Subsequent Installation and Testing of Car Radio

Job No. 82 — 20

(Optional, SA 55152 and SA 55160)

In addition to the radios made by the two firms of

Becker and Telefunken

which have been approved for installation at works, the Sindelfingen works has approved the radios made by the two firms of

Blaupunkt and Philips

for subsequent installation at branches and agencies.

All the suppliers of car radios issue installation instructions with the sets and also a digest of the list of parts. The car radios should be fitted according to the installation instructions. The latest modifications are incorporated in the instructions in each case. For this reason, no detailed data on the subject have been included in this Workshop Manual.

The same applies to the installation of aerials. Those made by the firms of Sihn and Hirschmann have been approved. Drilling templates are supplied together with the installation instructions. The templates make the work of installation considerably easier.

When a car radio is installed, the whole ignition system must be fitted with suppressors. Methods of interference suppression are indicated in the installation instructions and these enable complete suppression to be obtained for VHF reception. The most important parts of the suppression system are:

Suppressed spark plugs — resistance of . . . . . 5000 Ohms

Suppressed distributor rotor arm — resistance of . . . . . 5000 Ohms

Suppressed plug contacts for the ignition cables at the distributor and at the spark plugs — each resistance of . . . . . 5000 Ohms

Suppressed plug contacts for the high tension cable from the ignition coil to the distributor at the distributor end — resistance of . . . . . 5000 Ohms

Note: With such an all-embracing system of interference suppression, a particularly unfavourable combination of factors might lead to misfiring under full-load conditions and at high engine speeds, since the suppressor resistors reduce the actual spark considerably. In such cases it is advisable to remove the suppressed plug contacts at the distributor and if necessary, also the suppressed plug contact of the high tension cable from the ignition coil to the distributor. It will then be necessary to put up with some slight ignition interference in VHF and short-wave reception; the interference level is, however, tolerable if the radio station is tuned to the exact carrier frequency.

If the installation of the radio is carried out strictly according to the installation instructions, there is as a rule no possibility of interference or of malfunction.

In this connection it should be noted that only those suppressed spark plugs approved by us may be used and that the specified electrode gap of 0.9—1.0 mm must be maintained (see also Job No. 01—3, Section C).

The following hints are designed to facilitate the servicing of installed car radios in which faults develop.

Trouble-Shooting Hints for Radio

No Reception or Faulty Reception	
Cause	**Remedies**
Set the wave-change switch on medium wave, tune in several stations with the tuning knob and check the reception.	
1. No battery voltage or battery voltage too low. With the car engine stopped, switch on the radio and turn the volume control to full.	1. Measure the battery voltage at the radio feed-in leads; it must be at least 11 Volts. If there is no battery voltage: Check the fuse, the leads and the battery connection and if necessary, replace the fuses or attend to the battery connection. If the battery voltage is too low: switch off the set immediately and once more check the voltage. If the voltage is then normal, there is a short-circuit in the set and the set must be removed from the vehicle. If the battery voltage is the same whether the set is switched on or not or if there is very little voltage difference, the battery is not fully charged or the contact resistance in the leads or in the contacts is too great.
2. Switch or switch-on relay defective. Check the battery voltage at the contact of the automatic aerial.	2. If there is no voltage, remove the set from the vehicle.
3. Aerial plug not plugged in.	3. Push the aerial plug into the aerial socket.
4. Loud-speaker or loud-speaker connections defective.	4. Check the loud-speaker and the connections to the converter. Try the set with another loud-speaker connected. Attend to the connections at the converter or remove and repair the set.
5. Vibrator defective.	5. Check whether the vibrator is actually operating by listening at the converter. If necessary, replace the vibrator.

Cause	Remedies
6. Short-circuit in aerial.	6. Connect another aerial temporarily to the set. If the reception is now good, replace the aerial. **Note:** Penetrating damp or bodywork shampoo can cause short-circuiting in a car aerial and this affects the reception of the set. It is not possible, however, to measure the resistance of an aerial circuit with a D. C. Ohmmeter. The simplest way of checking the efficiency of the aerial, therefore, is to compare its performance with that of another car-aerial, known to be in good order.
7. Wave-change switch defective.	7. Check the reception in all wave ranges. If reception is nil or unsatisfactory on one or more wave ranges, remove the set from the vehicle.
8. Automatic tuning defective.	8. Check the automatic tuning of the set in all wave ranges, setting the sensitivity switch to the position "empfindlich" ("sensitive"). If no stations can be received or if too few are received or if all stations are off tune, remove the set from the vehicle.

Electrical Interference Noises with Engine Running

Cause	Remedies
When the starter is being operated, the car radio should always be switched off in order to avoid any possible damage to the vibrator, due to supply-voltage drops. All wave ranges should be checked with the engine running and interference in one or more of the ranges noted.	
1. Ignition interference: Characterized by audible chattering which varies with the engine speed. If the ignition is switched off for a moment, the interference disappears.	1. Check the interference suppressors of the ignition system according to the instructions on interference suppression. At the same time check the distributor contacts to see if they are oiled-up or dirty.
2. Regulator cut-out switch interference: This takes the form of irregular crackling noises which can also be heard with the ignition switched off.	2. Check the interference suppression of the regulator cut-out switch, if necessary, ground the regulator cut-out switch housing with a ground tape.
3. Generator interference: This kind of interference takes the form of so-called collector-singing and is also audible when the ignition is switched off.	3. Check the generator interference suppression and install an electrically conducting fan belt.

Cause	Remedies
Note: The interference symptoms mentioned in 2 and 3 can best be checked with the ignition switched off and the vehicle moving. Slight interference, due to static charges, can by caused by the fan belt of the generator.	

Interference Noises at High Speeds

Cause	Remedies
Static charges: These take the form of crackling noises which disappear when the foot brake is operated.	Check the wheel-hub suppressors or if these are not fitted, fit them to the front wheels.

Atmospheric or other Interference Noises

Cause	Remedies
1a) Atmospheric interference: This is due to electrical storm disturbances in the atmosphere and is particularly strong in the long wave range. 1b) Interference from a high tension supply or from electrical apparatus, such as street cars or electric motors: Interference of this kind is particularly strong in the medium and long wave ranges. 1c) Interference from other vehicles, not fitted with interference suppression: Such interference is particularly strong in VHF reception.	1a)—1c): In order to ascertain whether the interference is coming from an external source, pull the aerial plug out of the set. If the interference disappears, the cause must be atmospheric interference or interference from some other external source. There is no remedy for this.
2. Interference caused by faulty contacts in the set or in the vehicle.	2. Check in the same way by pulling out the aerial plug. If in spite of this the interference is still audible, the fault must lie in the leads and in the ground connections. The set must therefore be removed from the vehicle.

Note: Any defects in the car radio which cannot be detected and put right with the methods and tests described above, must be repaired by a radio specialist. The radio should be removed from the vehicle and sent for repair to the agency of the firm producing the set.