable 3" length of flexible tubing ensuring there is no leakage. Connect the other end to the fuel tank.

To connect up the wiring of the car, thoroughly study the wiring diagram. Take great care with all connections, nothing is more frustrating than an unreliable wiring system.

Next, mount ignition coil in a suitable place on the chassis as near the distributor as possible and connect it up.

Fit a suitable flexible line to the clutch slave cylinder and make sure slave cylinder is mounted firmly via bracket to bellhousing. Then run brake line to pedal carriage to be connected to clutch mastercylinder and bleed air out.

To obviate the cost of a new radiator, the Ford 2800cc V-6 radiator can be used after modifing bottom outlet to clear steering rack. Many other radiators can be used if size permits but should be mounted so ton of radiator leans forward. It is recommended that an electric fan be used rather than the stock engine fan. Numerous fans are suitable for this such as the Flex-a-lite fan which bolts directly onto the radiator. Convoluted flexible radiator hose should be used for cooling system.

A suitable driveshaft must be used according to what engine and rear axle you have used and can be made up from parts of the original driveshaft then cut and balanced. Or these driveshafts can be supplied by Marcos if you give us the specifications you require.

The brackets on the top end of the Spitfire steering column concerned can be used and bolted onto one of the three positions on the dashboard to suit driver. An angle bracket is needed to carry out this operation(see drawing F). The bottom fitting of the special Marcos universal joint in the steering must be fitted carefully ensuring that the angles are not too sharp, thus making the steering tight. It is essential that the two pinch bolts holding the Marcos universal joint assembly to rack and pinion are fitted so that they go through the grooves in the rack shaft and the Marcos special assembly correctly.

To fit Fuel Tank use special bracket shown in figure F in this manual.

We recommend fitting, then removing the door and frames before painting the car to minimize damage to paintwork. Fit the quarterwindow and dropglass rubbers into windowframe. Fit quarterwindow into rubbers and secure with small brackets (shown in Figure G). Fit the window regulator channel onto dropglass using an old innertube between the two, ensuring the bracket does not touch the frame when fitted. Slide the dropglass complete with channel into frame and tape into position to facilitate fitting. Fit the frame complete with glasses into the door shell. Trim the door to ensure that the frame fits into the aperature with an even gap all the way around. Drill and fix the front and the back edge of frame to door. Close the door and adjust the top frame edge either in or out by moving the bottom of the frame. When an even gap is obtained, bolt the frame to bottom of door. The frames should now be removed and doors painted . Refit the frames after painting car by same proceedure as above. Fit window motor and regulator, ensuring that the wires are on the motor as these are fairly inaccessible after motor is fitted. Connect all the wires for the window motors and switches. Move the dropglass into the full up position and mark the regulator gear tooth nearest the gearwheel. Repeat the procedure in the down position. Fill the gap between the relevant teeth with weld as shown in figure G2.

Fit door lock as shown in drawing  $\underline{\text{H2}}$ . Fit locks and striker plates using bolts listed. These door mechanisms are from MGB or TR-6. Use control rods modified from the same vehicle and the interior handles. Fit the outer door push button and fix brackets as in drawing H2 (MGB trunklatch)

Fit trunk hinges and trunk lid. Fit hinge brackets to rear bulkhead. Attach the hinges to the bracket and adjust to fit. In some cases it may be necessary to bend hinges to suit. Fit the trunk lid stay to the passenger side hinge and to trunk undertray as in drawing G2.

Fit trunk push button lock to back panel. Fit interior lock assembly to back panel and the bracket to the lid. Adjust to fit.

To fit rear windscreen, cut (4) 3" lengths of rear screen rubber supplied and fit onto aperature, 2 forward and 2 rear. Fit the screen into the rear rubbers and mark around the aperature, then grind the screen down to size using a grinding disc on a drill. Periodically check the screen in the aperature until there is an even gap all the way round of approx. 3/8 inch. Then fit the complete rubber into the aperature. Fit the back of the screen first, then the front edge, leaving the sides until last. When screen is fitted, fit the chrome filler strip. The tool used for this is called a Clayton Wright filler strip tool.

Ensure that any holes between the engine compartment and the cabin are effectively sealed. This is as much for noise as for the intrusion of fumes. Before fitting any upholstery, fit iginch sound deadening felt everywhere except the arm rest area adjacent to the door shut. Also felt glued to the inner side of the door skin will considerably reduce noise. Now is time for upholstery which can be done custom or upholstery kits can be ordered from Marcos Cars of America.

If you are using the headlights supplied with the Stage III kit you will also need front side marker turn signal lamps whichare Morris Minor, Austin Healey 3000 MkIII or can be supplied by Marcos.

A rain gutter should be installed to the top, front , and back edge of the door opening. This is a J shaped aluminum channel and should be pop riveted to the body.

Wheels and tires. Previous production Marcos' were fitted with either 175X13 or 185-70X13 on  $5\frac{1}{2}$  inch rims. (Spitfire bolt pattern) We do not recommend any wider than a 6" rim.

After the headlining has been fitted, the interior rear view mirror can be fitted. If you use a screw fitted mirror, you must feel for the wooden block bonded to the roof panel approx.  $\frac{1}{2}$  to 1 inch back from the windscreen opening in the middle. Make sure the screws are not too long and penetrate the roof.

When the inner mudguards have been fitted and prior to painting, the lower scuttle should be lined up to match the line of the hood. To do this close the hoodand the side catches. Using a piece of wood, prop the lower scuttle panel (this is the F/glass part of the body directly underneath the hood latch)until it is directly in line with the side hood line. Then using F/glass cloth and resin obtainable from any bodyshop supply store, laminate the inner mudguard to the inside of the lower scuttle panel and leave overnight to dry properly.

windshield wipers. The wiper motor is a Lucas 14W model with a sweep of 120 degrees. The wheel boxes too are again Lucas part #72879, and the drive rack is standard Lucas. The wiper tubes to use are made up with the ends flared to the following lengths 20".  $10^{1}_{2}$ " with nut  $2^{1}_{5}$ ". Most of these wiper parts are used on British Leyland sports cars such as TR-6 or MGB or can be supplied to you by Marcos Cars of America.

We strongly advise you use some type hood lock for security and safety reasons.

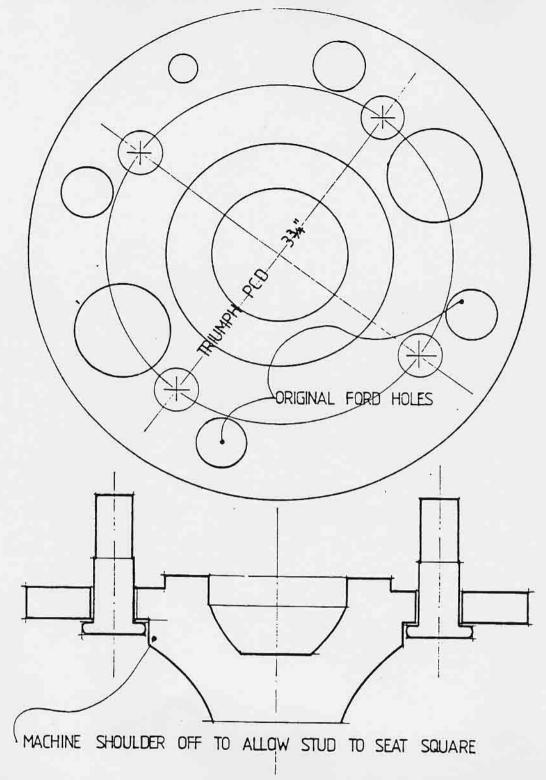
The glove box can be made up to your specs. using pressboard obtainable thru any upholstery shop.

Paintwork. Fiberglass cars are painted in exactly the same way as steel ones, but ensure that there are at least 2 good coats of fiberglass sealer applied before any other paint. The sealer should under no circumstances be rubbed down before priming as this breaks the seal, as its name implies, and could cause problems when applying the color coat. We have found through experience that the car is best painted without any body parts fitted i.e. door frames, locks, screens, bumpers etc..as this ensures that there are no unsightly marks and lines when the masking tape is removed.

Radio Noise Suppression. It must be pointed out that the cheaper radios are always harder to suppress. The antennae must be mounted at the rear of the car and not on the roof or near the engine compartment. A large suppressor should be fitted to the coil so the current runs through it. A smaller suppressor should be fitted to the alternator. In some cases it might be necessary to put a small one on the lead wire to the wiper motor as well. Ordinary cooking foil can be glued to the underside of the hood and should be grounded to the chassis by a wire.

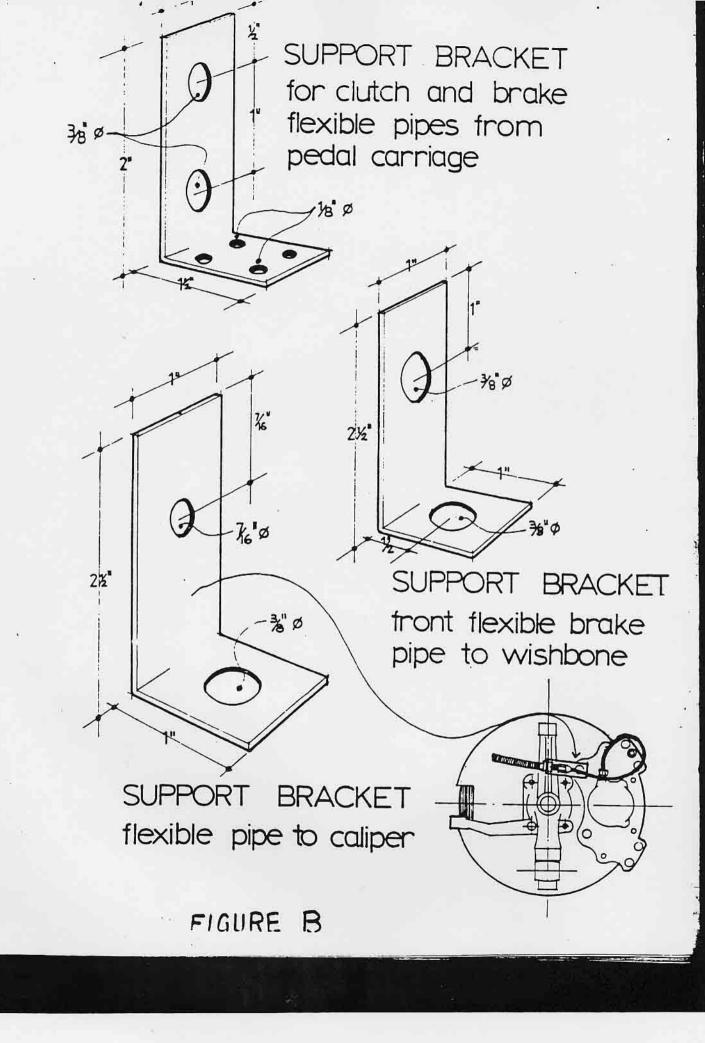
Should you have any difficulty obtaining any of the parts needed to complete your Marcos, we should be able to supply what you need.

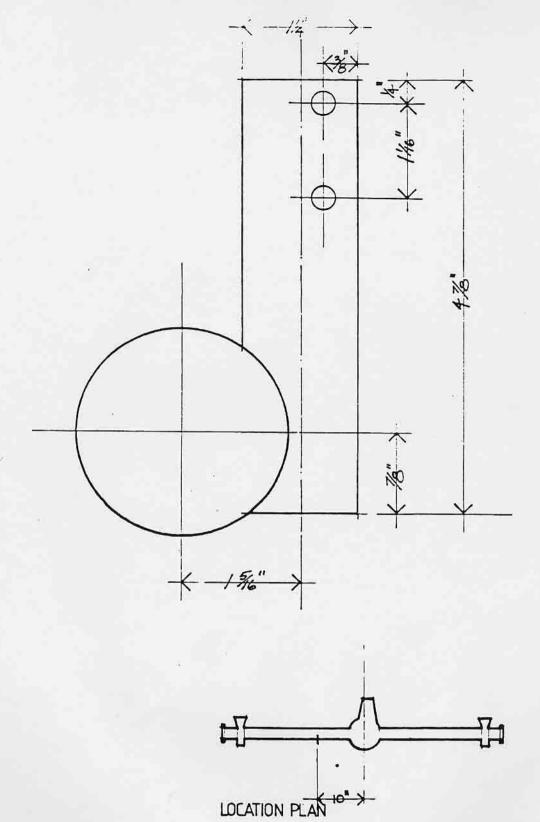
It is clearly understood that Marcos Cars of America cannot be held responsible for any purchasers of body chassis kits who use parts which we do not recommend.



REDRILL BRAKE DRUM THE SAME

HALF SHAFT MODIFICATIONS FIGURE A





HANDBRAKE BRACKET

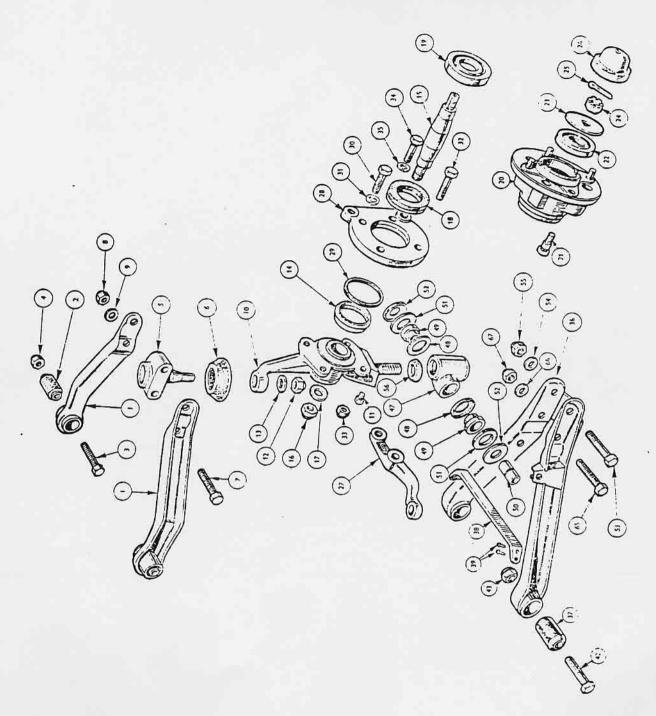
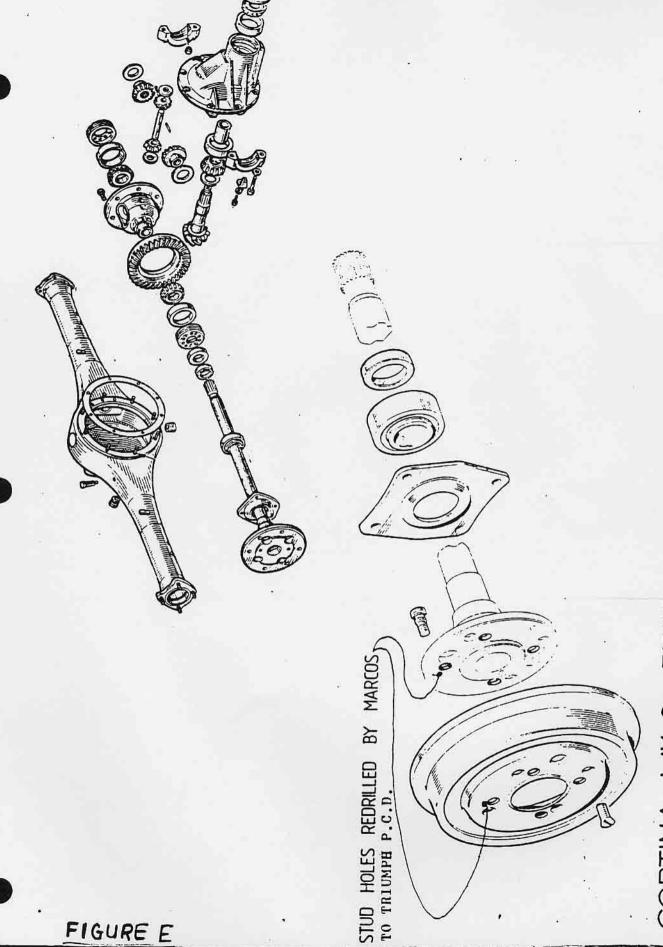
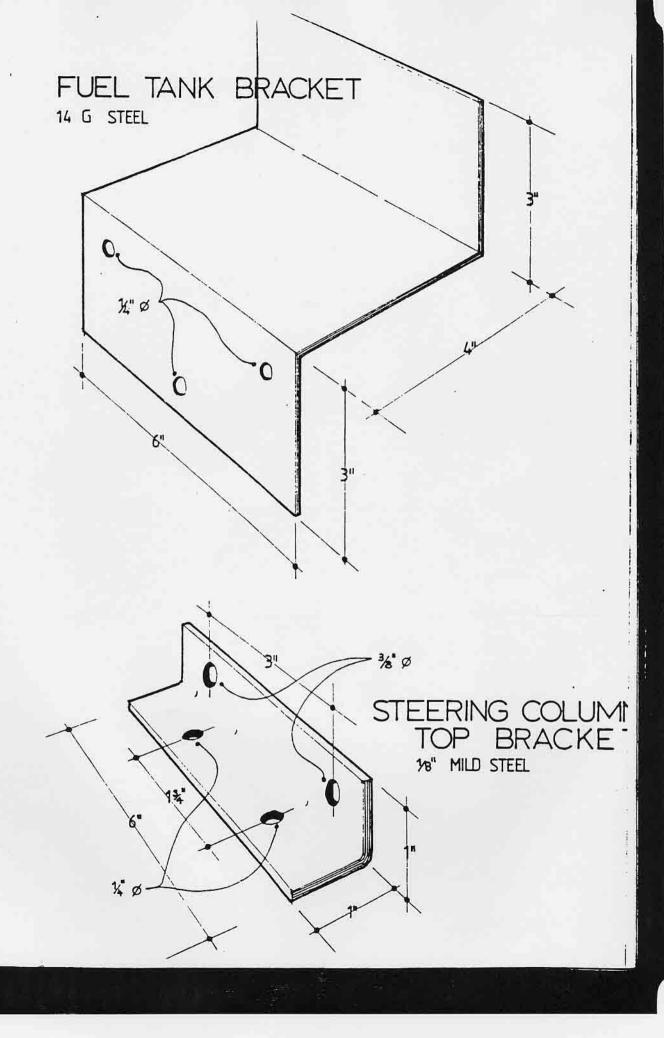


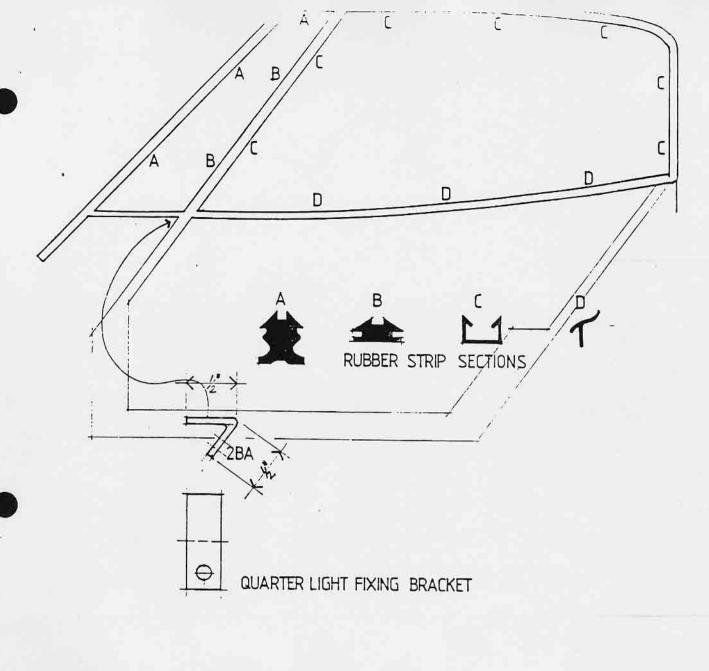
FIGURE D

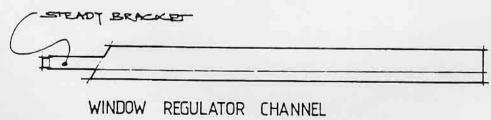


CORTINA MK 2 REAR AXLE AS USED BY MARCOS

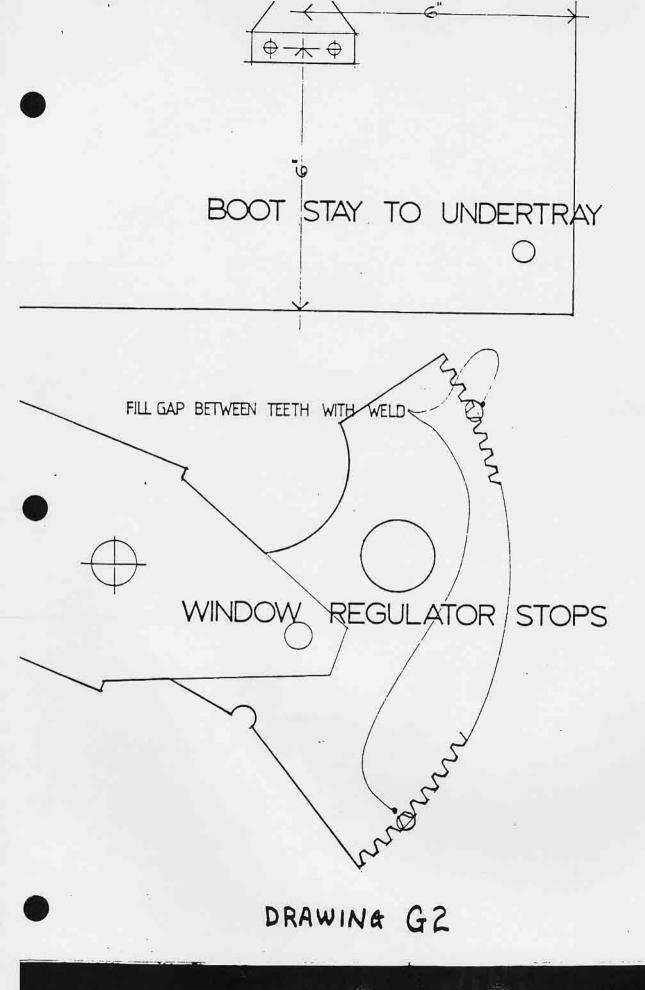
FIGURE E



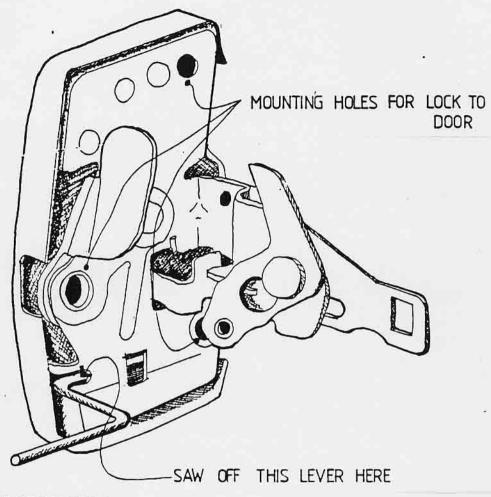




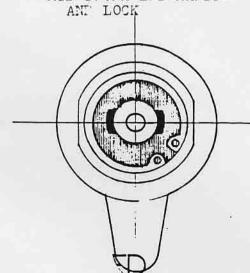
WINDOW FRAME

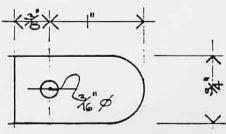


MARCOS REAR SUSPENSION SY ADJUSTABLE ROSE JOINTED PANHARD ROD FIXED LENGTH RADIUS RODS ADJUSTABLE RADIUS ROD -FORD 3L CAPRI OR CORTINA AXLE MODIFIED BY MARCOS SPRING / DAMPER UNIT SPECIAL MARCOS BRACKETS FIGURE

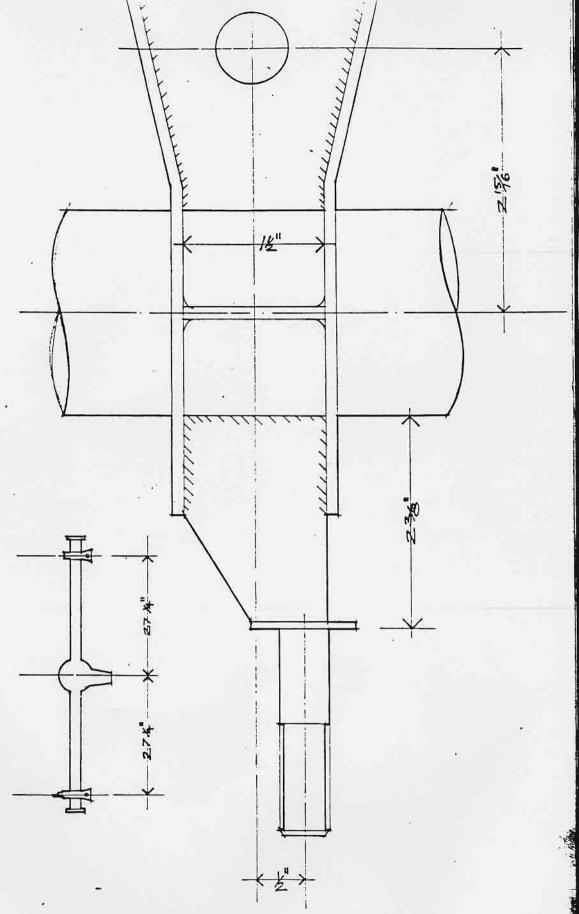


MGE TFUNK LID HANDLE

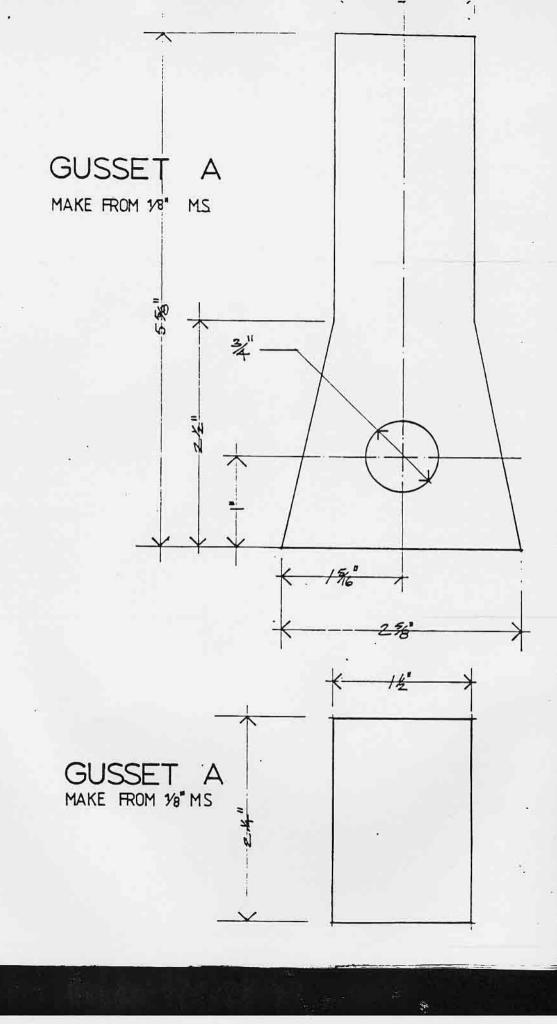


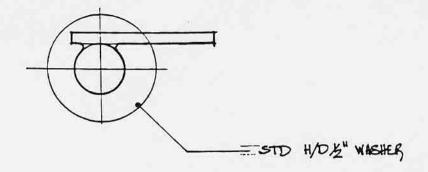


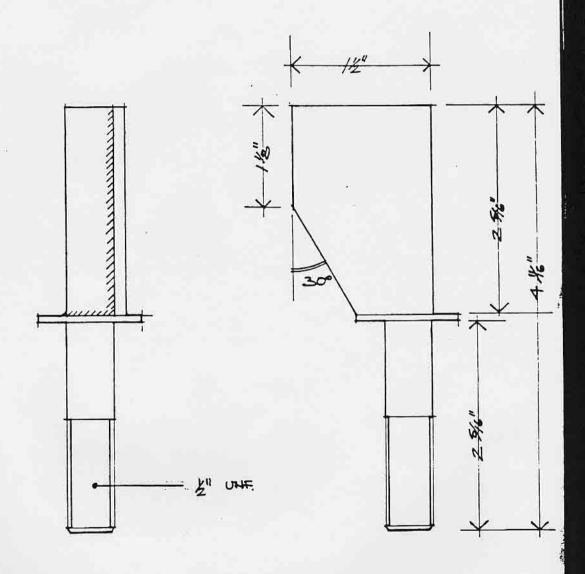
DRAWING H2



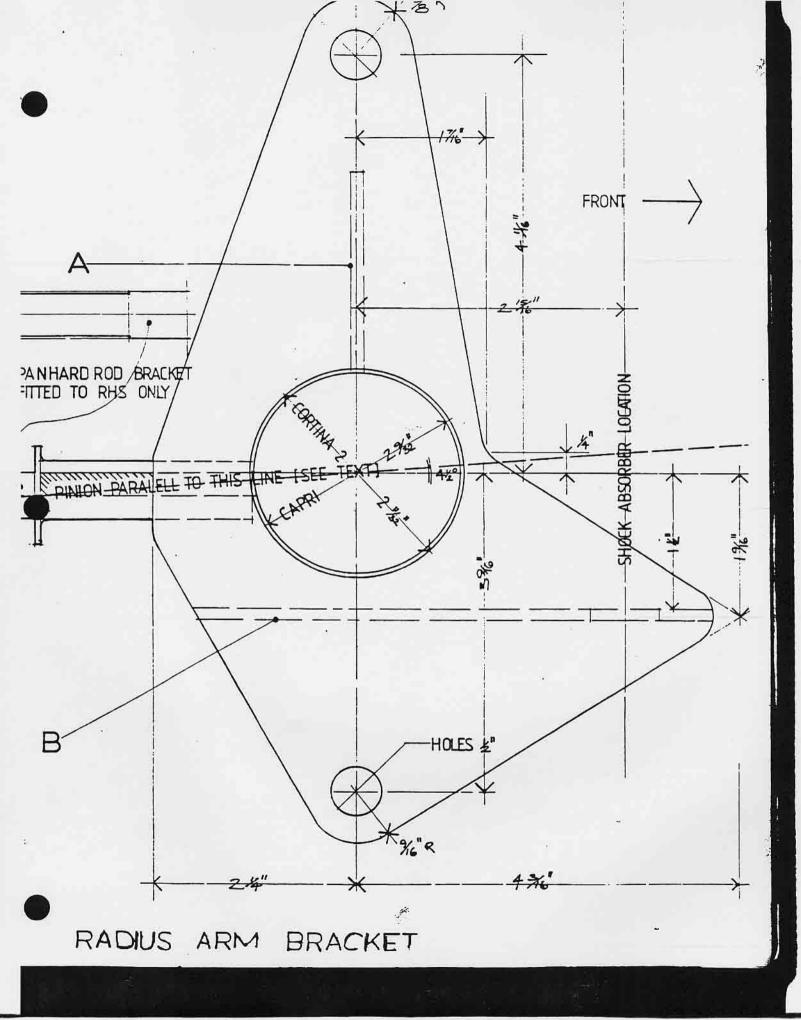
TOP VIEW RIGHT HAND BRACKET

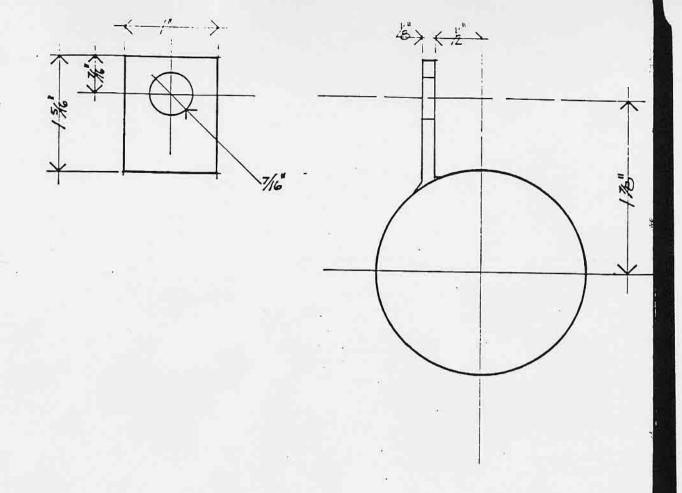


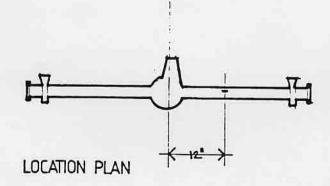




PANHARD ROD BRACKET







BRAKE PIPE SUPPORT BRACKET

SMITHS INDUSTRIES LIMITED OF WARCOS CARS KODEL 1600 KODEL 1800S MOTOR ACCESSORY SALES & SERVICE OWSION

(1964 - 1970)

286.6

SERVICE REPLACEMENTS AND OPTIONAL EQUIPMENT

VEHICLE MAK 261 -3.0"Cap 3.0 3.0 16,7 d SPEC. \* AE \* AE 4 APRIL 1967 SMITHS INDUSTRIES CODE No. RVI.2410/02 RVI.2410/02 TT.6811/00 BF.2201/09 PHW.1273/30 FHC. 6101/02 TB.111/013 FT. 5300/112 DI.1314/05 PHC, 6132/05 DF-1334/00 SN.6135/08 DP.1104/00 PL-2302/27 DF.1104/00 TL.2302/17 SN.6135/11 SN. 6135/12 FG.2333/12 PL.2302/27 BR.1300/01 PES 3086 FIB. 3392 FILL 4 3.2 PHF. 2301 SHP. 7914 BT.2204, VEHICLE MAKERS PART No. - MARCH 1967 3.0" Cap 3,00 3.6 16 7 d F 5'3" SPEC. BG S S 8 B 8 SMITHS INDUSTRIES CODE No. MAY 1966 RVI.2402/02 FT. 5300/112 PL. 2302/27 RVI.2402/02 TB, 1114/013 DF.1104/00 DI.1314/05 FHW, 1273/30 FHC. 6132/05 FHC, 6101/02 SN. 6135/12 DF-1334/00 TT.6811/00 BP.2201/09 PL.2302/27 BR.1300/01 SN. 6135/08 11/5513,NS TL.2302/17 FG.2333/12 PES. 3086 BT.2204/ PHF. 2301 FIB. 3392 FHW. 4.3.2 SHF. 7914 JUNE 1964 L'APRIL 1966 VEHICLE MAKERS 3'0"Cap P 5 30 6.4. SPEC. 8 2 SMITHS INDUSTRIES CODE No. RVI.2402/02 FHW-1273/30 FT. 5300/112 FHC. 6132/05 PHC. 6101/02 DP. 110./00 TL.2302/17 SN.6135/08 DP-1104/00 FG-2333/12 PL. 2302/27 PES. 3086 FIN. 4.342 PHF. 2 301 SHP. 7914 FHB. 3392 (Miles) (K110s) Wiles) (RHS) RHS EQUIPMENT (Mater) Speedometer Flex Complete Heating Equipment (P.250) Speedometer Flex Complete Speedometer Flex Complete Radiator & Seals only Transmitter (Temp. Ind. MODELS 1500S and 1600 Temperature Indicator Revolution Indicator Revolution Indicator Push/Pull Control Push/Pull Control Inner Flex only Outer Flex only Water Valve only 011 Pressure Gauge Voltage Stabiliaer 0il Pressure Gauge MODELS 1500S 1600. Temperature Gauge Motor only Speedometer Speedometer KODEL 1800S Speedometer Blower Unit Heater Unit Fuel Gauge Fuel Gauge Tank Unit Tank Unit

4" Impulse Type 8000rpm 4 Cylinder Positive Earth.
4" Impulse Type 8000rpm 4 Cylinder Negative Earth.
Inner Flex only DI.1110/00 Outer Flex only D0.1104/00 Chrome Bezel Black Dial White Printing & Pointer 12 Volt. with previous code INTERCHANGEABLE 8 Mariantes a change SPECIFICATION

Indicates a change NOT INTERCHANGEABLE with previous code

MODEL 15008 MODEL 1600 MODEL 18008 CARS

286.

(1964 - 1970)

MOTOR ACCESSORY SALES & SERVICE DIVISION SMITHS INDUSTRIES LIMITED

2 LITRE V.4 & 3 LITRE V.6 (1969 - 1973) MARCOS

286.7

SERVICE REPLACEMENTS AND OPTIONAL EQUIPMENT

VEHICLE MAKE 286.7 SPEC. SMITHS INDUSTRIES CODE No. VEHICLE MAKERS PART No. NOVEMBER 1970 - 1973 SPEC. \* AC 日日 4 4 FHC. 6132/05 FHC. 6101/02 SHB. 3134/04 SMITHS INDUSTRIES CODE No. PL.2302/27 BR.1300/01A BR.1311/00 FHW. 1273/30 FHB. 5402/24 RVI.2410/02 RVI.2611/02 BT.2204/08 TT.6811/00 TT.3802/00A BF.2201/09 TB.1114/013 FHM. 5352/04 SN. 6135/13 SN. 6135/14 PES. 7569/3 SHF. 7914 FHF.2301 N. O. K. VEHICLE MAKERS PART No. OCTOBER 1969 - OCTOBER 1970 SPEC. A B 7 7 FHC, 6132/05 FHC, 6101/02 BT.2204/08 TT.6811/00 TT.3802/00A SN.6135/11A SN.6135/12A SMITHS INDUSTRIES CODE No. PHW, 1273/30 RVI.2410/02 RVI.2611/02 SHB. 31 34/04 FHN. 5352/04 BP.2201/09 TB.1114/013 PL.2302/27 BR.1300/01 BR.1311/00 FHB. 54.02/24 SHP. 7914 PES. 7569 N.O.N 52mm (Miles) (K1108) 52mm 52mm Transmitter (Temp, Ind.) FORD ENGINE Transmitter (Temp, Ind.) VOLVO ENGINE VOLVO ENGINE FORD ENGINE 2 LITRE V.4 EQUIPMENT WATER (AIR) Radiator & Seals only Temperature Indicator Pugh/Pull Control Push/Pull Control Water Valve only Voltage Stabiliser Voltage Stabiliser 0il Pressure Gauge Runner only 44 Heating Equipment Speedometer Flex Rev. Indicator Motor only Blower Unit Heater Unit Speedometer Speedometer Fuel Gauge Tank Unit

\* Indicates a change NOT INTERCHANGEABLE with previous code with previous code INTERCHANGEABLE Indicates a change

Chrome Berel Black Dial White Printing & Pointer 12 Volt. 4" Nemas Angle Trip 140mph 1000rpm/220kph 620rpk, 4" Nemas Angle Trip 140mph 900rpm/220kph 562.5rpk, 4" Impulse Type 8000rpm 4 Cylinders Negative Earth in Impolse Type 6000 mm 6 cylinders Wooptive Earth 8 SPECIFICATION FINISH

MARCOS 2 LITRE V.4 3 LITRE V.6

(1969

- 1973)

SMITHS INDUSTRIES LIMITED

MANTIES MARCOS MOTOR ACCESSORY SALES & SERVICE DIVISION

(1970 - 1973)

286.8

SERVICE REPLACEMENTS AND OPTIONAL EQUIPMENT

VEHICLE MAKERS PART No. SPEC. SMITHS INDUSTRIES CODE No. VEHICLE MAKERS PART No. 000761 000638 000755 049000 619000 000635 549000 000642 092000 222000 - 1973 SPEC. # VB B 8 5 LAY 1971 FHB 8301/011 FHK 1201/02 SHF 3824 SMITHS INDUSTRIES CODE No. 00-891-17/-17 FHC. 1830/09 FH7. 1306/03B TBS,1114/012 31-634-583-01 FFF. 1215 FHM. 5761/03 SHF. 7925/06 FHC, 1830/10 FIR. 3425/05 RVI,1613/01 PL.2312/04 BV.2204/03 BR. 1307/00 SN. 5226/19 SN. 5226/22 BT.2204/21 BF.2201/27 TT. 6811/01 31-781-538 PES.7775 N.O.M. VEHICLE MAKERS PART No. 000755 079000 000760 000761 000762 000635 000638 179000 619000 777000 000642 000643 - AFRIL 1971 SPEC. SEPTEMBER 1970 7 AB 5 BF.2201/27 TBS.1114/012 31-634-583-01 31-781-538 FHB. 8301/01 FHM. 1201/02 FHC.1830/09 FHW.1306/03B SMITHS INDUSTRIES 00-891-142-14 FFF. 1215 FHM. 5761/03 FHC, 1830/10 SHF. 7925/06 FIR. 3425/05 RVI.1613/01 BT.2204/21 TT.6811/01 PL.2312/04 BV.2204/03 BR.1307/00 SN. 5226/19 SHF. 3824 CODE No. PES . 7775 N.O.M. (Wiles) 52mm 52mm 52 E EQUIPMENT Motor & Mounting Shell only Speedometer (DIST) (WATER VALVE) Oil Pressure Gauge Battery Condition Indicator Radiator & Seals only Transmitter (Temp. Ind.) Rotor Assembly only Temperature Indicator Revolution Indicator Engine Cooling Motor Heater Unit only Engine Cooling Fan Voltage Stabiliser Tank Locking Ring Tank Sealing Ring Heating Equipment Speedometer Flex Remote Control Lever Control Motor only Speedometer Speedometer Water Valve Fuel Gauge Tank Uni

Indicates a change NOT INTERCHANGEABLE with previous code

A Black Bezel Black Dial White Printing 12 Volt Negative Earth. Indicates a change INTERCHANGEABLE with previous code

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MANTIS (M. 70) MARCOS

286.8

(1970 - 0791)